

FLORA
OF
TROPICAL EAST AFRICA

prepared at the Royal Botanic Gardens, Kew in cooperation with the East African Herbarium, the National Herbarium of Tanzania and the Herbaria of Makerere University and Dar es Salaam University

EDITOR

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CYPERACEAE

BY

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CYPERACEAE

K. HOENSELAAR, B. VERDCOURT & H. BEENTJE*

Herbs, often tufted and with rhizomes or stolons, sometimes at base with very short internodes forming a tuber or corm. Stems solid or hollow, triangular or less often rounded or 4–6-angular or flattened, sometimes with transverse septa. Leaves (sub)basal or with a few cauline, usually in 3 ranks, with a usually closed sheath and a linear blade, the lowermost often reduced to a sheath. Inflorescence terminal (rarely pseudolateral), paniculate, spicate, anthelate or capitate or combinations thereof, with few to many spikelets, sometimes much reduced; often subtended by leafy involucre bracts. Spikelets with few to many flowers, each subtended by a glume (bract), glumes spirally arranged or distichous; flowers unisexual or bisexual. Stamens 1–3(–6); anthers basifixed, introrse. Ovary solitary and superior, 1-locular, of (2–)3 joined carpels; hypogynous scales or bristles absent or 3–6; style most often with 2–3 branches. Fruit a 1-seeded nutlet, sessile or nearly so, sometimes (in *Carex*, *Schoenoxiphium*) surrounded by a sac-like utricle.

104 genera and 5,000 species, especially in the tropics and subtropics, but with the large genus *Carex* well-represented in temperate zones. Often in moist conditions, and can be the dominant plants in wetlands.

KEY TO THE GENERA

[adapted by HB from Goetghebeur in Kubitzki, *Fam. Fl. Gen. Pl.* 4: 154–159 (1998)]

1. Flowers with 1 pistil and 2–3 stamens set between
a pair of keeled ciliate scales; forest species 1. **Hypolytrum** p. 6
- Flowers without lateral ciliate scales 2
2. All flowers unisexual 3
- All flowers bisexual, or at least 1 flower bisexual,
other flowers usually male (Cyperoideae) 8

* Kim Hoenselaar (c/o Herbarium, Royal Botanic Gardens, Kew) wrote up most of *Cyperus* and all of *Carpha*, *Cladium*, *Coleochloa*, *Machaerina*, *Pycnus*, *Rhynchospora* and *Tetraria* (± 180 species)

Bernard Verdcourt (c/o Herbarium, Royal Botanic Gardens, Kew) contributed *Abildgaardia*, *Alimula*, *Bolboschoenus*, *Bulbostylis*, *Carex*, *Courtoisina*, *Fimbristylis*, *Nemum*, *Queenlandiella*, *Remirea*, *Schoenoxiphium*, *Scleria*, *Sphaerocyperus* and *Websteria* (a total of 175 species); he also wrote the *Fuirena* treatment, based on the article in K.B. by Dr Muasya.

Henk Beentje (Herbarium, Royal Botanic Gardens, Kew) contributed *Ascolepis*, *Diplacrum*, *Eleocharis*, *Kyllinga*, *Kyllingiella*, *Lipocarpa*, *Oxycaryum* and *Schoenoplectiella*, and a small part of *Cyperus* (a total of ± 110 species). I would like to thank Dr Robert Vogt of the B herbarium for access to the important type collections in the Berlin Herbarium.

Muthama Muasya (Bolus Herbarium, University of Cape Town, South Africa) contributed *Ficinia* and *Isolepis*; his revision of *Fuirena* was adapted by BV.

Dave Simpson (Herbarium, Royal Botanic Gardens, Kew) contributed *Hypolytrum*.

3. Female flowers enclosed in a \pm utriculiform prophyll, and subtended by a bract; usually several flowers together, forming a female spike or the basal part of a bisexual spike (Caricoideae) 4
 Enclosing prophyll absent (Scleroideae, abnormal Cyperoideae) (loose utricle in *Coleochloa*) 5
4. Rachilla usually small and not protruding; utricles closed except for small apical hole . 35. **Carex** p.421
 Rachilla protruding in at least a few spikelets; usually some of the utricles partly open 34. **Schoenoxiphium** p.417
5. Leaves distichous, with open sheath and deciduous blade; inflorescence paniculate, with dense spikes of many few-glumed and 1–2-flowered spikelets; nutlets fusiform and long-beaked, surrounded at base by 3 long-fimbriate small scales 31. **Coleochloa** p.373
 Leaves usually 3-ranked (not in *Machaerina*); nutlets not long-beaked, scales absent; inflorescences various 6
6. Most leaves with well-developed blade; female spikelets 1-flowered or bisexual spikelets with 1 female flower; style base not distinct 7
 Leaves basal, reduced to a tubular \pm hyaline sheath; female spikelets many-flowered; inflorescence reduced to 1 terminal spikelet; style base distinct and thickened 6. **Eleocharis** p.36
7. Part of the spikelets bisexual with 1 female flower; if all spikelets unisexual, then female spikelets with reduced male flowers, or with reduced rachilla apex; male flowers usually with 3 stamens; contraligule usually well-developed 32. **Scleria** p.378
 All spikelets unisexual, female spikelet 1-flowered and surrounded by 2 empty glumes; rachilla apex reduced; male flowers usually with 1 stamen; contraligule usually not developed 33. **Diplacrum** p.415
8. Bisexual flowers with hypogynous bristles or scales (the single adaxial rachilla remnant of some genera should not be confused with a bristle) 9
 Bisexual flowers without hypogynous bristles or scales 20
9. Glumes, or glume-like scales, distichous, or glumes 2 10
 Glumes spirally arranged 14
10. Style 2-branched 11
 Style 3-branched 12
11. Plants aquatic, floating or submerged, with many pseudoverticillate vegetative branchlets; inflorescence of 1 spikelet; hypogynous bristles 6–11, longer than fruit 7. **Websteria** p.47
 Plants never completely aquatic, \pm unbranched; inflorescence of more than 1 spikelet; bristles 0–6, at most as long as the fruit 26. **Rhynchospora** p.356

12. Anthers conspicuously greenish yellow; leaves
 eligulate; hypogynous bristles 6 28. **Carpha** p.366
 Anthers not greenish yellow 13
13. Leaves distichous, eligulate, laterally compressed
 to subterete, never dorsiventrally flattened 29. **Machaerina** p.369
 Leaves spirally arranged, often ligulate 30. **Tetraria** p.371
14. Style 2-branched 15
 Style 3-branched 16
15. Leaves without a blade, or with short blade;
 inflorescence pseudolateral 4. **Schoenoplectus** p.24
 Leaves with well-developed blade 3. **Bolboschoenus** p.23
16. Inflorescence reduced to a single spikelet 4. **Schoenoplectus** p.24
 Inflorescence anthelate, paniculate or capitate 17
17. Inflorescence paniculate 2. **Fuirena** p.8
 Inflorescence anthelate or capitate 18
18. Leaves usually reduced to a sheath, or with
 short blade; inflorescence pseudolateral, the
 lowermost involucrel bract erect 4. **Schoenoplectus** p.24
 Leaves present; inflorescence terminal; involucrel
 bracts spreading 19
19. Leaves eligulate 3. **Bolboschoenus** p.23
 Leaves ligulate, the ligule tubular and hairy 2. **Fuirena** p.8
20. Glumes distichous, or only 2 in number
 (*Abildgaardia* with the lower ones distichous,
 the upper spiral) 21
 Glumes spirally arranged 39
21. Style 2-branched 22
 Style 3-branched 27
22. Inflorescence of 1–several sessile spikes, each
 with many bracts subtending reduced
 spikelets with 1–few glumes 23
 Inflorescence anthelate or capitate; spikelets
 with many distichous glumes 25
23. Spikelet bract longer than spikelet glume 25. **Lipocarpha** p.347
 Spikelet bract shorter than spikelet glume 24
24. Glumes 2 or more; nutlet laterally compressed 24. **Kyllinga** p.310
 Glume 1; nutlet dorsiventrally compressed 21. **Ascolepis** p.266
25. Nutlet dorsiventrally compressed 16. **Cyperus** p.132
 Nutlet laterally compressed 26
26. Glumes persistent on a deciduous rachilla, the
 spikelet falling as a unit; plant smelling of
 curry 23. **Queenslandiella** p.308
 Glumes deciduous; rachilla of spikelet usually
 persistent; plant not aromatic 22. **Pycurus** p.274
27. Spikelets with several empty glumes, only 1–2
 glumes each subtending a flower 28
 Spikelets usually many-flowered (1-flowered in
Ascolepis, *Remirea*); empty glumes rare (in
Remirea, *Courtoisina*, *Alinula*), or spikelets
 reduced to 1–2 glumes 30
28. Inflorescence paniculate 29
 Inflorescence capitate, a dense globose cluster 19. **Sphaerocyperus** p.261
29. Leaves distichous, eligulate, laterally compressed
 to subterete, never dorsiventrally flattened 29. **Machaerina** p.369
 Leaves spirally arranged, often ligulate 30. **Tetraria** p.371

30. Nutlet base with cup-like disk; glumes with many parallel veins 12. *Ficinia* p.118
 Not this combination of characters 31
31. Style base distinct, thickened, persistent or deciduous 32
 Style base neither distinct nor thickened, persistent 34
32. Leaf sheath opening with long hairs; style base often persistent (if deciduous, then nutlet usually transversely rugose) 9. *Bulbostylis* p.64
 Leaf sheath opening without hairs; style base deciduous 33
33. Nutlet > 1 mm long, conspicuously clavate-stipitate; glumes usually \pm coriaceous; inflorescence always with 1–few spikelets . . . 10. *Abildgaardia* p.112
 Nutlets usually < 1 mm long, rarely stipitate; glumes usually more delicate; inflorescence often with many spikelets 8. *Fimbristylis* p.49
34. Spikelet with two or more glumes 35
 Spikelet reduced to a single glume (with or without the spikelet prophyll) superposed to the spikelet bract 37
35. Beach plant with long creeping rhizome; leaves many, cauline, thick; inflorescence capitate; spikelets with 3–4 glumes; upper rachilla internode enlarged and corky and clasping the nutlet 18. *Remirea* p.260
 Without this character combination 36
36. Annual plants smelling of curry; inflorescence anthelate with digitately arranged spikelets; spikelets deciduous as a unit; glumes with winged keel 17. *Courtoisina* p.257
 Without this character combination 16. *Cyperus* p.132
37. Spikelet bract longer than spikelet glume . . . 25. *Lipocarpha* p.347
 Spikelet bract shorter than spikelet glume 38
38. Prophylls of spike and spikelet absent; glumes usually > 3 mm long (except in *A. pusilla*, *A. erythrocephala*) 21. *Ascolepis* p.266
 Prophylls of spikes and spikelets present; annuals, glumes < 2 mm long 20. *Alinula* p.263
39. Style 2-branched 40
 Style 3-branched 49
40. Inflorescence paniculate 41
 Inflorescence anthelate, capitate, or reduced to 1 spikelet 42
41. Style base distinct and thickened; spikelets 1–more-flowered, all flowers bisexual or the upper male; glumes usually deciduous 26. *Rhynchospora* p.356
 Style base not distinct, corky-thickened; spikelets 2–3-flowered, the lower male, the upper bisexual; glumes long-persistent . . . 27. *Cladium* p.364
42. Glumes often empty, 1–few glumes subtending a flower; flowers bisexual, or the upper male; style base distinct and thickened 26. *Rhynchospora* p.356
 Glumes usually each subtending a bisexual flower (the lower 1–2 empty in *Fimbristylis*) 43

43. Style base distinct and thickened 8. *Fimbristylis* p.49
 Style base neither distinct nor thickened 44
44. Glumes long-persistent, dark reddish brown to black, \pm scarious; nutlet blackish, smooth and shiny 11. *Nemum* p.116
 Without this character combination 45
45. Inflorescence terminal, primary bracts spreading 46
 Inflorescence pseudolateral, the lowermost involucrel bract erect 47
46. Floating aquatic with inflorescence an open umbel; glumes persistent, apically thickened; nutlet corky 14. *Oxycaryum* p.126
 Inflorescence capitate; glumes not thickened apically; nutlet not corky 25. *Lipocarpha* p.347
 (and some *Kyllingiella* with 2-branched style)
47. Glumes with many parallel veins 13. *Isolepis* p.120
 Glumes 1-veined, or with veins converging towards the apex 48
48. Glumes \gg 1.5 mm 4. *Schoenoplectus* p.24
 Glumes (glume-like scales) $<$ 1 mm 25. *Lipocarpha* p.347
49. Spikelets with several empty glumes, only 1–2 subtending a flower 16. *Cyperus* p.132
 Spikelets with several empty glumes, one glume with 2 stamens, one (top) glume with bisexual flower 27. *Cladium* p.364
 Spikelets usually many-flowered; empty glumes rare (in *Fimbristylis*, *Fuirena*) 50
50. Style base distinct, thickened 51
 Style base neither distinct nor thickened 52
51. Leaf sheath opening with long hairs; style base often persistent (if deciduous, then nutlet usually transversely rugose) 9. *Bulbostylis* p.64
 Leaf sheath opening without hairs; style base deciduous 8. *Fimbristylis* p.49
52. Inflorescence pseudolateral, the lowermost involucrel bract erect 53
 Inflorescence terminal; involucrel bracts spreading 54
53. Nutlet with basal cup-like gynophore 12. *Ficinia* p.118
 Nutlet with no such cup-like structure present go to 47 again
54. Inflorescence paniculate 2. *Fuirena* p.8
 Inflorescence anthelate or capitate 55
55. Nutlet base with cup-like disk; glumes with many parallel veins 12. *Ficinia* p.118
 Nutlets without such a cup; glumes few-veined 56
56. Plants small, perennial; culm base with fibrous remnants of leaf sheaths 15. *Kyllingiella* p.128
 Plants annual 57
57. Involucrel bracts long, leaf-like; inflorescence of several spikes, each with many crowded spikelets 16. *Cyperus* p.132
 Involucrel bracts rather short; inflorescence of a few false spikelets (really spikes) with many false glumes (really bracts of reduced spikelets) 25. *Lipocarpha* p.347

1. HYPOLYTRUM*

Rich. in Pers., Syn. 1: 70 (1805); Nelmes in K.B. 1955: 63–82 (1955)

Robust, rhizomatous, perennial herbs; roots coarse; cataphylls subtending lateral culms only, the upper ones with at least part of the margins adnate at first and completely sheathing the culm, later splitting; culms usually scapose. Leaves eligulate; basal leaf sheaths open adaxially, cauline leaf sheath tubular. Involucral bracts leaf-like. Inflorescence terminal, paniculate, the ultimate branches subtending small clusters of spikes; spikes ellipsoid or narrowly cylindrical, composed of tightly imbricate, spirally arranged bracts, each subtending a much reduced pseudanthium (spicoid). Spicoid composed of a naked terminal pistil and (2–3) floral bracts each subtending a single stamen, and a naked terminal pistil; floral bracts free, membranous, boat-shaped, strongly keeled; anthers oblong to linear, laterally dehiscent, without extended connective tip; filaments filiform, exceeding spicoid bract; stigma branches 2(–3); style elongate, rarely persistent. Nutlet compressed-ellipsoid to ellipsoid, apical portion spongy, triangular, base shortly stipitate or triangular stipitate; surface with or without longitudinal ridges, lateral costae 0 or 2.

About 50 species; tropics and subtropics.

- | | |
|--|----------------------------|
| 1. Culms several, lateral; cauline leaves absent | 1. <i>H. heteromorphum</i> |
| Culm solitary, central; 1–3 cauline leaves present | 2. <i>H. testui</i> |

1. **Hypolytrum heteromorphum** Nelmes in K.B. 1954: 522 (1955); Haines & Lye, Sedges & Rushes E. Afr.: 326, fig. 669 (1983). Type: Tanzania, Bukoba District: Bukoba, *Watkins* 526 (K!, holo.)

Robust, rhizomatous perennial; culms lateral, 24–50 cm long, compressed-terete, 1–2 mm wide, smooth to slightly scabrid in upper part. Leaves all basal, coriaceous, linear, 30–80 × 1–1.7 cm, gradually narrowed, acute, flat or slightly plicate, margins entire to serrulate; sheath 6.5–8 cm long, 0.7–1 cm wide (when flattened), membranous margins dark brown. Involucral bracts leaf-like, linear, 2.8–3.5 × 0.1–0.2 cm, acute. Inflorescence stiffly erect, paniculate, comprising up to 4 primary branches 1–3.2 cm long, each subtending 2–7 (rarely more) subsessile spikes; spikes mid-brown, linear-ellipsoid when young to ellipsoid when in fruit, 0.8–1.3 cm long, 1–2(–4 in fruit) mm wide; spicoid bracts ovate, 2.2–2.5 × 1.5–1.8 mm, acute, mid-brown; floral bracts lanceolate (when flattened), 1.4–1.7 mm long, obtuse, keel hispid. Anthers white, oblong, 0.5–0.8 mm long, filaments 1.8–3 mm long. Style 1.3 mm long (including stigma branches). Fruit compressed-ellipsoid, 2.3–2.8 mm long, 1.2–1.4 mm wide, base shortly stipitate, apical portion triangular, acute, surface pale brown with indistinct longitudinal ridges, lateral costae absent. Fig. 1, p. 7.

UGANDA. Masaka District: Malabigambo Forest Reserve, 2 Oct. 1953, *Drummond & Hemsley* 4563! & Namalala Central Forest Reserve 4 km along old railway N of Katera, Oct. 1996, *Lye* 22117!; Mengo District: Semunya Forest Reserve, 16 June 1950, *Dawkins* 598!

TANZANIA. Bukoba District: Minziro Forest Reserve, Aug. 1999, *Sitoni et al.* 732! & Kikuru Forest Reserve, 16 Sept. 1954, *Gillman* 157! & Munene Forest Reserve, April 1958, *Procter* 881!

DISTR. U 4; T 1; widespread in forest areas from Guinea to Congo-Kinshasa

HAB. Swamp forest, in permanently waterlogged situations; 1100–1200 m

2. **Hypolytrum testui** *Cherm.* in Bull. Soc. Bot. Fr. 77: 277 (1930); Haines & Lye, Sedges & Rushes E. Afr.: 326, fig. 670 (1983). Type: Gabon, Lipuizamory, *Le Testu* 6512 (P, holo.)

* By David Simpson, RBG Kew



FIG. 1. *HYPOLYTRUM HETEROMORPHUM* — 1, habit, $\times \frac{1}{2}$; 2, spike, $\times 4$; 3, glume, $\times 12$; 4, spicoid, $\times 12$; 5, diagram of spicoid; 6, fruit, $\times 12$. From Flora of West Tropical Africa 3, t. 413. Drawn by Margaret Stones.

Robust, rhizomatous perennial; culm central, 89–160 cm long, trigonous, 1.9–3.8 mm wide, smooth to scabrid in upper part. Leaves mostly basal but also 1–3 cauline, linear, 57–160 × 1.4–2.4 cm, gradually narrowed, acute, flat or slightly plicate, margins entire to serrulate; sheath 6.5–11 cm long, 1.4–2 cm wide (when flattened), membranous margins pale to mid-brown. Involucral bracts leaf-like, linear, 10–71 × 0.8–1.6 cm, gradually narrowed, acute. Inflorescence paniculate, comprising 7–13 primary branches 0.6–5 cm long, each subtending 7–10 secondary branches 0.5–1.3 mm long, in turn subtending 1–5 spikes; spikes ellipsoid to obovoid, becoming globose in fruit, 0.3–0.6 cm long, 1.5–2(–3 in fruit) mm wide, mid-brown; spicoid bracts mid-brown, oblong to obovate, 2.5–2.8 × 1.5–1.8 mm, obtuse; floral bracts oblong (when flattened), 2.2–2.5 mm long, broadly obtuse, keel glabrous or with 1–2 hairs. Anthers white, linear, 1–1.3 mm long, filaments to 4.5 mm long. Style 2.7–4.7 mm long (including stigma branches). Fruit ellipsoid, 2.3 mm long, 1.2 mm wide, apical portion triangular, obtuse, base triangular-stipitate, surface dark grey green to dark brown, apical portion and base paler, with longitudinal ridges and 2 lateral costae.

TANZANIA. Lushoto District: Amani, 2 March 1950, *Verdcourt* 103!; Tanga District: Mlinga Peak, 7 March 1953, *Drummond & Hemsley* 1447!; Iringa District: Udzungwa Mountain National Park, 0742 S 3653 E, June 2002, *Luke & Luke* 8771!

DISTR. T 3, 6, 7; Gabon, Congo-Kinshasa

HAB. Moist forest; 850–1200 m

SYN. *Hypolytrum nemorum* sensu C.B. Clarke in F.T.A. 8: 487 (1902), *non* (Vahl) Spreng.

NOTE. The name *Hypolytrum nemorum* (Vahl) Spreng. actually refers to a plant which is widespread in tropical Asia and Indomalesia which is distinct from *M. testui*. Much of our material had been named as *H. testui* in the past. Some specimens were determined as *H. leucandrum* Nelmes, although this name was never published; and there appears to be no difference between these specimens and others assigned to *M. testui*.

2. FUIRENA*

Rottb., *Descr. Icon. Rar.*: 70, t. 19 (1773); Muasya in K.B. 53: 187–202 (1998)

Annual or perennial herbs; horizontal woody rhizomes present in perennials. Culms many-noded with leaves throughout their length. Lower leaves with short lobes or reduced to sheaths, upper leaves with larger lobes; blade linear, hairy at least along the margin and at apex with unicellular hairs; sheath well-developed, closed, hairy, ligule tubular and hairy. Involucral bracts leaf-like. Inflorescence a panicle of (sub)digitate or corymbose clusters of spikelets, the branches usually hairy. Spikelets consisting of many erect, loosely imbricate fertile glumes, the lowest 2–3 occasionally sterile, with many flowers. Florets bisexual, sessile, in the axil of a single glume; glume with midrib excurrent into a mucro. Perianth segments** 3 or 6 in 1–2 whorls, outer set of 3 bristles retrorsely barbed or smooth, inner set of 3 sessile or with a stalked lamina, reddish brown. Stamens 1–3, with flattened filaments. pistil with a 3-branched style at apex. Nutlet obovoid, triangular with prominent angles, base cuneate to obtuse, apex with persistent cylindrical style base, surface smooth or tuberculate, cell walls straight or sinuous.

About 30 species in warm-temperate to tropical areas in both hemispheres.

* By Muthama Muasya; additional literature citations, distribution data and synonyms by Bernard Verdcourt

** hypogynous bristles of C.B. Clarke's publications

1. Glabrous annual, or perennial with 3-angled culm; glumes glabrous or with short hairs only (subgen. *Pentasticha*) 2
 Hairy annual, or perennial with 5-angled or terete culms; glumes hairy, with short and long hairs (subgen. *Fuirena*) 6
2. Bristles longer than nutlet; nutlet cell walls sinuous .. 1. *F. stricta* p.9
 Bristles shorter than nutlet or absent; nutlet cell walls straight 3
3. Plant annual; glumes smooth 2. *F. abnormalis* p.10
 Plants perennial; glumes hairy 4
4. Leaves glabrous except on margins and midrib near apex, up to 4 mm wide; spikelets 5-angular 5. *F. welwitschii* p.13
 Leaves pubescent, more than 5 mm wide; spikelets terete 5
5. Leaves with minute hairs, 53–60 µm long; nutlet dark green, surface tuberculate 4. *F. pachyrrhiza* p.13
 Leaves with hairs 80–980 µm long; nutlet white, surface smooth 3. *F. pubescens* p.11
6. Plant perennial, with woody horizontal rhizomes 7
 Plant annual, with minute roots 8
7. Culm 5-angular; inner perianth segments sessile 15. *F. umbellata* p.20
 Culm terete; inner perianth segments with a ciliate stalk 14. *F. ochreate* p.20
8. Perianth segments absent; nutlet surface convex, semi-transparent 6. *F. microcarpa* p.14
 Perianth segments absent or 6; nutlet surface concave, opaque 9
9. Nutlet base obtuse, 0.4–0.6 × 0.3–0.4 mm 7. *F. leptostachya* p.14
 Nutlet base obtuse or cuneate, 0.7–1 × 0.5–0.6 mm 10
10. Leaves glabrous except on margins; glumes with short straight mucro 10. *F. clavisetia* p.16
 Leaves hairy; glumes with a long often recurved mucro 11
11. Perianth segment stalk membranous, glumes with long scabrid mucro 13. *F. zambesiaca* p.19
 Perianth segment stalk smooth, glumes with short smooth mucro 12
12. Nutlet base obtuse; outline of perianth segment lamina square-shaped 13
 Nutlet base cuneate; outline of perianth segment lamina crescent-shaped 14
13. Perianth segment lamina with lateral edges incurved and swollen, with no prominent midrib or veins ... 11. *F. angolensis* p.17
 Perianth segment lamina with lateral edges pointed, not swollen, with midrib and lateral veins, or perianth segments absent 12. *F. ciliaris* p.17
14. Perianth 3-veined; Kenya 9. *F. mutali* p.16
 Perianth 0-veined; Tanzania 8. *F. sagittata* p.16

1. *Fuirena stricta* Steud., Pl. Glum. 2: 128 (1855); Boeck. in Linnaea 37: 99 (1874); K. Schum. in P.O.A. C: 12 (1895); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 648 (1895) & in F.T.A. 8: 465 (1902); Gordon-Gray in Strelitzia 2: 103, fig. 41 (1995); Lye in Fl. Eth. 6: 394 (1998). Type: Madagascar, *Boivin* s.n. (P, hol.; K!, iso.)

Tufted perennial, with culms arising at intervals of less than 10 mm on a short (rarely long) horizontal rhizome, 1–2 mm in diameter; culm trigonous, 25–90 cm tall, 1–2 mm in diameter, but \pm 3 mm in diameter across the sheath; glabrous except just below the inflorescence. Leaf-sheath glabrous, ligule hairy; blade 2–7 \times 0.2–0.4 cm, glabrous except for scabrid margins at the triangular tip, but sometimes with larger hairs on margins and midrib. Inflorescence a subdigitate or paniculate cluster of spikelets; spikelets 4–12 \times 2–4 mm, 5-angled or terete, many-flowered; glumes 2.2–3.1 mm long, including a 0.3–0.5 mm long mucro, with short hairs. Perianth segments 6, in 2 whorls, all similar and reduced to bristles with recurved barbs. Nutlet 1.3–1.9 \times 0.5–0.9 mm, including style-base up to 0.1 mm long, dark brown or dark green, base cuneate, surface concave and smooth.

subsp. **stricta**; Haines & Lye, *Sedges & Rushes E.Afr.*: 42, fig. 14a, 36–37 (1983); Muasya in K.B. 53: 192 (1998)

Spikelets 5-angled; mature nutlets brown.

UGANDA. Acholi District: Lolim, 12 June 1957, *Buechner* 65!; Masaka District: Lake Nabugabo, 1 Feb. 1970, *Lye & Haines* 5012! & Lake Nabugabo, 7 Oct. 1953, *Drummond & Hemsley* 4674!

KENYA. North Kavirondo District: Kavirondo, 9 Jan. 1896, *Scott Elliot* 6475!

TANZANIA. Kigoma District: Mwangi, 15 June 1980, *Hooper & Townsend* 1991!; Ulanga District: Mlahi, 13 Oct. 1975, *Vollesen* 2793!; Tunduru District: Puchapucha, 19 Dec. 1955, *Milne-Redhead & Taylor* 7817!

DISTR. U 1, 4; K 5; T 4, 6–8; W, NE and southern Africa; Madagascar and Mascarenes

HAB. Seasonally wet grassland, edge of permanent swamps, often in shallow standing water, also recorded from rock outcrops in *Brachystegia* woodland; 450–2850 m

subsp. **chlorocarpa** (*Ridl.*) *Lye* in *Nordic Journ. Bot.* 3: 241 (1983); Haines & Lye, *Sedges & Rushes E.Afr.*: 43, fig. 38 (1983); *Lye* in *Fl. Eth.* 6: 395, fig. 212.4 (1997); Muasya in K.B. 53: 192 (1998). Type: Angola, Huilla, Lopollo, *Welwitsch* 7113 (BM!, iso.)

Spikelets terete; mature nutlets dark green.

UGANDA. Toro District: Ruwenzori, July 1940, *Eggeling* 3988!; Masaka District: Bugabo, 28 July 1971, *Lye* 6528! & Katera, 23 June 1935, *Thomas* 1284!

KENYA. Trans-Nzoia District: Moi's Bridge, 8 Oct. 1981, *Gilbert & Mesfin* 6529!; Nairobi District: Nairobi, 2 Sept. 1947, *Bogdan* AB 1146!; North Kavirondo District: Kakamega Forest, 21 March 1977, *Hooper & Townsend* 1503!

TANZANIA. Mbulu District: Poroto Mts, March 1969, *Wingfield* 190!; Ufipa District: Tatanda, 9 June 1980, *Hooper & Townsend* 1907!; Songea District: Halau R., 12 Jan. 1956, *Milne-Redhead & Taylor* 8317!

DISTR. U 2, 4; K 3–7; T 1, 2, 4, 6–8; Ethiopia to Angola and South Africa; Madagascar

HAB. Seasonally wet grassland, edge of permanent swamps and streams; 900–2900 m

SYN. *F. chlorocarpa* *Ridl.* in *Trans. Linn. Soc. London, Bot.* 2: 159 (1884); C.B. Clarke in *F.T.A.* 8: 465 (1902); *Napper* in *J. EA. Nat. Hist. Soc.* 25 (1) (110): 20 (1965)

F. stricta *Steud.* var. *chlorocarpa* (*Ridl.*) *Kük.* in *N.B.G.B.* 9: 310 (1925) & in *Bot. Not.* 1934: 78 (1934) & in *F.D.-O.A.* 40: 388 (1932)

NOTE. Gordon-Gray gives the type of *F. chlorocarpa* as 'BM, holo.'; Haines and Lye say the type is at LISU. There is no specimen at K but a drawing made by Ridley with fine detail and presented by him to Kew in 1935–6. Ridley worked at the BM until 1878 and would have seen *Welwitsch's* sedges there, before the top set was finally sent to LISU after the well-known litigation.

2. ***Fuirena abnormalis*** *C.B. Clarke* in *F.T.A.* 8: 462 (1902); *Napper* in *J. EA Nat. Hist. Soc.* 25 (1) (110): 20 (1965); Haines & Lye, *Sedges & Rushes E.Afr.*: 25, fig. 62, 63 (1983); Muasya in K.B. 53: 193 (1998). Type: Mozambique, Tete, Zambesi R., Boroma [Boruma], *Menyhart* 1060 (K!, holo.)

Annual; culm terete, 11–90(–120) cm tall, 1–3 mm in diameter, but \pm 5 mm in diameter across the sheath, glabrous to minutely scabrid below the inflorescence. Leaf-sheath and ligule glabrous, blade 5–11 \times 0.3–0.9 cm, glabrous, or minutely scabrid on upper surface and margins. Inflorescence a paniculate cluster of spikelets; spikelets 3–7 \times 2–3 mm, terete, florets fewer than ten; glumes 1.9–2.5 mm long, including a 0.4–2.5 mm long mucro, glabrous. Perianth segments absent. Nutlet 0.9–1.4 \times 0.8–1.1 mm, including elongated nutlet apex up to 0.1 mm long, black, base obtuse, surface concave, with papillae in transverse wavy lines.

KENYA. Embu District: Riakanau, 13 June 1994, *Muasya* 482!; Machakos District: Kivaa, 23 Feb. 1995, *Muasya* & *Simpson* 783!; Masai District: Masai Mara Game Reserve, 17 Sept. 1978, *Kuchar* 9640!

TANZANIA. Mwanza District: Ukerewe Island, 20 March 1929, *Comrads* EAH 10551!; Singida District: Lake Singida, 27 April 1962, *Polhill* & *Paulo* 2213!; Songea District: Songea, 30 April 1956, *Milne-Redhead* & *Taylor* 9963!

DISTR. **K** 4, 6; **T** 1, 2, 4, 5, 7, 8; Zambia and Mozambique to southern tropical Africa

HAB. Edges of rivers and streams, seasonally wet grassland, and weed of rice fields and abandoned shambas; 900–1850 m

3. ***Fuirena pubescens*** (*Poir.*) *Kunth*, Enum. Pl. 2: 182 (1837); *A. Rich.*, Tent. Fl. Abyss. 2: 497 (1850); *Boeck.* in *Linnaea* 37: 104 (1874) & in *Flora* 62: 566 (1879); *C.B. Clarke* in *Durand* & *Schinz*, *Consp. Fl. Afr.* 5: 648 (1895) & in *Fl. Cap.* 7: 261 (1897); *Engl.*, *Hochgeb. Trop. Afr.*: 146 (1894); *K. Schum.* in *P.O.A. C.* 126 (1895); *Rendle*, *Cat. Afr. Pl. Welw.* 2: 128 (1899); *C.B. Clarke* in *F.T.A.* 8: 463 (1902); *Napper* in *J. EA Nat. Hist. Soc.* 25 (1) (110): 20 (1965); *Gordon-Gray* in *Strelitzia* 2: 101, fig. 39cF & 40 (1995); *Muasya* in *K.B.* 53: 193 (1998). Type: NE Algeria [Numidia], near La Calle, *Poiret s.n.* (P, holo.; see Note)

Perennial, culms arising at 10 mm intervals, from a horizontal rhizome 4 mm in diameter; culm trigonous, 23–116 cm tall, 2–4 mm in diameter, but \pm 6 mm in diameter across the sheath, entirely pubescent, or glabrous except just below the inflorescence. Leaf-sheath glabrous or pubescent; ligule hairy, blade 7–25 \times 0.5–0.9 cm, glabrous, or only lower surface hairy, or entirely pubescent. Inflorescence a subdigitate cluster of spikelets; spikelets 4–11 \times 3–5 mm, terete, many-flowered; glumes 3.8–4.8 mm long, including a 0.5–2 mm long mucro, with short hairs. Perianth segments absent. Nutlet white, 1.2–2 \times 0.8–1 mm, including style-base up to 0.2 mm long, base obtuse, surface convex, with obscure transverse and longitudinal ridges. Fig. 2, p. 12.

var. **pubescens**; *Haines* & *Lye*, *Sedges & Rushes E.Afr.*: 50, fig. 57, 58 (1983); *Muasya* in *K.B.* 53: 194 (1998)

Glumes with mucro 1.2–2 mm long.

UGANDA. Karamoja District: Nakipiripirit, July 1965, *J. Wilson* 1716!; Ankole District: Queen Elizabeth National Park, 8 Oct. 1969, *Lock* 69/328!; Kigezi District: Kachwekano, Dec. 1951, *Purseglove* P3735!

KENYA. Trans-Nzoia District: Kitale, 17 March 1977, *Hooper* & *Townsend* 1423!; Kiambu District: Kikuyu, 11 April 1960, *Verdcourt* 2648!; Meru District: Meru National Park, 15 April 1972, *Ament* & *Magogo* 5!

TANZANIA. Masai District: Ngorongoro crater, Jan. 1963, *Newbould* 6517!; Mbulu District: Tunduma, 10 Jan. 1975, *Brummitt* & *Polhill* 13677!; Songea District: River Nonganonga, 27 April 1959, *Milne-Redhead* & *Taylor* 9932!;

DISTR. **U** 1, 2; **K** 3–6; **T** 1, 2, 4, 6–8 (see note); widespread in Africa, Mascarenes, S Europe

HAB. Seasonally wet grassland, edge of swamps and streams, more open parts of *Miscanthus* swamp; 850–2300 m

SYN. *Carex pubescens* *Poir.*, *Voy. Barbarie* 2: 254 (1789)

Scirpus pubescens (*Poir.*) *Lam.*, *Ill.* 1: 139 (1791); *Poir.*, *Encycl. Meth.* 6: 762 (1804)



FIG. 2. *FUIRENA PUBESCENS* — 1, habit, $\times \frac{1}{2}$; 2, leaf sheath apex, $\times 2\frac{1}{2}$; 3, inflorescence, $\times 1\frac{1}{3}$; 4, glume lateral view, $\times 16$; 5, floret, $\times 17$; 6, achene, $\times 20$. 1–3 from Taylor 36; 4–6 from Browning 165. Reproduced from Strelitzia 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

NOTE. Muasya records this from K 5 and Napper from Zanzibar Is. Barbarie (land of Berbers) is placed by various authors in N Morocco, N Algeria and N Tunisia; Poiret in the 1804 reference states 'cette plante croît en Barbarie—je l'ai rencontrée aux environs de la Calle'. I could find no Calle in north Africa but Calle is an old name for Oporto, and the plant does occur in Portugal; so perhaps he meant to say he had also seen it there. Haines & Lye erroneously state the type is from West Indies.

var. *abbreviata* Lye in Bot. Not. 127: 112 (1974); Haines & Lye, Sedges & Rushes E.Afr.: 50, fig. 59 (1983); Muasya in K.B. 53: 194 (1998). Type: Uganda, Teso District: 16 km ESE of Soroti, Langdale-Brown 2356 (KAW, holo.)

Glumes with mucro 0.5–0.7 mm long.

UGANDA. Teso District: 16 km ESE of Soroti, *Langdale-Brown* 2356!; Mengo District: Namanve, March 1932, *Eggeling* 470! & King's Lake, Aug. 1935, *Chandler & Hancock* 14!
 DISTR. U 1, 2, 4; not recorded elsewhere but see note
 HAB. Papyrus swamp and lake edges; 1050–1200 m

NOTE. The status of this variety is not certain and much of the material from other parts of Africa merges with it; but after study of N African and European material it would not surprise me if all the tropical African material should be referred to this variety.

4. ***Fuirena pachyrrhiza*** *Ridl.* in *Trans. Linn. Soc. London, Bot.* 2: 161 (1884); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 647 (1895) & in *Fl. Cap.* 7: 262 (1897); K. Schum. in *P.O.A. C.* 126 (1895); Rendle, *Cat. Afr. Pl. Welw.* 2: 129 (1899); C.B. Clarke in *F.T.A.* 8: 464 (1902); Napper in *J. EA Nat. Hist. Soc.* 25 (1) (110): 20 (1965); Gordon-Gray in *Strelitzia* 2: 106, fig. 39 B & E (1995); Muasya in *K.B.* 53: 204 (1998). Types: Angola, Pungo Andongo, near Muta Locala, *Welwitsch* 7117 & between Cagui and R. Cuanza, *Welwitsch* 7118 (BM!, syn.)

Perennial, culms arising at \pm 14 mm intervals, from a horizontal rhizome 2–4 mm in diameter; culm trigonous, 20–95 cm tall, 2–4 mm in diameter, but \pm 6 mm in diameter across the sheath, minutely hairy, or glabrous except just below the inflorescence. Leaf-sheath glabrous or minutely hairy, ligule hairy; blade 5–26 \times 0.5–0.9 mm, minutely pubescent. Inflorescence a subdigitate cluster of spikelets; spikelets 7–21 \times 3–7 mm, terete, many-flowered; glumes 3.9–5.9 mm long, including a 1.6–2.9 mm long mucro, with short hairs. Perianth segments absent (but present in *Milne-Redhead & Taylor* 8145). Nutlet greenish-black, 1.3–1.9 \times 0.7–1.9 mm, including style-base up to 0.2 mm long, base obtuse; surface convex and tuberculate.

UGANDA. Teso District: Kumi, 9 May 1970, *Lye* 5372! & Soroti, 23 Mar. 1969, *Haines* 4613! & Bukedea, 6 May 1941, *Thomas* 3854!

KENYA. Northern Frontier District: Dandu, 14 May 1952, *Gillett* 13202!; Uasin Gishu District: near Kapsaret, 21 May 1951, *Williams* G 195!; Masai District: Siria Escarpment, Enkusero area, Dec. 1979, *Msafiri* 982!

TANZANIA. Dodoma District: Rungwa Game Reserve, 22 Feb. 1963, *Mdelwa* 15!; Chunya District: Lupa Forest Reserve, 23 Nov. 1962, *Boaler* 750!; Songea District: Songea, 6 Jan. 1956, *Milne-Redhead & Taylor* 8145!

DISTR. U 1–3; K 1, 4–6; T 1, 2, 4–8; widespread in tropical and southern Africa

HAB. Seasonally wet grassland, seasonal and permanent swamps, seepage areas; 15–2250 m

SYN. *F. macrostachya* Boeck. in *E.J.* 5: 507 (1884). Type: Tanzania, Tabora District: Igonda [Gonda], *Böhm* 73a (B†, holo.; K!, iso.)

F. pubescens (Poir.) Kunth var. *major* Lye in *Bot. Not.* 127: 112 (1974); Haines & Lye, *Sedges & Rushes E.Afr.*: 51, fig. 60–61 (1983). Type as for *F. pachyrrhiza*

NOTE. Lye in *Fl. Eth.* 6: 395 (1997) sinks both *F. pachyrrhiza* and *F. welwitschii* under *F. pubescens*.

5. ***Fuirena welwitschii*** *Ridl.* in *Trans. Linn. Soc. London ser. 2, Bot.* 2: 161 (1884); C.B. Clarke in *Trans. Linn. Soc. ser. 2, Bot.* 4: 54 (1894) & in *Durand & Schinz, Consp. Fl. Afr.* 5: 649 (1895); Rendle, *Cat. Afr. Pl. Welw.* 2: 128 (1899); C.B. Clarke in *F.T.A.* 8: 463 (1902); Muasya in *K.B.* 53: 195 (1998). Type: Angola, Pungo Andongo near Quibanga, *Welwitsch* 7108, Huila, Morro de Monino, *Welwitsch* 7109, near Lopollo, *Welwitsch* 7114 & near Eme, *Welwitsch* 7115 (syntypes BM!)

Perennial, with culms arising at 4–15 mm intervals on a horizontal rhizome 2–4 mm in diameter; culm trigonous, 17–74 cm tall, 1–3 mm in diameter, but \pm 4 mm in diameter across the sheath, glabrous except below the inflorescence. Leaf-sheath glabrous, ligule hairy; blade 6–20 \times 0.2–0.4 mm, glabrous, but scabrid at apex. Inflorescence a subdigitate cluster of spikelets; spikelets 5–20 \times 3–5 mm, 5-angled in transverse section, many-flowered; glumes 3.8–4.8 mm long, including a 1.2–1.9 mm

long mucro, with short hairs. Perianth segments absent. Nutlet brownish, 1–1.5 × 0.6–0.9 mm, including style-base up to 0.2 mm long, base obtuse; surface convex and tuberculate.

UGANDA. Moroto District: Mt Moroto, 11 Feb. 1964, *Tallantire* 64/50!; Masaka District: Kakuto County, 26 Oct. 1996, *Lye* 22098!

KENYA. Northern Frontier District: Ol Lolokwe, 15 April 1979, *Gilbert* 5381!; Nakuru District: Molo, 3 July 1971, *Lye & Katende* 6384!; Kiambu District: Karura Forest, 19 Dec. 1972, *Spjut & Ensor* 2807!

TANZANIA. Arusha District: Arusha National Park, Mt Meru E slope, Nasolo to Tuluusia Hill, 2 April 1968, *Greenway & Kanuri* 13298!; Ufipa District: Sumbawanga, 29 Nov. 1969, *Wingfield* 442!; Dodoma District: Salanga Forest, 21 Jan. 1974, *Richards & Arasululu* 26856!

DISTR. U 1; K 1, 3–6; T 1, 2, 4, 5, 7; southern tropical and subtropical Africa

HAB. Seasonally wet grassland, edges of permanent swamp and streams, seepage areas, pools on granite rocks; 1150–2300 m

SYN. *F. buchananii* Boeck., Beitr. Cyper. 1: 20 (1888); K. Schum. in P.O.A. C: 126 (1895). Type: Malawi, Shire Highlands, *Buchanan* s.n. (B†, holo.; K!, iso.)

F. pubescens (Poir.) Kunth var. *buchananii* (Boeck.) C. B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 648 (1895)

NOTE. When dealing with *F. pubescens* (see sp. 3) Gordon-Gray cites *Buchanan* 1453 as the type of *F. buchananii* being at Kew; C.B. Clarke cites *Buchanan* without a number from Shire Highlands and also *Buchanan* 1435! and 1442! unlocalized. 1453 at Kew was determined as *F. pubescens* by C.B. Clarke in 1892 but there is no mention of var. *buchananii* on it. The sheet in the type cover bears two specimens: 'Shire Highlands', *Buchanan* s.n. and 1435B; 1442 has not been found.

6. ***Fuirena microcarpa*** *Lye* in Bot. Not. 127: 111 (1974); Haines & Lye, Sedges & Rushes E.Afr.: 44, fig. 40, 41 (1983); Muasya in K.B. 53: 196 (1998). Type: Tanzania, Uzaramo District: Dar es Salaam, *Wingfield* 2100 (DSM!, holo.; EA!, K!, iso.)

Slender annual; culm terete, 14–21 cm tall, up to 1 mm in diameter, but ± 2 mm in diameter across the sheath, densely pubescent, or glabrous except just below the inflorescence. Leaf-sheath and ligule hairy; blade 5–8 × 0.2–0.3 mm, densely pubescent. Inflorescence a digitate cluster of spikelets; spikelets 2–4 × 1–2 mm, terete, many-flowered; glumes 1.5–2 mm long, including a 0.7–1 mm long mucro, with short and long hairs. Perianth segments absent. Nutlet 0.5–0.6 × 0.2–0.3 mm, including style-base less than 0.1 mm long, translucent and glassy-looking with the greenish to olive seed showing through, base obtuse; surface convex and smooth.

TANZANIA. Uzaramo District: Dar es Salaam, 14 July 1971, *Wingfield* 1638! & Dar es Salaam, 1 July 1995, *Muasya, Knox & Mponda* 944b!; Kilwa District: 19 km SSW of Kingupira, 15 Aug. 1976, *Vollesen* in MRC 3936a!

DISTR. T 6, 8; not known elsewhere

HAB. Seasonally wet grassland, seepage areas in *Brachystegia* woodland, also a weed in rice fields; 30–200 m

NOTE. There is a loose note by Muasya in the type folder of this species which indicates there has been confusion between *Wingfield* 1638 and 2100. The specimen labelled isotype at K is *Wingfield* 1638 from University of Dar es Salaam, S of sewage farm. In the original description the number given is 1638 and locality Manzese pond, Morogoro road, Dar es Salaam, and habitat is sandy rice field at pond edge, 30 m; but this locality is the one given on *Wingfield* 2100. This would be the correct type number and is given as such by Muasya. I (BV) do not believe this error in any way effects the validity of the name.

7. ***Fuirena leptostachya*** *Oliv.* in Trans. Linn. Soc. London 29: 168, t. 108 (1875); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 647 (1895); K. Schum. in P.O.A. C: 126 (1895); C.B. Clarke in F.T.A. 8: 466 (1902); Napper in J. EA Nat. Hist. Soc.

25 (1) (110): 21, fig. 4 (1965); Hooper in F.W.T.A. 3: 326 (1972); Haines & Lye, Sedges & Rushes E.Afr.: 44, fig. 42, 44 (1983); Lye in Fl. Eth. 6: 395, fig. 212.5 (1992); Muasya in K.B. 53: 197 (1998). Type: Uganda, West Nile District: Madi, *Grant* s.n. (K!, holo.)

Slender annual; culm terete, 7–43 cm tall, 1–2 mm in diameter, but \pm 3 mm in diameter across the sheath, densely pubescent. Leaf-sheath and ligule hairy; blade 6–16 \times 0.3–0.7 cm, densely pubescent. Inflorescence an irregular terminal cluster of spikelets; spikelets 4–12 \times 2–4 mm, terete, many-flowered; glumes 1.6–2 mm long, including a 0.5–0.7 mm long mucro, with short and long hairs. Perianth segments absent or 6, in 2 whorls, outer 3 segments represented by smooth bristles, inner 3 segments have smooth stalk ending in a crescent-shaped lamina without distinct veins. Nutlet pale brown, 0.4–0.6 \times 0.3–0.4 mm, including style-base up to 0.1 mm long, base obtuse; surface concave and smooth.

forma **leptostachya**; Muasya in K.B. 53: 197 (1998)

Perianth segments present.

UGANDA. Masaka District: Kalungu, 16 June 1971, *Lye* 6620! & Kalungu, 17 Sept. 1971, *Lye* 6631!; Mengo District: Kakoge, 12 Dec. 1955, *Langdale-Brown* 1665!

KENYA. Northern Frontier District: Moyale, 3 July 1952, *Gillett* 13478!; Trans-Nzoia District: Kitale, 8 Oct. 1981, *Gilbert & Mesfin* 6491!; Kiambu District: Thika road house, 21 July 1951, *Verdcourt* 568!

TANZANIA. Musoma District: Serengeti, 7 March 1962, *Greenway, Turner & Allen* 10508!; Moshi District: Masama, 1 Sept. 1968, *Bigger* 2166!; Kilosa District: Kilosa, 17 Oct. 1962, *Brown* 249!

DISTR. U 1, 3, 4; K 1, 3–6; T 1, 2, 4–8; widespread in tropical and subtropical Africa

HAB. Seasonally wet areas in grassland, wooded grassland and bushland, wet flushes on granite rocks, and weed in rice fields; 150–2050 m

forma **nudiflora** *Lye* in Nordic Journ. Bot. 3:241 (1983); Haines & Lye, Sedges & Rushes E.Afr.: 45, fig. 43 (1983). Type: Uganda, Masaka District: Bugabo, *Lye* 1825 (MHU, holo.; EA!, K!, iso.)

Perianth segments absent.

UGANDA. Masaka District: Bugabo, 28 July 1971, *Lye* 6523 & Bukoto, 28 July 1971, *Katende* 1221! & Lake Nabugabo, Aug. 1935, *Chandler* 1398!

TANZANIA. Ufipa District: Matai, 22 June 1996, *Faden et al.* 96/347!; Songea District: Songea, 27 June 1956, *Milne-Redhead & Taylor* 10916!; Lindi District: Nachingwea, 27 July 1952, *Anderson* 782!

DISTR. U 4; T 4, 7, 8; widespread in tropical and subtropical Africa

HAB. Seasonally wet grassland, seasonal swamp in *Brachystegia* woodland, swamp and lake edges, frequent as a weed in rice fields; 400–1350 m

SYN. *F. glomerata* sensu Boeck. in Flora 62: 566 (1879), *non* Lam.

F. schweinfurthiana Boeck. in Flora 63: 438 (1880). Type: Sudan, Djur, grosse Seriba Ghattas, Agad, *Schweinfurth* III 190 (B†, holo.; K!, P, iso.)

F. pygmaea Ridl. in Trans. Linn. Soc. ser. 2 Bot. 2: 160 (1884); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 648 (1895); Rendle, Cat. Afr. Pl. Welw. 2: 128 (1899); C.B. Clarke in F.T.A. 8: 464 (1902). Types: Angola, Pungo Andongo, near Sansamanda, *Welwitsch* 7111 (BM, syn.) & between Mopopo & Sansamanda, *Welwitsch* 7171 (BM, syn.) & Huilla, Monino, *Welwitsch* 7112 (BM, syn.)

F. leptostachya Oliv. var. *nudiflora* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 647 (1895), *nom. nud.* & in F.T.A. 8: 466 (1902) adnot.*

F. moiseri Turrill in K.B. 1925: 71 (1925). Type: Nigeria, Fodama, *Moiser* 157 (K, holo.)

* The variety is not validated here because it is not accepted; the proposed type was *Schweinfurth* 2504 (Sudan, Bongo, Gir)

8. *Fuirena sagittata* Lye in Bot. Not. 127: 110 (1974); Haines & Lye, Sedges & Rushes E.Afr.: 46, fig. 45, 47 (1983); Muasya in K.B. 53: 197 (1998). Type: Tanzania, Dodoma District: Mwitikira, *Greenway* 780 (EA!, holo.; BM!, K!, iso.)

Robust annual; culm terete, 6–45 cm tall, 1–2 mm in diameter, but \pm 3 mm in diameter across the sheath, densely pubescent. Leaf-sheath and ligule hairy; blade 4–11 \times 0.3–0.6 cm, densely pubescent. Inflorescence an irregular terminal cluster of spikelets; spikelets 4–12 \times 2–3 mm, terete, many-flowered; glumes 1.7–2.3 mm long, including a 0.4–0.7 mm long mucro, with short and long hairs. Perianth segments 6, in 2 whorls, outer 3 segments represented by bristles with recurved spines, inner 3 segments have smooth stalks ending in a sagittate lamina as long as the nutlet, but lacking distinct veins. Nutlet greyish yellow, 0.6–1 \times 0.3–0.7 mm, including style-base up to 0.1 mm long, base cuneate; surface concave and smooth.

TANZANIA. Ufipa District: Isopa, 22 June 1996, *Faden et al.* 96/260!; Dodoma District: Mkwese area, July 1968, *Ludanga* 2463!; Mbeya District: Madibira, 23 July 1959, *Anderson* 1253! & Ruaha National Park, 6 Nov. 1970, *Richards* 26362

DISTR. T 4, 5, 7, 8; not known elsewhere

HAB. Seasonally wet grassland, streamsides, waterholes, marshy areas in cultivations; 800–1900 m

NOTE. Annotations by Hooper indicate that she thought this taxon was a form of *F. leptostachya* but no combination appears to have been published.

9. *Fuirena mutali* Muasya & Nordal sp. nov. *Fuirenae ciliaris* affinis sed perianthii interioris lamina sagittata recedit. Type: Kenya, Kitui District: Endau, *Muasya, Kirika, Obunyalu & Musili* 2500 (EA, holo.; K!, ETH, GENT, iso.)

Slender annual, culm 10–30 cm tall. Leaf-sheath hairy; lowest leaf blades reduced to lobes, upper blades to 12 cm long, hairy; ligule hairy to almost smooth. Inflorescence a cluster of 3-many spikelets; spikelet sessile or stalked, 4–7 mm long and 2–3 mm wide, terete, many-flowered; glume 1.8–2 mm long, excluding a straight or recurved mucro 0.8–1.9 mm long, hairy. Perianth segments 6, in 2 whorls; outer 3 segments bristles with conspicuous recurved spines; inner 3 segments as long as the nutlet, comprising a smooth stalk ending in a sagittate lamina whose lower tips are elongated and recurved towards stalk, lamina has a midrib and two lateral veins. Nutlet brownish, 0.9–1 mm long and 0.6–0.7 mm wide, surface concave and smooth, base obtuse.

KENYA. Kitui District: Ikisaya, 9 Jan. 2004, *Muasya et al.* 2500! & Endau–Zombe road, at \pm 1 km from Endau, 9 Jan. 2004, *Muasya et al.* 250! & Endui, 18 km from Mwingi towards Garissa, 19 Jan. 2005, *Kirika, Muthoka & Mbale* NMK 450!

DISTR. K 4; not known elsewhere

HAB. Seasonal seepage; 400–700 m

NOTES. *Fuirena mutali* is closely affiliated to *F. ciliaris*, but differs in perianth morphology. The outer perianth bristles have retrorse spines in *F. mutali* whereas they are smooth or slightly scaberulous in *F. ciliaris*. The laminae of the inner segments share the presence of 3 veins, but differ in shape which is sagittate in *F. mutali* (versus square in *F. ciliaris*).

ETYMOLOGY. The species is named after a kind of arrowhead used by the people at the type locality, *mutali* in Akamba language, which resembles the inner perianth segment.

10. *Fuirena clavisetia* Peter in Abh. Königl. Ges. Wiss. 13, 2: 50 (1928); Napper in J. EA Nat. Hist. Soc. 25 (1) (110): 21, fig. 8 (1965); Haines & Lye, Sedges & Rushes E.Afr.: 48, fig. 51, 52 (1983); Muasya in K.B. 53: 198 (1998). Type: Tanzania, Uzaramo District: Dar es Salaam, Geresane, *Peter* 39372 (K!, lecto., chosen by Haines & Lye 1983; in original reference Peter gives 'Usaramo' but cites no specimens)

* The variety is not validated here because it is not accepted; the proposed type was *Schweinfurth* 2504 (Sudan, Bongo, Gir)

Robust annual; culm terete, 30–75 cm tall, 2–5 mm in diameter, but \pm 6 mm in diameter across the sheath, glabrous except just below the inflorescence. Leaf-sheath pubescent or glabrous, ligule hairy; blade 5–18 \times 0.4–0.8 cm, glabrous, but margins with long translucent hairs. Inflorescence a digitate cluster of spikelets; spikelets 5–16 \times 2–4 mm, terete, many-flowered; glumes 2.1–2.4 mm long, including a 0.1–0.2 mm long mucro, with short and long hairs. Perianth segments 6, in 2 whorls, outer 3 segments represented by bristles with recurved spines at least near the tip, inner 3 segments have smooth stalks ending in a swollen tailed lamina, but lacking distinct veins. Nutlet light brown, 1–1.2 \times 0.4–0.7 mm, including style-base up to 0.2 mm long, base obtuse, surface concave and smooth.

KENYA. Kwale District: Shimba Hills National Park, 4 May 1994, *Muasya* 468! & Mwaluganje, 5 Mar 1999, *Luke* 5710! & Tiomin Kwale Mine, South Dune, 04 26S 39 24 E, 25 May 1999, *Luke* 5919!

TANZANIA. Uzaramo District: Dar es Salaam, 6 March 1971, *Wingfield* 1201! & Geresane, 2 April 1926, *Peter* 39372!; Lindi District: Nyangedi, 19 March 1935, *Schlieben* 6140!; Zanzibar: Kinyasini, 21 Jan. 1929, *Greenway* 1115!

DISTR. **K** 7; **T** 5, 6, 8; **Z**, **P**; southern tropical Africa

HAB. *Elaeis* swamp, river and stream banks, drainage ditches; 0–300(–500) m

SYN. *F. glomerata* Lam. var. *angolensis* sensu Peter, F.D.-O.A.: 389 (1932), quoad *Peter* 39372 & 44710, non C.B. Clarke

11. ***Fuirena angolensis*** (C.B. Clarke) Lye in Bot. Not. 127; 112 (1974); Raynal, Mitt. Bot. Munchen 13: 354 (1977); Haines & Lye, Sedges & Rushes E.Afr.: 47, fig. 49, 50 (1983); *Muasya* in K.B. 53: 199 (1998). Type: Angola, Huilla to Humpata, *Johnston* s.n. (K!, lecto.)

Robust annual; culm terete, 9–39 cm tall, 1–3 mm in diameter, but \pm 4 mm in diameter across the sheath, densely pubescent. Leaf-sheath and ligule hairy; blade 4–18 \times 0.2–0.9 cm, densely pubescent. Inflorescence a digitate cluster of spikelets; spikelets 3–7 mm long, but extending to 18 mm when mature, and 1–4 mm wide, terete, many-flowered; glumes 2.3–3.2 mm long, including a 0.9–1.5 mm long mucro, with short and long hairs. Perianth segments 6, in 2 whorls, outer 3 segments represented by smooth bristles, inner 3 segments with smooth stalks ending in a rectangular lamina with a 3-toothed apex and incurved sides, but lacking distinct veins. Nutlet reddish-brown, 0.7–1.2 \times 0.4–0.6 mm, including style-base up to 0.2 mm long, base obtuse, surface concave and smooth.

KENYA. Machakos District: Makueni, 17 Oct. 1947, *Bogdan* 1382! & Emali, 12 April 1969, *Napper* & *Mwangangi* 2007! & Kivaa, 23 Feb. 1995, *Muasya* & *Simpson* 783!

TANZANIA. Singida District: Iramba Plateau, July 1958, *Hammond* 48!; Kondo District: Manki (Hado), 10 June 1979, *Mwasumbi* 11783!; Iringa District: Ndonya R., 24 April 1970, *Greenway* & *Kanuri* 14412!

DISTR. **K** 4; **T** 1, 2, 4, 5, 7; southern tropical Africa

HAB. Temporary waterholes, ditches, seepage areas, streamsides, seasonally wet grassland; 750–1750 m

SYN. *F. glomerata* Lam. var. *angolensis* C.B. Clarke in Schinz, Bull. Herb. Boiss. 4, App. 31: 31 (1896), *nom. nud.*; C.B. Clarke in F.T.A. 8: 466 (1902). Type as for species

NOTE. C.B. Clarke's var. *angolensis* was only validated with a description in 1902, and the four specimens cited (*Gregory* 102, *Newton* s.n., *Johnston* s.n. and *Rautanen/Radanen* s.n.) are syntypes.

12. ***Fuirena ciliaris*** (L.) Roxb., Fl. Indica ed. Carey & Wallich 1: 184 (1820) & Fl. Indica 1: 180 (1832); K. Schum. in P.O.A. C: 126 (1895); Napper in J. EA Nat. Hist. Soc. 25 (1) (110): 20, fig. 5 (1965); Hooper in F.W.T.A. ed. 2: 326 (1972); Kern in Fl. Males. ser. 1, 7: 519, fig. 32 (1974); Haines & Lye, Sedges & Rushes E.Afr.: 46, fig. 46, 48 (1983); Gordon-Gray in *Strelitzia* 2: 96 (1995); Lye in Fl. Eth. 6: 395, fig. 216.6 (1997); *Muasya* in K.B. 53: 199 (1998). Type: India orientalis, *König* s.n. (BM, holo.)

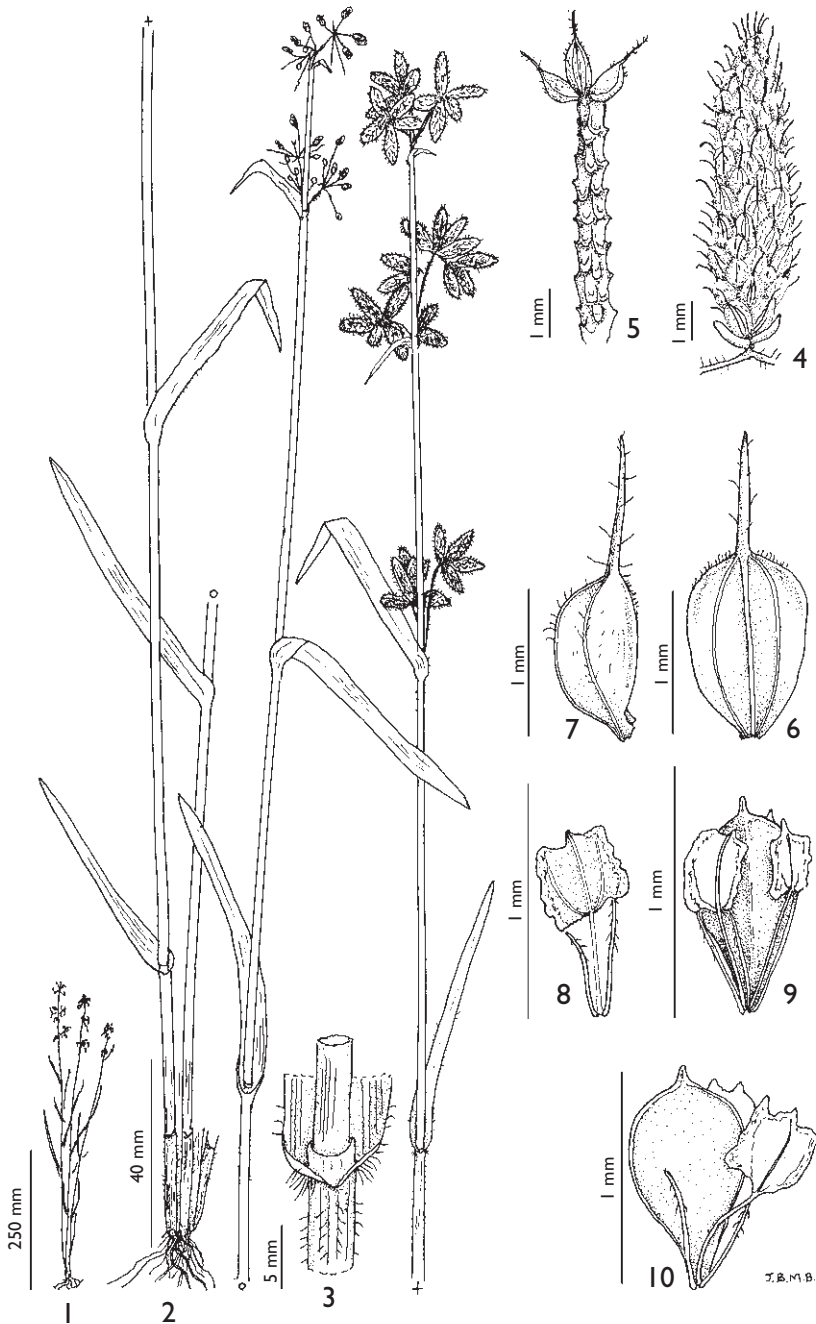


FIG. 3. *FUIRENA CILIARIS* — 1, habit; 2, habit; 3, leaf sheath apex; 4, spikelet; 5, rachilla; 6–7, glume, adaxial and lateral views; 8, two bristles and one scale; 9–10, nutlet with bristles and scales, adaxial and abaxial views. From *Drummond* 5574. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

Robust annual; culm terete, 11–60 cm tall, 2–5 mm in diameter, but \pm 7 mm in diameter across the sheath, densely pubescent, or glabrous except just below the inflorescence. Leaf-sheath and ligule hairy; blade 5–14 \times 0.3–0.8 cm, densely pubescent. Inflorescence a digitate cluster of spikelets; spikelets 5–9 \times 2–4 mm, terete, many-flowered; glumes 2–2.7 mm long, including a 0.8–1.4 mm long mucro, with short and long hairs. Perianth segments absent, or 6, in 2 whorls, outer 3 segments represented by smooth bristles, inner 3 segments with smooth stalks ending in a square lamina with raised midrib and lateral veins. Nutlet 0.7–1.1 \times 0.4–0.7 mm, including style-base up to 0.1 mm long, brown, surface flat and opaque, base obtuse. Fig. 3, p. 18.

forma **ciliaris**

Perianth segments present.

KENYA. Lamu District: Kiunga, 5 April 1980, *Gilbert & Kuchar* 5897!; Tana River District: Tarasa, 2 March 1977, *Hooper & Townsend* 1141!; Kilifi District: Sabaki bridge, 26 Aug. 1982, *Robertson* 3365!

TANZANIA. Handeni District: Handeni, 1 Aug. 1957, *Semsei* 2675!; Uzaramo District: Dar es Salaam, 25 Nov. 1966, *Jaasund & Jaasund* 2187!; Kilwa District: Tingino, 31 May 1906, *Braun* 328!; Zanzibar: Zanzibar Is., 1908, *Last* s.n.!

DISTR. **K** 7; **T** 3, 4, 6, 8; **Z**; widespread in tropical and subtropical Africa; extending to China, SE Asia and Australia

HAB. Mainly coastal streams, pools, seasonal swamp edges, springs (often within *Brachystegia* woodland on black cotton soil), seasonally wet grassland, and weed in rice fields; 0–300(–500) m

SYN. *Scirpus ciliaris* L., Mant. Pl. 2: 182 (1771)

Fuirena glomerata sensu C.B. Clarke in F.T.A. 8: 465 (1902); Hutchinson in F.W.T.A. 2: 470 (1936), *non* Lam.

Fuirena ciliaris (L.) Roxb. var. *ciliaris* (L.) Gordon-Gray in *Strelitzia* 2: 97, fig. 38 1, D (1995)

forma **apetala** (*Wingf.*) *Lye* in *Nordic Journ. Bot.* 3: 241 (1983); Haines & Lye, *Sedges & Rushes E.Afr.* 47 (1983); Muasya in K.B. 53: 200 (1998). Type: Tanzania, Tanga District: 5 km S of Tanga, *Botany students* DSM 1501 (DSM!, holo.; EA!, K!, iso.)

Perianth segments absent.

TANZANIA. Tanga District: Tanga to Tangata, 20 Nov. 1915, *Peter* 14487! & Sawa, 19 Aug. 1976, *Faulkner* 4922B!; Uzaramo District: Kilwani Pond, 17 July 1971, *Wingfield* 1692!; Zanzibar: Kidichi, 9 July 1960, *Faulkner* 2635B!

DISTR. **T** 3, 6; **Z**; West tropical Africa

HAB. Seasonally wet grassland, edges of permanent coastal pools, coconut plantations and weed in rice fields; 0–30 m

SYN. *F. ciliaris* (L.) Roxb. var. *apetala* Wingf. in *Bot. Notis.* 130: 319 (1977)

13. ***Fuirena zambesiaca*** *Lye* in *Bot. Not.* 127: 111 (1974); Haines & Lye, *Sedges & Rushes E.Afr.*: 43, fig. 14b, 39 (1983); Muasya in K.B. 53: 200 (1998). Type: Mozambique, Marrupa, 4 km from Maua, *Pedro & Pedrogao* 4222 (EA!, holo.)

Slender annual; culm terete, 14–46 cm tall, 1–2 mm in diameter, but \pm 3 mm in diameter across the sheath, densely pubescent, or glabrous except just below the inflorescence. Leaf-sheath and ligule hairy; blade 7–12 \times 0.2–0.5 cm, densely pubescent. Inflorescence a subdigitate to irregular cluster of spikelets; spikelets 3–14 \times 2–4 mm, terete, many-flowered; glumes 2.3–2.7 mm long, including a 0.2–0.5 mm long mucro, with short and long hairs. Perianth segments 6, in 2 whorls, outer 3 segments represented by bristles with antrorsely curved spines, inner 3 segments with membranous stalks ending in a squarish lamina with emarginate apex, lacking prominent veins. Nutlet yellowish brown, 0.8–1 \times 0.4–0.5 mm, including style-base up to 0.2 mm long, base cuneate, surface concave and smooth.

KENYA. Embu District: Seven Forks, 3 March 1974, *Robertson* 2016!

TANZANIA. Uzaramo District: Dar es Salaam, 15 July 1972, *Wingfield* 2041!; Ulanga District: Kilombero, 18 June 1932, *Schlieben* 2432!; Songea District: Songea, 6 June 1956, *Milne-Redhead* & *Taylor* 10651!

DISTR. **K** 4; **T** 6, 8; Mozambique

HAB. Seasonally wet grassland, or pools on sandy ground, in crevices of large rock outcrops in dry woodland; 0–900 m

14. *Fuirena ochreatea* *Kunth*, Enum. Pl. 2: 184 (1837); Haines & Lye, *Sedges & Rushes E.Afr.*: 48, fig. 53, 54 (1983); Muasya in *K.B.* 53: 200 (1998). Type: Zanzibar, *Bojer* s.n. (?B†, hol.; Pl, iso.)

Perennial, with culms arising at 7 mm intervals on a horizontal rhizome 8 mm in diameter; culm terete, 25–69 cm tall, 2–4 mm in diameter, but \pm 6 mm in diameter across the sheath, densely pubescent, or glabrous except just below the inflorescence. Leaf-sheath hairy, ligule hairy at rim; blade 5–16 \times 0.5–1.2 cm, densely pubescent. Inflorescence a subdigitate cluster of spikelets; spikelets 7–11 \times 2–4 mm, terete, many-flowered; glumes 4.1–5.2 mm long, including a 1.5–2.5 mm long mucro, with short and long hairs. Perianth segments 6, in 2 whorls, outer 3 segments represented by subulate bristles, inner 3 segments with ciliate stalk ending in a rectangular to oblong lamina with a squarish apex and distinct veins. Nutlet reddish brown, 0.8–1.1 \times 0.5–0.7 mm, including style-base up to 0.3 mm long, base cuneate, surface concave and smooth.

KENYA. Kwale District: Shimba Hills National Park, 7 Feb. 1953, *Drummond* & *Hemsley* 1165! & Shimba Hills National Park, 17 March 1968, *Magogo* & *Glover* 333! & Matuga, 3 Dec. 1951, *Bogdan* AB 3340!

TANZANIA. Bagamoyo District: Bana Forest Reserve, 10 Aug. 1968, *Shabani* 162!; Uzaramo District: Fungoni, Nov. 1964, *Procter* 2730!; Kilwa District: Kingupira, 25 Feb. 1976, *Vollesen* 3283!

DISTR. **K** 7; **T** 3, 4, 6–8; **Z**, **P**; southern tropical Africa

HAB. Seasonally wet grassland, edge of permanent swamp and stream, and often growing in water to 30 cm depth; sea level–450 m

SYN. *F. calolepis* *K. Schum.* in *P.O.A. C.*: 122 (1895) & in *E.J.* 24: 239, t. 5 fig. H–M (1897); Napper in *J. EA. Nat. Hist. Soc.* 25 (1) (110): 21, figs. 7, 21 (1965). Type: Tanzania, Usambara, Kibafuta swamp, *Holst* 2133 (B†, lecto., K!, iso.), from four syntypes

F. cinerascens *Ridl.* in *Trans. Linn. Soc. ser. 2 Bot.* 2: 161 (1884), *nom. nud.*, *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 648 (1895), *nom. nud.* & *K. Schum.* in *P.O.A. C.*: 126 (1895), *nom. nud.*; *C.B. Clarke* in *F.T.A.* 8: 467 (1902). Type: Tanzania, Usaramo, *Kirk* 62 (K!, lecto. & iso.)

NOTE. The seven sheets of *F. cinerascens* cited by *C.B. Clarke* are all syntypes.

15. *Fuirena umbellata* *Rottb.*, *Descr. Icon. Rar. Pl.* 70 t. 19 f. 3 (1773); *Kunth*, Enum. Pl. 2: 185 (1837); *Benth.* in *Niger Fl.*: 553 (1849); *Boeck.* in *Peters, Reise Mossamb. Bot.*: 545 (1861) & in *Linnaea* 37: 110 (1872) & in *Flora* 62: 566 (1879); *Oliv.* in *Trans. Linn. Soc.* 29: 168 (1875); *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 648 (1895); *K. Schum.* in *P.O.A. C.*: 126 (1895); *Rendle* in *Cat. Afr. Pl. Welw.* 2: 129 (1899); *C.B. Clarke* in *F.T.A.* 8: 467 (1902); *Napper* in *J. EA Nat. Hist. Soc.* 25 (1) (110): 21, fig. 15 (1965); *Hooper* in *F.W.T.A.* 3: 325 (1972); *Forbes, Rev. Fuirena*: 122, 123 (1980); *Haines & Lye, Sedges & Rushes E.Afr.*: 49, fig. 55, 56 (1983); *Gordon-Gray* in *Strelitzia* 2: 104, fig. 41 BD (1995); *Lye* in *Fl. Eth.* 6: 396, fig. 212.8 (1997). Type: Surinam, *Rowlander* s.n. (C, lecto.; *Røtbull* also cites several pre-Linnaean names which are syntypes)

Perennial, with culms arising at 15 mm intervals on a horizontal woody rhizome 5 mm in diameter, with the basal parts of culms swollen and bulb-like; culm pentagonal, 24–116 cm tall, 3–9 mm in diameter, but \pm 11 mm in diameter across

the sheath, glabrous except just below the inflorescence. Leaf-sheath minutely hairy, or glabrous, ligule densely hairy; blade 6–30 × 0.7–2.5 cm, glabrous or upper surface minutely pubescent, margins with translucent hairs. Inflorescence a corymbose cluster of spikelets; spikelets 4–11 × 2–4 mm, terete, many-flowered; glumes 2.4–3.5 mm long, including a 0.5–1.2 mm long mucro, with short and long hairs. Perianth segments 3, in 1 whorls, outer 3 segments vestigial, inner 3 segments sessile with lamina apex square or rounded with the midrib excurrent in a short slender mucro, 3-veined. Nutlet brown, 0.9–1.4 × 0.5–0.8 mm, including style-base up to 0.2 mm long, base cuneate, surface concave and smooth.

UGANDA. Busoga District: Bukoli, 26 March 1953, *Wood* 675!; Masaka District: Lake Nabugabo, 1 Feb. 1969, *Lye, Morrison & Lester* 1831!; Mengo District: Kyawega Forest Reserve, 21 Sept. 1949, *Dawkins* 385!

KENYA. Central Kavirondo District: W Kano, Aug. 1958, *McMahon* 7!; Kwale District: Shimba Hills National Park, 3 April 1968, *Magogo & Glover* 736! & Matuga, 29 Oct. 1958, *Bogdan* AB 4730!;

TANZANIA. Lushoto District: Amani, 24 June 1928, *Greenway* 743!; Tanga District: Lwengera Valley, 20 July 1953, *Drummond & Hensley* 3370!; Songea District: Luhira R., 15 Jan. 1956, *Milne-Redhead & Taylor* 8248!;

DISTR. U 1–4; K 5, 7; T 1–4, 6–8; Z, P; widespread in tropical Africa; India, SE Asia, Polynesia and tropical south and central America

HAB. Seasonally wet grassland, swamp forest, stream and lake banks; sea level–1900 m

SYN. *F. paniculata* L.f., Suppl. Pl.: 105 (1781); Lam., Encycl. meth. 2: 566 (1788) & Ill. 1: 150, t. 39 (1791). Type based on *F. umbellata* Röttb.

F. seriata C.B. Clarke in Mém. Soc. Bot. fr. 8: 28 (1907). Types: Mali, Sikoro, *Chevalier* 231 & Koulaya, *Chevalier* s.n. (P, syn.)

F. multiflora Peter in Abh. Ges. Wiss. Göttingen n.f. 13 (2): 50, in clav. (1928). Type: Tanzania, East Usambaras, no specimens cited

F. appendiculata Peter in Abh. Ges. Wiss. Göttingen n.f. 13 (2): 50, in clav. (1928). Type: Tanzania, Moshi, no specimens cited

Scirpus fuirena Koyama in J. Fac. Sci. Tokyo sect. 3 Bot. 7: 361 (1958), *nom. nov.* based on *F. umbellata*

SPECIES OF UNCERTAIN IDENTITY

Fuirena brachylepis Peter in Abh. Ges. Wiss. Göttingen n.f. 13 (2) 50, in clav. (1928). Type: Tanzania, Ujiji, no specimens cited

Perennial with extensive inflorescence; spikelets 6–7 mm long, 2.5–3 mm wide; glumes with curved awn. Inner hypogynous scales thin and shortly stalked, hyaline, obovate, 3-veined, truncate above with induplicate margin, with or without a small mucro.

NOTE. The description is derived from information given in Peter's key. All the material of Peter's species was at the Berlin Herbarium and was destroyed in World War II.



FIG. 4. *BOLBOSCHOENUS MARITIMUS* — 1, habit, $\times \frac{1}{15}$; 2, leaf sheath apex, $\times \frac{1}{3}$; 3, inflorescence, $\times \frac{2}{3}$; 4, spikelet, $\times 6$; 5–6, glume, adaxial and abaxial surface, $\times 7$; 7, anther, $\times 10$; 8, ovary, style and branches, $\times 7$; 9, nutlet, $\times 7$. 1–5 & 9 from *Ward 1707*; 6–7 from *Ward 3485*. Reproduced from *Strelitzia 2* (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

3. BOLBOSCHOENUS

(Asch.) Palla in Koch, Syn. Deutsch. Schweiz. Fl. ed. 3, 3: 2531 (1904);
Goetghebeur & Simpson in K.B. 46: 169–178 (1991)

Scirpus sect. *Bolboschoenus* Asch., Fl. Prov. Brandenburg 3: 753 (1864)

Perennial herb with swollen stem bases and/or rhizomes. Culms many-noded, thickened at base. Leaves eligulate. Inflorescences with few to very many spikelets; bracts several, leafy. Spikelets with spirally arranged glumes, each subtending a bisexual flower. Hypogynous bristles present. Stamens 3. Style long, filiform, with 2–3 branches. Nutlets trigonous to plano-convex compressed, essentially ± smooth, with fine exocarp sculpture of isodiametric or radially elongated cells sometimes with low central papillae.

A genus of 16 species with 2 in Africa, one widespread, the other restricted to the SW.

***Bolboschoenus maritimus* (L.) Palla** in Koch, Syn. Deutsch. Schweiz. Fl. ed. 3, 3: 2531 (1904); Gordon Gray in *Strelitzia* 2: 25, figs. 8, 9 (1995); Galen Smith & Kukkonen in *Taxon* 48: 356 (1999); Marhold et al. in *Willdenowia* 36: 105, fig. 1 (2006). Types: Sweden, Roslagen, *Linnaeus* s.n. (UPS, Herb. Celsius 2: 212, lecto.); Sweden, E Roslagen, Borstilla, 2 km W of Kalla near Husbacka, *Nilsson* 9515 (UPS, epitype; BR, H, MO, NU, NY, isoeotypes)

Perennial 0.4–1.2 m tall with swollen stem bases and stiff spreading rhizomes; stems triangular, glabrous, 2–5(–10) mm thick, covered in the lower half by green leaf sheaths with brown slightly hairy throats; blades long and flat, the upper overtopping the stem, 25–40 mm long, 5–10 mm wide, scabrid on keel and margins. Main bracts 8–15 cm long and overtopping the inflorescence. Inflorescence compound, open, with terminal cluster of several sessile spikelets and with small heads of 1–3 sessile spikelets, the heads on unequal branches 1–3 cm long, the total number of spikelets per inflorescence being 20–40(–50); spikelets golden brown to reddish brown, elongate, (5–)15–40 mm long, 3–5 mm wide; glumes golden or pale to dark brown, 5–6 mm long, emarginate and with a mucro. Perianth segments 6, white or brown, linear with retrorse bristles. Stamens with long flattened filaments. Nutlets pale brown becoming dark brown, obovoid, 2–2.6(–3) mm long, 1.4–1.8(–2.3) mm wide, smooth, bluntly acuminate, convex on one side and flattened on the other. Fig. 4, p. 22.

KENYA. Northern Frontier District: Isiolo, Sericho, Uaso Nyiro R., 20 Feb. 1970, *van Swinderen* Is14!; Machakos District: Kiboko, 22 Feb. 1949, *Bogdan* 2399!; Lamu District: Kiwayu area and Ziwa, 5 Jan. 1999, *Luke & Luke* 5630!

TANZANIA. Mbulu District: Yaida Valley, Yaida Ro and swamp, 13 Jan. 1970, *Richards* 25105!; Lushoto District: Mkomazi, 23 Apr. 1934, *Greenway* 3976!; Ufipa District: Rukwa, 13 June 1956, *E.A. Robinson* 1642!

DISTR. K 1, 4, 7; T 2–5; Mauretania, Senegal, Mali, Sudan, Ethiopia, Somalia, Angola, Malawi, Mozambique; widespread in temperate and tropical regions

HAB. Seasonal swamps, often on black cotton or saline soil, muddy river banks, lake flood plains, ricefields; 10–1350 m

SYN. *Scirpus maritimus* L., Sp. Pl. 1: 51 (1753); C.B. Clarke in F.T.A. 8: 455 (1902)

Schoenoplectus maritimus (L.) Lye in *Blyttia* 29: 45 (1971); Haines & Lye, *Sedges & Rushes* E. Afr.: 53, fig. 64 (1983); Lye in *Fl. Somalia* 4: 103, fig. 60/e–g (1995) & in *Fl. Eth.* 6: 397, figs. 212.9 and 212.14/1–3 (1997)

NOTE. Dr Jane Browning informed the editor just before publication that she believes *B. maritimus* does not occur in tropical Africa, and that our taxon should be named *B. glaucus* (Lam.) S.G. Smith in *Novon* 5: 101 (1995); basionym *Scirpus glaucus* Lam., *Tabl. Encycl.* 1: 142 (1791). Type: Senegal, *Rousillon* s.n. (P-Lam., holo.). Browning, Gordon-Gray, Smith & van Staden published on this subject in *Nordic. J. Bot.* 1: 475–482 (1998).

4. SCHOENOPLECTUS

Palla in Verh. Zool.-Bot. Ges. Wien 38, Sitzungsber.: 49 (1888) & in E.J. 10: 298 (1889)
and

5. SCHOENOPLECTIELLA

Lye in Lidia 6(1): 20–29 (2003)

Schoenoplectus Palla in Verh. Zool.-Bot. Ges. Wien 38, Sitzungsber.: 49 (1888) & in
E.J. 10: 298 (1889) pro parte

Annuals or perennials, with or without leaves. Culm scapose or nearly so, with or without a node above the base. Leaves usually reduced to sheaths. Involucral bracts leafy and spreading or more usually stem-like and in the same direction as the stem, with or without transverse septa. Inflorescence a dense apparently lateral, but really terminal, cluster of few to many spikelets, less often a more open anthela. Spikelets with many bisexual flowers subtended by spirally arranged glumes. Perianth bristles absent or present and of barbed or smooth needle-like bristles, or more flattened and plumose. Stamens usually 3, filaments often persistent. Style 2–3-branched. Nutlet obovoid to round, usually apiculate, smooth or ridged.

25–50 species; tropics of Old and New Worlds.

Annual species may have basal flowers ± hidden in the lower leaf sheaths, with very long styles protruding from the sheaths, and nutlets larger than those of the aerial florets.

Lye described *Schoenoplectiella* out of *Schoenoplectus* for those taxa that are more closely related to *Eleocharis* than to *Schoenoplectus*. These differ in mostly being annual and producing solitary female flowers in the basal leaf sheaths. As the first five of our taxa are perennial and do not produce such flowers, these will be treated here as *Schoenoplectus* – even though this genus, according to Lye, is not supposed to occur in East Africa! Both genera are included in the key to the species.

1. Plant submerged with 6–10 cm long leaves at intervals over whole stem, not tufted; spikelets solitary and stalked 1. *S. rhodesicus* p.25
Plants with at least some part of leaves above water, leaves tufted at base 2
2. Perennials with rhizome present; basal cleistogamous flowers always absent from leaf-sheath; stem 1.5–12 mm thick near base (above leaf-sheath); inflorescence bract 1–10 cm long, much shorter than the stem; *Schoenoplectus sensu stricto* 3
Annuals or short-lived perennials without rhizome and with basal cleistogamous flowers usually present in leaf-sheath as well as in upper inflorescence; stem 0.3–2 mm wide near base [except in *S. articulatus* where stem near base is 1–8 mm thick, but stem has many clear transverse septa and inflorescence bract is 6–40 cm long]; *Schoenoplectiella* 6
3. Inflorescence spikelets sessile 4
Inflorescence with at least some spikelets stalked 5
4. Stem round; spikelets 3–8 × 1–2.5 mm; perianth absent; nutlets smooth 2. *S. corymbosus* p.25
Stem triangular; spikelets 5–30 × 2–6 mm; perianth of 6 brown bristles; nutlets wrinkled 3. *S. mucronatus* p.26
5. Stem 1.5–5 mm thick; style 3-branched; nutlet 1.2–1.6 mm long, wrinkled 4. *S. confusus* p.28
Stem 6–12 mm thick; style 2-branched; nutlet 2–2.5 mm long, smooth 5. *S. scirpoides* p.29

6. Stem 5–80 cm long, 1–8 mm thick near base (above leaf-sheath), articulate with clear transverse septa; spikelets 4–10 mm thick; glumes 4–6.5 mm 6. *S. articulata* p.30
 Stem up to 40 cm long, 0.3–2 mm thick near base, not articulate (except in *S. roylei* & *S. senegalensis*); spikelets always less than 4 mm thick; glumes 1.3–4 mm long 7
7. Stems articulated with transverse septa (may be faint on stem, but often clear on inflorescence bract) 8
 Stems without transverse septa 9
8. Glumes 2–2.5 mm long; nutlet 0.8–1.2 mm long 7. *S. roylei* p.30
 Glumes 2.5–3.2 mm long; nutlet 0.9–1.5 mm long 8. *S. senegalensis* p.31
9. Spikelets ‘bristly’ with glume mucros; glumes 1.3–1.8 mm long 9. *S. microglumis* p.33
 Spikelets flat 10
10. Glumes 1.5–2 mm long; inflorescence bract longer than the 1–2 cm long culm 14. *S. proxima* p.36
 Glumes 2–4 mm long 11
11. Inflorescence bract 15–40 cm long, much longer than the stem, which makes it look as if inflorescence is near base of plant; nutlet smooth 10. *S. hooperiae* p.33
 Inflorescence bract 3–20 cm long, usually shorter than stem; nutlet transversely wrinkled 12
12. Style branches 2; nutlet biconvex 11. *S. erecta* p.34
 Style branches usually 3; nutlet triangular 13
13. Stem round; spikelets sessile, 0.5–1.5 mm thick 12. *S. juncea* p.34
 Stem usually triangular; at least some spikelets stalked, 2–2.5 mm thick 13. *S. lateriflora* p.35

1. ***Schoenoplectus rhodesicus*** (*Podlech*) *Lye* in *Nordic Journ. Bot.* 3: 242 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 54, figs. 67, 68 (1983). Type: Zambia, Kasama, *Robinson* 3758 (M, holo.)

Perennial submerged aquatic; stems 30–60 cm long, round, 1–1.5 mm thick, ridged, with long internodes and axillary shoots from nodes. Leaves spreading, linear, 6–10 cm long, flat, 0.6–1 mm wide, 3-veined; leaf-sheath green, 2–3 cm long. Inflorescence a solitary stalked spikelet, stalk 2–5 cm long; inflorescence bract erect, stem-like, 0.7–1.5 cm long; spikelet narrowly ovoid, 4–8 × 2–3 mm; glumes reddish brown with green midrib, triangular to lanceolate, 3.5–4 mm long, mucronate. Perianth segments 6, very narrow, barbellate with recurved hooks, slightly longer than the nutlet. Stamens 3. Style 3-branched. Nutlet reddish brown, 1.6–2 × 1.5–1.6 mm, 3-angular, almost smooth or with faint transverse wrinkles.

TANZANIA. Rungwe District: Lake Ikapo, 22 km SE of Tukuyu, Oct. 1969, *Wingfield* 456!

DISTR. T 7; Zambia, Zimbabwe

HAB. Completely submerged and rooting in mud in water 0.9–1.5 m deep; ± 870 m (elsewhere to 1750 m)

SYN. *Scirpus rhodesicus* Podlech in *Mitt. Bot. Staats. München* 4: 117 (1961)

2. ***Schoenoplectus corymbosus*** (*Roem. & Schult.*) *J. Raynal* in *Fabregues & Lebrun, Catal. Vasc. Pl. Niger*: 343 (1976); Haines & Lye, *Sedges & Rushes E. Afr.*: 56 (1983); *Lye* in *Fl. Somalia* 4: 103 (1995) & in *Fl. Eth.* 6: 399 (1997). Type: India, ‘in India orientali’, no collector mentioned (Z or BM, holo.)

Perennial herb; rhizome short, ascending; stems many, tufted, dark and/or glossy green, 50–360 cm tall, round or sometimes slightly triangular near apex, 2–10 mm

thick near base (but outside sheath), ridged, filled with pith; base surrounded by dark scales and leaf sheaths. Leaves absent; leaf sheaths often splitting, ending in a short lobe. Inflorescence an anthela with clusters of \pm sessile spikelets on very unequal flat stalks 1–4(–12) cm long, rarely a few spikelets solitary and stalked; main inflorescence bract stem-like and continuing in the direction of the stem, 1–5 cm long, rounded and with distinct longitudinal ribs and dark brown or blackened apex; spikelets dark or pale brown, ovoid, 3–8 \times 1–2.5 mm, acute, occasionally producing viviparous shoots; glumes grey with red-brown spots or patches or reddish brown all over with paler midrib, ovate, 2–4 mm long, apex mucronate, midrib often raised, margin sometimes ciliate, otherwise glabrous or with short spine-like hairs. Perianth segments absent. Stamens 3, with persistent ribbon-like filaments 2.5 mm long; anther 1–1.4 mm long with crest 0.2–0.5 mm. Style pale green, (2–)3(–4)-branched, often splitting irregularly. Nutlet yellow-white turning dark brown or black, 1.2–2 \times 0.9–1.5 mm, smooth. Fig. 5, p. 27.

UGANDA. Busoga District: Lake Victoria Nyanza, Ingira Island, Apr. 1955, *Greenway* 8822!; Mengo District: Lake Victoria, Port Kibanga, Aug. 1914, *Dummer* 1020! & Migyera, dam site W of Nabiswera town, Aug. 2001, *Lye & Namaganda* 25202!

KENYA. Ravine District: Timboroa, Nov. 200, *Smith, Beentje & Muasya* 227!; Naivasha District: SW Lake Naivasha, Apr. 1968, *Mwangangi* 694!; Nairobi: Between Wilson Airport and Army barracks, Feb. 1978, *Gilbert* 4991!;

TANZANIA. Moshi District: Sanya Chini, June 1967, *Vesey-FitzGerald* 5270!; Ufipa District: Lake Kwela, Nov. 1956, *Richards* 6858!; Iringa District: Udzungwa Scarp Forest Reserve, June 2001, *Ndangalasi* 466!

DISTR. **U** 2–4; **K** 3–6; **T** 1–7; Mali, Nigeria, Cameroon, Bioko, Congo-Kinshasa, Rwanda, Burundi, Sudan, Ethiopia, Angola and South Africa; Egypt, Madagascar, India

HAB. Lakes (where it may be locally dominant), swamps, pools, streamside marshes, usually in standing water up to 100(–300) cm deep; less often in seasonally flooded grassland or forest margins; 1000–2950 m

USES. Used for making baskets and mats in southern Tanzania (Poroto Mts, Kihehe area, Udzungwa scarp)

SYN. *Isolepis corymbosa* Roem. & Schult. in Syst. 2: 110 (1817)

Scirpus corymbosus (Roem. & Schult.) Roth, Nov. Pl. Sp.: 28 (1821), *non Scirpus corymbosus* L. (1756); C.B. Clarke in F.T.A. 8: 455 (1902)

Scirpus brachyceras A. Rich. in Tent. Fl. Abyss. 2: 496 (1851). Type: Ethiopia, near Adoua, “K’at’ema”, *Schimper* 288 (P, holo.; K!, iso.)

Schoenoplectus corymbosus (Roem. & Schult.) J. J. Raynal var. *junciformis* Peter, F.D.-O.A.: 396 (1929). Type: Tanzania, Kigoma District: W of Uvinza, km 1171.5, *Peter* 36444 (K!, syn.; not found at B)

Schoenoplectus corymbosus (Roem. & Schult.) J. J. Raynal var. *brachyceras* (A. Rich.) Lye in Nordic Journ. Bot. 3: 242 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 56, fig. 70 (1983); Lye in Fl. Eth. 6: 399, fig. 212.11 (1997)

NOTE. Two varieties were kept up by Lye – though he calls them forms, too. Distinctions are as follows:

spikelets paler; inflorescence bract rounded with distinct longitudinal

ridges var. **corymbosus**
spikelets usually dark; inflorescence bract boat-shaped var. **brachyceras**

I am not impressed by these so-called differences; there are dark-spikeleted specimens with ridges, and pale-spikeleted ones without. The difference rounded/boat-shaped makes no sense to me – surely both are gutter-shaped with inrolled edges? The differences in habitat suggested in Haines & Lye seem spurious as well, with overlap for specimens that seem unequivocally one ‘variety’ or another. I am therefore uniting the varieties.

Var. *junciformis* is a form with more contracted inflorescences; it is not accepted here as a separate taxon.

3. ***Schoenoplectus mucronatus* (L.) A. Kern** in Sched. Fl. Austr.-Hung. 5: 91 (1888); Haines & Lye, Sedges & Rushes E. Afr.: 55, fig. 69 (1983). Type: “Habitat in Angliae, Italiae, Helvetiae, Virginiae stagnis maritimis”, lectotype: *Rathgeb*, Herb. Linn. No. 71.31 (LINN) chosen by Kukkonen in Cafferty & Jarvis (ed.), Taxon 53: 181 (2004)

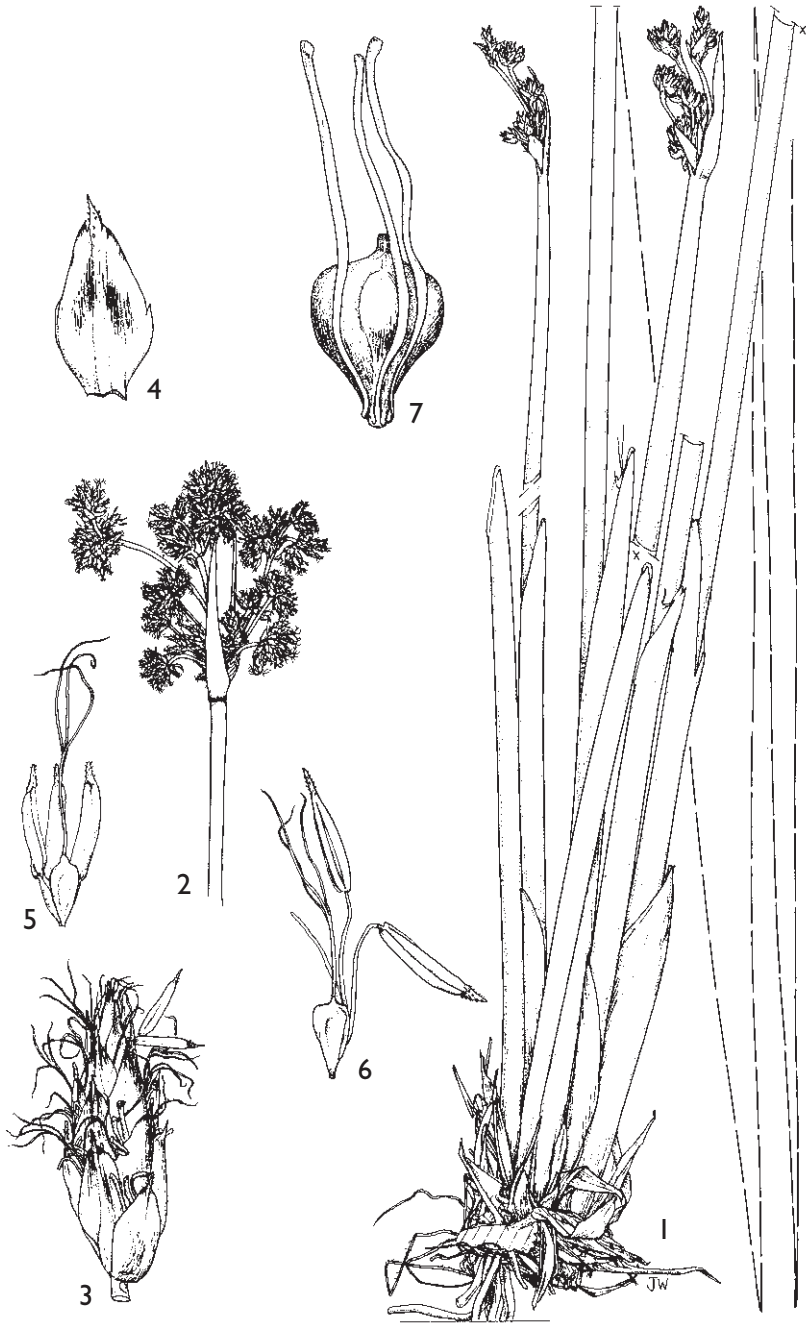


FIG. 5. *SCHOENOPLECTUS CORYMBOSUS* — 1, partial habit, $\times \frac{2}{3}$; 2, inflorescence, $\times \frac{2}{3}$; 3, spikelet, $\times 6$; 4, glume, $\times 10$; 5, young flower, $\times 10$; 6, flower, $\times 10$; 7, nutlet, $\times 20$. 1 from Richards 6616, 2 & 7 from Greenway & Kanuri 12546, 3–6 from Grimshaw 93. Drawn by Juliet Williamson.

Perennial; rhizome erect or horizontal; stems 3–10, tufted, 40–80 cm tall, sharply triangular, 3–8 mm thick, indistinctly ridged. Leaves absent; leaf sheaths pale brown, 4–15 cm long, ending in a triangular apex or a minute mucro. Inflorescence an apparently lateral cluster of 4–25 sessile spikelets; main inflorescence bract similar to stem, usually erect but sometimes at an angle, 15–30 mm long, acute; spikelets pale brown, ovoid to cylindrical, to 5 mm at anthesis but increasing to 30 × 6 mm in fruit, obtuse or acute; glumes pale brown, concave, 3–3.5 mm long, ridged, margin ciliate, apex acute. Perianth of 6 brown bristles with recurved teeth, usually longer than nutlet. Stamens 3, the flattened filaments persistent. Style 2–3-branched. Nutlet black, 2 × 1.2–1.4 mm, bluntly 3-angular, minutely transversely wrinkled.

UGANDA. West Nile District: Koboko, May 1938, *Hazel* 585!

TANZANIA. Bukoba District: Bukoba, Aug. 1931, *Haarer* 2082!; Rungwe District: Bomalakitana near Kyimbila, Nov. 1911, *Stolz* 990!

DISTR. U 1; T 1, 7; possibly introduced into Africa as a weed of rice-fields, Guinea, Liberia, Nigeria, Congo-Kinshasa, Angola, Zambia, Malawi, Zimbabwe, South Africa; widespread in temperate and tropical areas of Europe and Asia

HAB. Stream-bed; 1100–1200 m (see Note)

SYN. *Scirpus mucronatus* L., Sp. Pl. 1: 50 (1753); C.B. Clarke in F.T.A. 8: 454 (1902)

NOTE. The specimen cited by Lye from Urundi District, Tanzania, is from Burundi.

The Stolz specimen is probably from quite a bit higher up than the altitude range given above, but could be anything from 1500 to 2700 m.

4. **Schoenoplectus confusus** (*N.E. Br.*) *Lye* in Bot. Notis. 124: 290 (1971); Haines & Lye, Sedges & Rushes E. Afr.: 57, fig. 71, 72 (1983); Lye in Fl. Eth. 6: 399 (1997). Type: Ethiopia, Amogai, *Schimper* 253 (K!, holo.)

Tufted perennial; rhizome short and horizontal or sometimes erect; stems 5–many, tufted, glossy green, 40–100 cm tall, round, 1.5–5 mm thick, many-ridged, filled with pith; base surrounded by scales and old leaf sheaths. Leaves absent; leaf sheaths orange or reddish near base, upper ones green, ending in subulate lobe 2–6 mm long. Inflorescence apparently lateral, with clusters of spikelets on unequal stalks to 4 cm long; main inflorescence bract erect and continuing the stem, 3–10 cm long, 1.5–3.5 mm thick, filled with pith, apex blackish; spikelets green and black or brown, 5–10 × 2–3 mm, acute; glumes pale to dark brown with paler midrib, 2.4–3.5 mm long, with dark or pale mucro. Perianth absent or present. Stamens 3, white. Style 3-branched, white. Nutlet dark brown to shiny black, obovoid and 3-angled, 1.2–1.6 × 1–1.3 mm, with sharp transverse ridges.

var. **confusus**

Perianth absent.

UGANDA. Karamoja District: Bokora county, 4 km N of Lotome, *Lye & Katende* 5598!; Ankole District: Kashari county, Rubindi, Jan. 1994, *Rwaburindore* 3667!; Masaka District: Kabula county, Lyantonde Dam, July 1971, *Lye* 6485!

KENYA. Northern Frontier District: Mathews Range, Kitich, Dec. 1958, *Newbould* 3611!; South Nyeri District: Mwea-Tebera Irrigation Scheme, Jan. 2002, *Muasya* NMK 285!; Masai District: Isinya, 33 km on Kitengela–Kajiado road, Dec. 2001, *Kirika et al.* GBK 05!

TANZANIA. Mwanza District: probably Ukerewe Island, ± 1928, *Father Conrad* 5757!; Kondo District: Sambala, Ebagwute, Aug. 1924, *Burt* 2654!; Chunya District: 50 km on Mbeya–Chunya road, June 1996, *Faden et al.* 96/478!

DISTR. U 1, 2, 4; K 1, 3–6; T 1, 2, 4, 5, 7, 8; Ethiopia, Angola, Zambia, Zimbabwe

HAB. Stream banks, pool edges, seasonal swamp grassland, drainage lines in grassland and bushland, on mud, sand or in standing water; 1000–2100 m

LOCAL USES. Used to make mats, and replanted in Mbeya District when supplies become low (fide Harwood, 1963)

SYN. *Scirpus confusus* N.E. Br. in K.B. 1921: 300 (1921)

var. **rogersii** (*N.E. Br.*) *Lye* in *Nordic Journ. Bot.* 3: 242 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 57 (1983). Type: Zimbabwe, Matopos, *Rogers* 7914 (K!, holo.)

Perianth of well-developed bristles to 2 mm long.

KENYA. Nairobi, Kirichwa Ndogo, Dec. 1951, *Bally* 8075!

TANZANIA. Ufipa District: Malonje, Nov. 1949, *Bullock* 1892!; Mbeya District: Ikana on Tunduma–Sumbawanga road, June 1996, *Faden et al.* 96/202!; Songea District: 21 km N of Songea by Lumecha R., Jan. 1956, *Milne-Redhead & Taylor* 8117!

DISTR. **K** 4; **T** 4, 7, 8; Zambia, Zimbabwe, Botswana

HAB. Seasonal pools, stream bed, papyrus swamp; 950–2250 m

SYN. *Scirpus rogersii* N.E. Br. in *K.B.* 1921: 301 (1921)

5. ***Schoenoplectus scirpoides*** (*Schrad.*) *J. Browning* in *S. Afr. J. Bot.* 60, 3: 172 (1994), as *scirpoides*. Type: none mentioned in protologue of basionym, but Browning refers to plants collected in South Africa, Cape Province, by *Hesse* (LE?, not at B)

Perennial with stolons 6–11 mm thick; stems tufted, dark green, 70–450 cm long, terete and 6–12 mm thick near base, 2–4 mm thick and sometimes slightly and obtusely triangular by inflorescence, with longitudinal lines, filled with pith. Leaves absent or present and to 140 cm long, blade v-shaped and to 70 cm long, 3-angular and winged near apex; leaf-sheath 1–3.5 cm across, ending in an attenuate blade or apex. Inflorescence an apparently lateral anthela with single spikelets or umbels of spikelets on stalks of unequal length, 1–3 cm long; inflorescence bract erect, stem-like, 4–9 cm long, flat or angular; spikelets brown, ovoid, 6–15 × 2–4.5 mm, obtuse; glumes pale brown with darker lines and patches, 3–4 mm long, broad and concave, margin paler and ciliate, midrib distinct, apex whitish and mucronate. Perianth segments 4–6, plumose, as long as the nutlet or slightly longer. Stamens 3, filaments flattened and persistent, anthers with fan-like apex. Style 2-branched. Nutlet yellow-brown near base and dark brown at apex, obovoid, 2–2.5 mm long, smooth.

UGANDA. Haines & Lye report this from Lakes Albert, George and Mutanda

KENYA. Kisumu District: Lake edge, Kisumu, Feb. 1915, *Dummer* 1791! & Port Victoria, Mar.

1947, *Glasgow* 47/12!; Lamu District: Kiwayu area to Mvundeni, Jan. 1999, *Luke* 5642!

TANZANIA. Musoma District: Seronera River, 1.5 km to Banagi, Mar. 1961, *Greenway* 9937!;

Lushoto District: Lake Manka, Mar. 1975, *Wingfield* 2915!; Uzaramo District: Msasani saltmarsh, 6.5 km NW of Dar es Salaam centre, Mar. 1971, *Wingfield* 1917!

DISTR. **U** 2; **K** 5, 7; **T** 1, 3, 6; Ethiopia, Somalia, South Africa

HAB. Lakes, riverine fringes, coastal saltmarsh; may be locally dominant; in up to 270 cm deep water; 0–1550 m

SYN. *Pterolepis scirpoides* Schrad. in *Goett. Gel. Anz.* 3: 2071 (1821)

Malacochaete pterolepis Nees in *Linnaea* 9: 292 (1834) & 10: 184 (1836), based on *Pterolepis scirpoides* Schrad., *nom. illegit.*

Scirpus pterolepis (Nees) Kunth, *Enum. Pl.* 2: 166 (1837), *nom. illegit.*

Scirpus littoralis Schrad. var. *pterolepis* (Kunth) C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 625 (1894), *nom. illegit.*

Scirpus littoralis sensu C.B. Clarke in *F.T.A.* 8: 456 (1902)

Schoenoplectus littoralis (Schrad.) Palla var. *pterolepis* (Nees) C.C. Towns. in *K.B.* 15: 417 (1962)

Schoenoplectus subulatus sensu *Lye* in *Bot. Notis.* 124: 290 (1971); Haines & Lye, *Sedges & Rushes E. Afr.*: 54, figs. 65, 66 (1983); *Lye* in *Fl. Somalia* 4: 103 (1995) & in *Fl. Eth.* 6: 398, fig. 212.10 (1997), *non* Vahl

NOTE. Browning *et al.* in *S. Afr. J. Bot.* 60, 3: 169–174 (1994) reassess the status and taxonomy of *Schoenoplectus littoralis*, *Schoenoplectus subulatus* and *Scirpus pterolepis* in Southern Africa. I agree with them that *Schoenoplectus scirpoides* is the correct name for our taxon. *Schoenoplectus subulatus* differs mainly in the glabrous glumes and all East African specimens have at least some ciliae near the apex of the glumes; it has not yet been collected in our area, as far as I am aware. If the two taxa turn out to be the same the name *subulatus* would have priority.

Nees used his *Malacochaete pterolepis* name based on *Pterolepis scirpoides* of Schrad.; this combination is illegitimate, and therefore all later names based on this combination are illegitimate as well.

6. ***Schoenoplectiella articulata* (L.) Lye** in Lidia 6, 1: 20 (2003). Type: "Habitat in Malabaricae aquis arenosis", lectotype: "Tsjeli" in Rheede, Hort. Malab., 12: 135, t. 71, 1693, designated by Simpson in Cafferty & Jarvis (ed.), Taxon 53: 180 (2004)

Annual or short-lived perennial; roots shallow, white and brown; stems 3–10, tufted, 5–80 cm long (excluding the inflorescence bract – up to 120 cm long when including this!), terete, 1–8 mm thick, hollow or filled with pith, chambered, smooth and with shallow ridges. Leaves absent; leaf sheaths pink (basal ones) to grey, usually much wider than the stem, ending in a broad lobe. Inflorescence a dense head of up to 25 spikelets, lateral because overtopped by the erect main inflorescence bract, this 6–40 × 0.1–0.8 cm, structure like stem and visibly chambered by transverse septa; spikelets red-brown and green, 6–18 × 4–10 mm; glumes brown to reddish brown with green midrib, triangular, 4–6.5 mm long, slightly concave, acute to mucronate. Perianth absent. Stamens 3. Style 3-branched. Nutlet white turning to almost black, slightly obovoid, 1.8–2 × 1.5–1.7 mm, 3-angled, smooth; apex with or without minute flat rim.

Note that flowers may also be present at the base of the plant, in the axils of the sheaths; styles to 5 cm long, nutlet brown or black, ± globose, 3–5 mm across, remaining in sheath base.

UGANDA. Toro District (fide Haines & Lye); Teso District: Agu, Aug. 1932, *Chandler* 924!

KENYA. Kitui District: Ngaani, 16 km on Mutha–Enyali road, Jan. 2005, *Kirika et al.* NMK 460!;

Tana River District: Tana River National Primate Reserve, 1 km S of main gate, Mar. 1990,

Kabuye et al. TPR 667!; Kwale District: Msambweni, Nimboza pool, Jan. 1964, *Verdcourt* 3958!

TANZANIA. Tanga District: Kisarake near Mnyuzi railway station, July 1972, *Semsei* 4260!; Dodoma

District: Kilimatinde, Apr. 1962, *Polhill & Paulo* 2149!; Kilosa District: Vuma Hill area, no date,

Greenway & Kanuri 15127!; Pemba: Shengejuu–Pandani, Feb. 1929, *Greenway* 1499!

DISTR. U 2, 3; K 4, 7; T 3, 5–8; Z, P; widespread in Africa from Senegal to Sudan and Ethiopia and south to Mozambique and Angola; also Mascarene Islands and India

HAB. Pool edges, waterholes, sides of watercourses and the sea, on mud or in up to 30 cm deep water (within the grassland/wooded grassland/Acacia bushland zone); 0–1200 m

SYN. *Scirpus articulatus* L., Sp. Pl. 1: 47 (1753); C.B. Clarke in F.T.A. 8: 453 (1902); Lye in Fl. Eth. 6: 400, fig. 212.13 (1997)

Schoenoplectus articulatus (L.) Palla in E.J. 10: 299 (1889); Haines & Lye, Sedges & Rushes E. Afr.: 58, fig. 73 (1983); Lye in Fl. Somalia 4: 103 (1995)

NOTE. Close to *S. senegalensis* but differs in larger and smooth nutlets, less concave and more acuminate glumes.

7. ***Schoenoplectiella roylei* (Nees) Lye** in Lidia 6, 1: 26 (2003). Type: Nepal, *Royle* 48 (B, holo., not found)

Annual; roots shallow; stems tufted, dark green and glossy, 4–many, 2–20 (8 fide Lye) cm long (excluding erect inflorescence bract, which may add another 6–26 cm), round, 0.5–0.9 mm thick, ridged, with hardly visible transverse septa. Leaves absent; leaf-sheath pale brown or pale reddish brown, usually without any lobe; often with cleistogamous flowers with long style and nutlets 2–2.5 × 1–1.2 mm, transversely wrinkled. Inflorescence an apparently lateral cluster of 2–10 sessile spikelets; main inflorescence bract stem-like, 6–26 cm long, flattened, 0.7–1 mm wide, jointed with transverse septa; spikelets pale reddish brown to pale yellow-brown, ovoid, 4–6 × 2–3 mm; glumes pale reddish brown with green midrib, ovate, 2–2.5 mm long, slightly concave, apex rounded or very shortly mucronate. Perianth absent. Stamens 2–3. Style 3-branched. Nutlet pale brown turning dark brown to black, obovoid, 0.8–1.2 × 0.6–0.8 mm, 3-angled, transversely wrinkled.

UGANDA. Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1359!
 KENYA. Fort Hall District: Thika, July 1971, *Lye et al.* 6350! & Feb. 1997, *Muasya* 1135!; Nairobi, 3 km SE of Embakasi station, June 1971, *Lye & Katende* 6308!
 TANZANIA. Moshi District: Masama turnoff on Moshi–Arusha road, Sept. 1968, *Bigger* 2187!; Tabora District: Unyanyembe, E of Malongwe, Jan. 1926, *Peter* 34438a!; Mbeya District: Ruaha National Park, Trekimboga track, May 1970, *Vesey-FitzGerald* 6702!
 DISTR. U 4; K 4; T 2, 4, 7; Senegal, Mali, Ghana, Niger, Nigeria, Congo-Kinshasa, Ethiopia, Somalia, Zambia, Malawi, Zimbabwe, Botswana; India
 HAB. Seasonally wet grassland, pool/lake/dam edges, usually on mud or sand but sometimes in shallow water; 850–1600 m

SYN. *Isolepis roylei* Nees in Wight, Contrib. Bot. Ind.: 107 (1834)
Scirpus quinquefarius Boeck. in Linnaea 36: 701 (1870); C.B. Clarke in F.T.A. 8: 454 (1902).
 Type: India, *Wallich* 3465 (K, holo.)
Scirpus roylei (Nees) Parker in Duthie, Fl. Upper Gangetic Plain 3: 361 (1929), *nom* (Nees) Beetle (1942)
Schoenoplectus roylei (Nees) Ovcz. & Czukav. in Fl. Tadzhikist. 2: 40 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 59, figs. 76, 77 (1983); Lye in Fl. Somalia 4: 104 (1995) & in Fl. Eth. 6: 402, fig. 212.16 (1997)

8. ***Schoenoplectiella senegalensis*** (Steud.) Lye in Lidia 6, 1: 27 (2003). Type: Ethiopia, Gafta, *Schimper* 1194 (B, holo., not found; K!, P, iso.)

Annual or short-lived perennial (fide Greenway); roots shallow; stems tufted, many, bright green, 1–30 cm long (excluding erect inflorescence bract, which may add another 5–30 cm), round or angular, 0.3–1.6 mm thick, hollow with transverse septa, ± smooth. Leaves absent; leaf-sheath pale brown, rarely reddish near base, ending in an acute triangular lobe; sometimes with cleistogamous flower with style to 20 mm and nutlet 2–2.5 mm long. Inflorescence a dense, apparently lateral cluster of 1–25 sessile spikelets; main inflorescence bract stem-like, dark green, 5–30 cm long and usually longer than the stem, flattened and to 2.5 mm wide, with transverse septa; spikelets yellow-green turning golden brown, ovoid, 3–9 × 2–4 mm, acute to obtuse; glumes pale brown with darker apex and with pale green midrib, ovate to triangular, 2.5–3.2 mm long, concave, shortly mucronate. Perianth absent. Stamens 3; anthers 0.8–0.9 mm long. Style 3-branched. Nutlet dark brown, obovoid, 0.9–1.5 × 0.8–1.2 mm, sharply 3-angled, strongly transversely wrinkled on flat sides, but not on edges. Fig. 6, p. 32.

UGANDA. Karamoja District: Lokapel, June 1967, *Haines* 4207!; Toro District: Queen Elizabeth National Park, 3 km W of Kasenyi, *Lye & Katende* 5561!; Mengo District: Entebbe, 1909, *Fyffe* 38!
 KENYA. Machakos District: Yatta, 4.5 km from Matuu towards Mwingi, July 2003, *Muthoka et al.* NMK 428!; Masai District: Mt Suswa, June 1963, *Glover* 3796!; Teita District: Tsavo National Park East, Dika Plains, Jan. 1972, *Faden et al.* 72/103!
 TANZANIA. Ufipa District: Lake Kwela, Mar. 1959, *McCallum Webster* C9!; Dodoma District: 37 km on Itigi–Chunya road, Mar. 1965, *Richards* 19863!; Iringa District: 5 km on Msembe–Mbagi track, Mar. 1970, *Greenway & Kanuri* 14161!
 DISTR. U 1, 2, 4; K 1, 3–7; T 3–8; widespread in tropical and South Africa; Egypt, India
 HAB. Temporary pools or ditches, often within the dry bushland zone, or stream- or lake-side swamps, a weed of old rice paddies, or in shallow pools on rocky outcrops; may be in up to 20 cm deep water; (90–)200–1900 m

SYN. *Isolepis senegalensis* Steud. in Syn. Pl. Glum. 2: 96 (1855)
Schoenoplectus senegalensis (Steud.) Palla in E.J. 10: 299 (1888); Raynal in Cat. Pl. Vasc. Niger: 344 (1976); Haines & Lye, Sedges & Rushes E. Afr.: 58, figs. 74, 75 (1983); Lye in Fl. Somalia 4: 104 (1995) & in Fl. Eth. 6: 400, fig. 212.14.5–6, 212.15 (1997)
Scirpus praelongatus sensu Cufod., E.P.A. (1970–71), *non* Poir.
Scirpus jacobii C.E. Fischer in K.B. 1931: 103 (1931) & in F.W.T.A. ed. 2, 310 (1931), *nom. nov.* for *Isolepis senegalensis*, *non Scirpus senegalensis* Lam. (1791)



FIG. 6. *SCHOENOPLECTIELLA SENEGALENSIS* — 1, habit, $\times \frac{2}{3}$; 2, detail showing position of cleistogamous flower, $\times 2$; 3, inflorescence, $\times 2$; 4, spikelet, $\times 8$; 5, glume, $\times 8$; 6, young flower, $\times 8$; 7, flower, $\times 10$; 8, nutlet, $\times 16$. 1–2 & 8 from *Renvoize & Abdallah* 2248, 3–7 from *Faden, Phillips & Muasya* 96/529. Drawn by Juliet Williamson.

9. **Schoenoplectiella microglumis** (Lye) Lye in Lidia 6, 1: 26 (2003). Type: Uganda, Busoga District: Ndolwa, *Langdale-Brown* 2323 (KAW, holo.)

Tufted annual or sometimes perennial (fide Greenway); roots shallow; stems 10–many, tufted, 4–15 cm long (excluding erect inflorescence bract, which may add another 6–15 cm), round or angular, 0.6–0.8 mm thick, ridged. Leaves absent or very short; leaf-sheath pale brown, ending in a linear lobe 1–5 mm long or leaf-like; cleistogamous flower often produced in basal leaf-sheath, with transversely wrinkled nutlet 1.3–1.5 × 0.9–1 mm. Inflorescence apparently lateral, a dense cluster of 3–15 (sub)sessile spikelets; main inflorescence bract stem-like, 4–16 cm long, slightly flattened and ridged; spikelets reddish brown and pale brown variegated, ovoid or conical, 3–5 × 1.5–2 mm, with pointed parts of glumes; glumes spirally arranged, reddish brown with green midrib and pale margin, ovate, 1.3–1.8 mm long, mucronate. Perianth absent. Stamens 3. Style 3-branched. Nutlet pale yellow-brown turning dark brown to black, obovoid, 0.7–1 × 0.5–0.7 mm, bluntly triangular, transversely wrinkled.

UGANDA. Busoga District: Ndolwa, (not seen), *Langdale-Brown* 2323 (type)

KENYA. Fort Hall District: Thika, July 1971, *Faden et al.* 71/524! & Feb. 1997, *Muasya* 1134!; Nairobi: between Wilson Airport and Army barracks, Feb. 1978, *Gilbert* 4981!

TANZANIA. Moshi District: Dutch Corner, July 1969, *Vesey-FitzGerald* 6347!; Tabora District: S of Pozo Moyo, 8 km from Kaliua, June 1980, *Hooper & Townsend* 2106!; Iringa District: 13 km on Ufinda–Mafinga [Sao Hill] road, June 1996, *Faden et al.* 96/131!

DISTR. U 3; K 4; T 2, 4, 5, 7; Rwanda, Ethiopia, Zambia

HAB. Seasonally swampy grassland, on mud at pool and swamp edges, on shallow seepage soil over rock; may be very locally common; 950–1650 m

SYN. *Scirpus tenerimus* Peter in F.D.-O.A., Anhang: 124 (1936). Type: Tanzania, Tabora District: Unyanyembe, E of Makongwe km 729.5, *Peter* 45850 (B, lecto.; B!, iso., chosen on label in B herbarium), *non Scirpus tenerimus* Nees

Schoenoplectus microglumis Lye in Bot. Notis. 124: 287 (1971); Haines & Lye, Sedges & Rushes E. Afr.: 60, figs. 80, 81 (1983); Lye in Fl. Eth. 6: 403, fig. 212.18 (1997)

NOTE. Distinct in the small glumes.

10. **Schoenoplectiella hooperiae** (*J. Raynal*) Lye in Lidia 6, 1: 25 (2003). Type: Tanzania, Iringa District: Kinyantupa, 25 km from Msembe, *Greenway & Kanuri* 14441 (K!, holo.; NY, P, iso.)

Annual or perennial (fide Greenway) with dense tufted stems and shallow roots; stems 3–20 together, 4–15 cm long excluding the inflorescence bract (which adds another 15–40 cm), round or 3-angular, 1–2 mm thick. Leaves absent, leaf sheaths green, much wider than the stem, ending in a triangular lobe; often with solitary basal flower, nutlet to 2.6 × 2.3 mm. Involucre bract 15–40 cm long. Inflorescence of apparently lateral globose clusters of 3–15 densely packed sessile spikelets; spikelets brown or greenish brown, 4–8 × 2–3 mm; glumes lanceolate, 2–3 × 1.1–2.1 mm, midrib green, mucronate. Stamens 3, anthers ± 0.6 mm long. Style 3-branched. Nutlet reddish brown, obovoid-triangular, 1 × 0.6 mm, ± smooth.

TANZANIA. Arusha District: Arusha National Park, Maji ya Chai, July 1971, *Vesey-FitzGerald* 7059!;

Tabora District: Kaliua, on Urambo road, June 1980, *Hooper & Townsend* 2050!; Dodoma District: km 80 on Rungwa–Itigi road, July 1996, *Faden et al.* 96/496!

DISTR. T 2, 4, 5, 7; Zambia (1 specimen)

HAB. Seasonally wet sites in bushland zone; 500–1450 m

SYN. *Schoenoplectus hooperiae* J. Raynal in Adansonia ser. 2, 16: 146 (1976); Haines & Lye, Sedges & Rushes E. Afr.: 60, figs. 78 (1983)

NOTE. The glume mucro is certainly not always recurved, as Lye indicates as one of the main differentiating characters. In many specimens it is erect.

11. **Schoenoplectiella erecta** (Poir.) Lye in Lidia 6, 1: 25 (2003). Type: Mauritius, *du Petit Thouars* 13 (P, holo.)

Annual; stems densely tufted, 5–30 cm (excluding the inflorescence bract), 0.4–0.8 mm thick, at base surrounded by old bits of sheath. Leaves absent or less often present and up to 3 cm long; leaf sheaths ending in a 0.6–9 mm long obtuse lobe; basal cleistogamous flowers often produced in leaf sheaths, with nutlet 1.8–3 mm long. Inflorescence an apparently lateral group of (1–)2–20 subsessile or stalked spikelets; stalks to 2 cm long; main inflorescence bract stem-like, erect, 3–12 cm long; spikelets grey to light reddish brown, ovoid, 3–18 × 2–3.5 mm, acute; glumes light reddish brown with green midrib and pale margin, lanceolate, (2.5–)3–4 mm long, mucronate, glabrous or ciliate. Perianth segments absent. Stamens 3. Style 2(–3)-branched. Nutlets almost black, broadly flattened-obovoid, 1–1.6 × 1–1.3 mm, transversely wrinkled or hardly wrinkled.

SYN. *Scirpus erectus* Poir. in Encycl. Meth. 6: 761 (1804)

Schoenoplectus erectus (Poir.) J. Raynal in Adansonia ser. 2, 16: 141 (1976); Haines & Lye, *Sedges & Rushes E. Afr.*: 61 (1983)

subsp. **raynalii** (Schuyler) Beenje, **comb. nov.** Type: Botswana, 23 km on Maun–Shorob road, *Yalala* 425 (P, holo.; K!, iso.)

Nutlets strongly wrinkled.

UGANDA. Mengo District: Kirindi, Dec. 1935, *Chandler* 1480!

TANZANIA. Uzaramo District: Dar es Salaam, Sept. 1926, *Peter* 44876! & 6 km NW of Dar es Salaam, July 1971, *Wingfield* 1744!; Rufiji District: Mchungu Forest at mouth of Rufiji R., Aug. 1990, *Frontier Tanzania* 1391!

DISTR. U 4; T 6; Z (fide Haines & Lye); Zambia, Botswana

HAB. Seasonal swamps or water-holes; near sea-level and ± 1150 m

SYN. *Scirpus raynalii* Schuyler in *Notulae naturae* 438: 1 (1971)

Schoenoplectus erectus (Poir.) J. Raynal subsp. *raynalii* (Schuyler) Lye in *Nordic Journ. Bot.* 3: 243 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 62, figs. 82, 83 (1983)

NOTE. The other subspecies, subsp. *erecta*, differs in the hardly wrinkled nutlets; it occurs in Indian Ocean Islands.

Related to *S. lateriflora*, but differs in 2-branched style and biconvex (not triangular) nutlet, and a shorter basal nutlet.

12. **Schoenoplectiella juncea** (Willd.) Lye in Lidia 6, 1: 25 (2003). Type: Ghana, *Iser* s.n. (C, holo.)

Tufted annual; roots shallow; stems 3–20, tufted, bright green, 4–40 cm long excluding the inflorescence bract (which may add another 20 cm), round, 0.6–1.5 mm thick, slightly ridged, filled with pith. Leaves absent; leaf sheaths pale green, ending in a linear lobe to 5 mm long; sometimes with cleistogamous flower with style to 10 mm long and dark brown nutlet 2–3 × 1.5–2 mm, transversely wrinkled. Inflorescence a dense apparently lateral cluster of 1–10 sessile spikelets, sometimes appearing stalked through falling of lower glumes; main inflorescence bract stem-like, erect, 6–20 cm long, slightly flattened; spikelets green and pale brown or orange-green, 4–10 × 0.5–1.5 mm, 5-ridged with spiralling ridges; glumes golden yellow to almost orange with green midrib, ovate, 2.5–3 mm long. Perianth absent. Stamens 3. Style 3-branched. Nutlet pale when young turning dark brown, bluntly triangular, 1 × 0.8–0.9 mm, transversely strongly wrinkled.

UGANDA. Toro District: 3 km W of Kasenyi, *Lock* 69/401; Bunyoro District: Butiaba Flats, Sept. 1935, *Eggeling* 1137!

KENYA. Northern Frontier District: Ayanayangi swamp, June 1970, *Mathew & Gwynne* 6778!; Tana River District: 7 km SW of Ngao near Tarasa, Mar. 1977, *Hooper & Townsend* 1142!; Lamu District: Boni Forest, Sept. 1961, *Gillespie* 282!
 TANZANIA. Tanga District: Magunga East, Sept. 1953, *Faulkner* 1244!; Bagamoyo District: near Bana Forest Nursery, Aug. 1968, *Shabani* 151!; Uzaramo District: Banda Forest Reserve, Nov. 1969, *Ruffo* 330!; Zanzibar: Mwera Swamp, Aug. 1960, *Faulkner* 2700!
 DISTR. U 2; K 1, 6, 7; T 3, 6; Z; Ghana, Togo, Sudan, Somalia
 HAB. On moist sandy soil, in seasonal pools and swamps, along drainage lines, sometimes in standing water; 0–600 m

SYN. *Schoenus junceus* Willd. in *Phytogr.* 1: 2, t. 14 (1794)
Scirpus aureighumis S.S. Hooper in *K.B.* 26: 581 (1972) & in *F.W.T.A.* ed. 2, 3: 310 (1972).
 Type as for *S. juncea*, *nom. nov.* because of an existing *Scirpus junceus* Forst. f.
Schoenoplectus junceus (Willd.) J. Raynal in *Adansonia* ser. 2, 16: 139 (1976); Haines & Lye, *Sedges & Rushes E. Afr.*: 63, figs. 87, 88 (1983); Lye in *Fl. Somalia* 4: 104 (1995)

NOTE. *Glover et al.* 879 from Kenya, Masai District: Loita plains 6.5 km from Goregore must be from a higher altitude – but which?

13. *Schoenoplectiella lateriflora* (*J.F. Gmel.*) *Lye* in *Lidia* 6, 1: 25 (2003). Type: Sri Lanka, *König* s.n. (LD, holo.)

Tufted annual or sometimes perennial (fide Muasya); roots brown; stems tufted, 5–40 together, bright green, triangular or less often round, 4–40 cm long (excepting the stem-like inflorescence bract 4–20 cm long), 0.4–1.8 mm thick, ridged. Leaves present or absent; leaf-sheath ending in a proper leaf or in a lobe 1–2 mm long, often with cleistogamous flower with long (10–15 mm) style and black nutlets 2–2.5 × 1.4–2 mm, minutely wrinkled; leaf blade to 30 × 0.3 cm, flat or folded. Inflorescence an apparently lateral ± contracted cluster of spikelets on unequal stalks; main inflorescence bract stem-like, erect, 3–15 cm long, folded and connate near midrib; spikelets brown and green, 4–10 × 2–2.5 mm, acute; glumes pale brown with reddish dots or streaks, with green midrib, 2–3 mm long, the lowermost to 3.5 mm, mucronate, margin ciliate. Perianth absent. Stamens 3. Style 2–3-branched. Nutlet yellow-white turning dark shiny brown to almost black, 1–1.3 × 0.8–1.3 mm, 3-angled, transversely wrinkled or almost smooth.

subsp. *lateriflora*

Style 3-branched. Nutlet transversely wrinkled.

UGANDA. Mengo District: Mawokota county, 3 km N of Masaka border, Feb. 1970, *Lye & Haines* 5043!; Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1359a! & Kalungu county 1 km SW of W Mengo border, June 1971, *Lye* 6619!
 KENYA. Fort Hall District: between Thika and Murang'a [Fort Hall], Mar. 1948, *Bogdan* 1537!; Lamu District: Boni forest, Sept. 1961, *Gillespie* 283!; Kwale District: Shimba Hills, Longomwagandi area, Mar. 1973, *Sangai* in *EA* 15793!
 TANZANIA. Tanga District: 8 km on Tanga–Pangani road, Apr. 1973, *Faulkner* 4772!; Tabora District: Urambo, June 1980, *Hooper & Townsend* 2020!; Uzaramo District: Kilwani pond 7 km SW of Dar es Salaam, July 1971, *Wingfield* 1627!; Zanzibar island, Oct. 1873, *Hildebrandt* 1061!
 DISTR. U 4; K 4, 7; T 2–4, 6; Z; Senegal, Mali, Ghana, Benin, Niger, Nigeria, Angola, Zambia, Malawi, Mozambique, Zimbabwe, Botswana; Old World tropics
 HAB. Swamps, pond or lake shores, seasonal pools; may be in standing water to 30 cm deep, but usually on moist soil; 0–1200 m

SYN. *Scirpus lateriflorus* Gmel. in *Syst. Veg.* 1: 127 (1791)
Scirpus supinus sensu C.B. Clarke in *F.T.A.* 8: 452 (1902); E.P.A.: 1473 (1971), *non* L.
Schoenoplectus lateriflorus (Gmel.) *Lye* in *Bot. Notis.* 124: 290 (1971); Haines & Lye, *Sedges & Rushes E. Afr.*: 62, figs. 84, 85 (1983); *Lye* in *Fl. Somalia* 4: 104 (1995) & in *Fl. Eth.* 6: 402, fig. 212.17 (1997)

subsp. *laevinux* (Lye) *Beentje*, **comb. nov.** Type: Tanzania, Uzaramo District: 28 km NNW of Dar es Salaam, *Wingfield* 2036 (DSM, holo.; EA, K, iso.)

Style 2-branched. Nutlet almost smooth.

TANZANIA. Uzaramo District: log cabins 28 km NNW of Dar es Salaam, July 1972, *Wingfield* 2036!

DISTR. T 6; not known elsewhere

HAB. Seasonally swampy grassland; sea-level

SYN. *Schoenoplectus lateriflorus* (Gmel.) Lye subsp. *laevinux* Lye in *Nordic Journ. Bot.* 3: 242 (1983)

SPECIES OF DOUBTFUL OCCURRENCE

14. ***Schoenoplectiella proxima*** (*Steud.*) *Lye* in *Lidia* 6, 1: 26 (2003). Type: Egypt, no locality indicated, *Schimper* 31 (B, holo., not found; P, iso.)

Dwarf annual; stems tufted, 1–2 cm long (excepting the inflorescence bract which can add another 1–4 cm), round, 0.3–0.5 mm thick. Leaves absent; leaf-sheath relatively wide, sometimes ending in an up to 5 mm long lobe, often with cleistogamous flower with long style and dark brown nutlets 1–1.5 mm wide, minutely wrinkled. Inflorescence an apparently lateral single greenish brown spikelet; inflorescence bract erect, 1–4 cm long; spikelet ovoid, 2–5 × 1.5–2 mm, somewhat flattened, usually 5–8-flowered; glumes grey to brown with green midrib, ovate, 1.5–2 mm long. Style 3-branched. Nutlet dark grey to brown, ellipsoid, 0.9–1.1 × 0.5–0.7 mm, 3-angular, transversely wrinkled.

This species is cited from Tanzania by Haines & Lye; they mention *Scott Elliot* 3287 – I am not sure he actually collected in Tanzania, as all his collections I am aware of are either from Kenya or Uganda. I have not seen the specimen itself.

DISTR. Chad, ?Zambia

HAB. Seasonally swampy grassland

SYN. *Isolepis proxima* Steud., *Syn. Pl. Glum.* 2: 95 (1855)

Schoenoplectus proximus (Cherm.) J. Raynal in *Adansonia* ser. 2, 16: 152 (1976); Haines & Lye, *Sedges & Rushes E. Afr.*: 60, fig. 79 (1983)

6. ELEOCHARIS

R. Br., *Prodr.*: 224 (1810)

(sometimes spelled *Heleocharis*, but this is not correct)

Annual or perennial herbs, glabrous; rhizome often strong, horizontal, and often producing stolons. Culms green and photosynthesizing, hollow or filled with pith, rarely with transverse septa. Leaves reduced to scarious scales on stem base and to tubular sheaths, truncate or ending in a short lobe. Inflorescence a single terminal spikelet 0.1–50 mm long, or sometimes the spikelet aborted and only a scar present; lowest 1–2 glumes equal to or different from the upper; glumes spirally arranged, imbricate, florets bisexual but the lowermost 1–2 glumes usually sterile, glabrous, often with pale border and midrib. Perianth of 3–9 bristles, or reduced to a minute basal rim to the ovary/nutlet. Stamens 1–3. Style with swollen base, persistent in fruit, and with 2–3 branches, sometimes varying even within a single plant, the branches with beaded hairs (unicellular with annular constrictions). Nutlet obovoid or urn-shaped, with base of style persistent and often separated from main fruit body by a constriction, pitted or grooved longitudinally with transversal ridges.

About 180 species in temperate and tropical regions; mostly in the Americas. Wet or seasonally inundated habitats.

1. Plant perennial with stolons or rhizomes 1.5–6 mm thick; culms 20–120 cm tall; spikelet 8–50 × 2–6 mm 2
Annual or sometimes perennial plants either without stolons or with short (up to 2 cm) stolons less than 1 mm thick; culms usually less than 20 cm tall (but may be taller in *E. atropurpurea*, *decoriglumis*, *geniculata*); spikelet less than 7 mm long, except in *E. decoriglumis* and *E. complanata* (which lack stolons) 5
2. Culms hollow and septate, the septa visible as darker transverse partitions 1. *E. dulcis*
Culms filled with pith, not septate 3
3. Culms sharply triangular; perianth bristles few, smaller than the nutlet 2. *E. fistulosa*
Culms round or slightly angled; perianth bristles 6–8, at least as long as the nutlet 4
4. Sheaths ending in truncate, mucronate apex; nutlet smooth; above 1500 m 3. *E. marginulata*
Sheaths ending in triangular apex; nutlet finely ribbed and reticulate between ribs; below 1200 m 4. *E. variegata*
5. Spikelet 10–45 × 4–5 mm; glumes 3.5–4 mm long; culms triangular 5. *E. decoriglumis*
Spikelet less than 10 mm (except in *E. complanata* where up to 15 mm), less than 3.5 mm thick; glumes less than 2 mm long 6
6. Stem strongly flattened, 1–2 mm wide 6. *E. complanata*
Stem round or triangular, not flattened and not as wide 7
7. Sheaths pale-coloured throughout 8
Sheaths usually reddish or purple near base 9
8. Plant with tubers among the roots; glumes 1–1.3 mm long; perianth segments absent 7. *E. setifolia*
Plant without tubers, though short stolons may be present; glumes 1.8–2 mm long; perianth segments 6–7 8. *E. intricata*
9. Culms 12–45 cm tall; spikelet 2.5–3.5 mm wide 9. *E. geniculata*
Culms 1–13 cm tall; spikelet 0.5–2.5 mm wide 10
10. Glumes 1–2 mm long; perianth bristles 6–7, much longer than the nutlet 10. *E. minuta*
Glumes 0.8–1.5 mm long; perianth bristles 0–5, shorter than the nutlet 11
11. Nutlet with conspicuous pits in longitudinal rows; nutlets greyish white, 3-ribbed; style branches 3 11. *E. brainii*
Nutlets smooth 12
12. Nutlets black or black-brown, flattened; style branches 2 ... 12. *E. atropurpurea*
Nutlets pale brownish yellow, 3-ribbed; style branches 3 ... 13. *E. nigrescens*

1. *Eleocharis dulcis* (Burm.f.) Hensch. in Vita Rumph.: 186 (1833); Svenson in Rhodora 41: 11 (1939); Haines & Lye in Sedges & Rushes E. Afr.: 66, fig. 89 (1983). Type: "India", no further indication

Robust perennial 30–120 cm tall, with tufted culms from a contracted base; culms bright green, rounded (rarely quadrangular), hollow, 4–8 mm thick, septate at 3–10 cm intervals, contracted to 2–3 mm immediately below the inflorescence; roots orange, turning red-brown; stolons white when young, to 30 cm long and to 6 mm across, with 5–8 mm long sheaths at the nodes; sheaths to $\frac{1}{2}$ or $\frac{1}{3}$ of the culm height, ending in a triangular lobe. Inflorescence a pale green cylindrical spikelet 25–50 mm long, 2–6 mm across, narrower than the culm, sometimes aborting and leaving a scar; lowest glumes shorter than upper, most closely overlapping, green to pale brown with

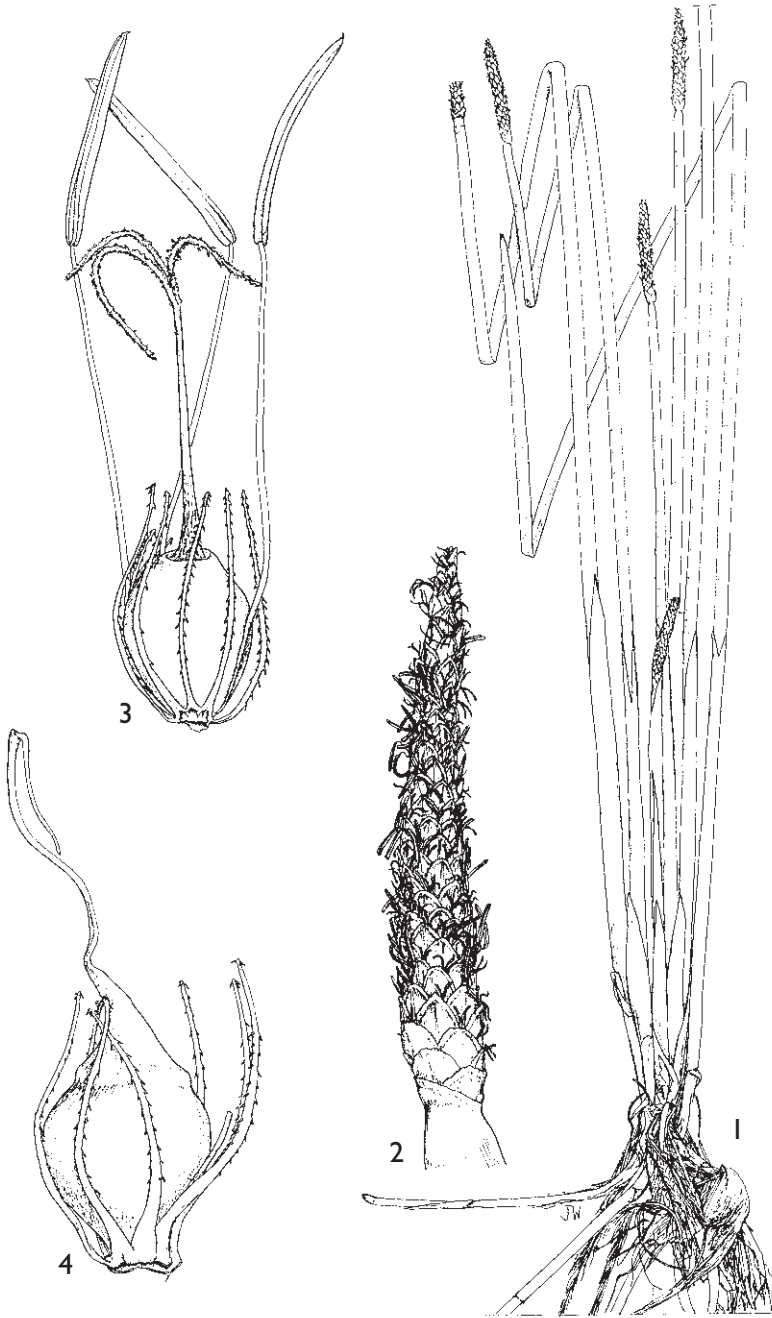


FIG. 7. *ELEOCHARIS DULCIS* — 1, habit, $\times \frac{1}{3}$; 2, inflorescence, $\times 1\frac{1}{2}$; 3, flower, $\times 10$; 4, nutlet, $\times 12$. 1 from Kirika, Mbale & Mbatha NMK 778, 2 from Vesey-FitzGerald 401, 3 from Milne-Redhead & Taylor 9164, 4 from Faden *et al.* 96/468. Drawn by Juliet Williamson.

pale margin, 4–6 mm long, with wide transparent margin and rounded apex; perianth of ± 7 long slender bristles with recurved spine-like teeth all over. Stamens white, 3, anthers elongate. Style white, with 2–3 branches. Nutlet 2–2 mm long excluding the long brown triangular appendage, smooth. Fig. 7, p. 38.

UGANDA. Busoga District: Jinja, Lake Victoria, May 1953, *G. Carter* 151!; Masaka District: Sese islands, Bugala Is., Kamwanyi, Mar. 1933, *A.S. Thomas* 916! & Bugala Is., Kalangala, Feb. 1945, *Greenway & Thomas* 7179!

KENYA. Meru District: Lorea swamp, Sept. 1961, *Bogdan* 5219!; Lamu District: 0.5 km from Kipini market towards Mpeketoni, Aug. 2006, *Kirika et al.* NMK 778!

TANZANIA. Kigoma District: Lake Chagu, June 1980, *Hooper & Townsend* 2088!; Rufiji District: Mafia Is., Ng'ombeni plantation, Dec. 1977, *Wingfield* 4472!; Mufindi District: Mafinga [Sao Hill], 2 km N of Lukoda Brooke Bond turnoff, June 1996, *Faden et al.* 96/150!

DISTR. U 3, 4; K 4, 7; T 4, 6–8; Togo, Congo-Kinshasa, Zambia, Mozambique, Zimbabwe, Botswana, South Africa; Madagascar, Asia to Queensland and Polynesia

HAB. Swamps, shallow parts of lakes, often in standing water; may be locally common or form pure stands; 0–2150 m

SYN. *Andropogon dulce* Burm.f. in Fl. Ind.: 219 (1768)

NOTE. The only *Eleocharis* in our area with transverse septa. This is a widespread species, cultivated in Asia: "Chinese water chestnut".

2. *Eleocharis fistulosa* (Poir.) Schult., Mant. 2: 89 (1824); C.B. Clarke in F.T.A. 8: 406 (1902); Svenson in Rhodora 31: 152 (1929); Svenson in Rhodora 41: 4 (1939). Type: Madagascar, 'dans les marais', *Du Petit-Thouars* s.n. (P, holo.)

Perennial herb 30–120 cm tall, stoloniferous, with 5–10 culms clumped together from a short vertical or horizontal base; culms green, sometimes pink, reddish brown or purple near base, sharply triangular, sometimes twisted, 2–5 mm thick, pithy; stolons 10–20 cm long and 2–3.5 mm across, with short blackish scales at the nodes, or scales absent, rooting at the nodes and ending in new plant clumps; sheaths grey, reddish or purple, much wider than culm, ending in short acute lobe. Inflorescence a cylindrical green spikelet 10–60 mm long, 3–5 mm across, the glume tips giving a serrate look; inflorescence bracts green with narrow transparent margin, similar to glumes but stiffer; glumes green with brownish parts, drying pale brown, 4–5 mm long, with many longitudinal ridges, sometimes folded, with a narrow transparent margin. Perianth segments of a few short or long bristles, barbellate or smooth. Stamens 3, yellow. Style dark brown, 3-branched. Nutlets pale brown, obovoid, 1.4–2 × 1.2–1.6 mm, longitudinally ridged with transverse bars; appendage large, darker than nutlet, with strong constriction between it and the nutlet.

UGANDA. Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1317! & 2.5 km S of Kasokero, May 1969, *Lye et al.* 2904! & Lyantonde Dam, July 1971, *Lye* 6484!

KENYA. Fort Hall District: between Thika and Murang'a [Fort Hall], Mar. 1948, *Bogdan* 1536! & 14 km S of Murang'a [Fort Hall] on Thika road, Nov. 1967, *Gillett* 18402!; Kisumu District: Kisumu, Maseno road, Aug. 1958, *McMahon* 5!

TANZANIA. Dodoma District: Lake Chaya, July 1996, *Faden et al.* 96/522!; Iringa District: Mufindi, Ngwazi marsh, Dec. 1994, *Goyder et al.* 3915!; Njombe District: Njombe–Kipengere road, 1.5 km beyond Igosi, Apr. 1970, *Wingfield* 783!

DISTR. U 4; K 4, 5, 7 (fide Luke); T 1, 4, 5, 7; widespread in Africa; also in Madagascar, Asia, Australia, South and Central America

HAB. Swamps (e.g. with *Miscanthus*), seasonally flooded grassland, pools and ditches, shallow lakes and streams; may be locally dominant in up to 60 cm of water, especially where vegetation is choking a shallow lake; 950–2150 m

SYN. *Scirpus fistulosus* Poir., Lam. Encycl. 6(2): 749 (1805)

S. acutangulus Roxb. in Fl. Ind. 1: 213 (1820). Type: India, no type indicated

Eleocharis acutangula (Roxb.) Schult., Mant. 2: 91 (1824); Haines & Lye in Sedges & Rushes E. Afr.: 67, fig. 92, 93 (1983); Lye in Fl. Eth. 6: 404, fig. 212.19 (1997)

NOTE. Almost everyone uses the name *E. acutangula* for this taxon. This name has a basionym dating to 1820; while *fistulosa*, always cited as a synonym, has a basionym date of 1805. Svenson in *Rhodora* 31: 152 (1929) seems to be the only one using the priority principle—even though he ascribes the combination to Link.

One reason cited is that *Eleocharis fistulosa* Link in *Jahrb. Gewächsk.* 3: 78 (1820) is a *nomen invalidum*, but this combination was never made. The full text of Link's note is "Scirpus fistulosus Enc. meth. 6: 709 Roem. & Sch. 1: 127 heißt Sc. angulosus im Herb. und ist ebenfalls eine Eleocharis." which leads me to believe that Link assigned *Scirpus fistulosus* Poir. 1805 (*non* Forssk. 1775) to *Eleocharis*, but did not make the combination *E. fistulosa*. Therefore, there is no reason why Schultes' combination should not be valid; and this name has priority.

Eleocharis mutata (L.) Roem. & Schult. is said by Haines & Lye to occur on Pemba and in Uvinsa District [T 4, Kigoma District]; they say it is similar to *E. acutangula* in habit, but differs in more glumes and different nutlets [size same; ending in crater-like rim with narrow triangular appendage, otherwise similar]. Similarly, Svenson in *Rhodora* 41: 6 (1939) cites *Greenway* 2730 from Pemba. I have not seen any specimens that conform to its description, and it will have to remain a problem taxon for our area.

3. *Eleocharis marginulata* Steud. in *Syn. Pl. Glum.* 2: 78 (1855); C.B. Clarke in *F.T.A.* 8: 410 (1902); Svenson in *Rhodora* 41: 96 (1939); Haines & Lye in *Sedges & Rushes E. Afr.*: 69, fig. 97, 98 (1983); Lye in *Fl. Eth.* 6: 404, fig. 212.20 (1997). Type: Ethiopia, near Adoa, *Schimper* II: 915 (P, holo.; K, iso.—not found)

Perennial with thick horizontal rhizome and dense tufted green culms 20–80 cm tall, round and ridged, sometimes compressed above, 1.5–2 mm thick; basal parts of culms often persistent; sheaths reddish brown or dark purple near base, reddish above, ending in a truncate but mucronate apex; roots coarse, grey. Spikelet ovoid, 8–20 × 3–4 mm; glumes reddish brown (the lowermost paler), 4 mm long, with pale midrib and thin transparent whitish border; perianth segments of 6 minutely barbellate bristles slightly shorter than the nutlet. Stamens 3, cream. Style 3-branched, white. Nutlet dull yellow to olive brown, obovoid, 1.4–1.6 × 1–1.2 mm, bluntly trigonous with narrow apex, slightly rough or smooth; appendage minute.

KENYA. Ravine District: Timboroa, Nov. 2000, *Smith, Beentje & Muasya* 235!; Kiambu District: Muguga, Njogu Inn, May 1952, *Verdcourt* 648!; Masai District: Nasampolai valley, Mar. 1972, *Greenway & Kanuri* 14992!

TANZANIA. Arusha District: Mt Meru National Park, crater, July 1996, *Muasya & Abdallah* 1064!; Lushoto District: Mtai–Mlalo road, near Kidologwai, May 1953, *Drummond & Hemsley* 2639!; Mbeya District: 2.5 km E of Mbeya market, June 1969, *Wingfield* 258!

DISTR. K 3–6; T 1–3, 7; Eritrea, Ethiopia

HAB. Lake margins, swamps, swampy grassland; may be very common locally; 1500–2600 m

4. *Eleocharis variegata* (Poir.) J. Presl in Oken, *Isis* 21: 269 (1828); Svenson in *Rhodora* 41: 8 (1939); Haines & Lye in *Sedges & Rushes E. Afr.*: 68, fig. 95, 96 (1983). Type: Madagascar, 'dans les marais', *Du Petit-Thouars* s.n. (P, holo.)

Perennial herb 25–90 cm tall, stoloniferous, with culms crowded in small tussocks, sometimes with a thick erect rhizome; culms rounded, 4-angular or triangular, sometimes twisted, 1–5 mm thick, ridged distinctly or obscurely; stolons to 30 cm long, 1.5–2.5 mm across, with 5–15 mm long grey-black scales at internodes; sheaths grey, green or purple, ± 3 above the prophyll, ending in a triangular greyish lobe. Inflorescence a cylindrical spike 10–55 mm long and 2.5–5 mm across; inflorescence bracts green at base, grey at apex, shorter than glumes; glumes reddish or purple with green or yellow mid-area and transparent upper margins, rarely all green or grey, 3–5 mm long, obtuse but often frayed. Perianth segments usually 7–8 reddish bristles longer than the nutlet, with many recurved teeth, or bristles fewer, hardly developed to absent. Stamens 3, white. Style branches 2–3. Nutlets brown when mature, urn-shaped and biconvex, 1.4–1.9 × 1.1–1.5 mm (excepting the appendage), finely ribbed and reticulate between ribs; appendage darker, conical.

UGANDA. Masaka District: Lake Nabugabo, Feb. 1970, *Lye & Haines* 5019! & 5020!; Mengo District: Namanve, Kiagwe, Aug. 1932, *Eggeling* 866! & Kampala, King's Lake, Sept. 1935, *Hancock & Chandler* 21!

TANZANIA. Arusha District: Lake Duluti, Dec. 1927, *Haarer* 972!; Kigoma District: Usinge swamp, Mweinda's-Ruhinda's, Nov. 1933, *Michelmore* 782!; Pemba: Matanga Twani [Mtangatwani], Sept. 1929, *Vaughan* 681!

DISTR. U 3, 4; T 2, 4; P; Sierra Leone, Guinea, Nigeria, Congo-Kinshasa, Angola, Zambia, Zimbabwe, Botswana; Madagascar, Indian Ocean islands

HAB. Lake margins, swampy grassland, seasonally flooded grassland, papyrus swamps and *Sphagnum* bogs; (0-)750-1200 m

SYN. *Scirpus variegatus* Poir. in Lam., Encycl. 6: 749 (1804/1805)

NOTE. Haines & Lye say *Eleocharis nupeensis* Hutch. occurs in T 8, and they cite *Milne-Redhead & Taylor* 10917 from Hanga Farm. They state it is "close to *variegata* but differs in being more slender and nutlets narrower above, and with very large light appendage". Svenson in *Rhodora* 41: 6 (1939) mentions the great complexity of the *E. fistulosa/nupeensis/mutata/variegata/calocarpa* group. He does not cite any specimens from East Africa; I have not seen any, either, though I have searched the Kew collections for the cited specimen. This will have to remain a mystery taxon, for our area.

5. ***Eleocharis decoriglumis*** *Berhaut* in Bull. Soc. Bot. France 100: 174 (1953); Haines & Lye in *Sedges & Rushes E. Afr.*: 70, fig. 99, 100 (1983). Type: Senegal, *Perrotet* 839 (P, holo.)

Annual; culms 2-5 cm tall when flowering, later elongating to 60 cm, triangular, 2-4 mm thick; roots slender; sheath 1 above the prophyll, reddish near base, grey above, delicate, ending in a very thin obtuse lobe. Spikelet \pm 1 cm when flowering, elongating to cylindrical and 2-4.5 \times 0.4-0.5 cm in fruit; glumes green with indistinct midrib and very distinct 0.2-0.5 mm wide reddish margin, 3.5-4 \times 2.2-3.2 mm, apex rounded, keel soft and rounded; perianth of 7-9 barbellate bristles 1.5-2 mm long with recurved hooks. Stamen 1, filament to 3 mm, anther to 0.7 mm. Style 2-branched, thickened at base. Nutlet pale brown or greenish, 1.5-1.6 mm long, with pits in longitudinal rows; appendage divided by strong constriction, dark brown low-conical, 0.3 mm long, swollen.

UGANDA. reported from Lake George in Toro District by Haines & Lye; no specimens seen

TANZANIA. Ulanga District: Mlahi, May 1977, *Vollesen* MRC 4584!

DISTR. U 2; T 6; Senegal, Mali, Chad

HAB. Seasonally swampy depression; 250-950 m

6. ***Eleocharis complanata*** *Boeck.* in *Flora* 62: 562 (1879); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 598 (1894/95) & in *F.T.A.* 8: 409 (1902); Haines & Lye in *Sedges & Rushes E. Afr.*: 73, fig. 110, 111 (1983). Type: Sudan, Bongo, 'Giv.', *Schweinfurth* 2576 (B!, holo.)

Annual, densely tufted, with many culms 5-20 cm tall, strongly flattened, 1-2 mm wide; roots slender; sheaths purple or reddish near base, greenish above, the upper ending in a triangular lobe. Spikelet ovoid to narrowly ovoid, 3-15 \times 1.5-3 mm, with up to 100 flowers; glumes pale with dark red mid-section which is divided by a pale midrib, 1.7-2 \times 0.9-1 mm, obtuse, but often frayed; perianth segments absent. Stamen 1. Style 3-branched. Nutlet light brown, triangular-ovoid, 0.7-0.8 \times 0.5-0.6 mm, \pm smooth with prominent ridges; appendage \pm 0.2 mm, pale.

TANZANIA. Kigoma District: 5 km on Kigoma-Kasulu road, July 1960, *Verdcourt* 2793!; Ulanga District: 10 km N of Mlahi, Oct. 1975, *Vollesen* MRC 2871!; Mbeya District: 14 km SW of Madibira on Igawa track, June 1996, *Faden et al.* 96/182!

DISTR. T 4, 6-8; Sudan

HAB. Seepage areas on sand, moist depressions, rice paddies, once on 'dry sandy soil'; 150–1050 m

NOTE. Close to *E. nigrescens* but differs in the flattened culm, and the larger glumes and nutlets.

7. *Eleocharis setifolia* (A. Rich.) J. Raynal in *Adansonia* ser. 2, 7: 318 (1967), as *Heleocharis*; Haines & Lye in *Sedges & Rushes E. Afr.*: 73, fig. 108, 109 (1983); Simpson in *K.B.* 43: 427 (1988); Lye in *Fl. Eth.* 6: 405, fig. 212.22.8 & 212.23 (1997). Type: Ethiopia, Dleladjeranne, Tacazze R., *Quartin Dillon* s.n. (P, holo.)

Annual; culms tufted, crowded, 4–20 cm tall, filiform, 0.3–0.4 mm thick, persistent after fruit has fallen; basal tubers small, entangled in roots, white with fleshy stems and branches, covered in tough short scales; sheaths pale, without reddish base, ending in short triangular lobe. Spikelets ovoid or obovoid, 2–5 × 1–2.5 mm, elongating to 5 mm in fruit; inflorescence bracts similar to glumes; glumes pale brown or pale greenish brown, 1–1.3 mm long, with or without distinct narrow green keeled midrib and paler margin, apex obtuse or emarginate. Perianth absent. Stamen 1, apiculate. Style 3-branched, white. Nutlet yellowish brown, urceolate-obovoid, 0.5–0.7 × 0.3 mm, strongly 3-ribbed, smooth or minutely tuberculate; appendage brown, triangular-conical, set in conspicuous rim.

KENYA. Nairobi: Thika Road House, July 1951, *Verdcourt* 541b! & between Wilson Airport and Army Barracks, Feb. 1978, *Gilbert* 4974!; Fort Hall District: Thika, between Thika turnoff and Gymkhana tennis club, July 1971, *Faden et al.* 71/527!

TANZANIA. Moshi District: 16 km on Moshi–Arusha road, Dec. 1961, *Polhill & Paulo* 991!; Tabora District: Unyanyembe, Malongwe, Jan. 1926, *Peter* 34442!; Iringa District: Trekimboga track towards Hippo Pools, May 1970, *Greenway & Kanuri* 14465!

DISTR. K 4; T 2, 4, 5, 7; Senegal to Nigeria, Congo-Kinshasa, Sudan, Ethiopia, Zambia; Philippines, Australia, Brazil, Caribbean

HAB. Ponds and pools, seepage areas, seasonally swampy grassland; may be locally common; 850–1700 m

SYN. *Isolepis setifolia* A. Rich. in *Tent. Fl. Abyss.* 2: 498 (1851)

Eleocharis schweinfurthiana Boeck. in *Flora* 62: 562 (1879); Svenson in *Rhodora* 39: 252 (1937). Type: Sudan, Djur, Seriba Ghattas, *Schweinfurth* 1949 (B!, holo.; K!, iso.)

E. microcarpa sensu C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 599 (1894/95) & in *F.T.A.* 8: 410 (1902), *non* Torrey

E. atropurpurea sensu E.P.A.: 1474 (1971), *non* (Retz) Kunth

NOTE. Probably closest to *E. nigrescens*, but differs in the much paler glumes and the appendage to the nutlet. Our material is subsp. *setifolia*; *E. setifolia* (A. Rich.) J. Raynal subsp. *schweinfurthiana* (Boeck.) D.A. Simpson in *K.B.* 43(3): 428 (1988) differs from subsp. *setifolia* in the perianth bristles, which are at least half as long as the nutlet. It occurs from Senegal and Mali to Nigeria, Congo-Kinshasa and Sudan.

8. *Eleocharis intricata* Kük. in *F.R.* 13: 135 (1914), as *Heleocharis*; Svenson in *Rhodora* 31: 239 (1929); Svenson in *Rhodora* 41: 54 (1939); Lye in *Fl. Somalia* 4: 106, fig. 62g (1995) in *Fl. Eth.* 6: 405 (1997). Type: Tanzania, Rungwe District: Kyimbila, *Stolz* 1132 (B!, holo.; B!, K!, iso.)

Annual or possibly perennial; culms 3–20 cm tall, angular, 0.4–1.2 mm thick; producing short horizontal or suberect stolons 0.5–1 mm thick and producing plants at short (a few mm) intervals, giving rise to dense tufts; roots slender; sheath pale or brown, ending in a pale transparent narrowly triangular lobe. Spikelet ovoid, 2–5 × 1–2.5 mm, with 4–8 flowers; glumes light brown to reddish brown with green midrib, 1.8–2.5 × 0.8–1 mm, acute or obtuse; perianth of 6–7 white or red-brown barbellate bristles with recurved teeth, longer than the nutlet. Stamens not seen. Style 2-branched. Nutlet glossy dark reddish brown or black, obovoid and flattened, 0.7–1 × 0.5 mm, with large pale triangular appendage 0.3 mm long.

TANZANIA. Rungwe District: Kyimbila, Konde, Feb. 1912, *Stolz* 1132! & 2 km beyond Kiwira on Mbeya–Tukuyu road, Mar. 1975, *Hooper & Townsend* 858!

DISTR. T 7; Chad, Ethiopia, Somalia; Madagascar, Mauritius, Libya, Egypt

HAB. Swamp, pool margins; 1350–1500 m

SYN. *E. intricata* Kük. var. *peteri* Schultze–Motel in Willdenowia 2: 507 (1960). Type: Zimbabwe, Victoria Falls, *Peter* 30806 (B!, holo.)

NOTE. Haines & Lye have this as a synonym of *Scirpus caducus* Del. in Fl. Egypte: 153 (1814). Type: Egypt, Damietta, collector unclear (P, holo.) = *Eleocharis caduca* (Del.) Schultes in Mant. 2: 88 (1824); Haines & Lye in Sedges & Rushes E. Afr.: 71, fig. 103 (1983). I have not made a decision but have followed Lye in his recent Flora treatments.

9. ***Eleocharis geniculata*** (L.) Roem. & Schult., Syst. Veg. 2: 150 (1817); Svenson in *Rhodora* 41: 50 (1939); Haines & Lye in Sedges & Rushes E. Afr.: 70, fig. 101 (1983); Lye in Fl. Somalia 4: 106, fig. 62/a–c (1995) in Fl. Eth. 6: 405, fig. 212.21 (1997). Lectotype: Jamaica, Herb. Clifford 21, *Scirpus* 1 (BM-000557653), chosen by Furtado in Gard. Bull. Straits Settle. 9: 299 (1937)

Annual herb with tufted culms from a compact base; culms 12–45 cm long, irregularly ridged, 0.6–0.9 mm thick; sheath reddish or purple at base, greyish above, ending in a short triangular acute lobe with hyaline margin; root system shallow. Spikelet ovoid, 3–4 × 2.5–3.5 mm; inflorescence bracts greenish, covering the glumes in bud; glumes grey at base, brown at apex, 1.8–2 × 1.4–1.5 mm, rounded at apex, midrib obscure and sometimes green, margin slightly frayed; perianth bristles ± 7, pink, glabrous, longer than the nutlet. Stamens 3, the filaments often persisting in fruit. Style 2-branched. Nutlet blackish purple, obovoid, 0.6–0.8 × 0.6–0.7 mm, smooth and shiny; appendage pale grey, minute and conical.

UGANDA. Masaka District: Sesse Islands, Sozi, Dec. 1922, *Maitland* 342!; Mengo District: Lake Victoria below Kampala water works, Kirindi, Dec. 1935, *Chandler* 1481!

KENYA. Lamu District: Kiwayu to Mvundeni, Jan. 1999, *Luke* 5640!

TANZANIA. Pangani District: Pangani, Mwera estate, Oct. 1957, *Tanner* 3743b!; Uzaramo District: Kurasini near Dar, Feb. 1971, *Batty* 1236!; Rufiji District: Mafia, Kironwe, Aug. 1937, *Greenway* 5001!; Pemba: Shengejuu–Pandani, Feb. 1929, *Greenway* 1504!

DISTR. U 4; K 7; T 3, 6; P; West Africa from Senegal to Nigeria, Cameroon, Gabon, Congo–Kinshasa, Somalia, Zambia, Mozambique, Zimbabwe, Botswana; widely distributed in the temperate and subtropic zones of the World

HAB. Lake shores, swamps, mangrove; 0–1150 m

SYN. *Scirpus geniculatus* L., Sp. Pl. 1: 48 (1753) pro parte

Eleocharis capitata R. Br., Prodr.: 225 (1810); C.B. Clarke in F.T.A. 8: 407 (1810), *non S. capitatus* L.

E. caribaea sensu Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 19 (1965), *non* (Rottb.) Blake

10. ***Eleocharis minuta*** Boeck. in E.J. 5: 503 (1884), as *Heleocharis*; Svenson in *Rhodora* 41: 54 (1939); Haines & Lye in Sedges & Rushes E. Afr.: 71, fig. 102 (1983). Type: Madagascar, Imerina, *Hildebrandt* 3527 (B, holo.; K!, iso.)

Dwarf annual or perennial with densely tufted culms 1–9 cm long, slightly flattened to quadrangular, 0.2–0.7 mm thick; sheaths 2 beyond the prophyll, purple near base, grey above, the upper ending in a triangular or truncate lobe; roots slender; stolons thin, to 2 cm long and 0.4–0.8 mm thick, but often not very conspicuous. Spikelet ovoid, 2–4 × 1–2 mm, 3–7-flowered, elongating to 7 mm in fruit; inflorescence bracts similar to glumes, sterile or fertile; glumes reddish brown to almost black, 1–2 mm long, with green midvein and pale border; perianth of 6–7 barbellate bristles much longer than the nutlet. Stamens 3. Style 2-branched. Nutlets dark olive brown, obovoid, 0.7–0.8 × 0.5–0.6 mm, smooth; appendage pale and conical, set in a conspicuous rim.

UGANDA. Mengo District: environs of Kampala, Apr. 1917, *Dummer* 3163! & King's Lake, Kampala, Sept. 1935, *Hancock & Chandler* 27!

TANZANIA. Iringa District: 13 km on Ufinda–Mafinga [Sao Hill] road, June 1996, *Faden et al.* 96/132!

DISTR. U 4; ?K 3 (see Note); T 7; Burundi, Zimbabwe; Madagascar, Mascareignes; E Australia
HAB. Lake shore, pond, swamp; 1150–1200 m (though Tanzanian specimen from much higher, possibly 1800 m)

NOTE. *Haines* 114 from K 3, Eldoret town, is possibly this species; it agrees in most respects but lacks any darker colour to the sheaths and is from 2100 m altitude.

11. ***Eleocharis brainii*** *Svenson* in *Rhodora* 39: 251 (1937); *Haines & Lye* in *Sedges & Rushes E. Afr.*: 74, fig. 112, 113 (1983). Type: Zimbabwe, 'Salisbury District', *Brain* 8963 (K!, holo.; G, fragm. iso.)

Dwarf annual; culms tufted, 1–5(–13) cm tall, filiform or obscurely 3-angular, 0.1–0.2 mm thick; sheaths 2 above the prophyll, reddish or purple near base, ending in a short triangular lobe; roots white, slender. Spikelet ovoid, 1–2 × 0.5–1 mm, of 4–5 fertile glumes; glumes uncoloured (the basal one) to dark reddish brown with paler margin and midrib, 1–1.5 mm long, obtuse at apex. Perianth absent or of few minute bristles. Stamen 1. Style 3-branched. Nutlet greyish white, urn-shaped, 0.5–0.6 × 0.4–0.5 mm, 3-ribbed and with rounded pits in rows; appendage grey-brown, low-pyramidal or only a rim.

UGANDA. Masaka District: Lake Nabugabo, Sept. 1967, *Haines* 4262!

TANZANIA. Tabora District: S of Pozo Moyo, 8 km from Kaliua, June 1980, *Hooper & Townsend* 2102!; Manyoni District: Lake Chaya, 16 km W of Kazikazi, July 1996, *Faden et al.* 96/517!; Songea District: near waterfall on R. Luhira N of Songea, Apr. 1956, *Milne-Redhead & Taylor* 9909!

DISTR. U 4; T 4, 5, 7, 8; Ghana, Nigeria, Congo-Kinshasa, Sudan, Zambia, Mozambique, Zimbabwe, Botswana

HAB. Swampy grassland, rock pools, lake shores, often half- or entirely submerged; 950–1450 m

NOTE. *Eleocharis retroflexa* (Poir.) Urban subsp. *chaetaria* (Roem. & Schult.) Koyama is cited by *Haines & Lye* as occurring in Western Tanzania, 1200–1500 m, "similar to *E. brainii* and *E. setifolia*, differs in well-developed bristles and different nutlet; when it produces decumbent culms and viviparous spikelets it is different from all other *Eleocharis*!". This has acute glumes, and so differs from everything else. I have not seen any specimens, and *Haines & Lye* do not cite any either. *Svenson* determined a specimen marked *E. chaetaria* from Sudan (*Schweinfurth* 2583) as *E. brainii*, so it is possible *Eleocharis chaetaria* Roem. & Schult., *Syst. Veg.*, ed. 15 bis 2: 154 (1817) is a synonym, or even the proper name. A problem is that for this taxon no type is mentioned, just "in humid grassy places of Calcutta".

12. ***Eleocharis atropurpurea*** (*Retz.*) *J. Presl* in *Reliq. Haenk.* 1: 196 (1828); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 627 (1895) & in *F.T.A.* 8: 407 (1902); *Svenson* in *Rhodora* 31: 227 (1929); *Haines & Lye* in *Sedges & Rushes E. Afr.*: 72, fig. 104, 105 (1983); *Lye* in *Fl. Somalia* 4: 106, fig. 62/d-f (1995) & in *Fl. Eth.* 6: 405, fig. 212.24 (1997). Type: India, *König* s.n. (LD, holo.)

Dwarf annual; culms often curved, dark vivid green, 1–12(–30) cm tall, filiform-rounded, 0.2–0.3 mm thick; sheaths 2 above the prophyll, the lower usually dark red or purple and truncate, the upper paler and with attenuate apex; root system slender. Spikelet ovoid, 2–8 × 1–2 mm, the lower glumes often deciduous; inflorescence bract lacking; glumes all fertile, spreading at maturity, dark reddish brown or purple with green midrib, ± 1 mm long, obtuse, sometimes with paler margin; perianth bristles 4–5, shorter than the nutlet and barbellate, or quite often absent. Stamens 1–3, anther 0.4–0.5 mm long. Style branches 2. Nutlets shiny black or blackish brown when mature, broadly ovoid, flattened, ± 0.5 × 0.4 mm, smooth and shiny; appendage minute, greyish. Fig. 8, p. 45.

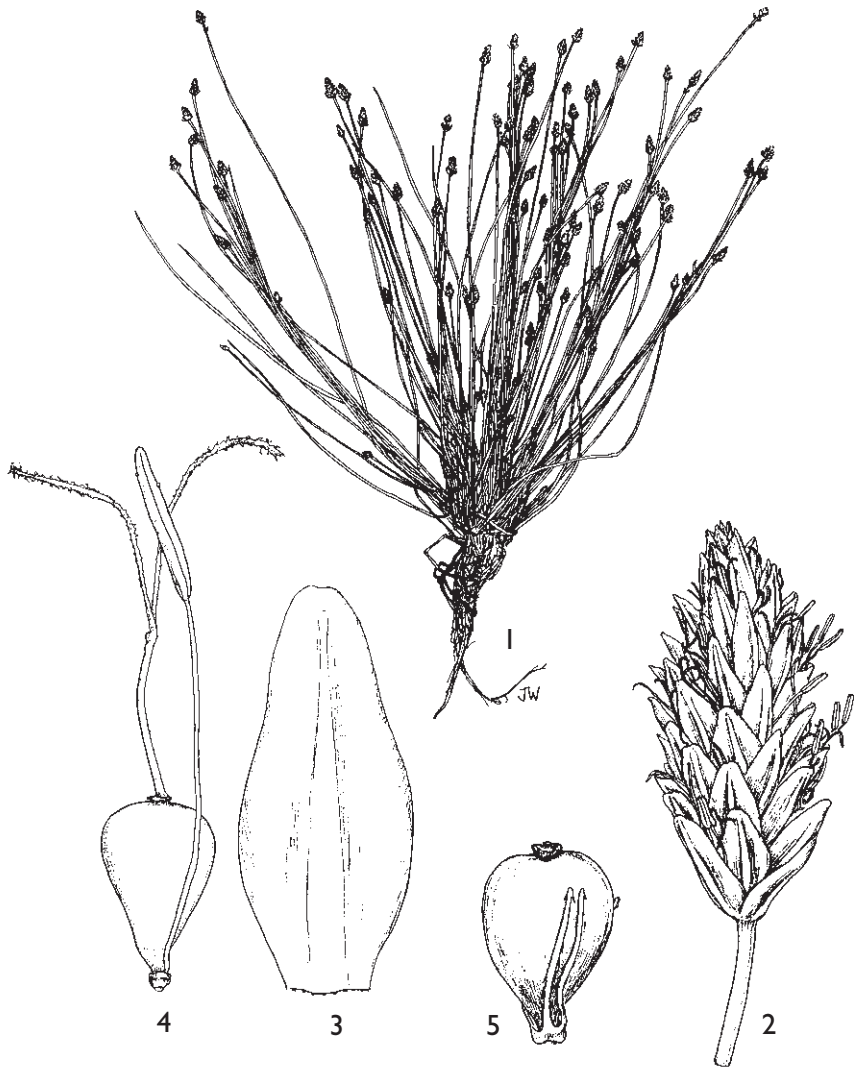


FIG. 8. *ELEOCHARIS ATROPURPUREA* — 1, habit, $\times \frac{2}{5}$; 2, inflorescence, $\times 10$; 3, glume, $\times 40$; 4, young flower, $\times 40$; 5, nutlet, $\times 40$. 1 & 5 from Greenway & Kanuri 14465a, 2–4 from Milne-Redhead & Taylor 10871. Drawn by Juliet Williamson.

UGANDA. Toro District: Queen Elizabeth National Park, 3 km W of Kasenyi, June 1970, *Lye & Katende* 5560!; Busoga District: Igwe, Oct. 1950, *G. Wood* Y12!

KENYA. Embu District: 29 km SSW of Embu, Feb. 1957, *Bogdan* 4446!; Fort Hall District: Thika, N side of Thika R. E of main road, July 1971, *Kabuye* 375!; Teita District: Tsavo National Park East, Dida Harea to Ndara Plains, Jan. 1972, *Faden & Faden* 72/130!

TANZANIA. Moshi District: Masama turnoff on Moshi–Arusha road, Sept. 1968, *Bigger* 2193!; Manyoni District: Lake Chaya, 16 km W of Kazikazi, July 1996, *Faden et al.* 96/521!; Songea District: 19 km E of Songea, June 1956, *Milne-Redhead & Taylor* 10871!

DISTR. U 2, 3; K 4, 7; T 2, 4–8; Nigeria to Sudan and Ethiopia, and south to Congo-Kinshasa, Zambia, Zimbabwe and Botswana; widespread in the tropics and subtropics of the Old and New World

HAB. Seasonal pools and seepage areas, rice paddies, shallow pools over rock, seasonally flooded grassland, pond and lake edges; may be locally common and sometimes even mat-forming; 0–1600 m

SYN. *Scirpus atropurpureus* Retz., Obs. 5: 14 (1789)

Eleocharis monandra Hochst. in Steud., Syn. Cyp.: 75 (1855). Lectotype: Sudan, Kordofan, Arasch-Cool, *Kotschy* 129 (K!, isolecto.), possibly chosen by Menapace

NOTE. Svenson has as combining author Kunth, Enum. 2: 151 (1837), but Presl made a proper combination, mentioning both basionym and protologue.

13. ***Eleocharis nigrescens*** (Nees) Kunth, Enum. Pl. 2: 157 (1805); Steud. in Syn. Pl. Glum. 2: 77 (1855); Svenson in *Rhodora* 39: 239, t. 462 (1937); Haines & Lye in *Sedges & Rushes E. Afr.*: 72, fig. 106, 107 (1983); Simpson in K.B. 43: 423 (1988). Type: Brazil, 'in maritimis', *Salzmann* s.n. (CGE, holo.; K!, iso.)

Tufted annual with crowded stems 3–11 cm tall, filiform, obscurely 3–4-angular and often rather flattened, 0.2–0.7 mm thick, often with branching base due to short branched vertical stolons or elongate internodes; sheaths reddish to purple near base, greyish above, the upper ending in an acute to attenuate lobe 1–2 mm long; roots slender. Spikelet ovoid, 2–5 × 1–2.5 mm; inflorescence bracts fertile, similar to glumes but slightly larger; glumes dark purple-brown with broad paler margin and paler midrib, 0.8–1.3 × 0.4–1 mm, obtuse at apex; perianth absent. Stamen 1. Style 3-branched. Nutlet pale brownish yellow, semi-translucent, obovoid-triangular, 0.4–0.6 × 0.2–0.4 mm, 3-ribbed to almost winged when dry, smooth; appendage flattened, darker than nutlet.

UGANDA. Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1372! & Kalungu county 3 km SW of West Mengo border, Sept. 1971, *Lye* 6633!

KENYA. Nairobi: Thika Road House, July 1951, *Verdcourt* 541!

TANZANIA. Tabora District: 10 km N of Tabora, June 1980, *Hooper & Townsend* 2114!; Uzaramo District: Kilwani pond, 7 km S of Dar es Salaam, July 1971, *Wingfield* 1624!; Iringa District: just N of Iringa town, July 1956, *Milne-Redhead & Taylor* 11206!; Zanzibar, Oct. 1873, *Hildebrandt* 1063!

DISTR. U 4; K 4; T 4, 6–8; Z; Senegal, Mali, Burkina Faso, Ivory Coast to Nigeria, Sudan, Zambia, Malawi, Zimbabwe; Madagascar, tropical Americas

HAB. Damp depressions, old rice paddies, pool edges, near waterfalls; 0–1700 m

SYN. *Scirpidium nigrescens* Nees in Fl. Brasil. 2, 1: 97 (1842)

Eleocharis atropurpurea (Retz.) Presl. var. *nigrescens* (Nees) Boeck. in *Linnaea* 36: 459 (1870)

E. hildebrandtii Boeck. in *Flora* 61: 34 (1878), as *Heleocharis*; C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 598 (1894/95) & in *F.T.A.* 8: 409 (1902). Type: Tanzania, Zanzibar, *Hildebrandt* 1063 (B!, holo.; K!, iso.)

NOTE. Close to *E. atropurpurea* but distinct in the absence of perianth bristles and the triangular (not flattened) nutlet. *Greenway & Kanuri* 15004 from K 6, Nasampolai Valley, has no perianth, sterile staminodes, and slightly flattened 3-angled nutlets; I am not sure what this is!

The combination of the name *nigrescens* in *Eleocharis* is sometimes ascribed to Steudel but Kunth gave both the new combination and cited the old name plus its protologue.

TAXA TO BE EXCLUDED

Eleocharis calocarpa Cherm.

Svenson in *Rhodora* 41: 6 (1939) cites *Hancock & Chandler* 21 from U 4, Mengo District: Kampala, and *Chandler* 1393 from Masaka District for this taxon. The taxon is very close to *variegata*, Svenson says. I believe both these specimens are *E. variegata*.

7. WEBSTERIA

S.H. Wright in Bull. Torrey Bot. Club 14: 135 (1887)

Submerged perennial aquatic plants rooting in mud; culms much-branched, many-noded with many sterile stems in successive whorls and only occasional fertile culms. Leaves a tubular sheath. Inflorescence a single spikelet. Spikelets of 2 glumes and a single bisexual flower; perianth-segments 6–11, filiform with many recurved spines; stamens 3 with large anthers. Style 2-branched. Nutlets broadly ovoid or round, flattened, with small persistent style-base.

A monotypic genus widely distributed in tropical Asia, Africa and America, also southern parts of North America.

Websteria confervoides (Poir.) S.S. Hooper in K.B. 26: 582 (1972) & in F.W.T.A. ed. 2, 3: 314 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 76, fig. 117 (1983); C.D. Adams in Fl. Trinidad & Tobago 3 (5): 389 (1992). Type: Madagascar, *Petit-Thouars* s.n. (P, holo.)

Slender but strong and wiry stemmed perennial 0.3–1 m long, with nodes in upper parts each with branches arranged subumbellately and subtended by greyish, pink or dark purple reduced leaves (scale-like bracts); each of the branches may have new whorls of branches, the branching repeated until nodes of the 4th order but the final subtending sterile culms or less often a stalked spikelet; branchlets filiform. Spikelets 8–12 mm long, 1.5–2 mm wide; glumes green or greyish with a reddish brown central line, lanceolate, 8–12 mm long, the lower shorter, 3-veined the upper 1-veined. Stamens lateral; anthers 4 mm long. Nutlets grey or pale brownish, obovoid, 2–2.5 mm long, 1.5–2 mm wide with darker tapering acuminate beak 2–3 mm long. Fig. 9, p. 48.

TANZANIA. Rungwe District: Poroto Mts, Lake Ndwati, Oct. 1969, *Wingfield* 457!

DISTR. T 7; Ivory Coast, S Nigeria, Congo-Kinshasa, Zambia; Madagascar, Sri Lanka, Malaysia,

Cuba, Trinidad, Guiana, Paraguay, Venezuela, Guatemala, Florida and S Carolina

HAB. Lake, wholly submerged in 0.9–1.5 m of water; 2055 m

SYN. *Scirpus confervoides* Poir., Encycl. Méth. 6: 755 (1804); Beetle in N. Amer. Fl. 18 (8): 496 (1947); Standley in Fieldiana Bot. 24 (1): 181 (1958); Kern in Fl. Males. Ser. 1, 7: 504, fig. 25 (1974)

S. submersus C. Wright in Sauvalle, An. Acad. Ci. Méd. Habana 8: 79 (1871) & in Fl. Cuba: 175 (1873); C.B. Clarke in Fl. Br. India 6: 653 (1893) & in Urb., Sym. Antill. 2: 91 (1900). Type: Cuba, Pinar del Rio, C. Wright (GH? holo.)

Rhynchospora ruppoides Benth. in Hook, Icon. Pl. 14, t. 1344 (1881). Types: Sri Lanka, Colombo, *Ferguson* in *Thwaites* CP 3936 (K!, syn.) & Paraguay, Caaguaza, *Balansa* 2550 (K!, syn.)

Websteria limnophila S.H. Wright in Bull. Torrey Bot. Club 14: 135 (1887). Type: U.S.A., Florida, Volusia County, Lake Helen, *S.H. Wright* s.n. and same locality and other lakes, *G.H. Webster* (ubi?, syn.)

W. submersa (C. Wright) Britton in Bull. Torrey Bot. Club 15: 19 (1888)

Eleocharis confervoides (Poir.) Koyama in Rev. Handb. Fl. Ceylon 5: 267 (1985)

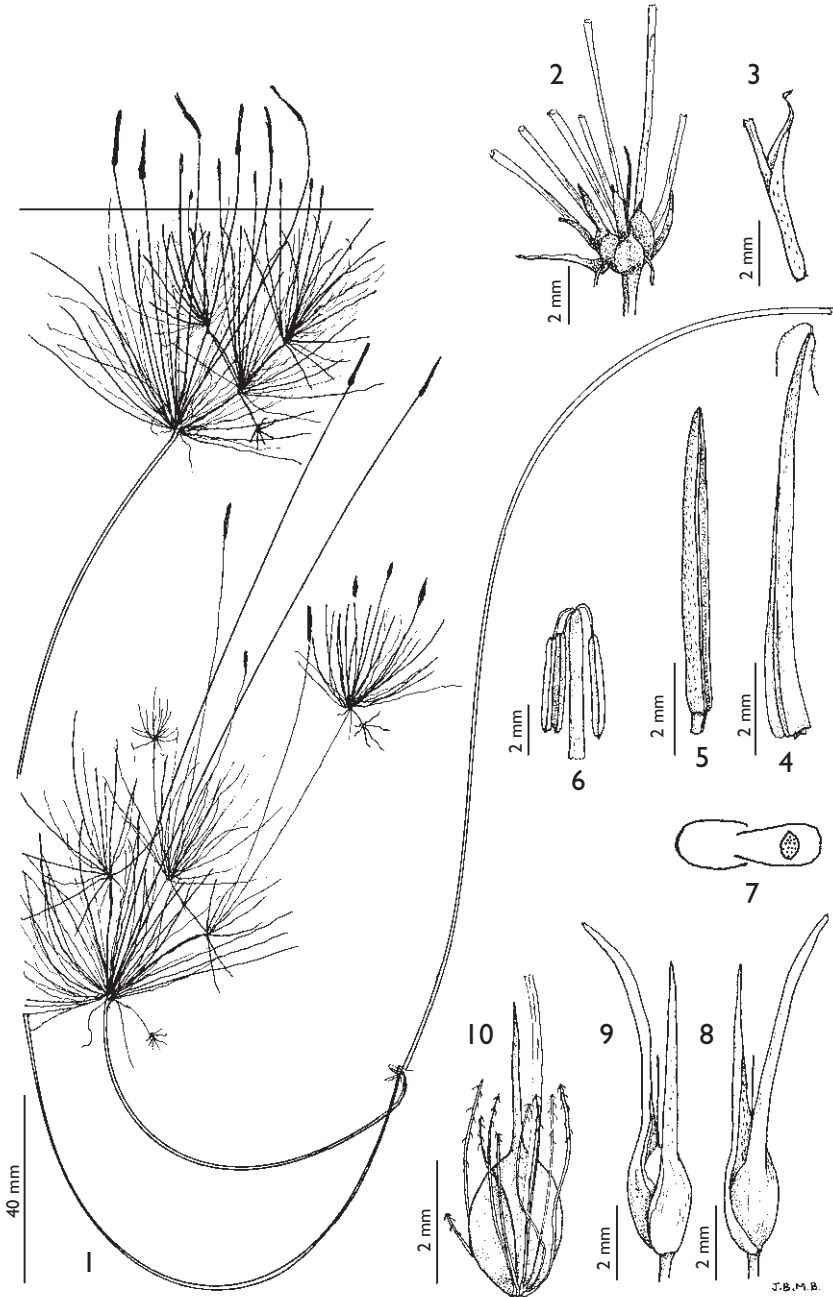


FIG. 9. *WEBSTERIA CONFERVOIDES* — 1, habit; 2, 'node' subtending branches; 3, leaf sheath apex; 4–5, spikelet, respectively with upper and lower scale; 6, spikelet apex; 7, diagram of spikelet; 8–9, spikelets, opposing views; 10, nutlet with bristles. From *P.A. Smith* 571. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

8. FIMBRISTYLIS

Vahl, Enum. Pl. 2: 285 (1805)

Annual or perennial herbs. Culms scapose or subscapose. Leaves sometimes reduced to a sheath only; ligule sometimes a fringe of hairs. Inflorescence usually compound of many spikelets, less often reduced to a single spikelet. Spikelets with spirally arranged or less often distichous glumes, the lower 1–2 usually empty, the next bisexual and the uppermost male or sterile. Perianth segments absent. Stamens 1–3. Styles 2–3-fid, often flattened with fimbriate margins when 2-fid, the base distinct and thickened. Fruit trigonous when style is 3-fid, and lenticular when 2-fid. Nutlets smooth, tuberculate or longitudinally ribbed, not transversely wrinkled; style-base widened, falling with rest of style.

About 300 species in tropics and warm temperate regions.

- | | |
|---|-------------------------------------|
| 1. Awns of glumes conspicuous, at least half as long as glume; annual | 2 |
| Awns of glumes shorter; annual or perennial | 3 |
| 2. Nutlet narrow and ± cylindrical; style not fimbriate, awn glabrous; style-base without slender processes | 17. <i>F. dipsacea</i> p.63 |
| Nutlet obovoid; style fimbriate; awn scabrid; style-base with slender processes | 16. <i>F. squarrosa</i> p.63 |
| 3. Inflorescence of 1–2 spikelets | 4 |
| Inflorescence of 3–many spikelets | 5 |
| 4. Inflorescence a solitary spikelet; glumes 1-veined | 14. <i>F. polytrichoides</i> p.62 |
| Inflorescence of 1–2(–3) spikelets; glumes several-veined | 15. <i>F. schoenoides</i> p.62 |
| 5. Stigmas 3; style angular; nutlets trigonous | 6 |
| Stigmas 2; style flat often ciliate; nutlets lenticular | 12 |
| 6. Perennials, hardened at base or stoloniferous | 7 |
| Annuals, base not hardened | 10 |
| 7. Spikelets in sessile or pedicelled clusters but occasionally some individual spikelets stalked | 8 |
| Spikelets never clustered | 9 |
| 8. Glumes shortly mucronate; upland species | 1. <i>F. complanata</i> p.50 |
| Glumes obtuse, not mucronate, coastal | 3. <i>F. cymosa</i> p.51 |
| 9. Stems flattened and winged above | 1. <i>F. complanata</i> p.50 |
| Stems rounded or triangular | 2. <i>F. subaphylla</i> p.51 |
| 10. Leaf-blades inrolled 0.5 mm wide; nutlets not warty (K 7, Maktau) | 18. <i>F.</i> sp. A p.64 |
| Leaf-blades flattened and much wider; nutlets warty | 11 |
| 11. Spikelets ± globose; glumes obtuse | 4. <i>F. littoralis</i> p.52 |
| Spikelets ovoid to lanceolate; glumes shortly mucronate | 5. <i>F. quinquangularis</i> p.53 |
| 12. Creeping stolons present | 13. <i>F. madagascariensis</i> p.61 |
| Stolons absent; rhizomes may be present | 13 |
| 13. Glumes with dense minute hairs on upper parts | 7. <i>F. ferruginea</i> p.55 |
| Glumes glabrous or with some spine-like hairs on midrib, or margins ciliate | 14 |
| 14. Plant base covered with thread-like fibres | 12. <i>F. scabrída</i> p.61 |
| Plant base without such fibres | 15 |

15. Leaves reduced to sheaths or leaf-blades very short; nutlets almost smooth 6. *F. longiculmis* p.54
 Leaf-blades well developed; nutlets smooth or striate* 16
16. Annual; spikelets 1–1.5 mm wide 10. *F. bisumbellata* p.58
 Perennial or rarely annual; spikelets 2–5.5 mm wide 17
17. Glumes 4–5 mm long; spikelets 2.5–5.5 mm wide 8. *F. robusta* p.57
 Glumes 2–3 mm long; spikelets 2–4 mm wide 18
18. Nutlet with ± 10 prominent longitudinal ribs on each face; tubercles absent 9. *F. dichotoma* p.57
 Nutlet with ± 20 longitudinal ribs on each face; with or without tubercles 11. *F. pilosa* p.60

1. ***Fimbristylis complanata*** (Retz.) Link, Hort. Reg. Bot. Berol. 1: 292 (1827); A. Rich., Tent. Fl. Abyss. 2: 505 (1850); Ridl. in Trans. Linn. Soc. ser. 2 Bot 2: 150 (1884); C.B. Clarke in Fl. Brit. India 6: 646 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 602 (1895); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in Fl. Cap. 7: 202 (1898); Rendle in Cat. Afr. Pl. Welw. 2: 123 (1899); C.B. Clarke in Urban, Symb. Antill. 2: 81 (1900) & in F.T.A. 8: 422 (1902); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 9, fig. 28 (1965) & in F.W.T.A. ed. 2, 3: 323 (1972); Gordon-Gray in Strelitzia 2: 90, fig. 34, C, F, G, J (1995); Lye in Fl. Somalia 4: 108 (1995) & in Fl. Eth. 6: 408, fig. 212.25 (1997). Type: India, *König* s.n. (LD, holo.; C, iso.)

Tufted rhizomatous perennial 0.5–1.2 m tall; rhizome woody, creeping with stems densely packed, 1.5–3 mm wide, glabrous or scabrid just below the inflorescence. Leaf sheaths closed, glabrous except for hairy margin near the ligule which is a distinct rim of dense hairs; blades 1–35 cm long, flat, the margin with dense spine-like hairs. Inflorescence compound of a central spikelet and many stalked spikelets or groups of spikelets; bracts 1–2 cm long, with scabrid margins; spikelets 5–8(–12) mm long, ± 2 mm wide; glumes golden or dark brown to almost black, ± 3 mm long, acute. Style branches 3. Nutlets brownish, trigonous, 0.8–1 mm long, ± 0.7 mm wide, with cells in longitudinal rows and scattered papillae; epidermal cells ± transversely rectangular.

subsp. ***complanata***; Haines & Lye in Sedges & Rushes E. Afr.: 78, fig. 119–120 (1983)

Spikelets in open inflorescences pedicellate save for central ones.

UGANDA. Kigezi District: N Kigezi, Kebisoni, May 1950, *Purseglove* 3399!; Busoga District: Bukoli, Bugiri Plantation, Bugiri–Busembatia road, 18 Apr. 1953, *Wood* 687!; Mubende District: 4–5 km E of Mubende, 26 June 1969, *Lye & Ruwaburindore* 3425B!

KENYA. Baringo District: km 24 from main road to Lake Bogoria, 1 Nov. 2000, *Smith, Beentje & Muasya* 92!; Nairobi District: Langata road near Nairobi National Park boundary, 22 Apr. 1978, *Gilbert & Thulin* 1021!; S Kavirondo District: Kanyamkago, 24 Apr. 1925, *Spranger* 527!

TANZANIA. Arusha District: SE of Ngurdoto Crater, Sakila, 20 Mar. 1968, *Greenway & Kanuri* 13216!; Lushoto District: W Usambaras, Kwai Valley, 25 Apr. 1953, *Drummond & Hemsley* 2247!; Kigoma District: Ujiji, Mar. 1939, *Loveridge* 713!

DISTR. U 2–4; K 3–5; T 1–4, 7; pantropical

HAB. Permanently inundated swamps, grassland with mixed herbs, *Juniperus-Nuxia-Agauria* mixed forest, often in rocky places; sea-level (fide Haines & Lye)–2700 m

SYN. *Scirpus complanatus* Retz., Obs. Bot. 5: 14 (1789)

Fimbristylis consanguinea Kunth, Enum. Pl. 2: 228 (1837); Kern in Fl. Males. Ser. 1, 7: (1974).

Types: South Africa, Cape Province, *Drège* 4414, 4418, 7404 (B†, syn.) (an isosyntype is apparently at L)

* If nutlets strongly papillate with large papillae and plant a perennial with spikelets 4–8(–16) × 2–3 mm it is possibly *F. madagascariensis* without or not showing stolons.

F. bequaertii De Wild., Pl. Bequaert. 4: 200 (1927). Type: Congo-Kinshasa, Kibimbi, *Bequaert* 126 (BR, holo.)

NOTE. Kern keeps *F. consanguinea* separate as a high altitude taxon as also does Koyama (Rev. Fl. Ceylon 5: 285 (1985)). Gordon-Gray points out this does not work in South Africa.

subsp. **keniaensis** (Kük.) Lye in Nordic Journ. Bot. 2: 334 (1982); Haines & Lye, Sedges & Rushes E. Afr.: 79, figs. 121, 122 (1983). Types: Kenya, Mt Kenya, W foothills, Cole's Mill, *R.E. & T.C.E. Fries* 1072 (B†, syn., K!, UPS, isosyn) & W Kenya Forest Station, *R.E. & T.C.E. Fries* 728 (B†, syn., K!, UPS, isosyn.)

Spikelets more crowded often with 2 or more sessile spikelets together.

KENYA. Naivasha District: South Kinangop, 3 June 1961, *Polhill* 427!; Fort Hall District: Thika, hillside, W of Blue Posts Hotel, 12 Apr. 1968, *Faden* 68/121!; Masai District: Narok to Olorukto, km 19, Orengetok, 17 May 1961, *Glover et al.* 1257! & 1295!

DISTR. K 3–6; Ethiopia

HAB. Swampy grassland, moist places, seepage areas in degraded *Juniperus* and *Croton-Brachylaena* semi-deciduous forest, roadsides; often on black cotton soils; 1450–2700 m

SYN. *Fimbristylis keniaensis* Kük. in N.B.G.B. 9: 307 (1925); Lye in Fl. Eth. 6: 407, fig. 212. 26 (1997)

NOTE. *Haines* 4106 (Nakuru District, 105.6 km from Eldoret, 17 Apr. 1936 shows that both taxa occur together sometimes. Napper did not separate them.

2. ***Fimbristylis subaphylla*** Boeck. in Flora 62: 565 (1829); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 610 (1895) & in F.T.A. 8: 421 (1902); F.P.S. 3: 312 (1956); Napper in J. A. Afr. Nat. Hist. Soc. 25(110): 10 (1965); Haines & Lye, Sedges & Rushes E. Afr. 79, fig. 123, 124 (1983). Types: Sudan, Equatoria, Bahr el-Ghazal [Gazellen Fluss], *Schweinfurth* 1144 (B†, syn., K!, isosyn.); *Schweinfurth* 1220–1236 (B†, syn.)

Tufted perennial 0.7–1.2 m tall with deeply buried creeping rhizome; stems 1–2 mm wide, angular or sometimes strongly compressed above, ridges glabrous. Leaves with closed pink sheaths, glabrous except for throat, the ligule a distinct rim of hairs; blades very short usually under 1 cm and not over 2 cm, the margins and upper surface hairy. Inflorescences long, slender and open with 3 orders of branching; bracts leafy, 1–1.5 cm long, pubescent above and with scabrid margin; spikelets 4–5 (–15) mm long, 1–1.5 mm wide; lower 1–3 glumes sterile, 1–2 mm long, brownish with excurrent midrib; fertile glumes pale rusty brown, ± 3 mm long, glabrous or with short marginal hairs, the midrib usually slightly excurrent. Style flattened, 3-branched. Nutlets white or yellowish, 0.6–0.8 mm long, 0.5–0.6 mm wide, faintly longitudinally striate and with scattered papillae; epidermal cells isodiametric.

UGANDA. Busoga District: Bulamogi, Lake Nakuwa, 28 Jan. 1951, *Wood* 216!; Masaka District: SW side of Lake Nabugabo, 7 Oct. 1953, *Drummond & Hemsley* 4662!; Mengo District, Kampala, King's Lake, 4 Sept. 1935, *Chandler & Hancock* 18!

TANZANIA. Kigoma District: Lake Chagu, 19 June 1980, *Hooper et al.* 2061! & 6 km S of Kigoma, Kitwe Point, 23 Apr. 1994, *Bidgood & Vollesen* 3164!

DISTR. U 3, 4; T 4; S Sudan

HAB. In swamps along edges of open water, in deep water sometimes forming small floating islands, also damp banks of forest tracks; 1050–1200 m

NOTE. Although the types have been wrongly referred to Ethiopia it does not occur there.

3. ***Fimbristylis cymosa*** R. Br., Prodr. Fl. Nov. Holl.: 228 (1810); Kern in Fl. Males. 7: 557 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 80, fig. 125 (1983); Koyama in Rev. Fl. Ceylon 5: 301 (1985); Lye in Fl. Somalia 4: 108 (1995). Type: Australia, Gulf of Carpentaria Is. & Prince of Wales Is., *R. Brown* s.n. (BM, syn.; K!, *R. Brown* 5959 isosyn.)

Very variable rhizomatous perennial forming dense tufts 10–90 cm tall and up to 90 cm wide. Leaves many, flat, 2–20 cm long, 0.7–2 mm wide, suddenly rounded at the apex. Inflorescence compound with many small pedunculate clusters of sessile spikelets; spikelets pale brown or yellowish brown with often wide whitish margin, 1.5 mm long, rounded at apex, the midrib not excurrent. Style 3-branched in Africa (but sometimes 2-branched elsewhere). Nutlets dark brown when mature, obovoid, 0.7 mm long, smooth or rough with cells in longitudinal rows.

KENYA. Kilifi District: 24 km S of Malindi, Mida, 3 Dec. 1961, *Polhill & Paulo* 897!; Mombasa, 27 Nov. 1951, *Bogdan* 3315!; Kwale District: Kinoneni, Kitoni Hot Springs, July 1967, *Makin* 418!

TANZANIA. Pangani District: Mkwaja, 13 June 1957, *Tanner* 3568!; Bagamoyo District: Saadani [Sadani], 30 Nov. 1915, *Peter* 14592!; Mikindani District: Mtwara–Mikindani road, 11 Mar. 1963, *Richards* 17846!; Zanzibar: Mbweni, 28 Mar. 1964, *Faulkner* 3366!

DISTR. **K** 7; **T** 3, 6, 8; **Z**; pantropical

HAB. Sandy foreshores, edges of mangrove swamps, coral rock, saline marshes; sea level–45 m

SYN. ? *Scirpus obtusifolius* Lam., *Tabl. Encycl.* 1: 141 (1791). Type: India, no specimen in P-Lam.
? *Fimbristylis obtusifolia* (Lam.) Kunth., *Enum. Pl.* 2: 240 (1837); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 608 (1895) & in F.C. 7: 203 (1898); Rendle in *Cat. Afr. Pl. Wetw.* 2: 123 (1899); C.B. Clarke in F.T.A. 8: 423 (1902) & *Illust. Cyp.*, t. 43, fig. 7–11 (1909); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 25 (110): 10, fig. 30 (1965) & in F.W.T.A. ed. 2, 3: 324 (1972); Gordon-Gray in *Strelitzia* 2: 93 figs. 35 C, F, 36 (1995)

NOTE. Napper and Gordon-Gray continued to use the name *F. obtusifolia* considering that the whole complex needed further study. It might be possible to establish subspecies. Koyama has treated *F. spathacea* Roth. as a subspecies of *F. cymosa* for Indian and Asian plants. This usually has a 2-branched style.

4. *Fimbristylis littoralis* *Gaud.* in Freycinet, *Voy. Bot. Uranie*: 413 (1829); Napper in *K.B.* 25: 439 (1971) & in F.W.T.A. ed. 2, 3: 323 (1972); Haines & Lye, *Sedges & Rushes of E. Afr.*: 80, fig. 126 (1983). Types: Indonesia, “insulis Mariannis, Moluccis inque insula Timor”, *Gaudichaud* s.n. (P, holo.)

Tufted annual 10–40 cm tall with shallow root system and many basal leaves; stems each with a basal shortly bifid prophyll followed by 2 short-bladed sheaths. Leaves distichous, channelled, 10–40 cm long, 1.5–2 mm wide, narrowed to an acute tip and bearing new leafy shoots in their axils. Inflorescence of many panicles; spikelets small, pale to dark brown, globose, 2–3 mm long; glumes brown, 1–1.3 mm long, rounded and midrib not produced. Stamens 2; style 3-branched. Nutlets triangular-ovoid, 0.6–0.7 mm long, tuberculate and with rows of transversely elongate cells.

KENYA. Kwale District: Shimba Hills National Reserve, Manolo river bridge ± 1 km from Kibaoni village towards Kwale town, 16 Dec. 2007, *Mbale et al.* NMK 985!

TANZANIA. Tabora District: road between Kaliuwa and Urambo, near Urambo, 17 June 1980, *Hooper et al.* 2018!; Rufiji District: Selours Game Reserve, opposite Sand Rivers Lodge, 7 June 1997, *Luke & Luke* 4634!; Zanzibar: ? Mwora Swamp, 19 Aug. 1960, *Faulkner* 2692!; Pemba: Chake Chake, 20 Oct. 1929, *Vaughan* 842!

HAB. Dry river beds and drying swamp; sea level to 300(–1200) m

DISTR. **K** 7; **T** 4, 6; **Z**; **P**; Indian Ocean coasts to SE Asia

SYN. *F. miliacea* sensu Vahl, *Enum.* 2: 287 (1805); C.B. Clarke in *Fl. Br. India* 6: 644 (1893) & in Durand & Schinz, *Consp. Fl. Afr.* 5: 607 (1895); K. Schum. in *P.O.A. C.* 124 (1895); C.B. Clarke in *Urb., Symb. Antill* 2: 81 (1900) & F.T.A. 8: 421 (1902); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 25 (110): 10, fig. 30 (1965), *non Scirpus miliaceus* L.

NOTE. Any material labelled *F. miliacea* needs careful examination to determine whether it is species 4 or 5.

5. *Fimbristylis quinquangularis* (Vahl) Kunth, Enum. 2: 229 (1837); C.B. Clarke in Fl. Br. India 6: 644 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 609 (1895) & F.T.A. 8: 421 (1902); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 10 (1965) & in K.B. 25: 439 (1971) & in F.W.T.A. ed 2, 3: 323 (1972). Type: India orientalis, König s.n. (C, hol.) (seen by S.T. Blake)

Tufted annual or possibly sometimes perennial with slender rootstock, 20–60(–125) cm tall; stems 0.5–1.5 mm wide, 4–5-angled. Leaves up to as long as the stems; blades flat with prominent midrib, 1–3 mm wide; ligule absent. Inflorescence open, paniculate, up to 10 cm long; involucre bracts slender, up to 3 cm long; spikelets ovoid, 2–5 mm long, 1–1.5 mm wide, acute; glumes golden brown or brown, 1–2 mm long, shortly mucronate. Stamen 1. Style with 3 stigmas. Nutlets white or pale yellowish brown, obovoid, obscurely 3-angled, 0.4–0.6 mm long, 0.3–0.5 mm wide, the epidermal cells forming raised transverse ridges in 2–8 vertical and 15–30 horizontal rows on each face, papillate, the papillae chambered or not.

- | | |
|---|----------------------------------|
| 1. Nutlets 0.7–0.8 mm long, verrucose with chambered papillae | b. subsp. <i>macroglumis</i> |
| Nutlets 0.4–0.6 mm long, papillae not distinctly chambered | 2 |
| 2. Glumes 1–1.5 mm long; nutlets with epidermal cells in 4–6 vertical rows on each face | a. subsp. <i>quinquangularis</i> |
| Glumes 1.2–2.5 mm long; nutlets with epidermal cells in 2–3 vertical rows on each face | c. subsp. <i>pallescens</i> |

a. subsp. **quinquangularis**

Glumes 1–1.5 mm long. Nutlets 0.4–0.6 mm long, 0.3–0.4 mm wide; transverse oblong-linear epidermal cells in 4–6 vertical rows on each face.

UGANDA. Teso District: Omunyal swamp, Makerere College 638 & same locality, 14 Sept. 1954, Lind 368!

TANZANIA. Tabora District: Kapapa, 17 Sept. 1970, Richards 25958!; Kilosa District: Mikumi National Park H.Q., Greenway & Kamuri 15109! & 8.5 km WSW of main gate, 28 June 1977, Wingfield 3970!

DISTR. U 3; T 4, 6; pantropical

HAB. Bogs, swampy grassland, rice fields, seasonal water holes; 500–1000 m

SYN. *Scirpus miliaceus* L., Syst. Nat. ed. 10: 868 (1759) & Sp. Pl. ed. 2: 75 (1762). Type: India, East, collector not known, Linn. Herb. 71/4 (LINN, lecto., chosen by Blake), *nom. rej.*

S. quinquangularis Vahl, Enum. Pl. 2: 279 (1805)

Fimbristylis miliacea (L.) Vahl, Enum. 2: 287 (1805); C.B. Clarke in F.T.A. 8: 421 (1902); Vollesen in Opera Bot. 59: 94 (1980); Lye in Fl. Eth. 6: 410, fig. 212.29* (1997)

F. miliacea (L.) Vahl subsp. *miliacea*; Haines & Lye, Sedges & Rushes of E. Afr.: 81, figs. 127, 128 (1983)

NOTE. Long ago C.B. Clarke (J.L.S. 30: 312 (1894)) noted that the Linnean type of *Scirpus miliacea* L. was *F. quinquangularis* and Blake (J. Arn. Arb. 35: 216 (1954)) and others showed that what had always been called *F. miliacea* was in fact misidentified and should be called *F. littoralis*. Napper argued that it would be best to suppress the name *F. miliacea* and this was done, *Scirpus miliaceus* L. appearing as a *nomen rejiciendum* in the code. The confusion will continue and all determination labels pre-1980 are suspect. Examination of the actual material is essential.

* There is an error here. Fig. 212.29 is indeed identical with fig. 128 from Haines & Lye (1983) which is a figure of subsp. *miliacea* from Uganda material but is stated to be drawn from Wingfield 2087 which is the type of subsp. *pallescens* which does not occur in Ethiopia.

b. subsp. **macroglumis** (Lye) Verdc. **comb. nov.** Type: Uganda, Ankole District: between Kaizi and Awempuno rivers, Lye & Katende 5501 (MHU, holo.; K!, iso.)

Often more robust than other subspecies and attaining 1 m, perhaps sometimes perennial; stems distinctly 5-angular. Glumes 1.5–2 mm long. Nutlets 0.7–0.8 mm long, 0.4–0.5 mm wide, verrucose with chambered papillae and transversely marked with fine lines with epidermal cells in 5–8 vertical rows and 15–20 horizontal rows on each face.

UGANDA. Ankole District: Queen Elizabeth National Park, between Kaizi & Rwempuno rivers, 2 June 1970, Lye & Katende 5501!; Masaka District: Koki, near Machobi, 21 Feb. 1971, Lye & Katende 5903; Mengo District: 16 km N of Luwero, 10 Dec. 1955, Langdale-Brown 1662!

KENYA. Kiambu District: Thika, hillside W of Blue Posts Hotel, 12 Apr. 1968, Faden 68/120!; Kericho District: 32 km NW of Kericho to junction of road S, just W of Kaituri then S for 8 km, Feb. 1973, Spjut & Ensor 3227!

TANZANIA. Kwimba District: Magu, 20 Oct, 1952, Tanner 1075!; Uzaramo District: 17 km WSW of Dar es Salaam, Kisarawe road, 2 km beyond Gongulambot, 8 May 1971, Wingfield 1550! & 12.5 km SW of Dar es Salaam, foot of Ukonga Hill, 19 Aug. 1972 Wingfield 2144!

DISTR. U 2, 4; K 4, 5; T 1, 6; not known elsewhere

HAB. Swamps and seasonally wet grassland, *Combretum* bushland, rock crevices near permanent water; 50–1650 m

SYN. *F. miliacea* (L.) Vahl var. *macroglumis* Lye in Nordic J. Bot. 2: 333 (1982); Haines & Lye, Sedges & Rushes of E. Afr.: 82, fig. 131 (1983)

c. subsp. **pallescens** (Lye) Verdc. **comb. nov.** Type: Tanzania, Uzaramo District: Dar es Salaam University Campus, Wingfield 2087 (DSM, holo.; K!, iso.)

Slender annual with 5-angled stems to 50 cm tall. Glumes 1.2–2.5 mm long. Nutlets 0.5–0.6 mm long, 0.4 mm wide, irregularly verrucose with unchambered papillae and transversely marked with fine lines with epidermal cells in 2–3 vertical rows and 20–30 horizontal rows per face.

TANZANIA. Uzaramo District: Dar es Salaam University Campus, ecology plot near Link Road, 3 Aug. 1972, Wingfield 2087! & same locality, 24 June 1974, Wingfield 2769!

DISTR. T 6; not known elsewhere

HAB. Seasonally swampy grassland on black soil, rice fields (fide Haines & Lye); 40 m

SYN. *F. miliacea* (L.) Vahl subsp. *pallescens* Lye in Nordic J. Bot. 2: 333 (1982); Haines & Lye, Sedges & Rushes of E. Afr.: 81, figs. 129, 130 (1983)

NOTE. According to a note by Wingfield on his 2762 Gordon-Gray had identified 2087 as *F. thonningiana* Boeck., a West African species.

6. **Fimbristylis longiculmis** Steud., Syn. Pl. Cyp.: 110 (1855); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 607 (1895); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in F.T.A. 8: 417 (1902); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 10, fig. 22 (1965); Haines & Lye, Sedges & Rushes of E. Afr.: 82, fig. 132 (1983); Gordon-Gray in Strelitzia 2: 93, figs. 3, 5, B, E (1995); Lye in Fl. Eth. 6: 409, fig. 212.27 (1997). Type: Madagascar, Nosy Boraha [Ile Sainte Marie], Boivin s.n. (P, holo.; K!, iso.)

Densely tufted rhizomatous perennial herb 0.6–1.3(–1.8) m tall; stems crowded, conspicuously flattened, dotted. Leaf sheaths greyish or pale brown; blades very short or absent. Inflorescence a panicle of few to many mostly stalked pale to dark brown spikelets 7–15(–20) mm long; glumes many, spirally arranged, reddish brown but paler below and near the slightly produced midrib, 3.5–4 mm long, glabrous. Style 2-branched. Nutlets obovoid-lenticular, almost smooth (but I have found smooth and warted in same spikelet).

KENYA. Mombasa, Taylor s.n.

TANZANIA. Uzaramo District: Pugu Hills, stream crossing Pugu–Minaki road, 4 Aug. 1973, Wingfield 2256!; Rufiji District: Mafia I., Kilindoni, 6 Aug. 1936, FitzGerald 5211/5!; Zanzibar I., Oct. 1873, Hildebrandt 1058b!; Pemba, road to Kiwani, 4 Mar. 1952, R.O. Williams 136!

DISTR. **K** 7; **T** 6; **Z**; **P**; Ethiopia, Madagascar

HAB. Waterlogged peaty areas and swamps by streams, roadsides and bushland; 1–100 m

SYN. *F. sansibarensis* Boeck. in Flora 63: 437 (1880). Type: Zanzibar I., *Hildebrandt* 1058b (B†, holo.; Kl, iso.)

7. ***Fimbristylis ferruginea*** (*L.*) *Vahl*, Enum. Pl. 2: 291 (1805); Delile, Fl. Egypte: 10, t. 6, fig. 3 (1812); Benth. in Niger Fl.: 554 (1849); Boeck. in Peters, Reise Mossamb. Bot.: 544 (1864) & in Linnaea 37: 16 (1871) & in Flora 62: 564 (1879); Schweinf., Beitr. Fl. Aethiop.: 216 (1867); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 149 (1884); C.B. Clarke in Fl. Br. India 6: 638 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 606 (1895); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in Fl. Cap. 7: 201 (1898); Rendle in Cat. Afr. Pl. Welw. 2: 122 (1899); C.B. Clarke in Urb. Symb. Antill. 2: 78 (1900); & in F.T.A. 8: 417 (1902); Nelmes & Baldwin in Am. J. Bot. 39: 375 (1952); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 10 (1965) & in F.W.T.A. ed. 2 3: 321, fig. 409 (1972); Gordon-Gray in Strelitzia 2: 92, figs 38A, D (1995); Lye in Fl. Somalia 4: 108 (1995) & in Fl. Eth. 6: 409 (1997); Adams in Cafferty & Jarvis in Taxon 53: 180 (2004). Type: Herb. van Royen 902.77–420 (L, lecto., chosen by Adams)

Tufted perennial 0.3–1.1 m tall with short rhizome forming clumps 60 cm wide; stems compressed, 1–2 mm wide, glabrous or with scattered spine-like or obtuse teeth. Leaf sheaths greyish pale brown or brown; blades up to 30 cm long, 1.5–2 mm wide. Inflorescence open or less so and sometimes subcapitate; spikelets few to many, shortly stalked to sessile or subsessile, brown or greyish, 5–18 mm long, 3–5 mm wide, ± acute; glumes reddish-brown, paler at base and near the excurrent midrib, 3–4 mm long, densely set with short whitish hairs in upper part. Stamens 3. Style 2-branched. Nutlet straw-coloured, obovoid-lenticular, 1–1.9 mm long, almost smooth, the surface cells very small, isodiametric. Fig. 10, p. 56.

a. subsp. **ferruginea**; Haines & Lye, Sedges & Rushes of E. Afr.: 83, figs. 133, 134 (1983); Lye in Fl. Somalia 4: 108 (1995) & in Fl. Eth. 6: 409 (1997)

Lower leaf sheaths shiny brown and leathery; leaf-blades mostly less than 10 cm long, often reduced to short lobes. Inflorescence not so open with few to many shortly stalked spikelets, or nearly all spikelets sessile or subsessile and then appearing subcapitate; spikelets distinctly acute. Nutlets 1–1.4 mm long.

KENYA. Kwale District: Gazi, 18 Nov 2000, *Smith, Beentje & Muasya* 244!; Kilifi District: 6.4 km N of Malindi, Sabaki, 31 Oct. 1961, *Polhill & Paulo* 683!; Tana R. District: Tana R. delta, Shekiko Camp and dunes, 24 Apr. 1990, *Robertson* 6123!

TANZANIA. Tanga District: Sawa [Poro-Moto], 4 Feb. 1965, *Faulkner* 3455!; Uzaramo District: 16 km NNW of Dar es Salaam, Kunduchi, 25 Feb. 1971, *Harris & Tadros* 5737; Mikindani District: Mtwara-Mikindani road, 11 Mar. 1963, *Richards* 17845A!; Zanzibar: Marahubi, Quarantine Station, 21 Aug. 1963, *Faulkner* 3256!

DISTR. **K** 7; **T** 3, 6, 8; **Z**; **P**; very widespread in the tropics

HAB. Tidal inlets, seasonally inundated *Suaeda-Avicennia* mangrove swamps bordering *Hyphaene-Sclerocarya* wooded grassland, salt marshes and intertidal mudflats down to spring tide level; sandy beaches; 0–240 m

SYN. *Scirpus ferrugineus* L., Sp. Pl. ed. 2: 74 (1762)

b. subsp. **sieberiana** (*Kunth*) *Lye* in Nordic J. Bot. 2: (1982); Haines & Lye, Sedges & Rushes of E. Afr.: 83, figs. 135, 136 (1983); Lye in Fl. Somalia 4: 108 (1995) & in Fl. Eth. 6: 410, fig. 212.28 (1997). Type: Mauritius, *Sieber* 210 (B†, holo.; AWH, iso.)

Lower leaf sheaths membranous, pale brown; leaf-blades 10–30 cm long, 1.5–2 mm wide. Inflorescence more open, of 1 sessile and usually 4–10 spikelets on 1–5 cm long peduncles, sometimes with 1–2 additional sessile spikelets at the base of stalked spikelets; spikelets more obtuse. Nutlets 1.3–1.7 mm long.



FIG. 10. *FIMBRISTYLIS FERRUGINEA* — 1, habit, $\times \frac{2}{3}$. From Flora of West Tropical Africa 3, t. 409. Drawn by Stella Ross-Craig.

KENYA. Baringo District, 24 km from main road to Lake Bogoria, 1 Nov. 2000, *Smith, Beentje & Muasya* 91!; South Nyeri District: Kirinyaga, Mwea-Tebera irrigation scheme, 29 Jan. 2002, *Muasya et al.* NMK 286!; Fort Hall District: near Murang'a [Fort Hall], Sagana, 28 Mar. 1969, *Haines & Napper* 4290! & *Napper & Haines* 1981!

TANZANIA. Pangani District: Mwere, Mkiziga, 23 Sept. 1955, *Tanner* 2237!; Singida District: Singida Lake, 27 Apr. 1962, *Polhill & Paulo* 2201!; Uzaramo District: 6 km W of Dar es Salaam centre, Kigogo-Tabata road, 29 Nov. 1973, *Wingfield* 2490!

DISTR. K 3, 4; T 3, 5–8; Ethiopia, Somalia; tropics and subtropics of the Old World

HAB. Muddy hollows in black cotton soil, moist valley bottoms in *Combretum* woodland, edges of rice fields, saline seepages, springs on gravel, lakesides; 30–1550 m

SYN. *F. sieberiana* Kunth, Enum. Pl. 2: 237 (1837); Kern in Blumea 8: 131 (1955); Podlech in Prodr. Fl. SW. Afr. (1967); Kern in Fl. Males., ser. 2, 7: 572 (1974); Vollesen in Opera Bot. 59: 94 (1986); Gordon-Gray in Strelitzia 2: 93 (ad not.) (1995)

8. ***Fimbristylis robusta*** Lye in Bot. Not. 127: 498 (1974); Haines & Lye, Sedges & Rushes of E. Afr.: 84, figs. 137, 138 (1983). Type: Uganda, Masaka District: N of Lake Nabugabo, Lye 6213 (MHU, holo.; not found at K)

Perennial 35–50 cm tall from a thick creeping rhizome at least 4 cm long, somewhat flattened, 7 mm wide, 5 mm thick (but leaf sheaths can make it appear up to 10 mm); or with many crowded rhizomes giving rise to robust tussocks; stems 0.5–1 mm wide, the bases robust and swollen. Leaf sheaths pale brown, fibrous, the throat with very dense rim of hairs; blades 15 cm long, 0.8–1.5 mm wide, flat or channelled, with spine-like teeth on margins. Inflorescence open with one sessile and 4–5 stalked spikelets; bracts leafy 0.5–1.5 mm long; spikelets dark brown, lanceolate, 7–12 mm long, 3.5–5.5 mm wide; glumes many, spirally arranged, chestnut brown with paler midrib, 4–5 mm long, strongly concave, shortly mucronate, glabrous, the lowest sterile one triangular and much narrower than the upper fertile ones. Stamens 3. Style fimbriate above, with 2 branches. Nutlet yellowish with many longitudinal striations probably darker when mature, obovoid, biconvex, narrowed at base, with fine sculpture of small surface cells.

UGANDA. Masaka District: 4–5 km N of Lake Nabugabo, 25 Sept. 1969, *Lye et al.* 4345! & same locality, Lye 6213

DISTR. U 4; not known elsewhere

HAB. Seasonally wet grassland; 1140 m

9. ***Fimbristylis dichotoma*** (L.) Vahl, Enum. Pl. 2: 287 (1805) (excl. descrip. & ref.); A. Rich., Tent. Fl. Abyss. 2: 504 (1850); Boeck. in Peters, Reise Mossamb. Bot. 1: 544 (1864) & in Flora 62: 564 (1879) & in Linnaea 37: 12 (1871) pro parte; C.B. Clarke in Fl. Br. India 6: 635 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 602 (1895); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in Fl. Cap. 7: 200 (1898) & in F.T.A. 8: 414 (1902); F.D.-O.A. 1: 403 (1937); Robyns & Tournay, F.P.N.A. 3: 260 (1955); Kern in Blumea 8: 155, 160 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 10, fig. 28 (1965); Podlech, Prodr. Fl. S.W. Afr. Cyperaceae: 23 (1967); Napper in F.W.T.A. ed. 2, 3: 320 (1972); Kern in Fl. Males. 7: 575 (1974); Haines & Lye, Sedges & Rushes of E. Afr.: 85, fig. 139, 140 (1983); Maquet in Fl. Rwanda 4: 452, figs. 1a–d (1988); Gordon-Gray in Strelitzia 2: 91, fig. 34H, K (1995); Lye in Fl. Eth. 6: 412, fig. 212. 32 (1997). Type: Sri Lanka [Ceylon], Herb. Hermann 2, fol. 63 (BM, lecto.)

Annual tufted plant or perennial with a short rhizome, 7–60 cm tall; stems \pm 1 mm wide, compressed, glabrous or with scattered hairs above, the base covered by persistent hardened leaf-bases. Leaves many, 5–50 cm long, (0.8–)2–3 mm wide, flat or channelled, glabrous except for dense short spine-like hairs along the margin and a few elsewhere, usually rounded at the apex when undamaged and sometimes with a short spine-like tooth; ligule on rim of dense short hairs; leaf-sheath wings very thin, brown or densely orange-brown speckled and \pm hairy. Inflorescence of many

spikelets arranged in (1–)2–3 orders of branches; main bracts leafy, 2–10 cm long; lowest bract of the spikelets reddish brown, \pm 2 mm long, mucronate; spikelets ovoid to cylindrical, 4–12 mm long, 2–3 mm wide; glumes reddish brown with paler midrib and margins, 2.5–3 mm long, obtuse or subacute at the apex, the midrib not or scarcely excurrent, glabrous and shiny or sometimes some spine-like hairs on the midrib. Stamens 2. Style compressed, ciliate, 2-branched. Nutlets pale to dark brown or greyish, biconvex, 0.8–1.2 mm long, \pm 1 mm wide, shiny, with 10 longitudinal grooves on each side and distinct transverse ribs but usually not tuberculate. Fig. 11, p. 59.

UGANDA. West Nile District: Koboko, May 1938, *Hazel* 582!; Teso District: N Teso, Adachal, 4 Nov. 1933, *Johnston* 640!; Mengo District: Entebbe, Sept. 1922, *Maitland* 312!

KENYA. West Suk District: Kacheliba, 56 km N of Kitale, banks of Suam R., 4 Dec. 1959, *Bogdan* 4960!; S Nyeri District: Kirinyaga, Mwea Plains, 19 Sept. 1971, *Robertson* 1600!; Kisumu–Londiani District: 96 km from Londiani to top of Fort Ternan Scarp, 8 Dec. 1956, *Verdcourt* 1623!

TANZANIA. Tanga District: Lwengera Valley, 6.4 km E of Korogwe, 20 July 1953, *Drummond & Hemsley* 3389!; Ufipa District: Mbala [Abercorn] to Sumbawanga, km 48, 3 Mar. 1951, *Bullock* 3745!; Songea District: by Kimarampaka Stream, 7 Jan. 1956, *Milne-Redhead & Taylor* 8155!; Zanzibar: Massazine, 14 July 1960, *Faulkner* 2658!

DISTR. U 1–4; K 1–5, 7; T 1–8; Z; very widespread in tropical and warm temperate regions

HAB. Grassland, swamps, river banks, bare black soil, cultivated areas (rice fields etc.) and other seasonally wet areas; sea-level–2000 m

SYN. *Scirpus dichotomus* L., Sp. Pl.: 50 (1753) & Sp. Pl. ed. 2: 74 (1762); Rottb., Desc. et lc.: 57, t. 13, fig. 1 (1786)

S. annuus All., Fl. Pedem. 2: 277 (1785). Types: Micheli, Nov. Gen. Pl.: 49 (1729); Monti, Cat. Pl. Agr.: 13 (1719) and Italy, Piedmont, Lake Vivrone, Bolengo, Azeglio, Canapiciensu, *Allioni* s.n. (TO, syn.)

S. diphyllus Retz., Obs. Bot. 5: 15 (1788). Type: India, Tranquebar, *König* s.n. (LD, hol.)

Fimbristylis diphylla (Retz.) Vahl, Enum. Pl. 2: 289 (1805); C.B. Clarke in Fl. Br. India 6: 636 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 603 (1895); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in Fl. Cap. 7: 200 (1898); Rendle in Cat. Afr. Pl. Welw. 2: 123 (1899); C.B. Clarke in F.T.A. 8: 415 (1902); F.D.-O.A. 1: 403 (1937)

F. annuus (All.) Roem. & Schultes, Syst. Veg. 2: 95 (1817)

NOTE. The synonymy of this species is very complicated. C.B. Clarke claimed there were 140 names for *F. diphylla*. He and Kern list a good deal of extra synonymy. Napper for F.W.T.A. ed. 2 recognises var. *dichotoma*, var. *laxa* (Vahl) Napper and var. *pluvistriata* (C.B. Clarke) Napper (see K.B. 25: 436–7 (1971)) with different nutlet sculpture.

A specimen lacking rootstock, *unknown collector* 254 (K) from Moshi by irrigation stream appears to be a form with smaller spikelets and nutlets more like *F. bisumbellata*. *Robertson et al.* 2005 (Kilifi District, Arabuko Sokoke Forest Reserve, behind mangroves) definitely has some tubercles on the ten nutlet ribs; more material needs investigation.

10. *Fimbristylis bisumbellata* (Forssk.) Bub. in Dodecanth.: 30 (1850); Nelmes & Baldwin in Amer. J. Bot. 39: 377 (1952); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 10 (1965) & in F.W.T.A. ed. 2, 3: 320 (1972); Kern in Fl. Males. 7: 579 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 86, figs 118 (not 117), 141, 142 (1983); Hepper & Friis, Pl. Forssk. Fl. Aegyp.-Arab.: 25 (1994); Gordon-Gray in Strelitzia 2: 90, fig. 34, B, E (1995); Lye in Fl. Somalia 4: 108, fig. 62/k–m (1995) & in Fl. Eth. 6: 412, fig. 212.33 (1997); Boulos, Fl. Egypt 4: 367, t. 111, fig. 1a, b (2005). Type: Egypt, Rashid and Cairo, *Forsskål* 1194 (C, hol.; BM, iso.)

Tufted leafy annual 5–25(–35) cm tall; stems 0.5–1 mm thick, \pm triangular (sometimes rather obscurely so), glabrous. Leaves flat, mostly much shorter than stems, 1–2 mm wide, scabrid on margins and ribs; sheaths straw-coloured to brown, thin with ligule a dense rim of short hairs. Inflorescences open, 2–6 cm wide, of 10–40 spikelets; main branches 1–3 cm long; spikelets small, angular-elongate-ovoid, 3–8 mm long, 1–1.5 mm wide, acute; glumes brown or golden-brown with 3-veined

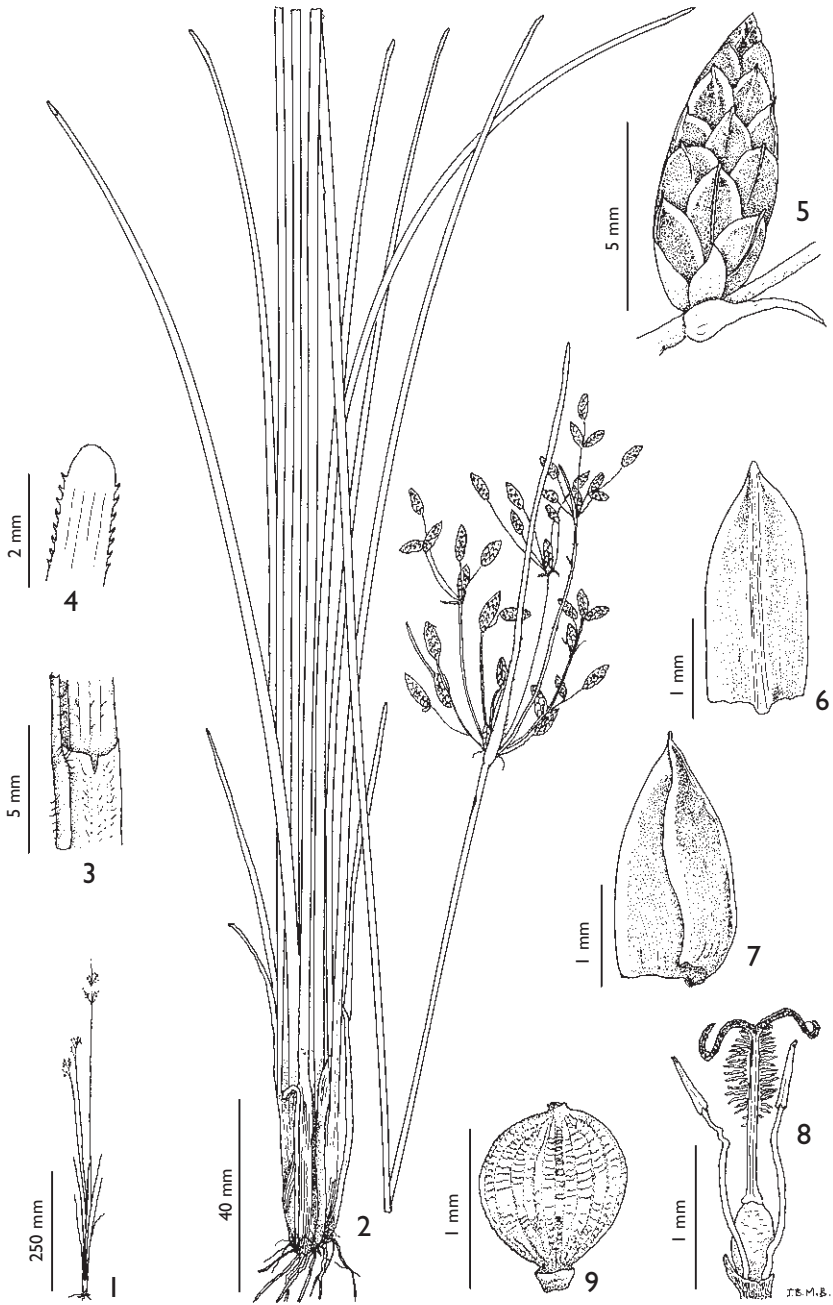


FIG. 11. *FIMBRISTYLIS DICHOTOMA* — 1, habit; 2, habit; 3, leaf sheath apex; 4, leaf apex; 5, spikelet; 6–7, glume, abaxial and lateral view. 8, floret; 9, nutlet. 1 from *Brummitt* 9546. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

green excurrent midrib, often with margins shortly ciliate. Stamen 1. Style fimbriate, 2-branched. Nutlet shiny pearly white, obovoid-lenticular (biconvex), 0.6–0.7 mm long, 0.4–0.5 mm wide, the epidermal cells in 5–7 vertical rows on each face.

KENYA. Northern Frontier Province: S Turkana, 9.6 km from mouth of Kerio R., Kakurio, 30 Aug. 1968, *Mwangangi & Gwynne* 1223!; Machakos District: Masaleni, Bushwhackers Camp, 23 Apr. 1969, *Napper & Kanuri* 2060!; Tana R. District: Bura, 4 Nov. 1963, *Thairu* 28!

TANZANIA. Pangani District, Pangani R., Hale, 1 Feb. 1915, *Peter* 8355; Mbeya District: 80 km NE of Mbeya, Utengule, Usanga, 20 Dec. 1969, *Wingfield* 491!; Tunduru District; R. Mawese, 18 Dec. 1955, *Milne-Redhead & Taylor* 7705!

DISTR. K 1, 4, 7; T 3, 4, 6–8; Senegal to Somalia and South Africa; widespread in the tropics. In East Africa particularly associated with river systems flowing into the Indian Ocean

HAB. Seasonally submerged sandbanks in rivers, mud flats, rocky and sandy river-banks, also in dense *Acacia-Commiphora* bush with *Adansonia* etc.; usually a sign of fertile soil and a good fodder plant; sea level–900(–1200) m*

SYN. *Scirpus bis-umbellatus* Forssk., Fl. Aegypt-Arab.: 15, LX No 25, Cent. 1 No 46 (1775)

Fimbristylis dichotoma sensu Vahl., Enum. Pl.: 2: 287 (1805) as to descript. & some refs. & sensu A. Rich. Tent. Fl. Abyss 2: 504 (1850); Boeck. in Linnaea 37: 12 (1871) etc.; C.B. Clarke in Fl. Cap. 7: 200 (1898) & F.T.A. 8: 414 (1902) and auctt. mult. pro parte sed *non Scirpus dichotomus* L.

F. dichotoma Peter, F.D.-O.A. 1: 403 (1937) as to material cited but excluding synonymy

NOTE. When dealing with older herbarium material anything labelled *F. diphylla* is what is now called *F. dichotoma* in recent literature and anything labelled *F. dichotoma* might well be *F. bisumbellata*.

11. ***Fimbristylis pilosa*** Vahl, Enum. Pl. 2: 290 (1805); Schumach., Beskr. Guin. Pl.: 32 (1827); Rendle in Cat. Afr. Pl. Welw. 2: 122 (1899); C.B. Clarke in F.T.A. 8: 416 (1902); Napper in F.W.T.A. ed. 2, 3: 321 (1972); Hepper, W. Afr. Herbaria of Isert and Thonning: 139 (1976); Haines & Lye, Sedges & Rushes of E. Afr.: 86, figs. 143, 144 (1983); Lye in Fl. Eth. 6: 410, fig. 212.30 (1997). Type: Ghana, *Thonning* 391 (C, syn., P-JU, isosyn.)**

Tufted perennial 25–60 cm tall, with short erect bulbous rhizome, or more rarely annual; base often covered by fibrous remnants of old split leaf sheaths; stems compressed above, angular below, 0.4–1 mm wide, usually densely set with short or long spine-like hairs. Leaves 15–20 cm long 0.5–3 mm wide, flat, channelled or inrolled with margins densely hairy; leaf sheaths hairy, with brownish wings near the throat; ligule a rim of dense hairs. Inflorescence simple with 1 sessile and 1–2 stalked spikelets or usually compound with 4–12 spikelets; bracts leafy 0.5–4 cm long, hairy; spikelets ovoid, 5–12 mm long, 3–4 mm wide; glumes reddish brown with paler margins and midrib, strongly concave, 2.5–3 mm long, 3 mm wide, glabrous or with few scattered hairs but shortly ciliate on margins, obtuse or shortly acuminate. Style flattened and ciliate, 2-branched. Nutlet brownish, obovoid-biconvex, 1.2–1.7 mm long, 1.4 mm wide, with \pm 20 longitudinal ridges connected with very many horizontal riblets visible when mature, \pm smooth or densely warted.

UGANDA. Kigezi District: Ishasha Gorge, *Lock* 69/449!; Teso District: Soroti, near Arabaka, km 10.5 on Moroto road, 15 June 1970, *Lye* 5700!; Busoga District: Namwendwa, June 1926, *Maitland* 1026!

KENYA. Kwale District: near Bedida, 14 July 2000, *Luke et al.* 6317!; Lamu District: Boni Forest, Marrarani, 5 Sept. 1961, *Gillespie* 277! & 280!

* *Bogdan* 1243 is given as Kiteita sandy banks of Athi R. This may refer to Kiteta a hill some distance from the Athi. *Bogdan* give 4000' for his collection.

** Vahl also cites a specimen from Insula Franciae (Mauritius) but this specimen in his herbarium is a different species.

TANZANIA. Uzaramo District: Dar es Salaam University Campus, ecology plot near Link road, 3 Aug. 1972, *Wingfield* 2086!; Kilwa, Selous Game Reserve, ± 20 km SSW of Kingupira, 22 Feb. 1976, *Vollesen* in MRC 3284!; Masasi District: Chidya, Kambona Forest Reserve, 12 Mar. 1991, *Bidgood et al.* 1938! & 1925!; Zanzibar: Chuini, 31 Jan. 1929, *Greenway* 1269!

DISTR. U 2, 3; K 7; T 6, 8; Z; Senegal to Nigeria, Congo-Kinshasa, Angola

HAB. Seasonally flooded grassland, bushed grasslands, muddy pool and swamp margins, on damp sandy soil in dry river beds, edge of *Brachystegia* patches; 30–1150 m

SYN. *Scirpus pilosus* (Vahl) Poir., *Encycl. Méth.*, Suppl. 5: 101 (1817)

Fimbristylis castanea Vahl var. *thomningiana* Boeck. in *Linnaea* 37: 19 (1871). Type as for *F. pilosa*
F. madagascariensis sensu *Vollesen* in *Opera Bot.* 59: 94 (1980), *non* Boeck.

NOTE. Many specimens at Kew accepted as this species by Hooper and Napper have densely warted fruit and more work needs doing. It is certainly not constant even in one locality.

Haines and Lye do not mention warts in fact in final note they state only faintly striate fruit without tubercles.

12. ***Fimbristylis scabrida*** *Schumacher*, *Beskr. Guin. Pl.*: 32 (1827); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 609 (1895) & in *F.T.A.* 8:422 (1902); Napper in *F.W.T.A.* ed. 2, 3:323 (1972); Hepper, *W. Afr. Herbaria of Isert & Thonning*: 139 (1976); Haines & Lye, *Sedges & Rushes of E. Afr.*: 87, fig. 145 (1983). Type: Ghana, *Thonning* 394 (C, holo.)

Tufted perennial 35–50 cm tall, the swollen base covered with fibrous remains of red split leaf sheaths; stems 0.7–1 mm wide, rounded or slightly compressed above, deeply ridged, scabrid with short spine-like teeth. Leaves ± 10 cm long, 1–2.5 mm wide, ± flat, scabrid on the margins, acuminate at apex, the tip with spine-like hairs; sheaths pale with thin wings but no ligule. Inflorescence an open panicle; bracts leafy, 1–3 cm long; spikelets lanceolate-cylindric, 6–14 mm long ± 2 mm wide; glumes reddish brown with pale margins, ± triangular, ± 3 mm long, acuminate, glabrous and shiny with short spine-like hairs near the midrib. Nutlet brownish, obovoid, ± trigonous but without distinct ribs, 1.2–1.3 mm long, 1.2 mm wide, the surface densely warted.

UGANDA. Kigezi District: Queen Elizabeth National Park, Ishasha, *Lock* 552

DISTR. U 2; Sierra Leone to Nigeria, Cameroon, Central African Republic, Congo-Kinshasa

HAB. Dry grassland heavily grazed by topi; 950 m

SYN. *F. muriculata* Benth. in *Niger Fl.* 554 (1849). Type: Ghana, Accra, *Don* s.n. (K, syn.!)

13. ***Fimbristylis madagascariensis*** *Boeck.* in *Bremen Abh.* 7: 38 (1880); F.D.-O.A. 1: 404 (1937); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 25 (110): 11, fig. 24 (1965); Haines & Lye, *Sedges & Rushes of E. Afr.*: 88, figs. 146 & 147 (1983). Type: Madagascar, Antananarivo, *Rustenberg* s.n. (B, holo.)

Perennial 30–60(–90) cm tall with erect woody rhizome, stoloniferous [although the stolens are not visible in much herbarium material]; stems solitary or few together, 30–60 cm tall, 1–2 mm wide, compressed, ridged, glabrous. Leaves 5–30 cm long, 1.5–2.5 mm wide, flat or channelled, with short spine-like marginal hairs, rounded at apex; sheaths with thin orange brownish wings; ligule a distinct rim of dense hairs. Inflorescence as in last species; main bract leafy 1–3 cm long, 2 mm wide; spikelets 4–8(–16) mm long, 2–3 mm wide; glumes usually entirely reddish brown, 3–4 mm long, obtuse with short mucro. Stamens 2–3. Style flattened with ciliate margin, 2-branched. Nutlets greyish, ovoid-globose, 1–3 mm long with cells in longitudinal rows and scattered large papillae.

UGANDA. Masaka District: 2–3 km S of Kasokero, 12 May 1969, *Lye* 2903! & Lake Nabugabo, June 1953, *Lind* 169!; Mengo District: edge of Entebbe swamp near aerodrome road, 20 Dec. 1951, *Norman* 78!

KENYA. Nairobi, fide Napper and Haines & Lye but nothing so named at K

TANZANIA. Bukoba District: Bukoba–Biharamulo road, km 4.8, Aug. 1931, *Haaver* 2061!; Buha District: 64 km from Kibondo on Kasulu road, Malagarasi Ferry, 24 Nov. 1962, *Verdcourt* 3448!; Ufipa District: 5 km S of Sumbawanga, Ngoli Mbuga, 19 June 1996, *Faden et al.* 96/304!

DISTR. U 4; K 4; T 1, 3², 4, 6 (see note); Burundi; Madagascar

HAB. *Miscanthus* swamps, lake and swamp edges, swamps in miombo woodland, seasonally wet grassland; ?0 (see note) (900–)1140–2100 m

SYN. *Fimbristylis diphylla* (Retz.) Vahl var. *tuberculata* Peter in F.D.-O.A. Anhang: 125 (1936) & main work: 404 (1937). Type: Tanzania, Sigi Krick near Mvuni (not traced); *Peter* 39634 (B†, holo.; Kl, iso.)

NOTE. *Wingfield* 2031 (Tanzania, Uzaramo District: 28 km NNW of Dar es Salaam, 200 m S of log cabin, 15 July 1972) in seasonal short grass and sedge grazed swamp at sea level, has been named by the collector as this species, but is more densely tufted with different coloured spikelets; but the nutlets are very densely warted. The nutlets are very densely warted in *Peter* 39634 but no stolons are apparent.

14. ***Fimbristylis polytrichoides*** (Retz.) Vahl, Enum. Pl. 2: 248 (1805); R. Br., Prodr.: 226 (1810); C.B. Clarke in Fl. Br. India 6: 632 (1893); K. Schum. in P.O.A. C: 124 (1895); C.B. Clarke in F.T.A. 8: 413 (1902); Fischer in K.B. 1932: 69 (1932); F.D.-O.A. 1: 403 (1937); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 11 (1965); Kern in Fl. Mal. 7: 586 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 89, figs 148, 149 (1983). Type: Sri Lanka [Zeylon], *König* s.n. (LD, syn., BM isosyn.*); Rumphius, Herb. Amb. 6: 17, t. 7, fig. 1 (1750) (syn.)

Very densely tufted perennial, 10–30(–40) cm tall; stems many, flattened, glabrous. Leaves up to $\frac{2}{3}$ the height of the stems, \pm 1.2 mm wide. Inflorescence 7–18 cm tall with a single straw-coloured or pale greenish brown ovoid to lanceolate spikelet 5–12 mm long, 2–4 mm wide; glumes with brown tinge near tip, lanceolate, 2–2.5 mm long, obtuse with single mid-vein. Stamen 1. Style 2-branched. Nutlet dark brown, obovoid-biconvex, 0.8–1.1 mm long, 0.5–0.7 mm wide, appearing smooth but with fine reticulate pattern of cells apart from scattered distinct tubercles, scarcely stipitate.

KENYA. Kwale District: Gazi, 18 Nov. 2000, *Smith, Beentje & Muasya* 241!; Kilifi District: 80 km N of Mombasa, Mida Creek, 26 Oct. 1958, *Bogdan* 4708! & 3 Dec. 1961, *Polhill & Paulo* 896!

TANZANIA. Tanga District: Mauni to Putini, Sigi Delta, 12 Oct. 1918, *Peter* 25639!; Uzaramo District: near Dar es Salaam, Ras Kiromoni, 4 June 1966, *Haines* 4132!; Mikindani District: Mtwara–Lindi road, 11 Mar. 1963, *Richards* 17838!; Zanzibar: Mnazi Moja, 11 June 1960, *Faulkner* 2598!

DISTR. K 7; T 3, 6, 8; Z; Madagascar, tropical Asia, Australia

HAB. Seasonally inundated mangrove swamp (*Avicennia*), seaward edges of saltmarshes, stone quarry, also inland lake edges; sea level–15 m

SYN. *Scirpus polytrichoides* Retz., Obs. Bot. 4: 11 (1786)

NOTE. Kern gives the authority as (Retz.) R. Br. and Hooper has annotated all our material as R. Br. Vahl misspelt the epithet '*polytrichirides*' but this error does not invalidate his combination. Napper and Haines and Lye say lake region and coast but no material from the lakes has been seen.

15. ***Fimbristylis schoenoides*** (Retz.) Vahl, Enum. Pl. 2: 286 (1805); Fischer in K.B. 1932: 69 (1932); Napper in F.W.T.A. ed., 2, 3: 321 (1972); Kern in Fl. Males. I, 7: 573 (1974); Haines & Lye, Sedges and grasses E. Afr.: 89, figs. 150, 151, (1983). Type: India, *König* s.n. (LD, holo.)

* R. Brown states there was a König specimen in the Banks Herbarium.

Tufted annual or perennial 10–50 cm tall with angular stems. Leaves 5–15 cm long, 1–2 mm wide. Inflorescence usually a solitary ovoid spikelet 4–8 (–15 in fruit) mm long, 3–5 mm wide but rarely with 1 (–2) additional stalked spikelets; glumes straw-coloured or pale brown, ovate, \pm 3 mm long, several-veined, \pm rounded at apex, glabrous. Style-branches 2, ciliate. Nutlet brown, obovoid, 1.5 mm long, 1.2 mm wide, minutely reticulate with isodiametric cells; gynophore 0.3–0.5 mm long.

TANZANIA. Nzega District: 5 km E of Nzega towards Sekenke, 24 June 1980, *Hooper & Townsend* 2117!; Tabora District: near Tabora, *Lindeman* 459!; Rungwe District: 4 km towards Kyela from turnoff on Mbeya–Malawi road, 28 June 1996, *Faden et al.* 96/449!

DISTR. T 4, 7; Senegal, Sierra Leone, Ghana; widespread in India and SE Asia to tropical Australia, introduced in America

HAB. Open marshy areas of well grazed grassland with some rice cultivation, murrum pit, weed in cultivated ground; 500–1200 m

SYN. *Scirpus schoenoides* Retz., Obs. Bot. 5: 14 (1788)

16. ***Fimbristylis squarrosa*** Vahl in Enum. Pl. 2: 289 (1805); Boeck. in Linnaea 37: 10 (1871); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 149 (1884); C.B. Clarke in Fl. Br. India 6: 635 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 609 (1895) & Fl. Cap. 7: 200 (1898); Rendle in Cat. Afr. Pl. Welw. 2: 122 (1899); C.B. Clarke in F.T.A. 8: 413 (1902); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 11, figs 35, 36 (1965) & F.W.T.A. ed. 2, 3: 320 (1972); Vollesen in Opera Bot. 159: 94 (1980); Gordon-Gray in Strelitzia 2: 95, 37 A–C (1995). Type: S America, probably *Loefling* s.n. (C, holo.)

Small annual herb 4–20 cm tall with few to many tufted stems. Leaves half to $\frac{3}{4}$ the length of the stem, very narrow, flat, densely hairy. Inflorescence umbelliform of mostly many greyish green or buff spikelets 6 mm long, 1.5–2 mm wide; bracts 3–4, often as long as the umbels; glumes pale brown with conspicuous green midrib, elliptic, produced into a long green often curved mucro. Style 2-branched, fimbriate and with linear processes hanging down over the nutlet which is brown, obovoid and almost smooth.

TANZANIA. Bukoba District: Kikuru Forest Reserve, Dec. 1958, *Procter* 1089!; Arusha District: Kiwanja Yamateo, 31 Dec. 1970, *Greenway & Kanuri* 14825!; Rufiji District: Selous Game Reserve, Sand Rivers Lodge, 21 Nov. 1997, *Luke & Luke* 5159!

DISTR. T 1, 2, 6, 7; Senegal to Angola & South Africa, widespread in tropics and subtropics except N America

HAB. Sand banks, mud flats, open parts of swamps, shallow pools, grassy edges of lakes etc., mostly seasonally wet places when just drying; 15–1550 m

SYN. *Scirpus squarrosus* (Vahl) Poir. in Encycl. Meth. Suppl 5: 100 (1817), *non* L.

NOTE. The authority '(Poir.) Vahl' given by Napper (1965) and Vollesen is a slip. Gordon-Gray also gives this authority with a totally erroneous reference to Encycl. Meth. 1806.

17. ***Fimbristylis dipsacea*** (Roth.) C.B. Clarke, Fl. Br. India 6: 635 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 604 (1895) & in F.T.A. 8: 413 (1902); Napper in F.W.T.A. ed 2, 3: 320 (1972); Kern in Fl. Males. ser. 2, 7: 590 (1974); Vollesen in Opera Bot. 59: 94 (1980); Haines & Lye, Sedges & Rushes of E. Afr.: 91, figs. 154, 155 (1983). Type: India, Malabar, *König* s.n. (C, holo.; LD, ?iso.)

Small annual mostly ephemeral herb 3–20 cm tall with very small root system and slender tufted angular glabrous stems 0.2–0.4 mm wide. Lower leaves without or with very reduced blades, upper 2–10 cm long, 0.2–0.3 mm wide, narrowly canaliculate; sheaths brownish with ligule. Inflorescence with one sessile and 2–10 stalked spikelets and occasionally additional secondary stalked spikelets; peduncles 1–15 mm long; bracts often longer than the inflorescence; spikelets green turning yellowish

brown, oblong to ovoid, 3–6 mm long, 2–3 mm wide, densely many-flowered, squarrose; glumes \pm 1 mm long, 0.5 mm wide, thin and membranous but with a thick green midrib produced into a straight or recurved awn 0.5–1 mm long. Stamen 1. Style with 2 long branches. Nutlet brownish, narrowly ellipsoid to cylindrical, sometimes slightly curved, 0.5–0.7 mm long, 0.15–0.2 mm wide, surface with small lateral rectangular cells in longitudinal lines and often with small irregular appendages or glands along the edges.

TANZANIA. Rufiji District: Mtanza Forest Reserve, W of Camp, Chanwande, 15 Sept. 2001, *Luke et al.* 76171 & R. Rufiji, Utete, 2 Dec. 1955, *Milne-Redhead & Taylor* 75301; Ulanga District, banks of Kilombero R., 10 km W of Mlahi, 15 Nov. 1976, *Vollesen* MRC 4101!

DISTR. T 6; Mali, Sierra Leone, Congo-Kinshasa; Madagascar, widespread in Asian tropics

HAB. Exposed mud flats becoming submerged in wet season, muddy river banks, dry river beds; 20–300 m

SYN. *Scirpus dipsaceus* Rottb., Desc. & Icon.: 56, t.12, fig. 1 (1773)

NOTE. This species belongs to the subgenus *Echinolytrum* (Desv.) Ohwi which contains a second American species.

18. *Fimbristylis* sp. A

Annual to 30 cm tall with fairly extensive well-branched roots; leaves and stems densely tufted, glabrous. Leaf blades of up to 15 cm long, inrolled and striate, \pm 0.5 cm wide. Inflorescence \pm 2 cm long, of one sessile and 4–9 stalked spikelets 5 \times 2.5 mm long; bracts linear, up to 15 mm long; bracteoles linear, 3–4 mm long; glumes pale brown, 3 mm long, keeled, acute, obscurely adpressed pubescent and strongly micro-rugulose. Stigmas 3. Nutlets white, trigonous, not papillate.

KENYA. Teita District: Maktau Hill, 16 Feb. 1980, *Gilbert* 5826!

DISTR. K 7; not known elsewhere

HAB. Between rocks on open slopes of basement complex inselberg with *Acalypha-Croton* bushland; 1400 m

NOTE. The *Gilbert* sheet bears the det. *Fimbristylis* sp. = *Greenway & Kanuri* 12949. The determination book at Kew gives the determination of the *Greenway* sheet as *Bulbostylis* collected in Tsavo National Park East but I have been unable to find the sheet. More material with ripe nutlets is needed before this can be assumed to be new.

9. BULBOSTYLIS

C.B. Clarke in Hook. f., Fl. Br. India 6: 651 (1893)*, *nom. conserv.*; S.S. Hooper in Taxon 17: 446 (1968)

Abildgaardia Vahl subg. *Bulbostylis* (C.B. Clarke) Lye in Nordic J. Bot. 1: 757 (1982)

Annual or perennial herbs. Culms stems scapose, rarely many-noded. Leaves usually with well developed blades, rarely reduced to sheaths; sheaths usually with 2 lateral tufts of hairs. Involucral bracts leaf-like or glume-like. Inflorescence usually lax but frequently a compact head of spikelets or sometimes reduced to a single spikelet; glumes spirally arranged, pale to almost black, often with a green midrib, sometimes distinctly mucronate or awned, glabrous to pubescent or scabrid. Perianth absent. Stamens 1–3, style with 1–3 stigmas. Nutlets obovoid to obconic, usually \pm trigonous, with various sculpturing; style base enlarged, usually persistent as a small knob or in a few species deciduous.

About 100 species throughout the tropics; in the flora area 52 species have been recognised.

* Although in the 1961 Code the name is conserved as Kunth, Enum. Pl. Cyp.: 205 (1837) its description as a genus must be attributed to C.B. Clarke (1893).

Lye in Mitt. Bot. Staatss. München 10: 539–547 (1971) and Goetghebeur & Coudijzer in B.J.B.B. 55: 207–259 (1985) have discussed the concept of the genus. In Haines & Lye, Sedges & Rushes of E. Afr. (1983) a curious dual nomenclature quite contrary to the Code is employed when each species has one name in *Abildgaardia* and another in *Bulbostylis*, both treated as correct names; which is not permissible. The names using the genus *Bulbostylis* are accepted here but the *Abildgaardia* names treated in the synonymy. Later in Fl. Eth. Lye treated *Abildgaardia* and *Bulbostylis* separately, as did Gordon-Gray in *Strelitzia* 2 (1995); this is followed in the present account.

1. Stems, especially near the base, with very dense short spreading pubescence and nutlets with transverse wrinkles; mostly annual with open inflorescences of many dark spikelets 14. *B. hispidula** p.80
 [this is the commonest and most widespread taxon of the genus in the flora area. *Bulbostylis lyei* will also key here but is much more uncommon and only recorded from Kigoma, Ufipa and Songea districts – the inflorescences have the branches much more erect and spikelets pale chestnut]
 Plant without all these characters present 2
2. Inflorescence a solitary spikelet 3
 Inflorescence of 2–many spikelets 9
3. Plant a small tufted annual 1.5–3 cm tall with 1–several inflorescences each of 1 spikelet; nutlets compressed ovoid with ± 12 irregular ribs on each side joined by transverse riblets (trabeculate); T 2, Mt Meru 46. *B. meruensis* p.109
 Not as above 4
4. Perennial swamp plant with creeping rhizome and stems 50–80 cm tall 11. *B. clarkeana* p.78
 Shorter plants of drier habitats; annual or perennial 5
5. Glumes 2–4 mm long 6
 Glumes 1.5 mm long 8
6. Nutlets trabeculate; K 1, Ol Lolokwe 51. *B. lolokweensis* p.111
 Nutlets not trabeculate 7
7. Annual with slender base 42. *B. striatella* p.106
 (forms with solitary spikelets)
 Perennial with ± woody base 4. *B. macra* p.72
8. Nutlet strongly transversely wrinkled 28. *B. sphaerocarpa* p.92
 Nutlet smooth or minutely reticulate 41. *B. glaberrima* p.106
9. Inflorescence a compact head of (2–)3–many sessile spikelets or occasionally an additional stalked spikelet or cluster of spikelets 10
 Inflorescence open of 2–3 or many mostly pedicellate spikets 31
10. Nutlets with longitudinal rows of isodiametric cells; additional sessile spikelets often present at culm bases 42. *B. striatella* p.106
 Not as above 11
11. Nutlet longitudinally ribbed with many horizontal connecting riblets (trabeculate) 12
 Nutlet not longitudinally ribbed 15
12. Glumes 1.2–1.5 mm long; nutlet ellipsoid-globose 39. *B. trabeculata* p.105
 Glumes 1.5–2.5 mm; nutlets distinctly obovoid to obpyramidal 13

* I have put this first since it will save a lot of time if the plant being keyed is this species; see also key to infra-specific taxa of *B. hispidula* on p. 80.

13. Spikelets dark; style-base not persistent at maturity 49. *B. schimperiana* p.110
 Spikelets dark or pale; style base usually persistent 14
14. Heads of 3–10 crowded reddish brown spikelets 47. *B. ugandensis* p.109
 Heads of 2–3 pale spikelets 48. *B. leiolepis* p.110
15. Lowest glumes at least distichously arranged; densely tufted perennial; usually coastal ... 1. *B. pilosa* p.70
 Glumes not distichously arranged 16
16. Annuals without remains of previous season's growth but base may be covered with prophylls and old leaf sheaths 17
 Perennials with swollen stem-base or at least with withered remains of previous season's growth 25
17. Nutlets strongly densely papillate or tuberculate, the papillae very evident 44. *B. cruciformis* p.108
 Nutlets transversely wrinkled, reticulate or almost smooth 18
18. Glumes 1.2–2 mm long; nutlet reticulate to almost smooth, not or very weakly transversely wrinkled 19
 Glumes 2.5–4 mm long; nutlet transversely wrinkled or reticulate 22
19. Dwarf montane annual \pm 2 cm tall on Elgon and Mt Kenya at 3000–3600 m; inflorescence bracts long drawn out 41. *B. glaberrima* p.106
 Not as above 20
20. Glumes with strongly recurved almost spiniform awns; small bright green delicate annual; **K** 1/7, Garissa 45. *B. squarrosa* p.108
 Glumes not strongly recurved or much less so 21
21. Glumes 1.2–1.5 mm long; nutlets flattened, prominently reticulate; **K** 2, Turkana 39. *B. trabeculata* p.105
 Glumes 1.5–2 mm long; nutlets triangular, appearing smooth at low magnifications ... 38. *B. barbata* p.104
22. Culms usually densely spreading pubescent; bracts with long marginal hairs; nutlets transversely rugose 14. *B. hispidula* subsp. *capitata* p.84
 Culms glabrous to shortly hairy 23
23. Nutlets with 8–12 wrinkles on each face and close microscopic ribbing 13. *B. contexta* p.79 (some forms of)
 Nutlets not as above 24
24. Nutlets transversely wrinkled with papillae on the margins 27. *B. buchananii* p.92
 Nutlets reticulate or almost smooth 40. *B. pallescens* p.105
25. Perennial with thick strong horizontal rhizome usually with old stems burnt down leaving stubs of equal height; nutlet 1.5–2.3 \times 1 mm with transverse rows of vertically elongate cells; **T** 4–7 3. *B. igneotonsa* p.71
 Not as above 26
26. Glumes obtuse or emarginate 9. *B. schoenoides* p.76
 Glumes acute 27

27. Inflorescence dark red-brown to almost black; nutlet transversely wrinkled; usually high altitude above (1900–)2400 m 8. *B. atrosanguinea* p.75
 Inflorescence paler brown or yellowish (dark red to black in *B. filamentosa*, *B. scabricaulis* which have nutlets faintly papillate and are from below 2100 m); nutlet smooth to transversely wrinkled, usually from lower altitudes below 1800 m 28
28. Spikelets obtuse; nutlets transversely wrinkled 6. *B. boeckeleriana* p.73
 Spikelets acute; nutlets smooth or minutely papillose 29
29. Mature nutlets minutely papillose 35. *B. filamentosa* p.101
 Mature nutlets smooth or reticulate 30
30. Culms strongly hairy or scabrid beneath the inflorescence 36. *B. scabricaulis* p.103
 Culms almost glabrous 37. *B. cardiocarpoides* p.103
31. Largest inflorescences of 2–3 spikelets only 32
 Largest inflorescences of 4–many spikelets* 38
32. Perennials with swollen stem bases (if a few well spaced stems from a horizontal rhizome see *B. rhizomatosus*) 33
 Distinctly annual with minute root system 36
33. Plant of permanent swamps above 1000 m ... 11. *B. clarkeana* p.78
 Plants of drier or seasonally wet habitats 34
34. Plant growing on very hot soil near steam-jets; culms with dense short upwardly directed hairs; nutlets with pattern of elongate surface cells but not transversely rugose; style-base not persistent 15. *B. mlangojajehenum* p.85
 Plant not growing near steam-jets and without other characters combined 35
35. Culm-bases forming a horizontal row of thickened bulb-like bases; spikelets 4–8 mm long, 2 mm wide 10. *B. oritrephes* p.77
 Culm bases not in rows; spikelets 8–12 mm long, 4–5 mm wide 7. *B. densecaespitosa* p.75
36. Nutlets pyriform with distinctly elongate cuneate base, closely reticulate 22. *B. taylorii* p.89
 Nutlets not as above 37
37. Nutlets trabeculate; inflorescences sometimes of two spikelets, one well separated from the other; **K** 1, **O**l Lolokwe 51. *B. lolokweensis* p.111
 Not such a combination of characters and distribution 38
38. Nutlets (ob-)pyriform with distinctly elongate-cuneate base; style-base not evident 39
 Nutlets if somewhat pyriform then not so basally elongate-cuneate 40
39. Nutlet pattern reticulate but with 4–5 strong transverse ridges on broad upper part 21. *B. rotundata* p.89
 Nutlet pattern closely reticulate but without the ridges on broad upper part 22. *B. taylorii* p.89

* It must be remembered that there can always be variation in this character.

40. Nutlet somewhat pyriform, strongly trabeculate; style-base not well marked; T 7, Ruaha National Park 50. *B. elegantissima* p.111
 Nutlet if distinctly trabeculate with style-base well marked and persistent 41
41. Nutlets papillose, tuberculate, reticulate or almost smooth (save in *B. pusilla* which is often transversely wrinkled); style-base usually persistent as a small knob 42
 Nutlets transversely wrinkled but sometimes papillose on the angles; style-base persistent or deciduous 50
42. Nutlet almost smooth (very finely reticulate); style-base not persistent 20. *B. hensi* p.88
 [Nutlet ± smooth; style-base small 16. *B. vanderijstii*] p.86
 Nutlet papillose, tuberculate, reticulate or almost smooth; style-base persistent 43
43. Basal glumes with awns much longer than the spikelets 33. *B. coleotricha* p.97
 Glumes without such long awns 44
44. Spikelets mostly ± 1 mm wide; stamens usually 1–2 45
 Spikelets wider; stamens usually 3 46
45. Nutlets 0.5–0.6 mm long, not transversely wrinkled, papillose, the surface cells less than twice as long as wide 31. *B. microelegans* p.96
 Nutlets 0.6–0.9 mm long, transversely wrinkled, the surface cells more than twice as long as wide and with minute papillae .. 29. *B. pusilla* p.93
46. Nutlets with large strong surface cells in longitudinal rows 43. *B. johnstonii* p.107
 Nutlets smooth or papillose to tuberculate (faintly wrinkled in *B. burchellii*) 47
47. Glumes spreading when fruiting; often above 2000 m 34. *B. densa* p.98
 Glumes not spreading, mostly lowland below 2000 m 48
48. Spikelets 2–2.5 mm wide 33. *B. coleotricha* p.97
 Spikelets 1–2 mm wide 49
49. Nutlets 0.7–0.8 mm long, distinctly papillose; inflorescence usually extensive, branched and with (10–)20–40(–60) spikelets 32. *B. abortiva* p.97
 Nutlets 0.9–1.1 mm long, minutely papillose; inflorescence less extensive 33. *B. coleotricha* p.97
50. Style-base persistent as a small knob on the mature fruit 51
 Style-base not persistent on the mature nutlet 63
51. Perennials with short to long rhizomes 52
 Annuals with slender root systems 58
52. Rhizome horizontally creeping with scattered culms 5. *B. rhizomatosa* p.72
 Rhizome short with crowded culms 53
53. Spikelets slender, 1–2.5 mm wide; glumes 2.5–3 mm long 54
 Spikelets wider, 2–5 mm wide; glumes 3–8 mm long 55

54. Glumes whitish tinged pale red-brown, densely shortly hairy; nutlets 0.8–1 × 0.7 mm with ± 10 transverse wrinkles and surface cells only slightly sinuous 12. *B. argenteobrunnea* p.78
 Glumes red-brown with pale hairy margins; nutlet 0.7–0.8 × 0.5–0.6 mm with ± 15 low transverse wrinkles and surface cells strongly sinuous 25. *B. burchellii* p.91
 2. *B. macrostachya* p.71
55. Glumes 6–8 mm long; nutlet 2–2.3 mm long 56
 Glumes 3–6 mm long; nutlet 1.3–1.6 mm long
56. Inflorescence more congested with 2–4 sessile spikelets 6. *B. boeckeleriana*
 var. *transiens* p.73
 Inflorescence open with only one sessile basal spikelet and several stalked ones 57
57. Spikelets 8–12 × 5 mm; glumes obtuse 7. *B. densecaespitosa* p.75
 Spikelets 5–8(–12) × 2–3 mm; glumes acute 13. *B. contexta* p.79
58. Nutlets small, 0.6–0.7 × 0.4 mm 26. *B. tanzaniae* p.91
 Nutlets 0.5–1.2 × 0.4–0.9 mm 59
59. Spikelets linear-lanceolate, 3–6 × 0.8–1.2 mm; nutlets 0.5–0.6 × 0.4 mm; T 7 30. *B. angustespicata* p.95
 Spikelets not linear-lanceolate 60
60. Spikelets ovoid to lanceolate, 2–5 × 1–2 mm; glumes 1–2 mm long; nutlets 0.6–1 × 0.6–0.8 mm (widespread and common) 29. *B. pusilla* p.93
 Spikelets 2–4 mm wide; glumes 2–3.5 mm wide 61
61. Culms strongly scabrid; glumes almost glabrous save for margin 24. *B. microcarpa* p.90
 Culms glabrous; glumes densely scabrid or shortly hairy 62
62. Glumes 2.5–3 mm long; nutlet papillate on the angles 14. *B. hispidula*
 subsp. *intermedia* p.84
 Glumes 2–2.3 mm long; nutlets without papillae 23. *B. afroorientalis* p.90
63. Spikelets obtuse; nutlets characteristic, pyriform with cuneate base, the parts of the broadened apical part with 4–5 strong transverse ridges but narrow basal part including middle of widened part into which it extends with small rectangular cells 21. *B. rotundata* p.89
 Spikelets obtuse or acute but nutlets not of this characteristic shape and sculpture 64
64. Glumes pale brown, 2–3 mm long 65
 Glumes reddish chestnut or dark brown to blackish, 3–5(–6) mm long 66
65. Glumes 2.5–3 mm long; nutlets with papillae on the angles 14. *B. hispidula*
 subsp. *intermedia* p.84
 23. *B. afroorientalis* p.90
66. Glumes 2–2.3 mm long; nutlets without papillae
 Culms and leaf sheaths (other than throat) glabrous 67
 Culms and leaf sheaths hairy (occasionally glabrous in *C. oligostachys*) 68

67. Slender plant with culms 5–30 cm tall and 0.1–0.5 mm wide 19. *B. wombaliensis* p.87
 Robust plant 30–80 cm tall with stems up to 1.5 mm thick; T 6, coast 14. *B. hispidula* subsp. *halophila* p.83
68. Annual; glumes almost blackish; nutlets with papillae on the angles 69
 Annual or perennial; glumes brown; nutlets without papillae 70
69. Inflorescence of 1 sessile and 1–4 stalked spikelets 14. *B. hispidula* subsp. *pyriformis* p.84
 All spikelets sessile or subsessile 18. *B. oligostachys* p.87
70. Inflorescence branches suberect with peduncles and bracts forming a tight angle at the base; usually an annual but a variety in T 8 is a robust perennial with rhizome; T 4, 8 17. *B. lyei* p.86
 Inflorescence with more open branching; peduncles more spreading 14. *B. hispidula* p.80

1. ***Bulbostylis pilosa*** (Willd.) Cherm. in Bull. Soc. Bot. Fr. 81: 266 (1934) & 82: 341 (1935); Hooper in F.W.T.A. ed. 2, 3: 316 (1972) & in Hepper, W. Afr. Herb. Isert & Thonning: 136 (1976); Haines & Lye, Sedges & Rushes E. Afr.: 96, figs. 160, 161 (1983). Type: West Africa, Guinea, *Isert* s.n. ((B-W 1095, holo.; C, iso.)

Densely tufted perennial 20–70 cm tall with a stout creeping rhizome; stems crowded, 0.5–2 mm thick, scabrid above, minutely hairy below inflorescence, glabrous to hairy towards the base. Leaves 5–25 cm long, 1–3.5 mm wide, ribbed, minutely hairy; sheaths brown or reddish brown, hairy and with long white hairs on margins of mouth. Inflorescence a terminal head of 3–10 clustered compressed ovoid spikelets, 8–15 mm long, 3–8 mm wide; glumes golden or reddish brown, with green midrib, ovate to triangular, 6–8 mm long, glabrous or with hairy margin and scabrid midrib; lowest glumes at least distichously arranged. Style branches 3. Nutlets greyish, obovoid, narrowed at base, 1.7–2 mm long, 1.2–1.5 mm wide, strongly transversely wrinkled; style-base reddish brown, persistent (included in length given above).

KENYA. Kwale District: Shimba Hills, 16 Apr. 1968, *Magogo & Glover* 900! & Mwele Mdogo forest, 17 km SW of Kwale, 8 Feb. 1953, *Drummond & Hemsley* 1174! & Waa, 8 Mar. 1931, *Thorold* 1586!

TANZANIA. Tanga District: Kange Estate, 10 Nov. 1951, *Faulkner* 815!; Tabora District: Ngulu, near Goweko, 14 Jan. 1926, *Peter* 34842!; Morogoro District: Morogoro, 22 May 1972, *Issa* 119! Zanzibar, *Taylor* s.n.

DISTR. K 7; T 3–8; Z; Senegal to S Nigeria, Congo-Kinshasa, Burundi, Angola, Zambia, Malawi, Mozambique and Zimbabwe

HAB. Seasonally flooded wooded grassland, mangrove swamps, bushland, *Brachystegia* etc. woodland, coconut groves, burnt grassland; 1–1400 m

SYN. *Schoenus pilosus* Willd., Phyt. 1: 3, t. 1 fig. 3 (1794)

Abildgaardia pilosa (Willd.) Nees in Linnaea 9: 289 (1835); Kunth, Enum. 2: 248 (1837); Benth. in Niger Flora: 554 (1849); T. Thoms. in Speke Nile app.: 654 (1863); Boeck. in Linnaea 37: 52 (1871); Oliv. in Trans. Linn. Soc. 29: 169, t. 109B (1875); Haines & Lye, Sedges & Rushes E. Afr.: 96, figs. 160, 161 (1983)

Fimbristylis aphyllanthoides Ridl. in Trans. Linn. Soc. ser. 2 Bot. 2: 151 (1884). Type: Angola, Pungo Andongo, low hills near Conde on right of R. Cuanza, also at Quissande, *Welwitsch* 6837 (LISU, holo.; BM, K, iso.)*

* Although two localities are cited only one specimen is cited, which must be the type collection.

"*F. (Abildgaardia pilosa)* Nees"); Oliv. in Trans. Linn. Soc. ser. 2 Bot. 2: 353 (1887) [I do not think this can be accepted as a new combination in *Fimbristylis*]
Bulbostylis aphyllanthoides (Ridl.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 611 (1895); Rendle, Cat. Afr. Pl. Welw. 2: 124 (1899); C.B. Clarke in F.T.A. 8: 436 (1902); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 6, fig. 19 (1965)
Fimbristylis pilosa (Willd.) K. Schum. in P.O.A. C. 124 (1895); F.D.O.-A.: 409 (1937), *non* Vahl
F. africana C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 601 (1894), *nom. nud.* ♂ in F.T.A. 8: 425 (1902). Type as for *Schoenus pilosus*

2. ***Bulbostylis macrostachya*** (Lye) R.W. Haines in Haines & Lye, Sedges & Rushes E. Afr. App. 3: 1 and in main work: 96, figs. 162, 163 (1983). Type: Tanzania, Mbeya District: Ruaha National Park, Magangwe Hill, *Bjørnstad* 2228 (O, holo.; K!, iso.)

Robust densely tufted perennial 25–80 cm tall; the thick swollen base covered with old flattened leaf sheaths, often with dense thick long greyish silky hairs within; stems 0.6–1.5 mm wide, very scabrid. Leaf-blades 5–20 cm long, 0.3–0.5 mm wide, strongly scabrid, straw-coloured to brown. Inflorescence of 1 sessile and 3–5 stalked spikelets; peduncles flattened, 0.5–4 cm long, densely scabrid; bracts 2–4, with sheathing pale brown base and filiform blade 3–8 mm long; spikelets 1–4 cm long, 3–5 mm wide; glumes reddish brown with green midrib, 6–8 mm long, shortly scabrid. Style branches 3. Nutlet grey to brown, obovoid, triangular, 2–2.3 mm long, 1.3–1.6 mm wide, with longitudinal ribs, surface transversely wrinkled and microscopically rugulose; style-base darker, prominent and persistent.

TANZANIA. Ufipa District: Mpui, 3 Jan. 1962, *Robinson* 4899! & 4908!; Mbeya District: 27 km due WSW of Mbeya, lower SE slope of Panda hill, 7 Feb. 1970, *Wingfield* 796! & 11 km due W of Mbeya, near track from Utengule to Lonji coffee farm below Mbeya Peak, Mar. 1970, *Wingfield* 799!

DISTR. T 4, 7; N Zambia

HAB. Bushland and *Brachystegia* woodland; 1350–1600 m

SYN. *Abildgaardia macrostachya* Lye in Nordic J. Bot. 1: 749 (1982) & Haines & Lye, Sedges & Rushes E. Afr.: 96, figs. 162, 163 (1983)

3. ***Bulbostylis igneotonsa*** *Raymond* in Nat. Canad. 99: 29, fig. 2 (1972). Type: Zambia, 15 km E of Kasama, *Robinson* 4732 (Herb. Raymond, holo.; K!, MTJB, iso.)

Perennial herb 13–60 cm tall with thick strong horizontal rhizome; roots rigid; stems many, in all specimens seen the old ones burnt right down leaving stubs of ± equal length on the horizontal rhizome and new leaves and flowering shoots arising from within these burnt bases; stems 1 mm wide, sulcate, graceful but stiff, glabrous or very shortly pilose; leaves with sheaths cinnamon-coloured, short and acute, the mouth with many long multicellular hairs up to 2 cm long, often forming tangled woolly masses. Inflorescence pale to dark brown, capitate, obturbinate, ± 1 cm long and wide, mostly with long white hairs at the base but sometimes glabrous; spikelets 2–5, sessile, oblong, acute; bracts 2–4, ± equalling the head, long-awned; glumes orange-brown to red-brown, ovate, 8–9 mm long, long-acuminate, glabrous to densely shortly pubescent and often erose-ciliate at the margin. Stigmas 3, thick. Nut pale brownish, triangular-rhomboid, 1.5–2.3 mm long, 1 mm wide, the angles blunt, thickened, with transverse rows of raised vertically elongate cells; style base conic, thick, persistent.

TANZANIA. Mpanda District: Mlala Hills, 27 Oct. 1959, *Richards* 11559!; Ufipa District: Sumbawanga road, rocks above Kawimbe, 25 Nov. 1960, *Richards* 13635!; Mbeya District: Chimala escarpment, 3 Dec. 1963, *Richards* 18536!

DISTR. T 4, 7; Angola, Zambia, Malawi

HAB. *Brachystegia* woodland, rocky grassy places near streams; 1100–1200(–2100) m

NOTE. This is a fire-resisting species, very common in Zambia but less so in East Africa. *Richards* 18536 cited above (from 2100 m) has some inflorescences with 1–2 of the spikelets with pedicels 10–15 mm long, not noted in any other material.

4. ***Bulbostylis macra*** (*Ridl.*) *C.B. Clarke* in Durand & Schinz, *Consp. Fl. Afr.* 5: 614 (1895); Rendle, *Cat. Afr. Pl. Welw.* 2: 124 (1899); C.B. Clarke in *F.T.A.* 8: 444 (1902); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 70 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 97, fig. 164 (1983). Type: Angola, Huilla, Lopollo, *Welwitsch* 6955 (LISU, holo.; BM, iso.; K!, drawing)

Tufted perennial 5–35 cm tall with \pm swollen base; stems 0.2–0.5 mm thick, angular and scabrid below the inflorescence. Leaves many, bright emerald green, almost filiform, 2–12 cm long, 0.3–0.5 mm wide, scabrid or slightly hairy; sheaths with dense long whitish hairs at mouth. Inflorescence a solitary terminal ovoid to lanceolate spikelet 6–13 mm long, 2–4 mm wide; bracts glume-like but sometimes with green long leafy excurrent midrib; glumes reddish brown, lanceolate, \pm 4 mm long, hairy at least on margin. Style branches 3. Nutlet pale, ovoid, 2.5–3 mm long, 2 mm wide, trigonous, transversely wrinkled, with persistent blackish brown style-base.

TANZANIA. Ufipa District: 10 km W of Moravian mission at Tatanda–Kasanga road at intersection of Sumbawanga–Mbala road with Nawamba stream, 2 Nov. 1992, *Harder* 1376!; Mbeya/Chunya District: Usafwa, 19 July 1913, *Stolz* 2394!; Songea District: 16 km W of Songea, 2 Jan. 1956, *Milne-Redhead & Taylor* 8109!

DISTR. T 4, 7, 8; Angola, Zambia, Malawi, Mozambique, Zimbabwe

HAB. *Brachystegia* woodland on rocky hilltops and slopes; 1050–1900 m

SYN. *Fimbristylis macra* *Ridl.* in *Trans. Linn. Soc. ser. 2, Bot.* 2: 150 (1884)

Bulbostylis zambeziaca C.B. Clarke* in *F.T.A.* 8: 430 (1902); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 5 (1965). Types: Malawi, Mt Sochi, *Kirk* s.n. & between Blantyre and Matope, *Scott* s.n. & Shire Highlands, *Kampala*, *Scott Elliot* 8464 (all K, syn.)

5. ***Bulbostylis rhizomatosa*** (*Lye*) *R.W. Haines* in Haines & Lye, *Sedges & Rushes E. Afr. App.* 3: 1 (1983) and in main work: 97, figs. 165 & 166 (1983). Type: Congo-Kinshasa, Shaba [Katanga], *Schmitz* s.n. (BR, holo.)

Slender perennial 20–50 cm tall with solitary stem or 2–3 well-spaced stems from a horizontal rhizome 2–5 cm long, 3–4 mm thick, covered with blackish acuminate scales; stems 0.7–1.3 mm thick, triangular, scabrid or almost glabrous. Leaf blades 1–18 cm long, 0.7–1.5 mm wide, densely scabrid on the margin; sheaths green to pale reddish brown, minutely scabrid and throat with long white or reddish brown hairs 5–10 mm long. Inflorescence 1–4 cm long, 1–3 cm wide, of one sessile and 2–4 stalked spikelets; peduncles 0.5–3 cm long; bracts reddish brown and scale-like, 5–10 mm long with green excurrent midrib; spikelets ovoid, 5–10-flowered, 4–9 mm long, 2–3 mm wide; glumes reddish brown including midrib, 4–5 mm long with long marginal hairs but otherwise minutely scabrid or almost glabrous. Stamen 1. Style 3-branched. Nutlet dark reddish brown, broadly ovoid, triangular, 1.7–1.9 mm long, 1.6–1.8 mm wide, with longitudinal ribs, transversely wrinkled; style base dark, persistent.

TANZANIA. Will probably be found in S Tanzania

DISTR. Congo-Kinshasa, Zambia, Malawi

HAB. *Brachystegia* woodland

SYN. *Abildgaardia rhizomatosa* *Lye* in *Nordic Journ. Bot.* 1: 749 (1982); Haines & Lye, *Sedges & Rushes E. Afr.*: 97, figs. 165 & 166 (1983)

* First proposed as a *nom. nudum Fimbristylis zambeziaca* by K. Schum. in *P.O.A. C.* 125 (1895) and *Bulbostylis zambeziaca* by C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 616 (1895)

6. **Bulbostylis boeckeleriana** (Schweinf.) Beetle in Amer. Midl. Nat. 41: 458 (1949); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 4, figs. 10, 11, 18 (1965); Maquet in Fl. Rwanda 4: 424 (1988); Gordon-Gray in Strelitzia 2: 30, fig. 10B, E (1995); Lye in Fl. Eth. 6: 414, fig. 212.35 (1997). Type: Eritrea, Mt Bizen, Schweinfurth & Riva 1851 (G, lecto., chosen by Lye)

Tufted perennial (15–)20–70 cm tall with a short creeping rhizome; stems densely crowded, 0.6–1 mm wide, ridged, glabrous save for some short spike-like hairs beneath the inflorescence. Leaves 5–15 cm long, 0.5–1 mm wide, flat or channelled, glabrous or with a few spine-like hairs; sheaths pale brown, glabrous save for the long flexuous hairs at the throat. Inflorescences of 2–12 spikelets either sessile and capitate or 1–3 additional stalked inflorescences, sometimes of only 1 spikelet; bracts inconspicuous; spikelets 6–10 mm long, 2–4 mm wide; glumes reddish brown with green midrib, 4–6 mm long, acute or subulate, pubescent or with ciliate margins. Nutlets pale brown, obovoid, triangular, 1.3–1.6 mm long, \pm 1 mm wide, transversely wrinkled with densely set longitudinal white lines crossing the wrinkles; style base dark 0.2 mm long, persistent. Fig. 12, p. 74.

var. **boeckeleriana**; Haines & Lye, Sedges & Rushes E. Afr.: 98, figs. 167 & 168 (1983)

Inflorescences mostly head-like with all spikelets sessile but 1–3 pedunculate additional inflorescences or spikelets sometimes present.

UGANDA. Karamoja District: Kokumongole, 28 May 1939, A.S. Thomas 2860!; Ankole District: Ruizi R., 26 Oct. 1950, Jarrett 363!; Masaka District: Mawokota, 1 Feb. 1970, Lye & Haines 5030!

KENYA. Northern Frontier District: Mt Kulal north, 23 May 1971, van Swinderen M126!; Uasin Gishu District: Eldoret, near Kapsoret Forestry Reserve, 8 May 1951, Williams Sangai 173!; Masai District: Narok, Ngorengore plains, 12 Dec. 1963, Verdcourt 3831!

TANZANIA. Bukoba District: Karagwe, Aug. 1893, Scott Elliot 8119!; Kondo District: 82.5 km N of Kondo, Bukulu, 14 Jan. 1962, Polhill & Paulo 1269!; Iringa District: Mufindi, 20 km S of Mafinga, SW of Ngwazi house, 22 Dec. 1988, Gereau *et al.* 2673!

DISTR. U 1–4; K 1, 3–7; T 1, 5–8; Rwanda, Sudan, Eritrea, Ethiopia, South Africa

HAB. Dry grassland, wooded grassland, forest glades, swamp margins, rocky outcrops with *Acacia* etc., seepages in *Brachystegia* woodland; 250–2100 m

SYN. *Scirpus boeckelerianus* Schweinf. in Bull. Herb. Bot. Boiss. 2, app. 2: 50 (1894)

S. collinus Boeck. var. *boeckelerianus* (Schweinf.) Schweinf. in Bull. Herb. Bot. Boiss. 2, app. 2: 104 (1894)

Bulbostylis collina sensu C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 613 (1895) pro parte, & in Fl. Cap. 7: 208 (1898) & F.T.A. 8: 432 (1902), non (Kunth) C.B. Clarke

B. zeyheri sensu C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 616 (1895) pro parte, & in Fl. Cap. 7: 209 (1898) & F.T.A. 8: 437 (1902) pro parte, non (Boeck.) C.B. Clarke

B. cinnamomea sensu C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 613 (1895) pro parte, & in Fl. Cap. 7: 209 (1898), non (Boeck.) C.B. Clarke

B. schimperiana sensu Kük. in N.B.G.B. 9: 308 (1925) quoad *Fries* & *Fries* 2833, non (A. Rich.) C.B. Clarke

B. vaginosa Kük. in N.B.G.B. 9: 308 (1925). Types: Kenya, W Mt Kenya, Forest Station, R.E. & T.C.E. Fries 316 & 339 (B†, syn.; K!, UPS, isosyn.)

B. schoenoides sensu Vollesen in Opera Bot. 59: 93 (1980), non (Kunth) C.B. Clarke

Abildgaardia boeckeleriana (Schweinf.) Lye var. *boeckeleriana*; Haines & Lye, Sedges & Rushes E. Afr.: 98, figs. 167, 168 (1983)

var. **transiens** (K. Schum.) R.W. Haines in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 1 (1983) & in main work: 99 (1983). Type: Tanzania, Tanga District: E Usambaras, Bombwera, Holst 2199 (B†, holo.; K!, iso.)

Inflorescences laxer, typically with a single sessile spikelet surrounded by 1–5 stalked spikelets on peduncles 0.5–1.5 cm long, but usually with several spikelets in each element.

UGANDA. Busoga District: 19.2 km NE of Jinja, Namazingiri hill, 20 Sept. 1952, Wood 393!

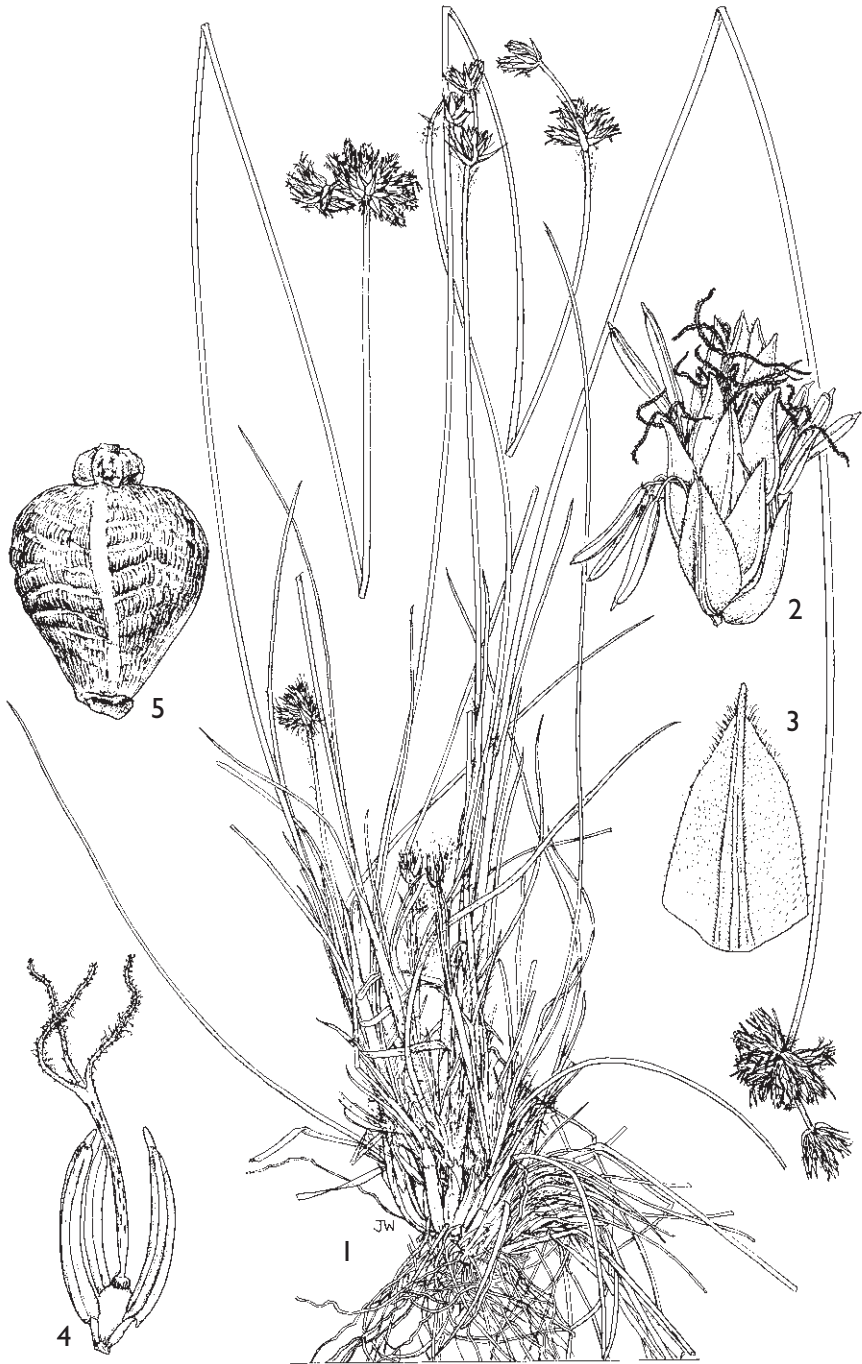


FIG. 12. *BULBOSTYLIS BOECKLERIANA* — 1. habit, $\times \frac{2}{5}$; 2. spikelet, $\times 5$; 3. glume, $\times 8$; 4. flower, $\times 10$; 5. nutlet, $\times 24$. All from *Conrads in EAH 10542*. Drawn by Juliet Williamson.

KENYA. Machakos/Masai District: Chyulu Hills north, 31 May 1976, *Agnew & Page* 11052! & 4 May 1938, *Bally* in CM 8098!; Kilifi District: Kakoneni, 19 Sept. 1958, *Moomaw* 931!

TANZANIA. Arusha District: Arusha National Park HQ, Momella, 1 Apr. 1968, *Greenway & Kanuri* 13282!; Handeni District: 30 km S of Handeni on Mziha road, 10 Mar. 1953, *Drummond & Hemsley* 1421!; Morogoro District: 5–8 km N of Mvomero, 23 Mar. 1975, *Hooper et al.* 953!

DISTR. U 3; K 4/6, 7; T 2, 3, 6–8; Mozambique, South Africa

HAB. Grassland and open bushland, often in rocky places but also in damp depressions, *Brachystegia* woodland; 100–1700 m

SYN. *Fimbristylis transiens* K. Schum. in P.O.A. C: 124 (1895)

Bulbostylis transiens (K. Schum.) C.B. Clarke in F.T.A. 8: 444 (1902); Napper in J. EA Nat. Hist. Soc. 25 (110): 6 (1965)

NOTE. By extending the definition of the variety I have called practically anything with a less robust branched inflorescence var. *transiens* and anything with a robust spherical head var. *boeckeleriana*; but many intermediates occur. There seems to be some geographical influence with eastern areas having predominantly more specimens with branched inflorescences; but there are many intermediates and it may prove best not to recognise varieties. Gordon-Gray has noted on the Kew isotype of var. *transiens* that it is the same species as *Gerrard* 698 and *Buchanan* 337 from Natal, which she has annotated as *B. boeckelerianus*. Despite the fact she states such variants (as *transiens*) are not known for Natal they do occur.

7. *Bulbostylis densecaespitosa* (Lye) R.W. Haines in Haines & Lye, *Sedges & Rushes E. Afr.*: App. 3: 1 (1983) & main work: 99, fig. 169 (1983). Type: Kenya, Tana River District: 48 km S of Garsen, *Polhill & Paulo* 643 (S, holo.; EA, K!, iso.)

Robust perennial forming a dense clump 25–60 cm tall with a thick woody rhizome \pm 5 mm in diameter; stems many, crowded, 0.5–1.5 mm thick, triangular, scabrid or almost glabrous. Leaf sheaths light reddish brown, densely woolly and with very long white hairs at the throat; leaf blades reduced to \pm 1 mm long, filiform, scabrid. Inflorescence of one central sessile spike and 2–5 stalked spikelets on 1–2.2 cm long stalks, the whole 4–6 cm wide; bracts reddish brown, glumaceous, densely woolly on the margin, with excurrent midrib to 2–3 mm; spikelets ovoid, 8–12 mm long, 5 mm wide; glumes reddish brown with green midrib, ovate, 3–4 mm long, closely overlapping, obtuse, minutely hairy but with long hairs on margins and densely woolly at apex. Style 3-branched. Nutlets cream to pale brown, obovoid or rounded, distinctly 3-sided, 1.5 mm long, 1.4 mm wide, transversely wrinkled, the wrinkles often branching, vertical ribs smooth or slightly papillate; style base reddish brown, usually forming a persistent knob.

KENYA. Kilifi District: N end of Mangea, 29 Mar. 1990, *Luke & Robertson* 2199! & Arabuko Sokoke Forest Reserve, 24 Oct. 1994, *Robertson et al.* 7010!; Tana River District: 48 km S of Garsen, 10 Oct. 1961, *Polhill & Paulo* 643!

DISTR. K 7; not known elsewhere

HAB. *Terminalia*, *Acacia*, *Euphorbia* with shrub clumps of *Grewia*, *Commiphora* etc. and *Cynometra*, *Brachylaena* etc. coastal forest; 50–300 m

SYN. *Abildgaardia densecaespitosa* Lye in *Nordic J. Bot.* 1: 754 (1982) & Haines & Lye, *Sedges & Rushes E. Afr.*: 99, fig. 169 (1983)

8. *Bulbostylis atrosanguinea* (Boeck.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 611 (1895) & F.T.A. 8: 425 (1902); F.D.-O.A. 1: 414 (1937); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 4, fig. 17 (1965); Haines & Lye, *Sedges & Rushes E. Afr.*: 100, fig. 171, 172 (1983). Type: Tanzania, Kilimanjaro, 11000 ft, *Johnston* 157 (K!, holo.)

Densely tufted perennial 10–40(–70) cm tall from short creeping rhizome, often inconspicuous because of the dense stems; stems 0.4–0.7 mm thick, glabrous or with short spine-like hairs. Leaf sheaths pale brown or with reddish dots or

streaks, glabrous save for long hairs at mouth; outer sheaths often burnt off; blades 5–12 cm long, 0.5 mm wide, flat or channeled, with many spine-like hairs on margins; cells on upper surface rectangular. Inflorescence a compact head of 3–8 spikelets, each up to 10 mm long and 3 mm wide; glumes pale to dark brown-purple or almost black, (2–)3–4 mm long, mostly acute, many-veined, glabrous or pubescent, often with frayed or ciliate margins. Nutlets pale brown or grey, ovoid, 1.3–1.7 mm long, 0.8–1 mm wide, with obscure transverse wrinkles and longitudinal interrupted microsculpture.

UGANDA. Acholi District: Imatong Mts, Langia, Apr. 1943, *Purseglove* 1423!; Karamoja District: Kadam Mt, Obdan Peak, 5 Apr. 1955, *Wood* 678 & Moroto Mt, Nov. 1964, *J. Wilson* 1730!

KENYA. North Nyeri District: Mt Kenya Forest Station, Dec. 1921, *R.E. & T.C.E. Fries* 314!, 338!; Londiani District: Tinderet Forest Reserve, Camp 6, ± 6 km SSE of Timboroa Station, 14 July 1949, *Maas Geesteranus* 5492!; Machakos/Masai District: Chyulu Hills saddle, 18 Jan. 1997, *P.A. & W.R.Q. Luke* 4599!

TANZANIA. Moshi District: Kilimanjaro, Legunishera Hill, 30 Dec. 1993, *Grimshaw* 93/1322!; Ufipa District: Mbizi Mt, Fuzu Hill, 18 June 1996, *Faden et al.* 96/290; Morogoro District: Uluguru Mts, Lukwanguli, 4 Jan. 1934, *Michelmore* 904!

DISTR. U 1, 3; K 3–6; T 2, 4, 6; Ethiopia, Angola, Zambia, Malawi

HAB. Afroalpine grassland, rocky moorland, ericoid scrub; (1900–)2400–3700 m

SYN. *Fimbristylis setifolia* A. Rich., Tent. Fl. Abyss. 2: 507 (1850). Type: Ethiopia, Wodjerat [Ouodgerate], *Petit* s.n. (P, holo.), non *B. setifolia* (Boeck.) Beetle (1949) – see below

Scirpus atrosanguineus Boeck. in E.J. 7: 276 (1885)

Fimbristylis atrosanguineus (Boeck.) K. Schum. in P.O.A. C: 125 (1895); Volkens, Kilimandscharo: 30 (1897)

F. schoenioides sensu K. Schum. in P.O.A. C: 125 (1895) pro parte

Bulbostylis setifolia (A. Rich.) Bodard in Ann. Fac. Sci. Univ. Dakar 9: 66 (1963); Lye in Fl. Eth. 6: 415, fig. 212.37 (1997), non *B. setifolia* (Boeck.) Beetle in Amer. Midl. Nat. 41: 486 (1949) [based on a species from Paraguay], *nom. illegit.**

Abildgaardia setifolia (A. Rich.) Lye in Bot. Notis. 127: 497 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 100, fig. 170, 171 (1983)

NOTE. *J. Bally* 55 (Mt Kenya, 3300 m) and *Townsend* 2274 (Mt Kenya ± 2 km SE of Lake Ellis, 3425 m) represent a large-headed form with inflorescences up to 2.5 cm long.

Maas Geesteranus 5492 had been determined as *B. cardiocarpa* (Ridl.) C.B. Clarke; *Emson* 41 had been identified as *B. cinnamomea* (Boeck.) C.B. Clarke

Glover et al. note on several sheets from the Maasai Mara that the species is grazed by all domestic stock.

9. ***Bulbostylis schoenioides*** (*Kunth*) *C.B. Clarke* in Trans. Linn. Soc. ser. 2, 4: 54 (1894) & in Durand & Schinz, *Consp. Fl. Afr.* 5: 616 (1895) pro parte; Rendle, *Cat. Afr. Pl. Welw.* 2: 124 (1899); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 62 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 101, fig. 172 (1983); Gordon-Gray in *Strelitzia* 2: 36, fig. 12H, K (1995); Lye in Fl. Eth. 6: 414, fig. 212.36 (1997). Type: South Africa, Cape province, between yellow R. and Zandplaat, *Drège* 1040 (P, lecto. **, K!, isolecto.) [locality as given by Gordon-Gray]

Densely tufted perennial 10–50 cm tall with basal parts with many blackened burnt-off old leaf bases; stems 0.5–0.8 mm wide, glabrous. Leaves (5–)10–25 cm long, 0.5–1(–2) mm wide, flat or slightly channeled, 3–5-ridged beneath, glabrous except for spiny margin, the upper surface with square surface cells; young leaf sheaths pale brown to vinaceous, glabrous save for hairy throat. Inflorescence a compact head of 1–5 obtuse spikelets; bracts shorter than spikelets (fide Haines & Lye) but in many specimens slender, green and up to 4 cm long; spikelets 6–10 mm long, 2–3 mm

* Haines & Lye (1983) point out that *setifolia* cannot be used for the African species, but Lye uses it in 1997. There seems to be nothing to invalidate the Beetle combination.

** Kunth cites just *Drège* but no collection number; Haines and Lye's citation of 1040 can be taken as a lectotypification.

wide; glumes dark blackish brown with pale brown to vinaceous midrib, pubescent, margin with short hairs, obtuse or emarginate at the apex, often erose. Styles white. Nutlets light brown, obovoid, 1.4 mm long, 1 mm wide, transversely wrinkled; style base persistent.

UGANDA. Masaka District: Katera, near Malabigambo Forest, 8 Oct. 1967, *Haines* 266!*

KENYA. Trans-Nzoia District: Kitale, Endebess, 11 June 1966, *Haines* 4291!

TANZANIA. Buha District: Kalinzi, 22 Nov. 1962, *Verdcourt* 3406!; Ufipa District: Nsangu, 11 Jan.

1961, *Vesey-FitzGerald* 2843!; Mbeya District: Ipinda, 5 Feb. 1959, *Vesey-FitzGerald* 2261!

DISTR. U 4; K 3; T 4, 7; Ethiopia, Malawi, South Africa

HAB. Swamp grassland, upland grassland with shrubs; 1200–2350 m

SYN. *Isolepis schoenoides* Kunth, Enum. Pl. 2: 208 (1837), non *Abildgaardia schoenoides* R. Br.

Scirpus cinnamomeus Boeck. in E.J. 5: 505 (1884). Type: Malawi, Shire Highlands, *Buchanan* 29, 1452 (B, syn.)

Bulbostylis cinnamomea (Boeck.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 612 (1895) & in Fl. Cap. 7209 (1898) & in F.T.A. 8: 432 (1902)

Fimbristylis cinnamomeus (Boeck.) K. Schum. in P.O.A. C: 125 (1895)

Fimbristylis schoenoides (Kunth) K. Schum. in P.O.A. C: 125 (1895) pro parte

Abildgaardia erratica (Hook.f.) Lye subsp. *schoenoides* (Kunth) Lye in Nordic J. Bot. 3: 239 (1983); *Haines & Lye, Sedges & Rushes E. Afr.*: 101, fig. 172 (1983)

10. ***Bulbostylis oritrephes*** (Ridl.) C.B. Clarke in Trans. Linn. Soc. ser. 2, 4: 54 (1894) & in Durand & Schinz, Consp. Fl. Afr. 5: 616 (1895); Rendle, Cat. Afr. Pl. Welw. 2: 125 (1899); C.B. Clarke in F.T.A. 8: 445 (1902); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 70 (1963), as *orytrephes*; Hooper in F.W.T.A. ed. 2, 3: 317 (1972); *Haines & Lye, Sedges & Rushes E. Afr.*: 101, fig. 173, 174 (1983); Maquet in Fl. Rwanda 4: 425 (1988); Gordon-Gray in *Strelitzia* 2: 33, fig. 12A, D (1995). Type: Angola, Golungo Alto, mountains E of Quilombo, Sobato Quilombo, *Welwitsch* 7016 & slope of Queta Mt, *Welwitsch* 7020 (LISU, syn.; BM, K, isosyn.)

Slender perennial 3–40 cm tall with rhizome composed of characteristic confluent swollen stem bases; stem 0.3–0.5 mm thick with many white spreading hairs 0.2–0.4 mm long below but almost glabrous above. Leaves 2–6 cm long, 0.2–0.5 mm wide, flat, usually densely hairy; sheaths grey to reddish or golden brown, glabrous or pubescent and few to many flexuous hairs at the throat. Inflorescence with 3(–10**) spikelets, one sessile surrounded by 1–2 stalked ones; bracts shorter than, or 2–3 × as long as, the sessile spikelet; spikelets 4–8 mm long, 2 mm wide; glumes dark reddish brown or blackish with paler midrib, subulate or acuminate at the apex, pubescent and with short marginal hairs. Nutlets pale brown, rounded obovoid, 1.2 mm long, 1 mm wide, wrinkled and with close microscopic ribbing; style base flattened, persistent.

UGANDA. Ankole District: E side of Lake Edward, Aug. 1894, *Scott Elliot* 8047!; Busoga District: Namutumba [Namitumba], 16 Feb. 1921, *Lankester* s.n.!; Mengo District: Kiserema, Nov. 1913, *Dummer* 706!

KENYA. recorded without details by *Haines & Lye*, no specimens at K

TANZANIA. Lushoto District: E Usambaras, Monga high pasture, 7 Mar. 1918, *Peter* 22665!; Mbeya District: Mbeya, 16 Feb. 1969, *Nicholson* 56!; Iringa District: Mbeya–Iringa road 12 km before James' Corner, 21 Jan. 1970, *Wingfield* 893!

DISTR. U 1–4; K (fide *Haines & Lye*); T 1, 3, 4, 7; Guinea to Cameroon, Congo-Kinshasa, Rwanda, Angola, South Africa

HAB. Burnt grassland, grassy hillsides, wooded grassland, shallow rocky soil, dried-up swamps, roadsides, mostly dry places; 1150–2400 m

SYN. *Fimbristylis oritrephes* Ridl. in Trans. Linn. Soc. ser. 2, 2: 155 (1884); K. Schum. in P.O.A. C: 125 (1895), as *orytrephes*

* cited in *Haines & Lye* as 4266, but the Kew sheet has 266.

** *Lye* gives 'fide Napper' but I cannot find any mention of this species by her.

Bulbostylis trichobasis sensu C.B. Clarke in F.T.A. 8: 445 (1902) quoad *Scott Elliot* 8047 etc., non (Bak.) C.B. Clarke

B. caespitosa Peter, F.D.-O.A. Abhang.: 127 (1936). Type: Tanzania, Lushoto District: E Usambaras, Monga, *Peter* 22665 (B†, holo.; K!, photo. & iso.)

B. trichobasis (Bak.) C.B. Clarke var. *caespitosa* (Peter) Kük. in F.D.-O.A. 1: 417 (1938). Type as for *B. caespitosa*

NOTE. C.B. Clarke annotated *Scott Elliot* 8047 as *B. uniseriata* sp. nov. but this was not published and later he thought it was *B. trichobasis*. The name has appeared in literature e.g. De Wildem. in Pl. Bequaert. 4: 198 (1927) "as *uniseriata* as a variety" and Brodard in Ann. Fac. Sci. Univ. Dakar 9: 70 (1963), but has never been validated.

The specific epithet probably means 'mountain-bred'.

11. ***Bulbostylis clarkeana*** *Bodard* in Bull. Soc. Bot. Fr. 108: 308 (1961) & in Ann. Fac. Sci. Univ. Dakar 9: 66 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 102, fig. 175, 176 (1983). Type: Guinea, Sulimania, Erimakuna, *Scott Elliot* 5244 (K!, holo.)

Perennial 50–80 cm tall with creeping rhizome and ± closely set slender stems 0.4–0.8 mm wide, angular, glabrous or minutely scabrid above. Leaf sheaths reddish to dark purple, glabrous, ending in a leaf-like tip to 2 cm long, but no proper leaf-blades. Inflorescence a solitary terminal spikelet or or with 1–2 additional spikelets; peduncle 1–6 mm long; bract glumaceous with subulate apex; spikelet 8–12 mm long, 2–4 mm wide; glumes spirally arranged, light brown with darker areas and green midrib, ovate-lanceolate, 3–4.5 mm long, minutely hairy. Stamens 3; style branches 3, densely papillose. Nut whitish, obovoid, 1.2 mm long, 0.8 mm wide, trigonous with 3 distinct longitudinal ribs, transversely wrinkled and with close microscopic raised riblets; style base red-brown, persistent.

UGANDA. Masaka District: Bukoto, swamp near Kitovu, 13 July 1971, *Lye* 6486!

TANZANIA. Ufipa District: Nsangu, 31 Dec. 1961, *Robinson* 4851!; Iringa District: Mbeya–Iringa road, 7 km N of Lugoda turn-off, 11 June 1996, *Faden et al.* 96/157!

DISTR. U 4; T 4, 7; Guinea, Zambia

HAB. *Miscanthus* and other perennial wet bogs; 1200–2000 m

SYN. *B. festucoides* sensu C.B. Clarke in F.T.A. 8: 430 (1902), non Kunth

B. oritrephes sensu Hooper in F.W.T.A. 3: 317 (1972) pro parte, non (Ridl.) C.B. Clarke

NOTE. Hutchinson (F.W.T.A. ed. 1, 2: 477 (1936)) first proposed the name *B. clarkeana* and it appeared in his key, which would have validated it but for the fact that after 1 Jan. 1935 Latin descriptions became necessary. Haines & Lye say 'not in Kenya or Tanzania' but I have accepted Robinson's determination of his no. 4851 as this species. Bodard (1963) cites *Drummond & Hemsley* 2464 but there is an error somewhere; their field book gives this as a Rubiaceae from the W Usambaras.

12. ***Bulbostylis argenteobrunnea*** *C.B. Clarke* in F.T.A. 8: 440 (1902), as *argenteobrunnea**; *Bodard* in Ann. Fac. Sci. Univ. Dakar 9: 78 (1963); *Napper* in J. E.A. Nat. Hist. Soc. 25 (110): 6 (1965); Haines & Lye, Sedges & Rushes E. Afr.: 102, fig. 177, 178 (1983). Type: Kenya, Machakos District: Kikumbuliyu, Ngomeni, *Scott Elliot* 6170 (K!, holo.; BM, iso.)

Short-lived perennial (or sometimes annual fide *Greenway & Kamuri* 12770) herb 10–35 cm tall, with short woody rhizome and slender roots; stems 0.5–1 mm wide, obscurely triangular or round, sometimes hairy, glabrous or minutely scabrid below the inflorescence. Leaves borne from basal 5 cm of plant; blades 3–8 cm long, 0.3–0.5 mm wide, flat, with 3 prominent ribs on lower surface; sheaths pale reddish brown or whitish with scattered reddish-brown dots, minutely hairy and with many long flexuous hairs at the throat. Inflorescence 1–2.5 mm long, 1–3 mm wide consisting of 1 sessile spikelet and 3–5 stalked spikelets or spikelet clusters;

* C.B. Clarke's original label has this spelling but it must be an error and does not occur in Latin.

peduncles 0.5–1.5 cm long, minutely hairy; inflorescence bracts 3 or 4, erect or spreading with glume-like base and excurrent green leafy tip 0.5–3 mm long; spikelets pale brown with green midrib, ovoid-ellipsoid, 4–7 mm long, 1.5–2.5 mm wide, 8–20-flowered; glumes pale reddish brown with green midrib, ovate-elliptic, membranous, 2.5–3 mm long, densely shortly white-hairy. Stamens 3. Style dark reddish brown, 3 mm long with 3 densely hairy stigmas. Nutlets silvery white or cream, obovoid, bluntly triangular in section, 0.8–1 mm long, 0.7 mm wide with \pm 10 transverse wrinkles on each side, the angles with one row of cells longer than wide, the wrinkles with close ribs; style base dark brown, persistent.

KENYA. Kitui District: Galunka, 28 May 1902, *Kassner* 843!; Teita District: Worssera look-out, 15 Dec. 1966, *Greenway & Kanuri* 12770!; Kilifi District: Mariakani, 14 Nov. 1961, *Bogdan* 5339!

DISTR. K 3, 4, 7; not known elsewhere

HAB. Isolated plants in sand pockets in rock crevices, mixed grassland on granite rock pavements, pasture derived from cleared bushland; 150–1050 m

SYN. *Abildgaardia argenteobrunnea* (C.B. Clarke) Lye in Bot. Notis. 127: 495 (1974); Haines & Lye, *Sedges & Rushes E. Afr.*: 102, fig. 177, 178 (1983)

NOTE. A population growing by hot springs near the soda lake Bogoria [Lake Hannington] was at first considered a new species by Muasya but he later decided it was *B. argenteobrunnea*. There are six collections from Bogoria at EA; *Bally* 15140 (W shore on S end of the lake, 26 June 1972) is one example.

13. *Bulbostylis contexta* (Nees) *Bodard* in Ann. Fac. Sci. Univ. Dakar 9: 72 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 103, fig. 179, 180 (1983); Gordon-Gray in *Strelitzia* 2: 31, fig. 10G, J (1995). Types: South Africa, Uitenhage area, Adda, *Ecklon* s.n. & Olifantshoek to Boeschmenrivier, *Ecklon* s.n. (B, syn.)

Robust perennial tussock plant 15–50 cm tall with short woody rhizome; stem 0.4–0.8 mm thick, angular or \pm flattened, scabrid or shortly hairy. Leaves basal; sheaths pale reddish brown, glabrous or shortly hairy but with long hairs at the throat; blades up to 10 cm long, 0.3–0.5 mm wide, shortly hairy or scabrid. Inflorescence a dense head or lax, 1–3 cm wide, of 1 sessile and 2–5 stalked spikelets and sometimes 1–2 additional spikelets at base of the stalked ones; peduncles 0.5–1.5 cm long; spikelets 5–8(–12) \times 2–3 mm; bracts reddish brown, triangular but with long excurrent green midrib; glumes ferruginous to dark reddish brown with paler margins, ovate-oblong to elliptic-oblong, 3.5–4.5 mm long, minutely hairy. Nutlets olive-brown to pale reddish brown, oblong-obovoid, 1–1.4 mm long (excluding style base), 0.8–1 mm wide, 3-angled, with 8–12 prominent rounded wrinkles on each face and close microscopic ribbing; style base 0.2–0.4 mm long, persistent.

TANZANIA. Ngara District: Bugufi, Murgwanza, 12 Dec. 1960, *Tanner* 5500!; Rungwe District: border of Mburu and Kitunda, 18 Oct. 1932, *Geilinger* 3146!

DISTR. T 1, 7; Angola, Zambia, Malawi, Mozambique, Zimbabwe, South Africa

HAB. Rocky hillsides; \pm 1650 m

SYN. *Trichelostylis contexta* Nees in *Linnaea* 10: 146 (1836)

Fimbristylis contexta (Nees) Kunth, Enum. Pl. 2: 245 (1837)

Isolepis collina Kunth, Enum. Pl. 2: 208 (1837); Steud., Syn. Pl. Glum. 2: 101 (1855). Type: South Africa, Alexandria, Addo, *Drège* 2037 (?B, holo.; K!, iso.)

Scirpus zeyheri Boeck. in *Linnaea* 36: 752 (1870). Type: South Africa, Magaliesberg [Macalisberg], *Zeyher* 1768 & *Burke* s.n.; Durban Flat, *Wood* 4008! & hills above the Apies River, *Rehmann* 4325! & Wonderboom Poort, *Rehmann*, 4478! (B, syn.; K!, isosyn.)

Bulbostylis zeyheri (Boeck.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 616 (1895) & in *Fl. Cap.* 7: 209 (1898) & in *F.T.A.* 8: 437 (1902) pro parte excl. cited specimens

B. collina (Kunth) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 613 (1895) & in *Fl. Cap.* 7: 208 (1898) & in *F.T.A.* 8: 432 (1902) pro parte excl. cited specimens

B. kirkii C.B. Clarke in *Fl. Cap.* 7: 209 (1898). Type: South Africa, Natal, Inanda, *Wood* 1576 (K, not found)

- B. burkei* C. B. Clarke in Fl. Cap. 7: 207 (1898). Type: South Africa, Orange Free State, Caledon R., *Burke* 332 & without locality, *Zeyher* 1769 (Kl, syn.)
Abildgaardia contexta (Nees) Lye in Bot. Notis. 127: 495 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 103, fig. 179, 180 (1983)

NOTE. Gordon-Gray says extremely common in Natal, polymorphic and taxonomically difficult. Lye does not mention any inflorescence but open lax ones, but Gordon-Gray dealing with variation mentions plants with single hemispherical heads of closely packed sessile spikelets. I am not sure that *B. boeckeleriana* should be kept distinct from *B. contexta* and the specimen is not really different from *B. boeckeleriana* var. *transiens*. Haines & Lye state of *B. contexta* 'only from Tanzania' and do not state from which specimen the drawing is taken.

14. **Bulbostylis hispidula** (Vahl) R.W. Haines in Haines & Lye, Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 104, fig. 181a&b, 182 (1983); Gordon-Gray in *Strelitzia* 2: 33 (1995); Lye in Fl. Somalia 4: 111 (1995) & in Fl. Eth. 6: 416, fig. 212.39 (1997). Type: Guinea, *Thonning* 349 (C, holo.; MO, P-JU, iso.)

Very polymorphic species 10–80 cm tall, either a tufted perennial with short creeping rhizome with remains of burnt-off basal leaves, or annual with slender root system; stems 0.3–1 mm thick, angular, ridged, glabrous to densely set with transparent hairs. Leaves 1–15 cm long, 0.2–0.5 mm wide, flat or channeled, usually densely hairy; sheaths pale, glabrous to densely hairy but always with long slender hairs of up to 15 mm long at the mouth and often giving a woolly appearance. Inflorescence simple or compound, lax with one sessile and 2–many additional stalked spikelets or groups of sessile and stalked spikelets or rarely all spikelets sessile; bracts short or up to 2 cm, green and leaf-like; spikelets ovoid to elongate, 4–15 mm long, 2–4 mm wide; glumes pale to dark red-brown or almost black, usually with paler midribs and margins, 2.5–4.5 mm long, acute, minutely short-pubescent. Style shortly hairy with 3 branches. Nutlets pale grey or white to pale or dark brown, obpyriform, 1–1.3 mm long, 1 mm wide, 3-angular, the angles smooth or papillate, with 5–10 transverse wrinkles which have a microsculpture of close longitudinal lines; swollen style-base persistent or not. Fig. 13, p. 81.

- | | | |
|--|-------------------------------|---|
| 1. Plants of sea-shore with robust stems 30–80 cm tall and 0.5–1.5 mm wide; leaf-blades very short, 0.5–1.5 cm long, 0.3–0.5 mm wide | c. subsp. <i>halophila</i> | |
| Plants not confined to sea-shore, with larger leaves and usually less robust | | 2 |
| 2. Perennials with short woody rhizome, more robust to 50 cm tall; nutlets with 4–5 strong transverse wrinkles | b. subsp. <i>brachyphylla</i> | |
| Slender tufted annuals or perennials | | 3 |
| 3. Inflorescence capitate of several sessile spikelets | g. subsp. <i>capitata</i> | |
| Inflorescence not distinctly capitate, usually with many spikelets mostly stalked, or much reduced with only 1–2 spikelets | | 4 |
| 4. Inflorescences reduced to 1–2 spikelets; stems densely hairy; nutlets with faint to strong transverse wrinkles but no tubercle-like papillae | d. subsp. <i>filiiformis</i> | |
| Inflorescences with a sessile spikelet and 2–8(–many) stalked spikelets; stems glabrous or shortly to densely hairy; nutlets with or without tubercle-like papillae as well as transverse wrinkles | | 5 |
| 5. Nutlets with transverse wrinkles but no tubercle-like papillae; stems mostly densely spreading pubescent (but a not infrequent form has almost glabrous stems or sparse upwardly directed ones) | a. subsp. <i>hispidula</i> | |
| Nutlets with tubercle-like papillae as well as transverse wrinkles | | 6 |

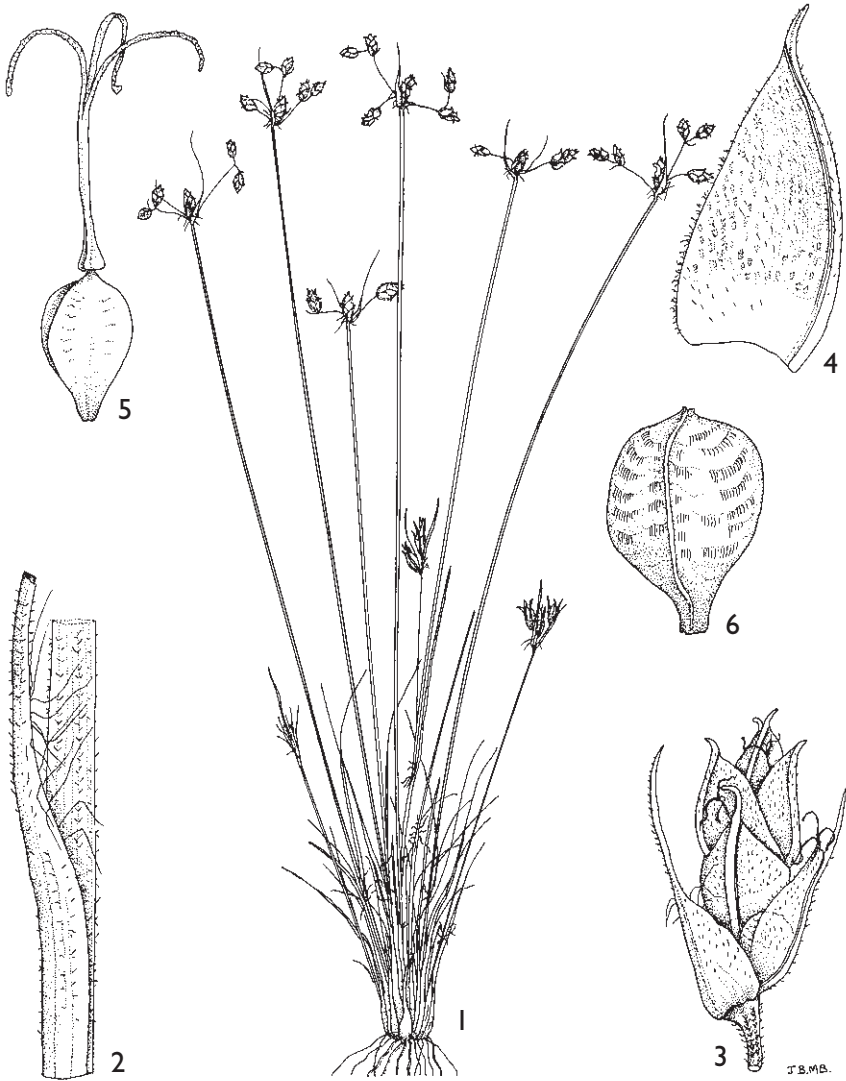


FIG. 13. *BULBOSTYLIS HISPIDULA* — 1, habit, $\times \frac{1}{2}$; 2, mouth of leaf sheath, $\times 2.5$; 3, spikelet, $\times 2$; 4, glume, $\times 15$; 5, young nutlet with style, $\times 17$; 6, nutlet, $\times 20$. All from Browning 240. Reproduced from Strelitzia 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

- 6. Nutlets broadly obovoid with distinct tubercle-like papillae on the sides and on the 3-angular ribs apart from transverse wrinkles and microsculpture e. subsp. *intermedia*
- Nutlets more pyriform with \pm stipitate base and papillae restricted to the 3-angular ribs but not on the side f. subsp. *pyriformis*

a. subsp. **hispidula**; Lye in Fl. Somalia 4: 111, fig. 63/e–h (1995) & in Fl. Eth. 6: 416, fig. 212.39 (1997)

Slender annual or tufted perennial; stems glabrous or hairy. Leaves up to 10 cm long and 0.5 cm wide. Inflorescences simple umbel-like; spikelets 4–10 mm long, 2–4 mm wide; glumes brown with pale midrib and margin. Nutlet white to dark brown, very variable, usually with transverse wavy wrinkles and fine longitudinal microsculpture but no papillae; style-base persistent as a distinct knob, or deciduous.

UGANDA. West Nile District: Obonyi, 12 Apr. 1957, *Brooks* G98!; Ankole District: Queen Elizabeth National Park, between Ruampuno and Mehuera rivers, 6 June 1957, *Buechner* 81!; Mbale District: Budama, Tororo, July 1926, *Maitland* 1187!

KENYA. Uasin Gishu District: Eldoret, Ol Dane Sapuk, 25 Apr. 1951, *G.R. Williams Sangai* 130!; Machakos District: Machakos, 8 Dec. 1893, *Scott Elliot* 6383!; Masai District: Mara Game reserve, 17 June 1971, *Taiti* 1109!

TANZANIA. Mwanza District: Mwanza, 14 Apr. 1952, *Tanner* 638!; Arusha District: Momella, Park HQ, 1 Apr. 1968, *Greenway & Kanuri* 13285; Tanga District: Lwengera Valley, 6.4 km E of Korogwe, 20 July 1953, *Drummond & Hemsley* 3398!; Zanzibar: Dole road, near Bububu, 2 Mar. 1952, *R.O. Williams* 124!

DISTR. U 1–4; K 1–7; T 1–7; Z, P; pantropical but commonest in Africa

HAB. Grassland often with scattered shrubs or trees, bushland, often on seasonally water-logged soil but also in rocky areas, old cultivations, coastal wooded grassland; 0–2050 m

SYN. *Scirpus hispidulus* Vahl, Enum. Pl. 2: 276 (1905); Schumach., Beskr. Guin. Pl.: 31 (1827)

Isolepis exilis Kunth, Nov. Gen. 1: 424 (1815). Type: Senegal, *Perrotet* 832 (P, holo. or lecto.)

Fimbristylis exilis (Kunth) Roem. & Schult., Syst. Veg. 2: 98 (1817); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 604 (1895) pro parte & in Bull. Herb. Boiss. 4, App. 3: 31 (1896) & in Fl. Cap. 7: 201 (1898) & in Urban, Symb. Ant. 2: 80 (1900); Rendle, Cat. Afr. Pl. Welw. 2: 123 (1899); C.B. Clarke in F.T.A. 8: 418 (1902); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 5, 23, 39 (1965)

F. hispidula (Vahl) Kunth, Enum. Pl. 2: 227 (1837); Benth. in Niger Fl.: 554 (1849); Boeck. in Peter, Reise Mossamb. Bot.: 545 (1864) & in Linnaea 37: 27 (1871) & in Flora 62: 564 (1879); Oliv. in Trans. Linn. Soc. 29: 168 (1875); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 152 (1884); K. Schum. in P.O.A. C. 124 (1895); Napper in F.W.T.A. ed. 2, 3: 324 (1972); Hepper, W.Afr. Herb. Isert & Thonning: 138 (1976)

F. hildebrandtii Boeck. in Flora 58: 263 (1875); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 155 (1884); K. Schum. in P.O.A. C. 124 (1895). Type: Tanzania, Zanzibar, *Hildebrandt* 1059 (herb. Hasskarl, holo.)

Abildgaardia hispidula (Vahl) Lye in Bot. Notis. 127: 496 (1974)

A. hispidula (Vahl) Lye subsp. *hispidula*; Haines & Lye, Sedges & Rushes E. Afr.: 104, fig. 181a/b, 182 (1983)

b. subsp. **brachyphylla** (*Cherm.*) *R.W. Haines* in Haines & Lye, Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 105, fig. 183 (1983). Type: Central African Republic, Yalinga to Wadda, 20 km NW of Yalinga, *Le Testu* 2811; between Yalinga and Mangapou, 80 km W of Yalinga, *Le Testu* 3132; Ste. Famille, 20 km from Fort-de-Possel towards Dounou, *Tisserant* 14 (P, syn.; K, photo of 2811!)

Robust tussocky perennial, much less slender than subsp. *hispidula* with stem 10–50 cm tall and 0.4–0.8 mm thick. Inflorescence of one spikelet or mostly of one sessile spikelet and 1–5 stalked spikelets and sometimes additional spikelets at the base of the stalked ones, less open than in typical subsp.; peduncles 0.5–1 cm long; glumes dark, 3.5–4.5 mm long. Nutlets with fewer and stronger transverse undulations.

UGANDA. Busoga District: 37 km NE of Kamuli, Kagulu Rock, 15 May 1953, *Wood* 748!

KENYA. Machakos District: S end of Mua Hills, 2 Feb. 1969, *Napper & Faden* 1851!, 1852

TANZANIA. Ngara District: Bushubi, Murusagamba, 14 Feb. 1961, *Tanner* 5759!; Pangani District: between Pangani and Msumbugwe Forest, 17 Nov. 1955, *Milne-Redhead & Taylor* 7084!; Iringa District: Mufindi, 19 km NW of Mafinga on Madibira road along tributary of Ndembera R., 23 Dec. 1988, *Gereau et al.* 2693a

DISTR. U 3; K 4; T 1–3, 7; Z, P; widespread in tropical and SW Africa

HAB. Grassland, grassland with scattered trees, *Terminalia-julbernardia* and *Uapaca* woodland; 100–1700 m

SYN. *Fimbristylis exilis* (Kunth) Roem. & Schult. var. *brachyphylla* Cherm. in Arch. Bot. Caen 4, Mém. 7: 32 (1931)

F. hispidula (Vahl) Kunth var. *brachyphylla* (Cherm.) Podl. in Mitt. Bot. Staats. München 3: 528 (1960)

F. hispidula (Vahl) Kunth var. *brachyphylla* (Cherm.) Napper in K.B. 25: 440, t. 1 fig. 6 (1971) & in F.W.T.A. 3: 316 (1972)

NOTE. It is very difficult to tell in some specimens if they are perennial or annual – I have used this name for specimens which have darker denser inflorescences than in typical *hispidula* and are usually distinctly perennial. Napper has included *Fimbristylis hensii* C.B. Clarke in the synonymy. Chermezon mentions it is similar but has smooth nutlets.

c. subsp. **halophila** (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983). Type: Tanzania, Uzaramo District: Dar es Salaam, Msimbazi, *Haines* 4134 (K!, holo.)

Robust perennial forming tussocks 30–80 cm tall with a short creeping rhizome; stems 0.5–1.5 mm wide; leaf blades short, 0.5–1.5 cm long, 0.3–0.5 mm wide. Inflorescence of a sessile spikelet and 2–5 rays each with one spikelet or one sessile and 1–2 stalked spikelets. Nutlets with faces having 5–7 rounded transverse wrinkles, with elongate and rectangular cells but angles with isodiametric 5–6-angular cells.

TANZANIA. Bagamoyo District: Bena Forest Reserve, 30 Oct. 1965, *Mgaza & Shabani* 792!; Uzaramo District: Dar es Salaam, Msimbazi, 1 June 1966, *Haines* 4196! & Dar es Salaam, 12 July 1966, *Archbold* 854!

DISTR. T 6; not known elsewhere

HAB. Muddy tidal inlets, short grassland, abandoned cultivations, sandy beaches; sea level–15 m

SYN. *Abildgaardia hispidula* (Vahl) Lye subsp. *halophila* Lye in Nordic J. Bot. 3: 326 (1983) & in Haines & Lye, Sedges & Rushes E. Afr.: 105, fig. 184, 185 (1983)

NOTE. The type at Kew bore the number 134 and perhaps some duplicates do.

d. subsp. **filiformis** (C.B. Clarke) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983). Type: Kenya, Machakos District: Kikumbuliyu, Ngomeni, *Scott Elliot* 6231 (K!, holo.)

Annual 5–15 cm tall with stems very densely covered with spreading pubescence. Leaves 4–10 cm long. Inflorescences reduced to 1–2(–3) spikelets only, usually overtopped by the inflorescence bracts up to 2 cm long which appear like a continuation of the stem. Nutlets faintly to strongly transversely rugose.

UGANDA. Karamoja District: 32 km N of Kacheliba, 8 May 1953, *Padiwa* 90!; Mengo District: Kirerema, 10 Aug. 1913, *Dummer* 115!; Mubende District: near Kakumiro, 8 Oct. 1956, *Lind* 2066!

KENYA. Northern Frontier District: Dandu, 6 May 1952, *Gillett* 13099!; Nairobi District: behind Nairobi Golf range, S of road from Nairobi to Nairobi National Park, 14 May 1974, *Faden & Ng'weno* 74/562!; Kwale District: Diani, 13 June 1982, *Robertson* 3222!

TANZANIA. Ngara District: Bushubi, Keza, 15 May 1960, *Tanner* 4963!; Tabora District: Tabora School grounds, Apr. 1940, *Lindeman* 761!; Iringa District: Kidatu, 6 Feb. 1971, *Mhoro* 5051

DISTR. U 1, 2, 4; K 1, 4, 7; T 1, 4, 5, 7; Z, P; Congo-Kinshasa, Ethiopia, Zambia

HAB. Grassland, *Acacia* etc. scrub, wooded grassland by mangroves, bushland on sandy dunes, dry banks, roadsides, wet rock crevices, seasonal pools; 0–1700 m

SYN. *Bulbostylis filiformis* C.B. Clarke in F.T.A. 8: 441 (1902); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 5 (1965)

Abildgaardia hispidula (Vahl) Lye subsp. *filiformis* (C.B. Clarke) Lye in Nordic J. Bot. 3: 239 (1983)

NOTE. Typical specimens are distinctive and the variant has frequently been treated as a separate species. There are, however, many intermediates with typical *hispidula*. Some specimens are ± glabrous e.g. *Robinson* 5096 (Ufipa District: Mwimbi, 21 Apr. 1962), Two specimens from Lamu District: *Gillespie* 13 (88 km NE of Lamu, 21 July 1961) and *Greenway & Rawlins* 9294 (Osine, 8 Oct. 1957) have many cleistogamous flowers right down among the rootstocks.

e. subsp. **intermedia** (Lye) R.W. Haines in *Sedges & Rushes E. Afr. App.* 3: 1 (1983). Type: Kenya, Kwale District: 1–2 km NE of Makondeni, *Lye* 6280 (EA, holo.; K, MHU, P, iso.)

Tufted annual 10–30 cm tall with minute root system, glabrous; leaf-blades 5–15 cm long. Inflorescence lax, of one sessile spikelet and 2–8 rays with either a single spikelet or groups of sessile and stalked spikelets. Nutlets with transverse wavy rugulation and some of the surface cells with distinct papillae and the 3 marginal ribs distinctly verrucose.

KENYA. Kwale District: 1–2 km NE of Makondeni, *Lye* 6280
DISTR. **K** 7; known only from the type
HAB. Dry grassland and shallow soil on rocks; near sea level

SYN. *Abildgaardia hispidula* (Vahl) Lye subsp. *intermedia* Lye in *Nordic J. Bot.* 3: 326 (1983) & in *Sedges & Rushes E. Afr.*: 106, fig. 188, 189 (1983)

f. subsp. **pyriformis** (Lye) R.W. Haines in *Sedges & Rushes E. Afr. App.* 3: 1 (1983) and in main work: 107, fig. 190 (1983); Lye in *Fl. Somalia* 4: 111 (1995). Type: Uganda, Karamoja District: Moroto, *Haines* 4208 (MHU, holo.; K!, iso.)

Tufted annual 5–30 cm tall with slender root system; stems with spreading pubescence. Leaves 5–15 cm long. Inflorescence lax and simply umbelliform but sometimes with solitary spikelets. Nutlets with transversely rugulose sides and the 3 marginal ribs distinctly tuberculate; base of nutlets is very distinctly narrowed giving them a marked obpyriform shape.

UGANDA. West Nile District: Terego, July 1938, *Hazel* 606!; Karamoja District: near Nabilatuk, 9 Aug. 1956, *Dyson-Hudson* 102! & Moruangaberu, Aug. 1960, *J. Wilson* 1028!

KENYA. Baringo District: 6 km N of Kampi ya Samaki, 13 June 1977, *Gilbert* 4756; S Nyeri District: Riakanau, Kithunguthya, 30 Jan. 2002, *Muasya et al.* NMK 300!; Teita District: between Voi and Sagalla Hill, 11 Dec. 1961, *Polhill & Paulo* 953!

TANZANIA. Musoma District: Bukwaya, Nyabekwabi, Chamazoze, 10 Apr. 1959, *Tanner* 4144!; Mbulu District: Lake Manyara National Park, Ndabash, 3 Mar. 1964, *Greenway & Kanuri* 11301!; Kondo District: Mnenya [Mnenia] below scarp, 21 Mar. 1928, *Burt* 1819!

DISTR. **U** 1, ?3; **K** 3, 4, 7; **T** 1, 2, 4, 5; ?not known elsewhere

HAB. Heavily grazed grassland and bush, *Acacia-Diospyros*, *Acacia-Commiphora* scrub, grassland with scattered *Balanites* and *Acacia*, roadsides, rocky slopes, shady areas and cultivation; 0–1500 m

SYN. *Abildgaardia hispidula* (Vahl) Lye var. *pyriformis* Lye in *Bot. Notis.* 127: 494 (1974)

Abildgaardia hispidula (Vahl) Lye subsp. *pyriformis* (Lye) Lye in *Nordic J. Bot.* 3: 239 (1983)

g. subsp. **capitata** *Verdcourt* **subsp. nov.** a subsp. *hispidula* inflorescentiis capitatis spicularum plurium compositis; similis *B. barbatae* (Rottb.) C.B. Clarke nuculis transverse rugosis differt. Typus: Tanzania, Njombe District: Makumbako, *Hooper & Townsend* 874 (K!, holo.)

Tufted annual 25–30 cm tall, usually with dense spreading pubescence as in typical subspecies but sometimes with only sparse short hairs. Inflorescences tightly capitate of 5–10 spikelets 7–12 mm wide; bracts with long marginal hairs. Nutlets transversely rugose, the rugae closely vertically striate and in some forms irregular papillae are present.

UGANDA. Teso District: Kumi, Ngora, Kapiri Rock, 13 Oct. 1996, *Lye & Katende* 21985!

TANZANIA. Morogoro District: Mindu Hill Forest Reserve, N slope of Mindu Hills above Kasanga 2 village, 7 Feb. 2001, *Wiland & Mboya* 44!; Njombe District: Great North Road between Njombe and Mbeya, 3 km W of Ikingula near Makumbako, 18 Mar. 1975, *Hooper & Townsend* 874! & Kimani R., 2 Apr. 1972, *Nicholson* 217!

DISTR. **U** 3; **T** 6, 7; not known elsewhere

HAB. Grassland, rocky soil on hilltops, roadside, swamps; 500–1650 m

NOTE. A number of specimens from **T** 7 with small heads (e.g. *Richards* 18676, Chunya District: S Rukwa, Mbangala, 14 Dec. 1963) are similar to subsp. *filiiformis* but have more spikelets per inflorescence.

h. subsp. A

Several specimens having the dense spreading pubescence, inflorescences and nutlets of the typical subsp. *hispidula* differ in their very dark blackish spikelets.

TANZANIA. Bukoba District: Minziro Forest Reserve, Bulemba–Kijoka Hill N of Kagera R., 24 Nov. 1999, *Simon et al.* 398! & Bulemba Hill, Kigazi village, Mgoni Peak, 17 Nov. 1999, *Sitoni & Simon* 930!; Kigoma District: Gombe Stream National Park, on Lake Tanganyika shore between Mkenke and Rusambo valleys, 30 Dec. 1998, *Gobbo & Mlangwe* 92!

DISTR. T 1, 4

HAB. Forest and rocky wooded grassland; 750–1200 m

NOTE. A very similar looking plant from the same area (*Gobbo et al.* 513, Minziro Forest Reserve, W foot of Bulemba Hill, 15 Nov. 1999) differs in the nutlets having reticulate faces and not transversely rugose. This is very puzzling and I have checked several fruiting spikelets.

j. subsp.?

Dense spreading pubescence on culm and leaves. Small head of 3–4 spikelets \pm 5 cm diameter, overtopped by the linear bracts; glumes dark pubescent and with conspicuous hairy keel. Nutlet transversely ribbed with areas of closely vertical striae, but no warts.

TANZANIA. Chunya District: S Rukwa, Mbangala, 14 Dec. 1963, *Richards* 18676!; Mbeya District: Usangu Plain, near Utengule, 29 Jan. 1963, *Richards* 17603! & Mbeya to Iringa road \pm 12 km before James Corner, 21 Jan. 1970, *Wingfield* 897!

DISTR. T 7

HAB. Seasonally boggy grassland and swamps on peat soil, lake-sides and dry grassland; 750–1600 m

NOTE. This has been annotated as immature *hispidula* but the nutlets are ripe on one sheet; also, if this was the immature stage, one would expect it throughout the range.

15. *Bulbostylis mlangoyajehenum* Verdc. sp. nov. possibiliter affinis *B. hispidula* (Vahl) R.W. Haines sed pilis minutis culmorum suberectis haud patentibus, nuce haud transverse rugosa sed cellulis superficialibus elongatis sculpturata, habitatione arida calida prope thermas differt. Typus: Kenya, Naivasha District: Njoroa Gorge, Hell's Gate steam jets, *Verdcourt* 714 (K!, holo.; EA, K!, PRE, iso.)

Very densely tufted perennial 15–40 cm long with very many (up to several hundred) rigidly erect narrowly striate culms with dense upwardly directed hairs \pm 0.5 mm long (not densely spreading pubescent). Leaf sheaths pale yellow-brown, up to 5 cm long, densely appressed-pubescent, with long hairs at the throat; blades short, 1.2 cm long. Inflorescences obtriangular, not open and spreading, of one sessile spikelet and 4–5 stalked spikelets; stalks stout, strongly striate, 5–7 mm long; bracts 5–9 mm long, apiculate; spikelets 9 mm long; glumes pale yellow-brown with white-margined green keels, ovate, 3.5–4 mm long, 3 mm wide, acute, finely short-pubescent. Nutlets white, elongate-obovoid, \pm trigonous, 1–1.1 mm long, 0.8 mm wide, not transversely rugose, but with pattern of elongate surface cells; style base pale, not persistent.

KENYA. Naivasha District: road from W side of Lake Naivasha to Hell's Gate, 13 Apr. 1975, *Hooper & Townsend* 1046! & footslopes of Orgaria, 5 Oct. 1969, *Greenway* 13819!; Masai District: Olchoro Oroiu Gorge, 21 Oct. 1962, *Glover & Samuel* 3347!

DISTR. K 3, 6; not known elsewhere

HAB. On very hot soil by steam jets; 1700–1950 m

NOTE. It is extraordinary that this plant, well known to the many visitors to Hell's Gate, appears to be new. It has mostly been named "*Fimbristylis exilis*" but differs from *B. hispidula* indumentum, habit and nutlet; it has also been confused with four other quite different species. Material from Suswa has more reduced inflorescences and sometimes darker spikelets.

The specific epithet is a Swahili translation of 'Hell's Gate'.

16. *Bulbostylis vanderystii* Cherm. in Rev. Zool. Bot. Afr. 24: 299 (1934) & in B.J.B.B. 13: 183 (1935); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 67 (1963). Type: Congo-Kinshasa, Kasai, Panzi, *Vanderyst* 16050 (BR, holo.)

Tufted herb 25–45 cm tall; rhizome horizontal, short, woody; stems 0.5–0.75 mm wide, smooth, glabrous, striate. Leaves: all leaves burnt off \pm 5 cm above top of roots in cited specimen; described as 10–20 cm long, 0.25 mm wide, channelled, slightly scabrid, glabrous; sheaths red-brown, the mouth densely long-pilose. Inflorescences a head 7–10 cm wide of 6–10 spikelets; involucre bracts 2–3, erect, 0.5–1 cm long; spikelets lanceolate, 6–8 mm long, 2–2.5 mm wide, acute; glumes not distichous, ferruginous with straw-coloured keel, thin, lanceolate, 4.5 mm long, shortly mucronate, \pm 3–5-veined. Stamens 3. Style 3-fid, glabrous. Nutlet yellowish, obovoid, trigonous, \pm smooth; style-base brownish, small.

TANZANIA. Kigoma District: 57.6 km S of Uvinsa, 31 Aug. 1950, *Bullock* 3267!

DISTR. T 4; Congo-Kinshasa

HAB. Grassland and sand overlying rock; \pm 1710 m

NOTE. The specimen has originally been determined as *B. cinnamomea* (Boeck) C.B. Clarke but redetermined by Bodard in 1961. Neither name is mentioned by Haines & Lye. Bodard wrongly cites the specimen as *Bullock* 3767.

17. *Bulbostylis lyei* Verdc., **nom. nov.** Types: Central African Republic, Haut Oubangui, R. Ngukpwanga, 25 km SW of Ippy, *Tisserant* 1953 & R. Dounou, 25 km N of Bessou, *Tisserant* 157 (P, syn.) [seen by Napper in 1953]

Robust tufted annual 30–90 cm tall with small rootsystem but sometimes distinctly perennial; stems 0.4–0.7 mm thick, ridged, usually densely scabrid to shortly hairy or spreading hairy, sometimes \pm glabrous. Leaf sheaths straw-coloured to reddish brown or purplish, glabrous to shortly hairy and with 5–10 mm long hairs at orifice (or these can be virtually lacking); blades 10–25 cm long, 0.5–1.5 mm wide, scabrid to densely shortly hairy. Inflorescence simple or compound umbelliform, or rarely reduced to a single spikelet, mostly with 1–3 sessile spikelets and with 1–8 rays each with a solitary spikelet or a group of one sessile and 1–3 stalked spikelets; bracts 2–5, leafy, the largest 1–7 cm long, densely scabrid or shortly hairy; spikelets lanceolate, (0.6–)1.2–1.6 cm long, (2–)4–6 mm wide; peduncles 1–4 cm long; glumes light to pale reddish brown, 10–15, elliptic, 3–6 mm long, 2 mm wide, scabrid or densely adpressed hirtellous. Nutlet whitish, yellowish or pale reddish brown, narrowly obovoid, trigonous, 1–1.2 mm long, 0.8 mm wide, very strongly transversely wrinkled, \pm 15 wrinkles per face; angular ribs not papillate; style-base reddish brown, not persisting.

TANZANIA. Kigoma District: Ujiji, Mar. 1939, *Loveridge* 725a!; Ufipa District: Sumbawanga–Mpanda road, 8 km N of Sumbawanga, Fiengalezia, 10 June 1980, *Hooper et al.* 1922!; Songea District: 8 km W of Songea, 9 Feb. 1956, *Milne-Redhead & Taylor* 8727!

DISTR. T 1, 4, 8; Guinea, Ivory Coast, Ghana, Togo, Central African Republic, Congo-Kinshasa, Zambia

HAB. Abandoned shallow flooded cultivations and damp grassland, often overgrazed; 650–1750 m

SYN. *Fimbristylis tisserantii* Cherm. in Arch. Bot. Caen 4, Mém. 7: 32 (1931); Napper in K.B. 25: 440, t. 7, fig. 7 (1971) & in F.W.T.A. ed. 2, 3: 325 (1972). Types as for *B. lyei*

F. exilis (Kunth) Roem. & Schult. var. *rufescens* Cherm. in Bull. Soc. Bot. Fr. 81: 266 (1934). Types: Togo, Sokodé, *Mahoux* 2160, 2161 & 2169 (P, syn.) [2169 seen by Napper]

Bulbostylis tisserantii (Cherm.) Lye in Mitt. Bot. Staatss. München 10: 547 (1971), **nom. illegit.**, non *B. tisserantii* Cherm. **nom. nov.** for *B. fasciculata* Cherm., non Uitten

NOTE. In Congo-Kinshasan and Zambian material I have seen long hairs have been \pm lacking on leaf sheaths.

subsp. ?

Tufted perennial with woody rhizome.

TANZANIA. Kilwa District: Selous Game Reserve, ± 3 km NNW of Kingupira, 20 Feb. 1976, Vollesen MRC 3195!

DISTR. T 8

HAB. *Terminalia-Pteleopsis-Pseudolachnostylis* woodland on sandy ridge in wooded grassland; ± 125 m

SYN. *Bulbostylis contexta* sensu Vollesen in Opera Bot. 59: 92 (1980), non (Nees) Bodard

18. ***Bulbostylis oligostachys*** (A. Rich.) Lye in Mitt. Bot. Staatss. München 10: 547 (1971); Haines & Lye, Sedges & Rushes E. Afr.: 108, fig. 191, 192 (1983). Type: Ethiopia, near Dschomara, Schimper 1268 (P, lecto.)

Tufted annual 5–30(–45) cm tall with many stems 0.7 mm wide, ridged, glabrous to densely shortly pubescent. Leaf sheaths glabrous to hairy; blades 5–15 cm long, 0.5 mm wide, densely hairy, glabrous, or with short spine-like hairs. Inflorescence condensed umbelliform with sessile and stalked spikelets, ± triangular in outline; stalks up to 5 mm long; longest bracts exceeding the spikelets; glumes blackish in upper half but with ± pale marginal area and midrib which is produced, 3 mm long, shortly pubescent and with ciliate margins. Nutlets pale brown, 3-angled, 1.1–1.2 mm long, 0.8–0.9 mm wide, strongly transversely rugose and ribs with ± raised cells; style-base orange-brown, soon deciduous.

UGANDA. Karamoja District: Napak, 28 May 1940, Thomas 3636!; Mbale District: Bukwa to Kapchorwa, 20 Jan. 1966, Haines 4031! & Kapchorwa, 7 Sept. 1957, Lind 256!

KENYA. Trans-Nzoia District: 10 km from Eldoret towards Kitale, 8 Oct. 1981, Gilbert & Mesfin 6477! & Mt Elgon, 6 June 1997, Wesche 1422!; Nakuru District: Molo near Eldoret, 1 July ?, Haines 259!

TANZANIA. Ufipa District: Nsangu Mt, 13 Mar. 1959, McCallum Webster 34!; Mbeya District: S slopes Poroto Mts, Mbeya near junction of Liwati and Kasiro rivers, 18 Mar. 1932, Clair-Thompson 938!; Rungwe District: W of Mwakeleli, Kandete, 17 Mar. 1975, Hooper et al. 867!

DISTR. U 1–3; K 3; T 4, 7; Ethiopia

HAB. Wet rocks and flushes in wooded grassland, peat pans at base of granite outcrops, silty roadside ditches, river valley with lava and on pumice rubble; 1800–2500 m

SYN. *Fimbristylis oligostachys* A. Rich., Tent. Fl. Abyss. 2: 505 (1850); C.B. Clarke in F.T.A. 8: 423 (1902); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 9, fig. 3 (1965)

Scirpus purpureo-atra Boeck. in Linnaea 38: 379 (1874). Type: Ethiopia, Begemedet, Schimper 1251 (B, holo.; K!, P, iso.)

Abildgaardia oligostachys (A. Rich.) Lye in Nordic J. Bot. 3: 239 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 108, fig. 191, 192 (1983)

Bulbostylis hispidula (Vahl) R.W. Haines subsp. *oligostachys* (A. Rich.) Lye in Bot. Notis. 127: 496 (1974) & in Fl. Eth. 6: 417, fig. 212.40 (1997)

NOTE. A. Richard cites a *Quartin Dillon* specimen as well, so the Schimper one should be a lectotype – not a holotype as stated by Lye.

Haines & Lye state that the nutlet ribs are tuberculate, and Lye in Fl. Eth. includes it in his key under this character; but I could not find tubercles on the type or on the cited material.

19. ***Bulbostylis wombaliensis*** (De Wild.) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 108, fig. 193, 194 (1983). Type: Congo-Kinshasa, Wombali, Vanderyst s.n. (BR, holo.)

Slender annual with crowded culms 5–30 cm tall from a slender erect rhizome 0.5–1 mm wide with remains of scales and densely set with brown or blackish roots; stems 0.1–0.5 mm wide, ridged, glabrous. Leaves with blades mostly only 3–15 mm

long, 0.1–0.3 mm wide with scabrid margins; sheaths glabrous but throat margins with hairs 0.5–2 mm long. Inflorescence a simple or sometimes subcompound umbel-like head; spikelets narrow, 5–8(–10) mm long, acute; glumes pale brown spotted with usually green midrib, 3–4 mm long, glabrous. Stamen 1 placed laterally. Style with 3 stigmas. Nutlets white, obovoid, 1 mm long, 0.7 mm wide, transversely wavy, with very distinct ribs; style compressed with thick triangular base but not persistent.

UGANDA. Busoga District: Bwengerere route N of Bugadi and N of South Busoga, 17 Feb. 1998, *Lye & Katende* 23278!; Masaka District: near Lake Nabugabo, 9 Apr. 1966, *Haines* 4095 (95 on K sheet)! & 4–5 km N of Lake Nabugabo, 25 Sep. 1969, *Lye et al.* 4346!

DISTR. U 3, 4; Congo-Kinshasa

HAB. Flat grassy patches on rock outcrop, poor sandy raised beaches grazed by cattle; 1100–1200 m

SYN. *Fimbristylis wombaliensis* De Wild. in Pl. Bequaert. 4: 208 (1927)

Abildgaardia wombaliensis (De Wild.) Lye in Bot. Notis. 127: 497 (1974) & in Haines & Lye, Sedges & Rushes E. Afr.: 108, fig. 193, 194 (1983)

20. **Bulbostylis hensii** (*C.B. Clarke*) *R.W. Haines* in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 109, fig. 195, 196 (1983); Maquet in Fl. Rwanda 4: 425 (1988). Type: Congo-Kinshasa, Lower Congo, Stanley Pool and Lutete, *Hens* 62, 67, 74, 75, 239; *De Meuse* s.n.; Bolongo Cataracts, *Luja* 134 (BR, syn.) & Angola, Loango, *Soyaux* 151 (P, syn.)

Perennial tussock plant with short erect rhizome or perhaps sometimes annual, up to 20–40 cm long; stems 0.3–0.6 mm thick, ridged, with dense hairs \pm 0.5 mm long. Leaves with similar hairs to the stems; sheaths greenish or pale reddish brown; blade green, filiform, 1–2 cm long. Inflorescence a simple umbel with 2–5 spikelets or rarely reduced to one; bracts brown with green midrib, up to 10 mm long including long green minutely scabrid midrib 5 mm long, margins with flexuous hairs 1–1.5 mm long; spikelets ovoid, 5–15 mm long, 2–3 mm wide, acute; glume light reddish brown but almost black along the green midrib above, ovate, 3–3.5 mm long, densely scabrid. Style branches 3. Nutlets light yellowish brown becoming brown with pale angles, obovoid, obtusely triangular, \pm smooth according to SEM of Haines & Lye but surface finely reticulate, not transversely wrinkled; style base dark, not persistent.

UGANDA. Ankole District: 6 km N of Rubaare, 8 Dec. 1968, *Lye* 608! & Rubaare [Lubare] Ridge, 27 Feb. 1966, *Haines* 209!

KENYA. Teita District: Taita Hills, Wundanyi, 18 Feb. 1982, *Kabuye* 82/108!

DISTR. U 2; K 7; Senegal to Cameroon, Congo-Kinshasa, Rwanda, Angola

HAB. Dry grassland in hilly areas, roadside banks, old quarry floor; 1400–1600 m

SYN. *Fimbristylis hensii* C.B. Clarke in F.T.A. 8: 419 (1902)

F. exilis Roem. & Schultes var. *lerinux* C.B. Clarke Durand & Schinz, Consp. Fl. Afr. 5: 608 (1895) & Durand & Schinz, Et. Fl. Congo 1: 302 (1896), *nom. nud.*

F. hispidula (Vahl) R.W. Haines subsp. *hensii* (C.B. Clarke) Raynal in Fl. et Méd. Trad. Miss. Rwanda 1: 88 (1980)

Abildgaardia subumbellata Lye in Nordic J. Bot. 1: 756 (1982). Type: Uganda, Ankole, 6 km NE of Rubaare, *Lye* 608 (MHU, holo.; K, iso.)

Bulbostylis subumbellata (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983), *non* (K. Schum.) C.B. Clarke ex Prain*

NOTE. The epithet *subumbellata* is not mentioned in the main text of Sedges & Rushes E. Afr. but the SEM of the nut of *B. hensii* is taken from *Lye* 608, and the same picture accompanies the original description of *A. subumbellata*.

* Since this was published in Kew Index in synonymy it is not valid.

21. ***Bulbostylis rotundata*** (Kük.) R.W. Haines in *Sedges & Rushes E. Afr. App.* 3: 1 (1983) & in main work: 110, fig. 197, 198 (1983). Types: Tanzania, Dodoma District: Lake Chaya, *Peter* 45768 & Tabora District: Goweko to Igalula, *Peter* 45934 (B, syn.)

Slender annual 10–30 cm tall; stems few to many, crowded, 0.4–0.6 mm wide, angular, distinctly ribbed, scabrid and sometimes with scattered hairs. Leaves filiform, 5–10 cm long, scabrid or slightly hairy. Inflorescence of one sessile and 1–4 stalked spikelets, with peduncles 0.2–2 cm long; bracts 1–2, the larger 4–8 mm long, filiform with clasping membranous base; spikelets reddish brown, ovoid, 4–7 mm long, 2–4 mm wide; glumes reddish brown, 2.5–3 mm long, shortly hairy; midrib ending below the rounded or emarginate tip. Nutlet white, obpyriform with narrowed cuneate part, 1–2 mm long, 0.7–0.8 mm wide, with 3 distinct longitudinal ridges, 4–5 strong wrinkles on each side of the upper expanded part and also with close reticulation (see Haines & Lye fig. 197, SEM); style base not persistent.

TANZANIA. Ufipa District: Rukwa Valley, Tumba, 15 Feb. 1952, *Siame* 139!; Dodoma District: Lake Chaya, *Peter* 34255b; Iringa District: Ruaha National Park, Magangwe Ranger Post, 29 May 1972, *Mgegela* in *Bjørnstad* 2020!

DISTR. T 4, 5, 7; not known elsewhere

HAB. Seasonally flooded grassland, open *Combretum-Terminalia* woodland; 1200–1350 m

SYN. *Fimbristylis rotundata* Kük. in F.D.-O.A. 1, Anhang: 126, t. 89, fig. 1a–e (1936) & 1: 407 (1937)

Abildgaardia rotundata (Kük.) Lye in *Nordic J. Bot.* 1: 758 (1982); Haines & Lye, *Sedges & Rushes E. Afr.*: 110, fig. 197, 198 (1983)

NOTE. *Peter* 34255b (Tanzania, Dodoma District: Lake Chaya to Tura, is also cited in the main text of F.D.-O.A.

Nutlets of approximately the same shape have been seen in some *B. hispidula*, e.g. *Sitoni* 1157 (Mwanza, Magu Hill) but that has the characteristic dense spreading pubescence.

22. ***Bulbostylis taylorii*** C.B. Clarke* in Durand & Schinz, *Consp. Fl. Afr.* 5: 616 (1895), *nom. nud.* & in F.T.A. 8: 439 (1902); F.D.-O.A. 1: 417 (1938); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 77 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 111, fig. 199, 200 (1983). Types: Tanzania, between Zanzibar and Uyui, *W.E. Taylor* s.n. (BM!, holo.)**

Tufted slender annual 3–13 cm tall with very small root system; stems 0.3–0.6 mm thick, angular and almost glabrous. Leaf-blades 1–5 cm long, 0.4–0.8 mm wide, flat, scabrid on margin and some ribs; sheaths light brown and straw-coloured, hairy and with longer hairs in throat. Inflorescence of one sessile spikelet and 1–3 stalked spikelets on 2–7 mm long peduncles; main bract purplish brown, glume-like, 4–8 mm long, midrib green, produced into a scabrid leafy awn; spikelets almost black, ovoid, 3–5 mm long, 2–3 mm wide with obtuse apex; glumes dark reddish brown, ovate, 2 mm long, obtuse or emarginate. Stamens 3. Style with 3 long stigmas. Nutlets greyish white, characteristically obpyriform with much narrowed basal part, 0.8–1 mm long, 0.7–0.8 mm wide, obtusely triangular with distinct longitudinal ribs, very closely reticulate (from Haines & Lye's SEM illustration) but described as almost smooth.

TANZANIA. Mpanda District: Uzondo plateau, 26 Apr. 2006, *Bidgood et al.* 5547!; Iringa District: 58 km on Mafinga–Madibara road, 26 May 2006, *Bidgood et al.* 5127!; [District unclear] between Zanzibar and Uyui, 1886, *W.E. Taylor* s.n.!

* Bodard and Haines & Lye give the combination (K. Schum.) C.B. Clarke but this is incorrect. K. Schum. in P.O.A. C: 125 (1895) mentions the name but with no description, merely referring to C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 626 (1895), where C.B. Clarke states sp. nov. *W.E. Taylor*, *Herb. Mus. Brit.* with no description.

** Both C.B. Clarke and Haines & Lye give the locality as Zanzibar or Zanzibar Island, but the actual label has only the standard Taylor label 'Between Zanzibar and Uyui' and could have come from anywhere between the Coast and Tabora.

DISTR. T 3, 4, 5 or 6, 7; not known elsewhere

HAB. Open *Brachystegia* – *Pterocarpus* woodland with rock outcrops; 400–1550 m

SYN. *Abildgaardia taylorii* (C.B. Clarke) Lye in Bot. Not. 127: 497 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 111, fig. 199, 200 (1983)

NOTE. *Peter* 34255b (Tanzania, Dodoma District: Lake Chaya to Tura, is also cited in the main text of F.D.-O.A.

Nutlets of approximately the same shape have been seen in some *B. hispidula*, e.g. *Sitoni* 1157 (Mwanza, Magu Hill) but that has the characteristic dense spreading pubescence.

Bodard states under *Bulbostylis taylorii* "I have not found the type of this species – the specimen of the Berlin Herbarium differs little from *B. densa* by their hirsute stem" but it is not clear what he means. There was presumably a duplicate *Taylor* specimen at B.

Haines & Lye state "only known from the type specimen and not recorded since". Peter, however, does record four specimens as this species: Tanzania, S Pare Mts, various localities near Buiko (*Peter* 10423, 10856, 11049, 46630); but I have not seen these. One of them is mentioned by Bodard.

23. ***Bulbostylis afroorientalis*** (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 111, fig. 201, 202 (1983). Type: Kenya, Kwale District: 4 km E of Kinango, *Lye* 6288 (EA, holo.; K!, iso.)

Tufted annual 5–20 tall, glabrous; root system small. Leaves many, 1–10 cm long, almost filiform, scabrid; sheaths straw-coloured to light reddish-brown, hairy to glabrous and with long flexuous hairs at the mouth. Inflorescence 0.5–2.5 cm wide, of 1 sessile and 1–6 pedunculate spikelets and sometimes with an additional stalked spikelet from the base of 1–2 of the pedunculate spikelets; bracts reddish brown with subulate green leafy tip of up to 2 cm long; spikelets ovoid, 3–6 mm long, 2–4 mm wide, often with spreading glumes which are light reddish brown with green or straw-coloured midrib, ovate, 2–2.3 mm long, densely shortly hairy. Nutlets yellowish brown to grey, obovoid with 3 distinct angles, 0.7–0.8 mm long, 0.4–0.5 mm wide, with or without a darker persistent style base; sculpture reticulate, transversely wrinkled with elongate strongly sinuous cells and on the angles some cells wider than long.

KENYA. Kwale District: Mwache R. bridge, 23 Aug. 1995, *Luke* & *Luke* 4387! & 4 km E of Kinango, 24 June 1971, *Lye* & *Katende* 6288! & Samburu to Mackinnon road 1.5 km, 25 July 1971, *Faden* & *Evans* 71/631!

DISTR. K 7; not known elsewhere

HAB. Seasonally wet seepage grassland with scattered trees; 80–300 m

SYN. *Abildgaardia afroorientalis* Lye in Nordic J. Bot. 3: 233 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 111, fig. 201, 202 (1983)

NOTE. Two further specimens from further north on the Kenya coast are, I believe, also this species – Tana River District: 48 km S of Garsen, Kurawa, 20 Sept. 1951, *Polhill* & *Paulo* 514 at 15 m in *Dobera*, *Acacia*, *Hyphaene* scattered tree grassland; and Lamu District: Boni Forest, Mararani, 4 Sept. 1961, *Gillespie* 270. They are more robust, 30–40 cm tall, with broader leaves and nutlets much darker when adult.

24. ***Bulbostylis microcarpa*** (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 112, fig. 203, 204 (1983). Type: Tanzania, Lushoto District: 4 km W of Mkomazi, 30 m from Pangani R.*, *Wingfield* 1921 (EA, holo.; K!, iso.)

* Haines & Lye have put 50 km from Pangani River, but the field notes say 30 m: metres not miles.

Tufted annual 5–20 tall; stems 2–4 mm thick with prominent ridges, strongly scabrid. Leaves dense, many, filiform, 1–10 cm long, scabrid; sheaths scabrid and with long hairs at the mouth. Inflorescences 1.5–3 cm wide, of 1 sessile and 1–3 pedunculate spikelets; bracts glumaceous with long flexuous hairs along the margin and a green scabrid awn up to 8 mm long; spikelets ovoid, 4–6 mm long, 2–4 mm wide, often with spreading glumes, 10–20-flowered; glumes chestnut-red with paler margins and midrib, ovate, 2.5–3 mm long, glabrous save along margins; midrib usually just meeting the apex. Nutlets whitish or grey, obovoid, 3-angular, 0.4–0.5 mm long, transversely wrinkled, with elongate \pm sinuous cells, but ribs with shorter cells sometimes wider than long; style-base persistent, dark.

TANZANIA. Pare District: 6 km N of Buiko, by R. Pangani, 30 May 1915, *Peter* 10423! & on Lake Manka [Mangasee] near Mkoma, 6 June 1915, *Peter* 10856! & Buiko to Hedaru, 13 June 1915, *Peter* 11049!

DISTR. T 3; not known elsewhere

HAB. Saline grassland with bushes on \pm bare sandy soil; 400–600 m

SYN. *Bulbostylis taylori* sensu F.D.-O.A.: 412 (1937) & 417 (1938), *non* C.B. Clarke

Abildgaardia microcarpa Lye in *Nordic Journ. Bot.* 3: 234 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 112 (1983)

25. *Bulbostylis burchellii* (Ficalho & Hiern) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 612 (1895) & in *Fl. Cap.* 7: 210 (1898); Rendle, *Cat. Afr. Pl. Welw.* 2: 125 (1899); C.B. Clarke in *F.T.A.* 8: 440 (1902); F.D.-O.A. 1: 417 (1938); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 73 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 113, fig. 205, 206 (1983); Gordon-Gray in *Strelitzia* 2: 30, fig. 10C, F (1995). Types: Zambia, upper course of R. Nindi (affluent of Zambesi), *Serpa Pinto* 60, 62 (LISU, syn.)

Densely tufted perennial 15–60 cm tall with woody rhizome; stems crowded, 0.3–0.6 mm wide, angular, scabrid. Leaves 5–20 cm long, filiform, densely scabrid; sheaths brown, scabrid to hairy and with long whitish hairs on the mouth. Inflorescence open and umbelliform of 7–20 spikelets and often with 2–4 secondary umbels; spikelets lanceolate, 4–10 mm long, 1–2 mm wide; glumes reddish brown with paler margins, 2.5–3 mm long, finely hairy; midrib prominently 3-ribbed. Nutlets white or tinged brownish, obovoid, somewhat triangular, 0.7–1 mm long, (0.4–)0.5–0.6(–0.7) mm wide, the surface appearing smooth or faintly wrinkled but with many close longitudinal riblets (Haines & Lye's SEM shows surface cells elongate with very strongly sinuate margins); style bases dark, flattened, persistent.

TANZANIA. Pangani District: Mkweja, Serewa, 27 Nov. 1955, *Tanner* 2356!; Uzaramo District: Funguni public land, 17 Jan. 1977, *Magogo* 776!; Rufiji District: Ngumbuluni Forest Reserve, Ikwiriri, 20 Dec. 1988, *Ngoundai* 207!

DISTR. T 3, 6; Angola, Zambia, Malawi, Mozambique, Zimbabwe, Botswana and South Africa
HAB. Open coastal forest on sandy soil and marginal mangrove vegetation; 10–75 m

SYN. *Fimbristylis burchellii* Ficalho & Hiern in *Trans. Linn. Soc. ser. 2, Bot.* 2: 28, t. 6B fig. 7–15 (1881); K. Schum. in *P.O.A. C.* 125 (1895)

F. hispidula Boeck. in *Linnaea* 37: 27 (1871) pro parte

F. huillensis Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 154 (1884). Type: Angola, Catomba, *Welwitsch* 6951 (BM, holo.)

Abildgaardia burchellii (Ficalho & Hiern) Lye in *Bot. Notis.* 127: 495 (1974); Haines & Lye, *Sedges & Rushes E. Afr.*: 113, fig. 205, 206 (1983)

26. *Bulbostylis tanzaniae* (Lye) R.W. Haines in *Sedges & Rushes E. Afr. App.* 3: 1 (1983). Type: Tanzania, Mpanda District: near Mpanda, *Nye* 204 (BM!, holo.)

Slender annual growing in small tussocks, 5–25 (–35) cm tall; stems 1–10, 0.5–0.8 mm wide, scabrid or shortly hairy at least above. Leaves 5–10 cm long, usually less than 0.5 mm wide, strongly scabrid on margin. Inflorescence of one sessile spikelet and few to several stalked spikelets or additional groups of sessile and stalked spikelets; bracts filiform, up to 3 cm long, often shorter than inflorescence; spikelets 5–9 mm long, 2 mm wide; glumes reddish brown, paler along margins, \pm 2 mm long, strongly hairy along the margin but central parts \pm glabrous. Nutlets greyish, obovoid, triangular, 0.6–0.7 mm long, \pm 0.4 mm wide, transversely wrinkled, surface cells of various sizes, the triangular ribs with tubercles; style base dark reddish brown, small, persistent.

TANZANIA. Mpanda District: near Mpanda, 26 May 1957, *Nye* 204! & same locality, 26 May 1957, *Nye* 205!; Ufipa District: Kalambo Falls, Kapozwa, 21 June 1996, *Faden et al.* 96/314!; Singida District: 16 km from Singida, 2 Feb. 1968, *Richards* 23175A!; Mbeya District: 32 km W of Mbeya, Songwe, Malonde Hot Springs, 10 Apr. 1980, *R.A. Nicholson* s.n.!

DISTR. T 4, 5, 7, 8; Congo-Kinshasa, Zambia

HAB. Seasonally wet grassland, often on sandy soil, also limestone and dry rocky areas; 1000–1400 m

SYN. *Abildgaardia tanzaniae* Lye in *Nordic J. Bot.* 1: 753, fig. 9 (1982) & in Haines & Lye, *Sedges & Rushes E. Afr.*: 113, fig. 207, 208 (1983)

27. ***Bulbostylis buchananii*** *C.B. Clarke* in *F.T.A.* 8: 437 (1902); *F.D.-O.A.* 1: 413 (1938); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 75 (1963); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 3, fig. 6 (1965); Haines & Lye, *Sedges & Rushes E. Afr.*: 114, fig. 209, 210 (1983); Lye in *Fl. Eth.* 6: 417 (1997). Type: Malawi, *Buchanan* 1329 (K!, holo.)

A densely tufted annual or short-lived perennial 5–35 cm tall; stems 0.3–0.6 mm wide, angular, scabrid or glabrous. Leaves filiform, 2–20 cm long, 2–6 mm wide, scabrid; sheaths pale brown with long hairs at mouth. Inflorescence a solitary terminal head of few to many spikelets, 0.5–1.2 cm diameter; bracts filiform, up to 5 cm long, usually long-setose; spikelets lanceolate, 3–6 mm long, 1–2 mm wide; glumes reddish brown, ovate, 2.5–4 mm long, acute to mucronate, densely hairy. Nutlets greyish, obovoid, triangular, 0.8–1.1 mm long, 0.6–0.7 mm wide, strongly transversely wrinkled with quite deep transverse grooves between the wrinkles which have close microscopic ribs, and with large papillae on the 3 angular longitudinal ribs.

KENYA. recorded from Rift Valley by Haines & Lye; Machakos/Masai District: Chyulu Hills, 23 Dec. 2000, *Luke & Luke* 7191B!

TANZANIA. Ufipa District: Mpui, Lake Kwela, 10 Mar. 1959, *McCallum Webster* 42!; Kondo District: Kikori Hills, 8 Mar. 1930, *B.D. Burt* 2789!; Masasi District: Ndanda Mission, 6 Mar. 1991, *Bidgood et al.* 1816!

DISTR. K 3, 4, 6; T 1–5, 7, 8; Malawi

HAB. *Brachystegia* and *Julbernardia-Parinari* woodland, open areas with sandy or lateritic soil, swamp, lake and stream edges, rock outcrops etc.; 350–1650 m

SYN. *Abildgaardia buchananii* (C.B. Clarke) Lye in *Bot. Notis.* 127: 495 (1974) & in Haines & Lye, *Sedges & Rushes E. Afr.*: 114, fig. 209, 210 (1983)

NOTE. Two specimens from Tanzania (Ufipa District: Lake Kwela, Mpui, 14 Mar. 1959, *McCallum Webster* c20!; Mbeya District: near road from Utengela to coffee farm below Mbeya Peak, 6 Apr. 1970, *Wingfield* 571(c) pro parte!) have the same transversely wrinkled nutlets; they occur with *B. buchananii* (*Wingfield* 571(c)) but the solitary spikelet inflorescence is distinctive. They might represent a separate taxon.

28. ***Bulbostylis sphaerocarpa*** (*Boeck.*) *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 616 (1895) & in *F.T.A.* 8: 430 (1902); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 70 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 114, fig. 211, 212 (1983); Lye in *Fl. Eth.* 6: 417, fig. 212.40 (1997). Type: Ethiopia, near Matamma, *Schweinfurth* 2046 G [see Note], lecto.; BM, BREM, K, iso.)

Small annual forming tufts with many stems 3–10 cm long. Leaves filiform, 2–10 cm long, scabrid. Inflorescence a solitary terminal spikelet and with additional cleistogamous flowers at base of stem, which give rise to underground fruits; spikelets ovoid-ellipsoid, 3–8 mm long, 1–1.5 mm wide, 5–10-flowered; glumes red-brown with paler midrib, \pm 1.5 mm long, sparsely hairy. Normal nutlets whitish, obovoid, 0.8–0.9 mm long, 0.5–0.8 mm wide, transversely wrinkled, the wrinkles with longitudinal microstriae, with dark purple persistent style-base; nutlets from stem-bases white to greyish pink, more triangular, 1.2–1.3 mm long, \pm 0.9 mm wide, strongly transversely wrinkled, with persistent reddish brown style-base.

TANZANIA. Mbeya District: 11 km W of Mbeya, near track from Utengule to coffee farm below Mbeya Peak, Mar. 1970, *Wingfield* 800! & *Wingfield* 392 (fide Haines & Lye)

DISTR. T 7; Ethiopia

HAB. Rather bare soil in *Brachystegia* woodland; 1400–1600 m

SYN. *Scirpus sphaerocarpus* Boeck. in *Linnaea* 36: 741 (1870)

S. nindensis Ficalho & Hiern in *Trans. Linn. Soc. ser. 2 Bot. 2: 27* (1884). Type: Zambia, upper Nindi R., *Serpa Pinto* 63 (LISU, holo.)

Fimbristylis sphaerocarpa (Boeck.) K. Schum. in *P.O.A. C: 125* (1895)

Abildgaardia sphaerocarpa (Boeck.) Lye in *Bot. Notis. 127: 497* (1974)

NOTE. Boeckeler cited several *Schweinfurth* specimens but Haines & Lye cite *Schweinfurth* 2046 as type. Later Lye gives 2046 at G as holotype but it is to be taken as a lectotype, although I would have thought it would be at B rather than G.

29. ***Bulbostylis pusilla*** (A. Rich.) C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr. 5: 615* (1895) & in *F.T.A. 8: 440* (1902); Bodard in *Ann. Fac. Sci. Univ. Dakar 9: 72* (1963); Napper in *F.W.T.A. ed. 2, 3: 318* (1972); Haines & Lye, *Sedges & Rushes E. Afr.: 117* (1983); Gordon-Gray in *Strelitzia 2: 35, fig. 12C* (1995); Lye in *Fl. Eth. 6: 418* (1997). Type: Ethiopia, Adua, *Quartin Dillon* s.n. (P, lecto.)*

Slender tufted annual 3–40 cm tall; stems few to many, crowded, angular, 0.2–0.5 mm thick, glabrous to densely hairy. Leaf sheaths straw-coloured to light brown, scabrid to hairy and with long hairs at mouth; blades up to 40 cm long, 2–4 mm wide, scabrid or hairy. Inflorescence simple or compound, lax with one sessile spikelet and 1–10 stalked spikelets and additional groups of sessile and stalked spikelets, up to 40 spikelets in all, the whole up to 5 cm long; spikelets ovoid or lanceolate, 2–5 mm long, 1–2 mm wide; glumes red-brown often with paler margins, 1–2 mm long, glabrous to shortly hairy and ciliate; keel 3-veined. Nutlets grey, light brown or olive, obovoid to obcordate, 0.6–1 mm long, 0.6–0.8 mm wide, almost rounded to sharply trigonous, transversely wrinkled often with papillae along the tops of the wrinkles; style-base a persistent dark brown knob. Fig. 14, p. 94.

a. subsp. **pusilla**

Culms not densely pubescent. Glumes glabrous on faces or \pm pubescent (see Note).

UGANDA. Masaka District: Sese, Fumve Is., 19 June 1950, *Wood* 736! & Bugala, Kalangala, 5 June 1932, *A.S. Thomas* 93!; Mengo District: N of Kisi near Entebbe, 31 Aug. 1969, *Lye* & *Rwaburindore* 3696!

KENYA. Northern Frontier District: Ndoto Mts, Ngurunit, 3 Dec. 1978, *Hepper* & *Jaeger* 7259! & 7266!; Nakuru District: E Mau Forest Reserve, Camp 11, 7 Sept. 1949, *Maas Geesteranus* 6147!

TANZANIA. Ngara District: Shanga, Kibogo, 6 Mar. 1961, *Tanner* 5852!; Arusha District: Ngurdoto National Park, Momela Lake, 10 Apr. 1965, *Richards* 20169!; Lushoto District: W Usambaras, Magamba–Mkusi road, 4.8 km NE of Lushoto, 18 Apr. 1953, *Drummond* & *Hemsley* 2137!

* Haines & Lye and Gordon-Gray give the type as *Schimper* 796 from Ethiopia, Guendeptha (P) but Bodard states “the type *Quartin Dillon*..” and this stands as a lectotypification since Richard cites both.



FIG. 14. *BULBOSTYLIS PUSILLA* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence, $\times 3$; 3. spikelet, $\times 12$; 4. glume, $\times 20$; 5. flower, $\times 24$; 6. nutlet, $\times 30$. 1–2 from Drummond & Hensley 2137, 3–5 from Tanner 5852, 6 from Peter 21684. Drawn by Juliet Williamson.

DISTR. U 2, 4; K 1, 3; T 1–3, 7; Mali to Nigeria, Central African Republic, Ethiopia

HAB. *Loudetia kagerensis* grassland, marshes by lakes etc., shallow soil on rock outcrops, open *Acacia-Juniperus-Olea* woodland; 800–2300 m

SYN. *Fimbristylis pusilla* A. Rich., Tent. Fl. Abyss. 2: 506 (1850); Zarb, Cat. Spéc. Bot. Pfund: 39 (1879)

Scirpus hochstetteri Boeck. in Linnaea 36: 739 (1870); Engl., Hochgebirgsfl. Trop. Afr.: 148 (1892), *nom. illegit.* (cites Richard's *Fimbristylis pusilla*)

S. gracillimus Boeck. in Linnaea 36: 761 (1870). Type: Ethiopia, Lake Amba, *Schimper* 2066 (B†, holo.)

NOTE. Haines & Lye (1983) and Lye (1997) keep a subsp. *yalingensis* (H.Cherm.) R.W. Haines distinct from subsp. *pusilla*, and it is clear from their cited specimens and determinations that the East African material is subsp. *yalingensis* [Type: Central African Republic, Yalinga, *Le Testu* 2987 (P, holo.)]. The two seem very poorly distinguished to me. In Fl. Eth. Lye separates them as follows:

glumes almost glabrous; nutlets 0.9–1 mm long subsp. *pusilla*

glumes often short-hairy; nutlets 0.6–0.9 mm long subsp. *yalingensis*

and the same differences are given in *Sedges & Rushes E. Afr.* (where the nutlet of *pusilla* is said to be 0.9–1 × 0.6–0.7 mm, and that of *yalingensis* 0.6–0.9 × 0.4–0.6 mm). A nutlet from the isotype of *pusilla* separated by C.B. Clarke measured 0.8 × 0.8 mm. Haines & Lye stated that they had seen no subsp. *pusilla* from East Africa but that it was likely to turn up in northern Kenya or Uganda. Certainly all the East African material has ± hairy glumes, whereas the Ethiopian type material has glabrous glumes (excluding marginal ciliae); but *Mooney* 5685, cited in Fl. Eth. as subsp. *pusilla*, has hairy glumes. Moreover *Bodard* says of the *Quartin Duillon* type “très peu vélues” so I have not kept *yalingensis* separate at present.

b. subsp. **congolensis** (*De Wild.*) *R.W. Haines* in Haines & Lye, *Sedges & Rushes E. Afr. App.* 3: 1 and in main work: 116, fig. 215 (1983); Lye in Fl. Eth. 6: 418, fig. 212.43 (1997). Type: Congo-Kinshasa, ?upper Congo, *Claessens* 1681 & lower Congo, *Lode Achten* s.n. (BR, syn.)

Stems and leaves densely short hairy. Glumes 1.5–2 mm long.

UGANDA. Mengo District: Kyabana, July/Aug. 1915, *Dummer* 2635!; Mubende District: Kakumiro, 4 Sept. 1941, *A.S. Thomas* 3924!

TANZANIA. Buha District: Birira to Nisusi, no dates found, *Peter* 37915 and 48492; Kigoma District: Lugufu to Kigamba, no dates found, *Peter* 36681, 46172

DISTR. U 4; K (recorded by Haines & Lye); T 4; Mali to Nigeria, Central African Republic, Congo-Kinshasa, Ethiopia

HAB. Grassland and bushland, sheltered crevices in rocky outcrops; 1050–1400 m

SYN. *Bulbostylis congolensis* *De Wild.*, Pl. Bequaert. 4: 194 (1927); *Bodard* in Ann. Fac. Sci. Univ. Dakar 9: 65 (1963); *Napper* in F.W.T.A. ed. 2, 3: 318 (1972)

B. polytricha *Cherm.* in Arch. Bot. Caen 4, Mém. 7: 39 (1931). Type: Central African Republic, Haut-Ubangi, Yalinga, *Le Testu* 3067; Wadda, Pipi, *Le Testu* 2874 & Balé, 10 km S of Ippy, *Tisserant* 2266 (P, syn.)

B. holotricha *Peter*, F.D.-O.A. 1, Anhang: 127, t. 89, fig. 2 (1936) & in main work: 412 (1937) & 418 (1938); *Nelmes & Baldwin* in Amer. J. Bot. 39: 375 (1952); *Napper* in J. E.A. Nat. Hist. Soc. 25 (110): 5, fig. 1 (1965). Type: Tanzania, Buha District: Birira to Nisusi, *Peter* 32915 (B†, holo.)

B. holotricha *Peter* forma *depauperata* *Kük.* in F.D.-O.A. 1, Anhang: 128 (1936). Type: Tanzania, Kigoma District: Uvinza, Lugufu to Kigamba, *Peter* 46169b (B†, holo.)

Abildgaardia pusilla (*A. Rich.*) *Lye* subsp. *congolensis* (*De Wild.*) *Lye* in Nordic J. Bot. 3: 329 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 116, fig. 215 (1983)

NOTE. Material with dense patent hairs on the stems is characteristic but specimens otherwise identical in appearance have glabrous stems, e.g. *Thomas* 4321 (17 Oct. 1945) from the same locality as the cited *Thomas* 3924; and *Hooper et al.* 1978 from Kigoma District: Mwanje market at junction of Kasulu and Ujiji roads. *Lye & Rwaburindore* 4404 (Mengo District: Bulemezi, near Kakinzi School, 14 Oct. 1969) is similar.

30. ***Bulbostylis angustespicata*** (*Lye*) *Verdc. comb. nov.* Type: Tanzania, Mbeya District: Mbeya, Iyunga School, *Wingfield* 812 (K!, holo.; EA, iso.)

Slender annual 10–22 cm tall with very small root-system; stems angular with prominent longitudinal ridges, 0.2–0.3 mm wide, minutely scabrid below inflorescences but otherwise glabrous. Leaves 1–7 cm long, 2–4 mm wide, with 3 longitudinal ridges on lower surface, scabrid on margin and ribs; sheaths straw-coloured to pale reddish brown, scabrid on ridges and with whitish hairs 0.5–2 mm long at the mouth. Inflorescence umbellate, 2–2.8 cm long, 1–3 cm wide, open, of 1 sessile spikelet and 3–5 stalks with either solitary spikelets or a group of 1 sessile and 1–2 stalked spikelets; bracts reddish brown, 2–4, glume-like, 2–5 mm long, scabrid and with white hairs on margin, with straw-coloured midrib extended into a scabrid awn 1–3 mm long; axes scabrid; spikelets linear-lanceolate, 3–6 × 0.8–1.2 mm; glumes medium to dark reddish brown with paler midrib, ovate, 1.8–2 mm long, 0.6–0.8 mm wide, minutely scabrid to almost glabrous save for white hairs on margin. Nutlet cream, pyriform, 0.5–0.6 mm long, 0.4 mm wide, trigonous with 3 prominent greyish ridges and 5–7 prominent transverse undulations on each side; style base dark reddish brown, under 0.1 mm long and wide, ± persistent.

TANZANIA. Mbeya District: Iyunga School, Apr. 1970, *Wingfield* 812!

DISTR. T 7; known only from the type

HAB. Cultivated ground, school playing field, abandoned chicken runs; ± 1560 m

SYN. *Abildgaardia angustepicata* Lye in *Lidia* 1(1): 33 (1985) & in *Nordic J. Bot.* 7: 43, figs. 7, 8 (1987)

NOTE. Lye gives no information on the affinities of this species.

31. ***Bulbostylis microelegans*** (Lye) R.W. Haines in *Sedges & Rushes E. Afr. App.* 3: 1 (1983) & in main work: 117, figs. 216, 217 (1983); Lye in *Fl. Eth.* 6: 419, fig. 212.45 (1997). Type: Kenya, near Nairobi, 1 km SW of National Park main gate, *Lye* & *Katende* 6323 (MHU, holo.; K!, iso.)

Slender tufted annual 5–25 cm tall; stems grooved, 0.2–0.3 mm wide, glabrous. Leaves channeled, ± 2 mm wide, glabrous save for some flexuous hairs ± 3 mm long on the sheaths. Inflorescence umbel-like of 1 sessile and 2–6 stalked spikelets in groups of sessile and stalked spikelets; bracts small, adpressed, smaller than the spikelets which are long and narrow, 3–5 mm long, 0.7–1 mm wide; glumes dark brown with 3-veined green midrib, ovate, 1.5 mm long, acute or obtuse, glabrous or pubescent. Stamens 2. Nutlet greyish white, obovoid, 3-angled, 0.5–0.6 mm long with tubercles (cuticular papillae) arranged in longitudinal and horizontal rows projecting through the shiny surface but often smooth when young; minute epidermal papillae present below the cuticular papillae.

UGANDA. Karamoja District: Moroto, 67 km S of Greek R. road, 17 Aug. 1969, *Haines* 4301!

Busoga District: 1.6 km N of Buyindi Hill, 23 May 1951, *G.H.S. Wood* 168! & 200!; Mengo District: Entebbe, Mosquito Research Tower, 26 Apr. 1969, *Haines* 4294!

KENYA. Nakuru District: 135 m NW of Lake Nakuru, 7 Aug. 1967, *Mwangangi* 115!; Nairobi District: Thika Road House, 8 July 1951, *Verdcourt* 544! & Nairobi, Carnivore (former Golf driving range), 30 June 1987, *Ng'weno* & *Faden* 87/76!

TANZANIA. Arusha District: foot of Mt Meru, 28 May 1968, *Renvoize* 2436!; Iringa District: 9 km SW of Iringa on Mbeya road, 10 June 1996, *Faden et al.* 96/113!

DISTR. U 1–4; K 3, 4; T 2, ?4, 6, 7; Ethiopia

HAB. Grassland and scrub on poor soil, shallow wet soil over rocks, bare soil at edge of grassland paths, murram pits; 1200–1800 m

SYN. *B. pusilla* sensu Vollesen in *Opera Bot.* 59: 93 (1980), *non* (A. Rich.) C.B. Clarke

Abildgaardia microelegans Lye in *Nordic J. Bot.* 1: 756 (1982) & in *Haines & Lye, Sedges & Rushes E. Afr.*: 117, figs. 216, 217 (1983)

NOTE. *Aleljung* 326 (Tanzania, Mbeya District: Uyole, 23 Mar. 1975) is probably related to the above and looks very like it; the nutlets are not densely papillate but have transverse areas of short vertical ribs.

32. *Bulbostylis abortiva* (Steud.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 610 (1895); Durand & Schinz, Etud. Fl. Congo 1: 304 (1896); Rendle, Cat. Afr. Pl. Welw. 2: 124 (1899); C.B. Clarke in F.T.A. 8: 441 (1902); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 74 (1963); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 5 (1965); Hooper in F.W.T.A. ed. 2, 3: 318 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 117, fig. 218, 219 (1983); Lye in Fl. Eth. 6: 420, fig. 212.46 (1997). Type: Madagascar, Nosy Be [Nossibé], *Boivin* 1996 (P, holo.; K!, iso.)

Tufted annual 15–50(–80) cm tall; stems up to 1.5 mm thick, deeply grooved, usually with dense short white spine-like hairs. Leaves up to 20 cm long and 0.5 mm wide, flat and channeled, with similar spine-like hairs; sheaths with slender hairs up to 15 mm long. Inflorescence open and umbelliform with (10–)20–40(–60) spikelets; main inflorescence bracts 5–60 mm long, the longest much longer than the nearest spikelet, with long slender marginal hairs at the base and short spine-like hairs above; spikelets 3–7 mm long, 1–2 mm wide; glumes reddish brown with pale midrib, broadly ovate, 1–2 mm long with translucent 0.2–0.3 mm wide margin with short hairs, obtuse to rounded at apex or lower ones shortly subulate or acuminate, midrib 3-veined, 1–2 mm wide. Nutlet at first uncoloured but grey or yellow-brown at maturity, obovoid, 0.7–0.8 mm long, almost smooth or with a translucent surface layer which breaks up into square or circular scales, giving a sometimes tuberculate appearance; epidermal cells isodiametric with strongly sinuose walls; style-base persisting as a brownish knob.

UGANDA. Acholi District: Murchison Falls National Park, 4.8 km N of Chobi, 26 Sept. 1967, *Angus* 6033!; Bunyoro District: Murchison Falls National Park, 3–4 km S of Partap Lodge Pier, 15 Sept. 1969, *Lye et al.* 3978!; Busoga District: centre of Dagusi Is., 16 June 1953, *G.H.S. Wood* 783!

KENYA. Eldoret, Aug. 1967, *Haines* 249!; Baringo District: 2.6 km on Kabarnet–Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 136!; Kwale District: near Pemba R., Cha Simba, 17 Mar. 1902, *Kassner* 346!

TANZANIA. Moshi District: 16 km on Moshi–Arusha road, 15 Dec. 1961, *Polhill & Paulo* 993!; Kigoma District: Kasye Forest, 24 Mar. 1994, *Bidgood et al.* 2949!; Songea District: Mbinga, Kigonsera, 4 Apr. 1973, *Mhoro* DSM 2955B

DISTR. U 1–3; K 3, 7 (see Note); T 2, 4, 6, ?8; throughout tropical Africa and Madagascar

HAB. Shallow soil over rock, grassland, seasonally moist hollows, cultivation, miombo woodland; 50–2000 m

SYN. *Fimbriostylis abortiva* Steud., Syn. Pl. Glum. 2: 111 (1855); K. Schum. in P.O.A. C: 125 (1895)

Scirpus schweinfurthianus Boeck. in Linnaea 36: 758 (1869) & in Flora 62: 563 (1879). Type: Ethiopia, Gallabat, near Matamma, *Schweinfurth* 2039 (B, holo.; K, iso.)

Isolepis schweinfurthiana (Boeck.) Oliv. in Trans. Linn. Soc. 29: 167 (1875)

Fimbriostylis flexuosa Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 155 (1884). Types: Angola, Pungo Andongo, between Candumbe and Mangué, *Welwitsch* 6829 (LISU, syn.) & near Banza do Sola de Umbilla, *Welwitsch* 6828 in part (LISU, syn.)

NOTE. I am not certain of the Kenya Coast record. C.B. Clarke thought it matched his *Bulbostylis coleotricha* var. *lanifera* (Boeck.) C.B. Clarke but Bodard has suggested it is nearer *B. abortiva* and Hooper states it does not match West African *lanifera*.

33. *Bulbostylis coleotricha* (A. Rich.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 613 (1895) & in F.T.A. 8: 442 (1902); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 74 (1963); Hooper in F.W.T.A. ed. 2, 3: 317 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 118, fig. 220, 221 (1983); Lye in Fl. Eth. 6: 420, fig. 212.47 (1997). Type: Ethiopia, Guendepa, *Schimper* 1226 (P, lecto.; G, HEID, K!, UPS, iso.)

Slender tufted annual 8–30 cm tall with all parts hairy; stems 0.3–0.5 (–0.8) mm wide, deeply grooved with the ridges scabrid-hairy. Leaf sheaths with long slender hairs 3–10 mm long; blades 3–15 cm long, 0.2–0.5 mm wide, channeled, distinctly ridged and with short stiff dense hairs. Inflorescences lax with one sessile spikelet and 2–8 stalked spikelets, or groups of spikelets, but sometimes only 1–3 spikelets; main inflorescence bracts longer than the longest spikelet, all bracts narrowly lanceolate with long subulate apices with long hairs; spikelets ovoid, 2–5 mm long, 1.5–3 mm wide; glumes pale to dark brown with conspicuous pale green midrib, ovate, 2–3 mm long, glabrous to densely shortly white-hairy and margins ciliate, awned. Nutlets grey, pale yellow or yellow-brown to dark brown, obovoid, 3-angled, 0.8–1 mm long, minutely papillose; style-base persisting as dark knob at maturity.

a. var. **coleotricha**; Haines & Lye, *Sedges & Rushes E. Afr.*: 118, fig. 220, 221 (1983)

Spikelets 1–2 mm wide.

UGANDA. Karamoja District: Napak, 26 June 1966, *Haines* 4168! & Kadam Mt, Nov. 1964, *J. Wilson* 1729!; Teso District: Ngora, Kapiri Rock, 13 June 1970, *Lye* 5709!

KENYA. Baringo District: 8 km W of Kabarnet, 30 Aug. 1961, *Bogdan* 5194!, 5195!

TANZANIA. Lushoto District: W Usambaras, near Magamba Secondary School, 2 June 1996, *Faden et al.* 96/22!; Rufiji District: Selous Game Reserve, Sand Rivers Lodge, 7 June 1997, *Luke & Luke* 4640!

DISTR. U 1–3; K 3; T 3, 6; Senegal to Cameroon, Ethiopia

HAB. Shallow soil overlying rock outcrops and crevices, dry river beds; 70–1800 m

SYN. *Fimbristylis coleotricha* A. Rich., tent. Fl. Abyss. 2: 506 (1851)

Scirpus coleotrichus (A. Rich.) Boeck. in *Linnaea* 36: 763 (1870) & in *Flora*: 563 (1879)

Abildgaardia coleotricha (A. Rich.) Lye in *Bot. Not.* 127: 495 (1974)

b. var. **miegei** (*Bodard*) *R.W. Haines* in *Sedges & Rushes E. Afr.* App. 3: 1 (1983) & in main work: 119, figs. 222, 223 (1983). Type: Mali, Sotuba, *J. & A. Raynal* 5164 (P, holo.)

Spikelets larger, 2–2.5 mm wide.

UGANDA. Masaka District: Mityebili, near Kalisiao, 8 Oct. 1967, *Haines* 4265!; Mengo District: Kampala–Hoima road km 85, Bukomero, Singo, Sept. 1932, *Eggeling* 551 in FD 926! & Kaazi, 9 Sept. 1961, *Rose* 230 B!

KENYA. Baringo District: 32 km NW of Eldama Ravine, Gobat, near Molo R., Aug. 1958, *Bagenal* in *Bogdan* 4636!

DISTR. U 4; K 3; Mali

HAB. Cracks in granite boulder, laterite outcrops, seasonally damp grassland; 1100–1200 m

SYN. *Bulbostylis miegei* *Bodard* in *Bull. Soc. Bot. Fr.* 108: 307 (1961) & in *Ann. Fac. Sci. Univ. Dakar* 9: 75 (1963)

Abildgaardia coleotricha (A. Rich.) Lye var. *miegei* (*Bodard*) Lye in *Nordic J. Bot.* 3: 239 (1983)

NOTE. Hooper sinks *B. miegei* into *B. coleotricha*; Haines & Lye do not mention *B. lanifera* (Boeck.) Peter but Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 6 (1965) sinks it into *B. coleotricha*, as does Hooper. The type of *Scirpus laniferus* Boeck. in *Linnaea* 36: 268 (1870) is *Barter* 1030 from Nigeria, Nupe. Kük. in *F.D.-O.A.*: 418 (1938) describes a *B. lanifera* var. *glabra* based on *Fimbristylis andongensis* var. *glabra* Ridley in *Trans. Linn. Soc. ser. 2 Bot.* 2: 153 (1884) from Angola.

34. ***Bulbostylis densa*** (*Roxb.*) *Hand.-Mazz.* in *Kersten & Schenk, Vegetationsbilder* 20: 16 (1930); Hara in *J. Jap. Bot.* 18: 467 (1942); *F.P.N.A.*: 265 (1955); *Bodard* in *Ann. Fac. Sci. Univ. Dakar* 9: 73 (1963); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 5, fig. 9 (1965); Hooper in *F.W.T.A. ed. 2, 3*: 318 (1972); Kern in *Fl. Males. ser. 1, 7*: 538 (1974); Koyama in *Rev. Fl. Ceylon* 5: 324 (1983); Gordon-Gray in *Strelitzia* 2: 31 (1995); Lye in *Fl. Eth.* 6: 419 (1997). Type: Nepal, *Wallich* 3514c (K!, syn. or lecto.)



FIG. 15. *BULBOSTYLIS DENSA* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence, $\times 4$; 3. spikelet, $\times 12$; 4. glume, $\times 16$; 5. flower, $\times 24$; 6. nutlet, $\times 20$. All from *Magogo* 20. Drawn by Juliet Williamson.

Tufted annual 5–30 cm tall, glabrous or with scattered short spine-like hairs on stems and leaves; stems deeply grooved, 0.2–0.4 mm wide. Leaf-sheath with many slender hairs 1–2 mm long; blades 0.2–0.3 mm wide. Inflorescence of one sessile spikelet and up to 8 stalked spikelets, the stalks shorter or longer than the spikelets; bracts filiform, 4–7 mm long, the longest exceeding the sessile spikelet; spikelets 2–4 mm long, 1.5–3 mm wide; glumes few, dark brown with green or grey midrib, 1.5–3 mm long, obtuse with tiny point, glabrous or pubescent but margin ciliate, spreading when in fruit. Nutlets whitish yellow, obovoid, about half the length of the glume and forcing the glumes open at maturity, 1 mm long, becoming brown or greyish with white margins, obscurely to very distinctly tuberculate; style-base persisting as a yellowish brown or dark brown knob. Fig. 15, p. 99.

SYN. *Scirpus densus* Roxb., Fl. Ind. 1: 231 (1820)

Isolepis trifida Nees in Wright, Contrib. Bot. India: 108 (1834). Type: Nepal, Royle 51 (LIV, holo.)

Bulbostylis capillaris (L.) C.B. Clarke var. *trifida* (Nees) C.B. Clarke in Fl. Brit. India 6: 652 (1893) & in F.T.A. 8: 438 (1902)

B. trifida (Nees) Nelmes in K.B. 5: 209 (1950) & in K.B. 6: 318 (1952), *nom. superfl.*

NOTE. Hooper records *B. densa* var. *densa* from Senegal to Cameroon and throughout the tropics, and var. *cameroonensis* (C.B. Clarke) Hooper from Mt Cameroon (see general Note).

subsp. **afromontana** (Lye) Haines, Sedges & Rushes E. Afr. App. 3: 1 (1983); Goetgh. & Coudijzer in B.J.B.B. 55: 251 (1985); Maquet in Fl. Rwanda 4: 424 (1988); Gordon-Gray in Strelitzia 2: 31, figs. 10H, K (1995). Type: Uganda, Kigezi District: N slope of Mgahinga–Muhavura saddle, Lye 5329 (EA, holo.; K!, iso.)

Differs from typical subsp. by the glumes being rounded on the back rather than having a distinct keel, and the nutlets with less evident tubercles.

UGANDA. Toro District: Ruwenzori, Nyinabitaba ridge above Mubuku valley, 0.8 km N of U.M.C. hut, 28 Dec. 1950, Wood 285! & June 1983, Osmaston 3841!; Mbale District: Mt Elgon, Kapchorwa, 8 Sept. 1954, Lind 271!

KENYA. Northern Frontier District: Ol Lolokwe opposite Subata repeater station, 5 Apr. 1979, Gilbert 5377a!; Uasin Gishu District: Eldoret, 5 Aug. 1967, Haines 4249!; Nanyuki District: Nanyuki, Hines Farm, microwave repeater station, 23 Oct. 1977, Gilbert 4910!

TANZANIA. Arusha District: Arusha National Park, Mt Meru, Kitoto, 6 Oct. 1977, Raynal 19428!; Pare District: S Pare Mts, Tona, Tschahunga Mts, 13 July 1915, Peter 12099!; Morogoro District: Nguru Mts, Mgundwilo Mt near Maskati mission, 10 June 1978, Thulin & Mhoro 3135!

DISTR. U 1–4; K 1, 3–5; T 1–4, 6, 7; Congo-Kinshasa, Rwanda, Ethiopia

HAB. Upland grassland, both dry and bordering swampy streams, murram pits, dry rocky places with thin or eroded soil particularly in forest (*Juniperus*, bamboo) clearings, damp rocks of waterfalls, also more lowland grassland and *Combretum-Acacia* scrub; (1200–)1400–2600 m

SYN. *Bulbostylis densa* auctt., *non* (Roxb.) Hand.-Mazz. sensu stricto

Abildgaardia densa (Roxb.) Lye subsp. *afromontana* Lye in Nordic J. Bot. 3: 237 (1983)

NOTE. I have followed Lye recognising this subsp. *afromontana* but it is not well defined. The variation and distribution of *B. densa* in Africa needs more study, particularly how the lowland and highland variants can be separated.

Maas Geesteranus 5811 (Kenya, Kericho District: SW Mau Forest Reserve) from 1920 m differs in its nutlet sculpture, having transverse lines of short vertical ribs and neither tuberculate nor transversely rugulose as in *B. pusilla*. Kerfoot 2929 from the same district, Sambret, appears exactly similar so some distinct taxon may be involved.

B. densa and *B. pusilla* are not always easily distinguished and a number of specimens with neither papillate nor transversely rugulose sculpture, but with merely reticulate cell pattern, resemble both; e.g. Robinson 5095 (Tanzania, Ufipa District: Mwimbi, 21 Apr. 1962) could belong to either; Smith, Beentje & Muasya 170 & 171 (Kenya, Trans-Nzoia District: Mt Elgon National Park, Koitoboss route, 3 Nov. 2000 at 3150 m) and Smith, Beentje & Muasya 180 (from the same area but at 3320 m) have similar reticulate nutlets and may be a new high altitude taxon.

35. *Bulbostylis filamentosa* (Vahl) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 613 (1895) & in *Fl. Cap.* 7: 206 (1898); Rendle, *Cat. Afr. Pl. Welw.* 2: 124 (1899); C.B. Clarke in *F.T.A.* 8: 431 (1902); De Wild., *Pl. Bequaert.* 4: 195 (1927); F.D.-O.A. 1: 413 (1937); Robyns & Tournay, *F.P.N.A.* 3: 264 (1955); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 68 (1963); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 4 adnot. (1965); Hooper in *F.W.T.A. ed. 2, 3:* 317 (1972); Hepper, *W. Afr. Herb. Isert & Thonning:* 136 (1976); Haines & Lye, *Sedges & Rushes E. Afr.:* 120, fig. 226, 227 (1983); Maquet in *Fl. Rwanda* 4: 425 (1988); Gordon-Gray in *Strelitzia* 2: 35 adnot. (1995). Type: Guinea, *Thonning* s.n. (C, holo.; P-JU, iso.)

Fairly robust perennial 20–100 cm tall; stems crowded, 0.6–1 mm wide, glabrous or minutely hairy. Leaves 10–15 cm long, 0.3–0.5 mm wide, scabrid; leaf sheaths brownish, the throat with long hairs. Inflorescence a dense crowded head of many spikelets 0.5–1.5 cm in diameter; bracts glume-like, mucronate; spikelets 5–8 mm long; glumes dark reddish brown, appearing almost black when dry with paler margin and greenish midrib and mucro, (1.7–)2.5–3 mm long, minutely hairy or scabrid. Nutlets greyish, obovoid, distinctly triangular in section, 0.8–0.9 mm long, 0.7–0.7 mm wide, densely minutely papillose when mature; style-base minute, persistent. Fig. 16, p. 102.

UGANDA. Masaka District, *vide* Haines & Lye

KENYA. Naivasha District: Longonot crater lip, Mar. 1922, *Dummer* 5284!; Kwale District: Shimba Hills, 3 km SW of Kwale, 24 June 1971, *Lye & Katende* 6283! & Marere Hill, 7 Mar. 1968, *Magogo & Glover* 231!

TANZANIA. Biharamulo District: near Biharamulo boma, 15 Nov. 1962, *Verdcourt* 3309!; Ngara District: Bugufi, Nterungwe, 4 Jan. 1961, *Tanner* 5679!; Mbeya District: Mbeya–Iringa main road, ± 12 km before Ngololo [James Corner], 21 Jan. 1970, *Wingfield* 892!

DISTR. U 4; K 3, 7; T 1–4, 7; Guinea and Mali to N Nigeria, Central African Republic, Congo-Kinshasa, Rwanda, Angola

HAB. Seasonally wet habitats, grassland, *Terminalia–Lannea–Pappia* and *Brachystegia* woodland, crevices in rock faces; near sea level (*vide* Haines & Lye) –2400 (–2700) m

SYN. *Scirpus filamentosus* Vahl in *Enum. Pl.* 2: 262 (1805); Schum., *Beskr. Guin. Pl.* 30 (1827); Boeck. in *Linnaea* 36: 747 (1870) pro parte & in *Flora* 62: 563 (1879)

Isolepis filamentosa (Vahl) Roem. & Schult., *Syst. Veg.* 2: 113 (1812); Benth. in *Niger Fl.* 553 (1849)

Fimbristylis cardiocarpa Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 154 (1884); K. Schum. in *P.O.A. C.* 125 (1895), *non* F. Müll. (1859). Types: Angola, Pungo Andongo, Pedras de Guinga, *Welwitsch* 6816 (LISU, syn.) & Huila, Morro de Monino, *Welwitsch* 6948, 6960 (LISU, syn.), *nom. illegit.*

Bulbostylis cardiocarpa (Ridl.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 612 (1895) & *Fl. Cap.* 7: 208 (1898); Rendle, *Cat. Afr. Pl. Welw.* 2: 124 (1899); C.B. Clarke in *F.T.A.* 8: 434 (1902); Hutch. & Dalziel, *F.W.T.A.* 2: 477 (1931); F.D.-O.A. 1: 413 (1937); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 4 (1965)

B. metralis Cherm. in *Arch. Bot. Caen* 4, mém. 7: 34 (1931); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 67 (1963); Hooper in *F.W.T.A. ed. 2, 3:* 317 (1972). Type: Central African Republic, Haut-Ubangi, between Wadda & Kotto, *Le Testu* 4122 (P, holo.)

Abildgaardia filamentosa (Vahl) Lye var. *metralis* (Cherm.) Lye in *Bot. Notis.* 127: 496 (1974); Haines & Lye, *Sedges & Rushes E. Afr.:* 121 (1983)

Bulbostylis filamentosa (Vahl) C.B. Clarke var. *metralis* (Cherm.) Haines, *Sedges & Rushes E. Afr. App.* 3: 1 (1983) & in main work: 121 (1983)

NOTE. Haines & Lye distinguish var. *metralis* from var. *filamentosa* by being taller, 60–100 cm (rather than 20–70 cm); culms 1–1.5 mm wide (rather than 0.3–0.8 mm) and glabrous (rather than glabrous or scabrid), the characters Chermeson emphasized when he described *B. metralis*. Hooper keeps both up as species, and says of *B. metralis* ‘distinguished from *B. filamentosa* by the dark clearly white-fringed leaf-sheath and the lanceolate glumes.’ Haines & Lye add that most of the East African plants of *A. filamentosa* could possibly be included in var. *metralis*. Maquet does not keep up var. *metralis*, and Gordon-Gray states “*B. metralis* ‘from Madagascar’ is now generally accepted as a synonym of *B. filamentosa*”.

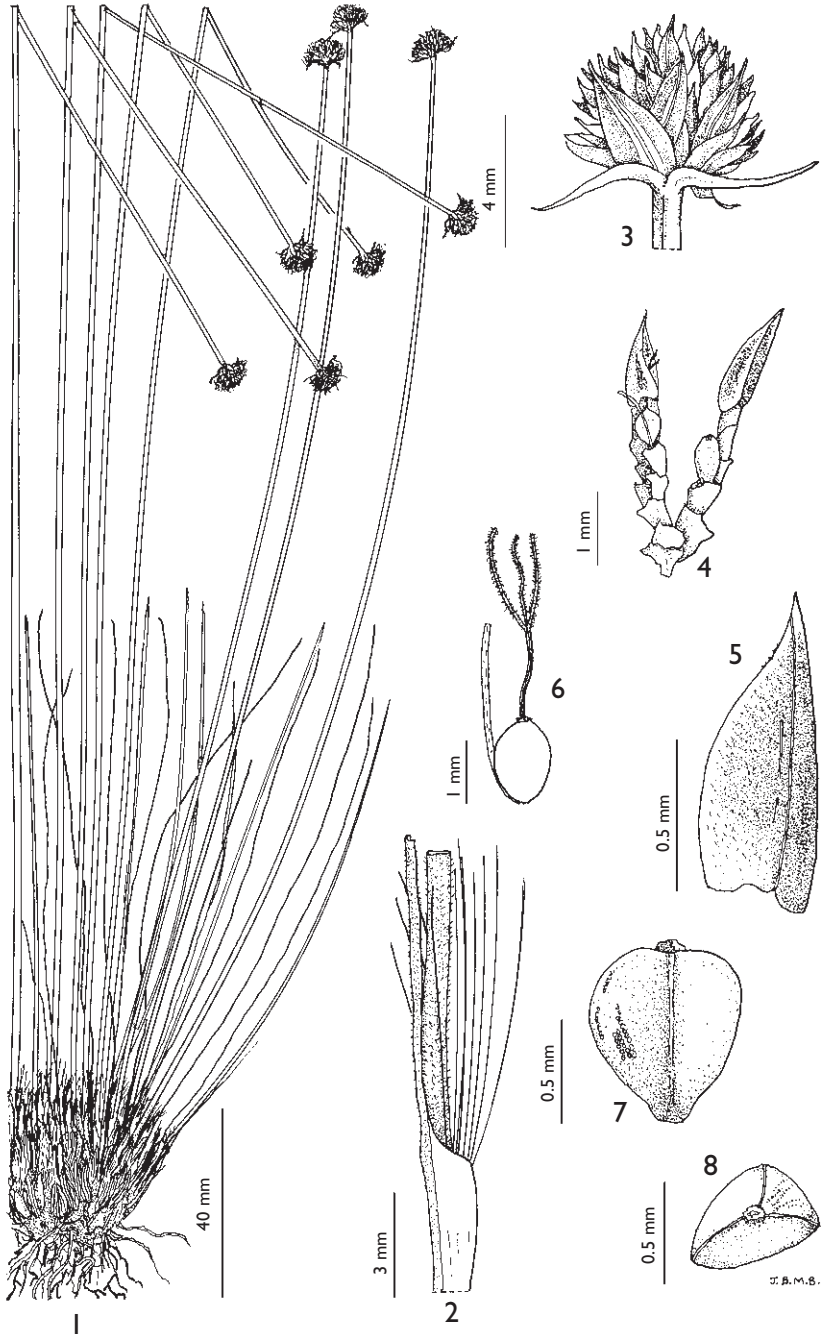


FIG. 16. *BULBOSTYLIS FILAMENTOSA* — 1, habit; 2, leaf sheath apex; 3, inflorescence; 4, two spikelets, lower glumes removed; 5, glume; 6, floret; 7–8, nutlet, side and apical views. 1–6 from Brummitt 11305, 7–8 from Pawek 13802. Reproduced from Flora Zambesiaca. Drawn by Jane Browning.

36. *Bulbostylis scabricaulis* Cherm. in Bull. Soc. Bot. Fr. 68: 419 (1922); Hooper in F.W.T.A. 3: 316 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 121, fig. 228, 229 (1983); Gordon-Gray in Strelitzia 2: 35, fig. 12G, J (1995). Types: Madagascar, Mevatanana, *Perrier de la Bathie* 477 (P, syn.) & Ampombo, *Perrier de la Bathie* 4578 (P, syn.); K!, iso.)

Tufted perennial 15–50 cm tall with small clusters of bulb-like persistent woody stem-bases remaining attached to each other and new ones arising within the broadened and hardened lower leaf sheaths; stems 0.1–1 mm thick, glabrous or with short adpressed hairs below and much denser ones above that render stems scabrid. Leaf sheaths pale to dark reddish brown or golden brown with long flexuous hairs at the throat; blades flat or channelled, up to 25 cm long, 0.5 mm wide, shortly hairy. Inflorescences of many sessile or very shortly stalked spikelets 5–8 mm long, 0.5–2 mm wide, forming dark brown to almost black heads; bracts 0.5–3 cm long, long drawn-out above; glumes paler at midrib and margin, acute or with short projection, sparsely pubescent or ± glabrous. Nutlet at first yellowish white, later dark brown, reticulate or obscurely papillate; style base persistent.

UGANDA. West Nile District: Kobopo, May 1938, *Hazel* 583!; Teso District: Serere, July 1926, *Maitland* 1287! & May 1932, *Chandler* 754!

KENYA. Masai District: Mt Suswa South face, 29 Feb. 1964, *Napper & Glover* 1741!

TANZANIA. Moshi District: Kilimanjaro, Useri, Jan. 1929, *Haarer* 1722!; Ulanga District: Sali, Ngongo Mt, 23 Jan. 1979, *Cribb et al.* 11129!; Songea District: ± 13.5 km E of Songea, 1 Feb. 1954, *Milne-Redhead & Taylor* 8458!

DISTR. U 1–4; K 6; T 2, 3, 6–8; Senegal to Angola, central and SE Africa, Botswana, Lesotho, South Africa; Madagascar

HAB. Seasonal grassland with bracken and *Protea*, near swamps, soil in crevices on rocky slopes; 1000–2100 m

SYN. *Fimbristylis collina* Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 154 (1884). Type: Angola, mountains E of Quilombo, Quiacatubia, *Welwitsch* 7004 (LISU, lecto.; K, BM, isolecto.; chosen by Lye), *non Bulbostylis collina* (Kunth) C.B. Clarke

Bulbostylis cardiocarpa (Ridl.) C.B. Clarke var. *holubii* C.B. Clarke in F.T.A. 8: 434 (1902). Type: Botswana, Leshumo Valley, *Holub* s.n. (K, holo.)

B. filamentosa (Vahl) Kunth var. *scabricaulis* (Cherm.) Bodard in Ann. Fac. Sci. Univ. Dakar 9: 68 (1963)

B. filamentosa auctt., *non* (Vahl) Kunth sensu stricto

Abildgaardia filamentosa (Vahl) Lye var. *holubii* (C.B. Clarke) Lye in Bot. Notis. 127: 496 (1974)

A. collina (Ridl.) Lye in Nordic J. Bot. 1: 757 (1982); Haines & Lye, Sedges & Rushes E. Afr.: 121, figs. 228, 229 (1983)

NOTE. *Bidgood et al.* 5099 (Iringa District: 33 km on Mafinga–Madibira road, 26 Mar. 2006, in dwarf *Brachystegia taxifolia* woodland) is a form with spreading pubescence.

37. *Bulbostylis cardiocarpoides* Cherm. in Rev. Zool. Bot. Afr. 24: 298 (1934) & in B.J.B.B. 13: 282 (1935); Haines & Lye, Sedges & Rushes E. Afr.: 122, fig. 230, 231 (1983). Type: Congo-Kinshasa, Lower Congo, Kisantu, *Vanderyst* 28044, 28175, 28178, 28181, 28182 & Kisantu, Kikonka, *Vanderyst* 33327 (all BR, syn.) & between Kasindi and Lubango in Kibali Ituri W of Lake Edward, *Lebrun* 4785 (BR, syn.)

Small tufted perennial 6–20 cm tall with the new shoots appearing amongst the old which are usually rotted or burnt; stems 0.4–0.5 mm thick. Leaves 4–8 cm long, 0.2–0.4 mm wide, flat or channeled, glabrous or with a few spine-like hairs particularly near the apex; leaf sheaths pale or reddish brown, glabrous save at the throat which has many hairs 3–5 mm long. Inflorescence of 3–many sessile spreading spikelets forming a head or cross; bracts 3–12 mm long, ± erect; spikelets 3–5 mm long, 1–1.5 mm wide, acute; glumes reddish brown with paler midrib and margins, acute or shortly subulate, glabrous and shiny. Nutlet pale brown, obovoid, 1 mm long, 0.6 mm wide, smooth and shiny; style base blackish, persistent.

UGANDA. Masaka District: Lake Nabugabo, 13 Mar. 1966, *Haines* 4076! & Sese Is., Kalangala, Bugala Is., 24 Feb. 1945, *Greenway & Thomas* 7172!, 7170A!; Mengo District: near Entebbe, N of Kisi, 31 Aug. 1969, *Lye & Rwaburindore* 3697A!

DISTR. U 4; Congo-Kinshasa, Burundi

HAB. Disturbed dry sandy *Loudetia kagerensis* grassland and open sandy ground on raised beach near lake; 1100–1200 m

SYN. *B. puberula* sensu Robyns & Tournay in F.P.N.A. 3: 264 (1955), non (Poir.) C.B. Clarke
B. puberula (Poir.) C.B. Clarke var. *viguieri* sensu Bodard in Ann. Fac. Sci. Univ. Dakar 9: 69 (1963), non *B. viguieri* Cherm.
Abildgaardia cardiocarpoides (Cherm.) Lye in Bot. Notis. 127: 495 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 122, figs. 230, 231 (1983)

NOTE. Bodard puts this in the synonymy of *B. puberula* var. *viguieri* (Cherm.) Bodard but this Madagascan taxon is not the same.

38. ***Bulbostylis barbata*** (Rottb.) C.B. Clarke in Fl. Brit. India 1: 651 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 611 (1895); Durand & Schinz, Etud. Fl. Congo 1: 304 (1896); C.B. Clarke in F.T.A. 8: 431 (1902); F.D.-O.A. 1: 413 (1937); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 4 (1965); Hooper in F.W.T.A. ed. 2, 3: 316 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 122, figs. 232, 233 (1983); Lye in Fl. Somalia 4: 112, fig. 63/m–p (1995) & in Fl. Eth. 6: 421, fig. 212.48 (1997). Type: India, Madras (no material found at C)

Tufted annual 3–30 cm tall with slender roots; stems many, 0.2–0.4 mm wide, angular, glabrous. Leaf sheaths pale brown, with long hairs at mouth; blades filiform, 1–10 cm long, 0.2–0.5 mm wide, scabrid on margins near tips. Inflorescence a head of few to many spikelets 3–15 mm in diameter; bracts filiform, 0.5–3 cm long; spikelets 3–8 mm long, 1–1.5 mm wide; glumes pale brown, tinged with red with green keels and pale margins, ovate, 1.5–2 mm long, glabrous to sparsely hairy, with bent-back subulate tips. Nutlets pale brown, obovoid, ± triangular, 0.5–0.7 mm long, 0.3–0.5 mm wide, smooth but with dense pattern of minute isodiametric cells; style base dark, persistent.

UGANDA. Teso District: Komi, Ngora, Kapiri Rock, 13 Oct. 1996, *Lye & Katende* 21985!

KENYA. Kitui District: 5.4 km E of Mutomo, 24 Mar. 1969, *Napper & Kanuri* 2079!; Kilifi District: Arabuko-Sokoke Forest reserve, Jilori, 25 Nov. 1961, *Polhill & Paulo* 847!; Tana River District: Garissa–Thika road km 22, 15 Dec. 1977, *Stannard & Gilbert* 1979!

TANZANIA. Rufiji District: Rufiji, 3 Feb. 1931, *Musk* 53! & Selous Game Reserve, Sand Rivers Lodge, 7 June 1997, *Luke & Luke* 4637!; Lindi District: Rondo Plateau, St Cyprians College, 15 Feb. 1991, *Bidgood et al.* 1594!; Zanzibar: Dale road near Bububu, 2 Mar. 1952, *R.O. Williams* 125!

DISTR. U 3; K 4, 7; T 6, 8; Z; Senegal to Ethiopia and Angola; widespread in Old World tropics
HAB. Mixed woodland and bushland with grass, dry river beds, crevices in granite outcrops, deep roadside ditches, also a weed; near sea level –1300 m

SYN. *Scirpus barbatus* Rottb., Descr. et Ic.: 52, t. 17, fig. 4 (1773); Boeck. in Linnaea 36: 751 (1870) excl. var.

S. antarcticus sensu Vahl, Enum. Pl. 2: 261 (1805); Schum., Beskr. Guin. Pl.: 29 (1827), non L. *Isolepis barbata* (Rottb.) R. Br., Prodr.: 222 (1810); Kunth, Enum. Pl. 2: 208 (1837); Benth. in Niger Fl.: 553 (1849)

I. wallichiana Roem. & Schultes, Mant. 2: 533 (1824). Type: Nepal, herb. *Wallich* (K-Wall, holo.)

I. willdenowii Steud., Syn. Pl. Gl. 2: 102 (1855); Benth. in Niger Fl.: 553 (1849). Type: Sierra Leone (?error?) (also cites Kunth (Cyper. 210))

I. subtristachya Schweinf., Beitr. Fl. Aethiop.: 216 (1867); Boeck. in Linnaea 36: 752 (1870). Type: Ethiopia, Agow territory near Mawerr, *Schimper* 2166 (B†, holo.; Kl, iso.)

Fimbristylis barbata (Rottb.) Benth., Fl. Austr. 7: 321 (1878); K. Schum. in P.O.A. C: 125 (1895)
Abildgaardia wallichiana (Roem. & Schultes) Lye in Nordic J. Bot. 3: 239 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 122, figs. 232, 233 (1983)

NOTE. Rottbøll cites three pre-Linnean references but clearly had a specimen, since he writes 'in missionis herbario inveni'; no specimen is listed in the Rottbøll microfiche.

Abildgaardia barbata Bezov. (1807) is a different plant.

39. **Bulbostylis trabeculata** Rendle* in Cat. Afr. Pl. Welw. 2: 126 (1899); C.B. Clarke in F.T.A. 8: 437 (1902); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 70 (1963); Haines & Lye, Sedges & Rushes E. Afr.: fig. 234 (1983)— see note. Types: Angola, Loanda, Casanga Is., *Welwitsch* 6982 & Praia do Zamba Grande and Matanga d'el Rei, *Welwitsch* 7000 & Mocamedes, Cabo Negro, banks of R. Caroca, *Welwitsch* 6962 (LISU, syn.; BM, isosyn.; drawing of 6982, K!)

Slender annual 3–10 cm tall with very reduced root-system; stems few to many, 0.2–0.3 mm wide, angular, longitudinally ridged, almost glabrous. Leaf sheaths whitish to pale brown with long hairs at the throat; blades up to 2 cm long, 0.3 mm wide, scabrid on margins and ribs. Inflorescence a small head 3–6 mm wide of 1–4 sessile spikelets; bracts 2–3, green and filiform, the largest 0.5–2 cm long; spikelets 2–4 mm long, 1–1.5 mm wide; glumes reddish brown with greenish midrib, mucronate. Anthers 0.6–0.7 mm long without a prominent connective. Nutlet greyish, lenticular, with distinct cells, transverse, with walls raised forming 8–10 longitudinal lines on each side of nutlet; style-base darker, persistent.

var. **trabeculata**

SYN. *Fimbristylis barbata* sensu Ridl. in Trans. Linn. Soc. ser. 2 Bot. 2: 126 (1884), *non* (Rottb.) Benth.

F. barbata (Rottb.) Benth. var. *subtristachya* sensu Ridl. in Trans. Linn. Soc. ser. 2 Bot. 2: 126 (1884), *non Isolepis subtristachya* Boeck.

var. **microglumis** (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 123, fig. 235 (1983). Type: Kenya, Turkana, Ekidir, *Mathew & Gwynne* 6774 (K, holo.; not found)

Differing from var. *trabeculata* in its smaller glumes 1.2–1.5 mm long.

KENYA. Turkana District: Ekidit, date unknown, *Mathew & Gwynne* 6774

DISTR. K 2; known only from the type

HAB. Seasonal swamp on mud under *Acacia seyal*; 600 m

SYN. *Abildgaardia trabeculata* (Rendle) Lye var. *microglumis* Lye in Nordic J. Bot. 1: 755 (1982) & Haines & Lye, Sedges & Rushes E. Afr.: 123, fig. 235 (1983)

NOTE. Although in Haines & Lye fig. 234 is captioned var. *microglumis* it is clearly stated that the habit drawing was drawn from *Welwitsch* 6982, one of the syntypes of typical *B. trabeculata*.

40. **Bulbostylis pallescens** (Lye) R.W. Haines in Haines & Lye, Sedges & Rushes E. Afr. App. 3: 1 and in main work: 124, figs. 236, 237 (1983); Lye in Fl. Somalia 4: 111 (1995). Type: Kenya, Northern Frontier District: Garissa to Modo-Gash, 13 km S of Modo-Gash, *Stannard & Gilbert* 938 (EA, holo.; K!, iso.)

Tufted annual 5–12 cm tall with very small root system; stems 0.3–0.5 mm wide, prominently ribbed and with short spine-like hairs. Leaves basal, the blades 1–5 cm long, 0.3–0.7 mm wide, densely scabrid on margin and ribs; sheaths straw-coloured to pale brown, densely scabrid and with long flexuous hairs in the throat. Inflorescence 5–20 mm wide, of 2–5 crowded spikelets; main bract filiform, 5–10 mm long, the only one longer than a spikelet; spikelets straw and brown or pale green, ovoid, 3–6 mm long, 2–4 mm wide; glumes greyish or straw-coloured but often reddish brown below, ovate, 2.6–3 mm long, pubescent; midrib green, produced as a

* This is usually attributed to C.B. Clarke but his first mention of the name is in Durand & Schinz, Consp. Fl. Afr. 5: 616 (1895) without a description; but as name for *Fimbristylis barbata* sensu Ridl., *non F. barbata* (R. Br.) Ridl. Rendle gives enough description by quoting *Welwitsch* fieldnotes to validate it.

distinct mucro. Stamens 2–3. Style 3-branched. Nutlet pale brown, obovoid, 0.7–0.8 mm long, 0.4–0.5 mm wide, triangular in section, reticulate with rectangular cells (but much more quadrate in ripe nutlets than in the K isotype); style-base darker (but pale in K isotype), persistent.

KENYA. Northern Frontier District: 13 km S of Modo-Gash, 11 Dec. 1977, *Stannard & Gilbert* 938!; Naivasha District: Green Crater Lake, 20 May 1959, *McCallum Webster* s.n. 'C'!

DISTR. **K** 1, 3; Somalia

HAB. *Commiphora*, *Euphorbia*, *Cordia*, *Acacia* etc. bush with sparse ground cover; 250–?1800 m

SYN. *Abildgaardia pallescens* Lye in *Nordic Journ. Bot.* 1(6): 751 (1981 publ. 1982)

NOTE. I at first thought the Naivasha specimen might be incorrectly named, since although it closely resembles the type, the nutlets did not agree with Haines & Lye's SEM figure. I then discovered that nutlets from the K isotype did not agree either. This is presumably to do with maturity.

41. ***Bulbostylis glaberrima*** Kük. in *N.B.G.B.* 9: 308 (1925); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 6, fig. 3 (1965); Haines & Lye, *Sedges & Rushes E. Afr.*: 125, figs. 238, 239* (1983). Type: Kenya, Aberdare Mts, *Fries & Fries* 2394 (UPS, holo.; K!, iso.)

Dwarf annual up to 2 cm tall with very slender root system and base covered with many pale multi-veined prophylls; stems green and ridged, 0.2 mm wide, glabrous or with few hairs. Leaves \pm 1 cm long, 0.2–0.4 mm wide, flat or \pm canaliculate, glabrous, with few teeth at apex; sheaths pale, tubular when young, glabrous. Inflorescence of a single spikelet (less often with 1–2 additional) surrounded by leaves and leaf sheaths; main bract pale brown with projecting greenish midrib \pm equalling spikelet which is 2–4 mm long; glumes pale brown with darker patches near the greenish midrib, \pm 1.5 mm long. Stamens and style-branches 3. Nutlet whitish at first, becoming dark grey or blackish, obovoid, triangular, minutely reticulate; stipe base a distinct flattened persistent rim.

UGANDA. Mbale District: Bugiso, Mt Elgon above Butadiri (date unknown) *Hedberg* 4545 & Mt Elgon, (date unknown) *Hamilton* 233

KENYA. Aberdare Mts, 14 Mar. 1922, *R.E. & T.C.E. Fries* 2394!

DISTR. **U** 3; **K** 3/4; not known elsewhere

HAB. Marshes and rocky outcrops in *Erica* belt; 3000–3600 m

SYN. *B. heterostachya* sensu Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 63 (1963), *non* Cherm.

Abildgaardia glaberrima (Kük.) Lye in *Bot. Notis.* 127: 496 (1974); Haines & Lye, *Sedges & Rushes E. Afr.*: 125, figs. 238, 239 (1983)

NOTE. Lye notes this taxon may be conspecific with *B. heterostachya* Cherm.

42. ***Bulbostylis striatella*** *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 616 (1895) & in *Fl. Cap.* 7: 205 (1898) & in *F.T.A.* 8: 429 (1902); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 72 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 125, figs. 240, 241 (1983); Lye in *Fl. Eth.* 6: 421, fig. 212.49 (1997). Type: South Africa, Natal, *Buchanan* 86 (K, lecto., chosen by Lye)

Tufted annual or short-lived perennial 12–15 cm tall, often forming dense cushions about 5 cm tall; stems angular, 0.2–0.4 mm thick, glabrous. Leaf sheaths pale brown; blades 2–6 cm long, 0.3–0.8 mm wide, flat but appearing almost filiform, densely scabrid. Inflorescence a solitary terminal spikelet or 2–3 clustered spikelets on peduncles 1–12 cm long but often with additional sessile spikelets at the plant base; normal spikelets 3–8 mm long, 2–4 mm wide, often with spreading glumes;

* There are two line drawings of *B. glaberrima* and no S.E.M.

glumes pale to dark reddish brown, usually with green midrib 3–4 mm long, glabrous with midrib and sometimes wings scabrid. Style branches 2. Nutlets whitish turning grey or brownish, obovoid, 1–1.4 mm long, 0.9–1 mm wide with reticulate pattern of isodiametric cells in longitudinal rows; style base brown, persistent.

KENYA. Northern Frontier District: S Turkana, Ayangyanga swamp, 12 June 1970, *Mathew & Gwynne* 6774!; Nakuru District: Njoro to Rongai, 5 June 1947, *Bogdan* 674a!; Masai District: Nasampolai, near Sakutiek, 15 May 1971, *Robertson* 1510!

TANZANIA. Masai District: Ngorongoro Conservation Area, Mokilal, 14 Mar. 1988, *Chuwva* 2622! & Malenda, *Newbould* 5855 (fide Haines & Lye)

DISTR. **K** 1, 3, 6; **T** 2, 4 (see Note); Ethiopia, South Africa

HAB. Rocky river slopes, sandy soil in rock crevices, *Pennisetum* grassland, roadsides, weed in grass plots; 1800–2700 m

SYN. *B. humilis* sensu Napper in J. E.A. Nat. Hist. Soc. 25 (110): 3, fig. 2 (1965), *non* (Kunth) C.B. Clarke

Abildgaardia striatella (C.B. Clarke) Lye in Nordic J. Bot. 3: 239 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 125, figs. 240, 241 (1983)

Bulbostylis arenaria sensu Gordon-Gray in Strelitzia 2: 29 (1995) pro parte, *non* (Nees) Lindau

NOTE. *Gilbert* 4703 (Kenya, Naivasha District: Lake Naivasha, behind Fisherman's camp, 29 May 1977) determined as *B. humilis* consists of plants 1.5–4 cm tall forming small dense tufts, and has been determined as *B. striatella* by Lye. Haines & Lye key this out under inflorescence a solitary spikelet and under inflorescence an open anthela but not under inflorescence headlike; but most specimens I have seen have heads of several sessile spikelets. The lectotype has both kinds. They do, however, key it out in their group "inflorescence an open anthela" but I have seen no material to warrant this.

Bidgood et al. 5515 (Tanzania, **T** 4, Mpanda District: Uzondo Plateau, 15 Apr. 2006, from seepage area in *Loudetia* grassland over rocks at 1550 m) appears to be a form with uniformly reduced inflorescences of one spikelet.

43. ***Bulbostylis johnstonii*** C.B. Clarke in F.T.A. 8: 442 (1902); F.D.-O.A. 1: 415 (1938); Bodard in Ann. Fac. Sci. Univ. Dakar 9: 76 (1963); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 5 (1965); Vollesen in Opera Bot. 59: 92 (1980); Haines & Lye, Sedges & Rushes E. Afr.: 126, figs. 242, 243 (1983). Type: Tanzania, Mt Kilimanjaro, *Johnston* s.n. (K!, lecto., chosen by Haines & Lye)

Slender tufted annual or short-lived perennial 10–30 cm tall with creeping rhizome (fide Vollesen); stems glabrous. Leaves filiform, up to half the length of the stems, scabrid; sheaths hairy and with long white hairs at margins of throat. Inflorescence open with 1–5 solitary stalked spikelets, 5–9 mm long, 2 mm wide; glumes rusty brown with yellowish keel, elliptic, 2.5–3.5 mm long, shortly hairy, shortly mucronate. Nutlet whitish becoming dark grey, obovoid, 1 mm long, not transversely wrinkled but reticulate with large quadrate cells in vertical rows; style-base reddish brown, persistent.

KENYA. Masai District: Masai Mara Reserve, Egerok, 19 Sept. 1947, *Bally* 5403!

TANZANIA. Kilimanjaro, Mbokom, Apr. 1926, *Haarer* 168!; Lushoto District: W Usambaras, 2.4 km NE of Bumbuli Mission on path to Mazumbai, 10 May 1953, *Drummond & Hemsley* 2467!; Kilwa District: Nakilala Valley, 14 Dec. 1975, *Vollesen* 3088!

DISTR. **K** 6; **T** 2–4, 8; Malawi

HAB. Hillside and valley grassland, *Erica-Agauria* associations, mossy areas with *Lycopodium*, swamps; 300–2000 m

SYN. *B. capillaris* sensu Peter in F.D.-O.A. 1: 415 (1937) quoad *Peter* 3091 from 'above Moshi', *non* Kunth

B. lanifera (Boeck.) Kük. var. *glabra* (Ridl.) Kük. in F.D.-O.A. 1: 418 (1938) quoad *Peter* 8819, 11975 and 38992 (38992a in K herb.)

Abildgaardia johnstonii (C.B. Clarke) Lye in Bot. Notis. 127: 496 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 126, figs. 242, 243 (1983)

NOTE. Haines & Lye state only recorded from Moshi District but then "drawn from *Renwoize & Abdallah 1718*" which was collected in the W Usambaras.

C.B. Clarke cites 4 syntypes but Haines & Lye cite only the *Johnston* specimens, which is therefore the equivalent of a lectotypification.

The *Bally* specimen from Kenya is a good match of the type so I have accepted the original determination that seems to be in Nelmes' handwriting, although Haines & Lye do not mention a Kenya record.

44. ***Bulbostylis cruciformis*** (*Lye*) *R.W. Haines* in Haines & Lye, *Sedges & Rushes E. Afr. App.* 3: 1 and in main work: 126, figs. 244, 245 (1983); *Lye* in *Fl. Eth.* 6: 422, fig. 212.51 (1997). Type: Kenya, Kitui District: Thika to Garissa, 26 km E of turning S to Kabaa, *Stannard & Gilbert 1112* (EA, holo.; K!, iso.)

Tufted annual 4–18 cm tall with very shallow root system; stems angular, 0.2–0.4 mm wide, scabrid below the inflorescence but otherwise glabrous. Leaves 1–3 cm long, 0.2–0.4 mm wide, scabrid on the margins and main ribs; sheaths straw-coloured to pale brown, scabrid to hairy with long hairs at the mouth. Inflorescence a head of 3–5 sessile spikelets often arranged in a cross, 5–8 mm wide; bracts leafy, 5–20 mm long, at least 1 or 2 longer than a spikelet, spreading or reflexed; glumes red-brown with green midrib, ovate-hastate, 2.5–3.2 mm long, narrowed at the apex and extending into a long usually recurved awn, glabrous or pubescent, ciliate at the margins. Stamens 3, style with 3 branches. Nutlets grey or white, obovoid, 0.6–0.7 mm long, 0.4–0.5 mm wide, covered with pearl-like glossy tubercles; style base brown, persistent.

KENYA. Northern Frontier District: Garissa–Modo Gash, 26 km from Garissa, 14 Dec. 1977, *Stannard & Gilbert 1062!* & Dadaab–Wajir road, 6 km N of Sabule Airstrip, 29 Nov. 1978, *Brenan et al. 14817!*; Tana R. District: Thika–Garissa road, 4 km towards Garissa from crossing of Namorumat Drift, 10 June 1974, *R.B. & A.J. Faden 74/76!*

DISTR. K 1, 4, 7; not known elsewhere

HAB. Open bushland/woodland of *Commiphora*, *Cordia*, *Acacia*, *Euphorbia* etc.; 200–1300 m

SYN. *Abildgaardia cruciformis* *Lye* in *Nordic J. Bot.* 1: 752 (1982) & Haines & Lye, *Sedges & Rushes E. Afr. App.*: 126, figs. 244, 245 (1983)

45. ***Bulbostylis squarrosa*** (*Lye*) *Verdc. comb. nov.* Type: Kenya, Northern Frontier District: 63 km S of Modo Gash, *Stannard & Gilbert 993* (K!, holo.; EA, iso.)

Delicate very bright green annual 12–20 cm tall; rootstock small; stems 0.2–0.4 mm thick, triangular, ridged, with scattered minute spine-like hairs. Leaf sheaths light reddish brown, with 5–7 prominent veins with short spine-like teeth, with 1–2 mm long hairs at the throat; blades flat with incurved margins, 1–5 cm long, 0.2–0.3 mm wide, strongly dotted with dark reddish brown glands, the veins and margin with dense scabrid hairs. Inflorescences congested, 3–6 mm long, 4–10 mm wide, of 2–7 sessile erect or spreading linear-lanceolate spikelets 3–6 mm long, 1.2–1.5 mm wide excluding glume tips; involucre bracts 2–6, the longest 1–2 cm long and overtopping the inflorescence; glumes loosely spirally arranged, light reddish brown with green midrib, 1.2–1.4 mm long, excurrent into strongly recurved almost spiniform 1–2 mm awns. Nutlet pale yellowish brown, obovoid-triangular, 0.7–0.8 mm long, 0.5–0.6 mm wide, smooth to weakly transversely wrinkled, not tuberculate but with surface sculpture of narrow elongate cells; style-base reddish brown, prominent, persisting on mature nutlet.

KENYA. Northern Frontier District: Garissa, 63 km S of Modo Gash, 12 Dec. 1977, *Stannard & Gilbert 993!*

DISTR. K 1/7; known only from the type

HAB. Dense mixed bushland, *Boswellia*, *Commiphora*, *Lannea*, *Acacia*; ± 290 m

SYN. *Abildgaardia squarrosa* Lye in Lidia 1(1): 31 (1985) & in Nordic J. Bot. 7: 39, fig. 1, 2 (1983) (very full description)

NOTE. Related to *B. cruciformis* (Lye) R.W. Haines but has taller and less scabrid culms, fewer leaves, narrower spikelets with fewer glumes, longer glume awns and non-tuberculate nutlet sculpture.

46. *Bulbostylis meruensis* Verdc. sp. nov., propter characteres nuclearum *B. schimperianae* et *B. ugandensis* probabiliter affinis sed habitu pumilo subalpino valde diversa. Type: Tanzania, Arusha District: W flank of Mt Meru, Gereau & Abdallah 1727 (K!, holo.; MO, iso.)

Small tufted annual 1.5–3 cm tall with reduced rootstock of a few slender roots; stem scarcely developed. Leaves overtopping the very short flowering stems, linear, 1.5–3 cm long; sheaths with long hairs, blades grooved with very short spine-like hairs and many brown dots. Inflorescences 1 to several per plant, shorter than the leaves, each with one spikelet; peduncles up to 10 mm long; glumes chestnut brown, oblong-ovate, 2.5–3 mm long, 2 mm wide with a broad green 3-ribbed keel produced into an acuminate apex, that of the lowest glume being 1 mm long, with some marginal hairs at apices of glumes. Anthers 0.6 mm long. Stigma bifid. Nutlets white, compressed ovoid, not in any way trigonous, \pm 1 mm long and wide but less thick, with \pm 12 irregular ribs on each side joined by transverse ribs; style-base orange brown, small, persistent.

TANZANIA. Arusha District: W flank of Mt Meru along track from Forestry Training Institute, \pm 0.5 km above upper edge of *Pinus* plantation, 18 Jan. 1985, Gereau & Abdallah 1727!

DISTR. T 2; known only from the type

HAB. Dense moor-like shrub formation; \pm 2610 m

NOTE. The inflorescence needs study from fresh material to understand the exact structure; what appear to be several separate inflorescences of one spikelet could be derived from a very reduced compound inflorescence with the lower axes much reduced.

47. *Bulbostylis ugandensis* (Lye) R.W. Haines in Haines & Lye, Sedges & Rushes E. Afr. App. 3: 1 and in main work: 127, figs. 246, 247 (1983); Maquet in Fl. Rwanda 4: 426, fig. 176.2 (1988). Type: Uganda, Mengo District: Entebbe, Lye 684 (MHU, holo.; K!, iso.)

Rather densely tufted annual or perennial 5–40(–50) cm tall; stems 0.3–0.5 mm thick, glabrous save for some scattered spine-like hairs beneath the inflorescence. Leaves 5–20 cm long, 0.3–0.7 mm wide, with short spine-like hairs on the ridges; throat hairs of the sheaths up to 1 cm long. Inflorescence a compact head of 3–10 sessile spikelets; main bract 3–12 mm long, with long hairs; spikelets 4–5(–8) mm long, 2–3 mm wide, obtuse; glumes reddish brown with usually green 3-veined midrib, 1.5–2 mm long, glabrous or pubescent, ciliate at margin, obtuse or emarginate at the apex. Nutlet obovoid, 0.8 mm long, 0.5–0.6 mm wide, with many very distinct longitudinal ribs and many narrow horizontal interconnecting ribs; style-base persistent on the nutlet.

UGANDA. Teso District: 0.5 km NW of Bukedea, 9 May 1970, Lye & Katende 5365!; Busoga District: Lolui Is., 22 May 1964, Jackson 150!; Mengo District: Entebbe, 17 June 1951, Norman 44!

KENYA. North Kavirondo District: Mumias, Bujumba, 27 May 1997, Agnew & Rutto s.n.

TANZANIA. Bukoba District: Bukoba, June 1931, Haarer 2043! & Minziro Forest Reserve, Muhangu, 22 May 2001, Festo 1510!; Musoma District: Seronera to Kleins Camp, km 91, 6 Apr. 1961, Greenway & Miles Turner 9995!

DISTR. U 3, 4; K 5; T 1; Rwanda, Burundi

HAB. *Loudetia*, *Andropogon* and *Eragrostis* grassland over laterite ironstone platforms, in waterlogged sandy soil, by rock pools, on rock outcrops, forest margins (in T 1), swamps; 1100–1650 m

- SYN. *Fimbristylis subumbellata* K. Schum. in P.O.A. C: 125 (1895). Type*: Tanzania, Bukoba, *Stuhlmann* 3966a (B, lecto.; K!, isolecto.)
Bulbostylis subumbellata (K. Schum.) Prain in Index Kew. suppl. 3: 30 (1908), *nom. invalid.*, *non* (Lye) R.W. Haines in Sedges & Rushes E. Afr. App. 3: 1 (1983)
B. schimperiana sensu Napper in J. E.A. Nat. Hist. Soc. 25 (110): 4, fig. 16 (1965) quoad descript. et distr., *non* (A. Rich.) C.B. Clarke
Abildgaardia ugandensis Lye in Nordic J. Bot. 1: 756 (1982) & in Sedges & Rushes E. Afr.: 127 (1983)

NOTE. *Verdcourt* 3369 (Buha District: Kasakela reserve, 18 Nov. 1962, on strand \pm 6 m behind high tide) may be a very young stage of this species and would add T 4 to the distribution.

48. ***Bulbostylis leirolepis* (Kük.) R.W. Haines** in Sedges & Rushes E. Afr. App. 3: 1 (1983) & in main work: 128, figs. 248, 249 (1983). Types: Tanzania, Buha District: Nisusi–Birira, *Peter* 37918 (ubi, lecto.; K!, isolecto.)**

Fairly robust annual, tufted, 15–30 cm tall; stems ridged, glabrous. Leaves \pm 6 cm long, 0.5 mm wide, minutely scabrid, the sheaths with scattered long hairs. Inflorescences small heads 4–8 mm wide of 2–3 sessile spikelets but appearing umbellate when lower glumes and nutlets are shed; bracts 1–2, up to 5–8 mm long with green excurrent midrib; spikelets ovoid, 4–8 mm long, 2.5–3.5 mm wide; glumes pale brownish below, darker above, ovate, 1.8–2 mm long, rounded or emarginate. Style 3-branched. Nutlets greyish, obtriangular in outline, 0.8–1 mm long, 0.6–0.7 mm wide with 6–8 longitudinal ribs and grooves on each side and close horizontal connecting riblets; style-base brownish, small, persistent.

TANZANIA. Buha District: Uha, Kisuzi [Nisusi] to Mbirira [Birira], 27 Feb. 1926, *Peter* 37918! & 38496

DISTR. T 4; not known elsewhere

HAB. Rocky places; 1250–1400 m

SYN. *B. schimperiana* (A. Rich.) C.B. Clarke var. *leirolepis* Kük. in F.D.-O.A. 1: 415 (1937) & in Anhang: 127 (1936)

Abildgaardia leirolepis (Kük.) Lye in Nordic J. Bot. 1: 757 (1982)

49. ***Bulbostylis schimperiana* (A. Rich.) C.B. Clarke** in Durand & Schinz, Consp. Fl. Afr. 5: 616 (1895) & in F.T.A. 8: 436 (1902); Napper in J. E.A. Nat. Hist. Soc. 25 (110): 4, fig. 16 (1965) pro parte***; Haines & Lye, Sedges & Rushes E. Afr.: 128, fig. 250, 251 (1983); Lye in Fl. Eth. 6: 421, fig. 212.50 (1997). Type: Ethiopia, Adowa, *Schimper* 299 (P, holo.; K!, iso.)

Tufted annual with shallow roots, (5–)10–25 cm tall; stems 0.4–1 mm wide, ridged, glabrous. Leaves up to 8 cm long, 1 mm wide, glabrous or with scattered hairs and longer 2–5 mm long hairs at mouth of leaf-sheath. Inflorescence usually a single head of dark spikelets but sometimes an additional stalked head, or with 1 sessile and 1–8 stalked spikelets; spikelets dark, 4–7 mm long, 2–2.5 mm wide; glumes dark brown to black with paler brown midrib, 1.5–2 mm long, shortly pubescent, obtuse or with slightly projecting midrib. Stamens 2 with \pm 0.5 mm long anthers and filaments 2 mm long. Nutlets pale grey or whitish, obovoid with cuneate base, the surface with longitudinal ribs and grooves with horizontal ribs connecting the longitudinal ribs; style base not persistent.

* *Stuhlmann* 1104, 1505 & 3966a are all cited by K. Schumann; it is clear from S. Hooper's annotation that she considered 3966a as a lectotype.

** Peter cites two numbers, 37918 and 38496. Haines & Lye give the type as 37918 so this is taken as a lectotypification.

*** Haines & Lye state this actually refers to *B. ugandensis*.

UGANDA. Mbale District: Bukwa to Kapchorwa, 20 Jan. 1966, *Haines* 4037!

KENYA. Northern Frontier District: Ol Lolokwe [Ol Doinyo Sabachi], 14 Apr. 1979, *Gilbert* 5379!;

Nakuru District: N end of Lake Nakuru, 1 Nov. 1964, *Greenway* 11770!; Machakos District: Makueni, 17 Oct. 1947, *Bogdan* 1394!

TANZANIA. Arusha District: W of Sanya Juu on the Engare Nanyuki road, 25 Dec. 1961, *Greenway* 10420!; Mbeya District: Mbeya, Iyunga School shamba, July 1968, *Wingfield* 75!; Rungwe District: Mbeya-Tukuyu road, 2 km beyond Kiwira, 17 Mar. 1975, *Hooper & Townsend* 857! & 852!

DISTR. U 4; K 1, 3, 4; T 2, 5, 7; Ethiopia

HAB. Grassland, *Acacia* woodland, *Tarchonanthus-Acacia* thicket, wet crevices in rockfaces, roadside ditches, weed in experimental plots; 1200–1800(–2100) m

SYN. *Isolepis schimperiana* Hochst. in *Flora* 1841 *Intelligenzbl.* 1, 2: 21 (1841), *nom. nud.*; A. Rich., *Tent. Fl. Abyss.* 2: 501 (1850)

Fimbristylis schimperiana Boeck. in *Flora* 41: 600 (1858). Type: Ethiopia, Memsah district E of Adowa, Lake Amba, *Schimper* 2066 (B, holo.) (see Note)

Scirpus schimperianus (A. Rich.) Boeck. in *Linnaea* 36: 750 (1869); Engl., *Hochgebirgsfl. Trop. Afr.*: 148 (1892);

Fimbristylis schimperiana (A. Rich.) K. Schum. in *P.O.A. C.* 125 (1895), *non* Boeck.

F. humilis Peter, *F.D.-O.A. Anhang*: 126, t. 88 (1936); Napper in *J. E.A. Nat. Hist. Soc.* 25 (110): 9, fig. 34 (1965). Type: Tanzania, no locality given, *Peter* 43743 (B, holo.)

Abildgaardia schimperiana (A. Rich.) Lye in *Bot. Notis.* 127: 497 (1974); Haines & Lye, *Sedges & Rushes E. Afr.*: 128, fig. 250, 251 (1983)

NOTE. C.B. Clarke gives *Fimbristylis schimperiana* Boeck., but does not cite *Schimper* 2066, neither have I seen it. Lye does not mention the name in *Fl. Eth.*

50. ***Bulbostylis elegantissima*** (Lye) R.W. Haines in Haines & Lye, *Sedges & Rushes E. Afr. App.* 3: 1 and in main work: 129, fig. 252 (1983). Type: Tanzania, Iringa District: Ruaha National Park, near ranger post just opposite Ilunda [Lunda] near Great Ruaha R., *Renvoize & Abdallah* 2219 (EA, holo.; K!, iso.)

Slender annual 10–20 cm tall with tufted stems and small root-system; stems glabrous below but with spine-like teeth below the inflorescence. Leaves up to 5 cm long, 0.5 mm wide, scabrid on margin and ribs, the sheath with long white hairs at throat. Inflorescences open with 1 sessile and 1–8 stalked spikelets and sometimes extra basal stalked spikelets; peduncles scabrid; bracts 1–5, filiform with a sheathing base, often less than 5 mm long; glumes reddish brown, 1.8–2.3 mm long, hairy at margin or all over, rounded or slightly emarginate at apex. Style 3-branched. Nutlets greyish, obovoid, 0.6–0.7 mm long, 0.5 mm wide, 3-angular with prominent ribs at angles and weaker ones on faces with many horizontal connecting riblets. Style-base not persistent.

TANZANIA. Iringa District: Ruaha National Park, river drive, 12 Jan. 1966, *Richards* 20966b! & near ranger post just opposite Ilunda [Lunda] near Great Ruaha R., 17 May 1968, *Renvoize & Abdallah* 2219!

DISTR. T 7; not known elsewhere

HAB. Grassland and sandy trackside; 750–850 m

SYN. *Abildgaardia elegantissima* Lye in *Nordic J. Bot.* 1: 755 (1982) & Haines & Lye, *Sedges & Rushes E. Afr. App.*: 129, fig. 252 (1983)

51. ***Bulbostylis lolokweensis*** Verdc. **sp. nov.** propter ornamentatum trabeculatum nucularum *B. schimperianae*, *B. ugandensis*, *B. elegantissimae* et *B. leirolepidis* probabiliter affinis sed inflorescentiis simplicioribus differt. Typus: Kenya, Northern Frontier District: Ol Lolokwe [Ol Doinyo Sabachi], opposite Subata repeater station, *Gilbert* 5377b (K!, holo.) (see note)

Tufted annual 8–20 cm tall with very reduced rootstock. Leaf sheaths with long hairs; blades linear, up to 8 cm long, with sparse short spine-like hairs. Inflorescence of a single terminal spikelet or with a second beneath but with separated, subsessile bracts 2–4 mm long or sometimes absent; spikelets ± 5 mm long, 1.5–3.5 mm wide;

glumes chestnut with a brighter chestnut keel, 2.5 mm long, 2 mm wide, subacute but midrib not produced, with dense hairs at margin and scattered hairs and glands on the surface. Nutlets white, trigonous, 1 mm long and wide, with clearly trabeculate sculpture; style-base not persistent.

KENYA. Northern Frontier District: Ol Lolokwe [Ol Doinyo Sabachi], opposite Subata repeater station, 5 Apr. 1979, *Gilbert* 5377b!

DISTR. K 1; known only from the type

HAB. Rocks with semi-permanent stream and wet flushes, with *Myrothamnus*, *Isoetes* and *Utricularia*; ± 1650 m

NOTE. The Kew specimen of *Gilbert* 5377 is a complicated mixture and the original determination *B. densa* is correct for most of the material, which has papillate nutlets. I had hoped that the original material at EA would provide further material of the new species but both sheets are entirely of *B. densa*. The new taxon is perhaps close to *B. leiolepis* but that has a persistent style base.

SPECIES DOUBTFULLY RECORDED

Bulbostylis fimbristylodes C.B. Clarke in *Mém. Soc. Bot. Fr.* 2, 8: 28 (1907); Bodard in *Ann. Fac. Sci. Univ. Dakar* 9: 61 (1963); Hooper in *F.W.T.A. ed. 2, 3: 317* (1972). Types: Mali, middle Niger, Koulikoro, *Chevalier* 2457, 2458, 2462 (P, syn.)

Both Bodard and Hooper state that *B. cytathera* Cherm. (*Arch. Bot. Caen* 4 *Mém.* 7: 35 (1931); types: Central African Republic, Haut-Oubangui, Yalinga, *Le Testu* 3004 & Moroubas, *Tisserant* 662 (P, syn.)) is a synonym, and Hooper does not give East Africa in the distribution; but the name *Scirpus fimbristylodes* appears on the label of *Stuhlmann* 1505 from Tanzania, Bukoba, Feb. 1891 – but K. Schumann did not publish this. The sheet is in fact a syntype of *Fimbristylis subumbellata* K. Schum., but not conspecific with *Stuhlmann* 3966a, the lectotype of that species. C.B. Clarke wrote extensive notes on the K duplicate of 1505 in 1894, 1899 and 1905, pointing out he was doubtful if it was the same taxon as 3966a; chiefly because it had pendent long white hairs from the head. Hooper pointed out (on the cover) that she did not think it was *B. subumbellata*. Until it can be matched with new mature material from the Bukoba area its identity must remain uncertain.

Bulbostylis craspedota *Chiov.* is cited by Lye in *Fl. Somalia* 4: 109 (1995), who says it occurs in N Kenya as well. I have seen no specimens.

10. ABILDGAARDIA

Vahl, *Enum. Pl.* 2: 296 (1805)

Annuals or perennials. Culms scapose. Leaves eligulate, sometimes reduced to sheaths; sheath margins glabrous or spiny. Involucral bracts leafy or glume-like. Inflorescence a head of congested spikelets or reduced to 1–2 terminal spikelets. Spikelets with glumes spirally arranged above but lower ones distichous, glabrous. Stamens 1–3; style with (2–)3 stigmas, the style base distinct, thickened. Nutlets obovoid, obconical or obpyriform, obtusely or sharply 3-angled, smooth or tuberculate; style base falling with style.

A pantropical genus with about 15 species. In Haynes & Lye, *Sedges & Rushes of East Africa*, the treatment is unorthodox and contrary to the code. Lye treats *Bulbostylis* as a subgenus of *Abildgaardia*. Each species is given a choice of two alternative names since Haines considered *Bulbostylis* should be kept as a genus. One name for each species is put in synonymy. Later in *Fl. Eth.* Lye keeps *Abildgaardia* and *Bulbostylis* separate.

- | | |
|--|-------------------------|
| 1. Leaves reduced to sheaths save for filiform blades less than 3 mm long which are eventually deciduous | 3. <i>A. hygrophila</i> |
| Leaves with well developed blades | 2 |
| 2. Inflorescence a solitary spikelet or with one additional stalked spikelet; rhizome absent | 1. <i>A. ovata</i> |
| Inflorescence with 1 sessile and 1–4 stalked spikelets, umbel-like; thick rhizome present | 2. <i>A. triflora</i> |

1. **Abildgaardia ovata** (*Burm.f.*) *Král* in *Sida* 4: 71 (1971); Haines & Lye, *Sedges & Rushes E. Afr.*: 94, figs. 157, 158 (1983); Maquet in *Fl. Rwanda* 4: 421 (1988); Gordon-Gray in *Strelitzia* 2: 19, fig. 2, B, E, 3 (1995); Lye in *Fl. Eth.* 6: 413, fig. 212.34 (1997). Type: Java, collector not stated (G, lecto.) (seen by Kern)*

Densely tufted perennial 5–40 cm tall with small root system but hardened at base and covered with persistent leaf-bases and old stiff prophylls; stems 0.5–1 mm wide, deeply ridged, compressed above, glabrous. Leaves flat or convolute, up to 25 cm long, 0.8 mm wide, upper surface with large rectangular cells, margin with many spine-like teeth; sheaths pale to dark brown, often with two very conspicuous spinous keels. Inflorescence of a solitary (or less often 2) ± shiny spikelet 5–10 mm long enlarging to 15–23 mm in fruit; glumes greyish to greenish, sometimes brownish near the midrib and at apex, lower glumes distichous, 2–3 mm long with an additional 3–6 mm long scabrid long narrow apex; upper larger but with shorter narrow apex; glumes breaking off and leaving persistent bases. Stamens 3. Style flattened with ciliate margins and 3 branches. Nutlet brownish with a silvery sheen, obovoid with cuneate base and short obtuse apex, tuberculate.

UGANDA. West Nile District: 0.8 km S of Maracha rest camp, 3 Aug. 1953, *Chancellor* 110!; Toro District: Nyakasura, 4 May 1937, *Kafamba & Mbatia* 28!; Mengo District: W Mengo, Kyadondo, near Kisaasi, 13 Apr. 1990, *Rwaburindore* 2966!

KENYA. Nairobi District: Nairobi Royal National Park, 21 Jan 1962, *Verdcourt* 3253!; Masai District: Mara Plains, Egalok, 20 Oct. 1958, *Verdcourt & Fraser Darling* 2297!; Kwale District: Shimba Hills, Longo Mwangandi area, 21 Mar. 1968, *Magogo & Glover* 384!

TANZANIA. Musoma District: km 75 from Bolongoja R. via Klein's Camp, Tabora, 30 Apr. 1961, *Greenway* 10131!; Lushoto District: W Usambaras, Bumbuli, 9 May 1953, *Drummond & Hemsley* 2445!; Iringa District: 6.4 km N of Iringa on Great North Road, 5 Feb. 1962, *Polhill & Paulo* 1360!; Zanzibar: Mzizini, 14 Apr. 1963, *Faulkner* 3138!

DISTR. U 1–4; K 3, 4, 6, 7; T 1, 3, 6–8; Z; P; widespread throughout tropics and warm temperate areas.

HAB. Hilltop and plains grassland, seasonally swampy vlei grassland, wooded grassland, grazed fallow areas; sea level–2150 m

SYN. *Carex ovata* *Burm. f.*, *Fl. Indica*: 194 (1768)

Cyperus monostachyos L., *Mant. Pl.*: 180 (1771). Type: India, *König* in *Herb. Linn.* 70.3 (LINN, lecto.)

Abildgaardia monostachya (L.) Vahl, *Enum. Pl.* 2: 296 (1805); Kunth, *Enum Pl.* 2: 247 (1837); Benth. in *Niger Fl.*: 554 (1849); Boeck. in *Linnaea* 37: 53 (1871); Oliv. in *Trans. Linn. Soc.* 29: 169, t. 109, fig. A (1875)

Fimbristylis monostachya (L.) Hassk., *Pl. Jav. rar.*: 61 (1848); Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 149 (1884); C.B. Clarke in *Fl. Brit. India* 6: 649 (1893) & in *Durand & Schinz, Consp. Fl. Afr.* 5: 607 (1895); K. Schum. in *P.O.A. C.*: 124 (1895); C.B. Clarke in *Fl. Cap.* 7: 203 (1898); Rendle in *Cat. Afr. Pl. Welw.* 2: 122 (1899); C.B. Clarke in *F.T.A.* 8: 424 (1902); Napper in *Journ. E. Afr. Nat. Hist. Soc.*: 25 (110): 8, fig. 40 (1965)

Fimbristylis ovata (*Burm.f.*) Kern in *Blumea* 15: 126 (1967); Napper in *F.W.T.A. ed. 2.3*: 324 (1972); Kern in *Fl. Males. Ser. 1, 7*: 565 (1974); Vollesen in *Opera Bot.* 59: 94 (1980); Koyama in *Rev. Fl. Ceylon* 5: 273 (1985)

* Burman also cites *Pluk. amalth*: 113, t. 416, f.1 and *Sloane, Hist. Jam.*: 120, t. 79, f.2

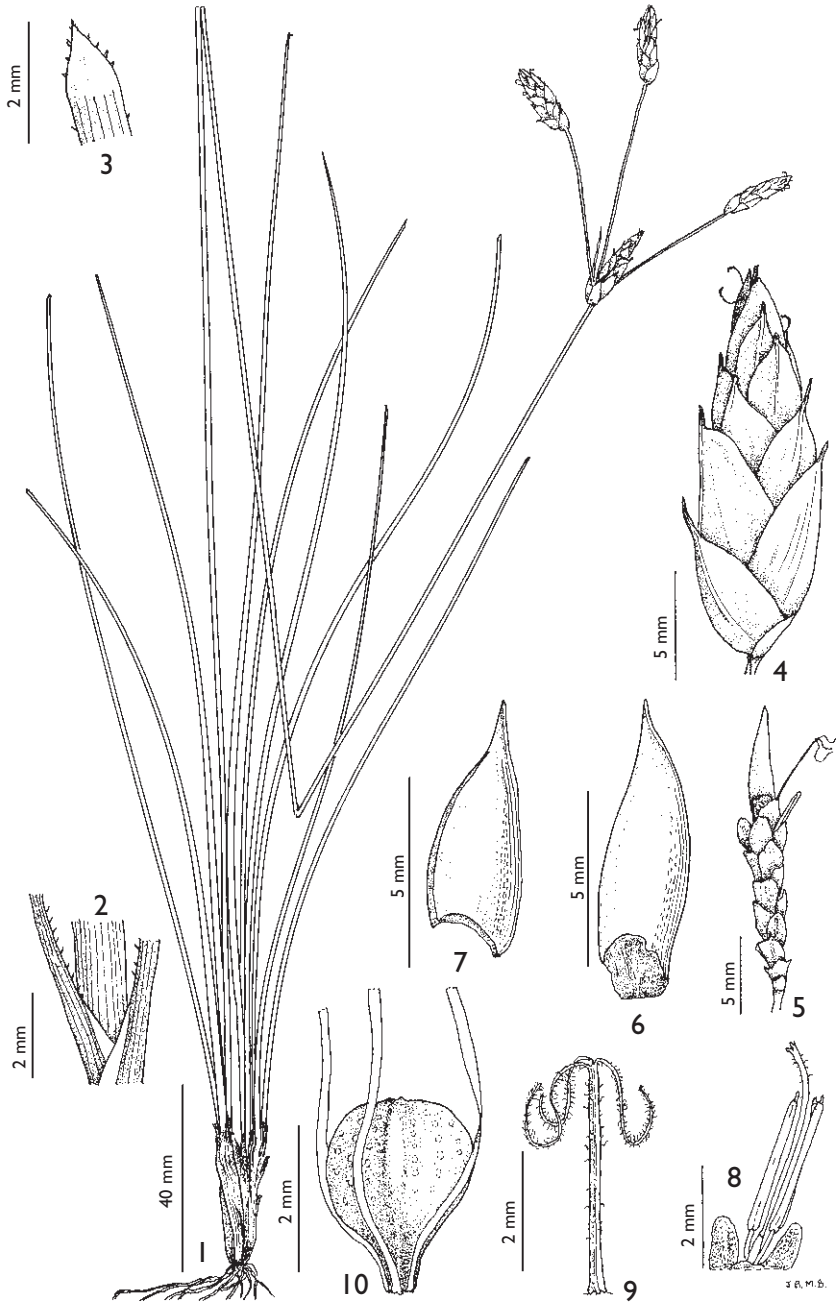


FIG. 17. *ABILDGAARDIA TRIFLORA* — 1, habit; 2, two leaf bases; 3, leaf apex; 4, spikelet; 5, rachilla; 6–7, glume, complete and upper abscised part; 8, young floret; 9, style and branches; 10, nutlet with filaments. From *Robinson* 2038. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

2. **Abildgaardia triflora** (L.) *Abeywickr.* in Ceylon J. Sci., Biol. Sci. 2: 135 (1959); Haines & Lye, *Sedges & Rushes E. Afr.*: 95, fig. 159 (1983); Gordon-Gray in *Strelitzia* 2: 20, fig. 2C, E (1995). Type: India, *König* s.n. in Herb. Linn. 70. 35(LINN, lecto.)

Densely tufted perennial 30–75 cm tall with a thick rhizome; stems 1–3 mm thick, angular or flattened, slightly scabrid above with golden red-brown to dark brown leaf sheaths at the base. Leaves 10–30 cm long, 0.2–2.5 mm wide, flat, scabrid at margins. Inflorescence of one sessile and 1–4 stalked spikelets on 1–8 mm long peduncles or rarely with a solitary spikelet; bracts leafy, 0.5–3 cm long; spikelets ovoid, 1–2.5 (–4 in fruit) cm long, 4–10 mm wide; glumes pale brown with darker brown stripe on each side of green midrib, ovate to triangular, 6–8 mm long, the lowest ± distichous, the rest spirally arranged; each supported by a reddish brown oblong scale ± 1.5 mm long. Style branches 3. Nutlet pale brown to grey, triangular, obovoid with long narrow base, 2.4–2.6 mm long, 1.5–1.8 mm wide, almost smooth to slightly tuberculate. Fig. 17, p. 114.

KENYA. Kwale District: near Mtongwe, Dongo Kundo, 13 May 1999, *Luke & Mbinda* 5880!; Mombasa, 19 Aug. 1949, *Bogdan* 2631!; Kilifi District: 24 km S of Malindi, Mida, 3 Dec. 1961, *Polhill & Paulo* 900!

TANZANIA. Lushoto District: Korogwe, Kwamndolwa, May 1958, *Semsei* 2774!; Rufiji District: Mafia I., June 1873, *Freye* s.n.!; Rovuma District, Rovuma R., Mar. 1861, *Kirk* s.n.!; Pemba: Tondooni, 14 Feb. 1929, *Greenway* 1426!

DISTR. **K** 7; **T** 3, 6, 8; **Z**; **P**; Ghana, Togo, Mozambique, South Africa; India, Sri Lanka

HAB. Tidal mud and sand flats, seasonally swampy depressions with black soil, salt marsh, *Hyphaene/Sclerocarya* wooded grassland bordering *Avicennia* mangrove swamp; sea level–45 m

SYN. *Cyperus triflorus* L., Mant. Pl.: 180 (1771)

Schoenus cyperoides Retz. Obs. Bot. 4: 8 (1786/7). Type: Sri Lanka [Zeylon], *König* s.n. (LD, holo.)

Abildgaardia tristachya Vahl, Enum. Pl. 2: 297 (1805); Kunth, Enum. Pl. 2: 248 (1837); Boeck. in *Linnaea* 37: 54 (1871). Type as for *Cyperus triflorus*, *nom. illegit.*

A. lanceolata Schumacher, Beskr. Guin. Pl.: 33 (1827). Type: Guinea, *Thonning* 348 (C, holo.; FT, iso.)

Fimbristylis tristachya (Vahl) Thwaites, Enum. Pl. Zeyl.: 434 (1864); C.B. Clarke in Hook. f., Fl. Br. India 6: 649 (1893) & in Durand & Schinz, *Consp. Fl. Afr.* 5: 610 (1895) & in F.T.A. 8: 424 (1902), *non* R. Br. *rec* Nees

F. triflora (L.) K. Schum. in P.O.A. C: 124 (1895); Turrill in K.B. 1925: 71 (1925); Napper in Journ. E. Afr. Nat. Hist. Soc. 25 (110): 9, fig. 24 (1965) & in F.W.T.A. 3: 324 (1972); Hepper, W. Afr. Herbaria Isert & Thonning: 139 (1976); Vollesen in *Opera Bot.* 59: 94 (1980)

3. **Abildgaardia hygrophila** (Gordon-Gray) *Lye* in Mitt. Bot. Staats. München 10: 547 (1971); Goetgh. & Coudijzer in B.J.B.B. 54: 65 (1984); Gordon-Gray in *Strelitzia* 2: 19, fig. 2A, D (1995). Type: South Africa, Natal, Port Edward, *Huntley* 701 (NU, holo.; BM, BOL, K, L, NBG, PRE, PRU, iso.)

Perennial, erect or slightly drooping, to 44 cm tall; rhizome woody, usually ± upright in soil, 5 mm wide. Leaf bases pale yellow to pale brown, rather spongy; sheaths entire, closely investing the flowering stems, soft, spongy, glabrous; blades scarcely developed, not exceeding 3 mm, filiform, glabrous, eventually deciduous. Inflorescence up to 2.3 cm long, 3.5 cm wide of either 1 sessile spikelet with 1–4 pedicelled spikelets, or a single head of (1–)2–4 sessile spikelets with or without 1–4 additional pedicelled heads or spikelets, variable even on one plant; pedicels up to 1 cm long; bracts 2–4, up to 5 mm long with apices up to 2 mm long; spikelets 10–22 mm long, 3–9 mm wide but can eventually attain 3.2 cm in length, compact when young but becoming irregular with age; glumes golden brown, 6.1–8.2 mm long, 3.2–4.3 mm wide, acute, mucronate with 3-veined rounded keel. Stigmas 3. Nutlets white, broadly obovoid, 1.2–1.4 mm long, 0.8–1.1 mm wide, 3-angled, markedly transversely ribbed and faintly reticulate; style base 3-winged.

TANZANIA. Tunduru District: ± 1.5 km E of R. Mawese, 19 Dec. 1955, *Milne-Redhead & Taylor* 7830!

DISTR. T 8; Zambia, South Africa

HAB. *Brachystegia* woodland on sand near edge of grassland; 450 m

SYN. *Fimbristylis hygrophila* Gordon-Gray in J. S. Afr. Bot. 32: 129, fig. 1 & t. 1 (1966)

11. NEMUM

Ham., Prod. Ind. Occ.: 13 (1825); Larridon, Reynders & Goetghebeur in Belg. J. Bot. 141, 2: 157–177 (2008)

Annual or perennial. Culms scapose. Leaves often distichous, ligulate or eligulate. Involucral bracts inconspicuous, often erect. Inflorescence a solitary spikelet or one sessile and 1-several stalked spikelets with main bract filiform to leafy, usually less than 1 cm long. Spikelets dark brown to almost black, broadly ovoid with many spirally arranged ovate or oblong glumes which have an indistinct midrib and are persistent on the rachilla after the nutlets have fallen. Style 2-branched. Nutlets smooth without persistent style-base.

A genus of 4 species throughout tropical Africa, only 1 occurring in the Flora area and this also extending to the West Indies.

Nemum angolense (*C.B. Clarke*) *Larridon & Goetgh.* in Belg. J. Bot. 141, 2: 158 (2008). Type: Angola, without locality, *Welwitsch* 6836 & 7166 (BM, syn.)

Slender tufted annual or perennial with limited root-system, 14–65 cm tall with 1–many flowering stems 0.4–2 mm wide, ridged. Leaves basal, filiform, to 25 cm long, 0.3–1 mm across; sheath with long hairs at mouth. Involucral bract filiform, ± 5 mm long, erect or spreading. Inflorescence anthelate with (1–)2–6 spikelets; spikelets dark reddish brown, ovoid to subglobose, 6 mm long, 5 mm wide; glumes reddish brown to almost blackish, many and densely set, oblong-elliptic, 1.5–3.5 × 0.5–2 mm, glabrous or ciliate at margin, usually frayed near the apex. Stamens 1–3. Style-branches 2. Nutlet at first yellowish, later shiny black, obovoid, somewhat flattened, 0.8–1 × 0.6–0.9 mm, smooth. Fig. 18, p. 117.

UGANDA. West Nile District: Midigo, 26 Nov. 1941, *A.S. Thomas* 4071A!

TANZANIA. Mpanda District: Uzondo Plateau, May 2000, *Bidgood, Leliyo & Vollesen* 4519; Songea

District: 12 km E of Songea, by Nonganonga stream, 12 Jan. 1956, *Milne-Redhead & Taylor* 8297!

DISTR. U 1; T 4, 8; Nigeria, Cameroon, Central African Republic, Congo-Kinshasa, Angola, Zambia, Mozambique

HAB. Seepage places on granite rocks, very wet boggy grassland; 1050–1700 m

SYN. *Scirpus angolensis* *C.B. Clarke*, Consp. Fl. Afr. 5: 617 (1894), *nom. illegit.*

S. spadiceus (Lam.) Boeck. var. *ciliatus* *Ridl.* in Trans. Linn. Soc. ser. 2, 2: 156 (1884), *nom. illegit.*, *non Scirpus ciliatus* *Rottb.*, 1772

S. ustulatus *Podlech* in Mitt. Bot. Staatss. München 4: 118 (1961), *nom. illegit. nov.* for *Scirpus spadiceus*. Type: Zambia, Kawambwa, *Robinson* 2323 (K, lecto.; GENT, MT, P, SRGH, isolecto.)

Nemum spadiceum *sensu* *Lye* in Bot. Not. 126: 328, fig. 5 (1973); *Haines & Lye*, Sedges & Rushes E. Afr.: 130, fig. 254 (1983), *non* (Lam.) Ham.



FIG. 18. *NEMUM ANGOLENSE* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence, $\times 5$; 3. glume, $\times 10$; 4. flower, $\times 14$; 5. nutlet, $\times 24$. All from *Milne-Redhead & Taylor 8297*. Drawn by Juliet Williamson.

12. FICINIA

Schrad. in *Analecta Flor. Cap.* 1: 43 (1832)

Tufted perennial herbs with horizontal woody rhizomes. Culms scapose. Leaf-blade often ligulate. Involucral bracts leaf-like. Inflorescence a lateral or terminal head, with 1–25 terete spikelets. Spikelets with many glumes each subtending a bisexual floret; glumes reddish brown to black, glabrous, obtuse, many-veined; apex obtuse or midrib excurrent into a short mucro. Perianth segments 0. Stamens 3, filaments flattened, anther crested. Pistil with style 3-branched. Nutlet blackish when mature, obovoid, surface smooth; gynophore absent or present.

A mainly tropical and subtropical African genus of 60 species.

- | | |
|---|-------------------------------|
| 1. Leaf blade 0.4–0.5 mm wide; inflorescence of 1–6 spikelets | 2 |
| Leaf blade 0.8–1 mm wide; inflorescence of 6–25 spikelets | 2. <i>F. gracilis</i> |
| 2. Gynophore lobed, 0.5–0.6 mm long | 1. <i>F. filiformis</i> |
| Gynophore absent | 3. <i>F. trollii</i> |

Ficinia ecklonea (Steud.) Nees is said to occur in Ethiopia and East Africa by Lye in *Fl. Eth.* 6: 427 (1997). The type is South Africa, Cape peninsula, *Ecklon* 869 (K, holo.). I have seen no East African specimens.

1. ***Ficinia filiformis*** (Lam.) Schrad. in *Anal. Flor. Cap.* 1: 46 (1832); C.B. Clarke in *F.T.A.* 8: 460 (1902); Haines & Lye, *Sedges & Rushes of E. Africa*: 133 (1983). Type: South Africa, Cape of Good Hope, no collector indicated (P-Lam, holo.)

Tufted perennial with a short woody rhizome to 2 mm thick; culm 5–31 cm tall and 0.4–0.5 mm thick, but \pm 0.8 mm thick across the sheath, terete, glabrous. Leaf-sheath brown to blackish below but with prominent grey translucent top, 4–5.8 cm long, glabrous; blade canaliculate, 5–20 cm long and 0.4–0.5 mm wide, margins scabrid. Involucral bracts 1–2, 1.5–2.3 cm long and 0.3–0.4 mm wide. Inflorescence pseudolateral, a non-proliferating head of 1–6 spikelets; spikelets terete, 4–7 mm long and 2–3 mm wide; glumes reddish brown to almost blackish, 2–3.5 mm long, each side of midrib 0.8–1 mm wide. Stamens 3, anthers 1.6–1.8 mm long, crested. Style trifid. Nutlet brownish, ovoid, 1.6–1.7 mm long and 0.9–1 mm wide, smooth; gynophore about $\frac{1}{3}$ the length of nutlet, upper margin 3-lobed.

TANZANIA. Kilimanjaro, 24 Mar. 1934, *Schlieben* 4978!; Lushoto District: W Usambara, Mlalo, 18 Jun. 1953, *Drummond & Hemsley* 2954!; Rungwe District: Kiwira Forest Station, Oct. 1969, *Procter* 1489!

DISTR. T 2, 3, 7; South Africa

HAB. Upland grassland and moorland, often on rocky slopes; 1800–3400 m

SYN. *Schoenus filiformis* Lam. in *Tab. Encycl. Bot.* 1: 135 (1791)

Scirpus leucocoleus K. Schum. in *P.O.A. C.* (1895) 125. Typus: Tanzania, Kilimanjaro, *Volkens* 1858 (B, holo.; BM, G, K, iso.)

2. ***Ficinia gracilis*** (Poir.) Schrad. in *Anal. Flor. Cap.* 1: 46 (1832); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 638 (1894) & in *F.T.A.* 8: 461 (1902); Haines & Lye, *Sedges & Rushes of E. Africa*: 133 (1983). Type: South Africa, Cape of Good Hope, herb. *Thouars* (P, holo.)

Tufted perennial with a short woody rhizome to 2 mm thick; culm 15–46 cm tall and 0.8–1.1 mm thick, but \pm 1.6 mm thick across the sheath, terete, glabrous. Leaf-sheath brown to blackish, 3–7 cm long, glabrous; blade 7–29 cm long and 0.8–1 mm wide, canaliculate to flat, margins scabrid. Involucral bracts 2–3, 2–4.5 cm long and 0.4–0.8 mm wide. Inflorescence a terminal non-proliferating head of 6–25 spikelets;



FIG. 19. *FICINIA GRACILIS* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence, $\times 2$; 3. spikelet, $\times 8$; 4. glume, $\times 16$; 5. flower, $\times 16$; 6. nutlet, $\times 20$. 1–2 from Richards 6605, 3–6 from Faden *et al.* 96/433. Drawn by Juliet Williamson.

spikelets 3–7 mm long and 1.4–2.5 mm wide, terete; glumes reddish brown to almost blackish, 2.5–3.3 mm long (including the 0.1–0.4 mm long recurved mucro), each side of midrib 0.8–1 mm wide. Stamens 3, anthers 1.5–2.1 mm long, crested. Style trifid. Nutlet brownish, ovoid, 1.2–1.4 mm long and 0.8–0.9 mm wide, smooth; gynophore $\pm \frac{1}{3}$ the length of nutlet, upper margin 3-lobed. Fig. 19, p. 119.

UGANDA. Karamoja District: Mt Kadam [Debasien], Jan 1936, *Eggeling* 2714!

KENYA. Trans-Nzoia District: Mt Elgon National Park, 3 Nov. 2000, *Smith, Beentje & Muasya* 179!; North Nyeri District: Mt Kenya, Timau, 15 Aug. 1980, *Young* 40! & Timau, 18 Oct. 1943, *Bally* 3259!

TANZANIA. Arusha District: Mt Meru crater, 27 Apr. 1969, *Vesey-FitzGerald* 6179!; Morogoro District: Uluguru Mts, Lukwangule, 2 Jan. 1934, *Michelmores* 883!; Rungwe District: Rungwe Crater, Oct. 1969, *Procter* 1461!

DISTR. U 1; K 3, 4; T 2, 6, 7; South Africa

HAB. Upland grassland and moorland; 2400–4500 m

SYN. *Scirpus gracilis* Poir. in *Encycl. Meth.* 6: 763 (1804)

3. **Ficinia trollii** (Kük.) *Muasya & D.A. Simpson* in *Novon* 10: 133 (2000); Haines & Lye, *Sedges & Rushes of E. Africa*: 140 (1983). Type: Tanzania, Morogoro District: Uluguru, Lukwangule, *Troll* 4916 (B, holo)

Tufted perennial with a short woody rhizome to 2 mm thick; culm 5–35 cm tall and 0.4–0.5 mm thick, but ± 1.3 mm thick across the sheath, terete, glabrous. Leaf-sheath reddish brown, 4 cm long, glabrous; blade canaliculate, to 15 cm long and 0.4–0.5 mm wide, margins scabrid. Involucral bracts 1–2, 1–5 cm long and to 0.5 mm wide. Inflorescence a pseudo-lateral non-proliferating lateral head of 2–5 spikelets; spikelets terete, 2–5.5 mm long and 2 mm wide; glumes 1.8 mm long, each side of midrib 0.8–1 mm wide, reddish brown to almost blackish. Stamens 3, anthers crested. Style trifid. Nutlet straw-brown, 1.2–1.5 mm long and 0.9 mm wide, smooth; gynophore absent.

TANZANIA. Morogoro District: Uluguru Mts, Lukwangule, 7 Feb. 1934, *Troll* 4916

DISTR. T 6; known only from the type

HAB. Bracken stands in open parts of mist forest; 2300 m

SYN. *Scirpus trollii* Kük. in *F.R.* 53: 72 (1944)

Isolepis trollii (Kük.) Lye in *Lye & Haines, Bot. Not.* 130: 313 (1977)

NOTE. Possibly not distinct from *F. filiformis*, seeing that the lack of gynophore is the only difference (HB).

13. ISOLEPIS

R. Br., *Prod.*: 221 (1810); *Muasya & Simpson* in *K.B.* 57: 257–362 (2002)

Annual or short lived-perennials; tufted or mat-forming. Culm consisting of several internodes (in *I. fluitans* and *I. graminoides*) or reduced to peduncle only. Leaves eligulate, of a minute lobe or elongated to form a linear blade. Inflorescence with 1–several spikelets, subtended by a single involucral bract. Bract shorter than spikelets, resulting in a terminal inflorescence, or longer and continuing in direction of culm resulting in a pseudolateral inflorescence. Spikelets terete, with spirally arranged glumes, sometimes proliferating; glumes ovate to obovate, green to reddish-brown, carinate, acute to obtuse, arranged on the rachilla with the space between successive glumes < 0.1 mm. Flowers bisexual; perianth segments absent. Stamens 1–3; filament ribbon-like; anther 0.2–2.5 mm long, apex crested. Pistil with 2–3 stigma branches. Nutlets 2- or 3-sided, smooth, reticulate, papillose or striate.

A mainly southern hemisphere genus with ± 60 species.

- | | |
|--|-----------------------------|
| 1. Plants mat-forming; spikelets terminal; style bifid; nutlets smooth | 2 |
| Plants tufted; spikelets pseudolateral; style trifid or bifid; nutlets papillose or striated | 3 |
| 2. Peduncle > 1 cm long, not covered by leaf sheath; widespread | 1. <i>I. fluitans</i> |
| Peduncle < 0.5 cm long, partially covered by leaf sheath; Mt Elgon & Ruwenzori | 2. <i>I. graminoides</i> |
| 3. Nutlet longitudinally striated | 4 |
| Nutlet papillose to tuberculate | 8 |
| 4. Leaf blade reduced to a lobe, under 9 mm long; inflorescence proliferating | 3. <i>I. costata</i> |
| Leaf blade well developed, longer than 10 mm; inflorescence not proliferating | 5 |
| 5. Glumes 1–2.5 mm long; widespread, 2900–3700 m | 4. <i>I. setacea</i> |
| Glumes 2.4–4.8 mm long; East African mountains, 3650–4350 m | 6 |
| 6. Spikelet 6–8.5 mm long; Mt Kenya | 5. <i>I. keniaensis</i> |
| Spikelet 3.5–5 mm long; other mountains | 7 |
| 7. Spikelet 3.5–4.2 mm long; Mt Ruwenzori | 6. <i>I. ruwenzoriensis</i> |
| Spikelet 4–5 mm long; Mt Kilimanjaro | 7. <i>I. kilimanjarica</i> |
| 8. Inflorescence bract shorter than, or as long as, the inflorescence; nutlet ovoid to obovoid; anther crested | 8. <i>I. cernua</i> |
| Inflorescence bract longer than the inflorescence; nutlet ellipsoid; anther not crested | 9 |
| 9. Glumes 0.7–1.1 (–1.3) mm long; nutlet 0.5–0.8 mm long; K 4, T 7 | 9. <i>I. sepulcralis</i> |
| Glumes 1.3–1.8 mm long; nutlet 0.8–1 mm long; T 7 | 10. <i>I. natans</i> |

1. **Isolepis fluitans** (*L.*) *R. Br.*, Prod.: 221 (1810); Haines & Lye in *Sedges & Rushes E. Afr.*: 138 (1983); Muasya & Simpson in *K.B.* 57: 278 (2002). Type: Europe, lectotype *Morison* 1699 (OXF, lecto.; chosen by Simpson *et al.* 2001)

Mat-forming short-lived perennial; rhizome horizontal, green and above ground, 4–30 × 0.3–1.2 mm; culms 1–47 cm tall, 0.2–1.1 mm diameter, with one or more internodes; peduncle 1–19 cm tall, 0.2–0.9 mm diameter. Leaves with sheath green or brown, 3–25 × 0.3–1.7 mm; blade 2–80 × 0.2–1.1 mm. Inflorescence terminal, not proliferating; bract 2–12 × 0.3–1.3 mm; spikelet 1, 2.4–9.4 × 0.7–2.7 mm, with 4–28 glumes; glumes green or with brown patches, 1.5–3.4 × 0.5–1.3 mm, acute to obtuse, midrib green with mucro < 0.1 mm long. Stamens 2–3, anthers 0.4–1.5 mm, crested. Style bifid. Nutlets brown, 0.9–1.8 × 0.5–1.2 mm, minutely reticulate. Fig. 20, p. 122.

UGANDA. Kigezi District: Bufumbira, 24 April 1970, *Lye* 5275!; Toro District: Ruwenzori, 11 Feb. 1974, *Lisowski* 11066!; Mt Elgon, Jan. 1918, *Dummer* 3501!

KENYA. Kiambu District: Limuru, 31 Oct. 1947, *Bogdan* 1408!; Narok District: 15 Aug. 1970, *Greenway* & *Kamuri* 14559!; Trans-Nzoia District: Cherangani Hills, 3 Nov. 1968, *Thulin* & *Tidigs* 97!

TANZANIA. Bukoba District: Aug. 1931, *Haarer* 2122!; Lushoto District: W Usambara, 23 April 1968, *Renvoize* & *Abdullah* 1717A!; Mbeya District: 21 June 1969, *Wingfield* 273!

DISTR. **U** 2, 3; **K** 2–6; **T** 1–3, 7; widespread in tropical Africa; Madagascar, Europe, North Africa, India, Australia and New Zealand

HAB. Floating in shallow water or terrestrial in seepage and bogs; 1200–3700 m

SYN. *Scirpus fluitans* L., Sp. Pl. 1: 48 (1753); C.B. Clarke in F.T.A. 8: 449 (1902)

S. fluitans L. var. *terrester* Kük. in Th. & R. E. Fries, Journ. Ntzll. 9: 309 (1925), *nom. nud.* based on Kenya: *Fries* & *Fries* 731, 1182a & 2912 (B, BR, K)

Isolepis fluitans var. *major* Lye in Bot. Notiser 127(4): 522 (1974); Lye in Fl. Eth. 6: 425, fig. 212.55 (1997). Type: Uganda, *Lye* 5754 (MHU, holo.; EA, iso.)

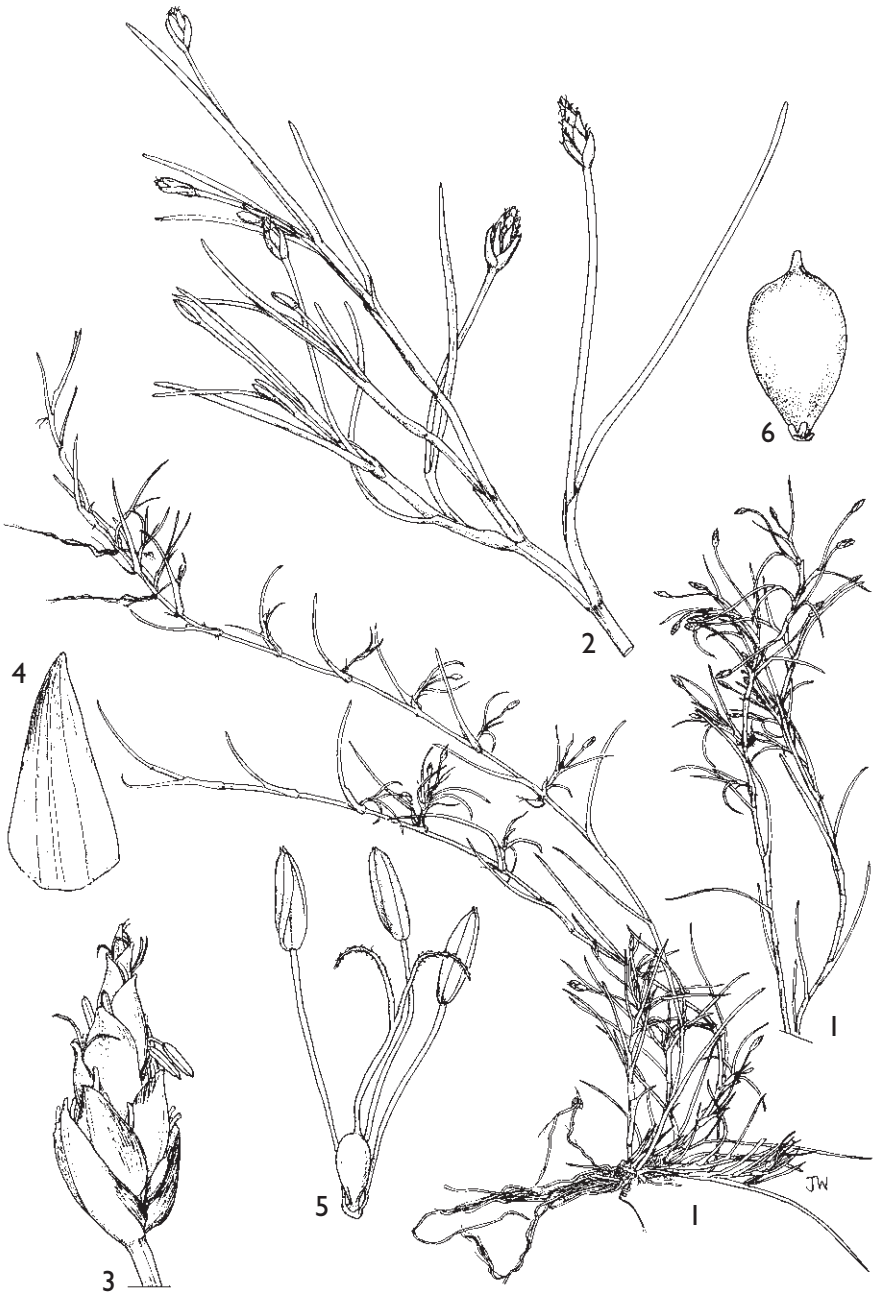


FIG. 20. *ISOLEPIS FLUITANS* — 1. habit, $\times \frac{2}{3}$; 2. detail of habit, $\times 2$; 3. spikelet, $\times 8$; 4. glume, $\times 12$; 5. flower, $\times 16$; 6. nutlet, $\times 16$. 1 from Knox & Muasya 3135, 2–6 from Smith *et al.* 65. Drawn by Juliet Williamson.

2. **Isolepis graminoides** (*R.W. Haines & Lye*) *Lye* in Bot. Notiser 127(4): 525 (1974); Haines & Lye in Sedges & Rushes E. Afr.: 138 (1983); Muasya & Simpson in K.B. 57: 282 (2002). Type: Kenya, *Hamilton* 1418 (MHU, holo.; EA, iso.)

Mat-forming short-lived perennial; rhizome 3–12 × 0.3–0.8 mm, horizontal, green and above ground; culms 0.5–3.2 cm tall, 0.2–0.6 mm diameter, with peduncle 0.2–0.5 cm, 0.2–0.4 mm diameter, with nodes. Leaves with sheath green, 3–14 × 0.4–1 mm and covering peduncle and part of spikelet; blade 12–35 × 0.3–1.2 mm. Inflorescence terminal, not proliferating; bract 3–4 × 0.8–1 mm; spikelet 1, 3–7.1 × 0.9–2 mm, with 5–18 glumes; glumes green or with brown patches, 2–3.1 × 0.6–1 mm, obtuse, midrib green with mucro < 0.1 mm long. Stamens 3, anthers 0.7–0.9 mm long, crested. Style bifid. Nutlets brown, 1–1.5 × 0.7–0.9 mm, minutely reticulate.

UGANDA. Tofo District: Ruwenzori, 2 April 1948, *Hedberg* 643! & Ruwenzori, Mageny, 29 Jan.

2002, *Lye & Namaganda* 25426!; Mbale District: Mt Elgon, 16 April 1950, *Forbes* 277!

KENYA. Trans-Nzoia District: Mt Elgon, *Hamilton* 1418! & March 1970, *Hamilton* 4319!

DISTR. U 2, 3; K 3; not known elsewhere

HAB. Afroalpine bogs; 3200–3500 m

SYN. *Scirpus graminoides* R.W. Haines & Lye in Bot. Notiser 123: 430 (1970)

3. **Isolepis costata** *A. Rich.*, Tent. Fl. Abyss. 2: 499 (1851); Haines & Lye in Sedges & Rushes E. Afr.: 135 (1983); Muasya & Simpson in K.B. 57: 316 (2002); Lye in Fl. Eth. 6: 423, fig. 212.53 (1997). Type: Ethiopia, Ethiopia, Ouodgerate, *Petit* s.n. (P, syn.) & without locality, *Schimper* II–1153 (P, syn.; BM, BR, K, UPS, isosyn.)

Tufted annual or short-lived perennial; rhizome 1–22 × 0.7–2 mm, ascending, whitish; culms 7–81 cm tall, 0.3–1.3 mm diameter, without nodes. Leaves with brown sheath 8–101 × 0.5–1.8 mm; blade 1–9 × 0.1–0.8 mm. Inflorescence pseudolateral, proliferating; bract 2–7 × 0.2–0.6 mm; spikelets 1–25, 1.4–5.5 × 0.7–2.1 mm, with 4–31 glumes; glumes brown to dark brown, 1–2.1 × 0.4–0.9 mm, acute to obtuse, midrib green to partially brown with mucro < 0.1 mm long. Stamens 1–3, anthers 0.3–1 mm long, crested. Style bifid or trifid. Nutlets golden brown, 0.7–1.3 × 0.4–0.8 mm, surface with longitudinal ribs and densely set transverse bars connecting the ribs.

UGANDA. Kigezi District: Bufumbira, 2 Oct. 1970, *Katende* K601!; Toro District: Ruwenzori, 31 March 1948, *Hedberg* 612!; Mbale District: Mt Elgon, 23 Feb. 1974, *Lisowski* 10799!

KENYA. Trans-Nzoia District: Cherangani Hills, 3 Aug. 1968, *Thulin & Tidigs* 52!; Nakuru District: 16 March 1955, *Bogdan* 3996!; Mt Kenya, 21 Aug. 1948, *Hedberg* 2012!

TANZANIA. Masai District: Crater Highlands, 30 July 1962, *Newbould* 6245!; Iringa District: Mufindi, 15 March 1962, *Polhill & Paulo* 1762!; Njombe District: Kitulo Plateau, 8 Nov. 1987, *Mwasumbi & Thomas* 13477!

DISTR. U 2, 3; K 2–4; T 2, 3, 6–8; widespread in tropical Africa; Madagascar

HAB. Seepage areas, stream banks, montane forests; 1700–3500 m

SYN. *Scirpus costatus* (*A. Rich.*) Boeck. in *Linnaea* 36: 511 (1870); C.B. Clarke in F.T.A. 8: 451 (1902)

S. macer Boeck. in E.J. 5: 503 (1884). Type: Madagascar, *Hildebrandt* 3738 (P, holo.; BM, K, iso.)

S. costatus (*A. Rich.*) Boeck. var. *macer* (Boeck.) Cherm. in Bull. Soc. Bot. France 74: 607 (1927).

Isolepis costata *A. Rich.* var. *macra* (Boeck.) B.L. Burt in Notes Roy. Bot. Gard. Edinburgh 43(3): 363 (1986)

4. **Isolepis setacea** (*L.*) *R. Br.*, Prod.: 222 (1810); Haines & Lye in Sedges & Rushes E. Afr.: 134 (1983); Muasya & Simpson in K.B. 57: 289 (2002); Lye in Fl. Eth. 6: 423, fig. 212.52 (1997). Type: Europe (LINN, lecto., chosen by Simpson *et al.* 2001)

Tufted annual or short-lived perennial; rhizome whitish, ascending or occasionally horizontal, 1–18 × 0.3–1 mm; culms 1.2–25 cm tall, 0.2–0.8 mm diameter, without

nodes. Leaves with brown sheath 2–33 × 0.3–1 mm; blade 1–98 × 0.1–0.7 mm. Inflorescence pseudolateral, not proliferating; bract 2–23 × 0.2–0.6 mm; spikelets 1–4, 1.7–6.5 × 0.5–2.5 mm; with 4–35 glumes; glumes green or with brown to dark brown patches, 1–2.5 × 0.4–1 mm, acute, midrib green with mucro < 0.1 mm long. Stamens 1–3, anthers 0.2–0.6 mm, crested. Style trifid. Nutlets brown to dark brown, 0.7–1.3 × 0.4–0.9 mm, surface with longitudinal ribs and densely set transverse bars connecting the ribs.

UGANDA. Kigezi District: Bufumbira, 24 April 1970, *Lye* 5297!; Toro District: Ruwenzori, 2 April 1948, *Hedberg* 649!; Mt Elgon, Jan. 1918, *Dummer* 3494!

KENYA. Trans-Nzoia District: Mt Elgon, 10 June 1966, *Haines* 4151! & Cherangani Hill, 2 Feb. 1995, *Muasya & Simpson* 909!; Mt Kenya, 12 Dec. 1957, *Verdcourt* 2027!

TANZANIA. Kilimanjaro, 23 July 1994, *Grimshaw* 94/644!; Morogoro District: Uluguru Mt, 19 Sept. 1970, *Thulin & Mhoro* 1014! Mbeya District: Poroto Mt, 29 May 1980, *Hooper & Townsend* 1754!

DISTR. U 2, 3; K 2–4; T 2, 6, 7; Widespread in alpine and subalpine regions in Europe, Africa, India, and Western China

HAB. Seepage and wet grassland; 2400–3800 m

SYN. *Scirpus setaceus* L., Sp. Pl. 1: 49 (1753); C.B. Clarke in F.T.A. 8: 450 (1902); A.V.P.: 56 (1957) *Isolepis setacea* (L.) R. Br. var. *aberdarica* R.W. Haines & Lye in Bot. Notiser 130(3): 311 (1977). Type: Kenya, *Lye* 74/86 (EA!, holo.)

5. ***Isolepis keniaensis*** *Lye* in Nordic Journ. Bot. 2(6): 565 (1983); Haines & Lye in Sedges & Rushes E. Afr.: 136 (1983); Muasya & Simpson in K.B. 57: 291 (2002). Type: Kenya, *Cabot* 'plant A' (K!, holo.)

Tufted annual or short-lived perennial; rhizome whitish, ascending, 5–13 × 0.7–1 mm; culms 3–4.8 cm tall, 0.4–0.6 mm diameter, without nodes. Leaves with brown sheath 13–23 × 0.8–1.7 mm; blade 45–107 × 0.6–1 mm. Inflorescence pseudolateral, not proliferating; bract 20–67 × 0.3–0.7 mm; spikelets 1–3, 6–8.5 × 2.1–2.6 mm, with 18–27 glumes; glumes green, 2.4–3.2 × 0.8–1.4 mm, acute, midrib green with mucro to 0.1 mm long. Stamens 3, anthers 0.8–0.9 mm, crested. Style trifid. Nutlets brown, 1.3–1.5 × 0.8–1 mm, surface with longitudinal ribs and densely set transverse bars connecting the ribs.

KENYA. Mt Kenya, Feb. 1979, *Cabot* plant A! & Mt Kenya, Teleki Valley, 3 Oct. 2004, *Muasya & Gehrke* 2552!

DISTR. K 4; endemic to Mt Kenya

HAB. Alpine bog; 3650–3850 m

6. ***Isolepis ruwenzoriensis*** *R.W. Haines & Lye* in Bot. Notiser 127(4): 524 (1974) & in Sedges & Rushes E. Afr.: 138 (1983); Muasya & Simpson in K.B. 57: 292 (2002). Type: Uganda, *Osmaston* 3916 (K!, holo.)

Tufted annual or short-lived perennial; rhizome whitish, ascending, 5–13 × 0.5–0.7 mm; culms 2.8–5 cm tall, 0.3–0.5 mm diameter, without nodes. Leaves with brown sheath 10–16 × 0.4–0.7 mm; blade 27–42 × 0.5–0.6 mm. Inflorescence pseudolateral, not proliferating; bract 10–16 × 0.4–0.6 mm; spikelets 1–2, 3.5–4.2 × 1.2–1.6 mm, with 6–9 glumes; glumes green, 2.6–4.7 × 0.9–1.2 mm, acute, midrib green with mucro 0.1–0.3 mm. Stamens 3, anthers to 0.7 mm, crested. Style trifid. Nutlets dark brown, 1.1–1.3 × 0.7–0.9 mm, surface with longitudinal ribs and densely set transverse bars connecting the ribs.

UGANDA. Toro District: Ruwenzori, July 1951, *Osmaston* 3916!

DISTR. U 2; known only from the type

HAB. Alpine bog; 3850 m

7. *Isolepis kilimanjarica* R.W. Haines & Lye in Bot. Notiser 127 (4): 522 (1974) & in Sedges & Rushes E. Afr.: 136 (1983); Muasya & Simpson in K.B. 57: 292 (2002). Type: Tanzania, Hedberg 1348 (UPS, holo.; NU, iso.)

Tufted annual or short-lived perennial; rhizome whitish, horizontal, to 1–5 × 1–1.5 mm; culms 1–3 cm tall, 0.3–0.4 mm diameter, without nodes. Leaves with brown sheath 4–10 × 0.4–0.8 mm; blade 30–70 × 0.6–1.5 mm. Inflorescence pseudolateral, not proliferating; bract to 10 mm; spikelet 1, 4–5 × 2–2.5 mm; glumes green or with brown to dark brown patches, 3–3.5 mm, acute, midrib green with mucro < 0.1 mm. Stamens 3. Style trifid. Nutlets brown, 1.2–1.4 × 0.9–1 mm, surface with longitudinal ribs and densely set transverse bars connecting the ribs.

TANZANIA. Kilimanjaro, Hedberg 1348

DISTR. T 2; known only from the type

HAB. Alpine bog; 4350 m

8. *Isolepis cernua* (Vahl) Roem. & Schult., Syst. Veg. 2: 106 (1817)

Tufted short-lived perennial; rhizome whitish, ascending, 1–19 × 0.3–1.5 mm; culms 1–30 cm tall, 0.2–1 mm diameter, without nodes. Leaves with brown or green sheath 4–30 × 0.3–1.8 mm; blade 1–122 × 0.1–0.7 mm. Inflorescence pseudolateral, not proliferating; bract 2–22 × 0.2–1.3 mm; spikelet 1 (occasionally 2), 1.4–9 × 1–2.4 mm, with 4–27 glumes; glumes green or with brown to dark brown patches, 0.8–2.1 × 0.4–1.6 mm, obtuse, midrib green with mucro < 0.1 mm. Stamens 2–3, anthers 0.2–1 mm, crested. Style trifid. Nutlets brown, 0.5–1.2 × 0.4–1 mm, tuberculate.

var. *meruensis* (R.W. Haines & Lye) Muasya in K.B. 57: 299 (2002). Type: Tanzania, Arusha District: Meru crater, Njeku gorge, Vesey-FitzGerald 6295 (EA!, holo.; DSM, Kl, iso.)

TANZANIA. Arusha District: Mt Meru, 21 March 1966, Greenway & Kanuri 12465! & Mt Meru, 2 March 1971, Richards & Arasuluhu 26694! & Mt Meru, Njeku Gorge; 6 July 1996, Muasya & Abdalla 1061!

DISTR. T 2; endemic to Mt Meru

HAB. Alpine seepage and edge of spring; 2100–2800 m

SYN. *I. meruensis* R.W. Haines & Lye in Bot. Notiser 130: 311 (1977) & in Sedges & Rushes E. Afr.: 141 (1983)

9. *Isolepis sepulcralis* Steud., Syn. Pl. Glumac. 2: 94 (1855); Haines & Lye in Sedges & Rushes E. Afr.: 140 (1983); Muasya & Simpson in K.B. 57: 337 (2002). Type: St. Helena, near Napoleon's grave, D'Urville 69a (P, holo.; P, Kl, iso.)

Tufted annual or short-lived perennial; rhizome whitish, ascending, 1–12 × 0.3–1 mm; culms 2–26 cm tall, 0.1–0.6 mm diameter, without nodes. Leaves with sheath 1–23 × 0.2–0.7 mm, brown; blade 1–43 × 0.1–0.4 mm. Inflorescence pseudolateral, occasionally proliferating; bract 2–16 × 0.1–0.6 mm; spikelets 1–5, 1.3–4.9 × 0.7–2 mm, with 7–32 glumes; glumes green to dark brown, 0.7–1.3 × 0.2–0.6 mm, acute, midrib green or partly dark brown with mucro < 0.1 mm. Stamens 1–2, anthers 0.2–0.4 mm, not crested. Style trifid. Nutlets dark brown, 0.5–0.8 × 0.3–0.4 mm, minutely papillose.

KENYA. W Mt Kenya, 11 Jan. 1922, Fries & Fries 842!; Kiambu District: Limuru, 15 Feb. 1948, Bogdan 1514a!; Machakos District: 2 Feb. 1969, Napper & Faden 1863!

TANZANIA. Mbeya District: 13 Dec. 1962, Richards 17045! & stream below Simambwe-Njanganda road, 23 June 1969, Wingfield 296!; Rungwe District: NW of Mt Rungwe, 29 Nov. 1958, Napper 1168!

DISTR. K 4; T 7; Angola, Zimbabwe, South Africa; Atlantic Is., Madagascar; Australia and New Zealand

HAB. Seepage and wet grassland; 1800–2300 m

10. **Isolepis natans** (Thunb.) A. Dietr., Sp. Pl. 2: 106 (1833); Haines & Lye in *Sedges & Rushes E. Afr.*: 138 (1983); Muasya & Simpson in *K.B.* 57: 282 (2002). Type: South Africa, *Thunberg* 1633 (UPS, holo.)

Tufted annual or short-lived perennial; rhizome whitish, ascending, 1–2 × 1–2 mm; culms 4.5–10 cm tall, 0.3–2.2 mm diameter, without nodes. Leaves with brown sheath 8–14 × 0.6–1 mm; blade 5–18 × 0.2–1.5 mm. Inflorescence pseudolateral, occasionally proliferating; bract 3–7 × 0.2–0.4 mm; spikelets 1–3, 2.1–4.7 × 1.3–2 mm, with 8–45 glumes; glumes green to dark brown, 1.3–1.8 × 0.4–0.7 mm, acute, midrib green with mucro < 0.1 mm. Stamens 2, anthers 0.6–0.7 mm, not crested. Style trifid. Nutlets dark brown, 0.8–1 × 0.4–0.5 mm, minutely papillose.

TANZANIA. Rungwe District: near Upper Kiwira R., 25 Oct. 1947, *Brenan & Greenway* 8220b!; Iringa District: Udzungwa Mountain National Park, below Camp 294, 30 May 2002, *Luke et al.* 8558!

DISTR. T 7; Angola, Zimbabwe, South Africa

HAB. Swampy grassland; 1980 m

SYN. *Scirpus natans* Thunb., *Prod. Pl. Cap.* 17 (1794).

14. OXYCARYUM

Nees in *Martius, Fl. Bras.* 2: 90 (1842); Lye in *Bot. Not.* 124: 280–286 (1971)

Stoloniferous floating perennial. Culms scapose. Leaves ligulate, the lower leaf sheaths inflated. Involucral bracts leaf-like. Inflorescence subumbellate, globose heads sessile or with peduncles of variable length; each head with many closely packed spikelets; these subtended by scale-like bracts but lacking prophylls; glumes spirally inserted, stiff, margins ciliate, margins thick and acuminate. Floret bisexual, perianth segments 0. Stamens 3. Style 2-branched. Nutlet lenticular and with a corky base, margin and tip.

Monotypic. Tropical Africa and Central and S America.

Oxycaryum cubense (Poepp. & Kunth) Lye in *Bot. Not.* 124: 281 (1971); Haines & Lye, *Sedges & Rushes E. Afr.*: 144, fig. 282 (1983); Lye in *Fl. Eth.* 6: 428, fig. 212.59 (1997). Type: Cuba, 'in paludosis', *Poeppig* s.n. (B, holo., not found)

Perennial aquatic floating herb, with long hanging roots and stolons 5–20 cm long and to 3 mm thick, with ovate blackish scales 2–3 cm long; stolons spreading horizontally and producing new plants at their tips; stems 40–70 cm tall, 3–5 mm thick (to 8 mm across the sheath), sharply triangular, glabrous, covered in the lower part by inflated lower-leaf sheaths to 12 cm long, with a rim of hairs as ligule. Leaves basal or nearly so, often purplish near base, linear, 40–90 × 0.4–1.1 cm; midrib and margins scabrid. Inflorescence an open umbel of (3–)5–10 heads on stalks 1–45 mm long, each head with many tightly packed spikelets; heads globose, 5–15 mm across; inflorescence bracts leaf-like, 15–60 cm long, 4–9 mm wide; spikelets brown, terete, many-flowered, 3.5–6 mm long, 2.5–5.5 mm wide; glumes brown, ± 3.5 mm long, apex thick and acuminate, keel of midrib smooth or scabrid, margin with long ciliate hairs. Perianth absent. Stamens 3, anthers 1.5–1.8 mm, crested. Style-branches 2. Nutlets yellowish and brown, elongate, 1.9–3 × 0.6–1 mm, long-beaked, smooth, glabrous. Fig. 21, p. 127.

UGANDA. Busoga District: Lake Kyoga, Busumbula, Feb. 1999, *Lye et al.* 23439!; Mbale District: Bugiri near Tororo, Apr. 1966, *Haines* 4113!; Masaka District: Bukoto county, Makonzi port, Aug. 1971, *Katende* 1290!



FIG. 21. *OXYCARYUM CUBENSE* — 1, habit, $\times \frac{2}{3}$; 2, single spike of inflorescence, $\times 2$; 3, spikelet, $\times 6$; 4, glume, $\times 10$; 5, anther, $\times 10$; 6, ovary & style, $\times 10$; 7, nutlet, $\times 10$. 1 & 5–6 from Hooper & Townsend 1944, 2–4 from Wingfield 519, 7 from Lye 5992. Drawn by Juliet Williamson.

KENYA. Baringo District: Kamnarok Game Reserve, Jan. 2004, *Mwachala et al.* 340!; Tana River District: Tana River National Primate Reserve, Baomo Lodge, Mar. 1990, *Kabuye et al.* TPR 531! TANZANIA. Mwanza District: Lake Victoria, Ilungu, Mar. 2000, *Kayombo & Makoye* 3305!; Mpanda District: Lake Katavi north edge, June 1980, *Hooper & Townsend* 1944!; Rufiji District: Mafia Island, Kipora, Aug. 1937, *Greenway* 5195! DISTR. U 3, 4; K 3, 7; T 1, 4, 6–8; widespread in tropical Africa and America HAB. Floating in lakes, swamps and pools, either on its own (may form mats) or on small floating islands, or on lake and river edges in up to 30 cm deep water, rooting in silt; 0–1200 m CONSERVATION NOTES. Widespread but nowhere common, apart from temporarily in suitable habitats. Least concern (LC).

SYN. *Scirpus cubensis* Poepp. & Kunth, Enum. Pl. 2: 172 (1837); C.B. Clarke in F.T.A. 8: 451 (1902)

15. KYLLINGIELLA

Haines & Lye in Bot. Notis. 131: 175–177 (1978)

Perennial leafy herbs with erect or horizontal woody rhizomes; culms scapose. Leaves eligulate. Inflorescence a compact head consisting of several rounded or ovoid spikelets. Spikelets may consist of smaller spikelets; spikelets with few to many spirally arranged scales or glumes, each subtending a sessile flower. Perianth segments 0. Stamens 1–2, filaments flattened, anther not crested. Pistil with style 2 or 3-branched at apex. Nutlet obovoid, minutely papillose.

3–4 species, mostly in tropical and subtropical Africa.

This genus is close to *Isolepis* morphologically, but differs inflorescence and glume structure.

- | | |
|---|---------------------------|
| 1. Inflorescence whitish or grey; heads not particularly squarrose | 2 |
| Inflorescence greenish; heads squarrose with tips of glumes projecting outwards | 1. <i>K. polyphylla</i> |
| 2. Inflorescence heads 3–10 mm long, drying greyish; glumes 1.2–1.5 mm long, with bent cucullate apex | 3 |
| Inflorescence heads 2–3 mm long, drying whitish; glumes 1.8–2.4 mm long, with straight (non-cucullate) apex ... | 2. <i>K. ugandensis</i> |
| 3. Glumes 1.2–1.7 mm; nutlets 0.5–1.1 mm long; widespread | 3. <i>K. microcephala</i> |
| Glumes 1.9–2.5 mm; nutlets 1.3–1.7 mm long; T 7 only ... | 4. <i>K. simpsonii</i> |

1. ***Kyllingiella polyphylla*** (*A. Rich.*) Lye in Haines & Lye, Sedges & Rushes E. Afr.: 143, fig. 280 (1983); Lye in Fl. Eth. 6: 427, fig. 212.58 (1997). Type: Ethiopia, Chiré, *Quartin Dillon* s.n. (P, holo.)

Slender perennial; stems 3–18 cm tall, 0.3–0.5 mm thick, arising closely at intervals of less than 5 mm on a short horizontal rhizome, rhizome to 2 mm diameter; base swollen, covered by fibrous remains of old leaf sheaths. Leaves 3–many per stem, pale green, half to more than the stem length, 4–17 cm long, 1.1–1.6 mm wide, flat, margin and midrib with minute spine-like hairs; sheath pale brown, to 2.8 cm long. Inflorescence bracts spreading, 4–6, the longest 4–9 cm long and similar to leaves. Inflorescence a terminal pale green head, globose or slightly wider than long, 3–10 mm across, consisting of many spikelets 2–4 mm long; each spikelet with many spirally arranged squarrose glumes/scales, whitish with green midrib and apex, 1.2–2.5 mm long, with narrow green acumen 0.5–0.8 mm long. Stamen 1, anthers 0.3–0.6 mm, not crested. Style 3-branched. Nutlet creamy yellow, obovoid, 0.5–0.7 × 0.3–0.4 mm, minutely papillose.

KENYA. Northern Frontier District: Moyale, Apr. 1952, *Gillett* 12939!; Embu District: 2 km NW of Kamburu bridge on Tana R., Jan. 1972, *Robertson* 1668!; Machakos District: Yatta Plateau 4 km E of Athi R. on Machakos–Kitui road, Nov. 1982, *Gillett et al.* 23968!

TANZANIA. Masai District: Tarangire National Park, Feb. 1970, *Vesey-FitzGerald* 6547!; Iringa District: Ruaha National Park, Mbage Camp, Jan. 1966, *Richards* 20946!; Mbeya District: 10 km WSW of Mbeya near R. Nzorwe, Dec. 1969, *Wingfield* 495!

DISTR. K 1, 4; T 2, 4–7; Eritrea, Ethiopia, ?Angola, Zambia, Zimbabwe

HAB. Edges of depressions or shallow soil over rocks in the woodland zone; 750–1400(–2000) m

SYN. *Isolepis polyphylla* A. Rich. in Tent. Fl. Abyss. 2: 503 (1851)

Scirpus steudneri Boeck. in *Linnaea* 36: 733 (1870); C.B. Clarke in F.T.A. 8: 458 (1902).

Type: Eritrea, Keren, *Steudner* 904 (B, holo., not found)

NOTE. Though Haines & Lye state the combination was published in *Nordic Journ. Bot.* 3 (1983), this did not occur.

2. ***Kyllingiella ugandensis*** *Haines & Lye* in *Bot. Notiser* 131: 177 (1978) & *Sedges & Rushes E. Afr.*: 142 (1983). Type: Uganda, Acholi District: Lotuturi, *Kertland* 111 (MHU, holo.)

Slender perennial, culm(s) arising from a short erect rhizome, rhizome 1 mm diameter; culm 8–16 cm tall, triangular, 0.2–0.5 mm in diameter, but \pm 0.7 mm in diameter across the sheath, glabrous, base slightly swollen and covered in old leaf sheaths. Leaf-sheath glabrous, 0.8–1.2 cm long; blades 3–7, 4–15 \times 0.1–0.15 cm, glabrous except for slightly scabrid midrib and margins. Inflorescence bracts 2–3, the longest to 4 cm long. Inflorescence a dense terminal head 2–3 mm long, 3–4 mm wide of 3–6 tightly packed whitish spikelets; spikelets ovoid, to 3 mm long, several-flowered; glumes lanceolate, 1.8–2.4 mm long, 0.3–0.4 mm wide, apex obtuse. Perianth segments absent. Stamens not seen. Style trifid. Nutlet dark brown when mature and with metallic sheen, obovoid to ellipsoid, 0.7–0.9 \times 0.4–0.6 mm, surface minutely papillose to tuberculate; base of style often persisting.

UGANDA. Acholi District: Lotuturi, June 1963, *Kertland* 111

DISTR. U 1; known only from the type

HAB. no data; 1200 m

3. ***Kyllingiella microcephala*** (*Steud.*) *R.W. Haines & Lye* in *Bot. Notis.* 131: 176 (1978) & in *Sedges & Rushes E. Afr.*: 142, fig. 277 (1983); *Lye* in *Fl. Eth.* 6: 425, fig. 212.56 (1997). Type: Ethiopia, Gon Ambra, *Schimper* 650 (P, holo.; BR, K!, iso.)

Perennial, tufted, leafy; stems 5–47 cm tall, 3-angled, 0.3–1.1 mm thick, glabrous; base swollen, conical or bulbous, covered in persistent coarse brown old leaf-base fibres. Leaves 1–4 per stem, bright or dark green, \pm half the stem length, flat or with margins inrolled, 3–22 cm long, 1–2 mm wide, margin and midrib with short spine-like hairs; sheath grey or brown, 1.4–3.5 cm long, without ligule. Inflorescence bracts 2–4, spreading or recurved, leaf-like, the longest 2–8 cm long. Inflorescence a dense terminal white head 3–10 mm in diameter, consisting of many tightly packed rounded pseudospikelets 2–4 mm long; pseudospikelets consisting of many 1-flowered spikelets; pseudoglumes very closely packed, lanceolate, 1.2–1.7 \times 0.4–0.6 mm, apex cucullate, obtuse and slightly bent, margin incurved. Perianth segments absent. Stamen 1(–2), filament white, anthers pale yellow, 0.5–0.7 mm long. Style 2(–3)-branched. Nutlet pale yellowish grey turning to almost black, 0.5–1.1 \times 0.3–0.4 mm, with minute tubercles in rows and a metallic shine, style base persistent as small dark knob. Fig. 22, p. 130.



FIG. 22. *KYLLINGIELLA MICROCEPHALA* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence, $\times 4$; 3. pseudo-spikelet, $\times 16$; 4. pseudo-glumes (upper and lower), $\times 16$; 5. stamens, $\times 16$; 6. ovary & style, $\times 32$; 7. nutlet, $\times 5$. 1–2 from *Richards* 15547, 3–7 from *Bidgood et al.* 2265. Drawn by Juliet Williamson.

UGANDA. Karamoja District: Lodoketeminit, May 1963, *Kerfoot* 4920 & Lokapel, June 1967, *Haines* 4218; West Nile District, Era Forest Reserve, May 1975, *Katende* 1819
 KENYA. Northern Frontier District: Moyale, Apr. 1952, *Gillett* 12940!; West Pokot District: N of Kongelai escarpment, May 1969, *Napper & Tweedie* 2125!; Embu District: Kiangombe, Nov. 2000, *Smith, Beentje & Muasya* 268!
 TANZANIA. Musoma District: between Kampi ya Mpofu and Klein's Camp, Jan. 1963, *Greenway & Turner* 10936!; Kondo District: Kondo, Jan. 1962, *Polhill & Paulo* 1195!; Chunya District: near Mbangala, Feb. 1994, *Bidgood et al.* 2265!
 DISTR. U 1; K 1–4; T 1, 4–8; tropical Africa from Senegal to Sudan and Ethiopia and south to Congo-Kinshasa, Mozambique, Zimbabwe and Botswana; India
 HAB. Within the woodland zone or bushland zone on moist sand or mud, or by swamps or on thin soil over rocks, also in grassy clearings within these zones; may be locally common; 400–1950 m

SYN. *Kyllinga microcephala* Steud. in *Flora* 25: 597 (1842)
Isolepis kyllingioides A. Rich. in *Tent. Fl. Abyss.* 2: 502 (1851). Types: Ethiopia, Gon Ambra, *Schimper* 650 (BR!, K!, P, syn.) & Chiré, *Quartin Dillon* s.n. (P, syn.)
Scirpus kyllingioides (A. Rich.) Boeck. in *Linnaea* 36: 733 (1870); C.B. Clarke in *F.T.A.* 8: 457 (1902)
S. microcephalus (Steud.) Dandy in *F.P.S.* 3: 366 (1956)
Isolepis microcephala (Steud.) Lye in *Bot. Notis.* 124, 4: 480 (1971)

NOTE. *Milne-Redhead & Taylor* 8395 states the plant can be aromatic.

4. ***Kyllingiella simpsonii*** *Muasya* in *K.B.* 57 (4): 997, t. 1 (2002). Type: Tanzania, Chunya District: Rungwa Game Reserve, 1 km W of Itigi–Mbeya road, *Sayalel* in C.A.W.M. 5320 (EA, holo.; K!, iso.)

Tufted perennial with short horizontal rhizome to 3 mm thick; stems 30–62 cm tall, 0.7–1.5 mm thick, glabrous; base covered by fibrous remains of old leaf sheaths. Leaves several per stem, 5–15 cm long, 1.5–2.3 mm wide, flat or inrolled, margin and midrib with minute spine-like hairs; sheath pale brown, 4.4–7.5 cm long, glabrous. Inflorescence a dense terminal dirty white head 3–7 × 5–9 mm, of many tightly packed spikelets; inflorescence bracts ± 3, leaf-like, the largest 3–10 cm long; spikelets cylindrical, to 3 mm long, many-flowered; glumes boat-shaped, 1.9–2.5 × 0.3–0.5 mm, apex obtuse. Stamens 1–3. Style 3-branched. Nutlet whitish turning dark brown, 1.3–1.7 × 0.3–0.4 mm, minutely papillose.

TANZANIA. Chunya District: Rungwa Game Reserve, 1 km W of Itigi–Mbeya road, Jan. 1969, *Sayalel* in C.A.W.M. 5320!

DISTR. T 7; Congo-Kinshasa, Zambia

HAB. Seasonally wet depression in miombo woodland; ± 1380 m

16. CYPERUS*

L. in Sp. Pl.: 44 (1753)

Mariscus Gaertn. in Fruct. Sem. Pl. 1: 11 (1788)*Juncellus* C.B. Clarke in J.D.Hooker in Fl. Brit. India 7: 594 (1893)

Annuals or perennials, rhizomatous or stoloniferous. Culms mostly scapose. Leaves rarely without blade; ligule 0. Involucral bracts one to several, mostly leaf-like, the lowermost largest, the others progressively smaller. Inflorescence terminal or pseudolateral, capitate or anthelate and often with primary, and sometimes secondary branches terminating in 1 or more or digitate clusters of spikelets (spikes), sometimes the spikelets more spaced out on an elongated axis. Spikelets linear to ovoid, laterally flattened; axis persistent or spikelet falling off as entity when nutlets are ripened (subgenus *Mariscus*); glumes few to many, 2-ranked, dehiscent (or persistent in subgenus *Mariscus*), glabrous, keel obtuse to mucronate. Flowers bisexual. Perianth segments 0. Stamens 1–3. Stigma (2–)3-branched; style base not thickened. Nutlets trigonous, dorsiventrally compressed, with a flat side pressed against the rachilla, sometimes almost rounded.

Some 550 species in a range of habitats in tropics and temperate parts of the World.

NOTE ON USING THE KEY: *Cyperus* species are difficult to key, with many characters showing considerable variability. Therefore, good specimens are essential, and that means flowering or fruiting material **complete with basal parts** and maybe even a note or two what those basal parts look like when fresh. Without a complete specimen, you have no hope of getting a name – unless you can find a friendly cyperologist with wide experience!

- | | |
|---|-------------------------------|
| Group 1: Inflorescence capitate, forming a sessile ± dense head just above the involucral bracts | Group 1 p.133 |
| Group 2: Inflorescence anthelate, with one or more spikes with a distinct axis and at least one stalked just above the involucral bracts; spikelets on individual spikes arranged in digitate (sub-)sessile clusters . . . | Group 2 p.137 |
| Group 3: Inflorescence anthelate, with one or more spikes with a distinct axis and at least one stalked just above the involucral bracts; spikelets arranged spaced along the branchlets and at least some of the spikes on the end of a branch | Group 3 p.140 |
| Involucral bracts absent, inflorescence ± paniculate | 1. C. blysmoides p.148 |

* Footnote to *Cyperus*: It is unfortunate that due to tight deadlines the treatment of this genus is not as good as it should be. Though Hoenselaar worked very hard on the group (as well as completing seven other genera), due to financial constraints her contract ended before she could complete the treatment; she had by then written descriptions for 150 species. The editor then completed the descriptions by writing another 11, and wrote the key, and made minor adjustments in KH's work (always indicated in the text, e.g. changed *dives* to a variety of *exaltatus*); checked literature and typification and added a number of obscure synonyms used in East Africa. As a result of all this the key, to a genus on which HB has worked only briefly, is idealistic rather than practical; unless perfect specimens with complete basal parts are at hand, identification will not be easy.

* Nearly all species descriptions were written by Kim Hoenselaar; except the species *C. cyperoides*, *distans*, *dubius*, *impubes*, *leptocladus*, *neoschimperi/vexillatus*, *oblongoincrassatus*, *obsoletenervosus/pseudovestitus/vestitus*, *penzoanus*, *glaucophyllus/pseudoleptocladus*, *rotundus*, written or considerably changed by Henk Beentje, while *foliaceus* / *tenuispica*, *haspan*, *kwaleensis* and *mollipes*, *plateilema* are combined treatments.

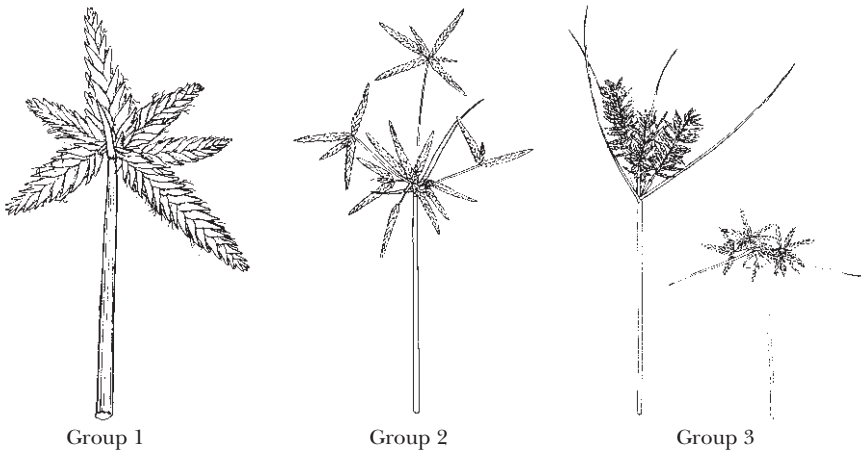


FIG. 23. Three main inflorescence types.

GROUP 1: CAPITATE SPECIES

- | | |
|---|--|
| 1. Inflorescence bright yellow | 2 |
| Inflorescence grey, white, cream or brown | 5 |
| 2. Head ovoid; glumes 6.4–10 × 2.7–4.6 mm;
nutlets black, smooth | 2. <i>C. flavissimus</i> p.149 |
| Head globose or nearly so; glumes 3.7–6.4
× 1.4–2.1 mm; nutlets grey, minutely
papillose | 3 |
| 3. Inflorescence bracts 2–3(–5); stem base
swollen, covered by fleshy scales | 3. <i>C. boreochrysocephalus</i> p.149 |
| Inflorescence bracts 1–2; stem base
slightly swollen, covered by non-fleshy
leaf scale remnants | 4. <i>C. chrysocephalus</i> p.150 |
| 5. Leaves absent, only leaf sheaths present
near culm base; nutlet surrounded by
corky yellow tissue; swamp or aquatic
species | 6 |
| Leaves present, with a blade more than
1 cm long; nutlets without corky tissue | 7 |
| 6. Culms 3–5 mm across; involucrel bract
8–12 mm long | 5. <i>C. colymbetes</i> p.151 |
| Culms 0.8–1.3 mm across; involucrel bract
0.5–2 mm long; | 6. <i>C. pectinatus</i> p.151 |
| (<i>C. graciliculmis</i> and <i>C. laevigatus</i> are sometimes leafless, with involucrel bracts
11–50 mm long; these never have corky nutlet tissue) | |
| 7. Leaves and culm hairy | 8 |
| Leaves and culm glabrous, though leaves
may be scabrid on margin | 9 |
| 8. Horizontal rhizome present; inflores-
cence whitish or pale yellow; glumes
3.1–4.2 mm long; nutlets black | 9. <i>C. albopilosus</i> p.155 |
| Rhizome absent; inflorescence golden
brown; glumes 2.3–2.9 mm long;
nutlets grey to red-brown | 10. <i>C. nyassensis</i> p.155 |

9. Annuals or very short-lived perennials
with very small root systems, culm base
not or only very slightly swollen 10
Perennials with either swollen culm
bases or rhizomes or stolons 16
(99. *C. perrieri* is a perennial with hardly swollen culm bases and occasionally
capitate heads)
10. Spikelets 2–4.5 × 1–2.2 mm; glumes
1–1.8 mm long; nutlets yellowish or
whitish 11
Spikelets 5–20 × 0.9–6 mm; glumes >
2.2 mm (except in 34. *C. amabilis*,
0.9–1.8 mm); nutlets grey, brown or
blackish 12
(*C. difformis* may have an annual form with spikelets 2.2–8.7 mm long, glumes
0.5–1 mm long and pale yellow-brown nutlets; *C. tanganyicensis* may have an
annual form with spikelets 4.6–12.7 × 1.4–1.6 mm, glumes 1.9–2.1 mm and
dark purple-black nutlets)
11. Nutlet yellow or orange, 1–1.2 mm long 11. *C. michelianus* p.156
Nutlet whitish, 0.5–0.6 mm long 12. *C. micromariscus* p.157
12. Leaf sheath 2–10 cm long; largest
involucral bract 13–44 cm long; glumes
rounded at apex; style 2-branched 13. *C. pustulatus* p.157
Leaf sheath less than 5 cm long; largest
involucral bract less than 15 cm long;
glumes pointed or mucronate at apex;
style 3-branched or unbranched 13
13. Largest involucral bract up to 15 cm long;
glumes 0.9–1.8 mm long 14. *C. amabilis* p.158
Largest involucral bract 0.7–5.5 cm long;
glumes 2.1–4 mm long 14
14. Nutlets grey to grey-brown; glume apex
mucronate, recurved 15
Nutlets purple-black; glume apex acute
or acuminate, not recurved 15. *C. boreobellus* p.158
15. Leaf blades 2–6 cm long; glumes
2.1–2.7 mm long 16. *C. kaessneri* p.160
Leaf blades 3–14 cm long; glumes
2.8–4 mm long 17. *C. rubicundus* p.160
16. Rhizomes or stolons present 17
Rhizomes and stolons absent 34
17. Glumes 1.4–2.4 mm long 18
Glumes 2.4–8.9 mm long 21
18. Involucral bracts at most 5 cm long 19
Involucral bracts 5–13 cm long 21. *C. pulchellus* p.163
19. Leaf blade 2–5 cm long; nutlets 0.6–
0.8 mm long 18. *C. holostigma* p.161
Leaf blade 19–50 cm long; nutlets 1–
1.5 mm long 20
20. Culm 1–1.6 mm across; leaf blade 2–4 mm
wide; nutlets papillose 19. *C. afroalpinus* p.162
Culm less than 1 mm across; leaf blade
less than 1 mm wide; nutlets smooth 7. *C. graciliculmis* p.153
21. Largest involucral bract at most 3.8 cm
long 22
Largest involucral bract usually much
longer 23

22. Involucral bracts 2; styles 3-branched; species of sea-dunes; **K** 7 22. *C. chordorrhizus* p.163
 Involucral bract 1; styles 2-branched; widespread species from a variety of habitats 8. *C. laevigatus* p.153
23. Stolons slender and ending in bulbs ... 23. *C. usitatus* p.164
 Stolons tough, not ending in bulbs, or stolons absent 24
24. Glumes/inflorescences white, pale to reddish brown or green 25
 Glumes/inflorescences dark red-brown to black 24. *C. rigidifolius* p.165
25. Inflorescence a globose head 26
 Inflorescence subglobose, composed of digitate clusters 29
26. Nutlets 0.7–0.8 mm wide; glume apex obtuse and frayed 25. *C. diurensis* p.166
 Nutlets 0.9–3.2 mm wide; glume apex acute or obtuse, never frayed 27
27. Nutlets 0.9–1.8 mm long (1.6–2.5 mm in *C. niveus*), brown or brown-black 28
 Nutlets 2.5–3.2 mm long, yellowbrown to olive green 26. *C. angolensis* p.167
28. Involucral bracts 6–13 mm wide; filaments 1–3 mm long, anthers 0.6–1.3 mm long 27. *C. mapanioides* p.167
 Involucral bracts 1–6 mm wide; filaments 4–7 mm long, anthers 1.6–3.7 mm long 28. *C. niveus* p.168
29. Largest involucral bract 3.5–10 cm long; nutlets 1.4–1.7 mm long; **T** 4, 7, on rocks in miombo woodland 29. *C. chinsalensis* p.171
 Largest involucral bract 13–56 cm long; nutlets 1.8–3.7 mm long (1.4–1.9 mm in *C. mapanioides*) 30
30. Leaf blade 1.6–7 mm wide; glumes green 31
 Leaf blade often wider, to 13 mm; glumes yellowish white or shiny to pale (reddish) brown 32
31. Spikelets 11–17 mm long; involucral bracts 5–9 30. *C. luteus* p.171
 Spikelets 5–10 mm long; involucral bracts 3–5 31. *C. neoschimperii* p.172
32. Glumes 5.1–8.1 × 3.1–4.8 mm; stamens 2; plant of sea dunes 20. *C. crassipes* p.162
 Glumes 2.4–6 × 1.3–3.5 mm; stamens 3; widespread plant of a variety of other habitats 33
33. Glumes 3.8–6 × 1.6–2.4 mm; spikelets 1.3–2.2 mm wide; nutlet 2.4–2.7 mm 32. *C. hemisphaericus* p.173
 Glumes 2.4–4.7 × 1.3–3.5 mm; spikelets 2.4–4 mm wide; nutlet 1.4–1.9 mm ... 27. *C. mapanioides* p.167
34. Glumes less than 2.5 mm long 35
 Glumes more than 2.5 mm long 42
 (note several taxa are keyed out each way)
35. Glumes 0.5–1 mm long; leaf width 2.4–8.3 mm 33. *C. difformis* p.173
 Glumes > 1.3 mm long; leaves < 5 mm wide 36

36. Nutlets 1.2–2.7 mm long; leaf sheath usually over 3.5 cm long 42
 Nutlets 0.5–1.1 mm long; leaf sheaths 0.5–3.5 cm long 37
37. Glume apex mucronate and recurved; spikelets 3–5 in number; **T** 7 only ... 34. *C. tanganyicanus* p.174
 Glume apex acute or acuminate, rarely rounded, never recurved; spikelets nearly always more than 5 38
38. Glumes and inflorescence dark red-brown; largest involucre bract 1–3.5 cm long; **T** 8 only 35. *C. castaneobellus* p.174
 Glumes and inflorescence pale-coloured; largest involucre bract usually (much) longer 39
39. Leaf < 1 mm wide; glumes 1.9–2.4 mm long; nutlets 0.4–0.8 mm long 40
 Leaf 1–3 mm wide; glumes 1.3–1.9 mm long; nutlets 0.2–0.4 mm long 41
40. Leaf sheath fibres pale; grassland, 120 m 36. *C. clavimux* p.175
 Leaf sheath fibres dark; rocks, 300–900 m 37. *C. kirkii* p.175
41. Glumes 0.5–1 mm wide, apex straight .. 38. *C. meeboldii* p.176
 Glumes 0.9–1.4 mm wide, apex ± recurved 21. *C. pulchellus* p.163
42. Inflorescence lobed or of digitate clusters 43
 Inflorescence capitate, ± globose 45
43. Inflorescence and glumes dark red-brown; **T** 7, on rocks 39. *C. nyererei* p.176
 Inflorescence and glumes whitish or golden brown 44
44. Inflorescence and glumes golden brown; spikelets 8–20 mm long 40. *C. grandibulbosus* p.177
 Inflorescence and glumes whitish; spikelets 4–7 mm long 41. *C. phillipsae* p.178
45. Glumes more than 5 mm long; spikelets usually more than 8 mm long 46
 Glumes less than 5 mm long; spikelets less than 8 mm long 51
 (note two taxa key out either way!)
46. Leaf base very swollen, to 3 cm across; leaves 6–9 mm wide; inflorescence head 25–30 mm across; **T** 6 only 42. *C. gigantobulbes* p.178
 Leaf base less swollen; leaves and inflorescence head narrower 47
47. Inflorescence head 20–25 mm across; culm round; **T** 4 only 43. *C. tatandaensis* p.178
 Inflorescence head narrower; culm triangular (except sometimes in *C. nduru*) 48
48. Largest involucre bract 0.5–1.5 cm long; nutlets smooth 44. *C. nduru* p.179
 Largest involucre bract usually much larger; nutlets minutely papillate 49
49. Spikelets 6–22 mm long, 5–10 mm wide; nutlets 2–2.1 mm in diameter 45. *C. margaritaceus* p.179
 Spikelets 2–8 mm long, 0.7–2 mm wide; nutlets 0.5–1.2 mm in diameter 50

50. Inflorescence and glumes white 46. *C. mollipes* p.180
 Inflorescence and glumes pale grey with darker margins 47. *C. plateilema* p.182
51. Leaf < 1 mm wide; largest involucre bract 3–6.2 cm long; nutlets black, smooth; T 6 only 48. *C. stramineoferrugineus* p.183
 Leaf more than 1 mm wide; largest involucre bract usually much longer; nutlets grey or brown, minutely papillose 52
52. Large plant with leaf sheaths 6.5–12 cm long; inflorescence and glumes dark red-brown 53
 Leaf sheaths 3–8 cm long; inflorescence and glumes pale-coloured or with red-brown spots; leaf 0.5–2.4 mm wide 54
53. Leaf 3–12 mm wide; lowermost involucre bract 22–36 cm long 49. *C. kerstenii* p.183
 Leaf 1–2.5 mm wide; lowermost involucre bract 8–20 cm long 51. *C. karisimbiensis* p.184
54. Inflorescence and glumes red-brown, or the glumes white above and dark purple below, or white with red-brown blotches; spikelets 2.9–5 mm long 55
 Inflorescence and glumes whitish or green or pinkish 56
55. Glumes dark purple (the lower) or creamy white (the middle and upper); leaf sheaths thin and splitting 50. *C. albosanguineus* p.184
 Glumes red-brown or white with red-brown blotches 47. *C. plateilema* p.182
56. Glumes pale, with dark central patch 57
 Glumes uniformly coloured 58
57. Nutlets 0.6–0.7 mm long 51. *C. karisimbiensis* p.184
 Nutlets 2.1–2.3 mm long 47. *C. plateilema* p.182
58. Leaf base with many fibrous remains of old leaf-bases; culms round 52. *C. kyllingiformis* p.185
 Leaf bases without or with fibres; culms triangular 59
59. Glumes 2–3 mm long, apex concave; spikelets 2–6 53. *C. dubius* p.186
 Glumes 3–6 mm long, apex acute or acuminate; spikelets many 60
60. Leaf blade 5–30 cm × 1–7 mm; glumes 1.1–1.4 mm wide; 0–2000(–2400) m .. 46. *C. mollipes* p.180
 Leaf blade 10–46 cm × 1–2.5 mm; glumes 1.5–1.7 mm wide; 1850–3050 m 51. *C. karisimbiensis* p.184

GROUP 2: ANTHELATE DIGITATE SPECIES

1. Basal leaves absent, or reduced and to 1 cm long 2
 Basal leaves present and > 5 cm long 5
2. Largest involucre bract less than 11 cm long 3
 Largest involucre bract 18–37 cm long . 54. *C. involucratus* p.187

3. Inflorescence with 5–13 primary branches, unequal 4
 Inflorescence with 50–100 primary branches, all of equal length; found near the coast 55. *C. prolifer* p.189
4. Culm 0.5–1.6 mm across; involucre bracts 2(–3) 56. *C. denudatus* p.190
 Culm 5–7 mm across; involucre bracts 1(–2) 57. *C. platycaulis* p.190
5. Slender annuals or short-lived plants with minute root system and without rhizomes, stolons or swollen culm bases 6
 Robust perennials with rhizomes, stolons or moderately to considerably swollen culm bases 17
6. Leaf blade 0.2–1.1 mm wide; glumes with recurved mucro 7
 Leaf blade usually wider (1–2.5 mm in *C. amabilis* and *C. submicrolepis*); glume apex obtuse, acute, acuminate or with a non-recurved mucro (slightly recurved in *C. foliaceus*, 2–10 mm wide leaves) 8
7. Culm 0.2–0.5 mm across; involucre bracts 0.3–0.7 mm wide; glumes 1.3–2.2 mm long; nutlet 0.5–0.8 mm long 58. *C. cuspidatus* p.191
 Culm 0.5–0.9 mm across; involucre bracts 1.5–2.3 mm wide; glumes 2.2–2.8 mm long; nutlet 1–1.1 mm long 59. *C. maderaspatanus* p.192
8. Spikelets up to 12 mm long 9
 Spikelets usually longer, 10–53 mm long 15
9. Glumes 2.7–6 mm long; spikelets up to 5 mm across 10
 Glumes 0.5–1.8 mm long; spikelets less than 2.4 mm across 11
10. Largest involucre bract 2–10 cm long; leaves scabrid near apex; glumes dark red-brown to black 39. *C. nyererei* p.176
 Largest involucre bract 13–44 cm long; leaves glabrous; glumes pale with spots 13. *C. pustulatus* p.157
11. Glumes whitish green, with acute apex; leaf blade 1–3 mm wide 60. *C. submicrolepis* p.192
 Glumes orange, red-brown or yellow-brown (sometimes green in *C. foliaceus* with leaves 2–10 mm wide), with mucronate apex 12
12. Leaves 1–14 cm long; culm 0.2–1.8 mm across; largest involucre bract 1–15 cm long 13
 Leaves 9–44 cm long; culm 1.4–4 mm across; largest involucre bract to 35 cm long 14
13. Stamen 1; nutlet 0.6–1 mm long 14. *C. amabilis* p.198
 Stamens 2–3; nutlet 0.5–0.6 mm long 61. *C. tenuispica* p.193
14. Glume 0.5–1 mm long; stamens 2 33. *C. difformis* p.173
 Glume 1.1–1.6 mm long; stamens 3 62. *C. foliaceus* p.193

15. Glumes light brown, acute; involucrel
bracts 5–9; 0–650 m altitude 63. *C. zollingeri* p.194
Glumes mucronate 16
16. Glumes orange; nutlets minutely papillose;
involucrel bracts 4–6; ± 510 m altitude 64. *C. sp. nov.* p.195
Glumes green-brown; nutlets smooth;
involucrel bracts 3–6; 0–1200 m altitude 65. *C. compressus* p.195
17. Plants without stolons or rhizomes 18
Plants with either stolons or rhizomes,
or both 20
18. Largest involucrel bract 2–10 cm long 39. *C. nyererei* p.176
Largest involucrel bract usually longer,
8–35 cm 19
19. Largest involucrel bract 1.3–2 mm wide;
glumes 4–6.4 mm long; **K** 4 66. *C. benadirensis* p.196
Largest involucrel bract 3–6.4 mm wide;
glumes 0.5–1 mm long; widespread 33. *C. difformis* p.173
20. Plant with bulbs on slender stolons 23. *C. usitatus* p.164
Plant without bulbs at end of stolons 21
21. Glumes 4.4–8.1 mm long; coastal, below
250 m 22
Glumes less than 4 mm long 23
22. Inflorescence compound; glumes obtuse 67. *C. holstii* p.196
Inflorescence simple; glumes acuminate
or mucronate 20. *C. crassipes* p.162
23. Glumes dark red-brown to black with
green midrib; plants from above 1700 m 24
Glumes not this combination of colours 25
24. Largest involucrel bract 3–5 cm long;
spikelets 4.5–7 mm long; **T** 2 19. *C. afroalpinus* p.162
Largest involucrel bract usually much
longer, 4.5–22 cm long; spikelets
7–18 mm long; widespread 24. *C. rigidifolius* p.165
25. Leaf blade more than 7 mm wide 26
Leaf blade less than 7 mm wide 31
[Note two species are keyed out both ways because of variability!]
26. Glumes rounded at apex 68. *C. derreilema* p.197
Glumes acuminate or mucronate 27
27. Plant with stolons; stamens 2 69. *C. dichrostachyus* p.198
Plants with rhizomes; stamens 3 28
28. Leaves 22–75 cm long, up to 13 mm wide;
largest involucrel bract 14–31 cm long 29
Leaves 54–200 cm long, 9–37 mm wide;
largest involucrel bract 30–125 cm long 30
29. Spikelets 4–12.5 mm long; glumes 2–2.7 ×
0.6–1.3 mm; nutlet 1.3–1.8 × 0.4–0.6 mm 70. *C. glaucophyllus* p.198
Spikelets 4–6 mm long; glumes 1.1–1.4 ×
0.6–0.9 mm (Uganda & Kenya) or
1.9–3 × 1.3–1.6 mm (**T** 4, 5, 7); nutlet
1.1–1.4 × 0.6–1.1 mm 71. *C. laxus* p.201
(for proliferous plants with small nutlets, see note under *glaucophyllus*)
30. Culm 0.8–2 m long; leaf blade 14–37 mm
wide; spikelets 3–7 mm long 72. *C. ajax* p.202
Culm 0.5–1.2 m long; leaf blade 9–16 mm
wide; spikelets 4–13 mm long;
inflorescence often proliferous 73. *C. fischerianus* p.202

31. Largest involucrel bract up to 14 cm long 32
 Largest involucrel bract longer, 14–31 cm
 long see lead 29!
32. Plants with stolons; small round tubers
 present at base of culm; glumes dark
 red-brown to black 74. *C. mwinilungensis* p.203
 Plants with ± woody rhizomes 33
33. Culm round, the base with many
 crowded stiff leaves and often with
 many persistent dead leaves as well ... 76. *C. tenax* p.203
 Culm triangular, with fewer non-stiff
 leaves and no persistent dead leaves ... 34
34. Glumes obtuse; spikelets falling off entire
 when mature; **T** 8 77. *C. deciduus* p.204
 Glumes acute or mucronate; rachilla
 persistent, lower glumes shed when
 mature 35
35. Glumes acute; largest involucrel bract
 1.5–2.2 cm long; culm less than 1 mm
 across 78. *C. matagoroensis* p.205
 Glumes mucronate; largest involucrel
 bract usually longer, nearly always
 more than 4 cm long; culm usually
 more than 1 mm across 36
36. Rhizome short; leaf blade glabrous;
 longest involucrel bract to 7 cm long 79. *C. haspan* p.205
 Rhizome usually creeping; leaf blade
 scabrid near apex; longest involucrel
 bract usually longer 37
37. Inflorescence simple; leaf blades 15–36 cm
 long 38
 Inflorescence compound; leaf blades
 22–75 cm long 70. *C. glaucophyllus* p.198
38. Culms many and densely tufted; glumes
 green to reddish brown; **U** 2 80. *C. afromontanus* p.207
 Culms scattered along the rhizome;
 glumes purple-black; **T** 6, 7 81. *C. purpureoviridis* p.208

GROUP 3: ANTHELATE SPACED SPECIES

1. Plants without basal leaf blades (though
 leaf sheaths may be present, and
 involucrel bracts are nearly always
 present just below the inflorescence) 2
 Plants with basal leaf blades present and
 > 5 cm long 4
2. Longest involucrel bracts scale-like,
 0.7–1.2 cm long; culm round, septate
 at regular intervals; widespread,
 altitude 0–1500 m 82. *C. articulatus* p.208
 Longest involucrel bracts much longer
 (> 6 cm); culm triangular to almost
 round, but never septate 3

3. Longest involucre bracts 6–18 cm long; inflorescence of simple spikes carrying spikelets; widespread, altitude 300–2000 m 83. *C. papyrus* p.209
 Longest involucre bracts 28–45 cm long; inflorescence of compound spikes, each primary spike carrying an umbel of secondary spikes carrying the spikelets; U 2, 4, altitude ± 1200 m 84. *C. pseudopilosus* p.211
4. Slender annuals or short-lived plants with minute root system and without rhizomes, stolons or swollen culm bases; or perennials with cylindrical (not swollen) lower culm and without rhizomes or stolons (for this last group, in case of doubt or incomplete material, see also 16–26, perennials without stolons or rhizomes) 5
 Robust perennials with rhizomes, stolons or moderately to considerably swollen culm bases 15
5. Glumes rounded at apex 6
 Glumes mucronate, acute or acuminate at apex 8
 Glumes obtuse: see *C. rotundus* which normally has stolons, but may sometimes look like an annual; glumes red-brown with translucent margin, obtuse at apex and with pale keel ending in a mucro that runs short just below the apex; widespread and common 85. *C. rotundus* p.211
6. Leaves and bracts glabrous; glumes 2.7–3.2 × 2.5–3 mm 13. *C. pustulatus* p.157
 Leaves and bracts scabrid on margins and veins 7
7. Glumes 1.4–1.9 mm long; widespread, moist sites between 750 and 1200 m 87. *C. iria* p.214
 Glumes 1.8–3.1 mm long; T 6, 7, rock crevices at 1700–2300 m 88. *C. longinvolucratus* p.214
 (and glumes ± 4.3 mm long, one specimen from U 2, Langdale-Brown 1423)
8. Spikelets less than 10 mm long 9
 Spikelets more than 10 mm long 12
 Note: one species is keyed both ways
9. Spikelets 2–3.5 mm long; glumes usually with darker patches of colour on pale background, 1–1.5 mm long, not recurved; primary branches of inflorescence 0.1–1.5 cm long 12. *C. micromariscus* p.157
 Spikelets nearly always longer; glumes ± uniform in colour (though the keel may be green), with recurved mucro; primary branches of inflorescence usually longer 10

10. Stamens 1; nutlets dark grey, 0.5–0.8 × 0.2–0.4 mm; widespread species of grassland, roadsides, ruderal sites 89. *C. squarrosus* p.215
 Stamens 3; nutlets red-brown, 1.3–2.2 × 0.3–1.5 mm 11
11. Primary inflorescence branches 2–8.5 cm long; nutlets 0.3–0.5 mm wide; **U** 3, 4, **T** 4, in wet habitats at 1050–1200 m . . 90. *C. reduncus* p.217
 Primary inflorescence branches 0.5–1.5 cm long; nutlets 1–1.3 mm wide; **K** 1, in *Commiphora* bushland 91. *C. soyauxii* p.217
12. Spikelets 4.8–12.4 × 3–5 mm; glume apex with recurved mucro 90. *C. reduncus* p.217
 Spikelets 10–32 × 1.5–2.9 mm (or rarely to 4.7 mm wide in *C. kituiensis*); glume apex acute or with mucro, but not recurved 13
13. Culm to 32 cm long; glumes with darker veins but without dark patch 64. *C. sp. nov.* p.195
 Culm 27–50 cm long in flowering specimens 14
14. Leaves 5–8 mm wide; inflorescence a compound anthela, the spikelets on secondary as well as on primary branches; glumes of uniform colour . . 92. *C. kituiensis* p.218
 Leaves 1.6–3.1 mm wide; inflorescence a simple anthela; glumes with darker patch on margin 93. *C. sphacelatus* p.218
15. Plants with swollen culm base, but without rhizomes or stolons 16
 Plants with rhizomes or stolons 27
16. Leaf blades 17–40 mm wide; nutlets black when mature; at or near coast . 94. *C. grandis* p.218
 Leaf blades less than 15 mm wide; mature nutlets not black 17
17. Inflorescence compound, the main branches with side branches, on which the spikelets are inserted 18
 Inflorescence simple, with spikelets inserted on main branches 19
18. Largest involucre bract 44–73 cm long; spikelets 2.5–6.7 mm long 95. *C. alopecuroides* p.219
 Largest involucre bract 24–39 cm long; spikelets 10–32 mm long 92. *C. kituiensis* p.218
19. Spikelets 7–11 × 5.9–7.1 mm 96. *C. afrovaricus* p.220
 Spikelets less than 3 mm wide 20
20. Spikelets 5–23 × 1–2.8 mm 21
 Spikelets less than 9 mm long (except sometimes *C. pluribracteatus*, but that has spikelets 0.7–1.1 mm wide) 23
21. Culm with thick ovoid pseudobulb 1.5–4 cm across; leaf blade 1.4–6 mm wide; glumes 3.3–5.5 mm long; widespread 97. *C. vestitus* p.220
 Culm base less than 1.5 cm across 22
22. Leaf blade 2.4–5.7 mm wide; glumes 2.8–4.8 mm long 98. *C. bulbosus* p.221
 Leaf blade 1.6–3.1 mm wide; glumes 2.2–2.9 mm long 93. *C. sphacelatus* p.218

23. Leaf blade 0.5–2 mm wide; glumes rounded at apex 24
 Leaf blade more than 2 mm wide; glumes acute to mucronate at apex 25
24. Largest involucre bract 8–40 cm long; spikelets 2.5–3.7 mm long 88. *C. longinvolucratus* p.214
 Largest involucre bract 2.5–6 cm long; spikelets 4.3–7.1 mm long 99. *C. perrieri* p.222
25. Largest involucre bract 2.5–10 cm long; leaf blade hairy 100. *C. pluribracteatus* p.223
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34. Inflorescence compound, the main branches with side branches, on which the spikelets are inserted 35
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38. Involucral bracts 1–3; rachilla remaining attached to inflorescence when glumes fall; nutlets 1.3–1.7 mm long 85. *C. rotundus* p.211
 Involucral bracts 4–8; rachillae falling off with glumes in entirety; nutlets 2.2–2.5 mm long 109. *C. ferrugineoviridis* p.231
39. Glume acute, acuminate or mucronate 40
 Glume obtuse, rounded or emarginate 41
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 Leaf blade 4.4–7.5 mm wide; spikelets in loose clusters, 4–10 per cluster; nutlets 1.1 mm long 111. *C. corymbosus* p.233
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 altitudes below 1600 m 51
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 nutlet 0.8–0.9 mm long 118. *C. endlichii* p.237
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 long; glumes 1.3–1.7 mm wide 108. *C. maculatus* p.230
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 spikelets in clusters of 3–10, 6–13 mm
 long 118. *C. endlichii* p.237
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 keel; in (seasonally) wet sites 85. *C. rotundus* p.211
 Largest involucre bract to 12 cm long,
 1–3 mm wide; spikelets 6–24 mm long;
 glumes with 4–8 veins on either side of
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59. Inflorescence simple, with spikelets
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73. Leaf blades 1–5 mm wide; on thin soil overlying rock; **K** 7 at 360 m 128. *C. kwaleensis* p.246
 Leaf blades usually wider; widespread above 650 m 74
74. Rhizome short, woody and nodular; inflorescence bluish grey 129. *C. maranguensis* p.246
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75. Culm round; inflorescence sub-digitate, dark red-brown 76. *C. tenax* p.203
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76. Spikelets in pseudo-umbels, each 1.4–3.5 mm long; glume apex mucronate and recurved 130. *C. renschii* p.247
 Spikelets usually much longer, in brush-like structures, not resembling compound umbels; glume apex never recurved 77
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 Leaf blade 3–4.7 mm wide; nutlets grey, 1.3–1.7 mm long 133. *C. kilimandscharicus* p.250
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 Glumes 1.9–2.8 mm long; nutlets 1.4–1.7 × 0.6–0.8 mm long, minutely papillose 125. *C. nutans* p.243
87. Spikelets less than 1 mm across, terete or angular; glumes acute 126. *C. digitatus* p.244
 Spikelets more than 1 mm across, compressed; glumes acuminate to mucronate 88
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 Leaf blade 2.9–8 mm wide; culm 2–3.8 mm across; nutlets dark brown, 1.4–1.7 mm long, minutely papillose 125. *C. nutans* p.243
89. Spikelets olive or grey-green with bluish tinge 129. *C. maranguensis* p.246
 Spikelets brown or red-brown 90
90. Leaf blade 1–5 mm wide; nutlets grey; **K** 7 at 360 m 128. *C. kwaleensis* p.246
 Leaf blade 2.5–11 mm wide; nutlets red-brown to black; above 650 m 124. *C. tenuiculmis* p.242

1. **Cyperus blismoides** *C.B. Clarke* in F.T.A. 8: 354 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 194, fig. 380 (1983). Type: Ethiopia, Schoata District near Enderdert, *Schimper* 580 (M!, lecto., chosen here)

Perennial, up to 30 cm tall, with a basal bulb covered by brown to blackish scales, 6 mm in diameter, with very slender stolons ending in new bulbs; culms 3.5–19.5 cm long, 0.4–1 mm wide, trigonous, with longitudinal grooves, smooth to sometimes slightly scabrid. Leaves crowded at the base, up to 35 cm long; leaf sheath pale brownish-green, 1.5–5 cm long; leaf blade linear, flat, 10–30 cm long, 0.8–3.8 mm wide, glabrous or sometimes scabrid near the apex, apex acuminate. Involucral bracts absent. Inflorescence paniculate, 4–10 spikelets spread out on a 3–10 cm long central axis, narrowly ovoid, 7–15 mm long, 0.8–1.9 mm wide; glumes reddish-brown, sometimes yellowish-brown, ovate, 2.2–5.6 mm long, 1.3–2.5 mm wide, keel greenish, excurrent, with lateral veins on either side, apex shortly mucronate. Stamens 3; filaments 2.4–3.8 mm long; anthers 1.6–2.9 mm long. Nutlet grey to brown, obovoid-ellipsoid, 1.7–1.8 mm long, 0.9–1 mm wide, minutely papillose in longitudinal rows.

KENYA. Garissa District: Garissa–Hagadera road, 42 km from Garissa, 27 Nov. 1978, *Brenan et al.* 14780!; Nairobi/Mackakos District: Rhino Point farm, 8 Apr. 1975, *Ombok* EA15858!; Tana River District: Tana River National Primate Reserve, Mchelelo 2.3 km N, 15 Mar. 1990, *Kabuye et al.* TPR 449!

TANZANIA. Moshi District: Ngare Nairobi, Mar. 1928, *Haarer* 1212!; Moshi District: Kilimanjaro, Leranpwa Village area, 29 Nov. 1993, *Grimshaw* 93/1112!; Kigoma District: Gombe Stream National Park, between Menke and Kakombe streams, Jan. 2000, *Gobbo* 581!

DISTR. **K** 1, 3, 4, 6, 7; **T** 2, 4; Eritrea, Ethiopia

HAB. In seasonally wet habitats, flooded grasslands, swampy areas, on shallow soils on rocky outcrops, also a weed in cultivation; 30–2150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus bulbosus* Vahl var. *spicatus* Boeck. in *Linnaea* 36: 301 (1870); Kük. in E.P. 4, 20 (101): 126 (1936). Type: Ethiopia, *Schimper* 580 (B, holo.)

NOTE. Distinct from *C. bulbosus* in the inflorescence consisting of a simple spike; and the absence of involucral bracts. The distribution areas are the same.

The same name in Hochst. in *Flora* 27: 102 (1844) is a *nom. nudum*.

2. *Cyperus flavissimus* Schrad. in Gött. Gel. Anz. 3: 2067 (1821). Type: South Africa, Hesse s.n. (LE, holo.)

Perennial, up to 58 cm tall; culms crowded, bases swollen and fused into a horizontal rhizome, 14–56 cm long, 1.1–1.9 mm wide, trigonous to rounded, with longitudinal grooves, glabrous. Leaves up to 42 cm long; leaf sheath almost black at the base, brown on the culm, 2.5–5 cm long, leaf sheaths at the base breaking up into thin fibres; leaf blade linear, flat, 14–37 cm long, (1.9–)2.9–4.3 mm wide, scabrid on margins and primary vein, apex acuminate. Involucral bracts leaf-like, spreading, 3–5, lowermost 4–11.5 cm long, 2.5–4.4 mm wide. Inflorescence capitate, spikelets in a dense head, 4–17, ovoid, 9–19 mm long, 4.8–10 mm wide, rachis straight; glumes bright yellow-orange, ovate to boat-shaped, 6.4–10.3 mm long, 2.7–4.6 mm wide, keel acute, with 6–8 conspicuous striations on either side of keel, apex acute. Stamens 3; filaments 5.4–8.7 mm long; anthers 3.6–4.3 mm long. Nutlet brown to black, obovoid, trigonous, 2.2–3.3 mm long, 1.6–2.5 mm wide, smooth, shortly apiculate.

TANZANIA. Ufipa District: Sopa Village, 11 Dec. 1956, *Richards* 7232!; Chunya District: just N of Vhunya, 50 km N of Mbeya, 7 Feb. 1974, *Bally & Carter* 16477!; Iringa District: Njombe, 34 km W of Makambako on Mbeya road, 6 Feb. 1989, *Gereau et al.* 6063!

DISTR. T 4, 7; Somalia, Swaziland, South Africa

HAB. Open woodland and grassland, on sandy soil; 1000–2000 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus obtusiflorus* Vahl var. *flavissimus* (Schrad.) Boeck. in *Linnaea* 35: 529 (1868); Kük. in *E.P.* 4, 20 (101): 286 (1936)

C. compactus Lam. var. *flavissimus* (Schrad.) C.B. Clarke in *Durand & Schinz, Consp. Fl. Afric.* 5: 552 (1894) & in *F.T.A.* 8: 320 (1902)

C. niveus Retz. var. *flavissimus* (Schrad.) R.W. Haines & Lye, *Sedges & Rushes E. Afr.*: 257 (1983) & *Fl. Somalia* 4: 130 (1995)

NOTE. Described by Haines and Lye as variety of *niveus*, but the striking colour and much larger nutlets caused me to accept this as a full species. As this former variety is being accepted as species, it is questionable if we should continue to recognize var. *tisserantii* and var. *ledermannii* at varietal level; I have chosen to do so, but more fieldwork could resolve this matter differently.

3. *Cyperus boreochrysocephalus* Lye in *Nordic Journ. Bot.* 3: 216 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 219, figs. 444, 445 (1983). Type: Uganda, Karamoja District: 5 km N of Lothaa, *Lye* 5462 (MHU, holo.; C, EA, K, P, UPS, iso.)

Perennial, slender, up to 61 cm tall, with a swollen culm-base covered by fleshy brown scales, the outer ones usually splitting up into blackish fibres; culms few, 12–60 cm long, 0.5–2 mm wide, trigonous, smooth. Leaves up to 36.5 cm long; leaf sheath brown to greyish, turning darker when older, 2.4–6.5 cm long, slightly torn at base; leaf blade linear, flat or sometimes folded, 6–30 cm long, 1.2–4 mm wide, scabrid at least on margins and primary vein, apex acute to acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–3, lowermost 2.7–13 cm long, 1.3–2.2 mm wide. Inflorescence capitate, globose, 9–16 mm long, 9–14 mm wide; spikelets in a dense head, many per head, lanceolate, 5.1–9 mm long, 0.7–1.7 mm wide, 2-flowered, perfecting 1(–2) nutlets; glumes yellow, set far apart, oblong-elliptic to lanceolate, 3.8–6.2 mm long, 0.8–1.9 mm wide, keel with 9–20 parallel veins on either side, apex very obtuse. Stamens 3; filaments 4–6.1 mm long; anthers 1.6–2.5 mm long. Nutlet grey, narrowly oblong-ellipsoid, trigonous, 1.9–3 mm long, 0.5–0.8 mm wide, acuminate at apex, minutely papillose.

UGANDA. Karamoja District: Kokumongole, 28 May 1939, *Thomas* 2853! & Bukora County, 5–6 km N of Lothaa, 10 May 1970, *Lye & Katende* 5462! & Kasumeri Estate, Moroto, May 1971, *Wilson* 2050!

KENYA. West Suk District: 24 km NNW of Kapenguria, 20 July 1961, *Bogdan* 5170!; Trans Nzoia District: NE Mt Elgon, 12 May 1971, *Mabberley* 1128!; Narok District: 8 km from Aitong on track to Ngore Ngore, 12 Dec. 1963, *Verdcourt* 3828D!

TANZANIA. Musoma District: Serengeti National Park, Seronera, 21 Mar. 1961, *Greenway* 9868! & Nyaraswiga plain between Seronera and Seronera Hill, 31 Mar. 1967, *Braun* 199! & headwaters of Mara River, North Mara, 10 Nov. 1953, *Tanner* 1762!

DISTR. U 1; K 2, 3, 5, 6; T 1; not known elsewhere

HAB. Grassland, bushed grassland; 1100–2200 m

CONSERVATION NOTES. Least concern (LC)

SYN. ?*Mariscus remotus* C.B. Clarke in F.T.A. 8: 382 (1901). Type: Congo-Kinshasa, River Lavo (Luvoi), *Descamps* s.n. (BR, holo.)

?*Cyperus remotus* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 561 (1936)

NOTE. This might be synonym for *C. remotus* from the Congo. The description for *remotus* is incomplete and I was unable to see the type specimen.

4. ***Cyperus chrysocephalus*** (*K. Schum.*) Kük. in *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exp.*: 5 (1921); Haines & Lye, *Sedges & Rushes E. Afr.*: 220, fig. 446 (1983). Type: Angola, Kinebe R., Malungue, *Baum* 311 (K!, M!, syn.) & Mapalauna, *Baum* 311a (K!, syn.)

Perennial, up to 78 cm tall, with a somewhat swollen tussocky base, covered by black and dark brown fibrous remains of leaf sheaths; culms tufted, 18–77 cm long, 0.6–1.6 mm wide, trigonous, with a few deep longitudinal ridges, glabrous. Leaves up to 42 cm long; leaf sheath black, broken up into fibres when older, 4–8 cm long; leaf blade linear, folded to canaliculate, 13–34 cm long, 1.3–1.9 mm wide, slightly scabrid on margins, apex often showing signs of burning. Involucral bracts leaf-like, spreading to recurved, 1–2, lowermost 1.2–9(–17) cm long, 1.5–2 mm wide. Inflorescence capitate, a dense globose head, 7–12 mm long, 7–11 mm wide; spikelets many per head, linear-lanceolate, 5.2–8.9 mm long, 1.1–1.3 mm wide, producing one nutlet only; glumes yellow, linear-lanceolate, 3.8–6 mm long, 1.4–2 mm wide, keel flat with many veins on either side, apex obtuse. Stamens 3; filaments 3.7–5.8 mm long; anthers 1.9–2.4 mm long. Nutlet greyish, linear-oblong, 2.8–3.2 mm long, 0.6–0.8 mm wide, minutely papillose.

TANZANIA. Ufipa District; Kasapa Village, 9 Mar. 1957, *Richards* 8596!; Iringa District: Lupembe, 10 Nov. 1931, *Schlieben* 1410!; Songea District: ± 11 km W of Songea in Ulamboni valley, 31 Dec. 1955, *Milne-Redhead & Taylor* 8010!

DISTR. T 4, 7, 8; Congo-Kinshasa, Burundi, Angola, Zambia

HAB. Boggy grassland or on thin soil overlying rock; 950–1800 m

CONSERVATION NOTES. Probably Least Concern (LC) due to distribution

SYN. *Mariscus chrysocephalus* K. Schum. in *Warburg, Kunene–Sambesi-Exp.*: 178 (1903)

NOTE. Close to *C. chrysocephalus* is a ?new species, *Hoenselaar* ined. Four specimens from around Lake Victoria are very small, have a head consisting of 1–3 spikes, and are geographically very localized, well away from the distribution area of *C. chrysocephalus sensu stricto*.

Description: perennial, slender, up to 19 cm tall, the base slightly swollen, and covered in the fibrous remains of old leaf sheaths, sometimes stoloniferous; culms solitary, 7–17.5 cm long, 0.6–1.1 mm wide, trigonous, with a few longitudinal ridges, glabrous. Leaves up to 19.5 cm long; leaf sheath brown, turning black and fibrous when old, 1.8–3.5 cm long; leaf blade linear, folded, 6.2–16 cm long, 1.8–3.7 mm wide, slightly scabrid on margins, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–4, lowermost 2.9–9.8 cm long, 1.6–3 mm wide. Inflorescence capitate, with an irregular to triangular outline, consisting of one central spike and 1 or 2 lateral spikes, 5–11 mm long, 4–12 mm wide; spikelets many per inflorescence, linear-lanceolate, 4.4–4.9 mm long, 0.8–1 mm wide, falling off entirely; glumes golden to yellowish-orange, linear-lanceolate, 2.1–4 mm long, 1–2 mm wide, keel flat with several veins on either side, apex obtuse. Stamens 3; filaments 3–3.5 mm long; anthers 1.3–2 mm long. Nutlet not seen.

UGANDA. Mengo District: Lake Victoria, Kaazi, 9 Sept. 1961, *Rose* 231!

TANZANIA. Ngara District: West Lake Province, Murgwanza, Bugufi, 2 Dec. 1960, *Tanner* 5398 & Nyakisasa, Bushubi, 16 Feb. 1961, *Tanner* 5834 & Kabogo, Shanga, 6 Mar. 1961, *Tanner* 5855!

DISTR. U 4; T 1; not known elsewhere

HAB. On shallow soil on rocks; 1150–1800 m

5. *Cyperus colymbetes* Kotschy & Peyr. in Pl. Tinn. 49. t. 24 (1867); C.B. Clarke in F.T.A. 8: 317 (1902); Kük. in E.P. 4, 20 (101): 289 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 173, fig. 329 (1983) & Fl. Somalia 4: 119 (1995). Type: Sudan, *Tinne* s.n. (W, holotype.)

Perennial, fairly robust, up to 54 cm tall, with an erect or creeping subwoody rhizome from which new culms develop at irregular intervals, often floating; culms green, 20–70 cm long, 3–5 mm wide, triquetrous to winged, smooth. Leaves with leaf sheath reddish-brown to purple, very wide, ending in a thin ligule and a thick triangular apex, short basal sheaths as short as 1 cm, longer sheaths up to 20 cm long; leaf blade absent. Involucral bract leaf- to bract-like, sometimes culm-like, erect, 8–12 mm long. Inflorescence capitate; spikelets 3–15 (–20) per head, ovoid, 6–15 mm long, 4–10 mm wide, rachilla straight; glumes reddish-brown, ovate, 4.2–6 mm long, 2.4–3.7 mm wide, with large surface cells, 3–9-veined, keel thicker, scabrid towards apex, apex acute. Stamens 3; filaments 3–5.4 mm long; anthers 0.9–1.6 mm long. Nutlet brown, surrounded by yellow sterile tissue, 4.2–5.5 mm long, 1–1.4 mm wide, nutlet ellipsoid-oblong, 1.7–2.4 mm long, 0.9–1.1 mm wide, minutely papillose.

UGANDA. Toro District: Kanguranga Island, Lake George, *Lock* 68/23

KENYA. Central Kavirondo District: Rabout W Kano Nyanza, 13 Aug. 1958, *Mahan* 38!; Tana River District: Tana River National Primate Reserve, middle road 3.3 km, 14 Mar. 1990, *Kabuye et al.* TPR382!

TANZANIA. Lushoto District: Amani, 18 Feb. 1950, *Verdcourt* 77!; Ufipa District: Rukwa N, 15 June 1956, *Robinson* 1662!; Uzaramo District: Msimbazi pool, 6 km WSW of Dar es Salaam centre, 14 Nov. 1971, *Wingfield* 1793!

DISTR. U 2; K 5, 7; T 3, 4, 6; Sudan, Somalia, Mozambique

HAB. Muddy areas, on swampy ground, in (dried-up) pools and in shallow water; 10–950 m

CONSERVATION NOTES. Least Concern due to its wide distribution

SYN. *Anosporum colymbetes* (Kotschy & Peyr.) Boeck. in Bot. Zeit. (Berlin) 27: 26 (1869)

NOTE. This species is very closely related to *C. pectinatus* Vahl. Both species have nutlets surrounded by corky tissue to make it long-floating. *C. colymbetes* has much thicker and fewer culms which are almost winged. It also has larger involucral bracts.

6. *Cyperus pectinatus* Vahl in Enum. Plant. 2: 298 (1805); Haines & Lye, Sedges & Rushes E. Afr.: 172 (1983) & Fl. Eth. 6: 439, fig. 212.70 (1997). Type: Guinea, *Iseri* s.n. (C, holotype.)

Perennial, up to 122 cm tall, with a short rhizome, sometimes stoloniferous, roots pale to reddish-brown, sometimes spongy; culms tufted, 25–120 cm long, 0.8–1.3 mm wide, rounded to trigonous, with longitudinal grooves, smooth, when young culms erect, when mature culms often curving and eventually the inflorescence touching the ground. Leaves up to 14 cm long; leaf sheath greyish-black to purple, 1.5–14 cm long; leaf blade absent, the sheath ending in a short triangular limb. Involucral bracts culm-like, erect, 1–2, 0.5–2 mm long, 1–1.5 mm wide. Inflorescence capitate; spikelets in a digitate crowded head, 2–11 (–20) per head, ovoid-lanceolate, 5.6–16 (–28) mm long, 3.5–6 mm wide, rachis straight; glumes reddish-brown, ovate to boat-shaped, 3.3–5.5 mm long, 1.7–2.4 mm wide, keel green, 3-veined, scabrid, apex obtuse to acute. Stamens 3; filaments 3.5–4.4 mm long; anthers 1.4–1.8 mm long. Nutlet surrounded by spongy yellow, corky tissue, 2.7–4 mm long, 0.8–1.3 mm wide, nutlet itself (visible part) brown, lanceolate, 1.4–2 mm long, 0.5–0.8 mm wide, smooth. Fig. 24, p. 152; fig. 27; 1–3, p. 169.

UGANDA. Kigezi District: Rubanda County, Niomba Swamp, Lake Bunyonyi, 22 Apr. 1970, *Lye et al.* 5226!; Masaka District: Lake Kayonje, 5 Nov. 1961, *Rose* 10231!; Mengo District: Kujo Lake, Kampala, 29 Aug. 1935, *Chandler & Hancock* 15!

KENYA. Masai District: Nguruman, ± 9 km NE of Entasekera on Emungurorkine River, 6 Oct. 1977, *Fayad* 246!



FIG. 24. *CYPERUS PECTINATUS*— 1, habit, $\times \frac{2}{3}$; 2, inflorescence, $\times 1\frac{1}{2}$; 3, spikelet, $\times 3$; 4, glume, $\times 10$; 5, flower, $\times 10$; 6, nutlet, $\times 10$. 1 from *Peter* 8794, 2–4 & 6 from *Greenway & Kanuri* 12298, 5 from *Richards* 24601. Drawn by Juliet Williamson.

TANZANIA. Arusha District: Longel Swamp, Ngurdoto National Park, 6 Nov. 1965, *Greenway & Kanwiri* 12298!; Pare District: near Ruvu River, 5 Nov. 1955, *Milne-Redhead & Taylor* 7053!; Mpanda District: Katavi National Park, N edge of Lake Katavi, 11 June 1980, *Hooper & Townsend* 1945!

DISTR. U 2, 4; K 6; T 2–4, 7; widespread in west and central Africa down to South Africa

HAB. In swamps, lake edges, and in stagnant shallow water, sometimes floating; 750–2300 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus nudicaulis* Poir. in *Encycl.* (Lamarck) 7: 240 (1806); C.B. Clarke in *F.T.A.* 8: 316 (1902); Kük. in *E.P.* 4, 20 (101): 284 (1936). Type: Madagascar, *du Petit Thouars* s.n. (P, hol.).

NOTE. This species is closely related to *C. colymbetes*. Both species have nutlets surrounded by corky tissue to make them long-floating. The culms of *C. pectinatus* however are higher in number and much more slender than those of *C. colymbetes*, and are rounded to trigonous, whilst those of *C. colymbetes* are almost winged.

7. ***Cyperus graciliculmis*** Lye in *Nordic Journ. Bot.* 3: 224 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 161, fig. 299 (1983). Type: Tanzania, Kilosa District: Ukaguru Mts, Mt Mnyera, *Thulin & Mhoro* 2809 (UPS, holo.; K!, iso.)

Perennial, very slender, up to 55 cm tall, with a short creeping rhizome; culms tufted, crowded and many, slender, 20–50 cm long, 0.5–0.6 mm wide, trigonous to angular, wiry, smooth. Leaves up to 50 cm long; leaf sheath light reddish-brown above, dark purplish below, sometimes only ending in a short brown or green scabrid limb; when leaf blade present, filiform, wiry, flat, 20–50 cm long, 0.5–0.6 mm wide, glabrous, apex acute. Involucral bracts leaf-like, spreading, 2–5, lowermost 1.5–3.5 cm long, 0.5–0.6 mm wide. Inflorescence capitate, spikelets in digitate clusters, 2–3 per cluster, sessile, more rarely with an additional stalked spikelet on a 2–5 mm long peduncle, linear-lanceolate, 3.5–6.3 mm long, 1.5–2.5 mm wide, rachis straight; glumes reddish-brown, ovate, 2–2.4 mm long, 0.9–1.1 mm wide, glabrous, keel green. slightly excurrent, apex acute. Stamens 3; filaments 1.7–1.8 mm long. Nutlet reddish brown, ellipsoid, 1–1.2 mm long, 0.5–0.6 mm wide, almost smooth, sometimes the style base persistent on the young nutlet as a short mucro.

TANZANIA. Tanzania, Kilosa District: Ukaguru Mts, Mt Mnyera, 1 June 1978, *Thulin & Mhoro* 2809!

DISTR. T 6; known only from the type

HAB. On very steep slopes, partly with vertical bare rocks, on summit edge; 2075 m

CONSERVATION NOTES. Probably at least Vulnerable (VU-D1)

NOTE. This species is very easy recognizable due to its wiry and slender habit, and is very different from all other African species.

8. ***Cyperus laevigatus*** L. in *Mant. Pl.* 2: 179 (1771); Kük. in *E.P.* 4, 20 (101): 321 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 264, fig. 539 (1983) & *Fl. Somalia* 4: 132 (1995) & *Fl. Eth.* 6: 459 (1997). Type: South Africa, Cape of Good Hope, *König* s.n. Lectotype: Herb. Linn. No. 70.13 (LINN), chosen by Tucker & McVaugh in *McVaugh* (ed.), *Fl. Novo-Galiciana* 13: 308 (1993)

Perennial, up to 96 cm tall, with a long creeping rhizome, to 30 cm or more long, 1–5 mm in diameter, pale brown to purple-black; culms tufted, crowded, or spaced along the rhizome, 3–95 cm long, 0.5–4.4 mm wide, rounded to trigonous, sometimes triquetrous, glabrous, the base covered with short scales. Leaves up to 16 cm long; leaf sheath pale to dark purple brown, 1.5–14 cm long, rather loose; leaf blade sometimes absent but when present linear, inrolled, almost culm-like, 2.2–6.5 cm long, 0.5–2 mm wide, scabrid on margin but appears glabrous as margins are inrolled, apex acute. Involucral bract one, leaf-like, upright and continuing in the direction of the culm, making the inflorescence appear lateral, 1.1–3.8 cm long, 1–1.5 mm wide. Inflorescence capitate; spikelets 1 to 24 per head, loosely crowded, linear to lanceolate, 5–25 mm long, 1.5–4.1 mm wide, rachis

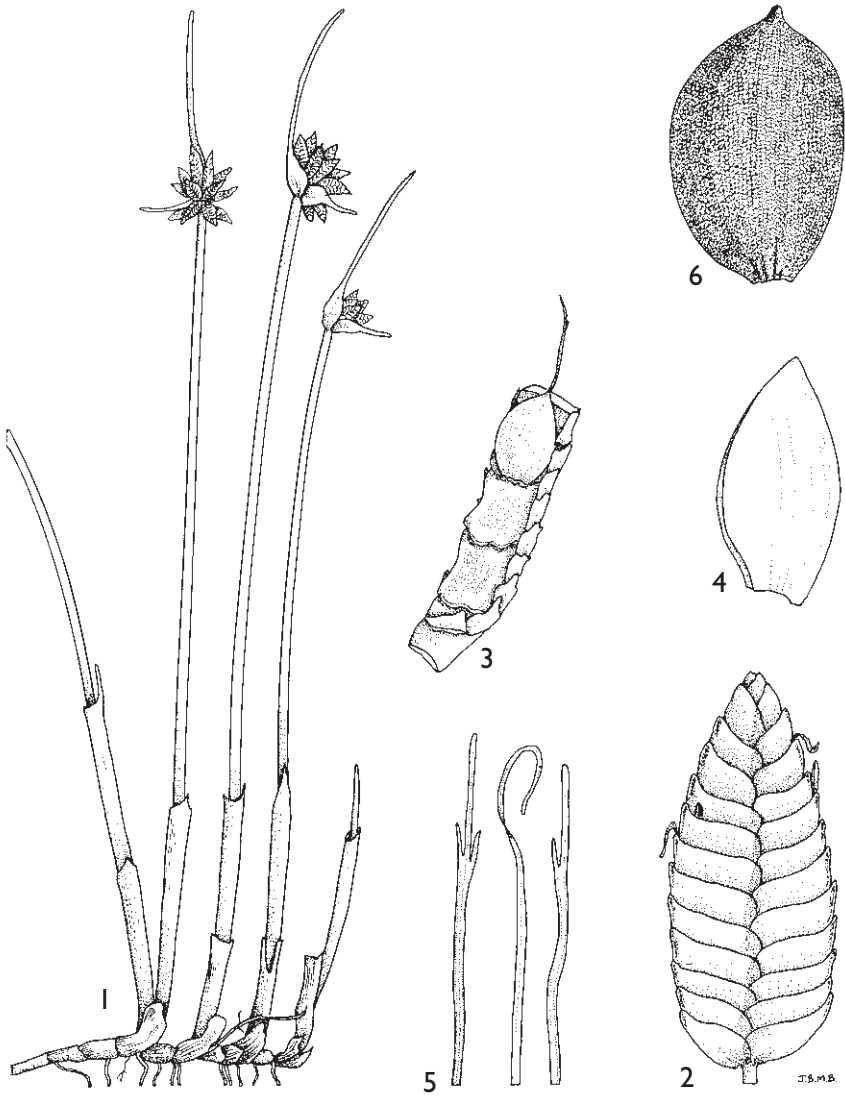


FIG. 25. *CYPERUS LAEVIGATUS* — 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 7$; 3, spikelet rachilla, $\times 15$; 4, glume lateral view, $\times 10$; 5, style and branches, showing variation within a single spikelet, $\times 17$; 6, nutlet, $\times 20$. All from *Pooley* 2183. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

straight to curved; glumes pale yellowish with reddish brown dots, sometimes dark red to almost black on the wings, broadly elliptic, 2.5–4.1 mm long, 1.8–2.1 mm wide, very closely overlapping, apex acute, shortly mucronate or frayed. Stamens 2; filaments 2.7–3.2 mm long; anthers 1.2–1.9 mm long. Style with 2 long linear branches. Nutlet grey to brown, often shiny, obovoid to ellipsoid, flat on one side, rounded on the other, 1.4–2.1 mm long, 0.8–1.2 mm wide, shortly apiculate, smooth but with distinct rather large isodiametric surface-cells. Fig. 25.

UGANDA. Toro District: Katwe, Sept. 1953, *Lind* 210!; Toro District: Bwamba Forest, Hot Springs, 2 Feb. 1945, *Greenway & Eggeling* 7069!; Busoga District: Lake Nakuwa, Bolannogi, 28 Jan. 1953, *Wood* 214a!

KENYA. Turkana District: Elliye Springs, near W shore of Lake Turkana [Rudolf], 23 Jan. 1971, *Wendelberger* 163!; Naivasha District: Hells Gate, 12 Sept. 1964, *Richards* 19149!; Voi District: Tsavo National Park East, Galana River 40 km from Voi Gate W of Lugard Falls, 12 Jan. 1967, *Greenway & Kanuri* 13039!

TANZANIA. Musoma District: Engari Nanyuki, 6 Apr. 1962, *Greenway & Watkins* 10572!; Masai District: head of Olduwai Gorge, 22 Dec. 1962, *Newbould* 6419!; Ufipa District: Lake Sundu, 10 Dec. 1958, *Richards* 10286!

DISTR. U 2, 3; K 1–7; T 1–7; widespread in Africa

HAB. On (salt-)lake shores, streambanks, in (temporary) pools and flood areas, and near hot springs, often forming dense mats; sea-level to 2300 m

CONSERVATION NOTES. Least Concern due to its wide distribution

SYN. *Pycurus laevigatus* (L.) Nees in *Linnaea* 10: 130 (1836)

Cyperus subaphyllus Boeck. in *Verh. Bot. Ver. Brandenburg* 30: 139 (1888). Type: Namibia, Lüderitz, *Schinz* s.n. (B, holo.)

Juncellus laevigatus (L.) C.B. Clarke in *Fl. Brit. India* 6: 596 (1893) & in *F.T.A.* 8: 308 (1902)

Cyperus laevigatus L. var. *subaphyllus* (Boeck.) Kük. in *E.P.* 4, 20 (101): 325 (1936)

C. laevigatus L. forma *atratus* Peter ex Kük. in *E.P.* 4, 20 (101): 325 (1936). Type: Tanzania, Lake Mogad in Ngorongoro Crater, *Peter* 43163 (B!, K!, P!, WAG!, syn); Irangi, near Kondoia Irangi, *Peter* 44546 (B!, isosyn.) & 44549 (B!, syn.); small lake near Meru, *Peter* 4684 (B!, K!, syn.) & 2685 (B!, syn.)

NOTE. Confused with *Pycurus* but the flat side of the nutlet is pressed against the rachilla, while in *Pycurus* one of the edges is pressed into the rachilla.

9. ***Cyperus albopilosus*** (*C.B. Clarke*) Kük. in *Bot. Notis.* 1934: 69 (1934); Haines & Lye, *Sedges & Rushes E. Afr.*: 217, figs. 438, 439 (1983) & *Fl. Eth.* 6: 466 (1997). Type: Malawi, Zomba, *Whyte* s.n. (K, holo.)

Perennial, up to 48 cm tall, with a horizontal somewhat moniliform rhizome; culms few, 15–47 cm long, 0.7–1.3 mm wide, trigonous, minutely but densely hairy. Leaves up to 21.5 cm long, up to halfway on the culm; leaf sheath pale green, 2.5–10.5 cm long; leaf blade linear, flat, rather stiff, 1–11 cm long, 3.1–4 mm wide, densely hairy on upper surface, apex acute. Involucral bracts leaf-like, spreading to reflexed, 2–3, lowermost 1.5–6 cm long, 3–4.2 mm wide. Inflorescence capitate, globose, with a single spike 7–9 mm long, 8–10 mm wide; spikelets many per inflorescence, lanceolate, 3.2–5.5 mm long, 1–1.3 mm wide; glumes dirty white to yellowish, lanceolate, 3.1–4.2 mm long, 1.7–2 mm wide, keel with many veins on either side, apex (long) acuminate. Stamens 3; filaments 2.2–4.1 mm long; anthers 0.9–1.1 mm long. Nutlet almost black, obovoid, trigonous to triquetrous, 1.9–2.1 mm long, 0.9–1 mm wide, minutely papillose.

KENYA. Trans-Nzoia District: Kitale, 12 May 1953, *Bogdan* 3727!

TANZANIA. Mpanda District: Silkub Highlands, 6 Dec. 1956, *Richards* 7171!; Ufipa District: 16 km S of Sumbawanga, 30 Dec. 1961, *Robinson* 4829!; Songea District: near R. Kurira 32 km E of Songea, 19 Jan. 1956, *Milne-Redhead & Taylor* 8365!

DISTR. K 3; T 4, 7, 8; Ethiopia, Zambia, Malawi, Zimbabwe

HAB. Grassland and wooded grassland: 900–2000 m

CONSERVATION NOTES. Least Concern (LC); although rare in the Flora area, outside the area it is widespread and it has a common habitat.

SYN. *Mariscus albopilosus* C.B. Clarke in *F.T.A.* 8: 394 (1902)

10. ***Cyperus nyassensis*** (*Podlech*) Lye in *Nordic Journ. Bot.* 2 (1982) & Haines & Lye, *Sedges & Rushes E. Afr.*: 211, fig. 424 (1983). Type: Malawi, Nyika Plateau W valleys, *Robinson* 3083 (M, holo.)

Perennial, tussocky, up to 36 cm tall, with a succulent culm; culms tufted, 14–34 cm long, 1–1.3 mm wide, trigonous to almost terete, hairy, sometimes only in the upper part. Leaves up to 23.5 cm long; leaf sheath greyish to pale brown, 3.5–8 cm long, hairy, covering the culm base; leaf blade linear, 8–20 cm long, 1.3–3 mm wide, villous on lower surface, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 3–4, lowermost 2.5–12 cm long, 1.3–2 mm wide, hairy on lower surface. Inflorescence capitate; spikelets in dense spikes, spikes sessile, 3–6 per head, 20–44 spikelets per spike, spikelets linear-lanceolate, 2.2–3.1 mm long, 0.5–9 mm wide, falling off entirely when mature; glumes golden to reddish-brown, lanceolate-obovate, 2.3–2.9 mm long, 1–1.2 mm wide, hairy to almost glabrous, keel slightly excurrent, apex slightly mucronate. Stamens 3; filaments 2.5–3.1 mm long. Nutlet grey to reddish-brown, ellipsoid, 1.6–2 mm long, 0.6–0.7 mm wide, minutely papillose.

TANZANIA. Mbulu District: Great North Road, Pienaars Heights or Dauar, between Babati and Berekò, 200 km S of Arusha, 6 Jan. 1962, *Polhill & Paulo* 1080!; Ufipa District: Sumbawanga, Ilemba, 18 Mar. 1957, *Richards* 8806!; Songea District: Matengo Hills, Lupembe Hill, 29 Feb. 1956, *Milne-Redhead & Taylor* 8914!

DISTR. T 2, 4, 8; Malawi

HAB. In rock crevices and on shallow soil over rocks; 1650–2100 m

CONSERVATION NOTES. Only 4 collections known from Tanzania; data on threat, and from Malawi, needed.

SYN. *Mariscus nyasensis* Podlech in Mitt. Bot. Staatss. München 4: 114 (1961)

11. *Cyperus michelianus* (L.) Link, Hort. Bot. Berol. 1: 3–3 (1827)

Annual, tussocky, up to 23 cm tall; culms crowded, 1–22 cm long, 0.5–1.5 mm wide, trigonous, glabrous. Leaves up to 18 long; leaf sheath reddish to purple, 0.7–3 cm long; leaf blade linear, flat but often folded and twisted when dried, 1–15 cm long, 1–2 mm wide, scabrid on margin and primary vein near apex. Involucral bracts leaf-like, spreading, 4–6, lowermost 3–12 cm long, 1.5–2.5 mm wide. Inflorescence capitate, made up out of several spikes, spikelets crowded, many per spike, oblong-lanceolate, 2.5–4.5 mm long, 1–1.8 mm wide; glumes uncoloured below, pale reddish-brown above, ovate-lanceolate, 1.3–1.8 mm long, 0.7–1 mm wide, keel green, rather thick, apex slightly mucronate. Stamens 1–2; filaments 1.8–2 mm long; anthers 0.3–0.7 mm long. Style 2-branched. Nutlet yellow to apricot, oblong, lenticular with one flat and one rounded side, 1–1.2 mm long, 0.3–0.4 mm wide, minutely papillose.

subsp. *pygmaeus* (Rottb.) Asch. & Graebn. in Syn. Mitteleur. Fl. 2(2): 273 (1904); Kük. in E.P. 4, 20 (101): 312 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 262, figs. 532, 533 (1983) & Fl. Somalia 4: 130 (1995). Type: India, *König* s.n. (C, holo.)

KENYA. Norther Frontier District: South Turkana, Ekidit, Ayangyangi Swamp, 12 June 1970, *Mathew & Gwynne* 6775!; Embu District: Rikana, 29 Nov. 2000, *Smith, Beentje & Muasya* 255!; Kilifi District: Tsavo National Park East, Dida Harea to Ndara, signpost 149–139, km 1.7, 30 Jan. 1971, *Faden & Faden* 72/139!

TANZANIA. Tanga District: Serewa, Mkwaja, Pangani, 27 Nov. 1955, *Tanner* 2365!; Kilosa District: 9 km from HQ, 13 July 1973, *Greenway & Kanuri* 15442!; Iringa District: by great Ruaha River on Great North Road crossing, 17 July 1956, *Milne-Redhead & Taylor* 11239!

DISTR. K 1, 4, 7; T 3, 6–8; Ghana, Nigeria, Sudan, Ethiopia, Somalia, Namibia; Mediterranean, S and E Asia, Australia

HAB. In seasonally wet habitats, in damp sandy places near pools and in mud; 30–1200 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution and common habitat

SYN. *Cyperus pygmaeus* Rottb., Descr. Icon. Rar. Pl.: 20 (1773)

Pycrus pygmaeus (Rottb.) Nees in Linnæa 9: 283 (1834)

Juncellus pygmaeus (Rottb.) C.B. Clarke in Fl. Brit. India 6: 596 (1893) & in F.T.A. 8: 308 (1902)

12. *Cyperus micromariscus* Lye in Nordic Journ. Bot. 3: 216 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 292, figs. 605, 606 (1983). Type: Tanzania, Uzaramo District: Msimbazi, near Dar es Salaam, *Haines* 4144 (MHU, holo.; K!, iso.)

Annual, slender, up to 12 cm tall, with a minute rootsystem; culms tufted, 1–10 cm long, 0.5–1.5 mm wide, trigonous, smooth. Leaves up to 12.5 cm long; leaf sheath green to purple, 1–2.7 cm long, much wider than the culm; leaf blade linear, flat, 2–9.8 cm long, 0.5–2.4 mm wide, scabrid on margin and primary vein, particularly near the apex, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–9, lowermost 5.2–10 cm long, 1–3 mm wide. Inflorescence capitate or a simple anthela, primary branches 0–4, 0.7–1.5 cm long; spikes sessile and at the end of primary branches, 5–10 mm long, 4–8 mm wide; spikelets in dense clusters, many per spike, ovoid, 2–3.5 mm long, 1.5–2.2 mm wide, falling off entirely when mature; glumes uncoloured but with reddish brown patches especially near the base, 1–1.5 mm long, 1.2–1.3 mm wide, midrib very prominent, green, apex excurrent. Stamens 1; filaments 1.5–1.6 mm long. Style with 2 stigma branches. Nutlet whitish, ellipsoid, flattened, 0.5–0.6 mm long, 0.4–0.5 mm wide, tuberculate.

TANZANIA. Uzaramo District: Msimbazi, 4 June 1966, *Haines* 4144!

DISTR. T 6; known only from the type

HAB. Weedy ricefield besides tidal creek; near sea-level

CONSERVATION NOTES. Possibly Vulnerable (VU-D1) but needs more information on local distribution and threats

13. *Cyperus pustulatus* Vahl in Enum. Pl. 2: 341 (1805); Kük. in E.P. 4, 20 (101): 161 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 265, figs. 540, 541 (1983) & Fl. Eth. 6: 460 (1997). Type: Guinea, *Thonning* s.n. (C, holo.)

Annual, slender to robust, up to 80 cm tall; culms 22–68 cm long, 0.7–2.1 mm wide, trigonous, glabrous. Leaves up to 45 cm long; leaf sheath brown-grey to purplish red, 2–10 cm long; leaf blade linear, flat to canaliculate, glabrous, 13–37 cm long, 1.7–4 mm wide, apex acuminate, glabrous. Involucral bracts 2–5, leaf-like, erect to spreading, the lowermost 13–44 cm long, 1.2–3.5 mm wide. Inflorescence simple, sometimes capitate; when simple primary branches 2–7, 1.8–20 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 3–21 per cluster, linear-lanceolate to elliptic, slightly compressed, 7–12 mm long, elongating to 25 mm long in fruit, 2–5 mm wide; glumes greyish green to pale brown, usually with a dark red to purple spot on the margin, giving the spikelet a red to purple band across the centre, ovate, 2.7–3.2 mm long, 2.5–3 mm wide, with prominent lateral veins on either side of the keel, keel rounded, apex rounded. Stamens 2; filaments 1.9–2.5 mm long; anthers 0.6–0.8 mm long. Style with 2 stigma branches. Nutlet brown to greyish-black, sometimes glaucous, dorso-ventrally compressed, or more rarely trigonous, ellipsoid to rounded to obovoid, 1.4–2 mm long, 1–1.7 mm wide, minutely papillose with many small isodiametric cells.

UGANDA. Teso District: Soroti, Omunyal Swamp, 14 Sept. 1954, *Lind* 361! & Mt Abela, SW of Katakwi, 10 May 1970, *Lye & Katende* 5436!

TANZANIA. Tabora District: Kaliua, junction of Railway Station, 16 June 1980, *Hooper & Townsend* 2008!; Buha District: Bitira, Nisusi, 27 Feb. 1926, *Peter* 37916!; Ufipa District: Kawa River Gorge, 15 Feb. 1959, *Richards* 10889!; Zanzibar: Upenja, 7 June 1975, *Mosha* CAWM 2333!

DISTR. U 3; T 4; Z; widespread in West and central Africa, Zambia

HAB. In grassy swamps, on muddy bed of stream, edge of pools, often on thin soil over rock; (90–)1100–1400 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Juncellus pustulatus* (Vahl) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 546 (1894) & in F.T.A. 8: 307 (1902)

Pycurus djalonis A. Chev., Explor. Bot. Afrique Occ. Franç. 1: 696 (1920), *nom. nud.*

Cyperus pustulatus Vahl var. *debilis* Kük. in E.P. 4: 20 (101): 161 (1936). Type: Tanzania, Tabora District: Unyamwesi, Kombe to Usinge, *Peter* 45989 (B, holo.)

C. pustulatus Vahl var. *djalonis* Kük. in E.P. 4: 20 (101): 161 (1936). Type: many syntypes, including Tanzania: Buha District: Birira, *Peter* 37916 & Machaso, *Peter* 37168 & Kigoma District: Uvinza E of Malagarasi, *Peter* 36098 & Lugufu, *Peter* 36600 (B, syn.)

14. ***Cyperus amabilis*** Vahl in Enum. Pl. 2: 318 (1805); C.B. Clarke in F.T.A. 8: 327 (1902); Kük. in E.P. 4, 20 (101): 265 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 266, figs. 544, 545 (1983) & *Fl. Somalia* 4: 125 (1995). Type: Ghana, *Thonning* s.n. (C, holo.)

Annual, slender, 7–31 cm tall; culms solitary or more often tufted, 4.7–27 cm long, 0.5–1.8 mm wide, trigonous, glabrous. Leaves up to 16 cm long; leaf sheath purplish-red, 0.5–3 cm long; leaf blade linear, glabrous, flat or inrolled, 1.5–13 cm long, 1–2.5 mm wide, apex acuminate, glabrous. Involucral bracts leaf-like, 2–7, spreading, 1.2–14.5 cm long, 0.5–2.8 mm wide. Inflorescence capitate in few cases, more often simple, occasionally compound anthelate, primary branches 3–10, 1.5–9 cm long; spikelets in digitate, ovoid clusters, sessile and at the end of primary and when present secondary branches, 5–25 per cluster, linear, 5–12 mm long, 0.9–1.6 mm wide; glumes pale orange brown, reddish brown or golden brown, linear-elliptic, glabrous, 0.9–1.8 mm long, 0.6–1 mm wide, keel green, acute to excurrent, sometimes with veins at either side of the keel, apex shortly mucronate. Stamens 1; filament 0.8–1.6 mm long; anthers 0.3–0.4 mm long. Nutlet (pale) brown, ellipsoid-obovoid, 0.6–1 mm long, 0.3–0.6 mm wide, minutely papillose in longitudinal rows. Fig. 26, p. 159.

UGANDA. West Nile District: near Omugo, 15 Aug. 1953, *Chandler* 164!; Bunyoro District: Murchison Falls Park, 3–4 km S of Paraa Lodge Pie.r, 15 Sept. 1969, *Lye et al.* 3977!; Busoga District: Lake Victoria, Lolui Island, 17 June 1953, *Wood* 778!

KENYA. Garissa District: Garissa–Modo Gosh, 26 km from Garissa, 14 Dec. 1977, *Stannard & Gilbert* 1063!; Machakos/Masai District: N end of Chyulu Hills, 30 May 1981, *Gilbert* 6171; Lamu District: Kiunga, 55 km NE of Lamu, 6 Aug. 1961, *Gillespie* 147!

TANZANIA. Tanga District: Kidingoma, Mvumoni, Madanga, Pangani, 8 May 1956, *Tanner* 2824!; Kilosa District: Mikumi National Park, 1 May 1968, *Renvoize* 1864!; Buha District: Kasakela Reserve, 18 Nov. 1962, *Verdcourt* 3868!

DISTR. U 1–4; K 1, 4, 6, 7; T 1–8; Z; widespread in West Africa, Sudan, Somalia, Zambia, Malawi, Mozambique, South Africa; Asia, Americas

HAB. In seasonally wet habitats, often on sandy soil near roads, lakes and swamps, sandy hollows on rocky soil; 20–1700 m

CONSERVATION NOTES. Least Concern (LC): due to its wide distribution and common habitat

SYN. *Cyperus muelleri* Boeck. in *Flora* 42: 434 bis (1859); C.B. Clarke in F.T.A. 8: 376 (1902). Type: Mozambique, no specimen indicated

C. amabilis Vahl var. *oligostachyus* (H.B.K.) Kük. in *Bot. Not.* 1934: 67 (1934) & in E.P. 4, 20 (101): 259 (1936). Several syntypes, among which Tanzania, Dodoma District: Chaya [Tschaya], *Peter* 34391a (B, syn.)

C. castaneus Willd. subsp. *amabilis* (Vahl) Lye in *Fl. Eth.* 6: 460 (1997)

NOTE. An easy recognizable species due to its golden, orange to reddish brown coloured, narrow spikelets.

15. ***Cyperus boreobellus*** Lye in *Nordic Journ. Bot.* 3: 220 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 258, figs. 522, 523 (1983). Type: Kenya, Kwale District: near Taru, between Samburu and Mackinnon Road, *Drummond & Hemsley* 4153 (K!, holo.; EA!, iso.)

Annual (perhaps perennial), fairly slender, growing in tussocks, up to 21 cm tall; culms tufted, 5–19 cm long, 0.6–1.1 mm wide, trigonous, glabrous. Leaves up to 18 cm long; leaf sheath dark purplish below, straw-coloured above, 1–3 cm long; leaf blade



FIG. 26. *CYPERUS AMABILIS* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence branch, $\times 2$; 3, spikelet, $\times 4$; 4, glume, $\times 36$; 5, flower, $\times 36$; 6, nutlet, $\times 32$. 1 from *Tanner* 4086, 2–6 from *Peter* 11422. Drawn by Juliet Williamson.

linear, flat, 5.5–15 cm long, 0.5–1 mm wide, apex acute, glabrous. Involucral bracts leaf-like, spreading, 2, lowermost 2.4–5.5 cm long, 1–1.4 mm wide. Inflorescence capitate, spikelets 4–7 per head, linear-lanceolate, 7–20 mm long, 2–3.5 mm wide, straight or curved, with 20–40 glumes per spikelet; glumes reddish-brown, ovate, 2.2–3.1 mm long, 1.2–1.6 mm wide, without or with 2 very obscure thin lateral veins, keel greenish, slightly excurrent, apex acute to acuminate. Stamens 3; anthers 1.1–1.4 mm long. Nutlet purplish black, obovoid, 0.8–0.9 mm long, \pm 0.6 mm wide minutely papillose, apiculate.

KENYA. Kwale District: near Taru, between Samburu and Mackinnon Road, 1953, *Drummond & Hemsley* 4153! & Kilibasi, 6 Dec. 1998, *Luke* 5582A!

DISTR. K 7; not known elsewhere

HAB. On damp shallow sandy soil over rocks (may be mat-forming) and in rocky pools; 350–400 m

CONSERVATION NOTES. Only known from 2 collections; needs more information on population size and local threats

NOTE. *C. boreobellus* is closely related to *C. kirkii* C.B. Clarke but has larger glumes and only occurs in Kenya. *C. kirkii* is only recorded from Tanzania.

16. **Cyperus kaessneri** *C.B. Clarke* in E.J. 38: 133 (1906); Kük. in E.P. 4, 20 (101): 306 (1936); Lye in Fl. Eth. 6: 465 (1997). Type: Kenya, Machakos District: near Kibwezi, *Kaessner* 716 (K!, M!, iso.)

Annual, growing in tussocks, up to 14 cm tall; culms tufted, 3.5–12.5 cm long, 0.5–0.7 mm wide, trigonous, smooth. Leaves up to 9 cm long; leaf sheath rusty reddish-brown, 1–3 cm long, with many veins; leaf blade linear, folded when dried, 2–6 cm long, 1.3–3 mm wide, minutely scabrid along the margin apex acute. Involucral bracts leaf-like, spreading, 1–3, lowermost 0.7–2.5 cm long, 0.9–2.5 mm wide. Inflorescence capitate, spikelets 4–20 per head, compressed squarrose, 6.5–12 mm long, 3.3–5.6 mm wide, rachis straight; glumes rusty reddish-brown, ovate to 3-angled, 2.1–2.7 mm long, 1.4–1.9 mm wide, with lateral veins on either side, keel pale brown, apex mucronate, recurved. Stamens 2; filaments 1.4–2.4 mm long. Nutlet grey to brownish-grey, ovoid, trigonous, 0.6–0.9 mm long, 0.5–0.6 m wide, almost smooth to minutely papillose.

KENYA. Kibwezi District: Dwa Rock, 16 May 1938, *Bally* 8093!; Kwale District: Matuga Agricultural Station, 7 Nov. 1968, *Adams* 7! & Tanga–Mombasa road, \pm 1.6 km from Tanzania border, 14 Aug. 1953, *Drummond & Hemsley* 3745!

TANZANIA. Tanga District: Kange Estate, 2 Nov. 1951, *Faulkner* 827! & Mombasa Road, Moa, 22 Nov. 1955, *Faulkner* 1741! & near Kwale and Moa on Tanga–Mombasa Road, 14 Nov. 1947, *Greenway & Brenan* 8307!

DISTR. K 4, 7; T 3; Eritrea, Ethiopia

HAB. In seasonally damp habitats, on limestone rocks, and in bushland; sea-level to 900 m

CONSERVATION NOTES. Least concern (LC)

NOTE. Clarke thought this was close to *C. teneriffae* but with the spikelets much narrower, and a different nutlet. It is possibly the same as *rubicundus*, but slightly smaller in general size, glume size and nutlet size. This species is accepted with some hesitation, and it might only be a variety of *rubicundus*.

17. **Cyperus rubicundus** *Vahl* in Enum. Pl. 2: 308 (1806); Haines & Lye, *Sedges & Rushes E. Afr.*: 258, figs. 520, 521 (1983) & Fl. Somalia 4: 133 (1995) & Fl. Eth. 6: 464 (1997). Type: Puerto Rico, *Ventenat* s.n. (C, holo.)

Annual, tussocky, with a small root system, up to 30 cm tall; culms tufted, 3.5–10(–28) cm long, 0.4–1.3 mm wide, trigonous, slightly scabrid below the inflorescence. Leaves up to 17.5 cm long; leaf sheath light grey to purple, 0.75–4.5 cm

long, frequently not enclosing the culm base; leaf blade linear, flat, 3–14.5 cm long, 1.2–2.5 mm wide, apex acute to acuminate, scabrid on margins and primary vein. Involucral bracts leaf-like, spreading, 1–2(–3), lowermost 1–5 cm long, 0.8–1.4 mm wide. Inflorescence capitate, spikelets in digitate clusters, 3–17(–30) per inflorescence, linear-lanceolate, squarrose, 5.5–20 mm long, 3.2–6 mm wide, rachis straight; glumes reddish-brown to chestnut, ovate, 2.8–4 mm long, 1.6–2.3 mm wide, with 5–8 pale-coloured veins on either side of the keel, acute to mucronate and recurved, scabrid. Stamens 2–3; filaments 2–3.5 mm long; anthers 0.4–0.8 mm long. Stigma unbranched, or shallowly branched with 3 stigmas. Nutlet greyish-brown, obovoid, triquetrous, 0.7–1.2 mm long, 0.6–0.8 mm wide, minutely papillose.

UGANDA. Ankole District: Katunguru, on Kazinga Channel, 25 Feb. 1966, *Haines* 4066!; Teso District: Kumi, July 1926, *Maitland* s.n.!; Mengo District: Nabuswara, 10 Sept. 1955, *Langdale-Brown* 1542!

KENYA. Baringo District: 3 km N of Loruk, 26 Oct. 1964, *Leipfert* 5214!; Machakos District: Yatta Plateau 4 km E of Athi R. on Machakos–Kitui road, 27 Nov. 1982, *Gillett et al.* 53958!; Narok District: Aitong, 27 Nov. 1961, *Glover et al.* 2667!

TANZANIA. Musoma District: Serengeti, Engare Nanyuki, 1 Mar. 1962, *Greenway* 10482!; Masai District: on the road from Longido to Arusha, near Longido, 30 Mar. 1970, *Richards* 25703!; Uzaramo District: Dar es Salaam region, north shore of Dar es Salaam, near edge of sea cliffs along Kenyatta Drive, 23 Dec. 1984, *Gereau* 1567!

DISTR. U 1–4; K 1–7; T 1–3, 5, 6; widespread in central, eastern and southern Africa; Madagascar, Teneriffe, India

HAB. In seasonally wet habitats, near temporary pools and swamps, in grasslands and wooded grassland, lava screes and shallow soils on rocks; also on alkaline soils; sea level to 2000 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus teneriffae* Poir. in *Encycl. Méth. Bot.* 7: 245 (1806); C.B. Clarke in *F.T.A.* 8: 317 (1902); Kük. in *E.P.* 4, 20 (101): 306 (1936). Type: Teneriffe, no collector mentioned (P-LAM, holo.)

Cyperus teneriffae Poir. var. *longimucronatus* Kük. in *N.B.G.B.* 9: 302 (1925) & in *E.P.* 4, 20 (101): 307 (1936). Types: Kenya, Mt Kenya, Coles Mill, *Fries & Fries* 986; Somalia, Osboda, *Senni* 242 (B, syn.)

18. *Cyperus holostigma* *Schweinf.* in *Bull. Herb. Boissier* 2(App. 2): 103 (1894); Lye in *Fl. Eth.* 6: 464 (1997). Type: Eritrea, Kohaito Plateau, *Schweinfurth* 120 (K!, holo.)

Dwarf perennial with short woody rhizome, 14 cm tall; culms tufted, 4.5–12 cm long, 0.4–0.8 mm wide, trigonous, smooth. Leaves up to 6 cm long; leaf sheath pale brown to brown, 0.5–1 cm long; leaf blade linear, flat but folded when dried, 2–5 cm long, 0.6–1 mm wide, apex acute to acuminate, scabrid on margins and primary vein. Involucral bracts leaf-like, spreading, 1–3, lowermost 1.5–3 cm long, 0.6–1 mm wide. Inflorescence capitate, spikelets 3–8 per head, linear to narrowly ellipsoid, 5–16 mm long, 1.3–1.9 mm wide, rachis straight, sometimes slightly curved; glumes dark reddish-brown to almost black with a prominent pallid margin, ovate, 1.9–2.2 mm long, 0.8–1.3 mm wide, several marginal veins on both sides, keel rounded, apex acute to rounded. Stamens 2; filaments 1.9–2.2 mm long; anthers 1.1–1.6 mm long. Style usually undivided. Nutlet silvery grey, ellipsoid-obovoid, trigonous to rounded, 0.6–0.8 mm long, 0.3–0.4 mm wide, minutely papillose in longitudinal rows.

KENYA. Nairobi District: Nairobi, 27 Sept. 1915, *Dawson* 270!; Fort Hall District: Thika, hillside N of Thika River, E of Nairobi–Murang'a [Fort Hall] road, 7 May 1967, *Faden* 67/303!

DISTR. K 4; Eritrea, Ethiopia

HAB. Wet depressions in wooded grassland; 1530 m

CONSERVATION NOTES. Least Concern (LC)?

NOTE. Only two collections from the Flora area.

The nutlet is rounded and sometimes looks more two-sided than three-sided; this would place it in *Pycreus*, but there is not enough material to support this. More material is needed.

19. **Cyperus afroalpinus** *Lye* in *Nordic Journ. Bot.* 3: 226 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 160, fig. 298 (1983). Type: Kenya, North Nyeri District: Aberdare Mts, Nyeri side, *Haines* 1969 (EA, holo.; K, iso.)

Perennial, slender, with a short creeping rhizome, up to 40 cm tall; culms many, crowded, 24.5–36 cm long, 1–1.6 mm wide, trigonous to triquetrous, slightly scabrid. Leaves up to 31 cm long; leaf sheath reddish-brown at least at the base, 3–7 cm long; leaf blade linear, flat, 19–24 cm long, 2–3.5 mm wide, scabrid on margins and leaves, apex acute to acuminate. Involucral bracts leaf-like, 3–4, the lowermost erect, 3–5 cm long, 2–2.5 mm wide. Inflorescence capitate or anthelate, simple, when simple primary branches 1–4, 0.7–4 cm long, spikelets in a dense cluster, sessile or at the end of primary branches, 3–7 per cluster, ovate-lanceolate, 4–7.5 mm long, 2–2.7 mm wide, rachis straight; glumes dark reddish-black to black, ovate-elliptic, 1.5–2 mm long, 0.9–1.2 mm wide, keel green to pale brown, apex rounded to acute, slightly excurrent. Stamens 3; filaments 1.7–2 mm long; anthers 0.9–1 mm long. Nutlet dark grey to reddish-brown, ellipsoid-obovoid, 1–1.5 mm long, 0.6–1 mm wide, apiculate and with a distinctly cuneate yellow base, strongly papillose.

UGANDA. Kigezi District: Kinaba Gap, *Chandler* 2453

KENYA. North Nyeri District: Aberdare Mts, Nyeri side, *Haines* 1969

TANZANIA. Moshi District: below Mandara [Bismark] Hut, 9 Sept. 1993, *Grimshaw* 93/685! & 14 Oct. 1993, *Grimshaw* 93/895!

DISTR. U 2; K 3/4; T 2; Congo-Kinshasa

HAB. Clearings in upper montane forest, bamboo and giant heath; 2400–2700 m

CONSERVATION NOTES. Least Concern (LC)?

20. **Cyperus crassipes** *Vahl* in *Enum. Pl.* 2: 299 (1805); Haines & Lye, *Sedges & Rushes E. Afr.*: 262, fig. 534 (1983); Lye in *Flora of Somalia* 4: 126 (1995). Type: Guinea, *Isert* s.n. (C, holo.)

Perennial, robust and tussocky, up to 70 cm tall, with a thick branched rhizome 3–5 mm in diameter and long stolons; culms few, 15–62 cm long, 1.6–4.3 mm wide, trigonous to almost terete, glabrous. Leaves up to 85 cm long; leaf sheath green to reddish-brown, at the base almost black, 4.5–10 cm long; leaf blade linear, flat or folded, rather thick, 25–80 cm long, 3–13 mm wide, apex acute to acuminate, scabrid on margin. Involucral bracts leaf-like, spreading to reflexed, (2–)4–8, lowermost 15–38 cm long, 4–8 mm wide. Inflorescence almost capitate to a simple anthela, primary branches 0–8, 0–7 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 8 to many per cluster, linear-lanceolate, 9–27 mm long, 2.4–5.2 mm wide, slightly compressed to almost terete, rachilla straight to sometimes slightly curved; glumes pale reddish-brown to pale brown, concave, elliptic-ovate, 5.1–8.1 mm long, 1.8–4.8 mm wide, keel slightly excurrent, sometimes slightly green, many veins on both sides, apex very shortly mucronate. Stamens 3; filaments 2.5–5(–8) mm long; anthers 1.9–3.7 mm long. Nutlet dark brown, obovoid, flattened on one side, this side pressed against the rachilla, 1.9–3 mm long, 1–1.4 mm wide, smooth or minutely papillose.

KENYA. Kilifi District: Malindi Township, 6 Sept. 1955, *Echlin* 20!; Lamu District: Osine, 8 Oct. 1957, *Greenway & Rawlins* 9293! & Kipini, Tana Lodge Compound, 21 Aug. 2006, *Kirika et al.* NMK 777!

TANZANIA. Pangani District: near Mwera, June 1967, *Procter* 3705!; Uzaramo District: Dar es Salaam, under Salendera Bridge on Ali Mwinyi road, 6 June 1996, *Muasya et al.* 96/49!; Mikindani District: sea-shore at Mtwara, 7 Mar. 1963, *Richards* 17781!

DISTR. K 7; T 3, 6, 8; Senegal, Gambia, Sierra Leone, Guinea, Liberia, Ivory Coast, Ghana, Togo, Benin, Nigeria, Equatorial Guinea, Gabon, Congo-Kinshasa, Somalia, Angola, Mozambique

HAB. On sea shores, in sand dunes; sea-level–60 m

CONSERVATION NOTES. Least Concern (LC)

- SYN. *Cyperus maritimus* Poir. in Encycl. Méth. Bot. 7: 240 (1806); C.B. Clarke in F.T.A. 8: 326 (1902); Kük. in E.P. 4, 20 (101): 269 (1936). Type: Madagascar, *du Petit Thouars* s.n. (P, holo.)
C. maritimus Poir. var. *crassipes* (Vahl) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 569 (1894) & in F.T.A. 8: 326 (1902)
C. frerei C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 563 (1894), *nom. nud.* & F.T.A. 8: 327 (1902); Kük. in E.P. 4, 20 (101): 283 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 256, fig. 516 (1983); Fl. Somalia 4: 127 (1995). Type: Kenya, Frere Town and Rabai Hills, near Mombasa, *Taylor* s.n. (BM!, holo.), **syn. nov.**

21. ***Cyperus pulchellus*** R. Br. in Prodr. Fl. Nov. Holl.: 213 (1810); Haines & Lye, Sedges & Rushes E. Afr.: 173, figs. 330, 331 (1983); Lye in Fl. Somalia 4: 119 (1995) & Fl. Eth. 6: 440 (1997). Type: Australia, Arnhem Bay, *Brown* 5915 (BM, holo.; K, iso.)

Perennial, slender, up to 37 cm high, with swollen stem-bases, sometimes almost rhizomatous; culms tufted, 11–36 cm long, 0.9–1.4 mm wide, trigonous, smooth to slightly scabrid, the base covered with fibrous remains of old leaf sheaths. Leaves up to 18.5 cm long; leaf sheath pale green to pale reddish-brown, basal sheaths darker and split into fibres, 1–3.5 cm long; leaf blade linear, flat to v-shaped, 2–15 cm long, 1.8–2.9(–4.2) mm wide, apex acute to acuminate, scabrid on margins and primary vein. Involucral bracts leaf-like, spreading to reflexed, 2–3, lowermost 5–11 cm long, 1.8–2.9 mm wide. Inflorescence capitate; spikelets 15–60 in a very dense globose head, lanceolate-ovate, 3.3–7.2 mm long, 1.5–2.5 mm wide, rachis straight; glumes greyish-white, with cinnamon tinge, lanceolate, 1.4–1.8 mm long, 0.5–1 mm wide, margin often curved inwards, keel indistinct, apex acute to rounded. Stamen 1. Nutlet grey to (pale) brown, flattened trigonous, (narrowly) obovoid to ellipsoid, 0.8–1 mm long, 0.2–0.4 mm wide, papillose in longitudinal rows.

UGANDA. Karamoja District: Moroto, *Haines* 4231

KENYA. Northern Frontier District: Ol Lolokwe [Ol Dionyo Sabachi], E side of summit plateau, 25 Mar. 1978, *Gilbert* 5004!; Kitui District: km from Mutha Centre towards Mutomo, 22 Jan. 2005, *Kirika et al.* NMK 459!; Fort Hall District: Thika, Plateau, 16 Jan. 1947, *Bogdan* 67!

TANZANIA. Nzega District: ± 5 km E of Nzega towards Sekenke, 24 June 1980, *Hooper & Townsend* 2115B!; Dodoma District: 39 km on Itigi–Tabora road, 26 May 2006, *Bidgood et al.* 6208!; Kilosa District: Mikumi National Park, May/June 1981, *Johnson* 1472/1473!

DISTR. U 1; K 1, 4, 7; T 4–6; widespread through west Africa, Chad, Ethiopia, Somalia, Malawi, South Africa; SE Asia, Australia

HAB. Bushland/grassland on wet soil, edge of pond; 1050–1150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Sorostachys kyllingioides* Steud. in Flora 33: 229 (1850), *nomen*, & Syn. Pl. Cyp.: 71 (1856). Type: Philippines, Luzon, *Cuming* 1417 (B, holo.; FT, G, K, L, iso.)

Cyperus sorostachys Boeck. in Linnaea 35: 588 (1868), *nom. invalid.* Type: as for *Sorostachys kyllingioides*

Cyperus zambesiensis C.B. Clarke in Trans. Linn. Soc. London, Bot. 4: 53 (1894) & in F.T.A. 8: 344 (1902). Type: Malawi, Mlanje, *Buchanan* 647 (K, holo.)

Sorostachys pulchellus (R. Br.) Lye in Nordic J. Bot. 3: 189 (1983)

22. ***Cyperus chordorrhizus*** *Chiov.* in Agric. Colon. 20: 105 (1926); Haines & Lye, Sedges & Rushes E. Afr.: 263, fig. 535 (1983); Lye in Flora of Somalia 4: 126 (1995). Type: Somalia, Sultanate of Obbia, between Obbia and Wuarandi, *Robecchi* 107 (CSET!, syn.); between Obbia and Magangib, *Puccioni & Stefaninin* 371! (CSET!, syn.); near Obbia, *Puccioni & Stefanini* 389 (CSET!, syn.); Kisimayo, *Gorini* 97 (CSET!, syn.); Mogadishu, *Senni* 619 (??, syn.); Kenya, Lamu District: Kiunga, *Riva* 1724b (CSET!, syn.)

Perennial, with a long creeping rhizome up to 5 m long, 1–4 mm in diameter, from the nodes of this stolon arise shorter lateral sterile shoots and fertile terminal shoots, up to 26 cm high. Leaves crowded on lateral and terminal shoots, stiff, up to 13 cm

long; leaf sheath grey, translucent, 0.5–2.5 cm long; leaf blade linear, subterete, 1–11 cm long, 1.6–3 mm wide, scabrid margin and a prominent impression below the apex, apex obtuse. Involucral bracts leaf-like, erect to spreading, 2, lowermost almost erect, 1.5–2 cm long, 1–2 mm wide. Inflorescence capitate; spikelets 2–10 per head, ovoid, 6.3–9.6 mm long, 3.3–4.6(–6.5) mm wide, rachilla straight; glumes reddish brown with pale margin, ovate, 3.3–5.2 mm long, 1.8–2.5 mm wide, keel flattish, 3–5-veined, apex rounded to acuminate. Stamens 3; filaments 3.3–4.2 mm long; anthers 1.4–2.1 mm long. Nutlet dark greyish to brownish-black, ellipsoid-lanceolate, 1.8–2.1 mm long, 0.8–1 mm wide, smooth to minutely papillose in longitudinal rows.

KENYA. Lamu District: Shella Sand Dunes, 16 Feb. 1956, *Greenway & Rawlins* 8916! & Kiungamini island 88 km NE of Lamu, 25 July 1961, *Gillespie* 49! & Kiwayu area, Mvundeni, 6 Jan. 1999, *Luke* 5646!

DISTR. K 7; Somalia

HAB. On sand dunes; sea-level

CONSERVATION NOTES. Restricted distribution and habitat, but without any specific threats

NOTE. Easy to recognize due to its long wiry stolons and shoots coming off these, and its crowded stiff leaves.

23. *Cyperus usitatus* *Burch.* in *Mant.* 2: 477 (1824); C.B. Clarke in *F.T.A.* 8: 353 (1902); Kük. in *E.P.* 4, 20 (101): 122 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 192, fig. 376 (1983) & *Fl. Eth.* 6: 452 (1997). Type: South Africa, Cape of Good Hope, Vyentjes, *Burchell* s.n. (ubi?)

Perennial, slender, up to 44 cm tall, producing thin stolons and small bulbs from the stolons; stolons 0.5–10 cm long, 0.2–1 mm in diameter, covered in light reddish-brown scales, sometimes fibrous; bulbs 5–10 mm in diameter; culms few, 5–42 cm long, 1–3.8 mm wide, triquetrous to trigonous, smooth. Leaves up to 30 cm long; leaf sheath grey, straw-coloured to pale brown, 1–5.5 cm long; leaf blade linear, flat, rather thick and sometimes semi-fleshy, shrivelling when dry, 3.5–25 cm long, 1–3.8 mm wide, scabrid on margin at least above, apex acuminate. Involucral bracts leaf-like, spreading, 2–4, lowermost 3–10 cm long, 0.6–2.5 mm wide, shape and surface as leaves. Inflorescence more often (loosely) capitate than simple, when simple primary branches 0–2; spikelets in crowded digitate clusters, 7–25 to many more per cluster, linear, rachis straight, 8–21 mm long, 1.3–3.2 mm wide; glumes golden brown to almost black, ovate-lanceolate to ovate, 3–6.4 mm long, 1.1–2.5 mm wide, keel sharp and slightly excurrent, with 3–9 ribs on either side, apex acuminate. Stamens 3; filaments 2–5.1 mm long; anthers 1.6–2.9 mm long. Nutlet grey, reddish-brown to dark brown, ellipsoid-oblong to obovoid, trigonous, 1.3–1.6 mm long, 0.6–1 mm wide, apiculate, minutely tuberculate to minutely papillose in longitudinal rows.

- | | |
|--|-----------------------------|
| 1. Bulbs 10–20 mm in diameter | a. var. <i>macrobulbous</i> |
| Bulbs 5–10 mm in diameter | 3 |
| 2. Bulbs 6–10 mm in diameter; glumes reddish-brown to almost black; nutlet ellipsoid-oblong, 0.6–0.8 mm wide | b. var. <i>usitatus</i> |
| Bulbs 5–6 mm in diameter; glumes golden brown; nutlet obovoid, 0.7–1 mm wide | c. subsp. <i>palmatus</i> |

a. var. *macrobulbus* Kük. in *E.P.* 4: 20 (101): 124 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 192 (1983). Syntypes: Namibia, Rehoboth-Aub, *Dinter* 2247 & Windhoek, *Foermer* 4; Botswana, Ntochokuta, *Seiner* 130; Tanzania, Turu near Itigi, *Peter* 33738 (Bl, syn.)

Bulb up to 2 cm in diameter.

TANZANIA. Dodoma District: Turu, E from Itigi towards Bangayega, 623.5 km, 30 Dec. 1925, *Peter* 33738! (Bl, syn., K!, photo of syn.)

DISTR. T 5; Botswana, Namibia, South Africa

HAB. No data; 1300 m

CONSERVATION NOTES. Least concern (LC)

b. var. **usitatus**

Bulbs 6–10 mm in diameter; glumes dark reddish-brown to almost black. Nutlet ellipsoid-oblong, 1.3–1.6 mm long, 0.6–0.8 mm wide.

UGANDA. Sebei District: Mt Elgon, Chesoweri, near Nyalit River, 4 July 1971, *Lye & Katende* 6422!

KENYA. Naivasha District: SW of Lake Naivasha near Y.M.C.A. Camp, 19 Apr. 1968, *Mwangangi* 771!; Nakuru District: Njoro, Njoro R., 4 June 1947, *Bogdan* 1673! & Lake Elmenteita, 16 June 1951, *Bogdan* 3042!

TANZANIA. Musoma District: Serengeti, Seronera, 19 Apr. 1961, *Greenway* 10066!; Ufipa District: Mpuu, 3 Jan. 1962, *Robinson* 4903!; Kilwa District: ± 5 km NNW of Kingupira, 12 Dec. 1975, *Vollesen* 3058!

DISTR. U 3; K 3; T 1, 2, 4–8; Ethiopia, South Africa

HAB. In seasonally wet habitats, flooded grassland, on rocky slopes and outcrops; 100–2150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus stuhlmannii* K. Schum. in P.O.A. C: 118 (1895); C.B. Clarke in F.T.A. 8: 354 (1902); Kük. in E.P. 4, 20 (101): 125 (1936). Type: Tanzania, Bukoba District: Karagwe, Kafuro, *Stuhlmann* 1826 (K, iso.)

Cyperus usitatus Roem. & Schult. var. *stuhlmannii* (K. Schum.) Lye in Nordic Journ. Bot. 3: 231 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 193 (1983)

NOTE. According to Lye the only difference is more ample inflorescence and the larger number of involucre bracts. No other difference has been found.

c. subsp. **palmatius** Lye in Nordic Journ. Bot. 3: 228 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 193, fig. 377 (1983). Type: Tanzania, Ufipa District: Ndago, Milepa-Zimba, *Bullock* 3625 (K!, holo.; K!, iso.)

Bulbs 5–6 mm in diameter; glumes golden-brown. Nutlet obovoid, 1.3–1.4 mm long, 0.7–1 mm wide.

TANZANIA. Arusha District: Magadini Ponds near Dutch Corner, 12 Apr. 1968, *Greenway & Kanuri* 13458!; Mpanda District: Katsunga area, 12 Jan. 1950, *Lazarus & Thomas* 86!; Singida District: huge granite outcrop 23 km from Singida, 28 Mar. 1965, *Richards* 19937B!

DISTR. T 2, 4, 5; not known anywhere else.

HAB. Seasonally wet grassland, lake shores, shallow soil on rocky outcrop; 1400–1800 m

CONSERVATION NOTES. ?Least Concern due to its common habitat

24. ***Cyperus rigidifolius*** Steud. in Flora 25: 593 (1842); C.B. Clarke in F.T.A. 8: 367 (1902); Kük. in E.P. 4, 20 (101): 104 (1936); A.V.P.: 55 (1957); Haines & Lye, Sedges & Rushes E. Afr.: 185, figs. 359, 360 (1983) & Fl. Eth. 6: 447, fig. 212.84 (1997). Type: Ethiopia, Enchadcap, *Schimper* 991 (P!, holo.; HAL, K!, MUN!, P!, UPS!, WAG!, iso.)

Perennial, slender to fairly robust, with a woody base and curving horizontal stolons up to 15 cm long, 1.5–3 mm in diameter, up to 72 cm tall; culms few, 15–60 cm long, 0.7–4.4 mm in diameter, trigonous, sometimes almost triquetrous, glabrous or slightly scabrid below the inflorescence. Leaves up to 35 cm long; leaf sheath green to pale brown, 3–10 cm long; leaf blade linear, flat, rather stiff, 7–28 cm long, 1.5–5 mm wide, scabrid on margin and primary vein, apex acuminate. Involucre bracts leaf-like, erect to spreading, 3–5, lowermost 4.5–22 cm long, 2–4.8 mm wide. Inflorescence capitate or a simple and compact anthela, primary branches 0–6, 0–11 cm long; spikelets in crowded digitate spikes, erect, sessile and at the end of primary branches, 5–10 spikelets per spike, lanceolate, somewhat compressed, 7–18 mm long, 2–2.8 mm wide, rachilla straight; glumes dark reddish-brown to almost black, ovate, 2.7–4 mm long, 1.8–2.2 mm wide, keel green, apex rounded. Stamens 3; filaments 3.4–4.2 mm long; anthers 1.5–2.7 mm long. Nutlet greyish brown to olive green, obovoid, trigonous, 1.6–1.9 mm long, 0.9–1.1 mm wide, with minute isodiametric surface cells.

UGANDA. Kigezi District: Rubanda, Echuya Forest Reserve, 1 Oct. 1970, *Katende* 587!; Mbale District: Bugishu, Bufumbo, July 1926, *Maitland* 1254! & Mt Elgon, Bupota, 19 Dec. 1926, *Snowden* 1030!

KENYA. Nandi District: Berabon, near Kapsabet area, 24 June 1984, *Siemens* 64!; Nairobi District: Nairobi, ± 5 km W of town, 18 May 1949, *Maas Geesteranus* 4679!; Kericho District: SW Mau, Timbilil catchment, Jan. 1961, *Kerfoot* i27/8!

TANZANIA. Moshi District: Kilimanjaro, 9 Feb. 1934, *Schlieben* 4748!; Lushoto District: W Usambara Mts, Soni, 22 Nov. 1970, *Faulkner* 4498!; Njombe District: Lihogosa Swamp, 18 Jan. 1957, *Richards* 7910!

DISTR. U 2–4; K 1, 3–6; T 1–4, 7; Congo-Kinshasa, Rwanda, Burundi, Ethiopia, South Africa, Swaziland

HAB. In seasonally wet grassland, swamps, bushland; 1700–2800 m

CONSERVATION NOTES. Least Concern due to its wide distribution and common habitat

SYN. *Cyperus adoensis* A. Rich., Tent. Fl. Abyss. 2: 484 (1851). Type: Ethiopia, Adua, *Schimper* I: 186 (P, holo.; BM, K, S, iso.)

C. longus L. var. *adoensis* (A. Rich.) Boeck. in *Linnaea* 36: 281 (1869-70)

C. rigidifolius Steud. var. *intercedens* Kük. in N.B.G.B. 9: 304 (1925) & in E.P. 4, 20 (101): 75 (1936). Types: Kenya, Nyeri, *Fries* & *Fries* 101; Tanzania, Kilimanjaro, Moshi, *Merker* 401 & Ngaruka, *Merker* 407 (B, syn.)

25. ***Cyperus diurensis*** Boeck. in *Flora* 62: 556 (1879); C.B. Clarke in F.T.A. 8: 381 (1902); Kük. in E.P. 4, 20 (101): 560 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 223, fig. 454 (1983) & *Fl. Eth.* 6: 467, fig. 212.118 (1997). Type: Sudan, Djur, Seriba Ghattas, *Schweinfurth* 198, series III (B, holo.; K!, iso.)

Perennial, up to 83 cm tall, with a slightly swollen culm base with 1–10 cm long slender stolons; culms few, 25–80 cm long, 0.7–2.5 mm wide, trigonous, glabrous. Leaves up to 45 cm long; leaf sheath 2.5–9 cm long; leaf blade linear, flat or sometimes folded, 22–39 cm long, 2–3.8 mm wide, scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 3–6, lowermost 5.5–30 cm long, 1.9–3.2 mm wide. Inflorescence capitate, a solitary globose head, 10–20 mm long, 11–22 mm wide; spikelets many per inflorescence, ovate-lanceolate, 6.5–14.1 mm long, 2.1–4 mm wide, falling off entire when mature; glumes whitish with a reddish-brown tinge, especially near apex, ovate to boat-shaped, 4–5.1 mm long, 1.6–2 mm wide, keel, apex obtuse, frayed. Stamens 2–3; filaments ± 5.4 mm long; anthers 2.2–2.7 mm long. Nutlet grey-brown, ellipsoid-oblong, trigonous, 1.7–2 mm long, 0.7–0.8 mm wide, minutely papillose.

UGANDA. West Nile District: Mt Otze, 7 June 1936, *Thomas* 1973!

KENYA. Lamu District: NE of Witu, 28 Feb. 1956, *Greenway* & *Rawlins* 8956!; Kilifi District: Cha Simba, between Kilifi and Kaloleni, 1 Oct. 1972, *Adams* 64!

TANZANIA. Ngara District: Kirushya, Bugufi, 23 Nov. 1959, *Tanner* 4528!; Ufipa District: Namwele, 24 Feb. 1950, *Bullock* 2575!; Kilwa District: Kingupira, 17 Mar. 1975, *Vollesen* 1927!

DISTR. U 1; K 7; T 1, 3–8; Congo-Kinshasa, Rwanda, Ethiopia, Sudan

HAB. In grassland, woodland and rocky outcrops; sea-level up to 1800 m

CONSERVATION NOTES. Least Concern due to its wide distribution and common habitat

SYN. *Cyperus gondanus* Boeck., Cyp. Nov. 1: 3 (1888). Type: Tanzania, Tabora District: Igonda [Gonda], *Boehm* s.n. (B, holo.)

Mariscus diurensis (Boeck.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afric.* 5: 586 (1894); C.B. Clarke in F.T.A. 8: 381 (1902)

Cyperus diurensis Boeck. var. *laetevirens* Peter & Kük. in E.P. 4, 20 (101): 560 (1936). Types: Tanzania, Tanga District: Ukereni Hill near Amboni, *Peter* 39476 (B, holo.)

C. diurensis Boeck. var. *longistolon* Kük. in *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exp.*: 4 (1921) & in E.P. 4, 20 (101): 560 (1936). Types: Tanzania, District unclear, Niakagunda, *Fries* 1472 & Tabora, Unyanyembe, *Peter* 35342 & Tabora District: Ngulu near Malongwe, *Peter* 346712 & 34761 & Dodoma District: Uyansi near Chaya [Tschaya], *Peter* 45830b & 45831 (B, syn.)

C. diurensis Boeck. var. *gondanus* (Boeck.) Kük. in E.P. 4, 20 (101): 560 (1936)

C. diurens Boeck. var. *acuminatosquamatus* Kük. in E.P. 4, 20 (101): 561 (1936). Types: Tanzania, various localities, *Peter* 21081, 20522, 12604, (B, syn.) & *Peter* 13879 (B, K!, WAG!, P!, syn.) & *Peter* 25094 (B, K!, P!, syn.)

26. ***Cyperus angolensis*** Boeck. in Flora 63: 435 (1880); F.T.A 8: 321 (1902); Kük. in E.P. 4, 20 (101): 281 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 255, figs. 514, 515 (1983). Type: Angola, Malange, *von Mechow* 182 (BR!, holo.; B!, BR!, M!, iso.)

Perennial, up to 100 cm tall, stoloniferous, stolons 1–11 cm long, 2–6 mm in diameter, densely covered by brown multi-veined scales which sometimes split into fibres; culms solitary, culm base swollen and covered in leaf sheaths, 14–98 cm long, 1.4–2.7 mm wide, trigonous, smooth. Leaves up to 64 cm long; leaf sheath at base brown, higher up green, 2.5–10 cm long; leaf blade linear, flat or folded, rather thick, 7–56 cm long, 3.5–8 mm wide, scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 2.5–13 cm long, 3.1–5 mm wide. Inflorescence capitate; spikelets crowded, many per head, ovoid, 6–11.2 mm long, 4–5.7 mm wide, rachis straight; glumes greyish-white to sometimes pinkish-white, lanceolate, 4.2–7 mm long, 1.5–2.7 mm wide, keel, apex acute. Stamens 3; filaments 5–6 mm long; anthers 1.6–3 mm long. Nutlet yellowish brown to olive green, obovoid, trigonous, 2.5–3.2 mm long, 1.3–1.6 mm wide, minutely papillose.

UGANDA. Acholi District: Imatongs, Apr. 1938, *Eggeling* 3549! & SE Imatongs, Lomwaga Mt, 5 Apr. 1945, *Greenway & Hummel* 7280! & Lamwo county, 2 km NE of Lotuturu, at end of road, 17 Feb. 1969, *Lye & Lester* 2082!

TANZANIA. Kigoma District: 58 km S of Uvinsa, 31 Aug. 1950, *Bullock* 3262!; Mpanda District: E side Kabesi Valley, 1 Sept. 1958, *Jefford et al.* 1992!; Mbeya District: Lupa N Forest Reserve, 158 km N of Mbeya on Itigi Road, 17 Nov. 1962, *Boaler* 715!

DISTR. U 1; T 1, 4, 7, 8; Ghana, Nigeria, Cameroon, Congo Brazzaville, Gabon, Rwanda, Congo-Kinshasa, Angola, Zambia, Malawi, Zimbabwe, South Africa

HAB. In dry grassland with shrubs or scattered trees, often in places where burning is frequent; (450–)1400–2550 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus ochrocephalus* C.B. Clarke in Trans. Linn. Soc. London, Bot. 4: 53 (1894) & F.T.A. 8: 322 (1902), *nom. illegit.*

C. angolensis Boeck. var. *ampibulbus* Peter & Kük. in E.P. 4, 20 (101): 282 (1936). Type: Tanzania, Kigoma District: Ujiji, E of Kigoma, *Peter* 36846 (B, holo.)

27. ***Cyperus mapanioides*** C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 568 (1895) & F.T.A. 8: 340 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 160, figs. 295, 296 (1983). Type: Congo-Kinshasa, Stanley Pool, *Hens* B7 (BR!, K!, syn.), 69 (BR!, syn.) & 389 (BR!, syn.)

Perennial, slender, with a thick creeping rhizome, up to 56 cm tall; culms 17–54 cm long, 1.4–3.9 mm wide, triquetrous, glabrous. Leaves up to 38 cm long; leaf sheath reddish-brown to deep purple, 1.5–7 cm long; leaf blade linear, flat, 10–31 cm long, 0.4–1.2 cm wide, with 2 main veins next to primary vein, scabrid on margins and veins, apex acute to acuminate. Involucral bracts 4–7, leaf-like, spreading, 10–34 cm long, 0.6–1.3 cm wide. Inflorescence capitate, sometimes loosely so; spikelets 7–20 per head, linear-lanceolate to ovoid, 7–18 mm long, 2.4–4 mm wide, glumes spreading when mature; glumes whitish grey, lanceolate-ovate, boat-shaped, many-veined, 2.7–4.7 mm long, 1.3–3.5 mm wide, scabrid on the margins, keel greenish-white, apex acute. Stamens 3; filaments 1.3–3 mm long; anthers 0.6–1.3 mm long. Nutlet shiny brown, ellipsoid-obovoid, trigonous, 1.4–1.9 mm long, 0.9–1.3 mm wide, smooth, sometimes slightly minutely papillose.

UGANDA. Bunyoro District: Rabongo Forest, Murchison Falls National Park, 14 May 1993, *Sheil* 1658!; Mengo District: Kyagwe, Damba island, 22 Nov. 1949, *Dawkins* 457!; Mengo District: Kifu forest, near Mukono, 19 Feb. 1966, *Haines* 4065!

KENYA. Machakos District: Makueni, Ngutwa, Jan. 2006, *Mbale, Muasya & Muthoka* NMK 646!

TANZANIA. Kigoma District: Kasye Forest, 25 Mar. 1994, *Bidgood et al.* 2972!; Rufiji District: Kiwengoma Forest, northern edge of Matumbi Highlands, 8 Feb. 1990, *Frontier Tanzania* 683!; Kilwa District: Nahomba Valley, 11 Feb. 1978, *Vollesen* 4929!

DISTR. U 2, 4; K 4; T 4, 6, 8; widespread in tropical West and central Africa, down into Angola
HAB. In (wet) forest or woodland, often alongside paths, in clearings and alongside streams; 400–1200 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus dichromeniformis* Kunth var. *major* Boeck. in *Flora* 62: 549 (1879). Type: Sudan, Niamniam and Monbuttu, *Schweinfurth* 3461 and 3886 (B, syn.)

C. mapanioides Kunth var. *major* (Boeck.) Kük. in *E.P.* 4, 20 (101): 230 (1936); C.B. Clarke in *F.T.A.* 8: 340 (1902)

NOTE. Looks very similar to *C. chinsalensis* but has more involucre bracts and smaller glumes.

28. ***Cyperus niveus*** Retz. in *Observ. Bot.* 5: 12 (1788); Haines & Lye, *Sedges & Rushes E. Afr.*: 256 (1983) & *Fl. Somalia* 4: 130 (1995) & *Fl. Eth.* 6: 464 (1997). Type: India, Midnapur, Tschandrancone, *König* s.n. (LD, hol.)

Perennial, up to 118 cm tall; culms crowded, bases swollen and fused into a horizontal rhizome, 5.5–116 cm tall, 0.8–3.7 mm wide, trigonous to rounded, smooth. Leaves up to 118 cm long; leaf sheath nearly black at the base, brown up to the culm, 1–13 cm long; leaf blade linear, canaliculate or flat, 5–56 cm long, 1.4–8 mm wide, glabrous or scabrid on margin and primary vein, apex acute to acuminate. Involucral bracts leaf-like, spreading, sometimes reflexed, 2–5, lowermost 2.5–20 cm long, 1.2–6 mm wide. Inflorescence capitate, spikelets 5 to many per head, ovoid-lanceolate, 7.2–17 mm long, 4–8.7 mm wide, rachis straight; glumes dirty white, sometimes with a pinkish or pale brown tinge, elliptic-lanceolate, ovate to boat-shaped, 4.3–8.9 mm long, 2.4–3.8 mm wide, keel flat to acute, mostly with 6–8 conspicuous striations on either side of keel, apex acute to sometimes obtuse. Stamens 3; filaments 4.2–7.2 mm long; anthers 1.6–3.7 mm long. Nutlet (dark) brown to black, shiny, obovoid, trigonous, 1.6–2.5 mm long, 1.3–1.8 mm wide, almost smooth to minutely papillose. Fig. 27: 4–7, p. 169.

NOTE: *Cyperus niveus* is quite variable and several infraspecific taxa have been described. Of the three varieties Haines and Lye recognize I only recognize two, var. *leucocephalus* and var. *tisserantii*. Var. *tisserantii* has previously been described as a variety of *C. margaritaceus*, along with *C. nduru*.

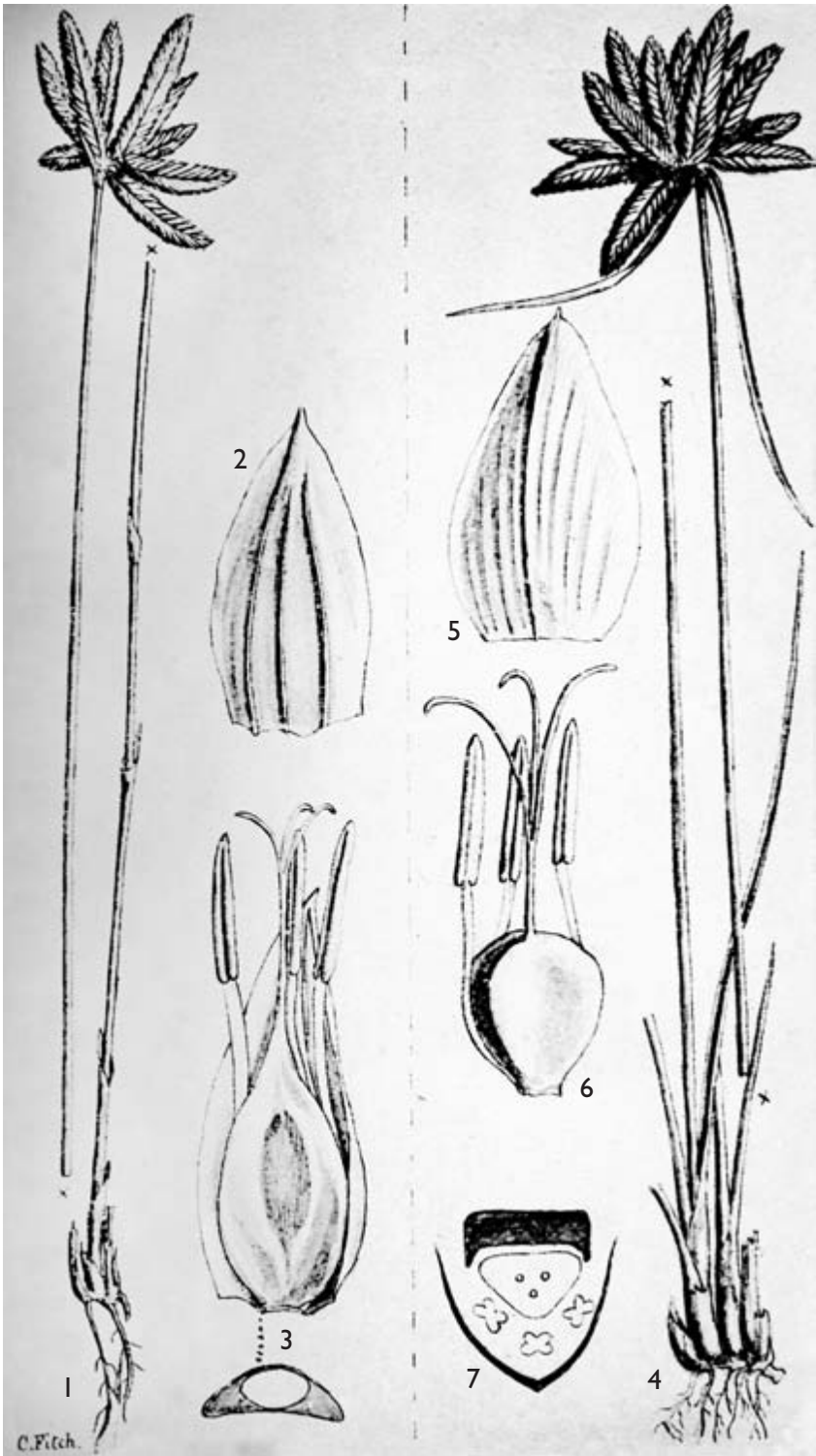
Leaf blade less than 1.2 mm wide, often in burnt areas, plant

showing signs of burning, spikelets up to 12 per head . . . a. var. *tisserantii*

Leaf blade 1.4–8 mm wide, spikelets many per head b. var. *leucocephalus*

a. var. ***tisserantii*** (*Cherm.*) *Lye* in *Nordic Journ. Bot.* 3: 231 (1983). Type: Central African Republic, Ouaka region, near Ippy, *Tisserant* 1878 (P!, hol.; P!, iso.)

FIG. 27. *CYPERUS PECTINATUS* — 1, habit, $\times 1$; 2, glume, enlarged; 3, flower in glume, enlarged slightly more. *CYPERUS NIVEUS* — 4, habit, $\times 1$. 5, glume, enlarged; 6, flower in glume, enlarged slightly more; 7, flower, diagrammatic. 1–3 from *Schweinfurth* 1157; 4–7 from *Thomson* s.n. Reproduced from C.B. Clarke (1909) *Illustrations of Cyperaceae*. Drawn by Charles Fitch.



Culms 5.5–20 cm long, 0.6–1.3 mm wide. Leaf blade canaliculate, 5–11 cm long, 0.6–1.2 mm wide. Involucral bracts 2–3, lowermost 2.5–7 cm long, 0.6–1.7 mm wide; spikelets 5–12 per head, ovoid, 7.2–13.5 mm long, 4–7.1 mm wide; glumes dirty white, ovate-lanceolate, 4.4–6.4 mm long, 2.5–3.8 mm. Nutlet \pm 2.5 mm long, \pm 1.8 mm wide.

UGANDA. District unclear: Queen Elizabeth National Park, Bunyampaka crater, Feb. 1966, *Haines* 4068!; Teso District: Lemu, Dec. 1931, *Chandler* 62!; Mubende District: Singo county, 10 km NW of Katera, 16 Mar. 1969, *Lye et al.* 2330!

KENYA. Trans-Nzoia District: Kitale, 8 Apr. 1953, *Bogdan* 3710!; Uashin Gishu District: near Kaposoret forests, 8 May 1951, *Williams* 174!; km 142, Nairobi–Namanga road, June 1961, *Lind* 3107!

TANZANIA. Tanga District: Mkwaja, Mkaramo Wa Chenya, 23 Nov. 1955, *Tanner* 2401!; Ufipa District: Kituria–Lukungu Rivers, 9 Dec. 1958, *Richards* 10270!; Ufipa District: Rukwa, \pm 2 km SW from the junction with the Sumbawanga–Mbala road, on the road to Safu, Nov. 1993, *Schmidt et al.* 1180!

DISTR. U 1–4; K 3, 6; T 1–4, 8; Senegal, Burkino Faso, Ivory Coast, Ghana, Togo, Benin, Nigeria, Cameroon, Gabon, Central African Republic, Ethiopia

HAB. In dry grassland and wooded grassland, where recently burnt; (0–)100–2200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Cyperus tisserantii* Cherm. in Arch. Bot. Mém. 4(7): 18 (1931)

Cyperus margaritaceus Vahl var. *tisserantii* (Cherm.) Kük. in E.P. 4, 20 (101): 285 (1936); *Haines & Lye, Sedges & Rushes E. Afr.*: 257 (1983)

NOTE. This variety often occurs in areas which are recently burnt. It shows similarities with *C. nduru*, which has far fewer leaves and fewer spikelets per inflorescence. It is debatable whether if *tisserantii* is treated as a variety, *C. nduru* should be described as a subspecific taxon as well.

b. var. **leucocephalus** (*Kunth*) *Fosberg* in K.B. 31: 835 (1977); *Haines & Lye, Sedges & Rushes E. Afr.*: 256, figs. 517, 518 (1983) & *Fl. Somalia* 4: 130 (1995) & *Fl. Eth.* 6: 464 (1997). Type: South Africa, Cape of Good Hope, ? *Drege* s.n. (B, holo.)

Culms 16–116 cm long, 1–3.7 mm wide, trigonous (to rounded). Leaf blade flat, 10–56 cm long, 1.4–8 mm wide. Involucral bracts 2–4, lowermost 3.5–23 cm long, 1.2–6 mm wide; spikelets (5–) many per head, 9–17 mm long, 4–9 mm wide; glumes (dirty) white, with a pinkish or pale brown tinge, elliptic-lanceolate to ovate, 4.3–8.9(–11.6) mm long, 2.4–3.8(–5.6) mm wide. Nutlet brown to black, obovoid, trigonous, 1.6–2.9 mm long, 1.3–1.8 mm wide.

UGANDA. Karamoja District: at Napyenyam at base of Mt Debasien, *Eggeling* 2563!; Toro District: Kalwe, 24 June 1945, *Thomas* 4156!; Teso District: Ngora, 6 May 1941, *Thomas* 3864!

KENYA. Nakuru/Baringo District: 49 km N of Nakuru on Marigat Road, 1 Nov. 2000, *Smith, Beentje & Muasya* 80!; Kitui District: 2 km NE of Mwingi on road to Garissa, 16 Dec. 1977, *Stannard & Gilbert* 1129!; Kwale District: near Taru, between Samburu and Mackinnon Road, 5 Sept. 1953, *Drummond & Hemsley* 4171!

TANZANIA. Handeni District: 30 km S of Handeni, Handeni–Mziha road, 10 Mar. 1953, *Drummond & Hemsley* 1462!; Pangani District: Msubugwe, 29 km SW of Pangani, 17 Mar. 1950, *Verdcourt* 114!; Kilosa District: Kilosa, 23 Jan. 1926, *Burt* 35!

DISTR. U 1–4, K 1–7; T 1–8; Z; Benin, Nigeria, Cameroon, Gabon, Congo-Kinshasa, Rwanda, Burundi, Ethiopia, Somalia, Botswana, Namibia, South Africa

HAB. Miombo woodland, dry grassland, on stony slopes, on shallow soil over rocks, in dried up riverbeds, swampy areas and in cultivated areas; sea-level to 2000 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus compactus* Lam., Tabl. Encycl. 1: 144 (1791); C.B. Clarke in F.T.A. 8: 319 (1902), *nom. illegit., non Retz.*

C. obtusiflorus Vahl, Enum. Pl. 2: 308 (1805); Kük. in E.P. 4, 20 (101): 285 (1936). Typus: Madagascar, no collector indicated (P-LAM, holo.)

C. sphaerocephalus Vahl var. *leucocephalus* Kunth, Enum. Pl. 2: 45 (1837)

C. obtusiflorus Vahl var. *ledermannii* Kük. in E.P. 4, 20 (101): 287 (1936). Type: Cameroon, *Ledermann* 5257 (B, holo.)

C. ledermannii (Kük.) Hooper in K.B. 26: 578 (1972)

C. niveus Retz var. *ledermannii* (Kük.) Lye in Nordic Journ. Bot. 3: 231 (1983) & *Haines & Lye, Sedges & Rushes E. Afr.*: 257 (1983)

NOTE. Haines & Lye already remarked on the few differences between *C. margaritaceus* and *C. niveus* (in my key separated only by presence/absence of rhizomes, but by Haines & Lye also separated by the slightly larger stem base in *margaritaceus*, and less compressed spikelets) with the taxa *tisserantii* and *nduru* intermediate – and possibly linked to fire regimes. It is quite possible this is all one species; *niveus* is the oldest name (HB).

29. **Cyperus chinsalensis** *Podlech* in Mitt. Bot. Staatss. München 4: 107 (1961); Haines & Lye, Sedges & Rushes E. Afr.: 159, fig. 294 (1983). Type: Zambia, 42 km S of Chinsali, *Robinson* 3207 (M, holo.; K!, iso.)

Perennial, with a creeping rhizome and persistent swollen stem-bases, up to 95 cm tall; culms triquetrous, 41–92 cm long, 1.8–2 mm wide, scabrid on the margins. Leaves up to 55 cm long; leaf sheaths pale brown to greenish-brown, 2–7 cm long; leaf blade linear, plicate, 20–48 cm long, 5–6 mm wide, scabrid on the margins and veins, apex acute to acuminate. Involucral bracts leaf-like, spreading, 2–4(–10), 3.5–10 cm long, 3–4 mm wide. Inflorescence loosely capitate, primary branches 0–3, 0–1.5 cm long; spikelets congested in loose clusters, sessile or at the end of short primary branches, 2–5 per cluster, broadly ovoid, 8–10 mm long, 4–6 mm wide, glumes spreading when mature; glumes white to very pale brown, straw-coloured, elliptic, glabrous, 3.5–4 mm long, 1.3–1.8 mm wide, keel not prominent, with many distinct veins on either side, apex obtuse. Stamens 3: filaments 1.9–3 mm long; anthers ± 1.6 mm long. Stigma 3-branched. Nutlet brown, broadly obovoid, trigonous, 1.4–1.7 mm long, 1–1.1 mm wide, smooth.

TANZANIA. Ufipa District: Mbeya region, above Tatanda, 16 Nov. 1986, *Goldblatt et al.* 8131!; Chunya District: Top of Igila Hill, 22 Mar. 1965, *Richards* 19809!; Iringa District: Ruaha National Park, N slopes of Magagwe Hill, 20 Dec. 1972, *Bjornstad* 2233!

DISTR. T 4, 7; Zambia

HAB. *Brachystegia* woodland and on granite rocks; 1500–2000 m

CONSERVATION NOTES. Least concern (LC)?

NOTE. This looks like *C. mapanioides* but for the swollen stem base, narrower leaves and fewer and smaller involucral bracts.

30. **Cyperus luteus** *Boeck.* in Linnaea 38: 370 (1874); Kük. in E.P. 4, 20 (101): 414 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 203, figs. 406, 407 (1983). Type: Madagascar, Nosy Be [Nossi-Bé], *Pervillé* 516 (P!, iso.)

Perennial, robust, with a swollen stem base and a short creeping rhizome, up to 100 cm tall; culms few, 30–80 cm long, 1.6–4.4 mm wide, trigonous, glabrous. Leaves with leaf sheath greenish or pale purple above, dark purple below, 3.5–11 cm long; leaf blade linear, flat, 21–49 cm long, 2.5–7.3 mm wide, scabrid on margin and primary vein, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 5–9, lowermost 13–46 cm long, 3.7–7 mm wide. Inflorescence a simple anthela, primary branches 4–8, 6–15 cm long, inflorescence sometimes more congested and capitate-like, then primary branches up to 1 cm long; spikelets in loose clusters, sessile and at the end of primary branches, 15 to many per cluster, linear-lanceolate, 11–17 mm long, 1–1.4 mm wide, spikelet falling off entirely when mature; glumes green with or without a golden or reddish-brown tinge, lanceolate-elliptic, 4.4–6 mm long, 1.3–1.5 mm wide, keel with several veins on either side, apex acute to acuminate. Stamens 3; filaments 4.5–5.6 mm long; anthers 1–2.9 mm long. Nutlet grey to brown, linear-ellipsoid, trigonous, 2.5–3.7 mm long, 0.6–0.9 mm wide, rather smooth to minutely papillose.

UGANDA. Kigezi District: Kachwekano Farm, May 1949, *Purseglove* 2788! & 2840! & Feb. 1950, *Purseglove* 3242!

KENYA. Meru District: 32 km NE of Meru, Nyambeni Hills, 7 Sept. 1961, *Bogdan* 5211!; Machakos District: Chyulu Hills, Main Forest Camp 3, 17 Feb. 2001, *Luke & Luke* 7349!; Kilifi District: Arabuko-Sokoke Forest, Sokoke Forest Station, 8 June 1973, *Musyoki & Hansen* 996!

TANZANIA. Kigoma District: Ruwe Valley, N side of Kasengasi Village, 15 July 1958, *Juniper & Jefford* 142!; Mpanda District: Kahoko, 23 July 1959, *Newbould & Harley* 4589!; Mbeya District: Mporoto Ridge, ± 4 km NW of Igoma on NW slope of Mlima wa Bangi, 2 June 1992, *Gereau et al.* 4525!

DISTR. U 2; K 4, 7; T 1, 3, 4, 6–8; Cameroon, Congo-Kinshasa, Rwanda, Malawi; Madagascar

HAB. In wet pastures and grassland, secondary forest, often found as a weed in cultivation; sea-level up to 2200 m

CONSERVATION NOTES. Least Concern (LC) due to common habitat and wide distribution

SYN. *Mariscus luteus* (Boeck.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afric.* 5: 589 (1894)

Mariscus foliosus C.B. Clarke in F.T.A. 8: 399 (1902). Types: Uganda, Ruwenzori, *Scott Elliot* 7674; Kenya, Kilifi District: Rabai Hills, *Taylor* s.n.; Malawi, Mt Zomba, *Whyte* s.n. & Nyika Plateau, *Whyte* s.n. (K!, syn.)

31. *Cyperus neoschimperi* Kük. in E.P. 4, 20 (101): 552 (1936), *nomen novum* for *C. variegatus* Boeck. Type: Ethiopia, Scholoda Mt, *Schimper* I.173 (B!, syn.) & Schoata Mts, *Schimper* II.578 (B!, syn.), 588 (not found), 1363 (B!, syn.)

Perennial, with short creeping rhizome; culms several, tufted, 10–60 cm high, 0.5–2 mm across, trigonous, glabrous, at base slightly swollen. Leaves with leaf sheaths reddish brown with wide translucent margin, darker near very base, to 12 cm long; blade 10–66 cm long, 1.5–4 mm wide, scabrid on margin and midrib. Involucral bracts 3–5, hanging or reflexed, wider at base, the longest 7–30 cm long, 3 mm wide. Inflorescence a simple anthela with 3–4 spikes to capitate and ± ovoid, mid- to dark brown, sessile or briefly stalked; spikes ovoid to narrowly ovoid, 10–25 × 10–20 mm; spikelets 10–20, closely set along and at the end of primary branches, 5–10 × 1–2.5 mm, 2–6-flowered, compressed, falling off entire when mature; rachilla slightly winged; glumes densely imbricate, reddish brown or yellowish with green keel, ovate-oblong, 3.2–5 mm long, several-veined, apex acute. Stamens 3; filaments ? 3.5–4 mm long; anthers 1.9–2 mm long. Style 3-branched. Nutlet reddish brown, oblong-ellipsoid, 1.8–2 × 0.6–0.7 mm, trigonous, apiculate, densely papillose.

UGANDA. Karamoja District: Mt Moroto, July 1930, *Liebenberg* 303! & Lokapel S of Moroto, June 1967, *Haines* 212!

KENYA. Northern Frontier District: Subata, Lolokwe, Nov. 1978, *Gilbert, Gachathi & Gatheri* 5305!; West Suk District: Kacheliba, Oct. 1964, *Leippert* 5116!; Machakos District: summit of Mua Hills, Sept. 1964, *Gilletti* 16212!

TANZANIA. Pare District: Same, Dec. 1927, *Haarer* 947!; Handeni District: Kwa Mkono, June 1966, *Archbold* 740!; Kilosa District: Usagara, Kidete, Dec. 1935, *Peter* 32783!

DISTR. U 1; K 1, 2, 4; T 3, 6; Sudan, Ethiopia, Somalia

HAB. Rocky slopes and hilltops, in cracks or on flat rocks; 500–2000 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Mariscus schimperi* Steud., *Syn. Cyper.*: 62 (1855); A. Rich., *Tent. Fl. Abyss.* 2: 491 (1851);

C.B. Clarke in F.T.A. 8: 383 (1902). Type as for *C. neoschimperi*

Cyperus variegatus Boeck. in *Linnaea* 36: 337 (1870), *non C. variegatus* H.B.K. Type as for *C. neoschimperi*

C. neoschimperi Kük. var. *subvirescens* Kük. in E.P. 4, 20 (101): 552 (1936). Type: Tanzania, Morogoro District: Ukami area, *Peter* 39072 (B!, holo.: B!, iso.)

C. vexillatus Kük. in E.P. 4, 20 (101): 547 (1936). Types: Tanzania, Kilosa District: Usagara, km 32 of railroad, km 327 to Kidete, *Peter* 32783 (B!, syn.; K!, isosyn.) & SW of Kidete, *Peter* 32802 (B!, syn.), **syn. nov.**

C. pseudovestitus sensu Haines & Lye, *Sedges & Rushes E. Afr.*: 212, fig. 427 (1983), *non* (C.B. Clarke) Kük.

NOTE. Close to *C. obsoletenervosus* but lacks stolons.

Of *C. vexillatus* Kükenthal says 'in between *vestitus* and *pseudovestitus*' but distinct from the first in hard keeled leaf sheaths and the blunt glumes, from the second in dark red-purple sheaths; I (HB) believe this agrees perfectly with the more capitate forms of *C. neoschimperi*.

32. **Cyperus hemisphaericus** Boeck. in Flora 42: 436 (1859) – the 3rd page 436 for this volume!; Kük. in E.P. 4, 20 (101): 406 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 206, fig. 413 (1983) & Fl. Somalia 4: 132 (1995). Type: Mozambique, Tete, *Peters* s.n. (B, holo.)

Perennial, robust, tussocky, up to 130 cm tall, with a short creeping rhizome; culms tufted, 15–115 cm long, 2.2–9 mm wide, trigonous, sometimes almost rounded, with longitudinal grooves, glabrous. Leaves many, crowded at the base, up to 1.3 m long; leaf sheath dark purple at base, (pale) brown higher up, 3.5–10 cm long; leaf blade linear, flat or folded, 15–125 cm long, 6–13 mm wide, scabrid on primary vein and margin, apex acuminate. Involucral bracts leaf-like, spreading, 6–10, lowermost 13–56 cm long, 4.5–12 mm wide. Inflorescence a simple anthela, sometimes very congested to almost capitate, primary branches (0–)2–8, (0–)1–9 cm long; spikelets sessile and at the end of primary branches, 12 to many per spike, linear-lanceolate, 9–16 mm long, 1.3–2.2 mm wide, falling off entire when mature; glumes yellowish-white with a paler margin, ovate-lanceolate, 3.8–6 mm long, 1.6–2.4 mm wide, keel flat with many veins on either side, apex acute. Stamens 2; filaments 4.6–6.2 mm long; anthers 2.5–2.7 mm long. Nutlet dark reddish-brown, oblong to obovoid, trigonous, 2.4–2.7 mm long, 0.6 mm wide, minutely papillose in longitudinal rows.

KENYA. Nyeri District: Kiandalia, Githi location, 14 Dec. 1963, *Kibui* 45!; Masai District: Kajiado, Ololua Forest, NMK-IPR Compound, 3 May 1997, *Bytebier* 814!; Kilifi District: 3 km W of Kibarani, 29 Sept. 1958, *Moomaw* 981!

TANZANIA. Uzaramo District: Ndege Beach, ± 35 km N of Dar es Salaam, 14 Nov. 1994, *Goyder et al.* 3743!; Morogoro District: Uluguru Mts, 14 Jan. 1933, *Schlieben* 3238!; Songea District: ± 9.5 km W of Songea, 4 Jan. 1956, *Milne-Redhead & Taylor* 8053!

DISTR. **K** 4–7; **T** 3, 6, 8; **Z**; **P**; Somalia, Malawi, Mozambique, Zimbabwe

HAB. In open grassland, *Brachystegia* woodland, wooded grassland; sea-level up to 1850 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Mariscus hemisphaericus* (Boeck.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 589 (1894) & F.T.A. 8: 400 (1902)

M. gregorii C.B. Clarke in J. Bot. 34: 225 (1896) & F.T.A. 8: 401 (1902). Type: Kenya, District unclear, River Tana, Kiroruma, *Gregory* 93 (K!, holo.)

Cyperus hemisphaericus Boeck. var. *gregorii* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 407 (1936)

C. hemisphaericus Boeck. var. *longibracteus* Kük. in E.P. 4, 20 (101): 407 (1936). Type: Tanzania, Tanga District: East Usambaras, *Peter* 39855 (B!, K!, syn.) & Useguha, Mnyussi, *Peter* 10329 (B!, K!, syn.); Uzaramo District: Dar es Salaam, *Holtz* 601 & *Peter* 39341 (B!, syn.) & 39389 (B!, syn.) & 39440 (B!, syn.); Mozambique, between Mapinga and Kondutschi, *Peter* 14816 (B!, syn.) & Beira, *Peter* 31116 (B!, syn.)

33. **Cyperus difformis** L. in Cent. Pl. 2: 6 (1756); C.B. Clarke in F.T.A. 8: 330 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 165, figs. 310, 311 (1983) & Fl. Somalia 4: 117 (1995) & Fl. Eth. 6: 436 (1997). Type: India, Herb. Linn. No. 70.10 (LINN, lecto.), chosen by Tucker in Syst. Bot. Monogr. 43: 50 (1994)

Perennial or annual up to 67 cm tall; culms 13–61 cm long, 1.4–3.2 mm wide, trigonous, smooth. Basal leaves without blades. Leaves up to 46 cm long; leaf sheath green to reddish-brown, 2–10.5 cm long; leaf blade linear, flat, 9–38 cm long, 2.4–8.3 mm wide, glabrous to scabrid on primary veins and margins, apex acuminate. Involucral bracts leaf-like, spreading, 2–4, 8–35 cm long, 3–6.4 mm wide. Inflorescence simple to compound, sometimes almost capitate, primary branches 0–14, 0–7 cm long; spikelets in dense digitate clusters, sessile or at the end of primary and secondary branches, 10–many per cluster, ovoid, 2.2–8.7 mm long, 0.8–1.4 mm wide, glumes spreading and showing nutlet when matures, axis straight, elongating when fruit matures, red with white scars where the glumes were attached; glumes pale yellowish-brown to dark reddish-brown, obovate to

rounded, 0.5–1 mm long, 0.3–0.8 mm wide, keel green, winged, apex shortly mucronate, seemingly rounded. Stamens 2; filaments 0.3–0.6 mm long. Nutlet pale yellowish-brown, ellipsoid-obovoid, 0.5–0.8 mm long, 0.3–0.5 mm wide, slightly exceeding the glume, smooth to minutely papillose.

UGANDA. Karamoja District: Bukora county, 4 km N of Lotome, 10 June 1970, *Lye & Katende* 5596! Ankole District: Queen Elizabeth National Park, between Kaizi and Rwempuno Rivers, 2 June 1970, *Lye & Katende* 5497; Busoga District: Bugiri, near Tororo, 12 Apr. 1966, *Haines* 112! KENYA. Baringo District: 6.8 km from main road to Lake Bogoria Reserve, 1 Nov. 2000, *Smith, Beentje & Muasya* 103!; Fort Hall District: Thika, Plateau, 24 June 1947, *Bogdan* 764!; Kericho District: Rift Valley Province, 32 km NW of Kericho to junction of road S (just W of Kaitui), then S on road 8 km, Feb. 1973, *Spjut & Ensor* 3203!

TANZANIA. Tanga District: Mwera Estate, Mwera, Pangani, 5 Oct. 1957, *Tanner* 3741!; Itigi District: road Itigi–Singida 23 km, 27 Mar. 1965, *Richards* 19911!; Kilwa District: Kingupira, 2 Apr. 1976, *Vollesen* 3417!

DISTR. U 1–4; K 3–5, 7; T 1–8; Z; P; widespread in Africa; SE Asia, Pacific

HAB. In swamps, alongside water edges, in temporary pools, seasonally wet grasslands, and roadside ditches; sea-level up to 1700 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus difformis* L. var. *subdecompositus* Kük. in E.P. 4, 20 (101): 240 (1936). Types: Nigeria, Sokoto, *Dalziel* 460 & Lagos, *Dawodun* 37; Cameroon: near Yaounde, *Zenker* 1513 & 1514; Tanzania, Lushoto District: Handei, *Peter* 8248 & 10114; Tanzania: Pangani District: Hale, *Peter* 40272; Madagascar: Bemarivo, *Perrier de la Bathie* 2388; Mauritius, *Sieber* 137 (B, syn.)

NOTE. Close to *C. submicrolepis* but much coarser with broader leaves and culm.

34. ***Cyperus tanganyicanus*** (Kük.) *Lye* in *Nordic Journ. Bot.* 3: 231 (1983) & *Haines & Lye, Sedges & Rushes E. Afr.*: 260, fig. 527 (1983). Type: Tanzania, Iringa District: Lupembe, on rocks near Mpaponzi, *Schlieben* 436 (B, lecto.; BM, K!, isolecto., chosen by *Lye*)

Perennial, slender, with minute swollen plant-base, up to 13 cm tall; culms tufted, 4–11.5 cm long, 0.4–0.6 mm wide, trigonous, smooth. Leaves up to 13 cm long; leaf sheath pale brown, sometimes slightly breaking up into fibers, 1–2 cm long; leaf blade linear, folded, linear, 4–11 cm long, 0.9–1.4 mm wide, glabrous, apex acute. Involucral bracts leaf-like, spreading, 2, lowermost 2–4.5 cm long, 0.6–1 mm wide. Inflorescence capitate, spikelets 3–5 per head, linear-lanceolate, 4.6–12.7 mm long, 1.4–1.6 mm wide, rachis straight to slightly curved, few to 10-flowered; glumes reddish-brown, elliptic-lanceolate, 1.9–2.1 mm long, 0.9–1.1 mm wide, with 3–5 prominent but thin uncoloured veins on each side of the keel, keel greenish, apex mucronate, recurved. Stamens 1–2. Nutlet dark purplish-black, ellipsoid-obovoid, trigonous, 0.8–1.1 mm long, 0.5–0.8 mm wide, minutely papillose in longitudinal rows, apiculate.

TANZANIA. Iringa District: Lupembe, on rocks near Mpaponzi, Mar. 1931, *Schlieben* 436!; Dodoma District: road Itigi–Singida km 23, 27 Mar. 1965, *Richards* 29912!

DISTR. T 7; not known elsewhere

HAB. In temporarily wet habitats, on damp shallow soil over rocks; ± 1350 m

CONSERVATION NOTES. DD; lacks information on threats

SYN. *Cyperus bellus* Kunth var. *tanganyicanus* Kük. in E.P. 4, 20 (101): 304 (1936)

NOTE. *C. tanganyicanus* is closely related to *C. kirkii* but has smaller glumes without a pale margin and bigger nutlets.

35. ***Cyperus castaneobellus*** *Lye* in *Nordic Journ. Bot.* 3: 227 (1983) & *Haines & Lye, Sedges & Rushes E. Afr.*: 258, figs. 525, 526 (1983). Type: Tanzania: Songea District: by Lumecha Bridge North of Songea, *Milne-Redhead & Taylor* 8405 (BR!, holo.; K!, EA, iso.)

Perennial, slender, growing in very dense tussocks, up to 19 cm tall; culms tufted, 4–18 cm long, 0.3–0.5 mm wide, trigonous, smooth. Leaves up to 11 cm long; leaf sheath brown with slightly reddish parts, 0.7–1.5 cm long; leaf blade linear, flat, 3.5–9.5 cm long, 0.3–0.6 mm wide, glabrous, apex acute. Involucral bracts leaf-like, spreading or sometimes slightly erect, 2, lowermost 1–3.5 cm long, 0.5–0.7 mm wide. Inflorescence capitate; spikelets 3–10 per head, linear-lanceolate, 4–10.5 mm long, 2–2.5 mm wide, straight to curved, with 8–20 glumes per spikelet; glumes dark reddish-brown to almost black, elliptic-lanceolate, 2–2.5 mm long, 0.9–1.1 mm wide, 3–4 veins on each side of keel, keel slightly paler coloured than rest of glume, slightly excurrent, apex acute to acuminate. Stamens 3; anthers 1.1–1.3 mm long. Nutlet dark reddish brown, obovoid, 0.6–0.8 mm long, 0.5–0.6 mm wide, minutely papillose in longitudinal rows, apiculate.

TANZANIA. Tanzania: Songea District: by Lumecha Bridge North of Songea, Jan. 1956, *Milne-Redhead & Taylor* 8405!

DISTR. T 8; known from type only

HAB. In shallow soil overlying rocks by riverside; 930 m

CONSERVATION NOTES. DD; lacks data on population size and threats, but probably at least Vulnerable

36. **Cyperus clavinox** *C.B. Clarke* in Durand & Schinz, *Consp. Fl. Afr.* 5: 551 (1894), *nom. nud.* & *F.T.A.* 8: 319 (1902); Kük. in *E.P.* 4, 20 (101): 304 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 261, figs. 530, 531 (1983). Type: Nigeria, Bornu, *Vogel* 64 & 65 (K, syn.)

Perennial, slender, up to 26 cm tall, with a slightly swollen culm-base covered by the fibrous remains of old leaf sheaths; culms 3–23 cm long, 0.8–0.9 mm wide, trigonous, smooth. Leaves up to 15.5 cm long; leaf sheath pale brown, 1–2.5 cm long; leaf blade linear, folded, sometimes canaliculate, 7–13 cm long, 0.8–0.9 mm wide, glabrous, apex acuminate. Involucral bracts leaf-like, spreading, 2, lowermost 7–8.5 cm long, 0.8–1 mm wide. Inflorescence capitate, spikelets up to 25 per inflorescence, elliptic-lanceolate, 7.5–10.5 mm long, 2.2–2.5 mm wide; glumes very pale brown to greyish-white, sometimes with slight reddish dots on the wings, ovate, 2.1–2.2 mm long, 1.6–1.9 mm wide, keel greenish, 3-veined, apex acuminate. Style usually unbranched. Nutlet dark grey to black, pear-shaped, ± 0.8 mm long, 0.6 mm wide, minutely papillose.

TANZANIA. Kilwa District: ± 4 km SSE of Kingupira, 27 Feb. 1976, *Vollesen* 3294!

DISTR. T 8; Nigeria, Chad, Zambia, Malawi, Zimbabwe, Botswana

HAB. Wet depression in *Terminalia spinosa* wooded grassland; 125 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus monostigma* *C.B. Clarke* in *Mém. Soc. Bot. France* 8: 26 (1907). Types: Congo-Brazzaville, *Chevalier* s.n.; ?Chad, Lac Fiottri & Baguirmi N, Moula, *Chevalier* 9609, 9610 (P, syn.)

NOTE. *C. clavinox* is closely related to *C. meeboldii* but has bigger glumes and nutlets.

37. **Cyperus kirkii** *C.B. Clarke* in *F.T.A.* 8: 318 (1902); Kük. in *E.P.* 4, 20 (101): 305 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 259, fig. 524 (1983). Type: Zambia, Lower Zambesi, near Lupata, *Kirk* 1 (K!, syn.); Zambia, Manganja Hills, *Meller* s.n. (K!, syn.)

Perennial, slender, tussocky, the base of the plant slightly swollen and covered with some fibrous remains of old leaf sheaths, up to 21 cm tall; culms tufted, 10–19 cm long, 0.6–0.9 mm wide, trigonous, smooth. Leaves up to 21 cm long; leaf sheath brown, 1–3 cm long; leaf blade linear, flat but strongly inrolled when dry, 6–18 cm long, 0.6–1 mm wide, glabrous, apex acuminate. Involucral bracts leaf-like,

spreading, 2, lowermost 2.5–6.5 cm long, 0.7–1 mm wide. Inflorescence capitate, spikelets 4–15 per head, linear-lanceolate, 7–15 mm long, 1.9–2.4 mm wide, straight or slightly curved, with 20–40 glumes per spikelet; glumes pale reddish-brown with an uncoloured margin, ovate, 1.9–2.4 mm long, 1–1.3 mm wide, 3–4 prominent ribs on either side of the keel, keel excurrent, apex acute to acuminate. Stamens 3; filaments 1.8–2.4 mm long; anthers 0.6–1.1 mm long. Nutlet grey to almost black, obovoid to pear-shaped, trigonous, 0.8–0.9 mm long, 0.4–0.8 mm wide, papillose in longitudinal rows, apiculate.

TANZANIA. Lindi District: Machingwea, Nazuatumbuzi Rocks, 19 Mar. 1961, *Anderson* 1313!;

Tunduru District: road 97 km from Masasi, 22 Mar. 1963, *Richards* 18063!

DISTR. T 8; Zambia, Malawi, Mozambique, Zimbabwe

HAB. On shallow peaty soils in rock crevices and on rocky outcrops; 300–900 m

CONSERVATION NOTES. Least concern (LC)

NOTE. *C. kirkii* is closely related to *C. tanganyinacus* but has larger glumes with a pale margin, and smaller nutlets. It also is similar to *C. boreobellus* which has slightly larger glumes and only occurs in Kenya.

38. *Cyperus meeboldii* Kük. in F.R. 18: 345 (1922); Kük. in E.P. 4, 20 (101): 309 (1936); Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: 260, figs. 528, 529 (1983) & in *Fl. Somalia* 4: 130 (1995) & *Fl. Eth.* 6: 462 (1997). Type: India, Badami, *Meebold* 11257 (B, holo.; not found)

Perennial up to 27 cm tall, slender, culm-base swollen, covered by black fibrous remains of old leaf sheaths; culms 2.5–25 cm long, 0.5–1.3 mm wide, trigonous, glabrous to sometimes slightly scabrid. Leaves up to 15.5 cm long; leaf sheath grey to pale brown, 0.5–2.5 cm long; leaf blade linear, flat or inrolled, 3–13 cm long, 0.9–2 mm wide, slightly scabrid on the margin, apex acute to acuminate. Involucral bracts leaf-like, spreading, sometimes slightly erect, 2–3, lowermost 2.5–15 cm long, 0.9–2.2 mm wide. Inflorescence capitate, with 15 to many spikelets in per head, ovoid to linear, 4–11 mm long, 1.1–2.5 mm wide, rachis straight; glumes (pale) reddish-brown, ovate, 1.3–1.9 mm long, 0.9–1.4 mm wide, keel pale brown, 3-veined, apex acuminate, slightly recurved. Stamens 1; filaments 1.4–1.6 mm long; anthers 0.3–0.7 mm long. Style usually unbranched, or with 3 branches. Nutlet grey to reddish-brown, pearshaped, 0.5–0.8 mm long, 0.3–0.4 mm wide, minutely papillose in longitudinal rows.

UGANDA. Karamoja District: Moroto, Lokapel, 3 June 1967, *Haines* 221!

KENYA. Northern Frontier District: Kaisut desert, 45 km N of Laisamis, 25 Nov. 1977, *Carter &*

Stannard 720!; Kiambu/Machakos District: Thika, Fourteen Falls, 27 Apr. 1960, *Napper* 1525!;

Kwale District: Taru Quarry, 5 July 1994, *Luke & Gray* 4050!

DISTR. U 1; K 1, 4, 7; Nigeria, Senegal, Gabon, Chad, Ethiopia, Somalia; India

HAB. In seasonally wet habitats, often in wet sandy soil or mud; 30–1400 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus adamii* Raymond in *Bull. Soc. Bot. France* 106: 145 (1959). Type: Senegal, Rhaddar, *Adam* 12353 (herb. Raymond, holo.)

NOTE. *C. meeboldii* is closely related to *C. clavinox* but has smaller glumes and nutlets, and usually fewer spikelets per inflorescence.

According to Lye this species also occurs in the coastal regions at Tanzania. I have seen no specimens from there.

39. *Cyperus nyererei* Lye in *Nordic Journ. Bot.* 3: 225 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 158, fig. 293 (1983). Type: Tanzania: Mbeya District: Kitulo Plateau, Igoma–Kitulo road 5 km beyond Kikondo, *Wingfield* 529 (DSM, holo.; K!, iso.)

Perennial up to 42 cm tall, densely tufted producing many black roots, culm base hard, covered with black fibres from old leaf sheaths; culms tufted, 15–40 cm long, 0.5–1 mm wide, trigonous, almost smooth to slightly scabrid. Leaves up to 21 cm long; leaf sheath purple to black, 1–3 cm long; leaf blade linear, flat, rather stiff, 5–18 cm long, 1.3–3 mm wide, scabrid on major veins and margins, apex acuminate. Involucral bracts leaf-like, spreading or erect, 2–3, lowermost 2.3–10 cm long, 1–2.2 mm wide. Inflorescence loosely capitate to simple, primary branches 0–3, 0–3 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 3–12 per cluster, lanceolate to ovoid, 6.8–10 mm long, 1.9–4 mm wide, the glumes spreading through maturity, rachis straight; glumes dark reddish-brown to black, lanceolate-ovate, 2.7–4 mm long, 0.6–1.4 mm wide, keel pale brown, apex acute to slightly acuminate. Stamens 3; filaments \pm 1.6 mm long; anthers 1–1.3 mm long. Nutlet greyish to reddish-brown, ellipsoid, 1.3–1.5 mm long, 0.6–0.7 mm wide, slightly apiculate, minutely papillose.

TANZANIA. Mbeya District: World's End viewpoint on Mbeya–Chunya road, Dec. 1969, *Wingfield* 5051 & Mbeya, base of steep ridge just north of Mbeya Peak, 6 Jan. 1991, *Gereau et al* 35071; Iringa District: Ludewa, Livingstone Mountains, on east face of Msalaba Mountain, above Luana, 16 Jan. 1991, *Gereau & Kayombo* 3645!

DISTR. **T** 7; not known elsewhere

HAB. Thin soil over rocks; 1950–2750 m

CONSERVATION NOTES. Lacks data on threats

40. *Cyperus grandibulbosus* C.B. Clarke in F.T.A. 8: 353 (1902); Kük. in E.P. 4, 20 (101): 125 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 193, fig. 378 (1983) & Fl. Somalia 4: 124 (1995) & Fl. Eth. 6: 451, fig. 212.92 (1997). Type: Kenya, Teita District: Taita Hills, Ndi Mountains, *Scott-Elliot* 6284 (K!, holo.)

Perennial up to 60 cm tall, slender to somewhat robust, with 7–10 mm thick black bulbs; culms growing directly from the bulb, 15–56 cm long, 1–2.4 mm wide, trigonous with longitudinal grooves, smooth. Leaves many from the base, up to 42 cm long; leaf sheath pale brownish-green, 1.5–10 cm long, rather wide and somewhat fleshy; leaf blade linear, folded when dried, 19–32 cm long, 1.9–4 mm wide, glabrous to somewhat scabrid on the margins, apex acuminate. Involucral bracts leaf-like, spreading, 3–6, lowermost 10–19 cm long, 1.6–3.8 mm wide. Inflorescence (loosely) capitate, very occasionally simple, then primary branches 0–3, 0–4 cm long; spikelets in loose digitate clusters, many per cluster, lanceolate, 8–20 mm long, 1.4–4 mm wide; glumes golden to yellowish-brown, sometimes with a slight reddish-brown tinge, ovate-lanceolate, glabrous, 3.7–6.4 mm long, 1.5–2.1 mm wide, keel green, excurrent, with several veins on either side, apex acuminate. Stamens 3; filaments 2.5–5.7 (–6.4) mm long; anthers 1.8–2.8 mm long. Nutlet grey, obovoid, trigonous, 1.7–1.8 mm long, 0.8–0.9 mm wide, minutely papillose.

KENYA. Northern Frontier District; Dandu, 1 May 1952, *Gillett* 12981!; Fort Hall District: Maboloni Rock, Yatta Plateau. 7 Dec. 1952, *Bally* 8377!; Teita District: Voi Gate W, Pipeline km 2.4, 12 Dec. 1966, *Greenway & Kanuri* 12716!

TANZANIA. Meru District: 35 km E of Arusha on Moshi road, 25 May 1972, *Parker* T51!

DISTR. **K** 1, 4, 7; **T** 2; Ethiopia, Somalia

HAB. In seasonally wet habitats, wooded grassland and grasslands, often on red loamy soil; 450–1250 m

CONSERVATION NOTES. Probably least concern (LC)

SYN. *Cyperus giolii* Chiov. in Ann. Bot. (Rome) 13: 375 (1915); Kük. in E.P. 4, 20 (101): 127 (1936). Type: Somalia, between Baidoa and Bur Acaba, *Paoli* 1133 (CSET!, holo.)

Cyperus grandibulbosus C.B. Clarke var. *amplus* Kük. in E.P. 4, 20 (101): 125 (1935). Type: Kenya, Machakos District: Kibwezi, *Scheffler* 13 (B!, holo.; K!, W!, iso.)

41. **Cyperus phillipsae** (*C.B. Clarke*) *Kük.* in *E.P.* 4, 20 (101): 497 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 210, fig. 420 (1983). Type: Somalia, *Lort Phillips* s.n. (K, holo.)

Perennial, up to 53 cm tall, with a fleshy culm-base, without rhizome; culms 20–50 cm long, 1.2–3 mm wide, trigonous, in the lower part covered by wide greyish-white leaf sheaths, glabrous. Leaves up to 46 cm long; leaf sheath greyish-white, papery, 3–10.5 cm long; leaf blades many, linear, flat, 22–35 cm long, 3.2–5.6 mm wide, strongly scabrid along margin, apex acuminate. Involucral bracts leaf-like, spreading, 6–7, lowermost 21–30 cm long, 3–5 mm wide. Inflorescence (capitate or) a simple anthela, primary branches (0–)4–6, 0.5–4 cm long; spikelets in dense spikes, spikes 1–1.5 cm long, sessile and at the end of primary branches; spikelets lanceolate, 3.9–5(–7.1) mm long, 1–1.3 mm wide, falling off entirely when matured, rachilla strongly nodular; glumes greyish-white, sometimes with orange or reddish-brown tinge, ovate, 2.9–4 mm long, 1.4–2 mm wide, keel green, apex shortly mucronate. Stamens 3. Nutlet reddish-brown, obovoid, trigonous, 1.1–1.2 mm long, 0.7–0.8 mm wide, minutely papillose.

KENYA. Tana River District: Kurawa, 48 km S of Garsen, 25 Sept. 1961, *Polhill & Paulo* 572!; Kilifi District: 15 June 1955, *Langridge* 40!; Lamu District: Kiunga Point 88 km NE of Lamu, 24 July 1961, *Gillespie* 35!

DISTR. K 1?, 7; Somalia

HAB. Sandy soil near shore, wooded grassland, old cultivations, forest glades; 0–15(–750) m

CONSERVATION NOTES. Probably Least Concern (LC) seeing the variety of habitats

SYN. *Mariscus phillipsiae* *C.B. Clarke* in *F.T.A.* 8: 391 (1902)

NOTE. One of the specimens is from K 1, Dandu, *Gillett* 13075, at 750 m in rich *Acacia-Commiphora* bushland. This collection is very similar to the collections from the coast, but has considerably longer spikelets. More collections might make clear whether this should get varietal rank.

42. **Cyperus gigantobulbes** *Lye* in *Nordic Journ. Bot.* 3: 219 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 254, figs. 512, 513 (1983). Type: Tanzania, Uzaramo District: near Ruvu R., *Milne-Redhead & Taylor* 7441 (K, holo.; not found)

Perennial, robust, with an \pm 3 cm thick swollen base containing many up to 7 cm long brown tough leaf sheaths from previous years growth, the outer splitting into fibres; culms solitary, 70–80 cm long, 2–4 mm wide, trigonous, glabrous. Leaves with sheath pale reddish brown to straw-coloured, to 7 cm; blade linear, flat, 20–30 cm long, 6–9 mm wide, densely scabrid at least on margin and primary vein above. Involucral bracts leaf-like, spreading to reflexed, \pm 4, lowermost to 20 cm long, 6 mm wide. Inflorescence capitate, 2.5–3 cm across; spikelets many in a dense congested head, 10-flowered, 10–12 mm long, 1.5–2 mm wide, rachis winged; glumes white, lanceolate, the base concave and enclosing nutlet when falling, 5–7 mm long, keel slightly excurrent, with \pm 6 veins on each side. Stamens 3; style 3-branched. Nutlet reddish-brown, ellipsoid, trigonous, 1.7–1.8 mm long, 0.6–0.8 mm wide, minutely papillose, apiculate.

TANZANIA. Tanzania, Uzaramo District: near Ruvu R., Nov. 1955, *Milne-Redhead & Taylor* 7441

DISTR. T 6; known only from the type

HAB. Seasonally wet habitat; 100 m

CONSERVATION NOTES. Data deficient, needs information on population and threats

NOTE. Based on Lye's description. Closely related to *angolensis*, but without stolons, a more swollen culm base, smaller nutlet and bigger glumes.

43. **Cyperus tatandaensis** *Muasya & D.A. Simpson* in *K.B.* 59 (4): 595 (2004). Type: Tanzania, Ufipa District: hill NW of Tatanda Mission, 23 June 1996, *Faden et al.* 96/376 (K!, holo.; EA, NHT, US, iso.)

Perennial up to 1 m tall, with short rhizome and swollen culm bases; culms moderately tufted, 77–95 cm long, 1.9–2.8 mm wide, terete, smooth, base slightly swollen. Leaves mostly basal, 1–3 cauline near the base; up to 29 cm long; leaf sheath brownish, 2–13 cm long, completely enclosing the culm on cauline leaves; leaf blade very narrowly ovate, flat, 10–16.5 cm long, 6–8 mm wide, margins minutely scabrid, gradually tapering to an acute or acuminate apex. Involucral bracts leaf-like, spreading, 3–7, lowermost 3.4–7 cm long, 5.5–7 mm wide, margins scabrid at the tip. Inflorescence congested capitate, 1–1.4 × 2–2.5 cm; spikelets in 10–15 per inflorescence, ovoid to narrowly ovoid, 10–15 mm long, 4–6 mm wide, flattened, rachilla straight, dorsiventrally broad with thick raised margins; glumes mid-brown, ovate, 6–8.7 mm long, 1.5–3.5 mm wide, sides chartaceous, 6–7-veined on each side, keel mid-brown, apex with mucro up to 1 mm long. Stamens 3; filaments 5–6.4 mm long; anthers 2.5–3.5 mm long. Nutlet greyish to reddish-brown, shiny, ellipsoid to ellipsoid-obovoid, trigonous with flat to slightly concave sides, 1.8–2.4 mm long, 1.3–1.6 mm wide, smooth.

TANZANIA. Tanzania, Ufipa District: hill NW of Tatanda Mission, 23 June 1996, *Faden et al.* 96/376! & 10 km on Tatanda-Mbala road, 24 Apr. 2006, *Bidgood et al.* 5653!

DISTR. T 4; not known anywhere else

HAB. *Brachystegia* woodland; 1700–1900 m

CONSERVATION NOTES. Known from only two collections in close proximity of each other, in an area which seems to be experiencing a decline in habitat due to tree cutting. Therefore this taxon is assessed as Endangered (EN B2a,b,iii).

44. *Cyperus nduru* Cherm. in Arch. Bot. Mém. 4(7): 18 (1931). Type: Central African Republic, Bambari, *Tisserant* 332 (P!, holo.)

Perennial, fairly robust, up to 29 cm tall, swollen bulb-like base; culms tufted, 7–28 cm long, 0.7–1.4 mm wide, trigonous to almost terete, smooth. Leaves very few, up to 12 cm long; leaf sheath black (when burnt) at base, brown on culm, 1–4.5 cm long; leaf blade linear, flat to inrolled, 2–7.5 cm long, 0.7–1.6 mm wide, glabrous to scabrid on margins, apex acute. Involucral bracts bract-like, spreading, 1–3, lowermost 0.5–1.5 cm long, 0.8–1.6 mm wide, not or only slightly exceeding the inflorescence. Inflorescence capitate; spikelets in a dense head, 1–6 per head, ovoid, 7–11 mm long, 4–5.6 mm wide, rachis straight; glumes white to brownish, ovate to boat-shaped, 4.7–5.6 mm long, 2.9–4.7 mm wide, keel acute, many veins on either side of keel, apex obtuse. Stamens 3; filaments 4.3–6.4 mm long; anthers 1.8–2.5 mm long. Nutlet pale brown to olive, ovoid, 2.4–2.9 mm long, ± 1.6 mm wide, smooth.

KENYA. Meru District: Meru National Park, bank of Kiolu River 3 km W of Muchwango, May 1972, *Ament & Magogo* 118!

TANZANIA. Ngara District: Mbuba, Bushubi, 2 July 1960, *Tanner* 5025!; Mpanda District: Mwesi, Sept. 1961, *Proctor* 1916!; Ufipa District: Kituria-Lukungu Rivers, 9 Dec. 1958, *Richards* 10274!; DISTR. T 1, 4, 7, 8; Sierra Leone, Guinea, Ghana, Nigeria, Cameroon, Congo-Brazzaville, Congo-Kinshasha, Zambia, Malawi, Mozambique, Zimbabwe

HAB. Regularly burnt wooded grassland or grassland, sometimes in woodland or on river banks; (650–)1050–1900 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus margaritaceus* Vahl var. *nduru* (Cherm.) Kük. in Bot. Notis. 1934: 67 (1934) & in E.P. 4, 20 (101): 285 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 257 (1983)

NOTE. Very similar to *C. margaritaceus* but slightly smaller, with shorter spikelets and glumes, and a narrower nutlet. Also similar to *C. niveus* var. *tisserantii* but with fewer leaves, shorter involucral bracts and fewer spikelets per head. I considered to reduce it to a variety of *niveus*, but in the end kept the two separate.

45. *Cyperus margaritaceus* Vahl in E.P. 2: 307 (1805); C.B. Clarke in F.T.A. 8: 321 (1902); Kük. in E.P. 4, 20 (101): 284 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 257, fig. 519 (1983). Type: Guinea, *Thonning* s.n. (C, holo.)

Perennial, robust, up to 70 cm tall, with swollen bulb-like base; culms 30–68 cm long, 0.8–1.9 mm wide, trigonous, with longitudinal ribs, glabrous. Leaves up to 45 cm long; basal leaf sheaths reddish-brown to blackish, covering the base, leaf base on culm pale brown, 2–8 cm long; leaf blade linear, flat to inrolled, 5–37 cm long, 1.6–3.7 mm wide, scabrid on margins, apex acuminate. Involucral bracts leaf-like, spreading or reflexed, 2–4, lowermost 2–8 cm long, 1–2.9 mm wide. Inflorescence capitate; spikelets 1–9 per head, (broadly) ovate, 6–22 mm long, 5–10 mm wide, rachis straight; glumes dirty white, yellowish to pale reddish-brown, boat-shaped to elliptic-lanceolate, 5.7–11 mm long, 3.2–6.4 mm wide, keel prominent, many veins on either side of keel, apex acute, sometimes slightly excurrent. Stamens 3; filaments 4.8–8.8 mm long; anthers 1.9–4.1 mm long. Nutlet pale brown to dark olive, ovoid to orbicular, trigonous, 2.2–3 mm long, 2–2.1 mm wide, smooth, apiculate.

TANZANIA. Dodoma District: 3 km N of Manyoni on Singida Road, 15 Apr. 1988, *Bidgood et al.* 1113!; Chunya District: Rungwa Game reserve, ± 1 km W of Itigi–Mbeya Road, 28–29 Jan. 1969, *Soyalel* 5327!; Songea District: ± 12 km E of Songea, 19 Feb. 1956, *Milne-Redhead & Taylor* 8833! DISTR. T 3–5, 7, 8; widespread in west tropical Africa, central Africa and southern Africa HAB. Open woodland or grassland, riverbanks, often on sandy or loamy soil; 900–2000 m CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus pseudoniveus* Boeck. in Verh. Bot. Ver. Prov. Brand. Abh. 29: 45 (1888). Type: Namibia, Olukonda, *Schinz* s.n. (B, holo.)

C. margaritaceus Vahl var. *pseudoniveus* (Boeck.) C.B. Clarke in F.T.A. 8: 322 (1902); Kük. in E.P. 4, 20 (101): 284 (1936)

46. ***Cyperus mollipes*** (*C.B. Clarke*) *K. Schum.* in P.O.A. C: 122 (1895); Kük. in E.P. 4: 20 (101): 557 (1936); Lye in Fl. Eth. 6: 468 (1997). Type: Sudan, Djur, Majob, *Schweinfurth* 1547 (B!, holo.; K!, iso.)

Perennial, tufted, 8–60 cm tall, with a bulbous or tuberous culm-base covered by rather thick brown or blackish old fibres from leaf sheaths; culms few to many and crowded, 0.5–3.5 mm wide, trigonous to triquetrous, glabrous. Leaves with leaf sheath pale to dark brown, 3–7 cm long; leaf blade linear, flat or slightly channelled, 5–30 × 0.1–0.7 cm, scabrid on at least margin and primary vein, attenuate. Involucral bracts leaf-like, often conspicuously dilated at the base, erect, spreading or reflexed, 2–5, lowermost 2–20 × 0.1–0.6 cm. Inflorescence capitate, hemispherical or irregular, white or cream, 8–21 mm in diameter; spikelets many per head, lanceolate, 4–8 mm long, 0.7–2 mm wide, 2–4-flowered but often only perfecting 1 nutlet; glumes white but usually pinkish brown when dry, concave, 3–5.9 mm long, 1.1–1.4 mm wide, keel obscure, with 4–10 veins on either side, apex acuminate. Stamens 3, filaments 3.7–7 mm long, anthers yellow, 1.6–2.3 mm long. Nutlet dark brown to blackish, oblong to broadly obovoid and slightly trigonous to cylindrical, 1.4–3.5 mm long, 0.5–1.2 mm wide, conspicuously apiculate, minutely papillose, completely enveloped by the glume when mature.

UGANDA. Karamoja District: escarpment S of Kapendongor, June 1970, *Lye & Katende* 5583!; Bunyoro District: Butiaba Flats near Bukimi, 9 Apr. 1950, *Dawkins* 563!; Ankole District: Bitolege, 12 Nov. 1950, *Jarrett* 234!

KENYA. West Suk District: 24 km NW of Kapenguria, 11 June 1958, *Bogdan* 4528!; Masai District: Mara Game Reserve, Olemelepo gate, Jan. 1972, *Taiti* 1887!; Tana River District: Tana River National Primate Reserve, Lodge T/O 0.6 km W, 13 Mar. 1990, *Kabuye et al.* TPR 249!

TANZANIA. Mbulu District: Tarangire National Park, swamp 13 km from Tarangire Camp, 1 Dec. 1969, *Richards* 24843!; Morogoro District: Morogoro–Mikumi road, 40 km before Mikumi, 29 Dec. 1971, *Wingfield* 1807!; Uzaramo District: Mafia Island, Utende, Kilimeloni, Nov./Dec. 1992, *Frontier Tanzania* 3309!

DISTR. U 1–4; K 1–7; T 1–8; Congo–Kinshasa, Rwanda, Sudan, Ethiopia, Somalia, Zambia, Malawi HAB. Grassland (especially rather open grassland or on heavy/black soils), open woodland, bushed grassland, scattered tree grassland, occasionally on thin soil over rock; may be locally common; 0–2000(–2400) m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

- SYN. *Kyllinga bulbocaulis* Boeck. in Flora 58: 258 (1875); C.B. Clarke in F.T.A. 8: 285 (1902). Type: "Zanzibar" *Speke & Grant* s.n., but according to Clarke Tanzania, Zanzibar, *Speke & Grant* 13 & Bukoba District: Karagwe [Karagi], *Speke & Grant* 410 (K!, syn.), *non Cyperus bulbocaulis* (Hochst.) Boeck. (1870)
- Cyperus macropus* Boeck. in Flora 62: 550 (1879). Type: Sudan, Djur, Seriba Ghattas, *Schweinfurth* 1917 (B!, holo. & iso.), *non Cyperus macropus* Miq., Fl. Ned. Ind., Eerste Bijv. 3: 599 (1861)
- Rhynchospora bulbocaulis* Boeck. in Flora 1879: 567 (1879), *non Cyperus bulbocaulis* (Hochst.) Boeck. in Linnæa 36: 372 (1870), based on *Mariscus bulbocaulis* Hochst. in Flora 27(1): 102 (1844). Type as for *C. mollipes*
- Mariscus macropus* (Boeck.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 590 (1894) & in F.T.A. 8: 388 (1902), *nom. illegit.*
- M. mollipes* C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 590 (1894) & F.T.A. 8: 387 (1902), *nomen novum* for *Rhynchospora bulbocaulis*
- Cyperus amomodorus* K. Schum. in P.O.A. C: 122 (1895); Haines & Lye, Sedges & Rushes E. Afr.: 218, fig. 442 (1983). Type: Tanzania, Bukoba District: Kavingo near Mpororo, *Stuhlmann* 1950 (B!, holo.)
- Mariscus globifer* C.B. Clarke in J. Bot. 34: 225 (1896) & in F.T.A. 8: 387 (1902). Type: Kenya, Nairobi/Machakos District: Athi, *Gregory* 30 (BM!, lecto.)
- M. circumclusus* C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 585 (1894), *nom. nudum* & in F.T.A. 8: 387 (1902). Type: Ethiopia, Sanka Berr, *Schimper* 1300 (B!, holo.)
- M. boeckeleri* C.B. Clarke in K.B. Add. Ser. 8: 13 (1908), *nomen novum* for *Kyllinga bulbocaulis* Boeck. in Flora 58: 258 (1875), **syn. nov.**
- Ascopholis gamblei* C.E.C. Fisch. in K.B. 1931: 105 (1931). Type: India, Ootacamund, Nilgiri Hills, *Gamble* 14279 (K, holo.)
- Cyperus mollipes* (C.B. Clarke) K. Schum. var. *bulbocaulis* (Boeck.) Kük. in E.P. 4, 20 (101): 557 (1936)
- C. mollipes* (C.B. Clarke) K. Schum. var. *amomodorus* (K. Schum.) Kük. in E.P. 4, 20 (101): 557 (1936)
- C. circumclusus* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 558 (1936); [also Schweinf. in Bull. Herb. Boissier 2, App. 2: 103 (1894), *nom. nudum*]; Haines & Lye, Sedges & Rushes E. Afr.: 217, figs. 440, 441 (1983), **syn. nov.**
- C. mollipes* (C.B. Clarke) K. Schum. var. *globifer* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 558 (1936)
- C. submacropus* Kük. in E.P. 4, 20 (101): 561 (1936); Lye in Fl. Eth. 6: 466 (1997). Type as for *C. macropus* and *C. mollipes*
- C. submacropus* Kük. var. *abbreviatus* Kük. in E.P. 4, 20 (101): 561 (1936). Types: Tanzania, various localities, *Peter* 13754 (B!, syn.), 39344 (B!, syn.), 31563 (B!, syn.), 31843b (B!, syn.), 31346c (B!, syn.), 33852b (B!, syn.)
- C. submacropus* Kük. var. *fuscofibrosus* Kük. in E.P. 4, 20 (101): 562 (1936). Types: Tanzania, various localities, *Peter* 33020b (B!, syn.), 32926 (B!, K!, syn.), 33123 (B!, K!, syn.), 32937 (B!, syn.), 32954 (B!, syn.)
- C. submacropus* Kük. var. *calocephalus* Kük. in E.P. 4, 20 (101): 561 (1936). Types: Tanzania, various localities, *Peter* 7248 (B!, syn.), 14912 (B!, K!, syn.), 33438 (B!, K!, syn.), 45712 (B!, syn.)
- Mariscus amomodorus* (K. Schum.) Cufod. in E.P.A.: 1449 (1970)
- Cyperus globifer* (C.B. Clarke) Lye in Nordic Journ. Bot. 3: 232 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 219, fig. 443 (1983)

NOTE. Hoenselaar sank *C. amomodorus* and *C. globifer* into *C. mollipes*, as the differences in size, number of bracts, shape of inflorescence, splitting/non-splitting of leaf sheaths, all overlap; she felt there is no consistent difference, and this is a single, very variable species. I (HB) fully agree with her.

Regarding the differences between *circumclusus* and *mollipes*, it is interesting to see that the author of these two species had a completely different 'take' on their differences from Haines and Lye: C.B. Clarke said of his *circumclusus* and *mollipes*: "spikelets and nuts are the same; bracts of *mollipes* entirely want the dilated striated base [of *circumclusus*]". He added that the type of *mollipes* lacked the lower part of the culm, so he could not comment on its leaf sheaths – this is rather strange, as the K specimen of the type, with notes from Clarke, has leaf sheaths and lower culm! What is more, in my (HB) opinion these look identical to those of *circumclusus*.

Haines & Lye: *circumclusus* and *amomodorus* (= *mollipes*) "very similar", but (extracted from descriptions)

spikelets 5–8 × 1–2 mm; glumes 3–4 mm long; nutlets obovoid, 1.4–1.7 × 0.8–1.2 mm	<i>C. circumclusus</i>
spikelets 4–6 × 0.7–1.5 mm; glumes 3.5–5 mm long; nutlets cylindrical, 2–2.7 × 0.5–0.7 mm	<i>C. mollipes</i>

which leaves as only absolute difference the size of the nutlet. I am unable to find a correlation between nutlet size/shape and glume size.

The type of *mollipes* has dark-coloured mature nutlets of 2.1–2.5 mm long, almost cylindrical; the type of *circumclusus* has paler nutlets of 2.3–2.5 mm long, rather trigonous. This is not, in my (HB) opinion, enough to separate taxa at species level; all the more since very few of our specimens exhibit mature nutlets. For this reason I hereby unite these two names, as the one distinguishing character used by C.B. Clarke (the inflorescence bract base) does not hold, when viewing our large range of specimens; the characters used by Haines & Lye, by other authors, and by Kükenthal are either very feeble or, again, are joined by a whole host of specimens with intermediate characteristics for any of their 'distinguishing characters'. After having come to this conclusion, I was gratified to see so many specimens with a det-label by Ms S. Hooper saying *mollipes* on what others had named *circumclusus*! The original names for both taxa were Boeckeler names that already had the same epithet within *Cyperus*; C.B. Clarke gave both new names, and his *mollipes* is the oldest, as his *circumclusus* in the same publication lacks any description.

C. submacroplus again differs very little from *C. mollipes*; Lye in Fl. Eth. distinguishes them by spikelets 3–6-flowered and glume not tightly enveloping the mature nutlet (*submacroplus*) or 1-flowered and glume tightly enveloping the mature nutlet (*mollipes*). *C. mollipes* certainly can have more than 1 flower per spikelet, although often only a single fruit develops; the type of *macroplus* has some spikelets that look 1-flowered, though most are several-flowered. The glumes of all specimens look pretty tightly enveloping at all times. Haines & Lye had *C. submacroplus* as a synonym of *circumclusus*.

The inflorescence carries bulbils in *Bally* 8126 from Lake Jipe (T 2), but I have not seen this in any other specimen.

47. ***Cyperus plateilema*** (Steud.) Kük. in E.P. 4, 20 (101): 558 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 216, fig. 435 (1983); Lye, Fl. Eth. 6: 467 (1997). Type: Ethiopia, Simen Mts, Schoata, *Schimper* 588 (B!, hol.; BR!, K!, M!, P!, WAG!, iso.)

Perennial, up to 50 cm tall, with slightly swollen culm-base covered by rather thin to rather thick grey or brown leaf sheaths which only rarely split into fibres; culms tufted, 5–50 cm long, 0.5–1.5 mm wide, trigonous, glabrous. Leaves few to many; leaf sheath grey to brown, upper ones membranous, 3.2–5.7 cm long; leaf blade linear, rather thick, 5–45 cm long, 1.1–2.4 mm wide, scabrid at least on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–4, lowermost 3–20 cm long, 1–2.2 mm wide. Inflorescence capitate, ovoid to hemispherical, 7–11 mm long, 7–15 mm wide; spikelets lanceolate, 3.5–7.3 mm long, 1–2.2 mm wide, only perfecting 1–2 nutlets; glumes pale grey with large dark reddish brown or blackish central area or patches on either side of keel, lanceolate, 3–6 mm long, 1.6–1.9 mm wide, keel slender with 3–5 veins on either side, apex rounded. Stamens 2–3; filaments 4.7–6 mm long; anthers 1.1–1.8 mm long. Nutlet reddish brown to grey, narrowly obovoid to ellipsoid-oblong, trigonous, 2–2.3 mm long, 0.6–0.8 mm wide, minutely papillose.

UGANDA. Karamoja District: Napak, May 1940, A.S. Thomas 3605!; Kigezi District: Muhavura–Mgahinga saddle, Apr. 1970, Lye & Katende 5296!; Mt Elgon, 28 Dec. 1996, Wesche 544!

KENYA. Mt Elgon, E slopes, 21 Jan. 1967, Bogdan 5398!; North Nyeri District: Nanyuki, Mt Kenya W slope, 23 Jan. 1970, Lye & Katende 4990!

TANZANIA. Mt Kilimanjaro, 12 Oct. 1993, Grimshaw 93/792! & Mt Kilimanjaro, Marangu route, 16 July 1968, Gilbert 3265!; Kilimanjaro, SE of Bismark hut, 21 July 1968, Bigger 2008!

DISTR. U 1–3; K 3, 4, 6; T 2; Ethiopia

HAB. Montane grasslands, giant heath zone, roadsides in rain forest, usually in swampy sites or on stream banks; 1900–3650 m

CONSERVATION NOTES. Least concern (LC) due to the habitat and altitude range

- SYN. *Mariscus plateilema* Steud. in Flora 25: 596 (1842); C.B. Clarke in F.T.A. 8: 386 (1902)
M. bulbocaulis Hochst. in Flora 27: 102 (1844); C.B. Clarke in F.T.A. 8: 386 (1902). Type:
 Ethiopia, Gondar, Semien Mts, near Enderer, *Schimper* 579 (B!, holo.; B!, Kl, MUN!, BR!,
 WAG!, P!, iso.)
Cyperus atrosanguineus Steud., Syn. Pl. Glumac.: 30 (1854). Type: Ethiopia, Endschedcap,
Schimper 575 (B!, holo.; B!, BR, ETH, K!, M, P, iso.; Aluka!)
C. bulbocaulis (Hochst.) Boeck. in Linnaea 36: 372 (1870); Kük. in E.P. 4, 20 (101): 559
 (1936)
C. bulbocaulis Hochst. var. *atrosanguineus* (Steud.) Kük. in E.P. 4, 20 (101): 559 (1936)
C. crassivaginitus Lye in Nordic Journ. Bot. 3: 217 (1983) & Haines & Lye, Sedges & Rushes
 E. Afr.: 216, fig. 436 (1983). Type: Uganda, Mbale District: 2 km N of Kapkwata R., *Lye*
 6427 (MHU, holo.; K!, iso.), **syn. nov.**

NOTE. HB has decided the differences of *C. crassivaginitus* with both type and the range of specimens seen for *C. plateilema* did not warrant separate status.

48. ***Cyperus stramineoferrugineus*** Kük. in E.P. 4, 20 (101): 555 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 216, fig. 437 (1983). Type: Tanzania, Uzaramo District: NE of Msua, *Peter* 31807 (B!, syn., K!, syn.) & Mkata River, *Peter* 32426 (B!, syn.)

Perennial, tussocky, up to 16 cm tall, with swollen culm-bases covered by fibrous remains of old leaf sheaths; culms few, 10–15 cm long, 0.5–1 mm wide, trigonous to somewhat compressed. Leaves up to 17.4 cm long; leaf sheath 2.4 cm long; leaf blade linear, flat to inrolled, 5–15 cm long, 0.3–1 mm wide, apex acuminate. Involucral bracts leaf-like, erect to spreading, 2–3, lowermost 3–6.2 cm long, 0.3–0.8 mm wide. Inflorescence capitate, 4–6 mm long, 6–8 mm wide; spikelets 9–12 per head, ovoid, 3–6.2 mm long, 1.2–2.1 mm wide, rachis straight; glumes straw-coloured to brown, 3.2–4.3 mm long, 0.9–1.2 mm wide, keel with 4–5 prominent veins on either side, apex acute. Stamens 3; filaments 4.1–4.9 mm long; anthers 1.6–2.2 mm long. Nutlet blackish, obovoid, trigonous, 1.9–2.2 mm long, 1.1–1.4 mm wide, rather smooth.

TANZANIA. Uzaramo District: NE of Msua, 4 Nov. 1925, *Peter* 31807!

DISTR. T 6; known from the type only

HAB. Grassland; 1200 m

CONSERVATION NOTES. Needs information on population, status and threats

- SYN. *Mariscus stramineoferrugineus* (Kük.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28: 16 (1971)

49. ***Cyperus kerstenii*** Boeck. in Linnaea 36: 373 (1870); Kük. in E.P. 4: 20 (101): 554 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 215, figs. 432, 433 (1983). Type: Tanzania, Mt Kilimanjaro, *Kersten* s.n. (B, holo.)

Perennial, robust, tussocky, up to 80 cm tall, with a swollen culm-base, covered by old brown leaf sheaths splitting up into fibres; culms few, 34–78 cm long, 1.8–2.2 mm wide, trigonous, glabrous. Leaves up to 63 cm long; leaf sheath greyish-brown above, dark brown below, 6.5–12 cm long; leaf blade linear, flat, rather thick, 35–51 cm long, 3–12 mm wide, strongly scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–3(–5), lowermost 22–36 cm long, 2.1–7 mm wide. Inflorescence capitate, 15–20 mm long, 11–21 mm wide; spikelets lanceolate, 6.2–8 mm long, 1.5–2.1 mm wide, 2–4-flowered but often perfecting one nutlet only, spikelet falling off entirely when mature; glumes dark reddish-brown, lanceolate, 2.5–5 mm long, 1.8–2.1 mm wide, keel rather slender, with 3–5 veins on either side, apex acute. Stamens 3; filaments 4–5.2 mm long; anthers 1.6–2.7 mm long. Nutlet reddish-brown, oblong, trigonous, 2.5–3 mm long, 0.7–0.9 mm wide, minutely papillose.

UGANDA. Karamoja District: summit of Mt Kadam [Debasien], May 1948, *Eggeling* 5800! & Mt Kadam, summit plateau of Obda peak, 5 Apr. 1953, *Wood* 6791!; Bugisu District; N Bugisu county, near Sasa River (Mt Elgon), 17 June 1970, *Lye* 5750!

KENYA. Nanyuki District: Aberdare Mts E slope above "Wanderer's Track", 8 Oct. 1967, *Hedberg* 4285! & Aberdares National Park Road, 23 Jan. 1965, *Agnew* 7031! & Aberdare Mts, Jikumuru Camp Site, 26 June 1976, *Timberlake* 1122!

TANZANIA. Kilimanjaro, 28 Jan. 1914, *Peter* 778! & Kilimanjaro, Bismark Hill, 28 Feb. 1934, *Greenway* 3914!; Masai District: Ngorongoro Empakaai Crater, W rim, 21 Sept. 1977, *Raynal* 19196!

DISTR. U 1, 3; K 2–4; T 2; not known elsewhere

HAB. Montane grassland, moorland and bogs, and next to streams; 2400–3600 m

CONSERVATION NOTES. Least Concern (LC) due to altitude range and distribution within national parks

SYN. *Mariscus kerstenii* (Boeck.) C.B. Clarke in F.T.A. 8: 392 (1902)

Cyperus vaginatissimus K. Schum. in P.O.A. C: 121 (1895). Type: Tanzania, Moshi District: Kifinika volcano, *Volkens* 1327, 1562 (B, syn.)

Cyperus kerstenii Boeck. var. *irregularis* Kük. in E.P. 4, 20 (101): 555 (1936). Types: Tanzania, Masai District: Ela Nairobi, *Jäger* 450 (B, syn.) & Kilimanjaro, Bismarck Hut, *Peter* 960 (B, syn., Aluka!)

NOTE. The specimen from the Turkana region (*Thorold* 2774) in Kenya is especially robust in habit.

50. *Cyperus albosanguineus* Kük. in E.P. 4, 20 (101): 555 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 215, fig. 434 (1983). Type: Uganda, Mt Elgon, *Granvik* 323; Kenya, Mt Kenya, Coles Mill, *Fries* ♂ *Fries* 1030 & 1037; Congo-Kinshasa, near Nyiragongo [Ninagongo], *Mildbraed* 1282 (syn., none traced)

Perennial, up to 53 cm tall, culm base swollen, covered with fibrous remains of old leaf sheaths; culms tufted, 5–50 cm long, 0.7–2.5 mm wide, trigonous, smooth. Leaves up to 31 cm long; leaf sheath pale or reddish-brown, 3–8 cm long; leaf blade linear, flat or inrolled, 4.2–23 cm long, 0.9–2.4 mm wide, glabrous to slightly scabrid on margin, apex acute to acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–3, lowermost 1–14 cm long, 1.3–3 mm wide. Inflorescence capitate, ovoid to rounded, 8–13 mm long, 9–13 mm wide; spikelets in dense spikes, ovoid, 2.9–5.1 mm long, 1.3–2 mm wide, rachis straight; glumes dark purple (the lower) or creamy white (the middle and upper), ovate-elliptic, 2.4–4.7 mm long, 1.6–2 mm wide, keel not prominent, apex acute to acuminate. Stamens 3; filaments 3.1–4 mm long; anthers 1.1–2.6 mm long. Nutlet grey to (reddish-)brown, narrowly obovoid, trigonous, 2–2.7 mm long, 0.8–1.1 mm wide, minutely papillose.

UGANDA. Mt Elgon, Bugishu, Sasa stream, Mar. 1951, *G. Wood* 146!

KENYA. Machakos District: Chyulu Hills, road running lengthwise, just N of junction with road to Kibwezi, 31 May 1981, *Gilbert* 6238! & Chyulu North, 5 May 1938, *Bally* 8096!; Masai District: Lemek, 20 Apr. 1961, *Glover et al* 741!

TANZANIA. Mbulu District: Mbulumbul, Block D1, 24 June 1944, *Greenway* 6960! & main peak Mt Hanang, 8 Feb. 1946, *Greenway* 7648!; Iringa District: Imagi Mt, 15 Dec. 1961, *Richards* 15653!

DISTR. U 3; K 3, 4, 6; T 2, 4, 7; Congo-Kinshasa

HAB. In (seasonally wet) grasslands, moorland, in rock crevices; 1550–4000 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Mariscus albosanguineus* (Kük.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28: 16 (1971)

51. *Cyperus karisimbiensis* (*Cherm.*) Kük. in E.P. 4, 20 (101): 559 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 221, fig. 448 (1983). Type: Rwanda, Karisimbi Vulcano, *Humbert* 8587 (B!, BR!, P!, syn.) & Uganda, Kigezi District: between Sabinyo Vulcano and Mgahinga Vulcano, *Humbert* 8643 (P!, syn.); note Haines & Lye state the type is *Humbert* 8587, which might be taken as a lectotypification

Perennial, tussocky, up to 48 cm tall, with a slightly swollen culm base covered by thin grey to brown leaf sheaths, the oldest sometime splitting into soft fibres; culms few, 13–46 cm long, 0.8–1.5 mm wide, trigonous, glabrous. Leaves many, up to 55 cm long; leaf sheath grey to brown, 6–11.5 cm long, the upper ones rather thin and membranous, the lower and dead ones only slightly thicker; leaf blade linear, flat, 10–46 cm long, 1–2.5 mm wide, scabrid at least on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading to erect, 3–4, lowermost 8–20 cm long, 1.5–3 mm wide. Inflorescence capitate; spikelets in a solitary hemispherical or irregular head, many per head, lanceolate, 4.4–7.3 mm long, 0.8–1.5 mm wide, 3–6-flowered and usually perfecting 2–3 nutlets; glumes pinkish white to darkish red-brown, lanceolate, 3.1–4.9 mm long, 1.5–1.7 mm wide, keel slender with 5–8 distinctive but narrow veins on either side, occasionally with a dark reddish brown central patch, apex acute. Stamens 3; filaments 2.8–5 mm long; anthers 1.1–1.2 mm long. Nutlet brown, trigonous, 1.5–3 mm long, 0.6–0.8 mm wide, minutely papillose.

UGANDA. Kigezi District: between Sabinyo Vulcano and Mgahinga Vulcano, *Humbert* 8643!

KENYA. North Nyeri District: Aberdare Mts, 17 Jan 1921, *Fries & Fries* 1037!

TANZANIA. Kilimanjaro, Bismark Hill, 27 Feb. 1934, *Greenway* 3842!

DISTR. U 2; K 3/4; T 2; Congo-Kinshasa, Rwanda

HAB. In woodland; 1850–3050 m

CONSERVATION NOTES. Least Concern (LC) due to the altitude range?

SYN. *Mariscus maritimus* C.B. Clarke in J. Bot. 34: 226 (1896) & F.T.A. 8: 382 (1902), *non Cyperus maritimus* Poir. (1806)

Cyperus coloratus var. *longinix* Kük. in N.B.G.B. 9: 305 (1925). Type: Kenya, North Nyeri District: Aberdare Mts, near West Kenya Forest Station, *Fries & Fries* 770 (K!, syn.) & Aberdare Mts, 1182 (K!, syn.) & 2304 (K!, syn.) & Tanzania, Moshi District: Kilimandjaro, *Schlieben* 4723 (syn.)

Mariscus karisimbiensis Cherm. in Bull. Soc. Bot. France 82: 335 (1935)

Cyperus karisimbiensis (Cherm.) Kük. var. *longinix* (Kük.) Kük. E.P. 4, 20 (101): 560 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 221 (1983)

NOTE. Kükenthal and Lye recognize var. *karisimbiensis* and var. *longinix*; not enough specimens were seen to be able to see much difference. These varieties are not recognized here.

52. ***Cyperus kyllingiformis*** Lye in Nordic Journ. Bot. 3: 218 (1983), as *kyllingaeformis* & Haines & Lye, *Sedges & Rushes E. Afr.*: 224, fig. 456 (1983). Type: Kenya, Trans Nzoia District: Kitale, *Bogdan* 3726 (K!, holo.; EA, iso.)

Perennial, medium-sized, up to 42 cm tall, with a strongly bulbous culm base covered by the fibrous remains of many old leaf sheaths, 1.5–2.7 cm in diameter; culms few, 15–40 cm long, 0.6–2 mm wide, terete, trigonous above, glabrous. Leaves up to 25.5 cm long; leaf sheath greyish (upper), 3–5.5 cm long, very thin (upper) to tough and fibrous (lower and old ones); leaf blade linear, flat or folded, 5–20 cm long, 2–3 mm wide, scabrid at least along the margin, apex acuminate. Involucral bracts leaf-like, spreading to reflexed, 2–4, lowermost 3–12 cm long, 1.8–2.1 mm wide. Inflorescence capitate, 6–11 mm long, 5–12 mm wide; spikelets in one ovoid or more commonly of few–many crowded small spikes, ovoid, 3–5 mm long, 1.2–1.5 mm wide, 2–5-flowered, very variable in size, falling off entire; glumes whitish, ovate, 2.8–3.7 mm long, 1.3–1.5 mm wide, keel obscure, with \pm 5 veins on either side, apex obtuse. Stamens 3; filaments 3.3–3.8 mm long. Nutlet reddish-brown, ellipsoid to oblong, trigonous, 2–2.4 mm long, 1.1–1.3 mm wide, minutely papillose.

KENYA. Trans-Nzoia District: Kitale, 12 May 1953, *Bogdan* 3726!

DISTR. K 3; known only from the type

HAB. Wooded grassland; 1400 m

CONSERVATION NOTES. Not enough data, but possibly extinct, as this habitat is under severe pressure in the area concerned

NOTE. Haines & Lye state this is most similar to *C. amamodorus*, but differs in less swollen culm base and the more greenish and on the whole smaller inflorescence.

53. *Cyperus dubius* Rottb. in Descr. Icon. Rar. Pl.: 20, t. 4 fig. 5 (1773); Kük. in E.P. IV, 20 (101): 563 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 221, figs. 449–450 (1983) & Lye in Fl. Somalia 4: 139 (1995) & Fl. Eth. 6: 468 (1997). Type: India, *König* s.n. (C, holo.; photo)

Perennial with tufted culms up to 45 cm tall, with a bulbous culm-base; culms many, crowded, sometimes semi-succulent, 8–40 cm long, 0.5–2 mm wide, bluntly to sharply triangular, glabrous; roots fragrant (fide *Hooper* 928). Leaves many, up to 33 cm long, often recurved; leaf sheath pale brown, thin and membranous, the lower somewhat thicker, brown and occasionally splitting up into fibres, to 4 cm long; leaf blade bright green or glaucous in very dry situations, linear, flat or slightly v-shaped, 5–33 cm tall, 1–4(–5) mm wide, scabrid on at least margin and primary vein, apex attenuate. Involucral bracts leaf-like, erect to spreading, 3–6, lowermost 4–23 cm long, 0.5–3.5 mm wide. Inflorescence capitate, green or greenish white or white tinged green, hemispherical to ovoid, 5–15 mm in diameter, of 3–6 congested sessile spikes; spikelets narrowly ovoid, 2–6 mm long, 1–2 mm wide, 3–9(–18)-flowered but with only few maturing nutlets; glumes greenish with uncoloured margin, ovate, 2–3 mm long, keel narrow, with 5–8 slender veins on either side, apex concave. Stamens 2–3, with white filaments and yellow anthers; style white. Nutlet brown with dark brown angles, obovoid, trigonous, 1.2–1.4 mm long, (including 0.1–0.2 mm long apiculus), 0.8–0.9 mm wide, strongly papillose.

var. **dubius**

Leaves 1–5 mm wide; head 5–15 mm in diameter; glumes 2–3 mm long; nutlets 1.2–1.4 mm long.

UGANDA. Karamoja District: Napak, June 1966, *Haines* 152!; Bunyoro District: Kiwulumba, Oct. 1970, *Katende* 636!; Mengo District: Bulemezi, Kakinzi School, Oct. 1969, *Lye & Rwabwirore* 4401!

KENYA. Baringo District: 8 km W of Kabarnet, Aug. 1961, *Bogdan* 5198!; Machakos District: Kitanga, km 7 on Machakos–Nairobi road, Jan. 2006, *Mbale, Muasya & Muthoka* NMK 625!; Kwale District: Dzombo Hill, Feb. 1989, *Mrima-Dzombo Expedition* 270!

TANZANIA. Tanga District: Pangani, Bushiri, June 1969, *Napper & Faulkner* 2185!; Morogoro District: Uluguru Mts above Morningside, Mar. 1975, *Hooper & Townsend* 928!; Kilwa District: Selous, Nahomba valley, Dec. 1977, *Vollesen* MRC 4797; Zanzibar: Marahubi, Nov. 1961, *Faulkner* 2943!!

DISTR. U 1–4; K 3, 4, 7; T 2–4, 6, 8; Z; widespread across Africa; India

HAB. In soil pockets of rocky outcrops in woodland or bushland or grassland, in forest margins and clearings, bushland and grassland near the sea, foreshore, riverine; 0–1550 m

USES. The bulbous base is eaten by rodents, francolin and guinea fowl; the whole plant is grazed by cattle, sheep, goats and hares.

CONSERVATION NOTES. Widespread; least concern (LC).

SYN. *Cyperus coloratus* Vahl, Enum. Pl. 2: 312 (1805). Type: 'Guinea', *Thonning* 396 (C, holo.)

C. capitatus Poir. in Lam. Encycl. 7: 246 (1806). Type: Madagascar, *du Petit Thouars* s.n. (P, holo.)

Mariscus coloratus (Vahl) Nees in Linnaea 9: 286 (1834); C.B. Clarke in F.T.A. 8: 381 (1902) *Isolepis boeckeleri* Oliv. in Trans. Linn. Soc. London 29(3): 167 (1875). Type: without locality, *Grant* s.n. (K!, holo.)

Mariscus dubius (Rottb.) G.E.C. Fisch. in Gamble, Fl. Madras: 1644 (1931)

Cyperus dubius Rottb. var. *capitatus* (Poir.) Kük. in E.P. IV, 20 (101): 564 (1936)

C. dubius Rottb. var. *coloratus* (Vahl) Kük. in E.P. IV, 20 (101): 565 (1936); Lye in Sedges & Rushes E. Afr.: 223, fig. 453 (1983)

C. dubius Rottb. var. *polyactis* Kük. in E.P. IV, 20 (101): 565 (1936). Types: Tanzania, Kigoma District: Uvinza, N of Malagarasi, *Peter* 35923 (B!, holo.; B!, iso.)

C. dubius Rottb. var. *stenactis* Kük. in E.P. IV, 20 (101): 565 (1936). Types: Tanzania, various localities, *Peter* 4442b (B!, syn.), 19555 (B!, Kl, syn.), 11306 (B!, syn.), 24546 (B!, syn.)

C. dubius Rottb. subsp. *coloratus* (Vahl) Lye in Nordic Journ. Bot. 3: 231 (1983) & Sedges & Rushes E. Afr.: 223, fig. 453 (1983)

var. **macrocephalus** Boeck. in Flora 62: 556 (1879); Kük. in E.P. IV, 20 (101): 564 (1936) Type: Sudan, Niarniam, *Schweinfurth* 3790 (Bl, holo.)

Leaves 4–8 mm wide; head 13–20 mm in diameter; glumes 3–4 mm long; nutlets 1.6–1.7 mm long

UGANDA. Karamoja District: Moroto, Kasuneri estate, May 1971, *J. Wilson* 2072!; Mengo District: Bulemezi, Kakinzi School, Oct. 1969, *Lye & Rwaburindore* 4402!; Masaka District: 17 km SE of Ntusi, Oct. 1969, *Lind & Rwaburindore* 4522!

KENYA. Uasin Gishu/Baringo District: 36 km on Kabarnet–Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 112!; Masai District: Narok, Ol Choro Orogwe ranch, June 1961, *Glover et al.* 1989!; Kwale District: near Kaya Fungo, June 1994, *Luke* 4004!

TANZANIA. Musoma District: Mara river area from Mto ya Mchanga to Neshesaw Hill, Feb. 1968, *Greenway et al.* 13303!; Tanga District: Pangani, Mkaramo, Nov. 1955, *Tanner* 2344!; Iringa District: Ruaha National Park between Mbagi and Msembe, Feb. 1967, *Richards* 21327!

DISTR. U 1–4; K 1–4, 6, 7; T 1, 3, 4, 6, 7; Sudan

HAB. Riverine or lake shores, in soil pockets in or thin soil on rocks, dry bushland, grassland; 50–1750 m

CONSERVATION NOTES. Widespread; least concern (LC)

SYN. *Mariscus coloratus* (Vahl) Nees var. *macrocephala* (Boeck.) C.B. Clarke in F.T.A. 8: 381 (1902)

Cyperus dubius Rottb. subsp. *macrocephalus* (Boeck.) Lye in Nordic Journ. Bot. 3: 231 (1983) & Sedges & Rushes E. Afr.: 222, figs. 451, 452 (1983)

NOTE. Most taxa previously recognized around or within this group are spurious, I believe.

There is quite some variation, with some of the coastal specimens very slender and with small heads, but there seems to be continuous variation to somewhat larger plants: *coloratus*, differing in being ‘smaller’ with rather acute spikelets, is, I think, not more than a form of *dubius* sensu stricto. The same goes for:

- var. *capitatus* which Kükenthal says differs in “culms filiform, leaves setaceous, head 5 mm diameter, spikelets small and few-flowered, glumes small, nutlets suborbicular”
- var. *stenactis* differs in “glume apex excurrent”
- var. *polyactis* with no discernible differences at all.

However, I accept *macrocephalus* as distinct; it is much larger in general, has wider leaves and larger heads, in which ‘subheads’ are more distinct. There are a few intermediates, and the ranges overlap, but most specimens can be sorted with only a glance. Ecological requirements seem only slightly different and taking the overlapping range into consideration I feel subspecific level, as used by Lye, is a step too far; like Chiovenda, I prefer varietal status.

54. ***Cyperus involucratus*** Rottb. in Descr. Pl. Rar.: 22 (1772); Haines & Lye, Sedges & Rushes E. Afr.: 154, fig. 283 (1983). Type: Ethiopia, Adua, *Schimper* 55 (P, holo.; HAL, K!, iso.)

Perennial, robust, up to 2 m tall, with a creeping rhizome, 2–10 mm in diameter and several culms usually placed in a row; culms 66–160 cm long, 3–8 mm wide, rounded to trigonous, with longitudinal ridges, glabrous to sometimes minutely scabrid, the base covered with black fibrous remains from old leaf sheaths; sheath almost black, pale brown to green, 1–36 cm long; blade absent. Involucral bracts many, leaf-like, spreading, spirally arranged along a 1–5 cm long axis, 18–37 cm long, 0.8–1.5 cm wide, linear, flat, scabrid, apex acute. Inflorescence compound, primary branches many, 3.5–10 cm long; spikelets in digitate clusters at the end of secondary and tertiary branches, 5–20 per cluster, lanceolate to elliptic-ovoid, much compressed, 3.5–11 mm long, 1.4–3 mm wide; glumes very pale brown, golden brown to reddish brown, elliptic-ovate, 1.4–2.2 mm long, 0.9–1.6 mm wide, 3-keeled, green, apex acute, sometimes slightly mucronate, glabrous. Stamens 3: filaments 1.6–2.2 mm long; anthers 0.8–1.4 mm long; the connective protruding into a needle-like apex. Nutlet yellow to brown, narrowly ovoid to oblong, trigonous, 0.7–1.1 mm long, 0.5–0.6 mm wide, minutely papillose. Fig. 28, p. 188.



FIG. 28. *CYPERUS INVOLUCRATUS* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence with involucre bracts, $\times \frac{2}{3}$; 3, spikelet, $\times 6$; 4, glume, $\times 14$; 5, flower, $\times 14$; 6, nutlet, $\times 24$. 1 from *Haines* 4012, 2–5 from *Lind* 208, 6 from *Thomas* 2184. Drawn by Juliet Williamson.

UGANDA. Karamoja District: Napenyenya, River Nakyranyet, 6 Jan. 1937, *A.S. Thomas* 2184!; Toro District: Katwe, Sept. 1953, *Lind* 208!; Mbale District: Bukwa, 22 Jan. 1966, *Haines* 4012! KENYA. Machakos District: Machakos, 11 Sept. 1934, *Gedye* 3531!; Narok District: Ol Choro Orogwe ranch, 3 July 1961, *Glover et al.* 2008!; Masai District: Mara Masai Reserve, Telek river, 15 Sept. 1947, *Bally* 5367!

TANZANIA. Arusha District: Tulusie, 28 Oct. 1965, *Greenway & Kanuri* 12230!; Kigoma District: Lubugwe, 11 July 1958, *Jefford et al.* 112!; Mbeya District: Mbeya, E of Muvwa, 26 Sept. 1990, *Lovett & Kayombo* 4778!

DISTR. U 1–4; K 1, 2, 4, 6, 7; T 1–8; Z; Senegal, Guinea, Sierra Leone, Liberia, Ghana, Nigeria, Cameroon, Congo Brazzaville, Congo-Kinshasha, Rwanda, Burundi, Sudan, Ethiopia, Somalia, Angola, Zambia, Malawi, Zimbabwe, South Africa

HAB. Swamps, grasslands, lake shores, streambanks; 30–2150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus flabelliformis* Rottb., Descr. Icon. Rar. Pl.: 42 (1773); C.B. Clarke in F.T.A. 8: 336 (1902), *nom. illegit.*

Cyperus alternifolius L. subsp. *flabelliformis* Kük. in E.P. 4, 20 (101): 193 (1936); Lye in Fl. Eth. 6: 434 (1997) & Fl. Somalia 4: 116 (1995), based on the Rottb. name

NOTE. Widely distributed as an ornamental.

55. ***Cyperus proliifer*** Lam. in Tabl. Encycl. 1: 147 (1791); C.B. Clarke in F.T.A. 8: 339 (1902); Kük. in E.P. 4, 20 (101): 256 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 171, figs. 326, 327 (1983); Lye in Fl. Somalia 4: 117 (1995). Type: Mauritius [Insula Francia], *Jos. Martia* s.n. (P, holo.)

Perennial, fairly robust, up to 130 cm tall, with a thick creeping rhizome and purple to blackish-brown roots; culms crowded, 55–120 cm long, 3–7 mm wide, terete to trigonous, smooth. Leaves with blades absent; leaf sheath reddish-brown to dark purple, 2–32 cm long. Involucral bracts scale-like to almost leaf-like, spreading, 3–4, lowermost 1.5–3(–11) cm long, 2–5 mm wide. Inflorescence a simple to compound anthela, primary branches up to 50–100, all equal in length giving the inflorescence a spherical to umbel-like appearance, 3–11 cm long; spikelets in digitate clusters, at the end of primary and sometimes secondary branches, 1–5 per cluster, linear to ovoid-lanceolate, 2.7–15 mm long, 0.9–1.9 mm wide, rachis straight; glumes pale reddish-brown, ovate, 1.1–1.6 mm long, 0.7–1 mm wide, keel pale brown to green, apex rounded to acute, slightly excurrent. Stamens 3; filaments 0.9–1.6 mm long; anthers 0.5–1.2 mm long, with spiny apex. Nutlet white to almost brown, obovoid, 0.4–0.5 mm long, 0.3–0.4 mm wide, almost smooth to minutely papillose.

KENYA. Kwale District: Matuga, 16 km SSW of Mombasa, 29 Oct. 1958, *Bogdan* 4729!; Kwale District: Mwandabara River, Shimba Hill, 30 Mar. 1973, *Sangai* 15787! & Mombasa waterworks, 8 Jan. 1934, *Gilson* K5!

TANZANIA. Uzaramo District: Dar es Salaam, 1 June 1966, *Haines* 4188!; Rufiji District: Mafia Island, Kerongwe, 22 Aug. 1937, *Greenway* 5142!; Mikindani District: road to Ruvuma River and Mozambique border, 8 Mar. 1963, *Richards* 17790!; Pemba: Road to Kigazini, 4 Mar. 1952, *R.O. Williams* 135!

DISTR. K 7; T 6, 8; Z; P; Somalia, Mozambique, South Africa; Madagascar

HAB. Swamp edges, stream-sides, seasonally flooded grasslands and in and along permanent pools, especially along the coastal areas; sea-level up to 450 m

CONSERVATION NOTES. Least Concern; common habitat and within the distribution area is common to abundant.

SYN. *Cyperus isocladius* Kunth, Enum. Pl. 2: 37 (1837); C.B. Clarke in F.T.A. 8: 339 (1902). Type: South Africa, East, *Drège* s.n. (B, holo.)

Cyperus proliifer Lam. var. *isocladius* (Kunth) Kük. in E.P. 4, 20 (101): 257 (1936)

NOTE. Easily recognizable due to its inflorescence shape, which shows resemblance to *C. papyrus*, making this taxon somewhat like a dwarf version.

Richards 25209 from Mbulu/Singida District: Yaida Swamp, Jan. 1970 has very sharply angled stems and comes from 1430 m altitude, quite beyond the normal range. *Wingfield* 2124 from Dar University Campus (Aug. 1972) has similarly sharply angled stems.

56. *Cyperus denudatus* L.f. in Suppl. Pl.: 98 (1782); C.B. Clarke in F.T.A. 8: 338 (1902); Kük. in E.P. 4, 20 (101): 255 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 169, figs. 319–321 (1983) & Fl. Eth. 6: 439 (1997). Type: South Africa, Cape of Good hope, without indication of collector (ubi?)

Perennial, with a 3 cm thick creeping scale-covered rhizome, up to 95 cm tall; culms tufted, crowded, 19–89 cm long, 0.5–1.6 mm wide, trigonous to slightly triquetrous, smooth. Leaves with leaf sheath reddish-brown to purple, 2–18 cm long; leaf blade absent or reduced to 1 cm long, then reddish-brown. Involucral bracts leaf-like, erect to spreading, 2(–3), lowermost 1–4 cm long, 1–2.3 mm wide. Inflorescence a simple to compound anthela, primary branches 5–12, 1.5–6.6(–16) cm long; spikelets in digitate clusters, sessile and at the end of primary and secondary branches, 2–5 per cluster, linear-lanceolate, 2.4–8(–20) mm long, 0.9–1.7 mm wide, rachis straight, sometimes slightly curved; glumes pale brown to reddish-brown to dark brown, ovate, 1.1–1.7 mm long, 0.6–0.8 mm wide, keel greenish, acute, apex slightly excurrent. Stamens 3; filaments 1.1–1.6 mm long; anthers 0.6–1 mm long. Nutlet whitish when young or depauperate, brown when mature, ovoid to obovoid, 0.5–0.7 mm long, 0.3–0.6 mm wide, base cuneate, muricate when young or depauperate, tuberculate when mature.

UGANDA. Ankole District: Queen Elizabeth National Park, between Kaizi & Rwempuno Rivers, June 1970, *Lye & Katende* 5498!; Masaka District: E of Katera, 16 Sept. 1961, *Rose* 10049!; Mubende District: Nakayenga, Oct. 1970, *Katende* 621!

KENYA. Baringo District: 2.6 km on Kabarnet–Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 125!; Nairobi District: Golf Range, between Wilson Airport and Army Barracks, just outside National Park 12 Feb. 1978, *Gilbert* 4984!; Tana River District: Kurawa, Oct. 1961, *Polhill & Paulo* 623!

TANZANIA. Tanga District: Kauge, 7 Aug. 1958, *Faulkner* 2177!; Tabora District: 10 km N of Tabora, 23 June 1980, *Hooper & Townsend* 2113!; Kilwa District: Kingupira, Lungonya plain, 13 May 1975, *Vollesen* 2297!

DISTR. U 2, 4; K 3, 4, 7; T 1–8; widespread on west, central and southern tropical Africa

HAB. River-sides, flood plains, swamps, damp grassland, moist rock crevices; 0–2000 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus platycaulis* Baker var. *recedens* Peter & Kük. in E.P. 4, 20 (101): 254 (1936). Types: Tanzania, many localities, *Holst* 2045, *Peter* 12528, 14506, 14506a, 23914, 24805, 35546, 36926, 39724, 40683, 46211, 46674 & *Schlieben* 2467 (B, syn.)

NOTE. Haines & Lye state this species is closely related to *C. haspan*, but differs in having no leaves.

Although *C. platycaulis* var. *recedens* has been put into synonymy of *C. platycaulis* by many others, it has more in common with *denudatus*: slender appearance, shorter glumes and the same colour as *denudatus*.

HB: in the protologue of *C. denudatus*, the taxon is not compared to any other sedge. ‘Culmo triquetro, involucrio subnullo.’ Hab. ad Caput Bona Spei. ‘Culmus triquetus, bipedalis, vagina unica in medio culmi; umbella composita, non multum expansa; involucrium universale radiis vix manifesto, ut fere nullis, partiale nullum; spicae oblongae, purpurescantes, carina viridi, apice patentiusculae’ (sic).

Haines & Lye include *C. phaeorhizus* here, which I (HB) have under *haspan*.

Haines & Lye feel maybe *denudatus* is a variety of *haspan* – and I (HB) agree that the two are very similar, apart from the absence/presence of leaves character.

57. *Cyperus platycaulis* Baker in J.L.S., Bot. 22: 532 (1887); Kük. in E.P. 4, 20 (101): 253 (1936). Type: Madagascar, *Baron* 4456 (Kl, holo.)

Perennial, robust, up to 95 cm tall; culms tufted, 76–90 cm long, 5–7 mm wide, triquetrous to slightly winged, smooth. Leaves up to 23 long; leaf sheath reddish-brown, 5–23 cm long; leaf blade absent or 1 cm long maximum. Involucral bracts bract- to leaf-like, 1(–2), erect, sometimes giving the inflorescence a lateral appearance, 1–4 cm long, 2–5 mm wide. Inflorescence almost capitate or simple anthela, primary branches 4–13, 1–6 cm long; spikelets in digitate clusters, sessile or

at the end of primary branches, 2–7(–10) per cluster, linear-lanceolate, 4.8–12 mm long, 1–2 mm wide, rachis straight; glumes dark reddish-brown to almost black, ovate, 1.7–2 mm long, 0.8–1 mm wide, keel acute, apex slightly excurrent. Stamens 3; filaments 1.7–1.8 mm long; anthers 0.9–1 mm long. Nutlet only seen immature.

UGANDA. Kigezi District: Kanaba Gap, Dec. 1938, *Chandler & Hancock* 2580! & Elephant Valley, 25 Aug. 1938, *Thomas* 2492A!; Mbale District: Mt Elgon, 28 Feb. 1993, *Naiga* 419!

KENYA. Elgeyo District: 36 km from Cherangani Village on road to Iten, 4 Nov. 2000, *Smith, Beentje & Muasya* 2081!; Ravine District: Timberoa, 9 Nov. 2000, *Smith, Beentje & Muasya* 232!; Nairobi District: Limuru, near Nairobi, 14 Apr. 1966, *Haines* 100!

TANZANIA. Ngara District: Kibirizi, Nyakisasa, 8 Mar. 1961, *Tanner* 5871!; Tabora District: near Kazeh, in Uryamwezi, *Speke & Grant* s.n.!; Iringa District: Mufindi, Penny Penns Farm, 30 km W of Mafinga on the Madibira road by the Ndembera River, 26 Dec. 1986, *Lovett & Congdon* 1180!

DISTR. U 2, 3; K 3–5; T 1–4, 7, 8; Madagascar

HAB. Mainly in wet areas, swamps, bordering lakes and ponds; (950–)1100–2950 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus lucentinigricans* K. Schum. in Abh. Königl. Ges. Wiss. 39: 59 (1894) & in P.O.A. C: 118 (1895); C.B. Clarke in F.T.A. 8: 339 (1902). Type: Tanzania, Lushoto District: Usambara Mts, *Holst* 3851 (B, holo.)

C. denudatus L. var. *delicatulus* C.B. Clarke in F.T.A. 8: 338 (1902). Type: Tanzania, Tabora, *Grant* s.n. (K, holo.)

C. denudatus L. var. *lucentinigricans* (K. Schum.) Kük. in N.B.G.B. 9: 303 (1925) & in E.P. 4, 20 (101): 254 (1936); *Haines & Lye*, Sedges & Rushes E. Afr.: 170, fig. 322 (1983)

C. platycaulis Baker var. *lucentinigricans* (K. Schum.) Kük. in E.P. 4, 20 (101): 254 (1936)

NOTE. Very close to *denudatus* and sometimes classified as a subspecies, but differences are large enough to recognize as separate species.

Haines & Lye have *platycaulis* as a synonym of *denudatus* var. *lucentinigricans* [“a robust perennial very similar to var. *denudatus*, but differing in the more sharply triangular to almost winged culms up to 8 mm thick; slightly smaller and narrower spikelets, usually darker glumes up to 2 mm long; roots also more frequently reddish than in var. *denudatus*”].

58. *Cyperus cuspidatus* *Kunth* in H.B.K., Nov. Gen. Sp. 1: 204 (1817); Kük. in E.P. 4, 20 (101): 261 (1936); *Haines & Lye*, Sedges & Rushes E. Afr.: 252, figs. 507, 508 (1983); *Lye* in Flora of Somalia 4: 125 (1995) & Fl. Eth. 6: 461 (1997). Type: Venezuela, *Humboldt & Bonpland* s.n. (P, holo.)

Annual, slender, up to 25 cm tall, with a slender root system; culms tufted, 1–17 cm long, 0.2–0.5 mm wide, trigonous, glabrous. Leaves up to 13.4 cm long; leaf sheath reddish-brown to purple, 0.1–1.4 cm long; leaf blade linear, flat or inrolled, 1–12 cm long, 0.2–1.1 mm wide, slightly scabrid near the apex, apex acuminate. Involucral bracts leaf-like to filiform, spreading, 2–7, lowermost 2–13 cm long, 0.3–0.7 mm wide. Inflorescence a simple anthela, primary branches 1–4, 0.5–8.5 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 4–25 per spike, linear, squarrose, 4–10 mm long, 1–2 mm wide, 8–25-flowered, rachis straight; glumes orange to reddish-brown, truncate, 1.3–2.2 mm long (including 0.4–0.8 recurved mucro), 0.4–0.5 mm wide, keel green, excurrent, strongly 3-veined, apex mucronate, recurved. Stamens 1–3; anthers ± 0.2 mm long. Nutlet reddish-brown with dark grey angles, obovoid, trigonous, (0.5–)0.7–0.8 mm long, (0.2–)0.3–0.4 mm wide, densely papillose.

UGANDA. Karamoja District: near Nabilatuk, 4 Aug. 1956, *Hudson* 79!; Busoga District: Kagula Rock, 40 km NE of Kamuli, 15 May 1953, *Wood* 751!; Teso District: Soroti Town, 9 May 1970, *Lye & Katende* 5388!

KENYA. Wajir District: Dadaab–Wajir road, 17 km N of Sabule Airstrip, 29 Nov. 1978, *Brenan et al.* 14823!; Kitui District: Migwani, 5 May 1960, *Napper* 1613!; Teita District: Mudanda Rock NE of Manga Hill, 3 Jan. 1972, *Faden & Faden* 72/4!

TANZANIA. Rungwe District: Suma, between Mbeya–Tukuyu road and Mwakeleli, 17 Mar. 1975, *Hooper & Townsend* 860!; Tunduru District: on road 9 km from Masasi, 22 Mar. 1963, *Richards* 18023A!; Songea District: ± 26 km E of Songea at Nangurukuru, 8 Apr. 1956, *Milne-Redhead & Taylor* 9558!

DISTR. U 1, 3; K 1, 4, 7; T 4, 6–8; Z, P; widespread in Africa, Asia and the Americas

HAB. In grassland, on rocky outcrops; near sea level–1550 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

59. *Cyperus maderaspatanus* Willd. in Sp. Pl. 1: 278 (1797); Haines & Lye, Sedges & Rushes E. Afr.: 253, fig. 509 (1983). Type: India, no further details (B-W, holo.)

Dwarf annual, delicate, up to 20 cm tall; culms tufted, crowded, 2.5–11(–20) cm long, 0.5–0.9 mm wide, trigonous, glabrous. Leaves up to 13 cm long; leaf sheath green to purple, 0.9–3.1 cm long; leaf blade linear, flat or inrolled, 1–10 cm long, 0.7–1.1 mm wide, scabrid on margin near apex, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 3.5–14.5 cm long, 1.5–2.3 mm wide. Inflorescence a simple anthela, primary branches 1–4, 0.5–1.5 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 3–16 per cluster, linear-lanceolate, flattened, 7.2–9 mm long, 1–1.3 mm wide, rachis straight, 10–14-flowered; glumes green with red streaks, 2.2–2.8 mm long (including the 0.8–1.1 mm long recurved mucro), 0.4–0.5 mm wide, imbricate at flowering, later diverging and spreading, keel 3-veined, apex mucronate. Stamens 1–2; anthers \pm 0.5 mm long. Nutlet brownish, oblong, trigonous, 1–1.1 mm long, \pm 0.4 mm wide, minutely tuberculate.

UGANDA. Karamoja District: Mt Napak, *Haines* 4181

KENYA. Kilifi District: Mawesa Chief's Office, 9 Sept. 1999, *Luke & Mbinda* 5973A! & Kibarani, 18 Jul. 1947, *Jeffery* 14; Kwale District: Kaya Puma, 18 Jul. 2000, *Luke, Mbinda & Mududu* 6375!

TANZANIA. Kigoma District: Kasekela Beach, Gombe Stream National Park, 20 Feb. 1970, *Clutton-Brock* 474; Uzaramo District: Dar es Salaam, Buguruni Police Station, 21 Jul. 1969, *Mwasumbi & Typis* 10580; Lindi District: Kingupira, 18 May 1976, *Vollesen* 3618!

DISTR. U 1; K 7; T 3, 4, 6, 8; India

HAB. Grassland, roadside; near sea level up to 1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Mariscus maderaspatanus* (Willd.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28: 10 (1971)

M. squarrosus C.B. Clarke in F.T.A. 8: 400 (1902), *non Cyperus squarrosus* L.

60. *Cyperus submicrolepis* Kük. in E.P. 4, 20 (101): 241 (1936); C.B. Clarke in F.T.A. 8: 330 (1902); Kük. in E.P. 4, 20 (101): 241 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 164, fig. 306 (1983). Type: Ivory Coast: Man, *Portères* s.n. (P, syn.); Nigeria, Jeba near Niger, *Barter* s.n. (syn.); Central African Republic, upper Ubangi, *Tisserant* 121, 1559, 1978, 2224 (P, syn.); Sudan, Kulikoro, *Chevalier*, 2469 (P, syn.), Sudan, Djur Ghattas, *Schweinfurt* 2328 (K!, PRE!, syn.) & Bongo, Gir, *Schweinfurt* 5295 (syn.); Uganda, District unclear, Zumbua, *Dummer* 2811 (K, syn.); Angola, between Chibia and Quihita, *Pearson* 2638 (K, syn.).

Annual, slender, with slightly purplish roots, up to 27 cm tall; culms 11–23.5 cm long, 0.8–1.3 mm wide, trigonous, smooth. Leaves up to 30 cm long; leaf sheath green to purplish with a wide transparent margin near the throat, 1–6 cm long; leaf blade linear, flat, 7–26 cm long, 1.1–3 mm wide, with strong longitudinal ribs, glabrous, apex acute to acuminate. Involucral bracts leaf-like, erect or spreading, 2–3, the lowermost 7.5–26.5 cm long, 1.6–2.7 mm wide. Inflorescence simple, primary branches 3–8, 0.5–2(–5) cm long; spikelets in dense digitate clusters, sessile or at the end of primary branches, 7–20 per cluster, ovoid, glumes spreading and showing nutlet when mature, 2.4–6.3 mm long, 1.1–2.4 mm wide; glumes whitish-green, elliptic-ovate, 0.8–1.3 mm long, 0.3–0.6 mm wide, keel with 3 greenish-brown veins, apex acute. Stamens 2. Nutlet grey to brown, ellipsoid-obovoid, 0.9–1.3 mm long, 0.3–0.6 mm long, apiculate, smooth to sometimes minutely papillose.

UGANDA. Teso District: Bukedea county, $\frac{1}{2}$ km NW of Bukedea, 9 May 1970, *Lye & Katende* 5362!; Teso District: Mkongoro, May 1934, *Johnston* 940!; Mengo District: 8.5 km N of Bale, Bugerere, 3 July 1956, *Langdale-Brown* 2148!

DISTR. U 3, 4; Senegal, Mali, Guinea, Ivory Coast, Ghana, Nigeria, Central African Republic, Congo-Kinshasa, Sudan, Angola, Zambia

HAB. In seasonally wet habitats, shallow pools and depressions, and shallow soil on rocky outcrops; 1050–1100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus microlepis* Boeck. in Flora 62: 551 (1879); C.B. Clarke in F.T.A. 8: 330 (1902), *nom. illegit.*

NOTE. Easy to recognize as its nutlet is larger than the glumes, and is showing when mature. Very close to *C. difformis* but differs slightly in size, leaf blade and culm width, and the keel is less winged than in *difformis*.

61. ***Cyperus tenuispica*** Steud. in Syn. Pl. Glum. 2: 11 (1854); Kük. in E.P. 4, 20 (101): 245 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 167, figs. 313, 314 (1983) & Fl. Somalia 4: 119 (1995) & Fl. Eth. 6: 437 (1997). Type: India, Mangalore, *Hohenacker* 1607 (P, holo.; K!, M!, iso.)

Annual, up to 30 cm tall, small rootsystem; culms few or several, 10–22 cm long, 0.2–1 mm wide, trigonous to 6-angular, glabrous. Leaves up to 18.5 cm long; leaf sheath pale reddish brown to dark brown, 1–4.5 cm long; leaf blade linear, flat, 6.5–14 cm long, 1.3–8 mm wide, glabrous, apex acute to acuminate. Involucral bracts leaf-like, spreading, 3–5, lowermost 5–14 cm long, 1–8 mm wide. Inflorescence simple to compound, primary branches 1–8, 1–9.5 cm long; spikelets in digitate clusters at the end of primary branches, 2–4 per cluster, linear-lanceolate, 5.3–9.5 mm long, 1.3–1.9 mm wide; glumes red-brown, sometimes with a paler margin, ovate-truncate, 1.1–1.4 mm long, 0.6–1 mm wide, keel excurrent, apex (shortly) mucronate. Stamens 2–3; filaments 0.7–1.2 mm long. Nutlet whitish to pale brown, rounded to obovoid, trigonous, 0.5–0.6 mm long, 0.3–0.5 mm wide, large rectangular surface cells with raised cell-walls.

UGANDA. Mengo District: 10 km N of Bale, Bugerere, July 1956, *Langdale-Brown* 2137!

TANZANIA. Tabora District: Kaliua, near Station, 16 June 1980, *Hooper & Townsend* 2006!;

Kigoma District: Kasye Forest, 20 Mar. 1994, *Bidgood, Mbago & Vollesen* 2844!; Ifipa District: 10 km on Kasanga road from Sumbawanga, 15 June 1996, *Faden et al.* 96/220!

DISTR. U 4; T 4, 6, 8; widespread in tropical Africa and South Africa; India

HAB. In seasonally wet habitats, swamps, rice fields; 0–1750 m

CONSERVATION NOTES. Least Concern due to its wide distribution and common habitat

NOTE. Often confused with *C. haspan* and *foliaceus*; from the first it is distinct by being very short-lived ('annual') and the lack of rhizomes; from the second it has traditionally been distinguished by number of stamens (2 rather than 3 and nutlet smooth rather than tuberculate), but I (HB) have found these characters too variable; I believe the easiest difference is the more slender habit, with the involucral bract being filiform, whereas in *C. foliaceus* it is consistently leaf-like and more than 4 mm wide. Several specimens called *C. tenuispica* under this regime have 3 stamens, however (including *Milne-Redhead & Taylor* 9959 & 10478, *Faden et al.* 96/220 and *Hooper & Townsend* 2006). Specimens with slightly wider involucral bracts such as *Langdale-Brown* 2137 have 2 stamens. I am not happy with the distinction between the two taxa, or how to distinguish between them. The type of *foliaceus* certainly has wide involucral bracts, and 2 stamens in many flowers.

62. ***Cyperus foliaceus*** C.B. Clarke in E.J. 38: 134 (1906); Kük. in E.P. 4, 20 (101): 247 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 167, figs. 315, 316 (1983). Type: Tanzania, Lushoto District: Amani, *Warnecke* 388 (B!, holo.)

Annual, slender to robust, up to 78 cm tall, with a minute root system; culms 18–59 cm long, 1.6–4 mm wide, trigonous, glabrous, with longitudinal grooves. Leaves up to 52 cm long; leaf sheath green to greenish-brown, 1–7.5 cm long; leaf blade linear, flat, 18–44 cm long, 2–10 mm wide, often with distinct transverse bars and prominent veins, apex acute to acuminate. Involucral bracts leaf-like, spreading,

3–4(–7), lowermost 20–31 cm long, 3–9 mm wide. Inflorescence a compound anthela, primary branches 7–15, 2–13 cm long, with a green to pale brown tubular prophyll at the base; spikelets in digitate clusters, sessile and at the end of primary, secondary and tertiary branches, 1–4 per cluster, linear-lanceolate, 2.9–11 mm long, 1.2–1.9 mm wide, wider during maturation due to spreading of glumes, rachis straight; glumes green to reddish-brown, margin translucent, truncate, 1.1–1.6 mm long, 0.5–0.7 mm wide, keel green, excurrent, apex mucronate, slightly recurved. Stamens 2–3; filaments 1.1–1.5 mm long; anthers 0.3–0.7 mm long. Nutlet shiny greyish-white, obovoid to almost orbicular, 0.4–0.7 mm long, 0.3–0.5 mm wide, base cuneate, isodiametric usually tuberculate surface-cells.

UGANDA. Bunyoro District: without specific locality, Sept. 1862, *Speke & Grant* s.n.!; Busoga District: near Kamubi, July 1926, *Maitland* s.n.!; Mubende District: Singo, Nakayenga, 8 Oct. 1970, *Katende* 622!

KENYA. Kwale District: Shimba Hills, Mkurumuji Point area, 28 Mar. 1968, *Magogo & Glover* 574! & Tiomin Mine Site, Central dune pt 67, 4 May 1999, *Luke & Mbinda* 5771! & Shimba Hills, Pengo Forest, 19 km SW of Kwale, 9 Feb. 1953, *Drummond & Hemsley* 1187!

TANZANIA. Tanga District: Korogwe, 2 Jan. 1958, *Tanner* 3952!; Kilosa District: Kikarawaza, SW boundary, 20 June 1973, *Greenway & Kanuri* 15180 & Kispeire, km 10.5, 5 July 1973, *Greenway & Kanuri* 15346!

DISTR. U 3, 4; K 7; T 3, 4, 6, 7; Z, P; Togo, Ethiopia

HAB. Woodlands, seasonally wet habitats, swamps, along streams and pools, usually on sandy soil; sea-level up to 1100 m

CONSERVATION NOTES. Least Concern due to its distribution and common habitat

NOTE. This taxon looks quite similar to *C. haspan*, with the only real difference being the short-lived ('annual') status with the lack of rhizome or stolons.

See also notes under *C. tenuispica*, with which there is much confusion.

There is some confusing variability within this taxon: there are specimens which are indistinguishable apart from the number of stamens, e.g. *Katende* 622 from U 4 and *Luke & Mbinda* 5771 from K 7; in the first there are 3 stamens (and slightly tuberculate nutlets), in the second there are 2 (and ± smooth nutlets). A third specimen, also from U 4, *Langdale-Brown* 2276, has 3 stamens – and ± smooth nutlets! Within *Liben* 846 from Rwanda there are 2 or 3 stamens within the same collection, with no other visible difference in the specimens.

63. *Cyperus zollingeri* Steud. in Syn. Pl. Glum. 2: 17 (1854); C.B. Clarke in F.T.A. 8: 360 (1902); Kük. in E.P. 4, 20 (101): 133 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 196, fig. 387 (1983). Type: India, Java, *Zollinger* 2689 (ubi?)

Annual, tussocky, up to 53 cm tall; culms solitary or tufted, 12–34 cm long, 0.7–1.9 mm long, trigonous, smooth. Leaves up to 22.5 cm long; leaf sheath greyish-brown to purple, 2–7 cm long; leaf blade linear, plicate to w-shaped, 8–17 cm long, 1.6–4.3 mm wide, apex acuminate. Involucral bracts leaf-like, spreading, 5–9, lowermost 10–28 cm long, 1.8–4.8 mm wide. Inflorescence simple (sometimes capitate), primary branches 5–9, 2–15 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 1–7 per cluster (when capitate up to 15 per head), linear, subquadrangular in cross-section, 12–53 mm long, 1.6–3 mm wide, rachis zig-zag when glumes shed; glumes light brown, margins uncoloured, ovate, 2.7–3.8 mm long, 1.4–2.9 mm wide, keel green, slightly excurrent, apex acute. Stamens 3; filaments 2.4–2.9 mm long. Nutlet grey to reddish-brown, obovoid, trigonous, 1.5–1.9 mm long, 0.9–1.2 mm long, almost smooth to slightly minutely papillose.

KENYA. Lamu District: Kiunga 88 km NE Lamu, 6 Aug. 1961, *Gillespie* 155!; Kilifi District: Soko Forest, near S end of forest, 21.3 km S of the Gede turnoff, 26 July 1971, *Faden et al.* 71/645!; Kwale District: Tiomin Mine, Mukurumudzi, 24 May 1999, *Luke et al.* 5912!

TANZANIA. Uzaramo District: Kisarawe, Kazimzumbwi Forest, Pugu Hills, south of Kisarawe, Feb. 1991, *Frontier-Tanzania* 1739!; Rufiji/Kilwa District: Selous Game Reserve, Sand River Lodge, 1 Apr. 1996, *Luke* 4443!; Lindi District: Rondo Plateau, St. Cyprians College, 15 Feb. 1991, *Bidgood et al.* 1595!; Zanzibar: Mnazi Mmoja, 24 May 1964, *Faulkner* 3379!

DISTR. **K** 7; **T** 6, 8; **Z**; widespread throughout west Africa, down to South Africa; tropical Asia
 HAB. In seasonally wet habitats; sea-level up to 650 m
 CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus rubroviridis* Cherm. in Bull. Soc. Bot. France 66: 350 (1919 publ. 1920); Kük. in E.P. 4, 20 (101): 135 (1936). Types: Madagascar, Berorona, *Perrier* 2395; Ankarafantsika, *Perrier* 2433; Lake Kinkony, *Perrier* 2458 (P, syn.)
C. ramosii Kük. in F.R. 21: 326 (1925). Type: Philippines, Luzon, Ilocos, *Ramos* 7672 (B, holo.)
C. rubroviridis Cherm. var. *unicapitatus* Kük. in E.P. 4, 20 (101): 136 (1935). Type: Tanzania, Tanga District: East Usambaras, Makumba Forest, Korogwe, 6 Aug. 1915, *Peter* 12577 (B!, holo.; K!, WAG!, iso.)
C. zollingeri Steud. var. *robusta* K. Schum. in P.O.A. C: 120 (1895). Type: Tanzania, *Holst* 2026, 4026 (B, syn.)

NOTE. There has been quite some confusion within the group around *C. zollingeri* and *tenuiculmis*. C.B. Clarke described *C. zollingeri* var. *parvus* on the basis of small plants with narrow leaves, a much depauperated umbel and dull-coloured hardly yellow spikelets. This variety has been regarded as a synonym for *tenuiculmis* ever since, but I think it is better taken as a synonym for *zollingeri*.

64. ***Cyperus* sp. nov.** based on: Zimbabwe, 8 km N of Gokwe on the road to Chnyenyetu, Nkongo, 12 Mar. 1963, *Bingham* 505 (K!, holo.)

Annual 5–32 cm tall, with shallow rootsystem; culms trigonous, longitudinally ridged, 3.5–17.5 cm long, 1–2 mm wide, glabrous. Leaves up to 30 cm long; leaf sheath reddish-brown, 1–3.5 cm long; leaf blade narrowly linear, sometimes plicate, 4–29 cm long, 2.5–5 mm wide, glabrous, sometimes slightly scabrid on the margins, apex acute to acuminate. Involucral bracts leaf-like, 4–6, spreading, 7.5–24 cm long, 3–5 mm wide. Inflorescence simple to compound, primary branches 3–8, 2.5–15 cm long; spikelets in loose digitate clusters, sessile or at the end of primary and secondary branches, 8–25 per cluster, linear, 18–20 mm long, 1.5–2 mm wide, glumes spreading when mature, giving the spikelet a squarrose look; glumes orange-brown, with reddish veins on either side of the keel, (narrowly) elliptic, 2.5–3.2 mm long, 0.8–1.3 mm wide, keel green, slightly excurrent, apex shortly mucronate, glabrous. Stamens 3: filaments 1.9–2.8 mm long; anthers 1.7–2.4 mm long. Nutlet dark reddish-brown, darker on the margins, narrowly obovoid, 1.4–1.9 mm long, 0.5–0.6 mm wide, minutely papillose in longitudinal rows.

TANZANIA. Kilosa District: Mweza River, km 14, 28 June 1973, *Greenway* & *Kanuri* 15284!; Rufiji District: Selous Game Reserve, opposite Sand Rivers Lodge, June 1997, *Luke* & *Luke* 4645!
 DISTR. **T** 6; Zambia, Zimbabwe
 HAB. Sandy river bed; ± 510 m
 CONSERVATION NOTES. Data needed on threats and population sizes

NOTE. Also represented by one specimen from Zambia (*Robinson* 1356 from Kabanga) and three from Zimbabwe (*Brain* 8695, *Brain* 4143 and *Bingham* 505); this is thought to be a new species.

65. ***Cyperus compressus* L.**, Sp. Pl. 1: 46 (1753); C.B. Clarke in F.T.A. 8: 347 (1902); Kük. in E.P. 4, 20 (101): 156 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 266, fig. 542 (1983) & *Fl. Somalia* 4: 125 (1995) & *Fl. Eth.* 6: 455, fig. 212.105 (1997). Type: America (LINN, lecto.)

Annual up to 60 cm tall, slender to robust; culms 10–46 cm long, 1–3 mm wide, trigonous, glabrous. Leaves up to 49 cm long; leaf sheath pale brown to red to purplish, 0.5–6 cm long; leaf blade linear, flat, 10–43 cm long, 2–5 mm wide, apex acute to acuminate, glabrous to minutely scabrid on the margins. Involucral bracts 3–6, leaf-like, spreading, the lowermost 12–30 cm long, 2–5.5 mm wide. Inflorescence a simple anthela, primary branches 2–7, (0–)0.5–13 cm long; spikelets

in digitate clusters, sessile and at the end of primary branches, 4–12 per cluster, linear-oblong, 10–29 mm long, 2–4 mm wide; glumes (pale) green to (pale) brown, ovate-elliptic, 2.7–4.7 mm long, 1.8–2.9 mm wide, with lateral veins on either site of the keel, keel green, acute, apex mucronate, up to 1 mm long. Stamens 3; filaments 2.9–3.5 mm long; anthers 0.6–1.1 mm long. Nutlet reddish brown to almost black, shiny, ellipsoid to obovoid, 1.4–2 mm long, 0.9–1.3 mm wide, smooth.

KENYA. Northern Frontier District: Dandu, 14 May 1952, *Gillett* 13187!; Kitui District: Galana River, E of Lugard Falls, Tsavo National Park, East, 26 Dec. 1966, *Greenway & Kanuri* 12873!; Lamu District: Kiunga, 88 km NE of Lamu, 6 Aug. 1961, *Gillespie* 169!

TANZANIA. Tanga District: 6.5 km E of Korogwe, 20 July 1953, *Drummond & Hemsley* 3400!; Uzuramo District: ± 16 km W of Dar es Salaam, 30 Nov. 1955, *Milne-Redhead & Taylor* 7511!; Mikindani District: road to Ruvuma River and Mozambique border, ± 48 km from Mtwara, 8 Mar. 1963, *Richards* 17791!

DISTR. **K** 1, 4, 7; **T** 1, 3, 4, 6–8; **Z**, **P**; Senegal, Sierra Leone, Liberia, Ivory Coast, Ghana, Togo, Nigeria, Cameroon, Equatorial Guinea, Central African Republic, Congo-Kinshasa, Somalia, Zambia, Malawi, Mozambique, Zimbabwe, Swaziland, South Africa; Asia, Americas

HAB. In roadside ditches, drainage trenches, in permanent and seasonal pools, on sandy soil and on black cotton; 0–1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus compressus* L. var. *floribundus* E.G. Camus, Notul. Syst. (Paris) 1: 243 (1910); Kük. in E.P. 4, 20 (101): 158 (1936). Type: Vietnam, Saigon, *Germain* 76 (P, holo.)

66. ***Cyperus benadirensis*** *Chiov.* in Fl. Somalia 2: 434 (1932); Lye in Fl. Somalia 4: 127 (1995). Type: Somalia, Baddada, *Senni* 383! (CSET!, syn.) & Licchitore, *Senni* 212 (CSET!, syn.)

Perennial to 54 cm tall, robust, tussocky, with swollen culm bases, covered in the fibrous remains of old leaf sheaths; culms tufted, 40–50 cm long, 1.1–2 mm wide, trigonous, smooth. Leaves up to 27 cm long; leaf sheath pale brownish to almost grey, 3–5 cm long; leaf blade linear, flat or sometimes margin inrolled, 6–22 cm long, 1.2–2.5 mm wide, margin scabrid, apex acuminate. Involucral bracts leaf-like, spreading, 3–5, lowermost 11–17.5 cm long, 1.3–2 mm wide. Inflorescence a simple anthela, primary branches 3–5, 1.2–3 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 5–8 per cluster, lanceolate, 6.8–15 mm long, 2.4–3.2 mm wide, rachis straight; glumes reddish-brown, ovate, 4.1–6.4 mm long, 1.5–2 mm wide, keel green, excurrent, with several slender lateral veins, apex mucronate. Stamens 3; filaments 5.2–5.6 mm long. Nutlet grey, obovoid to almost rounded, flat and strongly curved with adaxial side concave and abaxial side convex, or with 3 concave sides, 2–2.2 mm long, 1.4–1.8 mm wide, minutely papillose.

KENYA. Machakos District: Kangonde–Embu Road, Kikumini, 6 Jan. 2004, *Muasya et al.* 2447!; Kitui District: 1.6 km S of Tana River on Embu/Kangonde road, 8 May 1960, *Napper* 1649!

DISTR. **K** 4; Somalia

HAB. *Commiphora* grassland, cultivation edge; ± 1000 m

CONSERVATION NOTES. Data deficient, possibly least concern

NOTE. This species is only known from Somalia and from two locations in our area. The spikelets from the specimen in the Flora area are slightly narrower than those of the collections in Somalia, and the nutlets are slightly bigger.

67. ***Cyperus holstii*** *Kük.* in F.R. 21: 328 (1925); Kük. in E.P. 4, 20 (101): 75 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 184, 356 (1983). Type: Tanzania, Tanga District: Tanga coast area, *Holst* 2026, 4026 (B, syn.)

Perennial up to 115 cm tall, fairly robust, with ± 2 mm thick stolons covered by loose scales; culms few, 45–67 cm long, 3.5–6 mm in diameter, trigonous, smooth. Leaves 1–3, up to 50 cm long; leaf sheath pale brown, sometimes pale reddish-brown,

6–12 cm long; leaf blade linear, flat, 16–38 cm long, 5.5–10 mm wide, slightly scabrid on margin, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 6–9, lowermost 22–38 cm long, 5.5–7 mm wide. Inflorescence a compound anthela, primary branches 5–12, 6–26 cm long; spikelets in digitate spikes, sessile and on primary and secondary branches, 6–20 per spike, linear, 5–30 mm long, 1.4–2.2 mm wide, rachilla straight; glumes brown, boat-shaped, 4.4–6.5 mm long, 1.8–2.2 mm wide, keel green, with several veins on either side, apex obtuse. Stamens 3; filaments 2.7–4.3 mm long; anthers 1.7–1.8 mm long. Nutlet brownish, trigonous, 0.8–1 mm long, 0.5–0.6 mm wide, minutely papillose.

KENYA. Kwale District: Nimboza Pool, Msambweni, 19 Jan. 1964, *Verdcourt* 3959! & Ramisi–Langulun Msiu 4 km, 21 June 1994, *Luke & Gray* 4027! & Gongoni Forest Reserve, 7 Apr. 1997, *Luke* 4605!

TANZANIA. Tanga District: Tanga Bay, 4 Nov. 1929, *Greenway* 1861!; Lushoto District: Kwasunga, Makuyuni, May 1958, *Semsei* 2766!; Kilwa District: Selous Game Reserve, Muhinje area, 12 Jan. 1978, *Vollesen* 4876!

DISTR. **K** 7; **T** 3, 8; not known elsewhere

HAB. In seasonally wet grassland, alongside pools and in swamps; sea-level up to 250 m

CONSERVATION NOTES. Least concern to near threatened, due to small distribution area in a rapidly changing coastal strip.

68. *Cyperus derreilema* Steud. in Flora 25: 585 (1842); C.B. Clarke in F.T.A. 8: 343 (1902); Kük. in E.P. 4, 20 (101): 199 (1936), as *dereilema*; Haines & Lye, Sedges & Rushes E. Afr.: 155, fig. 285 (1983) & Fl. Eth. 6: 435 (1997). Type: Ethiopia, near Mt Silke, *Schimper* 659 (P, holo.; BR!, HAL, K, iso.)

Perennial, robust, up to 2.25 m tall, with a thick woody rhizome; culms tufted, 135–200 cm long, 3.5–8 mm wide, trigonous to triquetrous, smooth to sometimes slightly scabrid. Leaves up to 100 cm long; leaf sheath not prominent, only seen at the very base of the culm, brown; leaf blade linear, w-shaped or flat, 58–100 cm long, 1.1–2.2 cm wide, scabrid on veins and margins, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 5–9, lowermost 24–85 cm long, 0.7–2.2 cm wide. Inflorescence a compound anthela, primary branches 6–15, 5–17 cm long; spikelets in digitate clusters, at the end of primary, secondary and tertiary branches, (1–)2–6 per cluster, ovoid, 4.3–8 mm long, 1.9–2.5 mm wide, rachilla straight to slightly curved; glumes reddish-brown, ovate, 2.2–2.7 mm long, 1.1–1.4 mm wide with several veins on either side, keel green, not excurrent, apex rounded. Stamens 3; filaments 1.6–2.7 mm long; anthers 1.3–1.9 mm long. Nutlet reddish-brown, ellipsoid-ovoid, 1 mm long, 0.6–0.7 mm wide, almost smooth.

UGANDA. Acholi District: Imatong Mts, Lomuleng, 29 Dec. 1935, *Thomas* 1795!; Toro District:

Mt Ruwenzori, Aug. 1938, *Purseglove* 329!; Mbale District: Mt Elgon, 27 Dec. 1996, *Wesche* 627!

KENYA. Nakuru District: 16 km W of Ol Joro Orok, 8 Sept. 1951, *Bogdan* 3249!; North Nyeri District: Aberdare range, near the W part of the Nyeri Track, 12 July 1948, *Hedberg* 1516!; Masai District: Enunki, 9 Oct. 1971, *Greenway & Kanuri* 14922!

TANZANIA. Kilimanjaro, Mandara hut area, 15 Oct. 1993, *Grimshaw* 93944!; Mbeya District: Chunya Escarpment, 20 Jan. 1957, *Richards* 7954A!; Rungwe District: Ngori Forest, 4 Oct. 1932, *Geilinger* 2901!

DISTR. **U** 1–3; **K** 3, 4, 6; **T** 2, 7; Congo-Kinshasa, Rwanda, Ethiopia, Malawi

HAB. In montane and bamboo forests, often in open areas, sometimes in swamp and along streams and river beds; 2100–3050 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and habitat

SYN. *Cyperus deckenii* Boeck. in Linnaea 38: 361 (1874); C.B. Clarke in F.T.A. 8: 342 (1902). Type: Tanzania, Kilimanjaro, 6500–8500', *Kersten* s.n. (B, holo.)

C. derreilema Steud. subsp. *deckenii* (Boeck.) Kük. in E.P. 4, 20 (101): 199 (1936)

C. derreilema Steud. var. *brevispiculosus* Kük. in E.P. 4, 20 (101): 199 (1936). Type: Kenya, Mt Kenya, *Fries & Fries* 1215 & 772 & Mt Kenya, Coles Mill, *Fries & Fries* 1112 & Aberdares, *Fries & Fries* 2497 & Mt Elgon, *Granvik* 54; Tanzania, Kilimanjaro, 25 June 1926, *Peter* 41961 (WAG!, syn.)

NOTE. This species is related to *C. ajax* but can be distinguished by its rounded (not mucronate) glume apex.

The species is often cited as *derveilema*, but the protologue spells it as *derveilema*. I am not sure about the derivation so I am letting the original version stand (HB).

69. *Cyperus dichrostachyus* A. Rich. in Tent. Fl. Abyss. 2: 481 (1851); C.B. Clarke in F.T.A. 8: 331 (1902), as *dichroostachyus*; Kük. in E.P. 4, 20 (101): 233 (1936), as *dichroostachyus*; Haines & Lye, Sedges & Rushes E. Afr.: 165, figs. 308, 309 (1983) & Fl. Eth. 6: 436, fig. 212.63 (1997). Type: Ethiopia, Mt Scholoda 3 km W of Adua, Schimper 391 (P, lecto., HAL, K!, isolecto.)

Perennial, robust, up to 100 cm tall, stoloniferous, stolons reddish brown to almost black, up to 12 cm long, 1–3 mm in diameter; culms 33–90 cm long, 3–8 mm wide, triquetrous, glabrous. Leaves up to 95 cm long; leaf sheath light to dark brown, sometimes reddish to purplish brown, 2–11 cm long; leaf blade linear, flat, longitudinal veins sometimes clearly visible, 22–87 cm long, 0.7–1.8 cm wide, apex acuminate, scabrid towards the apex on midrib and margins. Involucral bracts 2–4, leaf-like, spreading, the lowermost sometimes erect, 10–48 cm long, 0.5–1.4 cm wide. Inflorescence simple to compound, primary branches 5–12, 1–9 cm long; spikelets in digitate clusters, sessile and at the end of primary, secondary and tertiary branches, 3–20 per cluster, ovoid-lanceolate, 2.4–5 mm long, 0.9–2 mm wide; glumes dark brown to almost black in the centre, margins pale brown to grey, ovate to obovate, 1.3–1.8 mm long, 0.6–1 mm wide, keel pale brown to greyish-green, 3-veined, apex acuminate to shortly mucronate. Stamens 2; filaments 1.2–1.4 mm long; anthers 0.4–0.8 mm long. Style with 3 stigma branches. Nutlet pale greyish brown, lanceolate to ellipsoid, 1–1.3 mm long, 0.5–0.6 mm wide, short-apiculate, minutely wrinkled to irregularly papillose. Fig. 29, p. 199.

UGANDA. Kigezi District: Kinaba gap, Dec. 1938, *Chandler & Hancock* 2581! & Muchoya Fen Bamboo Reserve, 5 Jan. 1962, *Morrison* 13! & Kabale–Kisoro Road, 26 Dec. 1961, *Morrison* 33! KENYA. Nakuru District: Endabarra, Mau Forest, 16 Jan. 1946, *Bally* 4835!; Kiambu District: Kabete, 15 June 1949, *Bogdan* 2483!; Narok District: Enesambulai Valley, 15 Aug. 1970, *Greenway & Kanuri* 14561!

TANZANIA. Lushoto District: West Usambaras, Mkuzi, 6.5 km NE of Lushoto, 21 Apr. 1953, *Drummond & Hemsley* 2173!; Ufipa District: Rukwa Escarpment, above Muse Gap, 29 Dec. 1961, *Robinson* 4791!; Njombe District: Milo, 3 Nov. 1978, *Archbold* 2648!

DISTR. U 1–4; K 1, 3–6; T 1–4, 6–8; Cameroon, Congo-Kinshasa, Rwanda, Burundi, Angola, Sudan, Ethiopia, Zambia, Malawi, Zimbabwe, South Africa

HAB. In wet habitats, on river-banks, near streams, pools and in swamps; 1200–2750 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

NOTE. Haines & Lye say this is somewhat similar to *C. difformis*, but differs in stoloniferous perennial habit, less congested inflorescence, usually larger leaves and bracts.

70. *Cyperus glaucophyllus* Boeck. in Beitr. Cyper. 1: 4 (1888); C.B. Clarke in F.T.A. 8: 345 (1902); Kük. in E.P. 4, 20 (101): 202 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 157, fig. 290 (1983). Type: Malawi, presumably from the Shire Highlands, *Buchanan* 24 (B, holo.; K!, iso.)

Perennial, up to 122 cm tall, with a creeping woody rhizome; culms few to many, 28–112 cm long, 1.1–5 mm wide, trigonous to triquetrous, smooth. Leaves up to 80 cm long; leaf sheath purplish at the base, brown, 2–11 cm long; leaf blade linear, flat, 22–75 cm long, 3.7–12 mm wide, scabrid on major veins and margin, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 2–5, lowermost 10–23 cm long, 2.7–10 mm wide. Inflorescence a compound anthela, primary branches 5–11, 1–11.5 cm long; spikelets in digitate clusters, at the end of primary and secondary branches, 2–8 per cluster, linear-lanceolate, 4–12.5 mm long, 1–2.5 (–4.4) mm wide,



FIG. 29. *CYPERUS DICHROSTACHYUS* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence primary branch, $\times 2$; 3, spikelet, $\times 10$; 4, glume, $\times 20$; 5, flower, $\times 20$; 6, nutlet, $\times 24$. 1–5 from *Verdcourt* 1020, 6 from *Napier* 5837. Drawn by Juliet Williamson.

rachis straight, 10–12-flowered; glumes reddish-brown, ovate-lanceolate, 2–2.7 mm long, 0.6–1.3 mm wide, keel green, slightly excurrent, apex acuminate to mucronate. Stamens 3; filaments 1.4–2.4 mm long; anthers 1.2–2 mm long. Nutlet reddish-brown to dark grey, (narrowly) ellipsoid-oblong, 1.3–1.8 mm long, 0.4–0.6 mm wide, smooth to minutely papillose.

UGANDA. Karamoja District: Lodoketeminit, near Moroto, 16 July 1959, *Kerfoot* 1167!

KENYA. Northern Frontier District: Kulal, 10 June 1960, *Oteke* 122!; Nanyuki District: 18 km NE of Nanyuki, Cedarvale Farm, 22 Oct. 1977, *Gilbert* 4889!; Masai District: Oltoroto hill SE of Sultan Hamud, Feb. 1969, *Napper* 1916!

TANZANIA. Kilimanjaro: slope between Umbwe and Weru Weru rivers, Sept. 1932, *Greenway* 3213!; Lushoto District: gorge \pm 2 km S of Bumbili, on Soni–Mazumbai road, 28 Mar. 1975, *Hooper & Townsend* 1023!; Dodoma District: Kondoa, Mondo Road, 3 Feb. 1973, *Richards* 28526!

DISTR. U 1; K 1, 3, 4, 6, ?7; T 1–3, 5, 6; Congo-Kinshasa, Rwanda, Burundi, Malawi, Swaziland, South Africa

HAB. In forest, secondary areas in forest zone, stream-sides; 750–2400 m

CONSERVATION NOTES. Least Concern (LC) due to wide distribution and common habitat.

SYN. *Cyperus leptocladus* Oliv. in Trans. Linn. Soc. 2, 2nd ser., Bot. 2: 353 (1887), *non* Kunth, *nom. nudum*

C. zambsiensis C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 581 (1894) & F.T.A. 8: 345 (1902). Type: Malawi, Shire Highlands, *Buchanan* 24 & 47 (K!, syn.)

C. deckenii C.B. Clarke in F.T.A. 8: 342 (1902) pro parte

C. baronii C.B. Clarke in F.T.A. 8: 344 (1902) pro parte

C. pseudoleptocladus Kük. in F.R. 29: 196 (1931) & in E.P. 4, 20 (101): 201 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 156, fig. 288, 289 (1983). Type: Tanzania, Kilosa District: Marangu, July 1893, *Volkens* 650 (B!, K!, syn.) & 652 (B!, K!, syn.); Lushoto District: Usambara, *Holst* s.n. (B, syn.) & *Engler* 1267 (B, syn.); Lushoto District: Lutindi, *Holst* 3385 (B, syn.); Rungwe District: Kymbila, *Stolz* 1146 (B, syn.); Malawi, Mt Malosa, *Whyte* s.n. (B!, K!, syn.)

C. pseudoleptocladus Kük. var. *polycarpus* Kük. in F.R. 29: 196 (1931) & in E.P. 4, 20 (101): 201 (1936) Types: Kenya, Naivasha District: Masai Highlands, Mau Plateau, Herb. For. Dep. Nairobi 153 (syn.); Tanzania, Kilosa District: Marangu, *Volkens* 704 (B!, syn.); Malawi, Mt Zomba, *Whyte* s.n. (syn.); South Africa, Transvaal, Pietersburg, Drift Helpmekeer, *Pott* 4748 (syn.)

C. glaucophyllus Boeck. var. *longispiculosus* Kük. in E.P. 4, 20 (101): 203 (1936). Tanzania: Lushoto District: West Usambara, track between Lushoto and Momba, *Peter* 40902 (B!, holo.; B!, K!, iso.)

C. glaucophyllus Boeck. var. *zambsiensis* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 203 (1936)

NOTE. There is a very confused and often confusing group of taxa: *C. ajax*, *derreilema*, *fischerianus*, *glaucophyllus*, *laxus* and *pseudoleptocladus*, and even *renschii*. Of these, *derreilema* is distinct in the obtuse (not acute/acuminate) glume apex. *C. renschii* and *laxus* key out on the tiny glumes, 1.2–1.6 mm long (all the others have glumes over 1.8 mm long) – except *laxus* subsp. *syvestris*, that is (glumes 1.9–3 mm long); these are distinct from each other in leaf, inflorescence and nutlet size. In the other four the differences seem to be gradual and quantitative rather than qualitative. *C. ajax* has very long and wide leaves, and is altogether more robust than the others; *fischerianus* is also pretty robust, and can be distinguished on size of leaf – and the often proliferating inflorescence (though Haines & Lye say this is very close to *pseudoleptocladus*, it can be distinguished easily by the involucre bracts, much wider at base in *fischerianus*). This leaves *glaucophyllus* and *pseudoleptocladus*.

The differences used by Haines & Lye do not hold up on studying more material; so I compared the types. In these there is also considerable variation (helped by the fact that Kükenthal lists seven syntypes for *pseudoleptocladus*) but no very large differences; Kükenthal's key in Das Pflanzenreich distinguishes the two on the arrangement of spikelets (single or digitate) but that is not corroborated by the material, and again variation is continuous; the descriptions by Kükenthal for each of the taxa could be either taxon, really. I see no other solution than to unite these two under the older name, *glaucophyllus*. (HB)

Several specimens from a small area in SE Kenya and NE Tanzania have proliferous inflorescences. These are rather small plants, with short rhizomes, slender culms to 80 cm long, leaves not exceeding 30 cm long and 3 mm wide, and small compound-anthelate inflorescences; primary branches 6–12, ultimate heads with few digitately held spikelets; spikelets 3–10 \times 1–1.4 mm; glumes pale brown with broad green keel, 2–2.5 mm long, apex acuminate and recurving.

Stamens 3. Nutlets (?immature only?) whitish, 0.5–0.7 × 0.3 mm, ± smooth. Kenya: Teita District: Bura, Nov. 1997, *Mwachala* EW153! & same locality, Dec. 1998, *Luke et al.* 5503!; Tanzania: Same District: Mkomazi Game Reserve, Ibaya Hill, June 1996, *Vollesen* 96/7!; Lushoto District: Mswaha–Mandera, July 1969, *Archbold* 1066! These occur in forest or dense bushland at altitudes between 390–1350 m; Vollesen comments the stems bend over and root when touching the ground. It is possible this represents a new taxon. *Harris & Pocs* 4255 from Southern Tanzania (Kilombero scarp) is similar, but has longer and wider leaves.

71. *Cyperus laxus* *Lam.* in *Tabl. Encycl.* 1: 146 (1791); Haines & Lye, *Sedges & Rushes E. Afr.*: 163 (1983). Type: Brazil, E Cayenne, no collector indicated (BM, herb. Sloane, holo.)

Perennial up to 124 cm tall, with short woody rhizome; culms tufted, 28–113 cm long, 1.1–4 mm wide, trigonous to triquetrous, smooth. Leaves up to 60 cm long; leaf sheath reddish-brown to purple, 4–9 cm long; leaf blade linear, flat, 25–53 cm long, 0.3–1.3 cm wide, scabrid on margins and veins, apex acuminate to acute, with 2 main veins next to primary vein. Involucral bracts leaf-like, erect or spreading, much overtopping the inflorescence, 5–8, lowermost 15.5–31 cm long. Inflorescence simple to compound, primary branches 6–10, 2–7 cm long; spikelets in small digitate clusters at the end of primary, secondary and sometimes tertiary branches, 3–5 per cluster, 4–6 mm long, 1.6–2.4 mm wide; glumes pale reddish-brown, ovate, 1.1–3 mm long, 0.6–1.6 mm wide, keel green, excurrent, apex mucronate, slightly recurved. Stamens 3; filaments 1.3–1.9 mm long. Nutlet reddish brown to black, ovoid to obovoid, 1.1–1.4 mm long, 0.6–1.1 mm wide, almost smooth to minutely papillose to minutely irregularly pitted.

NOTE. During examination of the specimens an obvious difference between specimens from Uganda and Kenya and specimens of Tanzania was observed. The latter show a much coarser habit, with wider leaves, a larger inflorescence and larger glumes. Lye described the subspecies *buchholzii* (Boeck) Lye and *sylvestris* (Ridl.) Lye in 1983, but both subspecies were put into synonymy later. After carefully examining the protologues of both subspecies, and comparing them to the studied material I feel strongly the subspecies should be recognized for the Flora area as the differences are considerable and the distribution is disjunct.

a. subsp. ***buchholzii*** (*Boeck*) *Lye* in *Nordic Journ. Bot.* 3 (2): 232 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 163, figs. 303, 304 (1983). Type: Cameroon, Bonjongo, Victoria, *Buchholz* s.n. (B, holo.)

Culms 28–49 cm long, 1.1–2.4 mm wide. Leaves 23–31 cm long, 3.2–8 mm wide; glumes 1.1–1.4 mm long, 0.6–0.9 mm wide, glabrous.

UGANDA. Busoga District: Butembe Bunya, very close to banks of White Nile at Kibibi, 16 km NW of Jinja, 6 Feb. 1953, *Wood* 634!; Mengo District: Kawanda near Kampala, Feb. 1936, *Chandler* 1553!; Mengo District: Entebbe road, Kajansi Forest, May 1937, *Chandler* 1638!

KENYA. Thika District: Blue Post Hotel, Apr. 1968, *Faden* 68/58!; Lamu District: Witu, Mambasasa, Utwani Forest Reserve, 18 Oct. 1957, *Greenway & Rawlins* 9364!; Kwale District: Gongoni Forest Reserve, 1.2 km NW of NE corner, along N boundary, 12 Nov. 1989, *Robertson & Luke* 5951!

TANZANIA. Mpanda District: Mahale Mts, Bilenge Camp, Dec. 1982, *McGrew & Collins* 6!

DISTR. U 2–4; K 4, 7; T 4; widespread in west and central Africa

HAB. In forest, secondary vegetation, on stream banks and in glades; (0–)1100–2400 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus buchholzii* Boeck., *Cyp. Nov.* 1: 3 (1888)

C. diffusus Vahl subsp. *buchholzii* (Boeck.) Kük. in *E.P.* 4, 20 (101): 210 (1936)

b. subsp. ***sylvestris*** (*Ridl.*) *Lye* in *Nordic Journ. Bot.* 3(2): 232 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 163 (1983). Type: Angola, *Welwitsch* 6898 (LISU, holo.; BM, iso.)

Culms 50–113 cm long, 2.8–4 mm wide. Leaves 36–53 cm long, 9–13 mm wide; glumes 1.9–3 mm long, 1.3–1.6 mm wide, scabrid near the apex.

TANZANIA. Ufipa District: near Lake Kwela, 14 Mar. 1959, *Webster* 30!; Dodoma District: Manyoni, km 13.5 of Itigi Station on the Chunya road; 16 Apr. 1964, *Greenway & Polhill* 11583!; Iringa District: Mufindi, Lake Ngwazi, 28 Mar. 1991, *Bidgood & Vollesen* 2148!

DISTR. T 4, 5, 7; Angola

HAB. In shady forest, open woodland, in plantations and secondary vegetation, on rocky outcrops in thin soil; 450–1850 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus sylvestris* Ridl. in Trans. Linn. Soc. 2nd ser. Bot. 2: 134 (1884)

C. diffusus Vahl subsp. *sylvestris* (Ridl.) Kük. in E.P. 4, 20 (101): 210 (1936)

72. ***Cyperus ajax*** C.B. Clarke in F.T.A. 8: 343 (1902); Kük. in E.P. 4, 20 (101): 198 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 155, fig. 284 (1983). Type: Malawi, Mt Malosa, *Whyte* s.n. (K!, syn.) & Mt Zomba, *Whyte* s.n. (K!, syn.)

Perennial, robust, up to 210 cm tall, with thick woody rhizome, up to 1.2 cm in diameter; culms 85–200 cm long, 4–7 mm wide, trigonous to triquetrous, smooth to somewhat scabrid. Leaves many, crowded, up to 215 cm long; leaf sheath reddish-brown, 4–14 cm long; leaf blade linear, flat, 64–200 cm long, 1.4–3.7 cm wide, with several prominent veins, scabrid on veins and margins, apex acute. Involucral bracts leaf-like, spreading to sometimes erect, 3–many, lowermost 34–100 cm long, 1.1–2.9 cm wide. Inflorescence compound, primary branches 6–many, 3–20 cm long; spikelets in digitate clusters, sessial and at the end of primary, secondary and tertiary branches, 3–7 per cluster, lanceolate-ovoid, 3.2–6.7 mm long, 0.8–2.2 mm wide, rachilla straight; glumes reddish-brown, sometimes reddish-green, ovate, 1.8–2.7 mm long, 1.2–1.8 mm wide, keel green, excurrent, apex mucronate. Stamens 3; filaments 1.3–1.9(–3.1) mm long; anthers 0.6–1.1 mm long. Nutlet reddish-brown, ellipsoid (obovoid), 0.9–1.3 mm long, 0.4–0.63 mm wide, almost smooth to minutely papillose.

UGANDA. Kigezi District: Kachwekano Farm, Jan. 1950, *Purseglove* 3205!; Toro District: Ruwenzori, Bujuku Valley, below Nyabitaba Hut, 16 Jan. 1967, *Wood* 833!; Mengo District: Endabarra, Mau Forest, 16 Jan. 1946, *Bally* 4860!

KENYA. Nakuru District: Eburru Forest Reserve, 16 July 2002, *Luke et al.* 8874!; Kiambu District: Kikuyu Escarpment Forest, Gatamayu River, 25 Jan. 1969, *Napper & Stewart* 1826!; Kericho District: Nyanza province, South Western Mau Forest Reserve, Camp 7, 10 Sept. 1949, *Maas Geesteranus* 5686!

TANZANIA. Lushoto District: Lushoto Township, 25 Apr. 1959, *Semsei* 2861!; Tukuyu District: Kiwira Forestry Reserve, 9 Feb. 1961, *Richards* 14345!; Songea District: Matengo Hills, Lupembe Hill, 20 May 1956, *Milne-Redhead & Taylor* 10259!

DISTR. U 2, 3/4; K 3–5; T 2, 3, 5–8; Congo-Kinshasa, Burundi, Rwanda, Malawi

HAB. In thickets and open and degraded upland forests, sometimes along river-banks; 950–2600 m

CONSERVATION NOTES. Least Concern (LC) due to its distribution and common habitat.

SYN. *Cyperus derreilema* Steud. var. *ajax* (C.B. Clarke) Kük. in N.B.G.B. 9: 302 (1925)

NOTE. This species is related to *C. derreilema* but differs in the mucronate (not rounded) apex to the glume.

73. ***Cyperus fischerianus*** A. Rich. in Tent. Fl. Abyss. 2: 488 (1850); C.B. Clarke in F.T.A. 8: 342 (1902); Kük. in E.P. 4, 20 (101): 203 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 155, fig. 286 (1983). Type: Ethiopia, Mt Scholoda, 3 km W of Adua, *Schimper* 348 (P, lecto., BR!, HAL, K!, UPS, isolecto.)

Perennial to 133 cm tall, robust, with short thick woody rhizomes forming dense tussocks; culms densely tufted, 55–120 cm long, 2.4–5.7 mm wide, trigonous to triquetrous, smooth. Leaves up to 145 cm long; leaf sheath dark purple and glossy and the base, rather thick, 5–15(–27) cm long; leaf blade linear, with several major veins, flat, 54–130 cm long, 0.9–1.6 cm wide, scabrid on margins and major veins,

apex acuminate. Involucral bracts leaf-like, spreading, 5–10 to many, lowermost 30–125 cm long, 0.8–1.6 cm wide. Inflorescence compound, often proliferating, primary branches 7–17, 3–10 cm long; spikelets in digitate clusters, at the end of primary, secondary and tertiary branches, 1–5 per cluster, linear-lanceolate, 4.3–12.7 mm long, 1.6–2.2 mm wide, rachis straight to slightly curved; glumes rusty reddish-brown, ovate-lanceolate, 2.1–2.4 mm long, 0.9–1.6 mm wide, keel shortly excurrent, apex acuminate. Stamens 3; filaments 2.1–2.7 mm long; anthers 1.1–1.6 mm long. Nutlet reddish-brown, obovoid-ellipsoid, 0.9–1.3 mm long, 0.6–0.7 mm wide, minutely papillose.

UGANDA. Karamoja District: Mt Kadam [Debasien], Jan. 1936, *Eggerling* 2746!; Sebei District: Mt Elgon, near Mutusyet, 4 July 1971, *Lye & Katende* 6410!; Mengo District: Kyewaga Forest, on E side of Entebbe Bay, 3 km from town, 7 Sept. 1949, *Dawkins* 359!

KENYA. Nandi District: near Kabsabet area, 5 Aug. 1984, *Siemen* 109!; Trans-Nzoia District: Kitale, 6 Sept. 1956, *Bogdan* 4260!; South Kavirondo District: Lambwa, 15 Oct. 1910, *H* 2767!

TANZANIA. Lushoto District: Lushoto Arboretum, 30 Dec. 1971, *Issa* 99!; Iringa District: Udzungwa Mountain National Park, Mt Luhomero, 26 Sept. 2000, *Luke et al.* 6671!; Mbeya District: Poroto Mts, 17 May 1957, *Richards* 9795!

DISTR. U 1–4; K 3–7; T 2, 3, 6, 7; Congo-Kinshasa, Eritrea, Ethiopia, Malawi

HAB. In montane and riverine forest, woodland, forest margins, in shade and semi-shade, often near wet areas; 400–2650 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus fischerianus* A. Rich. var. *ugandensis* Lye in *Nordic Journ. Bot.* 3: 230 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 156, fig. 287 (1983). Type: Uganda, Teso District: Soroti, *Haines* 4288 (MHU, holo.; K, iso.), **syn. nov.**

74. *Cyperus mwinilungensis* *Podlech* in *Mitt. Bot. Staatssamml. München* 4: 109 (1961). Type: Zambia, 40 km ESE of Kasama, *Robinson* 4561 (M, holo.; BR, K, iso.)

Perennial, fairly slender, up to 34 cm tall, stoloniferous, with small round tubers at the base of the culm; culms few, 20–31.5 cm long, 5–14 mm wide, trigonous to triquetrous, smooth (sometimes slightly scabrid). Leaves up to 33 cm long; leaf sheath reddish-brown, greenish-brown to brown, 1.5–5 cm long; leaf blade linear, flat, 5–30 cm long, 1.1–2.9 mm wide, glabrous to scabrid on margins, apex acute to acuminate. Involucral bracts leaf-like, erect, at least the lowermost, 2(–3), lowermost 1.5–7 cm long, 1.2–1.9 mm wide. Inflorescence a simple anthela, primary branches 1–4, 0.5–3 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 2–11 per cluster, ovoid-lanceolate to linear-lanceolate, 5–13 mm long, 1.6–2.5 mm wide, rachis straight; glumes dark reddish-brown to black, ovate-elliptic, 1.2–2.1 mm long, 1.1–1.4 mm wide, with 5–9 veins on either side of the keel, keel inconspicuous, apex rounded to slightly excurrent. Stamens 3; filaments 0.8–2.1 mm long; anthers 0.9–1.3 mm long. Nutlet immature.

var. **maior** *Podlech* in *Mitt. Bot. Staatss. München* 4: 110 (1961). Type: Zambia: Kasama District: 103 km E of Kasama, *Robinson* 4431 (M, holo.)

TANZANIA. Kigoma District: Mweinda's-Ruhinda's, Usinge swamps, 28 Nov. 1933, *Michelmores* 779!; Ufipa District: Sumbawanga, 20 km S of Mpuu, 3 Jan. 1962, *Robinson* 4909!; Songea District: Kwamponjore Valley, 7 Feb. 1956, *Milne-Redhead & Taylor* 8635!

DISTR. T 4, 8; Zambia

HAB. In seasonal bogs or swamp, in damp hollows; 1000–1400 m

CONSERVATION NOTES. Least Concern (LC) due to its distribution and habitat.

76. *Cyperus tenax* *Boeck.* in *Linnaea* 35: 504 (1868); C.B. Clarke in *F.T.A.* 8: 334 (1902); Kük. in *E.P.* 4, 20 (101): 259 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 267, figs. 546, 547 (1983). Type: South Africa, Cape, *Zeyher* 13 (B, holo.)

Perennial, densely tufted, up to 73 cm tall, with an erect rhizome covered by old leaf bases; culms tufted, 5–68 cm long, 0.6–1.8 mm wide, rounded, glabrous. Leaves up to 33 cm long; leaf sheath straw-coloured to purple, 1.5–7 cm long; leaf blade linear, flat or folded, 5–30 cm long, 1.1–4 mm wide, scabrid on margins and primary vein at least on young leaves, apex acuminate. Involucral bracts leaf-like, spreading, the lowermost (1–)3–14 cm long, 1.2–2 mm wide. Inflorescence a simple to compound anthela, primary branches 3–12, 0.5–5 cm long; spikelets in digitate, sessile and at the end of primary and sometimes secondary branches, 5–14 per cluster, linear, 3–19.1 mm long, 0.7–1.3 mm wide, up to 2.5 mm wide with glumes spreading, rachilla straight; glumes pale reddish-brown to almost black, ovate, 1.2–2.3 mm long, 0.8–1.3 mm wide, keel 3-veined, apex obtuse to slightly mucronate; glumes falling off with nutlet. Stamens 3: filaments 2–2.1 mm long; anthers 1.2–1.9 mm long. Nutlet yellowish-brown when young, dark grey with metallic shine when mature, narrowly obovoid to ellipsoid, 0.7–1.1 mm long, 0.3–0.4 mm wide, minute tubercles in longitudinal rows.

UGANDA. Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1337! & NW of Lake Nabugabo, 9 Oct. 1953, *Drummond & Hemsley* 4680!

KENYA. Kitui District: 5 km from Tana River on Embu–Kangondo road, 8 May 1960, *Napper* 1652!; Kwale District: near Mtongwe, 27 May 1999, *Luke et al.* 5934!; Kilifi District: near road to Kakokeni, 5.5 km NW of Jilore Forest Station, 20 Nov. 1969, *Perdue & Kibwa* 10128!

TANZANIA. Bukoba District: Bukoba, Aug. 1931, *Haarer* 2085!; Tanga District: Sawa, 21 Jan. 1956, *Faulkner* 1812!; Chunya District: Rungwa Game Reserve, ± 1 km W of Itigi–Mbeya road, Jan. 1969, *Sayalet* 5324!

DISTR. U 4; K 4, 7; T 1, 3–8, Z; P; Sierra Leone, Liberia, Ivory Coast, Benin, Nigeria, Equatorial Guinea, Gabon, Congo-Kinshasha, Angola, Malawi, Zimbabwe, South Africa

HAB. Seasonally flooded grassland, swampy grassland, mangrove edge, woodland; sea-level to 1550 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus grantii* Boeck. in *Flora* 58: 260 (1875). Type: ‘Afr. orient. tropica, 3800’, *Grant* s.n. (K, holo.)

C. monroviensis Boeck. in *E.J.* 5: 90 (1884). Type: Liberia, Monrovia, Aug. 1874, *Naumann* s.n. (B, holo.)

C. boehmii Boeck. in *E.J.* 5: 498 (1884); C.B. Clarke in *F.T.A.* 8: 335 (1902). Type: Tanzania, Lake Tanganyika, Mpanda District: Ugalla R., Mar. 1882, *Boehm* s.n. (B, holo.)

C. amabilis Vahl var. *pseudocastaneus* Kük. in *R.E. Fries, Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.*: 2 (1921). Type: Zambia, Kali, *Fries* 637 (B, holo.?)

C. tenax Boeck. var. *monroviensis* (Boeck.) Kük. in *E.P.* 4, 20 (101): 259 (1936)

C. tenax Boeck. var. *pseudocastaneus* (Kük.) Kük. in *E.P.* 4, 20 (101): 260 (1936)

NOTE. This species has a very leafy culm base, and is easy to recognize with the narrow long spikelets. The colour of the glumes is highly variable. In the past two varieties have been described based on colour, and glumes in the darker specimens are more open and spreading, and occur more inland. Too many intermediate specimens exist and the varieties are not upheld here.

77. *Cyperus deciduus* Boeck. in *Flora* 62: 547 (1879); Haines & Lye, *Sedges & Rushes E. Afr.*: 166, fig. 312 (1983). Type: Angola, Kimbundo, *Pogge* 466 (B, holo.)

Perennial, rather slender, up to 56 cm tall, with a woody rhizome up to 10 cm long, roots brown or purplish; culms from horizontal rhizome, 21–52 cm long, 0.6–1 mm wide, trigonous, smooth. Leaves up to 23.5 cm long; leaf sheath grey to reddish brown, 2–5.5 cm long; leaf blade linear, 8–18 cm long, 1.6–2.1 mm wide, scabrid on margins and veins, apex acute. Involucral bracts bract-like, erect, 1–2, lowermost 1–2.5 cm long, 1.1–1.7 mm wide. Inflorescence a simple anthela, primary branches 2–4, 1–3.5 cm long; spikelets in digitate clusters, sessile and on primary branches, disarticulate, 2–8 per cluster, linear, 6.3–13.7 mm long, 1.2–1.6 mm wide, rachis straight; glumes greenish-brown, ovate, 1.4–1.6 mm long, 0.9–1.1 mm wide, keel flat and indistinct, apex obtuse. Stamens 3; filaments 1.2–1.4 mm long; anthers 0.6–0.8 mm

long. Nutlet white to brownish, ellipsoid, 0.6–0.7 mm long, \pm 0.4 mm wide, wrinkly to roughly papillose in longitudinal rows.

TANZANIA. Songea District: by Kimarampaka Stream 12 km W of Songea, 7 Jan. 1956, *Milne-Redhead & Taylor* 8147! & \pm 11 km W of Songea, 11 Feb. 1956, *Milne-Redhead & Taylor* 8668!

DISTR. T 8; Congo-Kinshasa, Angola, Zimbabwe, Botswana, Namibia, Swaziland, South Africa

HAB. In boggy grassland, usually on shallow soil; 960 m

CONSERVATION NOTES. Least Concern (LC) due to its common habitat and widespread distribution.

SYN. *Mariscus deciduus* (Boeck.) C.B. Clarke in Fl. Cap. 7: 191 (1897) & F.T.A. 8: 394 (1902)

78. *Cyperus matagoroensis* *Muasya & D.A. Simpson* in KB 59 (4): 593 (2004). Type: Tanzania, Songea District: Matagoro Hills, 3 Feb. 1956, *Milne-Redhead & Taylor* 8595 (K!, holo.; BM, BR, iso.)

Perennial up to 55 cm tall, with short rhizome; culms moderately to densely tufted, 30–50 cm long, 0.7–0.9 mm wide, trigonous, smooth, densely covered at base by fibrous, dark reddish-brown to blackish leaf sheath remains. Leaves up to 32 cm long; leaf sheath brownish, 1.5–2 cm long; leaf blade narrowly linear, v-shaped in cross-section, 17–30 cm long, 0.5–0.7 mm wide, scabrid on the margins, apex acute. Involucral bracts leaf-like, spreading, 3–4, lowermost 1.5–2.2 cm long. Inflorescence simple, primary branches 3–4, 0.5–3 cm long; spikelets in digitate clusters, at the end of primary branches, 2–4 per cluster, elliptic-lanceolate to lanceolate, 8–10 mm long, 2–3 mm wide, rachilla straight; glumes dark reddish-brown with pale brown margins, ovate, 2.3–2.7 mm long, 0.5–0.7 mm wide, sides membranous, 1-veined on each side, keel green, apex acute. Stamens 3; anthers 1.3–1.5 mm long. Nutlet dark reddish, ellipsoid, trigonous, 1.3–1.6 mm long, 0.6–0.8 mm wide, minutely papillose.

TANZANIA. Ufipa District: Rukwa Escarpment, Namwele, 28 Dec. 1962, *Robinson* 4784!; Ufipa District: hill above Msanzi Village, 13 Dec. 1958, *Richards* 10344!; Mbeya District: Chimala Escarpment, 3 Feb. 1963, *Richards* 18534!

DISTR. T 4, 7, 8; Zambia

HAB. Woodland, shallow soils overlying rocks; 1400–2100 m

CONSERVATION NOTES. Data Deficient (DD); although several specimens have been collected there is no information about the status of the habitats in which the plants occur.

79. *Cyperus haspan* *L.* in Sp. Pl.: 45 (1753); C.B. Clarke in F.T.A. 8: 332 (1902); Kük. in E.P. 4, 20 (101): 247 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 168, figs. 317, 318 (1983), as *halpan*; Lye in Fl. Somalia 4: 117 (1995) & Fl. Eth. 6: 438 (1997). Type: Sri Lanka [Ceylon], *Hermann* 2: 43, No. 37 (BM-000621657, lecto., chosen by McGivney in Biol. Ser. Catholic Univ. Amer. 26: 45 (1938))

Perennial 15–60(–90) cm tall, with short sometimes creeping rhizome; roots reddish; culms pale to bright green, crowded, 0.8–2.5 mm wide, trigonous or triangular, smooth, glabrous. Leaves with leaf sheath reddish-brown or purple, 1–11 cm long; leaf blade present at least at some shoots, pale to bright green, linear, slightly v-shaped, 5–22(–33) cm long, 1.5–4.5 mm wide, attenuate, glabrous. Involucral bracts leaf-like, spreading or semi-erect or erect, 1–3, lowermost up to 7(–12) cm long. Inflorescence a simple to compound anthela, primary branches 1–10, 1–7 cm long; spikelets in sessile digitate clusters, at the end of primary and secondary branches, 2–9 per cluster, narrowly ovoid to cylindrical, 7–15(–30)-flowered, 3–12 \times 1–3 mm, with straight rachis; glumes light to dark brown or reddish-brown to almost black, ovate, 1.3–2.8 \times 0.9–1.3 mm, keel pale green, slightly excurrent, margin sometimes pale green. Stamens 3; anthers sulphur-yellow, 0.7–1.2 mm long; filaments white, 1.5–1.9 mm long. Styles white. Nutlet greyish-brown, ellipsoid, obovoid or almost orbicular, 0.5–1 mm long, 0.3–0.8 mm wide, irregularly tuberculate when mature. Fig. 30, p. 206.



FIG. 30. *CYPERUS HASPAN* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence, $\times 1$; 3, primary inflorescence branch, $\times 2$; 4, spikelet, $\times 6$; 5, glume, $\times 20$; 6, flower, $\times 20$; 7, nutlet, $\times 40$. 1 from Bjørnstad 1476, 2–4 from Polhill & Paulo 1229, 6 from Polhill & Paulo 1581. Drawn by Juliet Williamson.

UGANDA. West Nile District: Koboko, June 1938, *Hazel* 600!; Bunyoro District: Kiwulumba, Oct. 1970, *Katende* 638!; Masaka District: Lake Nabugabo, Feb. 1970, *Lye & Haines* 5014!

KENYA. Embu District: vicinity of Castle Forest Station on the S slopes of Mt Kenya, 16 Jan. 1973, *Spjut & Ensor* 2997!; Kitui District: 4 km on Endau-Zombe road, Jan. 2005, *Kirika, Muthoka & Mbale* NMK 473!; Lamu District: Badar Pan 3 km inland from Kiunga, Apr. 1980, *Gilbert & Kuchar* 5894!

TANZANIA. Arusha District: Sakila, SE of Ngurdoto Crater, Mar. 1968, *Greenway & Kamuri* 13220!; Dodoma District: Bereko, Jan. 1974, *Richards & Arasululu* 28708!; Iringa District: Ruaha National Park, Magangwe Ranger Post, Mar. 1972, *Bjørnstad* 1476!; Zanzibar: Mkokotoni, June 1960, *Faulkner* 2616!

DISTR. U 1–4; K 3–7; T 1–8; Z: widespread in Africa, Asia and the Americas

HAB. Swampy or marshy sites, wet hollows, seasonally wet grassland, areas of impeded drainage, thin seepage soil over rock; occasionally in silty sites; 0–2700 (–?3000) m

CONSERVATION NOTES. Least concern due to its common habitat and wide distribution.

SYN. *Cyperus phaeorhizus* K. Schum. in P.O.A. C: 119 (1895); C.B. Clarke in F.T.A. 8: 331 (1902); Kük. in E.P. 4, 20 (101): 252 (1936). Type: Tanzania, Tanga District: Marungu, *Volkens* 2275 (B!, holo.; K!, iso.), **syn. nov.**

C. princeae C.B. Clarke in E.J. 38: 133 (1906). Type: Tanzania, Uhehe, Udzungwa Mts at 1600 m, *Mrs Prince* s.n. (B!, holo.)

C. phaeorhizus K. Schum. var. *princeae* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 253 (1936)

C. kipasensis sensu Haines & Lye, *Sedges & Rushes* E. Afr.: 170, figs. 323, 324 (1983), *non Cherm.*

NOTE. See Kartesz & Gandhi in *Phytologia* 72: 19 (1992) for a discussion on the spelling of *haspan* vs. *halpan*. They conclude it should be *haspan*, as does Wilson in *Telopea* 5: 598 (1994).

Schumann, in his protologue, says *C. phaeorhizus* “is related to *C. haspan* L. but easily distinguishable by the few-flowered black spikelets and the red-brown roots.” The “black” spikelets of the type are dark brown, and spikelet colour in *haspan* sensu stricto can be pale brown, red-brown or dark brown. The red-brown roots occur in specimens with any of these colours of spikelet. The “few-flowered” is specified in the protologue as 8–12 per spikelet; I have seen dark brown spikelets with a range of 8–15 flowers in a single plant, pale brown spikelets with a range of 6–13 flowers, all from the same area in Iringa District; from Tarangire in Mbulu District (not too far from Kilimanjaro) come spikelets with a range of 7–30 flowers. I do not believe *phaeorhizus* can be kept distinct from *haspan*, as it is just a colour form with rather few flowers per spikelet, with no qualitative differences, and I hereby unite the two.

Haines and Lye classified *C. phaeorhizus* as a synonym of *C. denudatus*, but did not explain why. Although the two are similar, there are significant differences between them: *denudatus* lacks proper leaf blades and has very narrow spikelets, whereas *C. phaeorhizus* does have distinctive leaf blades, and the spikelets are wider through glumes spreading during maturing of the nutlet.

Polhill & Paulo 1581 states ‘occasionally rooting from the inflorescence if arched over’.

Plants without the rhizome and a more short-lived look are referred to *C. foliaceus*, which might only be a form of *C. haspan*.

The material formerly named as *C. kipasensis* was said, by Haines & Lye, to be close to *denudatus* and *haspan*, but with stolons and a light brown inflorescence. But *haspan* can have stolons as well, at least just like the only East African cited specimen (*Kahurananga et al.* 2758!) - for instance *Polhill & Paulo* 1581, *Wingfield* 891, *Milne-Redhead & Taylor* 11073; and there is no difference inflorescence colour, either. I (HB) am putting this particular specimen in *C. haspan*.

80. ***Cyperus afromontanus*** *Lye* in *Nordic Journ. Bot.* 3: 225 (1983) & Haines & Lye, *Sedges & Rushes* E. Afr.: 158, fig. 291 (1983). Type: Uganda, Kigezi District: Luheya, *Purseglove* 3677 (KAW, holo.; K!, iso.)

Perennial up to 55 cm tall, densely tufted, with a creeping rhizome; culms many, crowded, 48–51 cm long, 1.3–1.6 mm wide, trigonous to triquetrous, slightly scabrid. Leaves up to 38 cm long; leaf sheath purple at least at the base, 3–6 cm long; leaf blade rather stiff, linear, flat, 18–32 cm long, 3.2–5.1 mm wide, scabrid on margins and several major veins, apex acute to acuminate. Involucral bracts leaf-like, spreading to erect, 3–5, lowermost 9–13 cm long, 2.7–3.5 mm wide. Inflorescence a

simple anthela, primary branches 3–6, 1–2.5 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 3–5 per cluster, linear-lanceolate, 5.2–13 mm long, 1.4–1.8 mm wide, rachis straight; glumes green to reddish brown, ovate-lanceolate, 1.7–2.4 mm long, 0.8–1 mm wide, keel green, slightly excurrent. Stamens 3; anthers 1.2–1.3 mm long. Nutlet reddish-brown, ellipsoid-obovoid, 1–1.3 mm long, 0.6–0.7 mm wide, almost smooth.

UGANDA. Kigezi District: Luheya, June 1951, *Purseglove* 3677!

DISTR. U 2; known from the type only

HAB. Edge of bamboo forest; ± 2400 m

CONSERVATION NOTES. Data needed on population size and threats to the vegetation

NOTE. Lye states (in Haines and Lye 1983) that besides the type locality, the other place this species is recorded from is in the Poroto Mountains in Tanzania. I have not seen any specimen from there.

81. ***Cyperus purpureoviridis*** Lye in *Nordic Journ. Bot.* 3: 224 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 158, fig. 292 (1983). Type: Tanzania, Morogoro District: Nguru Mountains, near Maskati Mission, Nkolawe Mt, *Thulin* & *Mhoro* 3039 (UPS, holo.; K!, iso.)

Perennial up to 67 cm tall, fairly robust, with a thick creeping rhizome; culms scattered, 33–66 cm long, 1.4–1.8 m wide, trigonous, smooth. Leaves up to 40 cm long; leaf sheath reddish-brown, rather wide and baggy, 2–5 cm long; leaf blade linear, flat, 15–36 cm long, 2.8–4 mm wide, scabrid, apex acuminate. Involucral bracts leaf-like, spreading to erect, 2–3, lowermost 4–14 cm long, 2.5–2.9 mm wide. Inflorescence simple, primary branches 2–5, 3–5 cm long; spikelets in digitate clusters, sessile and at the end of primary branches, 2–9 per cluster, ovoid-lanceolate, 6 mm long, 2.4–3.2 mm wide, rachis straight; glumes purplish-black, ovate, 2.1–2.2 mm long, 1–1.3 mm wide, keel pale brown (sometimes continuously purplish-black), apex excurrent. Stamens 3; filaments 1.7–1.9 mm long; anthers 0.9–1.1 mm long. Nutlet glossy reddish-brown, obovoid, 0.9–1.1 mm long, 0.6–0.8 mm wide, densely set with irregular shiny translucent papillae.

TANZANIA. Iringa District: Udzungwa Mountain National Park, Mt Luhomero Pt 132, 30 Oct. 2000, *Luke et al.* 6857! & above Camp 232, Sept. 2001, *Luke et al.* 8016! & Mufindi, Kibwele Estate, Brook Bond Tanzania, Luisenga Stream at Mufindi Rod and Gun Club fishing lodge, 30 Jan. 1989, *Gereau* & *Lovett* 3003!

DISTR. T ?2, 6, 7; not known elsewhere

HAB. Montane forests and steep rocky slopes, swampy lake edge; 1700–2050 m

CONSERVATION NOTES. Possibly near threatened (NT) because of restricted distribution coupled to loss of montane forests.

NOTE. Lye stated this was closest to *C. nyererei* but differs in culm base, shorter spikelets and glumes, and shorter and more rounded nutlets.

Schlieben 4734b from T 2, Kilimanjaro at 1700 m in bushland, 28.2.1934, is similar but the inflorescence is rather young.

82. ***Cyperus articulatus*** L. in *Sp. Pl.*: 44 (1753); C.B. Clarke in *F.T.A.* 8: 356 (1902); Kük. in *E.P.* 4, 20 (101): 77 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 183, fig. 353 (1983) & *Fl. Somalia* 4: 120 (1995) & *Fl. Eth.* 6: 446 (1997). Type: "Habitat in *Jamaicae rivulis*", lectotype Herb. Sloane 2: 63 (BM-SL), designated by Tucker in *Syst. Bot. Monogr.* 2: 42 (1983)

Perennial, robust, up to 195 cm tall, with solitary culms from the end of stolons, stolons to 10 cm or more long, 2–8 mm thick, often woody, clothed with blackish or purple scales; culms few, basally swollen, 80–185 cm long, 0.4–1 cm wide, rounded, pith-filled with transverse rings at 5–50 mm intervals (septate), smooth. Leaves reduced to sheaths only, 3–5 sheaths covering the lowerpart of the culm, straw-

coloured, purple to blackish, 3–28 cm long, ending in a triangular limb; leaf blade absent. Involucral bracts scale-like, 3–5, lowermost 0.7–1.2 cm long. Inflorescence a simple anthela, primary branches 5–8, 1–10 cm long, spikelets in loosely digitate clusters, sessile and at the end of primary branches, 9–20 per cluster, linear, terete to flattened, 7.5–33 mm long, 0.9–2 mm wide, rachilla straight to slightly curved; glumes pale brown to reddish-brown, ovate, 2.7–4(–5.1) mm long, 1.3–1.9 mm wide, keel pale brown, apex obtuse. Stamens 3; filaments 2.7–3.5 mm long; anthers 0.9–1.5 mm long. Nutlet reddish-brown to almost black, narrowly ellipsoid, 1.3–1.6 mm long, 0.4–0.6 mm wide, shortly apiculate, smooth to minutely papillose.

UGANDA. West Nile/Acholi District: edge of Albert Nile, 18 June 1957, *Buechner* 75!; Mengo District: Kasirye, Lake George, 25 Feb. 1966, *Haines* 4067!; Masaka District: Bukoto County, Bukakata, 21 Mar. 1971, *Lye* 5922!

KENYA. Northern Frontier District: Samburu, Mathews, Ngeng, 14 Dec. 1958, *Newbould* 3190!; Masai District: Uaso Nyiro River, 19 June 1944, *Bally* 3176!; Tana River District: Kora Base, 31 July 1976, *Kibuwa* 2435!

TANZANIA. Masai/Pare District: Nyumba ya Mungu, 15 Nov. 1976, *Batty* 1136!; Kilosa District: at Ruaha River 2 km S of junction with Yovi River, 15 July 1970, *Thulin & Mhoro* 428!; Lindi District: Lake Lutamba, 25 Nov. 1934, *Schlieben* 5048!

DISTR. U 1–4; K 1–7; T 1–8; Z; P; widespread throughout Africa

HAB. In swamps, lake-shores, wet grasslands and pools, often in standing water; sea-level up to 1550 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *C. articulatus* L. var. *erythrostachys* Graebner in F.R. 16: 25 (1919); Kük. in E.P. 4, 20 (101): 80 (1936). Type: Tanzania, Ufipa District: Lake Kwera, *Fromm & Münzner* 140 (B, holo.)

NOTE. This species is very easy to recognize by its septate stem and the absence of leaf blades.

83. ***Cyperus papyrus*** L. in Sp. Pl. 1: 47 (1753); C.B. Clarke in F.T.A. 8: 374 (1902); Kük. in E.P. 4, 20 (101): 45 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 177, figs. 336, 337 (1983) & Fl. Eth. 6: 441. fig. 212.73 (1997). Type: “Habitat in Calabria, Sicilia, Syria, Aegyptus.” Lectotype: Herb. Linn. No. 15: *Papyrus* (UPS), designated by Simpson in Caffery & Jarvis (ed.), *Taxon* 53: 179 (2004)

Perennial, very robust, up to 5.5 m high, with a creeping rhizome, 2–5 cm in diameter, with a white central part of air-tissue and a lighter brown harder outside cylinder; the outside of the rhizome densely covered by blackish scales 5–10 × 5–10 mm wide, rhizome with many roots; culms 200–500 cm long, basally 1–2.6 cm wide, apically 0.4–1 cm wide, trigonous, sometimes almost rounded, glabrous. Leaf sheath brown to black, thick and leathery to sometimes almost woody, 4–26 cm long, glabrous; leaf blades absent. Involucral bracts pale-brown, 3–10, leaf-like, spreading, lowermost 6–18 cm long, 0.8–1.7 cm wide, glabrous. Inflorescence simple, primary branches up to 350, 7–40 cm long, triquetrous to rounded, at the base of the branches with reddish brown tubular prophylls 2.5–6 cm long; spikelets on an elongated axis at the end of primary or secondary branches, up to 40 per axis, lanceolate to cylindrical, 2.7–10 mm long, 0.4–1.3 mm wide, axis straight; glumes pale brown to golden, ovate to obovate, 1.3–2.3 mm long, 0.8–1.2 mm wide, keel flattened, sometimes green, apex obtuse. Stamens 3; filaments 1.6–2.2 mm long; anthers 0.6–1.4 mm long. Style with 3 branches. Nutlet grey, ellipsoid to ovoid, trigonous, 0.9–1.4 mm long, 0.4–0.5 mm wide, ± smooth. Fig. 31, p. 210.

UGANDA. Kigezi District: Kachwekano Farm, Mar. 1950, *Purseglove* 3338!; Teso District: Lake Kyoga, Lale, 13 Oct. 1952, *Verdcourt* 832!; Mengo District: Kampala, 23 Dec. 1966, *Haines* 4229!

KENYA. Naivasha District: shores of Lake Naivasha, 23 Mar. 1947, *Bogdan* 431! & N end of Lake Naivasha on the Eburru Rd, 12 Jan. 1969, *Greenway & Napper* 13548!; Kiambu District: Thika, at Gatharaini River by Thika Rd, 9.5 km SW of Ruiru, 8 Dec. 1966, *Perdue & Kibuwa* 8200!

TANZANIA. Lushoto District: East Usambaras, Monga–Uberi, 4 Jan. 1934, *Greenway* 3688!; Mpanda District: Mahali Mts, Kasoje, 25 Sept. 1958, *Newbould & Jefford* 2635!; Iringa District: Little Ruaha River, E of Sao, 31 Mar. 1933, *Greenway* 3432!

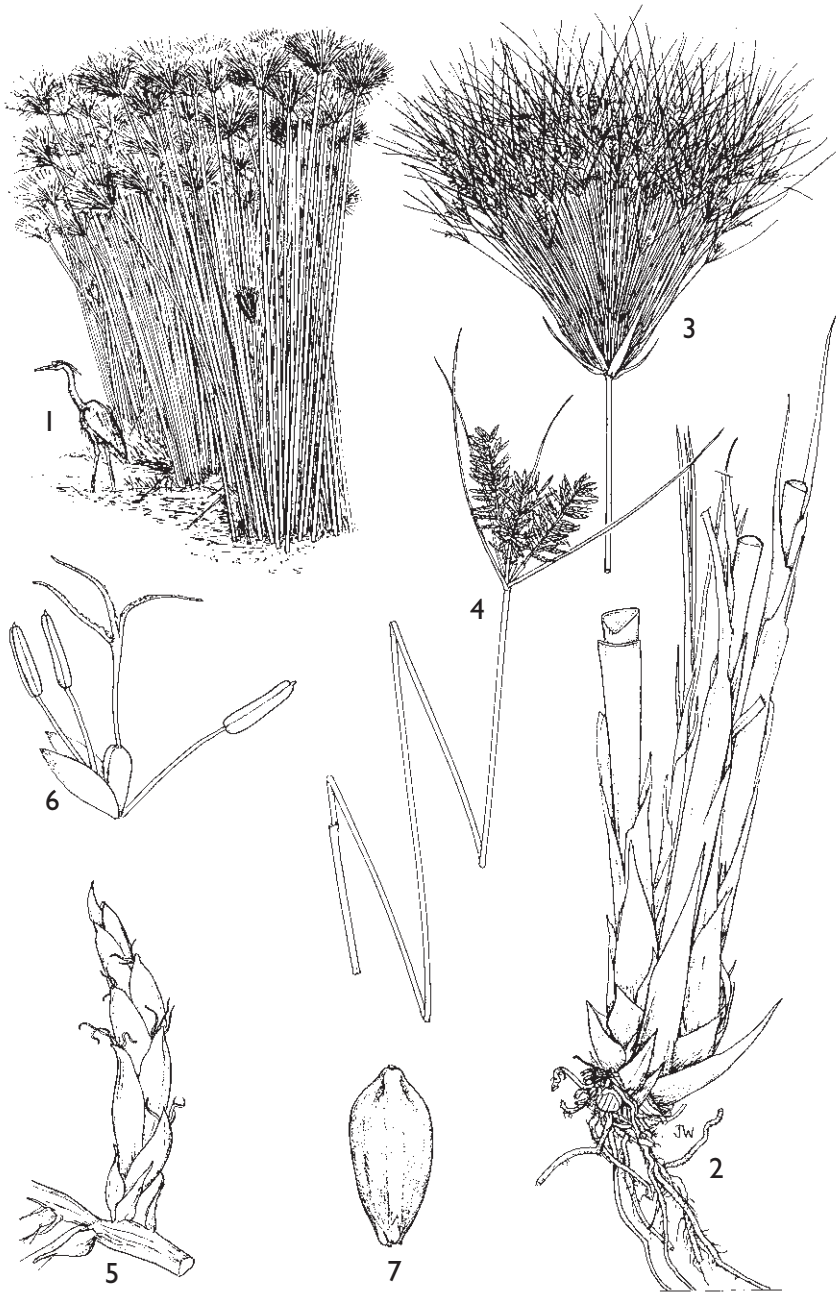


FIG. 31. *CYPERUS PYPYRUS* — 1, habit, $\times \frac{1}{50}$; 2, culm base and rhizome, $\times \frac{1}{3}$; 3, inflorescence, $\times \frac{1}{6}$; 4, primary inflorescence branch with prophyll, $\times \frac{2}{3}$; 5, spikelet, $\times 8$; 6, flower, $\times 10$; 7, nutlet, $\times 24$. 1 from photo on Meyer 8650, 2 from Napier Bax 22, 3 & 5 from Gereau *et al.* 6311, 4 & 6 from Vesey-FitzGerald 6765, 7 from Farrell 153. Drawn by Juliet Williamson.

DISTR. U 2–4; K 3, 4; T 1–7; Z; widespread in Africa; Mediterranean

HAB. Swamps and lake edges and -shores, sometimes forming dense and impenetrable floating mats in deeper water; 300–2000 m

CONSERVATION NOTES. Least Concern (LC) due to its widespread distribution and abundance

SYN. *Papyrus antiquorum* Willd. in Abhandl. Akad. Berlin 1812: 70 (1812). Type unclear (publication not found)

Cyperus papyrus L. var. *antiquorum* (Willd.) C.B. Clarke in F.T.A. 8: 374 (1902)

C. papyrus L. subsp. *ugandensis* Chiov. in Mem. Reale Ist. Bot. Modena 1: 73 (1931); Kük. in E.P. 4, 20 (101): 47 (1936). Type: Uganda, Ruwenzori Exped., *Scott Elliot* s.n. (ubi?)

84. ***Cyperus pseudopilosus*** (C.B. Clarke) Govaerts in Govaerts & Simpson, World Checklist Cyperaceae: 352 (2007). Type: Congo-Kinshasa, Bingila, *Devred* s.n. (BR, holo.)

Perennial up to 160 cm tall, robust, with a thick creeping rhizome, covered with scales; culms few, 97–152 cm long, 5.5–8 mm wide, triquetrous, glabrous. Leaves up to 42 cm long; leaf sheath reddish-brown, rather wide, 6–42 cm long; leaf blade not developed. Involucral bracts leaf-like, erect to spreading, 5–10, lowermost 28–45 cm long, 11–15 mm wide. Inflorescence a compound anthela, primary branches 5–8, 3.2–5.5 cm long; spikelets spaced out in an elongated spike, sessile and at the end of primary branches, 5–40 per cluster, linear-lanceolate, 3.3–5.7 mm long, 1.3–1.6 mm wide, falling off when mature, rachis slightly winged; glumes pale reddish-brown or yellowish, ovate-elliptic, 1.6–2 mm long, 0.8–1 mm wide, keel with 2–3 prominent veins on either side, apex acute to rounded. Stamens 3; filaments 2–2.5 mm long; anthers 0.5–1.2 mm long. Nutlet greyish-black, oblong to narrowly obovoid, trigonous, 1–1.4 mm long, 0.5–0.7 mm wide, minutely papillose in longitudinal rows.

UGANDA. Bunyoro District: Budongo Forest, 16 May 1969, *Haines* 4304!; Mengo District: Entebbe, Jan. 1929, *Liebenberg* 728!

DISTR. U 2, 4; Guinea, Liberia, Ivory Coast, Cameroon, Equatorial Guinea, Gabon, Congo Brazzaville, Congo-Kinshasa, Angola

HAB. Shallow pool in shady forest margin; ± 1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Mariscus trinervis* C.B. Clarke in F.T.A. 8: 399 (1902); *nom. inval.* based on Congo-Kinshasa, Mukenge, *Pogge* s.n. (BR)

M. pseudopilosus C.B. Clarke in B.S.B.B. 36: 89 (1897) & F.T.A. 8: 402 (1902)

Cyperus socialis C.B. Clarke in F.T.A. 8: 351 (1902); *Haines & Lye*, Sedges & Rushes E. Afr.: 181, fig. 349 (1983). Type: Angola, Cazengo, Lake Moembege, *Welwitsch* 7068 (BM, holo.)

Mariscus socialis (C.B. Clarke) S.S. Hooper in K.B. 26: 578 (1972)

85. ***Cyperus rotundus*** L. in Sp. Pl.: 45 (1753); C.B. Clarke in F.T.A. 8: 364 (1902); Kük. in E.P. 4, 20 (101): 107 (1936); U.O.P.Z.: 224 (1949); *Haines & Lye*, Sedges & Rushes E. Afr.: 186, figs. 362, 363 (1983) & Fl. Somalia 4: 121 (1995) & Fl. Eth. 6: 449 (1997). Type: India, Herb. Hermann 1, 3: 36 (BM, lecto., chosen by Tucker in Syst. Bot. Monogr. 43: 100 (1994))

Perennial or sometimes seemingly annual, 10–100 cm tall, gregarious, but not clump-forming, with a somewhat swollen culm-base arising from rather thick scale-covered stolons; nodules on roots white turning brown; culms few, green, 1–3 mm wide, triangular, glabrous. Leaves glossy green; leaf sheath green to reddish-brown; leaf blade linear, 10–40 × 0.2–0.8 cm wide, slightly M-shaped in cross-section, scabrid on margin and major veins, attenuate. Involucral bracts leaf-like, 1–5, erect or spreading, lowermost 3–26 cm long, 2–9 mm wide. Inflorescence a simple to compound anthela, primary branches 1–8, 0.5–12 cm long; spikelets in rather dense clusters, 3–15 per cluster, bright to golden to dark brown, linear-lanceolate and slightly flattened, 6–70 mm long, 1–2.5 mm wide, rachilla straight, remaining



FIG. 32. *CYPERUS ROTUNDUS*— 1, habit, $\times \frac{2}{3}$; 2, inflorescence, $\times \frac{1}{2}$; 3, spikelet, $\times 4$; 4, glume, $\times 10$; 5, flower, $\times 8$; 6, nutlet, $\times 16$. 1–2 from *Faulkner* 807, 3–5 from *Geiling* 3994, 6 from *Faulkner* 2672. Drawn by Juliet Williamson.

attached to rachis while lower glumes and nutlets are shed; glumes pale to dark reddish brown, ovate, 2.7–4.3 mm long, keel green, glabrous or slightly scabrid, with 1–2 veins on either side, apex obtuse. Stamens 3, yellow, 1.6–2.2 mm long. Style white, 3-branched. Nutlet greyish to brown, obovoid, trigonous, 1.3–1.7 mm long, 0.5–1 mm wide, minutely papillose. Fig. 32, p. 212.

UGANDA. Karamoja District: Moroto, May 1940, *A.S. Thomas* 3415! & Nakiloro, June 1970, *Lye & Katende* 5695!; Busoga District: Lwamba village forest, May 1953, *G.H.S. Wood* 740!

KENYA. South Nyeri District: Riakanau, Kithunguthya, Jan. 2002, *Muasya, Muthoka & Kirika* NMK 290!; Masai District: Chyulu Hills, Ol Donyo Wuas lodge, May 1997, *Luke & Luke* 4627!; Tana River District: Kurawa, Oct. 1961, *Polhill & Paulo* 665!

TANZANIA. Arusha District: Ngaramtoni, July 1999, *Kindeketa* 26!; Mpwapwa District: Great Ruaha at Mtera, June 1974, *Mhoro & Backéus* 1912!; Uzaramo District: Dar es Salaam town S of Msimbazi Bay, Feb. 1971, *Wingfield* 1122!; Zanzibar: Chukwani, Aug. 1959, *Faulkner* 2327!

DISTR. U 1–4; K 1–7; T 1–8; Z; widespread in Africa; India

HAB. Swamps, damp sites, riverbanks, drainage lines in coastal bush or forest glades, common weed in rice and maize fields, seasonally wet grassland; 0–1950 m

CONSERVATION NOTES. Least Concern

USES. Root nodules roasted and eaten (*Harwood* 60), or used as beads by Turkana (*Mwangangi* 1446); roots chewed raw for coughs and colds (*Meyerhoff* 74)

SYN. *Cyperus tuberosus* Rottb., Descr. Icon. Rar. Pl.: 28 (1773). Type: India, Malabar, *König* s.n. (C? holo.)

C. retzii Nees in Wight, Contrib. Bot. India: 82 (1834). Type: 'Peninsula India orientalis', *Wight* s.n. (K, holo.)

C. rotundus L. var. *spadiceus* Boeck. in *Linnaea* 36: 284 (1869). Type: Ethiopia, *Schimper* 370 (B, holo. - not found)

C. rotundus L. var. *platystachys* C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 575 (1894), *nom. nud.* & F.T.A. 8: 365, p.p. (1902); Kük. in E.P. 4, 20 (101): 114 (1936). Type: many specimens mentioned in Consp. Fl. Afr., but none in F.T.A.

C. nubicus C.B. Clarke in F.T.A. 8: 360 (1901). Types: Sudan, sea coast, *Bent* s.n.; Mt Erau, *Cholmley* s.n.; Somalia, Berbera plain at Dober Waina, *Cole* s.n. (all K, syn.)

C. taylorii C.B. Clarke in F.T.A. 8: 367 (1901). Type: Kenya, Kilifi District: Rabai Hills, near Mombasa, *Taylor* s.n. (BM, holo.)

C. merkeri C.B. Clarke in E.J. 38: 134 (1906). Type: Tanzania, Mbulu District: Mbugwe [Umbugwe] and Iraku, *Merker* 114 (B!, holo.)

C. platystachys Cherm. in Ann. Mus. Colon. Marseille 30, 3rd ser. 10: 48, pro maxima parte (1922)

C. rotundus L. subsp. *merkeri* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 115 (1935); Haines & Lye, Sedges & Rushes E. Afr.: 187, fig. 364 (1983)

C. rotundus L. subsp. *retzii* (Nees) Kük. in E.P. 4, 20 (101): 114 (1936)

C. rotundus L. subsp. *tuberosus* (Rottb.) Kük. in E.P. 4, 20 (101): 113 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 188, fig. 365 (1983)

C. rotundus L. var. *taylorii* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 114 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 188 (1983)

NOTE. Haines & Lye kept up four subspecies and varieties, based on Kükenthal taxa; Kükenthal had combined these taxa into *C. rotundus*. Differences between the taxa were only expressed in short sentences (rather than a key) and these have given me problems. Colour and degree of compression of the spikelet, plus glume length and glume apex configuration, were the characters used to distinguish these four taxa.

Regarding the *merkeri* taxon, C.B. Clarke, when describing his new species *C. merkeri* only compared it to an unknown taxon, *C. neuerensis*; he gave the length of the culm as 30 cm. Kükenthal in E.P. 4, 20 (101) combined what was a full species (*merkeri*) into a subspecies of *rotundus*. He did not give a key, but from his brief descriptions we can see he thought this subspecies differed from the typical one in longer culms (45–60 cm rather than 15–30 cm), and darker-coloured spikelets (dark dull red, rather than brown or dull red). Haines & Lye distinguished these two subspecies (again, without giving a key) by 'its shorter glumes with a usually much darker colour': glumes 2.7–3.2, rather than 3.3–4.3 mm; description of glume colour in the text overlaps for the two subspecies.

A taxon described from coastal Kenya, var. *taylorii*, was said to differ in the tall culms (30–50 cm, quite within the range of typical *rotundus*); the large congested head, 3–6 cm wide of many crowded up to 3 cm long spikelets (again, well within normal range) and obtuse glumes 4–5 mm long (rather on the long side, but not excessively so). It was known only from the type.

Finally the taxon *tuberosus* was distinguished from *rotundus* by the original author, Rottbøll, based on a leafy (not almost leafless) culm base, a sub-simple anthela, and terete spikelets. Haines & Lye suggested that this subspecies “is very closely related to subsp. *rotundus*” but kept the taxa separate based on slightly longer and more acute glumes, and less terete spikelets, in *tuberosus*.

After looking at all the East African material available, a few hundred specimens, I believe that for East Africa we are dealing with a single taxon, *rotundus*, with a few colour forms (and this was the basis on which specimens were mostly sorted, I think), and some variability in spikelet length and cross-section (the latter character used for distinguishing *tuberosus*) as well as in glume length. I am quite unable to write any key to the various forms that works on the bulk of the material; of course, the extremes are distinct, but there are more intermediate specimens than there are extreme ones. There are no constant qualitative characters separating the taxa, and hardly any convincing quantitative ones, either; geographically and habitat-wise there are no differences. Therefore I am reducing these names into synonyms of *rotundus*.

87. *Cyperus iria* L. in Sp. Pl.: 45 (1753); C.B. Clarke in F.T.A. 8: 346 (1902); Kük. in E.P. 4, 20 (101): 150 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 198, figs. 391, 392 (1983) & Fl. Somalia 4: 124 (1995) & Fl. Eth. 6: 453 (1997). Type: India, *Osbeck* 70.16 (LINN 7016, chosen by Tucker in Syst. Bot. Monogr. 43: 91 (1994))

Annual, up to 45 cm tall; culms tufted, 21–36 cm long, 1.4–2.2 mm wide, trigonous, glabrous. Leaves up to 37 cm long; leaf sheath green to reddish brown, 3.5–8 cm long; leaf blade linear, flat to folded, 17–29 cm long, 3.2–5 mm wide, scabrid on margins and veins, apex acuminate. Involucral bracts leaf-like, spreading, 2–4, lowermost 14–30 cm long, 2.1–4.3 mm wide. Inflorescence simple, primary branches 3–8, 1–11 cm long; spikelets in irregularly shaped clusters, sessile and at the end of primary branches, few to many per cluster, 4–14.3 mm long, 1.6–3.3 mm wide, the rachis straight to zigzag; glumes golden brown with an uncoloured margin, obovate to rounded, 1.4–1.9 mm long, 1.4–1.7 mm wide, keel greenish, with a slightly excurrent midrib, apex rounded. Stamens 2–3; filaments \pm 1.3 mm long. Nutlet dark brown to almost black, ellipsoid-obovoid, trigonous, 1.3–1.6 mm long, 0.6–0.8 mm wide, with a very short apiculus, minutely papillose in longitudinal rows to almost smooth.

UGANDA. Karamoja District: Moroto, Lokapel, 3 June 1967, *Haines* 4206! & Bokora county, 4 km N of Lotome, 10 June 1970, *Lye & Katende* 5595!; Busoga District: Bugabula County, Galinyanja swamp, 3 km S of Kinondo on road to Buyende, 8 July 1953, *Wood* 960!

KENYA. West Suk District: 24 km NNW of Kapenguria, 20 July 1961, *Bogdan* 5169!; Baringo District: 6.8 km from main road to Lake Bogoria Reserve, 1 Nov. 2000, *Smith, Beentje & Muasya* 102!

TANZANIA. Dodoma District: 26 km on Dodoma to Morogoro road, 12 Apr. 1988, *Bidgood et al.* 1026!; Kilosa District: Mikumi National Park, near Hippo Pool, Mkata Plain, 1 May 1968, *Renvoize & Abdallah* 1838!; Iringa District: Msembe-Kimiramatonge Circuit, km 2 from Msembe, 23 Feb. 1970, *Greenway & Kanuri* 13939!

DISTR. U 1, 3; K 2, 3; T 4–7; widespread throughout Africa and Asia, Australia

HAB. Swamp grassland, edge of seasonal pools, streambanks in dry zones, rice fields; 750–1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Chlorocyperus iria* (L.) Rikli in Pringsh. Jahrb. 27: 564 (1895)

88. *Cyperus longinvolucratus* Lye in Nordic Journ. Bot. 3: 220 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 208, fig. 417 (1983). Type: Tanzania, Iringa District: N part of Gologolo Mts, *Thulin & Mhoro* 965 (UPS, holo.; K!, iso.)

Perennial, slender, tussocky, up to 53 cm tall; culms tufted, 12–50 cm long, 0.5–2 mm wide, trigonous, glabrous, the basal culms narrow cylindrical. Leaves up to 36 cm long; leaf sheath pale brown to transparent, 3–12 cm long; leaf blade linear, folded to canaliculate, 8–30 cm long, 1–2 mm wide, scabrid at least along the margin, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–4, lowermost 8.5–40 cm long, 1.8–2 mm wide. Inflorescence a simple anthela, primary branches 1–3, 0.5–2.5 cm long; spikelets in rounded clusters, sessile and at the end of primary branches, 10–30 per cluster, lanceolate, 2.5–3.7 mm long, 0.7–1 mm wide, falling off entirely when mature; glumes pale to reddish-brown, ovate-lanceolate, 1.8–3.1 mm long, 1.4–1.5 mm wide, keel with 5 veins on either side, rounded. Stamens 2–3; filaments \pm 3.3 mm long. Nutlet reddish-brown, ellipsoid, trigonous, 1–1.9 mm long, 0.5–0.8 mm wide, very minutely papillose.

TANZANIA. Morogoro District: S Uluguru Mts, on Lukwangule Plateau, 71 Jan. 1976, *Cribb & Grey-Wilson* 10471!; Iringa District: N part of Gologolo Mts, 13 Sept. 1970, *Thulin & Mhoro* 965! DISTR. T 6, 7; not known elsewhere

HAB. On granite slab and in rock crevices; 1700–2300 m

CONSERVATION NOTES. Small distribution area, but in a safe habitat; least concern (LC)

NOTE. Lye also cites *Procter* 3849 from K as this species; it is from T 3, 1050 m. I have not seen the specimen.

89. *Cyperus squarrosus* L. in Cent. Pl. II: 6 (1756); Kük. in E.P. 4, 20 (101): 505 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 253, figs. 501, 502 (1983); Lye in *Flora of Somalia* 4: 125 (1995) & *Fl. Eth.* 6: 461, fig. 212.109 (1997). Type: India, LINN, lecto.

Annual, fairly slender, up to 40 cm tall, not swollen at base, with a minute root system; culms solitary or crowded and tufted, 1–33 cm long, 0.4–3 mm wide, trigonous, almost glabrous. Leaves up to 19 cm long; leaf sheath green to purple, rather wide, 0.6–4.7 cm long; leaf blade linear, flat, 2–13.5 cm long, 1–4 mm wide, slightly scabrid to glabrous, apex acuminate. Involucral bracts leaf-like, erect to spreading, 2–5, lowermost 1.6–14 cm long, 1–5 mm wide. Inflorescence a simple anthela, primary branches 1–7, 0.5–7 cm long; spikelets in dense spikes, sessile and at the end of primary branches, 6–41 per spike, crowded, linear, 2–7 mm long, 1.5–3 mm wide, flattened, squarrose with recurved glume-apices, 5–15-flowered; glumes yellowish to reddish-brown, elliptic, 1.4–2.7 mm long (including 0.3–1.1 mm long mucro), 0.3–0.4 mm wide, keel green, strongly excurrent with 3–4 veins on either side, apex strongly mucronate, recurved. Stamens 1; anthers 0.2–0.3 mm long. Nutlet dark grey, narrowly oblong to obovoid, trigonous, 0.5–0.8 mm long, 0.2–0.4 mm wide, minutely papillose, disarticulating at its base but held by persistent glume so that it falls with the spikelet. Fig. 33, p. 216.

UGANDA. Karamoja District: Bokora County, 4 km N of Lotome, 10 June 1970, *Lye & Katende* 5593!; Teso District: Serere, 26 Oct. 1955, *Langdale-Brown* 1611!; Busoga District: Bugabula County, Namaiera Hill, 9 Sept. 1953, *Wood* 802!

KENYA. West Suk District: 19 km N of Kacheliba, 7 Oct. 1964, *Leippert* 5041!; Nairobi District: Nairobi to Thika, Sukari Dam, 12 May 1951, *Bogdan* 2992!; Kwale District: Kaya Puma, 18 Jul. 2000, *Luke et al.* 6325!

TANZANIA. Iringa District: Msembe–Mbagi Track, 26 Feb. 1970, *Greenway & Kanuri* 13970!; Mbulu District: Tarangire National Park, 13 Feb. 1970, *Vesey-FitzGerald* 3300; Mwanza District: Ukiriguru, 26 Feb. 1968, *Kihongo* 3690

DISTR. U 1–3; K 1–7; T 1–8; widespread in Africa, India, Australia, the Americas

HAB. Grassland, roadside, shallow sandy washes; 200–2000 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus aristatus* Rottb., *Descr. Icon. Rar. Pl.*: 22 (1773); C.B. Clarke in *F.T.A.* 8: 348 (1902); Kük. in E.P. 4, 20 (101): 502 (1936), *nom. superfl.*

Mariscus squarrosus (L.) C.B. Clarke in *Fl. Brit. India* 6: 623 (1893) & *F.T.A.* 8: 400 (1902)



FIG. 33. *CYPERUS SQUARROSUS* — 1, habit, $\times \frac{2}{3}$; 2, habit of small plant, $\times 1$; 3, spike, $\times 5$; 4, spikelet, $\times 8$; 5, glume, $\times 32$; 6, flower, $\times 32$; 7, nutlet, $\times 40$. 1 from Bogdan 2992, 2 from Gillett 13039, 3 & 5–6 from Leippert 5041, 4 & 7 from Muasya, Muthoka & Kirika NMK 305. Drawn by Juliet Williamson.

90. **Cyperus reduncus** Boeck. in *Linnaea* 35: 580 (1868); C.B. Clarke in *F.T.A.* 8: 329 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 160, fig. 297 (1983) & *Fl. Eth.* 6: 437 (1997). Type: Ethiopia, Gopdia, *Schimper* s.n. (B, holo.)

Annual, up to 35 cm tall; culms tufted, 3.5–25 cm long, 0.8–2.2 mm wide, trigonous, glabrous to scabrid. Leaves up to 36 cm long; leaf sheath green to pale brown, 1.5–6 cm long; leaf blade linear, flat with few longitudinal ribs, 7–30 cm long, 2 mm wide, scabrid on ribs and margins, apex acuminate. Involucral bracts leaf-like, erect or spreading, overtopping the inflorescence, 4–7, lowermost 7–25 cm long, 2–3.8 mm wide. Inflorescence simple to compound, primary branches 4–8, 2–8.5 cm long; spikelets in laxly sub-digitate clusters, sessile and at the end of primary and secondary branches, 3–10 per cluster, 4.8–12.4 mm long, 3.2–4.9 mm wide, with spreading glumes; glumes greenish-yellow to reddish-brown, the margins uncoloured, linear-elliptic, 1.9–2.5 mm long, 0.4–0.8 mm wide, keel green, 3-veined, apex strongly mucronate, recurved. Stamens 3; filaments 1.6–2.2 mm long. Nutlet brownish-red, linear-oblong, 1.6–2.2 mm long, 0.3–0.5 mm wide, minutely papillose in longitudinal rows.

UGANDA. Mbale District: Tororo, near Kenyan border, 5 Aug. 1967, *Haines* 4251!; Teso District: Omnyual swamp, Soroti, 14 Sept. 1954, *Lind* 365!; Mengo District: 5 km N of Kakoge, 17 Dec. 1955, *Langdale-Brown* 1752!

TANZANIA. Tabora District: Kapapa, 17 Sept. 1970, *Richards* 25949! & Kaliua, near station, 16 June 1980, *Hooper & Townsend* 2000!

DISTR. U 3, 4; T 4; widespread in tropical west and central Africa, Ethiopia and Sudan

HAB. In wet areas, seasonally flooded grasslands, swamps, pools; 1050–1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Cyperus aristatus* C.B. Clarke in *J.L.S., Bot.* 21: 90 (1884), *nom. illegit., non* Rottb.

91. **Cyperus soyauxii** Boeck. in *E.J.* 5: 501 (1884)

Perennial up to 135 cm tall, tussocky, with a minute root system; culms tufted, 10–130 cm long, 2–5 mm wide at the base, \pm 1 mm wide below the inflorescence, trigonous, glabrous. Leaves up to 39 cm long; leaf sheath whitish or pale purplish, very thin, 3.5–9 cm long; leaf blade linear, flat, 3–30 cm long, 1.5–3.5 mm wide, scabrid on at least margin near the apex, apex acuminate. Involucral bracts leaf-like, erect to spreading, 6–7, lowermost 5–20 cm long, 1–2.2 mm wide. Inflorescence a simple anthela, primary branches 1–5, 0.5–1.5 cm long; spikelets in crowded spikes, \pm 12 mm long, 7 mm wide, sessile and at the end of primary branches, 10–30 per spike, ovoid, 4–6.3 mm long, 1.5–2.2 mm wide, hardly compressed, falling off entirely when matured; glumes greyish, ovate, 2–2.8 mm long, 1.6–1.8 mm wide, keel excurrent, with 3–6 prominent veins on each side, apex a shortly recurved mucro. Stamens 3; filaments \pm 2.7 mm long; anthers 0.8–1 mm long. Nutlet reddish-brown, obovoid, triquetrous, 1.3–1.6 mm long, 1–1.3 mm wide, minute papillate, the nutlet often strongly enwrapped in its glume.

SYN. *Mariscus soyauxii* (Boeck.) C.B. Clarke in *Durand & Schinz, Consp. Fl. Afric.* 5: 593 (1894) & *F.T.A.* 8: 393 (1902)

subsp. **pallescens** Lye in *Nordic Journ. Bot.* 3: 227 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 207, figs. 415, 416 (1983). Type: Kenya, Northern Frontier District: Garissa–Modo Gash, 26 km from Garissa, *Stannard & Gilbert* 1061 (EA!, holo.; K!, iso.)

KENYA. Northern Frontier District: Garissa–Modo Gash, 26 km from Garissa, 14 Dec. 1977, *Stannard & Gilbert* 1061!

DISTR. K 1; known only from the type

HAB. In medium dense *Commiphora* bushland; \pm 300 m

CONSERVATION NOTES. Needs data on population size and status of habitat.

NOTE. Haines & Lye say this also occurs in Turkana District, but do not cite any specimens other than the type.

92. **Cyperus kituiensis** *Muasya* in K.B. 59: 247 (2004) Type: Kenya, Kitui District: 1 km from Kaunange Primary School towards Endau, *Kirika et al.* NMK326 (EA, holo.; K!, iso.)

Annual or short-lived perennial up to 120 cm tall; culms few, 48–118 cm long, 2–6 mm wide, trigonous, smooth. Leaves up to 56 cm long; leaf sheath pale to mid-brown, 5–26 cm long; leaf blade linear, flat, 23–36 cm long, 5–8 mm wide, scabrid on margins, apex acuminate. Involucral bracts leaf-like, spreading, 3–4, lowermost 24–39 cm long, 5.4–8 mm wide. Inflorescence a compound anthela, lax, 5–7, 5–15.5 cm long; spikelets in loose clusters, at the end of primary and secondary branches, 5–25 per cluster, linear, flattened, 10–32 mm long, 2–2.9(–4.7) mm wide, spreading during maturation, rachis straight to curved when mature; glumes straw-coloured to golden/red-brown, 3.3–5.9 mm long, 1.6–2.2 mm wide, keel green, apex acute. Stamens 3; filaments 3.1–4 mm long; anthers 1.5–1.7 mm long. Nutlet golden-brown, obovoid, trigonous, 1.1–1.4 mm long, 0.8–1.1 mm wide, apiculate, minutely papillose with prominent ridges.

KENYA. Kitui District: Enzui, 18 km from Mwingi towards Garissa, 19 Jan. 2005, *Kirika et al.* NMK448 & 4 km from Endau Market towards Zombe, 25 Jan. 2005, *Kirika et al.* NMK471!

DISTR. **K** 4; not known elsewhere

HAB. Seasonally moist grassland or roadside ditch; 400–700 m

CONSERVATION NOTES. Vulnerable (D2); this species occurs in a small area, and occurs on private land and in road ditches; this makes it vulnerable to change.

NOTE. Easily recognized due to its nutlet.

93. **Cyperus sphacelatus** *Rottb.* in *Descr. Icon. Rar. Pl.*: 26 (1773); C.B. Clarke in *F.T.A.* 8: 346 (1902); Kük. in *E.P.* 4, 20 (101): 129 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 195, figs. 383, 384 (1983). Type: Surinam, *Rolander* s.n. (C., holo)

Annual up to 61 cm tall, slender to medium-sized, with a slightly swollen stem base and many slender roots; culms 27–50 cm long, 1.1–1.8 mm wide, trigonous, smooth. Leaves up to 29 cm long; leaf sheath green to reddish brown, 2.5–5 cm long; leaf blade linear, flat or w-shaped, 10–24 cm long, 1.6–3.1 mm wide, scabrid on margins and major veins, apex acute to acuminate. Involucral bracts leaf-like, spreading, 3–4, lowermost 7–20 cm long, 2.5–3.3 mm wide. Inflorescence simple, primary branches 3–5, 2.5–12.5 cm long; spikelets in loose clusters on an elongated axis, sessile and at the end of primary (and sometimes secondary) branches, 7–12(–20) spikelets per cluster, linear, 11–23 mm long, 1.6–2.1 mm wide, axis slightly zig-zag; glumes light brown with dark reddish-brown patch on the margin, ovate, 2.2–2.9 mm long, 1.3–1.9 mm wide, keel slightly green, excurrent, apex acute to acuminate. Stamens 3; filaments 2–2.9 mm long. Nutlet brown, obovoid, trigonous, 1.1–1.4 mm long, 0.5–0.8 mm wide, smooth.

UGANDA. Busoga District: Lolui Island, Lake Victoria, 22 May 1964, *Jackson* 1964!; Mengo District: Kyagwe Count, near Bugombe on Kome Island, 27 Oct. 1968, *Lye* 96! & Kampala, 5 Mar. 1966, *Haines* 4025!

TANZANIA. Musoma District: Bwasi, Majita, 23 Mar. 1959, *Tanner* 4084!; Kigoma District: Kitwe Sanctuary, 5 Feb. 1999, *Gobbo & Sirangi* 220! & Gombe Stream Reserve, along lake shore to Linda Valley, 2 May 1992, *Mbago* 1082!

DISTR. **U** 3, 4; **T** 1, 4; widespread throughout tropical Africa & Americas

HAB. Lake margins, swampy ground, shallow soil over rock; 450–1300 m

In open grassland, disturbed area, on rocks on shallow soil, roadside and slightly swampy grounds; 750–1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution.

94. **Cyperus grandis** *K. Schum.* in *P.O.A.* C: 118 (1895); C.B. Clarke in *F.T.A.* 8: 372 (1902); Kük. in *E.P.* 4, 20 (101): 54 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 178, fig. 339 (1983). Type: Tanzania, Zanzibar, *Hildebrandt* 1073 & Lushoto District: Mashewa, *Holst* 3520 (B, holo.; K!, syn.)

Perennial, robust, up to 2 m high; culms 110–200 cm long, 0.9–1.2 cm wide, trigonous to triquetrous, glabrous. Leaves up to 200 cm; leaf sheath reddish-brown to reddish-black, 17–35 cm long; leaf blade 80–175 cm long, 1.7–4 cm wide, linear, with 2 main veins next to primary vein, flat, scabrid on the veins and margins, apex acuminate. Involucral bracts 2–8, leaf-like, lowermost 23–127 cm long, 1.4–3.7 cm wide. Inflorescence simple to compound, primary branches 3–10, 10–30 cm long, prophylls 4–6 cm long; spikelets in crowded clusters on elongated axis, sessile and at the end of primary and secondary branches, many per cluster, linear (sometimes lanceolate), almost terete, 5–24 mm long, 0.7–1.2 mm wide; glumes yellow to pale brown, obovate, 2–2.6 mm long, 1–2 mm wide, keel green, 3–4-veined, apex (shortly) mucronate to awned, the awn up to 2–3 mm long. Stamens 3: filaments 1.7–2.3 mm long; anthers 0.8–1.2 mm long. Nutlet white, maturing black, ellipsoid, trigonous, 0.9–1 mm long, 0.4–0.6 mm wide, glabrous.

KENYA. Kwale District: Shimba Hills, Mkurumumuji Point area, 28 Mar. 1968, *Magogo & Glover* 569! & Taru, old quarry, 18 Sept. 1990, *Luke & Robertson* 2448! & near Gongoni Forest Reserve, 7 Apr. 1997, *Luke* 4608!

TANZANIA. Uzuramo District: Dar es Salaam, near University, 7 Apr. 1968, *Batty* 22! & Mtoni near Dar es Salaam, 13 Sept. 1969, *Harris* 3298!; Rufiji District: Selous Game Reserve, Kibimbawe Swamp, 8 Aug. 1993, *Luke & Luke* 3733!; Pemba: Makongwe Island, 16 Dec. 1930, *Greenway* 2728!

DISTR. **K** 7; **T** 6; **Z**; **P**; not known elsewhere

HAB. Swamps, in stagnant or moving water; sea-level–400 m

CONSERVATION NOTES. Possibly vulnerable due to the development taking place in the coastal strip, but specific data lacking. VU (B1 a biii)?

95. *Cyperus alopecuroides* Rottb. in Descr. Icon. Rar. Pl.: 38 (1773); Kük. in E.P. 4, 20 (101): 71 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 181, fig. 348 (1983); Lye in *Fl. Somalia* 4: 120 (1995) & *Fl. Eth.* 6: 445 (1997). Type: Arabia, *Forskåhl* s.n. (C, hol.)

Perennial, fairly robust, up to 170 cm tall; culms few, 22–140 cm long, 3.5–8.4 mm wide, trigonous, glabrous. Leaves basally crowded, up to 100 cm long; leaf sheath reddish-brown to blackish, 7–31 cm long; leaf blade linear, flat to w-shaped, 37–75 cm long, 4–15 mm wide, strongly scabrid on margin, apex acuminate. Involucral bracts leaf-like, spreading, 5–8, lowermost 44–73 cm long, 5–16 mm wide. Inflorescence a compound anthela, primary branches 6–10, 3–20 cm long; spikelets in crowded clusters, sessile and at the end of primary and secondary, sometimes tertiary branches, many per cluster, ovoid, 2.5–6.7 mm long, 1.8–2.7 mm wide, rachilla straight; glumes golden to reddish-brown, ovate, the margins inrolled, 1.2–1.7 mm long, 0.8–1.2 mm wide, keel green, rounded, apex excurrent. Stamens 3; filaments 1.4–2 mm long; anthers 0.6–0.8 mm long. Style with 2 stigma branches. Nutlet brown, flattened, pressed against the rachilla with the flat side, 0.7–1 mm long, 0.5–0.75 mm wide, smooth or minutely reticulate.

KENYA. Baringo District: Lake Baringo, 21 Aug. 1956, *Bogdan* 4227!; Machakos District: Mavoko Municipality, near Jomo Kenyatta Airport, ± 1 km to Mlongo centre towards Athi River from Nairobi, 10 Mar. 2003, *Muthoka et al.* 1/012/03!; Tana River District: Tana River National Primate Reserve, Baomo Village, 12 Mar. 1990, *Kabuye et al.* 149!

TANZANIA. Masai District: Great North Road, 24 km S of Arusha, 3 Jan. 1962, *Polhill & Paulo* 1034!; Ufipa District: central Rukwa, Baherine, Lake Rukwa, 3 Nov. 1964, *Richards* 19235!; Iringa District: Ifuguru, Great Ruaha River, 12 May 1970, *Greenway & Kanuri* 14506!

DISTR. **K** 1, 3, 4, 7; **T** 1–7; widespread in tropical Africa; Egypt, Madagascar, Arabia, S Asia

HAB. In swamps, seasonally wet grasslands, old cultivations; sea-level up to 1800 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Juncellus alopecuroides* (Rottb.) C.B. Clarke in *Fl. Brit. Ind.* 6: 595 (1893) & in *F.T.A.* 8: 307 (1902)

Cyperus alopecuroides Rottb. f. *pallidiflorus* (Peter) Kük., *E.P.* 4, 20 (101): 72 (1935). Type: Tanzania, Pare District: Pare, *Peter* 8400 (B!, syn.) & Pangani near Hale, *Peter* 8372 (K!, WAG!, syn.)

96. *Cyperus afrovaricus* Lye in Nordic Journ. Bot. 3: 222 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 208, fig. 418 (1983). Type: Tanzania, Masai District: 7 km Kibaya–Kondoa, *Leippert* 5461 (EA, holo.; K!, iso.)

Perennial, robust, tussocky, up to 64 cm tall; culms tufted, 30–60 cm long, 1–2.5 mm wide, trigonous, the base cylindrical and slightly swollen, glabrous. Leaves up to 36 cm long; leaf sheath grey to pale reddish-brown, rather thin, the basal sheaths splitting into fibres, 7–10 cm long; leaf blade linear, flat, up to 19–31 cm long, 1.9–3 mm wide, scabrid on at least margin, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 10–20 cm long, 1.8–2.1 mm wide. Inflorescence a simple anthela, primary branches 2–5, 0.5–3 cm long; spikelets in very densely crowded, spherical spikes 7.2–11 mm long, 5.9–7.1 mm wide, sessile and at the end of primary branches; spikelets lanceolate, 3–4 mm long, 0.5–1 mm wide, falling off entirely when mature; glumes dark reddish-brown, ovate-lanceolate, 2.5–3.6 mm long, 1–1.3 mm wide, keel greenish, with 5–7 veins on either side, apex acuminate. Stamens 3; filaments 3–3.9 mm long; anthers 1.7–1.9 mm long. Nutlet not seen.

TANZANIA. Masai District: 7 km Kibaya–Kondoa, 16 Jan. 1965, *Leippert* 5461!; Lushoto District: Magamba Peak, Sept. 1945, *Greenway* 7540!

DISTR. T 2, 3, 7? (see Note); not known elsewhere

HAB. In seasonally wet habitats, in rock crevices and on shallow soils over rocks; 1900–2250 m
CONSERVATION NOTES. Only known from a small area in Tanzania; part of the habitat (seasonally wet) is under threat of development.

NOTE. Lye also cites *Richards* 15665 from Mt Image in T 7.

97. *Cyperus vestitus* Krauss in Flora 28: 755 (1845); Kük. in E.P 4: 20 (101): 542 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 212, figs. 425, 426 (1983); Lye in Fl. Somalia 4: 138 (1995). Type: South Africa, Natal, *Krauss* 287 (B!, holo.; photo!; G, K!, M, MO, iso.)

Perennial, robust, succulent, 30–70 cm tall, with or without long stolons, with a thickened culm base or a ovoid pseudobulb to 4 cm in diameter; culms glossy, 9–60 cm long, 0.3–2.1 mm wide, trigonous, glabrous. Leaves up to 30 cm long; leaf sheath pale to red-brown with wide translucent margin, 3–6 cm long, covering the basal pseudobulb, sometimes splitting into fibres; leaf blade linear, flat, 5–50 cm long, 1.4–6 mm wide, scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 3.5–13 cm long, 2.7–5.6 mm wide. Inflorescence a simple anthela, primary branches (0–)2–6, (0–)1–7 cm long, spikes ovoid, 10–25 × 10–20 mm; spikelets in loose clusters, sessile and at the end of primary branches, 7–16 per cluster, linear-lanceolate, 5–13.5 × 1–2.8 mm, rachilla straight, spikelets falling on entirely when mature; glumes reddish-brown with uncoloured margin, ovate-oblong, 3.3–5.5 mm long, 2–2.8 mm wide, keel green with several veins on either side, excurrent, apex shortly mucronate. Stamens 3; filaments 4–5.1 mm long; anthers 2.2–2.8 mm long. Nutlet reddish brown to blackish, obovoid, trigonous, 1.4–2 mm long, 0.6–1 mm wide, papillose.

UGANDA. Karamoja District: near Loyoro, Aug. 1960, *J. Wilson* 1054!

KENYA. Northern Frontier District: Moyale, July 1952, *Gillett* 13632!; Kitui District: Nuus Hills, Feb. 2002, *Kirika, Mbi & Wambugu* NMK 313!; Tana River District: Kora National Park, Masasini Hill, Dec. 1983, *Mungai & Nyakundi* 61!

TANZANIA. Musoma District: Ikoma, Nov. 1953, *Tanner* 1850!; Handeni District: Kwa Mkono, Oct. 1976, *Archbold* 2220!; Kilwa District: Selous Game Reserve, Nakilala Valley, Jan. 1977, *Vollesen* MRC 4311!

DISTR. U 1; K 1, 2, 4, 7; T 1, 3, 8; Congo-Kinshasa, Rwanda, Somalia, Malawi, South Africa

HAB. In grassland, woodland and rocky bushland, often on rocky outcrops; sea-level to 1500(–2100) m

CONSERVATION NOTES. Least Concern (LC)

- SYN. *Mariscus albomarginatus* C.B. Clarke in Durand & Schinz, *Consp. Fl. Afric.* 5: 584 (1894), *nom. nud.* & in *F.T.A.* 8: 387 (1902). Type: Malawi, *Buchanan* 1432 (K, holo.)
M. vestitus (C. Krauss) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afric.* 5: 595 (1894), *nom. nud.* & in *F.T.A.* 8: 385 (1902)
Cyperus albomarginatus (C.B. Clarke) K. Schum. in *P.O.A. C.* 122 (1895), *non Cyperus albomarginatus* (Nees) Steud. (1854)
Mariscus inflatus C.B. Clarke in *F.T.A.* 8: 384 (1902). Type: South Africa, Graaf Reiner, Zuurberg Mts, *Day* s.n. (BM!, syn?)
Cyperus pseudocallistus Kük. in *F.R.* 21: 329 (1925). Types: Tanzania, Mwanza District: Kayenzi [Kagehi], *Fischer* 630 (B!, syn.) & Kilimanjaro, Kibo, *Endlich* 778a (B, syn., not found)
C. pseudocallistus Kük. var. *angustialatus* Kük. in *F.R.* 21: 329 (1925). Types: Tanzania, Lushoto District: Amani, *Braun* 2345 (B, syn., not found) & Kenya, Nairobi (sic), *Linton* 19 (B, syn., not found)
C. vestitus Krauss var. *pseudocallistus* (Kük.) Kük. in *E.P.* 4, 20 (101): 543 (1936)
C. obsoletenervosus Peter & Kük. in *E.P.* 4, 20 (101): 548 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 213 (1983). Type: Tanzania, Lushoto District: Umbasteppe, Kigala, *Peter* 13348 (B!, K!, syn., B website!) & Pare District: between Mkomasi and Mkumbara, *Peter* 10723 (B!, lecto.; B!, isosyn., B website!) - someone has chosen this last one as lectotype (label, B herbarium) probably because the sheet carries a stamp that the drawings in F.D.-O.A. were made from this sheet
Mariscus obsoletenervosus (Peter & Kük.) Greenway in *Journ. E.Afr. Nat. Hist. Soc.* 27: 203 (1969)
Cyperus pseudovestitus sensu Haines & Lye, *Sedges & Rushes E. Afr.*: 212, fig. 427 (1983), *non* (C.B. Clarke) Kük.

NOTE. There has been confusion about the taxa *C. obsoletenervosus*, *C. pseudovestitus* and *C. vestitus* in our area. The types of *pseudovestitus* (C.B. Clarke) Kük. in *E.P.* 4, 20 (101): 547 (1936) (South African Natal, Claremont, *Schlechter* 3145 (B, G, K!, M, Z, syn.) & Maritzburg, *Schlechter* 3310 (Z, syn.) & Umbilo River, *Rehmann* 8443 (K!, Z, syn.) & Grahamstown, *Daly* 669 (Z, syn.)) have inflorescences much more capitate than nearly all the East African material. Heads in South African material of this taxon consistently are made up of 1–3 tight ovoid spikes; in East African material the spikes are nearly always more lax, and higher in number, and with several of them stalked (except for a small group, e.g. *Faden et al.* 96/15 and *Peter* 39534 from Tanzania and *Napper* 1942 from Kenya); also, the glumes in EA material are longer than those of *Schlechter* 3145, with a green keel and an acute (not obtuse) apex – more like those of *Rehmann* 8443, another syntype of *C. pseudovestitus*! The type of *C. vestitus* is much more like the bulk of our material, including the types of *C. obsoletenervosus*, with the only exception being in the glume apex (though this is rather variable in our area) and the width of the pseudobulb; this last character varies considerably in South Africa, with some specimens resembling most of our material, which has more slender – though still succulent – pseudobulbs. It seems most practical to me to use the name *vestitus* for our material. The few capitate specimens cited above will have to remain unclear.

Haines & Lye called *pseudovestitus* very similar to *C. obsoletenervosus*, but differing in presence/absence of stolons. Stolons are not visible in most specimens from either South or East Africa!

98. ***Cyperus bulbosus*** *Vahl* in *Enum. Pl.* 2: 342 (1805); C.B. Clarke in *F.T.A.* 8: 352 (1902); Kük. in *E.P.* 4, 20 (101): 125 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 193, fig. 379 (1983) & *Fl. Somalia* 4: 124 (1995) & *Fl. Eth.* 6: 451 (1997). Type: Senegal, *Herb. de Jussieu* (C, lecto., P, iso.)

Perennial up to 54 cm tall, with a basal bulb from which the culm emerges, bulb to 10 mm in diameter; culms 19–44 cm long, 1.3–2.5 mm wide, trigonous, with longitudinal grooves, smooth. Leaves many, up to 40 cm long; leaf sheath greyish-brown to green, 2.5–8 cm long; leaf blade linear, 11–31 cm long, 2.4–5.7 mm wide, slightly scabrid on the margins, apex acuminate. Involucral bracts leaf-like, spreading, 3–6, lowermost 8–14 cm long, 2.4–4.4 mm wide. Inflorescence a simple anthela, primary branches 3–5, 1–6 cm long; spikelets in loose clusters on elongated axis and at the end of primary branches, one to few clusters sessile, 5–17 per cluster, linear-lanceolate, 7–21 mm long, 1.3–2.1 mm wide; glumes dark reddish-brown,

ovate, 2.8–4.8 mm long, 1.3–1.8 mm wide, keel slightly paler, with lateral veins on either side, apex acute, slightly excurrent. Stamens 3; filaments 2.4–3.3 mm long; anthers 1.7–2.2 mm long. Nutlet (brownish-)grey, oblong-ellipsoid, 1.1–1.9 mm long, 0.6–0.8 mm wide, papillose in longitudinal rows.

KENYA. Kiambu District: Machakos turn-off, Kamiti Plains, 11 Apr. 1970, *Brown* 1917A!; Masai District: Kaijiado, Selengei, Apr. 1970, *Qvortrup* 51! & 1.6 km S of Ol Orgesaile, 22 Apr. 1960, *Verdcourt* 2755!

TANZANIA. Arusha District: Eluanata 60 km from Arusha on Dodoma road, 25 Apr. 1965, *Leippert* 5700! & 40 km from Arusha on Dodoma road, 25 Apr. 1965, *Leippert* 5768! & Lockisale 25 km W of Arusha on road to Babati, 1 May 1989, *Mwasumbi* 14336!

DISTR. **K** 1, 4, 6; **T** 2, 3; widespread from west to central Africa, Mozambique

HAB. In seasonally wet grassland; 400–1600 m

CONSERVATION NOTES. Least Concern (LC) as it is widespread throughout Africa.

SYN. *Cyperus bulbosus* Vahl var. *melanolepis* Kük. in E.P. 4, 20 (101): 127 (1935). Type: Tanzania, Lushoto District: Pare, Biuko, *Peter* 10352 (B!, K!, syn.), *Peter* 10647 (B!, K!, syn.), *Peter* 41132 (B!, syn.), *Peter* 41225 (B!, syn.)

NOTE. Two sheets from **K** 7 (Tana River Primate Reserve, Mar. 1990, *Kabuye et al.* TPR 669! and Kwale District: Shimoni, May 1999, *Luke & Mbinda* 5853!) are similar but the glumes are medium brown and the nutlet is almost smooth.

99. *Cyperus perrieri* (Cherm.) *Hoenselaar* **comb. nov.** Type: Madagascar, Zazafotsy, *Perrier de la Bâthie* 2584 (P!, holo.; P!, iso.)

Perennial, up to 39 cm tall; culms densely tufted, the base of the culms surrounded by many fibres, 11–35 cm long, 0.9–1.1 mm wide, trigonous, glabrous. Leaves up to 22 cm long; leaf sheath brownish, 3.5–6 cm long, turning fibrous when old; leaf blade linear, canaliculate, 6–16 cm long, 0.5–2 mm wide, scabrid on margins, apex acute to acuminate. Involucral bracts leaf-like, erect, 2–3, lowermost 2.5–6 cm long, 0.8–1.3 mm wide. Inflorescence a simple anthela, primary branches 1–2, 1–2.7 cm long or sometimes capitate; spikes ovoid, sessile or at the end of primary branches; spikelets 3–12 per spike, ovoid-lanceolate, 4.3–7.1 mm long, 2.1–3 mm wide, rachis straight; glumes yellowish-brown to reddish-brown, boat-shaped, 2.2–2.9 mm long, 1.5–2 mm wide, keel flat, with many veins on either side, apex rounded. Stamens 3; filaments 3–3.2 mm long; anthers 1.3–1.7 mm long. Nutlet dark reddish-brown, sometimes the edges almost black, ellipsoid, trigonous, 1.5–2.1 mm long, 0.8–1 mm wide, smooth to minutely papillose.

TANZANIA. Kilwa District: Nakilala Valley, 14 Dec. 1975, *Vollesen* 3087!; Songea District: ± 12 km E of Songea, 21 Jan. 1956, *Milne-Redhead & Taylor* 8391! & near Lumecha bridge 21 km N of Songea, 29 Jan. 1956, *Milne-Redhead & Taylor* 8569!

DISTR. **T** 8; probably Mozambique; Madagascar

HAB. Margin of *Brachystegia* woodland with boggy grassland, shallow soil over rock; 300–1050 m

CONSERVATION NOTES. Needs information on population sizes and habitat threats.

SYN. *Mariscus perrieri* Cherm. in Bull. Mus. Hist. Nat. Paris 25: 301 (1919)

M. goniobolbus Cherm. var. *angustifolius* Cherm. in Bull. Soc. Bot. France 72: 614 (1925).

Type: Madagascar, Majunga, *Perrier* 15935 (P, holo.)

M. goniobolbus Cherm. var. *perrieri* (Cherm.) Cherm. in Bull. Soc. Bot. France 72: 169 (1925)

Cyperus pseudovestitus (C.B. Clarke) Kük. var. *perrieri* (Cherm.) Kük. in E.P. 4, 20 (101): 547 (1936)

C. pseudovestitus (C.B. Clarke) Kük. var. *astrocephalus* Kük. in Bot. Notis. 1934: 70 (1934). Type:

C. pseudovestitus (C.B. Clarke) Kük. var. *perrieri* (Cherm.) Kük. forma *angustifolius* (Cherm.) Kük. in E.P. 4, 20 (101): 548 (1936)

NOTE. In the type specimens there are more and longer involucral bracts; the leaves are slightly longer as well.

100. *Cyperus pluribracteatus* (Kük.) Govaerts in Govaerts & Simpson, World Checklist Cyperaceae: 350 (2007). Type: Tanzania, Dodoma District: Saranda, *Peter* 33483 & Makutupora, *Peter* 33699a (B, syn.)

Perennial, robust, up to 85 cm tall, with swollen fleshy culm-bases 0.8–1.3 cm in diameter; culms densely crowded in groups of 2–20, rarely solitary at the end of a stolon, 35–74 cm long, 1–3.1 mm wide, trigonous, hairy at least above. Leaves up to 40 cm long; leaf sheath pale brown to greyish, fleshy, 3–10.5 cm long; leaf blade linear, flat, 14–32 cm long, 2.5–5.5 mm wide, hairy, apex acuminate. Involucral bracts leaf-like, erect to spreading, hairy, 2–3, lowermost 2.5–10 cm long, 2–5 mm wide. Inflorescence a simple anthela, primary branches 3–8, 1.2–9.3 cm long; spikes with 20 to many spikelets, sessile and at the end of primary branches, 1.3–2.5 cm long, 1.2–1.6 cm wide; spikelets linear-lanceolate, 5.9–9 mm long, 0.7–1.1 mm wide, falling off entirely when matured, rachis straight; glumes pale brown, lanceolate-ovate, 2.9–3.8 mm long, 1–1.3 mm wide, densely hairy, keel green, apex somewhat recurved. Stamens 3; filaments 3–4.5 mm long; anthers 1.5–2.1 mm long. Nutlet reddish-brown, oblong-obovoid, trigonous, \pm 1.8 mm long, \pm 0.6 mm wide, minutely papillose.

UGANDA. Bunyoro District: Butiaba Escarpment, May 1941, *Eggeling* 4353!; Busoga District: Bukoli County, Sianana Hill, S of Buswale, 26 Mar. 1953, *Wood* 653!; Teso District: Ngora, 6 May 1941, *Thomas* 3866!

KENYA. Norther Frontier District: Moyale, 18 Apr. 1952, *Gillett* 12891!; Nairobi District: Kisumu, Feb. 1915, *Dümmer* 1823!; Kwale District: Shimba Hills, 1 June 1996, *Luke & Luke* 4505!

TANZANIA. Lushoto District: Tanga Region, 8 km on Mombo–Lushoto road, 2 July 1966, *Semsei* 4050!; Ufipa District: Ufipa Lake, Sundu, 10 Dec. 1958, *Vesey-FitzGerald* 2032!; Rufiji District: Nohomba Valley, 3 Dec. 1977, *Vollesen* 4801!

DISTR. U 2, 3; K 1, 2, 4, 6, 7; T 3–5, 7, 8; Rwanda, Burundi, Zimbabwe

HAB. In dryish grassland and on rocky outcrops; 0–2100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Mariscus psilostachys* C.B. Clarke in J. Bot. 34: 225 (1896) & in F.T.A. 8: 384 (1902). Type: Kenya, Njoro, *Gregory* s.n. (K, holo.)

Cyperus psilostachys (C.B. Clarke) Kük. in Bot. Notis. 1934: 69 (1934) & in E.P. 4: 20 (101): 546 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 211, fig. 423 (1983), *non Cyperus psilostachys* Steud. (1854)

Cyperus psilostachys (C.B. Clarke) Kük. var. *pluribracteatus* Kük. in E.P. 4: 20 (101): 546 (1936)

Cyperus psilostachys (C.B. Clarke) Kük. var. *subrufus* Kük. in E.P. 4: 20 (101): 546 (1936).

Types: Tanzania, between the coast and Uyui, *Taylor* s.n. & Lushoto District: Mt Gomba at Makuyuni, *Peter* 15366 & 15486 (B, syn.)

101. *Cyperus cyperoides* (L.) Kuntze in Revis. Gen. Pl. 3(2): 333 (1898); C.B. Clarke in F.T.A. 8: 404 (1902); Kük. in E.P. 4: 20 (101): 514 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 204, figs. 408, 409 (1983). Type: 'habitat in India orientali', *König* s.n. (LINN 71.42, lecto., chosen by Gordon-Gray in *Strelitzia* 2: 136, 1995)

Perennial, sometimes resembling annuals, 15–120 cm tall, with a swollen culm-base and usually a short woody rhizome; culms tufted/few, 6–90 cm long, 0.5–5 mm in diameter, bluntly trigonous, glabrous. Leaves with lowermost leaf sheaths dark red to purple, upper ones green to pale brown, the basal scales often splitting up into fibres; blade linear, flat or with central v-section, 10–39 cm long, 2–9(–12) mm wide, attenuate, scabrid on margin and midrib near apex. Involucral bracts erect to spreading, leaf-like, 4–15, lowermost 5–30 \times 0.2–1.2 cm. Inflorescence a simple anthela with 4–18 primary branches 0.2–12 cm long, sometimes with 1–6 sessile spikes at base of some stalked spikes; spikes cylindrical, 0.7–3 \times 0.5–1.3 cm, with 25–180 spreading spikelets; spikelets green, sometimes yellowish green when young, flushed brown to golden when older, 2.5–7 mm long, 1–4-flowered, rachilla straight, spikelets falling off entirely when mature; glumes pale green with green keel, ovate, 2–3.5 \times 0.6–1 mm, with 4–6 veins on either side, acute or obtuse. Stamens 3; anther 0.5 mm long. Style 3-branched. Nutlet reddish-brown, ellipsoid, 1.5–1.9 \times 0.6–0.8 mm, trigonous, minutely papillose. Fig. 34, p. 224.

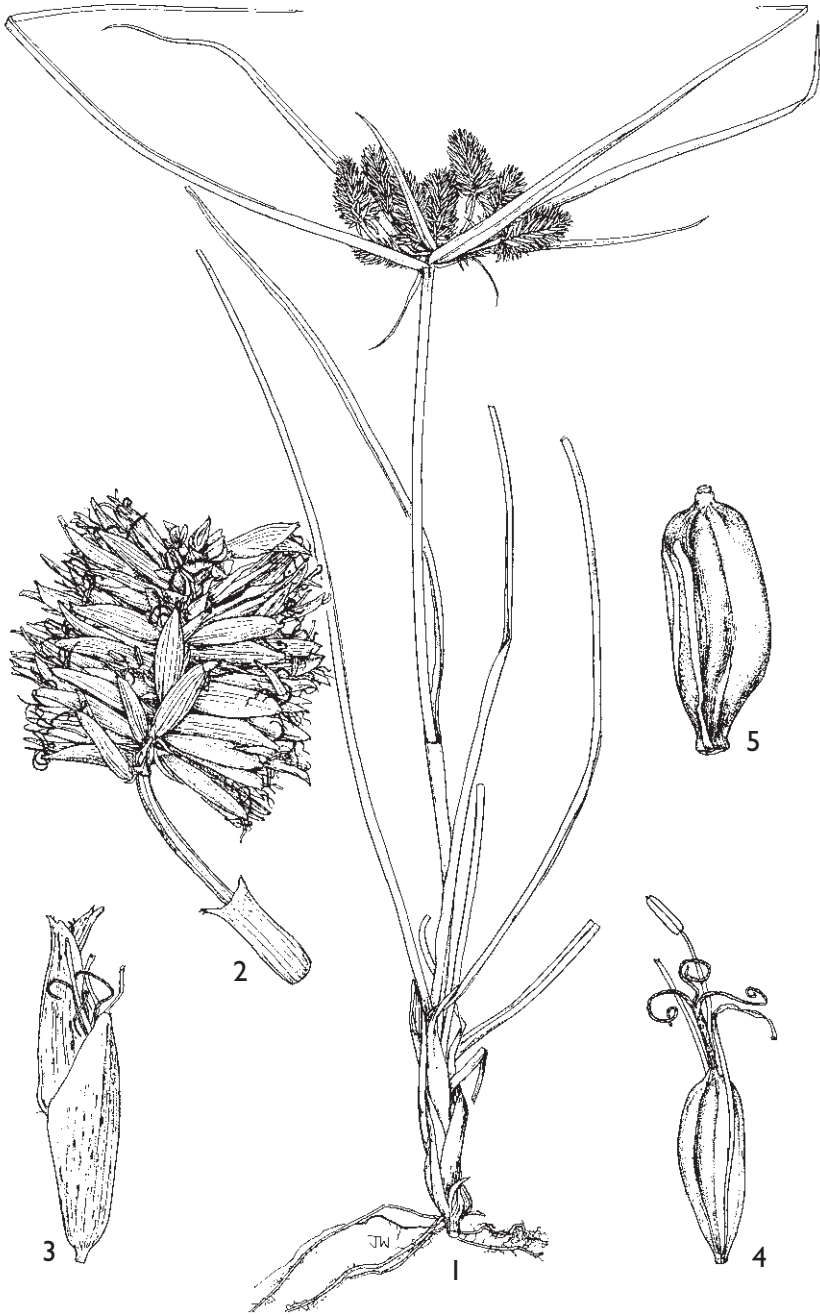


FIG. 34. *CYPERUS CYPEROIDES* — 1, habit, $\times \frac{2}{3}$; 2, spike, $\times 5$; 3, spikelet, $\times 12$; 4, flower, $\times 14$; 5, nutlet, $\times 20$. 1 from *Lamprey* 359, 2–4 from *Wingfield* 2409, 5 from *Acris* 124. Drawn by Juliet Williamson.

- UGANDA. Acholi/Bunyoro District: Murchison Falls/Kabalega National Park, Chobe, Oct. 1967, *Buzigye* 2!; Bunyoro District: Budongo Forest Reserve, between nature reserve and Royal Mile, Aug. 1995, *Poulsen, Nkuutu & Dumba* 889! Mengo District: Kampala, Makerere University Hill, Nov. 1969, *Lye* 4711!
- KENYA. Embu District: Kiangombe, Nov. 2000, *Smith, Beentje & Muasya* 281!; S Nyeri District: Kiandaka, Githi location, Dec. 1963, *Kibui* 43!; Kwale District: Shimba Hills, Mkurumuyi Point area, Mar. 1968, *Magogo & Glover* 545!
- TANZANIA. Bukoba District: Minziro Forest Reserve, Lyakataba Forest, Kigazi, Sept. 2001, *Festo* 1842!; Morogoro District: Milawilila Forest Reserve, Aug. 2000, *Mhoro* UMBCP 388!; Mufindi District: Ngwazi, Mar. 1989, *Kayombo & Kayombo* 64!; Zanzibar: Bungi, Nov. 1961, *Faulkner* 2949!
- DISTR. U 1–4; K 2–7; T 1–8; Z; Togo, Benin, Nigeria, Gabon, Congo-Brazzaville, Congo-Kinshasha, Rwanda, Burundi, Sudan, Ethiopia, Angola, Zimbabwe, South Africa; Madagascar, Asia, Pacific, West Indies
- HAB. Forest clearings and pathsides, grassland, woodland, especially in swampy situations or streamsides, also in (post-)cultivation areas; may be locally common, forming clusters or small tussocks; 0–1900(–2200) m
- CONSERVATION NOTES. Common and widespread; least Concern (LC)

SYN. *Scirpus cyperoides* L. in Mant. Pl. 2: 181 (1771)

Kyllinga sumatrensis Retz., Obs. Bot. 4: 13 (1786). Type: Indonesia, Sumatra, *Wennerberg* s.n. (LD, hol.)

Mariscus sieberianus Nees in Linnaea 9: 286 (1834); C.B. Clarke in F.T.A. 8: 388 (1902). Type: as for *Scirpus cyperoides* as there was already a *Mariscus cyperoides*

M. macer Kunth, Enum. Pl. 2: 121 (1837); C.B. Clarke in F.T.A. 8: 392 (1902). Type: South Africa, Cape of Good Hope, *Drège* s.n. (B, hol.)

M. macrocarpus Kunth, Enum. Pl. 2: 120 (1837); C.B. Clarke in F.T.A. 8: 393 (1902). Type: South Africa, between Cape and Durban [Port Natal], *Drège* 4421 (B!, hol.)

M. polyphyllus Steud. in Flora 25: 596 (1842). Type: Ethiopia, *Schimper* 1124 (B, not found)

M. cylindristachyus Steud., Syn. Pl. Glum. 2: 65 (1854). Type: Gabon ['Guinea'], *Jardin* s.n. (P, hol.)

M. nossibeensis Steud., Syn. Pl. Glum. 2: 63 (1854); C.B. Clarke in F.T.A. 8: 391 (1902). Type: Madagascar, Nosy Be [Nossibe], *Boivin* s.n. (P, hol.)

Cyperus macrocarpus (Kunth) Boeck in Linnaea 36: 380 (1870); Kük. in E.P. 4, 20 (101): 528 (1936)

C. kraussii Boeck. in Linnaea 36: 379 (1870). Type: South Africa, Cape of Good Hope, *Krauss* s.n. (B, hol.)

Mariscus cyperoides (L.) Urb. in Symb. Antill. 2: 164 (1900), *nom. illegit.*

M. sieberianus Nees var. *evolutior* C.B. Clarke in Fl. Brit. India 6: 622 (1894) & in F.T.A. 8: 389 (1902). Type: none indicated

M. umbellatus sensu C.B. Clarke in F.T.A. 8: 390 (1902), probably, *non* Vahl (1805)

M. pseudoflavus C.B. Clarke, Ill. Cyper.: t. 23, f. 8–9 (1909). Type: Tanzania, Mt Kilimanjaro, *H.H. Johnston* s.n. (BM, hol.; K!, iso.)

Cyperus cyperoides (L.) Kuntze var. *evolutior* (C.B. Clarke) Kük. in Sinensia 3: 80 (1932) & in E.P. IV, 20 (101): 516 (1936)

C. cyperoides (L.) Kuntze var. *aureus* Kük. in E.P. IV, 20 (101): 517 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 205 (1983). Type: Tanzania, Dodoma District: Itigi, Turu, Dec. 1925, *Peter* 33809! & Tabora District: Kirihilo S of Tabora, Jan. 1926, *Peter* 35252! & 35316! & Uyansi, between Chaya [Tschaya] and Tura, *Peter* 34257 (B!, syn.; K!, isosyn.)

C. cyperoides (L.) Kuntze var. *polyphyllus* (Steud.) Kük. in E.P. IV, 20 (101): 517 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 205 (1983)

C. cyperoides (L.) Kuntze var. *nossibeensis* (Steud.) Kük. in E.P. IV, 20 (101): 517 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 205 (1983)

C. cyperoides (L.) Kuntze var. *repens* Kük. in E.P. IV, 20 (101): 518 (1936). Types: Togo, Misa heights, *Baumann* 134 (B!, syn.); Tanzania, Morogoro District: Uluguru Mts, *Stuhlmann* 9227 (B, syn., not found)

C. subumbellatus Kük. in E.P. IV, 20 (101): 523 (1936); Lye in Fl. Eth. 6: 457 (1997), *nomen novum* for *C. umbellatus* (Rottb.) C.B. Clarke

C. macrocarpus (Kunth) Boeck. var. *pseudoflavus* (C.B. Clarke) Kük. in E.P. IV, 20 (101): 529 (1936)

C. macrocarpus (Kunth) Boeck var. *submacrocarpus* Kük. in E.P. 4, 20 (101): 528 (1936). Types: many specimens mentioned from Angola, Sudan, Uganda (*Speke & Grant* s.n., *Stuhlmann* 1279 & 2144, *Dummer* 4308) and Tanzania (*Stuhlmann* 3893, *Speke & Grant* 412, *Stuhlmann* 1785 & 4548, *Peter* 36199b (B!, syn.), 36200 (B!, syn.), 45713 (B!, syn.) & *Johnston* s.n.)

- C. macrocarpus* (Kunth) Boeck var. *kraussii* (Boeck.) Kük. in E.P. 4, 20 (101): 528 (1936)
Mariscus sumatrensis (Retz.) J. Raynal in Adansonia ser. 2, 15: 110 (1975)
Cyperus cyperoides (L.) Kuntze subsp. *flavus* Lye in Nordic Journ. Bot. 3: 231 (1983) & in Sedges & Rushes E. Afr.: 206, fig. 412 (1983), *nom. nov.* for *Mariscus cylindrostachyus* Steud.
C. cyperoides (L.) Kuntze subsp. *macrocarpus* (Kunth) Lye in Nordic Journ. Bot. 3: 231 (1983) & in Sedges & Rushes E. Afr.: 205, fig. 411 (1983)
C. cyperoides (L.) Kuntze subsp. *pseudoflavus* (C.B. Clarke) Lye in Nordic Journ. Bot. 3: 231 (1983) & in Sedges & Rushes E. Afr.: 205, fig. 410 (1983)

NOTE. As is usual with common and widespread pioneer taxa, a whole host of subspecies and varieties has been recognized in the past. Lye was doubtful about the status of three of the varieties ("it is doubtful if this variety is worth retaining/it is somewhat doubtful if this variety is worth retaining/like the previous two varieties it is of somewhat doubtful status" and then went on to combine another three previous names as subspecies of *C. cyperoides*. Here I also lump these taxa into the main body, helped by the fact that Lye already stated "this subspecies is not always easily recognized/however, there are many intermediate forms/intermediate forms are, however, by no means rare". I see this taxon as a single, rather variable species, with various forms influenced by habitat, amount of moisture available and time of the season.

102. ***Cyperus hirtellus*** (Chiov.) Kük. in E.P. 4, 20 (101): Haines & Lye, Sedges & Rushes E. Afr.: 210, figs. 421, 422 (1983). Type: Congo-Kinshasa, Katanga, Lake Moero, *Bovone* 42 (FT, holo.)

Perennial, up to 58 cm tall, stoloniferous with slightly swollen culm-base, stolons to 12 cm long, 1–2 mm in diameter, covered by pale brown or greyish scales; culms few, 14–50 cm long, 1.6–4 mm wide, trigonous, hairy at least above. Leaves up to 51 cm long; leaf sheath grey to brown, 3–10 cm long; leaf blade linear, flat, 16–41 cm long, 3–7 mm wide, hairy, apex acuminate. Involutural bracts leaf-like, erect to spreading, 4–8, hairy, lowermost 9–20 cm long, 3.2–5 mm wide. Inflorescence a simple anthela, primary branches 2–8, 0.5–10 cm long; spikelets in spikes, spikes sessile and at the end of primary branches; spikelets many per cluster, spreading, linear-lanceolate, 6.9–13 mm long, 0.7–1.5 mm wide, falling off entirely when mature, rachis straight; glumes pale to dark reddish-brown, margin pale, oblong, 3.3–4 mm long, 1–1.3 mm wide, hairy keel, apex obtuse. Stamens 3; filaments 2.2–4 mm long; anthers 1.8–2.5 mm long. Nutlet grey, obovoid, trigonous, 1.5 mm long, ± 0.8 mm wide, minutely papillose.

UGANDA. Karamoja District: near Moroto, 16 July 1959, *Kerfoot* 1169!

TANZANIA. Shinyanga District: Old Shinyanga, Block 9, No. 2 Flyround, sector 124, 12 Jan. 1950, *Welch* 121; Kondo District: between Mangoloma and Jogose, 20 Feb. 1928, *Phillips* 1822!; Iringa District: Iringa–Mbeya road, 48 km, 20 Dec. 1970, *Wingfield* 1833!

DISTR. U 1; T 1, 5, 7; Congo-Kinshasa, Zimbabwe

HAB. In open bushland and woodland, on sandy loamy soils; 1200–2000 m
 CONSERVATION NOTES. Widespread; least Concern (LC)

SYN. *Mariscus hirtellus* Chiov. in Nuovo Giorn. Bot. Ital., n.s., 26: 71 (1919)

NOTE. Looks like *C. psilostachys* but with the base less bulbous, and stolons present.

103. ***Cyperus pubens*** Kük. in F.R. 29: 200 (1931); Haines & Lye, Sedges & Rushes E. Afr.: 203, fig. 405 (1983). Type: Zimbabwe, Malangusti R., *Kassner* 2060 (B, K!, holo?)

Perennial fairly robust, up to 68 cm tall, with a swollen stem-base emitting thick scale-covered stolons, 0.3–0.5 cm in diameter; culms few, 31–62 cm long, 1.4–2 mm wide, trigonous, with short white densely set hairs below the inflorescence, almost glabrous near the base. Leaves up to 44 cm long; leaf sheath straw-coloured above, purplish-brown below, 3–11 cm long, densely set with white hairs; leaf blade linear, flat, 24–33 cm long, 4.4–7.3 mm wide, densely set with white hairs, apex acute.

Involucral bracts leaf-like, spreading, 3–4, lowermost 12–17 cm long, 3.2–4.1 mm wide. Inflorescence a simple anthela, primary branches 4–6, 3–8 cm long; spikelets in loose spikes, rachis of spike densely set with white hairs, sessile and on end of primary branches; spikelets 7–25 per spike, linear-lanceolate, 7–12 mm long, 0.9–1.1 mm wide, falling off entirely when mature; glumes pale brown, lanceolate, 4.7–6.6 mm long, 1.2–1.9 mm wide, keel flat, apex acute. Stamens 3; filaments 5.2–6.9 mm long; anthers 2.8–3.1 mm long. Nutlet grey, narrowly obovoid, trigonous, 3.2–3.4 mm long, 0.6–1 mm wide, minutely papillose.

TANZANIA. Chunya District: Lupa Forest Reserve, 153 km N of Mbeya SH Region, Apr. 1962, *Boaler* 529!; Songea District: ± 5 km E of Gumbiro, 2 Jan. 1956, *Milne-Redhead & Taylor* 8526! & Unangwa Hill, 13 Feb. 1956, 8687!

DISTR. T 7, 8; Zimbabwe

HAB. In *Brachystegia* woodland, on sandy soil; 900–1150 m

CONSERVATION NOTES. In a common habitat; probably least Concern (LC)

SYN. *Mariscus pubens* (Kük.) Podlech in Mitt. Bot. Staats. München 4: 115 (1961)

NOTE. Easily recognized due to its hairy leaf sheaths and rachis.

104. **Cyperus afrodonensis** *Lye* in Nordic Journ. Bot. 3: 222 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 191, fig. 374 (1983) & in Fl. Somalia 4: 122 (1995). Type: Kenya, Kilifi District: Malindi, *Bogdan* 2537 (K!, holo.)

Perennial, fairly robust, up to 52 cm tall, producing very slender stolons ending in bulbs, stolons to 5 cm long and 0.5–0.8 mm in diameter, bulbs 2–2.5 cm long, ± 10 mm in diameter, covered by rather thin reddish-brown scales; culms few, 15–40 cm long, 1.5–2.7 mm wide, trigonous, glabrous. Leaves up to 46 cm long; leaf sheath greyish-white above, brownish below, rather wide, 3–8 cm long; leaf blade linear, flat, at the base 5–10 cm long, higher up 10–38 cm long, 3–8 mm wide, rather thick and coriaceous, scabrid on at least margins, apex acuminate. Involucral bracts leaf-like, spreading, 3–8, lowermost 10–25 cm long, 3–5 mm wide. Inflorescence a simple anthela, primary branches 7–8, 3–5 cm long; spikelets in lax almost digitate groups, sessile or at the end of primary branches, 4–12 per cluster, linear-lanceolate, almost rounded in cross-section, 8–20 mm long, 3–4 mm wide, rachis straight; glumes densely imbricate, pale reddish-brown to golden brown, broadly ovate, 3–4.6 mm long, 2.4–2.6 mm wide, keel slightly excurrent, with multiple veins on either side, apex acute to acuminate. Stamens 3; filaments ± 4.1 mm long; anthers ± 1.9 mm long. Style with 2 branches. Nutlet greyish, obovoid, trigonous, ± 1.7–1.9 mm long, ± 1.3 mm wide, minutely papulose.

KENYA. Kilifi District: Malindi, 7 Aug. 1949, *Bogdan* 2537!

DISTR. K 7; Somalia

HAB. On sand dunes and sandy soil near sea-shore; sea-level

CONSERVATION NOTES. In a common habitat; possibly least Concern (LC)

NOTE. *C. afrodonensis* is also recorded by Lye from the Kiunga Archipelago in Kenya, but I have only seen the type specimen.

105. **Cyperus esculentus** *L.* in Sp. Pl.: 45 (1753); C.B. Clarke in F.T.A. 8: 355 (1902); Kük. in E.P. 4, 20 (101): 116 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 190, figs. 372, 373 (1983) & Fl. Somalia 4: 122 (1995) & Fl. Eth. 6: 451 (1997). Type: "Habitat Monspelii, inque Italia, Oriente", lectotype: "Cyperus rotundus esculentus angustifolius" in Bauhin, Theatri Bot., 221, 222, 1658, chosen by Simpson in Jarvis & al. (ed.), Regnum Veg. 127: 41 (1993)

Perennial, stoloniferous, up to 1 m high; stolons to ± 15 cm long, 0.5–1.5 cm thick, covered with brown scales and ending in a blackish tuber 3–8 mm in diameter; culms 18.5–74 cm long, 1.6–3.5 mm wide, trigonous to triquetrous, glabrous. Leaves up to

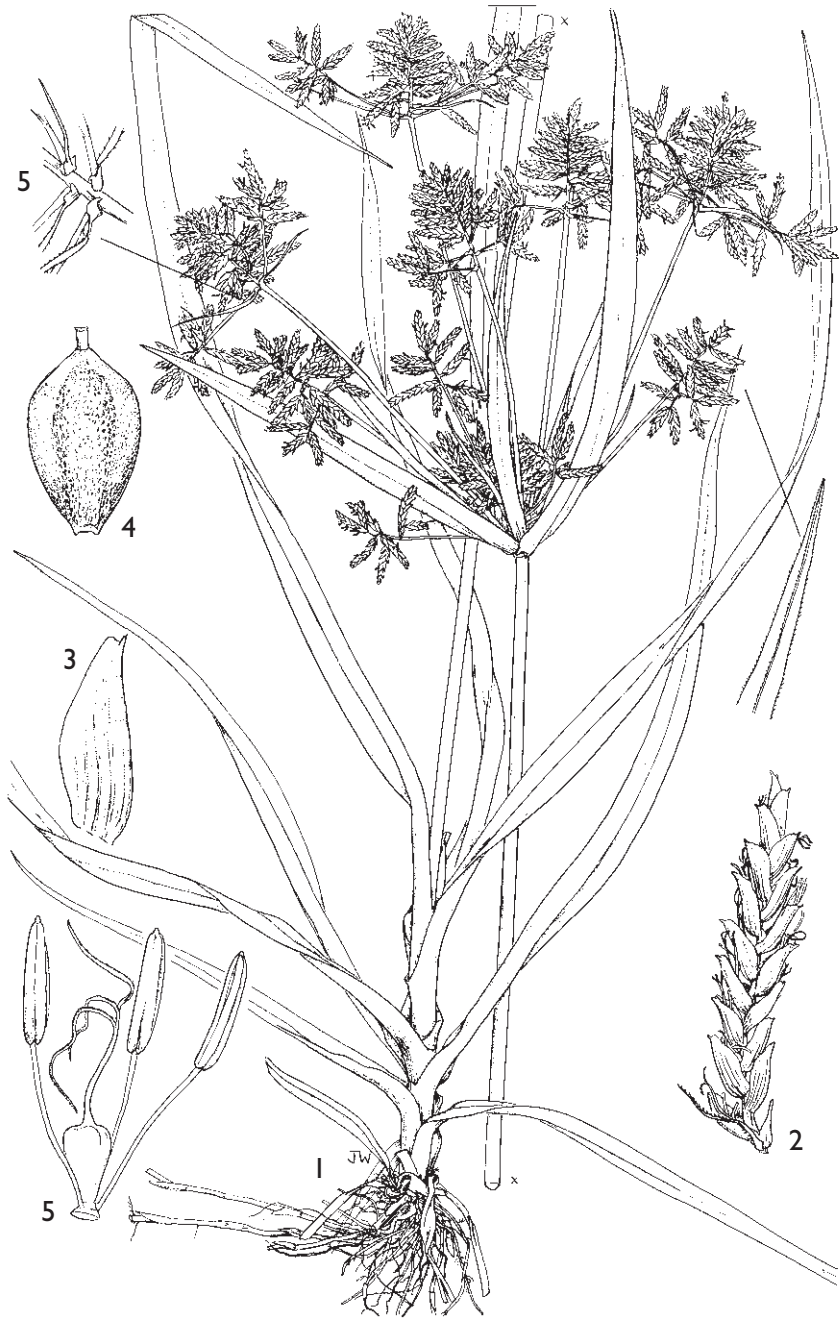


FIG. 35. *CYPERUS ESCULENTUS* — 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 4$; 3, glume, $\times 10$; 4, flower, $\times 10$; 5, nutlet, $\times 20$. 1 from Chandler 1490, 2 & 5 from Dummer 81, 3–4 from Lye 6444. Drawn by Juliet Williamson.

38 cm long, crowded near the base; leaf sheath pale brownish-green to green, 2–9 cm long; leaf blade linear, flat, 11.5–29 cm long, 2.3–8 mm wide, with 2 main veins next to primary vein, apex acuminate, glabrous to minutely scabrid on margins and veins. Involucral bracts 2–6, leaf-like, spreading, the lowermost 4–16.5 cm long, 2.1–8 mm wide. Inflorescence simple or compound, primary branches 5–10, 1–18 cm long; spikelets in loose clusters on elongated axis, sessile and at the end of primary and secondary branches, 9–20 per cluster, linear-lanceolate, 5.5–16 mm long, 1.2–2.5 mm wide, the apex of the spikelet obtuse; glumes yellowish-brown to reddish-brown, elliptic-ovate to obovate, with 3–4 distinct veins on each side of the keel, glabrous, 2.4–3.5 mm long, 1.4–2 mm wide, keel green to reddish-brown, apex obtuse. Stamens 3; filaments 2.5–4 mm long; anthers 1–2 mm long. Nutlet shiny grey, ellipsoid, trigonous, 1.3–1.5 mm long, 0.6–0.7 mm wide, surface with minute isodiametric cells. Fig. 35, p. 228.

UGANDA. Toro District: Fort Portal, 29 Nov. 1931, *Hazel* 20!; Teso District: shores of Lake Kyoga, Sambwa Peninsula near Serere, 2 Mar. 1936, *Michelmores* 1211!; Mengo District: Kampala Plantation, Dec. 1933, *Chandler* 1490!

KENYA. Trans-Nzoia District: 24 km SW of Kitale, Tilney's Farm, 24 June 1948, *Bogdan* 1792!; Nairobi District: Nairobi, 8 June 1947, *Bogdan* 731!; Kiambu District: S side of Chania and Thika River, 28 Dec. 1968, *Faden* 68/985!

TANZANIA. Arusha District: in Lekuruki Village, 5 July 1969, *Richards* 24886!; Ufipa District: near Chitukutu, 14 Jan. 1951, *Bullock* 361!; Iringa District: Njombe, 17 km W of Makambako on Mbeya road, 6 Feb. 1989, *Gereau et al.* 3074!

DISTR. U 2–4; K 3, 4, 7; T 1–5, 7, 8; widespread in Africa; S Europe

HAB. Swamps and seasonally wet grasslands, weed of shambas and gardens; 0–2100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus callistus* Ridl. in Trans. Linn. Soc. London, Bot. 2: 143 (1884); C.B. Clarke in F.T.A. 8: 355 (1902). Type: Angola, Loanda, *Welwitsch* 7079 (BM!, type)

C. esculentus L. var. *cyclolepis* Kük. in E.P. 4, 20 (101): 119 (1935). Types: South Africa, Pretoria, *Rehmann* 4776 & Kenya, Nairobi, *Thomas* 113 p.p. (B?, not found)

106. ***Cyperus fulgens*** C.B. Clarke in F.T.A. 8: 355 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 192, fig. 375 (1983). Type: Namibia, Hereroland, *Fleck* 642 (B, syn.); Botswana, Koobie to N Shaw Valley, *Baines* s.n. (K!, syn.) & Kwebe Hills, Nyamiland, *Lugard* 104 (K!, syn.)

Perennial up to 60 cm tall, slender to robust, with \pm 10–15 mm thick bulbs and slender stolons; culms few to tufted, 18–53 cm long, 1.1–2.3 mm wide, triquetrous to trigonous, smooth. Leaves many at the base, up to 34 cm long; leaf sheath brown, 2–6.5 cm long; leaf blade linear, flat to folded, 19–28 cm long, 1.6–5.7 mm wide, glabrous to minutely scabrid on the margins, apex acuminate. Involucral bracts leaf-like, spreading, 2–4, lowermost 9–15 cm long, 1.1–3.6 mm wide. Inflorescence simple, primary branches 2–5, 1.5–5.5 cm long; spikelets in lax clusters on an elongated axis, at the end of primary branches, 10–20 per cluster, linear-lanceolate, 7.3–13 mm long, 0.6–2 mm wide, rachis straight; glumes reddish brown, (narrowly) ovate, 3.2–4.6 mm long, 1.3–1.8 mm wide, with prominent lateral veins, keel greenish-brown, apex rounded to acute. Stamens 3; filaments 4–5 mm long; anthers 1.7–2.7 mm long. Nutlet brown to greyish-black, ellipsoid, trigonous, 1.4–2 mm long, 0.8–1 mm wide, smooth to minutely papillose.

KENYA. without locality (at least at K), 1978, *Gilbert & Thulin* 1197!; Isiolo District: Samburu Isiolo Game Reserve, S side of Ewaso Ng'iro River, 15 May 1971, *Faden & Evans* 71/402!

TANZANIA. Iringa District: Ruaha National Park, 1 km ESE of Msembe, 15 Jan. 1972, *Björnstad* 1248! & Ruaha National Park, Msembe, 19 Jan. 1972, *Pedersen* 696! & Msembe–Mbagi Track, km 2.7, 26 Feb. 1970, *Greenway & Kanuri* 13914!

DISTR. K 1; T 7; Malawi, Botswana, Namibia, South Africa

HAB. In open bushland, on gravelly ridge, in wooded grassland and in seasonally wet grassland; 800–1000 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

NOTE. The two specimens from Kenya are slightly smaller than those from the Tanzania region.

107. *Cyperus longus* L. in Sp. Pl.: 45 (1753); C.B. Clarke in F.T.A. 8: 366 (1902); Kük. in E.P. 4, 20 (101): 97 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 189, fig. 369 (1983) & Fl. Somalia 4: 121 (1995) & Fl. Eth. 6: 450, fig. 212.88 (1997). Type: Southern Europe, "habitat in Italiae, Galliae paludibus", lectotype: Herb. A. van Royen No. 909.89–686 (L, lecto., chosen by Kukkonen in Cafferty & Jarvis (ed.), Taxon 53: 179 (2004))

Perennial, fairly robust, up to 100 cm tall, with rather thick horizontal, often curved, scale-covered stolons and only slightly swollen culm bases; culms few, 25–95 cm long, 1.9–4 mm wide, trigonous above, terete below, glabrous. Leaves few, withering early, up to 50 cm long; leaf sheath pale to dark reddish-brown, 3–10 cm long; leaf blade flat, 16–40 cm long, 3–5 mm wide, slightly scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 6–28 cm long, 2–5.4 mm wide. Inflorescence a simple to compound anthela, primary branches 4–8, 0.5–10 cm long; spikelets in almost digitate spikes, sessile and at the end of primary branches, 3–15 spikelets per spike, linear-lanceolate, 8–25 mm long, 1.2–2 mm wide, rachilla straight; glumes reddish brown with narrow uncoloured margin, ovate, 2.7–3.5 mm long, 1.4–1.7 mm wide, keel green, apex obtuse. Stamens 3; filaments 2.9–3.8 mm long; anthers 1.4–2.2 mm long. Nutlet brown, ellipsoid, trigonous, 1.4–1.6 mm long, 0.5–0.75 mm wide, almost smooth.

UGANDA. Karamoja District: Kangole, 22 May 1940, *Thomas* 3450! & Bukora county, 5–6 km N of Lothaa, 10 May 1970, *Lye & Katende* 5461!; Toro District: Kasenyi, Queen Elizabeth National Park, 8 Dec. 1969, *Lock & Haines* 69/439!

KENYA. Turkana District: Southern Turkana at Nakurie, 10 km from mouth of the Kerio River, 30 Aug. 1968, *Mwangangi & Gwynne* 1224!; Teita District: Mayers' ranch, S of the Maungu Hills, 5 Feb. 1972, *Faden et al.* 72/151!; Tana River District: Tana River National Primate Reserve, Mchelelo, 11 Mar. 1990, *Kabuye et al.* 105!

TANZANIA. Kwimba District: Magu, Rurumba, 13 Apr. 1953, *Tanner* 1518!; Mbulu District: Tarangire National Park, Lemiyon Mbuga, 24 Jan. 1972, *Vesey-FitzGerald* 7239!; Morogoro District: between Mvomero and Turiani, 5 km N of Mvomero, 22 Mar. 1975, *Hooper et al.* 936!

DISTR. U 1, 2; K 1, 2, 4, 7; T 1–6, 8; widespread in Africa; S Europe

HAB. Lake edges, black cotton soils, ditches, periodically flooded depressions in grassland or bushland, in swamps and temporary pools; sea-level to 1600 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus tenuiflorus* Rottb., Descr. Ic. 30, t. 14.1 (1773). Type: grown in Hort. Hagensis by *Kaesemaker*, t. 14.1 (iconotype)

C. fenzelianus Steud. in Syn. Pl. Glum. 2: 33 (1854); C.B. Clarke in F.T.A. 8: 368 (1902). Type: Ethiopia, Sennar, *Kotschy* 171 (B, holo.)

C. longus L. var. *pallidus* Boeck. in Linnaea 36: 280 (1870). Type: no type mentioned, 'Egypt, Kordofan, Arabia felix, India orient.'

C. longus L. var. *tenuiflorus* (Rottb.) Boeck. in Linnaea 36: 281 (1870); Kük. in E.P. 4, 20 (101): 102 (1936);

C. fenzelianus Steud. var. *badiiformis* Chiov. in Ann. Bot. (Rome) 13: 376 (1915). Type: Somalia, Benadir, El Ualac, *Paoli* 1095 (CSET, holo.)

C. longus L. forma *badiiformis* (Chiov.) Kük. in E.P. 4, 20 (101): 101 (1935)

NOTE. Haines & Lye state this differs from *C. rotundus* only in the faintly swollen stem base and somewhat shorter glumes. Very polymorphic.

108. *Cyperus maculatus* Boeck. in Peters, Reise Mossamb.: 539 (1864); C.B. Clarke in F.T.A. 8: 363 (1902); Kük. in E.P. 4, 20 (101): 103 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 189, figs. 367, 368 (1983) & Fl. Somalia 4: 122 (1995). Type: Mozambique, *Peters* s.n. (B, holo.)

Perennial up to 92 cm tall, slender to robust, with up to 15 cm long stolons, but when growing in narrow rock-cracks the stolons are reduced and the basal part of the plant mainly consist of many densely crowded swollen woody culm-bases; culms few, 21–80 cm long, 1.3–3.3 mm in diameter, trigonous to subterete, glabrous. Leaves up to 44 cm long; leaf sheath green to pale reddish-brown, 1.5–15 cm long; leaf blade somewhat bluish-green, linear, flat, 13–35 cm long, 3–5.5 mm wide, scabrid on margin and primary vein, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 12–43 cm long, 2.2–4.2 mm wide. Inflorescence a simple to compound anthela, primary branches 4–6, 1.5–10 cm long; spikelets in lax almost digitate spikelets, sessile and on the end of primary (and sometimes secondary) branches, 7–15 per cluster, linear-lanceolate, 6.5–19 mm long, 1.2–1.9 mm wide, rachilla straight or curved; glumes reddish-brown with a wide uncoloured marginal border, ovate-elliptic, 2.4–3.5 mm long, 1.3–1.7 mm wide, closely overlapping, keel greenish, apex rounded to acute. Stamens 3; filaments 1.7–2.6 mm long; anthers 0.9–1.7 mm long. Nutlet brown, obovoid, trigonous, 1–1.3 mm long, 0.5–0.7 mm wide, minutely papillose.

UGANDA. Kigezi District: Lake Edward, Nov. 1950, *Purseglove* 3509!; Busoga District: Bulembe Bunya, on NE side of Vymba Is., 16 Jan. 1953, *Wood* 575!; Mengo District: Kyagwe county, Kisinsi point opposite Kaazi, 22 Feb. 1970, *Lye et al.* 5098!

KENYA. Kisumu District: Lake Victoria, Dhow Pier, 24 May 1953, *Verdcourt* 932!; Central Kavirondo District: Port Victoria, Block D, 16 Mar. 1947, *Glasgow* 47/71!; Voi District: Galana River, km 0.8 from Sobo Rocks, Tsavo National Park East, 9 Jan. 1967, *Greenway & Kanuri* 13004!

TANZANIA. Kigoma District: Zibwesa Point, Lake Tangyanika, 6 July 1958, *Juniper & Jefford* 2!; Rufiji District: Selous Game Reserve, opposite Sand River Lodge, 7 June 1997, *Luke & Luke* 4647!; Mbeya District: Itung port, Lake Nyasa, 28 Dec. 1969, *Wingfield* 562!

DISTR. U 2–4; K 4, 5, 7; T 2, 4–7; widespread in tropical and South Africa

HAB. In sandy habitats near lakes and rivers, in rock-crevices; 50–1700 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus longus* L. var. *maculatus* (Boeck.) Boeck. in *Linnaea* 36: 282 (1870)

NOTE. HB feels varietal status under *C. longus* might be better.

109. ***Cyperus ferrugineoviridis*** (*C.B. Clarke*) *Kük.* in *E.P.* 4, 20 (101): 412 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 202, figs. 403, 404 (1983) & *Fl. Somalia* 4: 132 (1995). Type: Uganda, Ruwenzori, *Scott Elliot* 7590 (K, syn.) & Tanzania, Kilimanjaro, *Volkens* 1620 (B, syn.)

Perennial up to 120 cm tall, robust, stoloniferous with a swollen stem-base and with or without a short rhizome, stolons to 15 cm long, 0.5–3 mm thick; culms few, 47–102 cm long, 2–4.2 mm wide, trigonous, sometimes almost triquetrous, glabrous. Leaves on lower half of culm, up to 58 cm long; leaf sheath rather conspicuous, green to brownish above, dark brown to purple near culm-base, 3–12.5 cm long; leaf blade linear, flat or W-shaped in cross-section, 15–45 cm long, 4.9–12 mm wide, scabrid on margins and primary vein, apex acute. Involucral bracts leaf-like, erect to spreading, 4–8, lowermost 9–40 cm long, 4–23.5 cm long. Inflorescence a lax anthela with 5–10 main branches; spikelets in loose clusters, sessile and at the end of primary (and sometimes secondary) branches, 10–30 per cluster, linear-lanceolate, 7.2–24 mm long, 0.9–1.6 mm wide, falling off entirely when mature; glumes greenish, golden or reddish-brown, with a translucent border, ovate-lanceolate, 4–5.2 mm long, 1.6–1.9 mm wide, keel green, sometimes slightly excurrent, apex rounded to sometimes acute. Stamens 3; filaments 4.4–5.5 mm long; anthers 1.8–3.2 mm long. Nutlet grey, obovoid, trigonous, 2.2–2.5 mm long, 0.8–0.9 mm wide, slightly apiculate, minutely papillose.

UGANDA. Toro District: S Kibale Forest, 16 Dec. 1938, *Loveridge* 255; Kigezi District: Kachwekano Farm, May 1949, *Purseglove* 2792!; Mubende District: Singo, Nakayengo, 8 Oct. 1970, *Katende* 620!

KENYA. Naivasha/Masai District: Mt Suswa, 4 Apr. 1963, *Glover* 3645!; Kisumu-Londiani District: Nyanza Province, Tinderet Forest Reserve, Camp 1, 15 June 1949, *Maas Geesteranus* 4995! & Camp 4, 30 June 1949, 5274!
 TANZANIA. Mbulu District: Kitingi River, 1 Mar. 1965, *Hukui* 25!; Mbeya District: Pungaluma Hills, 3 Jan. 1991, *Lovett & Kayombo* 5041!; Songea District: Songea near Government Rest Camp, 22 Jan. 1956, *Milne-Redhead & Taylor* 8402!
 DISTR. U 2–4; K 3/6, 5; T 1, 2, 5–8; Congo-Kinshasa, Rwanda, Burundi, Somalia, South Africa
 HAB. In grassland and cleared forest, also found as a weed in cultivated land; 900–2450 m
 CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus maranguensis* K. Schum. var. *ferrugineoviridis* C.B. Clarke in F.T.A. 8: 359 (1902).
C. ferrugineoviridis (C.B. Clarke) Kük. var. *distantiformis* Kük. in E.P. 4, 20 (101): 413 (1936).
 Types: Tanzania, Songea District: Lupembe, Ugololo, *Schlieben* 307 pro parte & Njombe District: Mpoponzi, *Schlieben* 791, 873 pro parte & Morogoro District: Uluguru Mts, *Schlieben* 3393 & W Kilimanjaro, Sanya, *Petzholtz* 92 (B, syn.)
C. ferrugineoviridis (C.B. Clarke) Kük. var. *luteiformis* Kük. in E.P. 4, 20 (101): 412 (1936).
 Types: Uganda, Ruwenzori, *Scott Elliot* 7590; Tanzania, Bukoba District: Karagwe, Kaforu, *Stuhlmann* 1839 & Bukoba District: Kagera R. at Kavingo, *Stuhlmann* 1949 & Kondo, *Burt Davy* 1100 & Morogoro District: Uluguru Mts, Lukwangule plateau, *Schlieben* 3547; South Africa, Pretoria saltpan, *Leemann* 27585 (B, syn.)
Mariscus ferrugineoviridis (C.B. Clarke) Cherm. in Bull. Jard. Bot. État 14: 330 (1937)
M. bequaertii Cherm. in Bull. Jard. Bot. État 14: 329 (1937). Type: Congo-Kinshasa, Rutshuru, *Bequaert* 5605, 6239; Mokoto Lakes, *Claessens* 36; Mulungu, *de Craene* 202, 202b (BR, syn.)
Cyperus bequaertii (Cherm.) Robyns & Tournay in F.P.N.A. 3: 246 (1955)

110. *Cyperus aterrimus* Steud. in Syn. Pl. Glum. 2: 31 (1854); C.B. Clarke in F.T.A. 8: 358 (1902); Kük. in E.P. 4, 20 (101): 141 (1936); Lye in Fl. Eth. 6: 454 (1997). Type: Ethiopia, Debra Eski, *Schimper* s.n. (P, syn.) & 233 (P, syn.)

Perennial, fairly robust, up to 100 cm tall, with a short 3–6 mm thick creeping rhizome and many crowded roots, occasionally with more slender curving scale-covered stolons; culms few, 26–82 cm long, 1.9–7 mm wide, trigonous, sometimes almost triquetrous, glabrous. Leaves up to 60 cm long; leaf sheath green to reddish-brown, 4–20 cm long; leaf blade linear, flat, 20–40 cm long, 5–12 mm wide, scabrid on margins and major veins, apex acute. Involucral bracts leaf-like, spreading, 4–7, lowermost 21–36 cm long, 4–11.5 mm wide. Inflorescence a compound anthela, primary branches 4–10, 1.5–12 cm long; spikelets in crowded spikes, giving the inflorescence a brush-like appearance, sessile and at the end of primary and secondary branches, to 82 spikelets per spike, linear-lanceolate, 8–15 mm long, 2–3 mm wide, rachilla straight; glumes dark reddish-brown, sometimes almost black, lanceolate, 3.2–3.5 mm long, 1.4–1.6 mm wide, keel usually green, apex acuminate to slightly mucronate. Stamens 3; filaments 2.7–3.7 mm long; anthers 0.5–0.6 mm long. Nutlet brown, ellipsoid-lanceoloid, trigonous, 2–2.4 mm long, 0.6–0.8 mm wide, almost smooth.

UGANDA. Kigezi District: Virunga Mts, W from Muhavura, 19 Nov. 1954, *Stauffer* 856! & Bufumira county, Mgahinga, E side, 24 Apr. 1970, *Lye & Katende* 5273!; Bugisu District: N Bugisu county, Mt Elgon near Sasa River, 17 June 1970, *Lye* 5752!
 KENYA. Trans Nzoia District: Suam Saw mills, 25 Dec. 1967, *Mwangangi* 433!; Nakuru District: Endabarra, Mau forest, 16 Jan. 1946, *Bally* 4834!; Kisumu-Londiani District: Kedowa, Sept. 1933, *Napier* 5378!
 TANZANIA. Moshi District: Kilimanjaro, Una stream, 22 Jan. 1934, *Schlieben* 4615!; Lushoto District: Mkuzi, 6.5 km NE of Lushoto, W Usambaras, 21 Apr. 1953, *Drummond & Hemsley* 2174!; Iringa District: Dabaga Highlands, Idewe Forest Reserve, 20 Feb. 1962, *Polhill & Paulo* 1555!
 DISTR. U 2, 3; K 3–5; T 2, 3, 7, 8; Bioko, Congo-Kinshasa, Rwanda, Burundi, Ethiopia, Malawi
 HAB. In wet grasslands, swamps and bogs, alongside water, in damp places in upland montane forest; 1200–3350 m
 CONSERVATION NOTES. Least Concern due to its wide distribution and common habitat

- SYN. *Cyperus atroviridis* C.B. Clarke in F.T.A. 8: 359 (1901); Haines & Lye, Sedges & Rushes E. Afr.: 199, figs. 395, 396 (1983). Type: Bioko [Fernando Poo], *Mann* 1466 (K, holo.)
C. aterrimus Steud. var. *agglomeratus* Kük. in N.B.G.B. 9: 304 (1925) & in E.P. 4, 20 (101): 142 (1936). Type: Kenya, Mt Kenya, Coles Mill, *Fries & Fries* 1089 (B, holo.)
C. aterrimus Steud. var. *atroviridis* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 142 (1936)

111. ***Cyperus corymbosus*** *Rotth.* in *Descr. Icon. Rar. Pl.*: 42 (1773); C.B. Clarke in F.T.A. 8: 357 (1902); Kük. in E.P. 4, 20 (101): 80 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 183, fig. 354 (1983). Type: India, *König* s.n. (C, holo.)

Perennial, fairly robust, up to 160 cm tall, with rather thick scale-covered stolons, 2–4 mm in diameter; culms 86–137 cm long, 4.4–8.3 mm wide, only very slightly articulated, rounded to trigonous, smooth. Leaves up to 41 cm long; leaf sheath greyish-brown to brown, 8.5–18 cm long; leaf blade linear, flat, 10–24 cm long, 4.4–7.5 mm wide, glabrous, apex acute. Involucral bracts leaf-like, spreading, 3–4(–7), lowermost 12.5–20 cm long, 3–7 mm wide. Inflorescence a compound anthela, with primary and secondary branches, primary branches 7–9, 4–20 cm long; spikelets in loose clusters on elongated axis, at the end of secondary branches, 4–10 per cluster, linear, 6.8–12.9 mm long, 0.8–1.3 mm wide, rachis straight; glumes grey to dark reddish-brown, ovate, 1.9–2.1(–4?) mm long, 0.9–1.1 mm wide, keel green, apex acute. Stamens 3; filaments 1.4–2.4 mm long; anthers 1.3–1.4 mm long. Nutlet pale brown, ellipsoid-obovoid, trigonous, ± 1.1 mm long, 0.5 mm wide, apiculate, smooth.

TANZANIA. Lushoto District: tributary of River Pangani, 6 km WNW of Korogwe, 26 Mar. 1975, *Hooper & Townsend* 1003B; Mpanda/Ufipa District: Rukwa, Sonta, 3 Nov. 1963, *Richards* 18331! & Rukwa Valley, 3 Nov. 1963, *Brown* 504!

DISTR. T 3, 4; Ivory Coast, Togo, Angola, Mozambique, South Africa

HAB. On riverbanks, in seasonally flooded habitats and swamps; 300–600 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

112. ***Cyperus latifolius*** *Poir.* in *Lamarck, Encycl.* 7: 268 (1806); C.B. Clarke in F.T.A. 8: 351 (1902); Kük. in E.P. 4, 20 (101): 87 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 182, figs. 350, 351 (1983) & *Fl. Eth.* 6: 446 (1997). Type: Madagascar, *du Petit-Thouars* s.n. (P!, holo.)

Perennial up to 200 cm tall, robust, with a hardened base producing 1–3 mm thick stolons covered with blackish scales; culms few, 46–160 cm long, 4–8.2 mm wide, triquetrous, usually slightly scabrid below the inflorescence. Leaves up to 2.7 m long; leaf sheath green to reddish-brown, slightly fleshy below, the lowest leafless sheaths almost black, 8–20 cm long; leaf blade linear, flat or V-shaped, 53–256 cm long, 9–28 mm wide, scabrid on margin and primary vein, apex acute to acuminate. Involucral bracts leaf-like, usually spreading, 3–6, lowermost 29–53 cm long, 9–21 mm wide. Inflorescence a compound anthela, primary branches 6–9, 2.5–23 cm long; spikelets in loose clusters, spreading and rather distantly placed, sessile and at the end of primary and secondary branches, 5–20 per cluster, linear, 7–30 mm long, 1.4–2.2 mm wide, rachilla straight; glumes straw-coloured to pale or dark reddish brown, with an indistinct uncoloured margin, oblong-elliptic, 2.4–3.2 mm long, 1.3–1.8 mm wide, keel green, apex rounded. Stamens 3; filaments 1.4–3 mm long; anthers 1.4–1.9 mm long. Nutlet pale brown when young, turning dark brown or grey when mature, obovoid, sometimes almost obcordate, trigonous, 1.3–1.6 mm long, 0.6–1 mm wide, minutely papillose.

UGANDA. Toro District: km 9.5 Fort Portal road, Apr. 1953, *Lind* 1301!; Mengo District: Kampala, Kugo Lake, 5 Dec. 1935, *Hancock & Chandler* 109! & River Mayanja, close to Wakyato, 10 May 1956, *Langdale-Brown* 2088!

KENYA. Nandi District: 3.2 km S of Kosirai, Nandi Reserve, 15 Jan. 1964, *Brunt* 1344!; Nairobi District: 23 km E of Nairobi, in Nairobi River Valley, 16 July 1951, *Bogdan* 3139!; Kwale District: Shimba Hills, Mkurumuji point area, 28 Mar. 1968, *Magogo & Glover* 576!

TANZANIA. Lushoto District: Soni, W Usambaras, 0.8 km from junction of Bumbuli road with Lushoto road, on the Bumbuli road, Nov. 1930, *Milne* 2!; Ufipa District: Sumbawanga, Chapota Swamp, 6 Mar. 1957, *Richards* 8531!; Songea District: \pm 11 km W of Songea, 11 Feb. 1956, *Milne-Redhead & Taylor* 8737!

DISTR. U 2–4; K 3, 4, 7; T 1–4, 7, 8; Benin, Cameroon, Congo-Kinshasa, Rwanda, Burundi, Ethiopia, Angola, Malawi, Mozambique, Botswana, Swaziland, South Africa; Madagascar

HAB. In swamps, marshes, boggy grasslands, in roadside ditches and along streams; sea level up to 2100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

113. **Cyperus procerus** *Rottb.* in *Descr. Icon. Rar. Pl.*: 29 (1773); *Kük.* in *E.P.* 4, 20 (101): 91 (1936); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 182, fig. 352 (1983) & *Fl. Somalia* 4: 120 (1995) & *Fl. Eth.* 6: 445, fig. 212.80 (1997). Type: Egypt, *Forskahl* s.n. (C, holo.)

Perennial up to 135 cm tall, robust, stoloniferous, stolons covered by distantly spaced black scales; culms 42–119 cm long, 2–5 mm wide, trigonous, smooth. Leaves up to 90 cm long; leaf sheath brown, sometimes slightly fibrous and blackish at base, 1–11 cm long; leaf blade linear, flat, 30–86 cm long, 5–10 mm wide, glabrous, apex acute to acuminate. Involucral bracts 2–4, spreading, leaf-like, lowermost 8–30 cm long, 3–8 mm wide. Inflorescence simple (to compound), primary branches 3–7, 0.5–12 cm long; spikelets loosely clustered, sessile and at the end of primary branches, 7–20 per cluster, linear, 8.5–28 mm long, 1.9–2.9 mm wide, glumes spreading with age, straight to slightly curved; glumes reddish-brown, with an uncoloured margin, ovate, 2.2–3.2 mm long, 1.6–1.9 mm wide, keel pale brown to brown, flattish, apex rounded to emarginate. Stamens 3; filaments 1.6–4 mm long; anthers 1–1.9 mm long. Nutlet brown, obovoid, trigonous, 1–1.6 mm long, 0.9–1.6 mm wide, smooth to slightly papillose in longitudinal rows.

KENYA. Lamu District: Mararani, Boni Forest, 10 Sept. 1961, *Gillespie* 347!

TANZANIA. Lushoto District: Korogwe, 'Mangewa' Estate, 19 June 1953, *Faulkner* 1187!; Ufipa District: Lake Lundu, 9 Dec. 1958, *Richards* 10258!; Iringa District: Ipogoro–M'kawe track, Mafinga [Sao Hill], 12 Dec. 1961, *Richards* 15602!

DISTR. K 7; T 3–7; widespread in west and tropical Africa down into South Africa; Egypt

HAB. In seasonally wet grasslands and swamps, growing in water; 30–1650 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Mariscus procerus* A. Rich., *Tent. Fl. Abyss.* 2: 489 (1851); C.B. Clarke in *F.T.A.* 8: 395 (1902), *non* Schrad.

Cyperus procerus *Rottb.* var. *stenanthus* *Kük.* in *E.P.* 4, 20 (101): 92 (1936). Syntypes: several from West Africa and Sudan, Djur, *Schweinfurth* 2017; Tanzania, Uzaramo District: Dar es Salaam, Magagoni Lake, *Peter* 44989, & Singida/Dodoma District: Turu, Itigi–Bangayega, *Peter* 33742b; Zimbabwe, Mamlova, *Pocock* 107 (B, syn.)

114. **Cyperus undulatus** *Kük.* in *F.R.* 21: 328 (1925) & in *E.P.* 4, 20 (101): 96 (1936); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 190, figs. 370, 371 (1983). Type: Kenya, Kibwezi, *Scheffler* 52 (B, syn.); Tanzania, Pare District: W Pare Mts, *von Höhnell* 10 (B, syn.) & Lushoto District: Mashewa [Mascheua], *Holst* 8714 (B, syn.)

Perennial, stoloniferous, up to 150 cm tall; culms 54–130 cm long, 2–3 mm wide, trigonous, with longitudinal grooves, smooth. Leaves up to 86 cm long; leaf sheath (bright) yellow, 4–22 cm long; leaf blade linear, flat, 22–74 cm long, 6–12 mm wide, with 2 main veins next to primary vein, \pm scabrid on the veins, apex acuminate. Involucral bracts 2–4, leaf-like, spreading, the lowermost 8.5–64 cm long, 4–10 mm wide. Inflorescence compound, primary branches 5–8, 1–14 cm long; spikelets in loose clusters on elongated axis, sessile and at the end of primary and secondary branches, 5–20 per cluster, linear, almost terete, 6–18(–30) mm long, 0.9–1.4 mm wide; glumes reddish brown with a uncoloured margin, ovate-lanceolate, 3.2–4.1 mm long,

1.3–2.2 mm wide, keel pale green, flattish, few-veined, apex rounded. Stamens 2; filaments 2.4–3.3 mm long; anthers 1.4–2.2 mm long. Nutlet grey, ellipsoid-obovoid, 1.3–1.6 mm long, 0.5–0.6 mm wide, transversely wrinkled with large surface-cells.

KENYA. Machakos District: 3 km SE of Kiboko Station, 25 June 1971, *Lye & Katende* 6295!; Embu District: Mbeere, Kiang'ombe Hill, 20 July 2005, *Kirika et al.* 565!; Teita District: Tsavo National Park, East, W of Lugard Falls, Galana River, 40 km from Voi Gate, 21 Jan. 1967, *Greenway & Kanuri* 13040!

TANZANIA. Moshi District: Kilimanjaro, Kware River, 24 Nov. 1968, *Bigger* 2333!; Pare District: Kisuwani, 5 Feb. 1930, *Greenway* 2161! & Makuyuni, 8 May 1939, *Gillman* 923!

DISTR. K 4, 7; T 2, 3; not known elsewhere

HAB. In seasonally wet habitats, bogs and saline swamps; 250–1400 m

CONSERVATION NOTES. Least Concern (LC) due to habitat and altitude range

NOTE. Easy recognizable due to its yellow-coloured leaf sheaths and its nutlet surface; near *longus*.

115. *Cyperus rohlfsii* Boeck. in Flora 65: 13 (1882); Haines & Lye, Sedges & Rushes E. Afr.: 214, fig. 431 (1983) & Fl. Eth. 6: 458 (1997). Type: Ethiopia, Djebel Gerara, *Rohlfs & Stecker* 47 (B, holo.)

Perennial, robust, up to 80(–120) cm tall, with a short rhizome or stoloniferous; culms solitary or several together from thick stolons, 24–72 cm long, 1.7–2.5 mm wide, trigonous, with longitudinal ridges, glabrous, the base swollen to subsucculent. Leaves up to 80 cm long; leaf sheath whitish-grey to pale brown, pinkish at base, papery, thin, 9–19 cm long; leaf blade linear, flat, 30–60 cm long, 3–5.5 mm wide, scabrid along the margin, apex acuminate. Involucral bracts leaf-like, spreading, 3–7, lowermost 21–72 cm long, 2.5–5.2 mm wide. Inflorescence a simple anthela, primary branches 4–10, 0.5–8 cm long; spikes 28–80 mm long, 4–6 mm wide, sessile and at the end of primary branches; spikelets many per spike, linear-lanceolate, 2.3–3.5 mm long, 0.7–1 mm wide, rachis straight, few glumes per spikelet; glumes yellowish-brown to reddish brown, boatshaped, 2.2–3 mm long, 1–1.2 mm wide, keel green, with several veins on either side, apex acuminate to almost mucronate. Stamens 3; filaments 2.3–3.5 mm long; anthers 1.6–1.8 mm long. Nutlet dark reddish-brown, oblong-ellipsoid, trigonous, 1.6–1.9 mm long, 0.6–0.9 mm wide, minutely papillose in longitudinal rows.

UGANDA. Karamoja District: Mt Kadam [Debasien], Jan. 1936, *Eggeling* 2721!

KENYA. Baringo District: Lake Bogoria [Hannington], W shore near steam jets, Jan. 1969, *Napper & Faden* 1804!; Kitui District: Mutomo Hill, Mar. 1968, *Bally* 13139!; Teita District: Mwatate, Mwambota Hill forest, Dec. 2007, *Mbale et al.* NMK 959!

TANZANIA. Masai District: Mozinik [Mosonik], Nov. 1962, *Newbould* 6337!; Lushoto District: 8 km N of Bumbuli, Mar. 1975, *Hooper & Townsend* 1018!; Iringa District: Udzungwa Mts National Park, above camp site 2, Nov. 1992, *Luke & Luke* 5122!

DISTR. U 1; K 1–4, 6, 7; T 2, 3, 6, 7; Eritrea, Ethiopia, Somalia

HAB. On rocky outcrops, thin soil over rock or lava, also in grassland or scattered tree grassland, rare on the coast; 0–1950 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Mariscus rohlfsii* (Boeck.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 592 (1894) & in F.T.A. 8: 394 (1902)

Cyperus impubes Steud. var. *rohlfsii* (Boeck.) Kük. in E.P. 4, 20 (101): 492 (1936)

C. oblongoincrassatus Kük. var. *clavator* Kük. in E.P. 4, 20 (101): 550 (1936). Type: Kenya, Machakos District: Sani, *Kässner* 762 (B!, K!, syn.) & Tanzania, Masai District: Sonjo Sale, *Merker* 408 (B, syn.), **syn. nov.**

NOTE. This looks like *C. oblongoincrassatus* but differs in the very narrow spikes, short spikelets and small glumes.

C. oblongoincrassatus var. *clavator* is brought into synonymy here. The Tanzanian syntype of this taxon has an unknown locality, though in the Rift Valley; I presume this would have been in T 2.

116. *Cyperus dilatatus* Schumach. in Beskr. Guin. Pl.: 38 (1827); C.B. Clarke in F.T.A. 8: 375 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 196, figs. 385, 386 (1983) & Fl. Somalia 4: 122 (1995). Type: Ghana, *Thonning* s.n. (C, holo.)

Perennial, robust, stoloniferous, up to 82 cm tall; culms few, 27–68 cm long, 2.4–3.5 mm wide, trigonous to almost triquetrous, smooth with longitudinal grooves. Leaves up to 38 cm long; leaf sheath purple to brown at base, slightly breaking up into fibres, 1.5–6 cm long; leaf blade linear to narrowly elliptic, flat, 20–32 cm long, 5.5–10 mm wide with several prominent veins, scabrid on margins and prominent veins, apex acute to acuminate. Involucral bracts leaf-like, spreading, 3–5, lowermost 12–31 cm long, 5–1.1 mm wide. Inflorescence simple, primary branches 5–6, 2–11 cm long; spikelets in loose clusters, sessile and at the end of primary branches, 11–20 per cluster, linear-lanceolate, 9–20 mm long, 1–2.4 mm wide, rachis straight; glumes brown to reddish-brown, ovate, 3.5–4.1 mm long, 1.3–2 mm wide, with few veins on either side of the keel, margin uncoloured, keel green, apex acute. Stamens 3; filaments \pm 3 mm long; anthers 1.8–4.1 mm long. Nutlet brown, obovoid-ellipsoid, trigonous, \pm 1.1 mm long, \pm 0.8 mm wide, smooth to minutely papillose.

UGANDA. Mengo District: Kawanda, near Kampala, 16 May 1972, *Parker* U53!

TANZANIA. Tanga District: Amboni, 18 May 1932, *Geilinger* 119!; Uzaramo District: near Dar es Salaam, Apr. 1902, *Holtz* 129!

DISTR. U 4; T 3, 6; widespread in West Africa, also found in central Africa and Somalia

HAB. In seasonally wet habitats; 0–1150 m

CONSERVATION NOTES. Least Concern (LC) due to its widespread distribution.

SYN. *Cyperus gracilinux* C.B. Clarke in J.L.S., Bot. 21: 162 (1884) & in F.T.A. 8: 362 (1902); Kük. in E.P. 4, 20 (101): 131 (1936). Types: Sudan, Jur Ghattas, *Schweinfurth* 2016 & 2029 (K!, syn.)

C. pseudosphacelatus Chiov., Ann. Bot. (Rome) 13: 374 (1915), *nom. illegit.* Type: Somalia, Gumbo, Piana del Giuba, *Paoli* 221 (FT!, holo.)

C. esphacelatus Kük. in E.P. 4, 20 (101): 131 (1935), *nomen novum* for *C. pseudosphacelatus* Chiov.

117. *Cyperus oblongoincrassatus* Kük. in E.P. 4, 20 (101): 550 (1936), *nomen novum* for *Mariscus taylorii*; Haines & Lye, Sedges & Rushes E. Afr.: 214, fig. 430 (1983). Type: Tanzania, between the coast and Uyui, *Taylor* s.n. (BM, holo.; Aluka!)

Perennial, 30–80 cm tall, with a short rhizome and sometimes with underground stolons; culms crowded and 30–50 cm long, 0.3–1 mm wide, trigonous, glabrous; culm base slightly to considerably swollen. Leaves with sheath reddish-brown, rather fleshy; leaf blade linear, flat, 30–50 cm long, 3–6 mm wide, scabrid on margins. Involucral bracts leaf-like, hanging, 5–8, lowermost at least 10 cm long. Inflorescence a simple anthela, primary branches 5–12, 0.5–4(–12) cm long; spikes 15–20 \times 8–10 mm; spikelets sessile and at the end of primary branches, linear-lanceolate, 3–5, 1–1.5 mm wide, 2–6-flowered; rachilla narrowly winged; glumes reddish-brown, ovate or lanceolate, 3–3.5 mm long, apex acute. Stamens 3; anthers linear. Nutlet ellipsoid, ‘50–75% of glume length’ (protologue), apiculate.

KENYA. Kitui District: Galunka, May 1902, *Kässner* 842!; Kwale District: Mackinnon Road, Sept. 1953, *Drummond & Hemsley* 4097!

TANZANIA. Lushoto District: E Usambara Mts, lower Sigi Valley, May 1950, *Verdcourt* 241! & Mongo, Sept. 1961, *Omari* in *Richards* 15323! & W Usambara Mts, Manka to Sakare, Sept. 1902, *Engler* 1077!

DISTR. K 4, 7; T 3, 4/5/6?, 6; not known elsewhere

HAB. Rocky sites, dry *Acacia-Commiphora* bushland; 350–1800 m

CONSERVATION NOTES. Least Concern (LC) due to its habitat and altitude range.

SYN. *Mariscus taylorii* C.B. Clarke in Durand & Schinz., Cons. Fl. Afr. 5: 594 (1894), *nom. nud.* & in F.T.A. 8: 384 (1901), as *taylori*, *non Cyperus taylorii* C.B. Clarke (1894). Type: as for *C. oblongoincrassatus*

- Cyperus clarkeanus* K. Schum. in P.O.A. C: 123 (1895) – this was intended as a *nomen novum* for *Mariscus taylorii*, which was still a *nom. nudum* at the time – so this is a *nomen invalid.*
- C. oblongoincrassatus* Kük. var. *udigensis* Peter & Kük. in E.P. 4, 20 (101): 550 (1936). Type: Tanzania, Tanga District: Udigo, Amboni, *Peter* 39570 (B!, syn.) & Uluguru Mts, *Schlieben* 3620 (B!, syn.)
- C. oblongoincrassatus* Kük. var. *groteanus* Kük. in E.P. 4, 20 (101): 550 (1936). Type: Tanzania, Lushoto District: Amani, *Grote* 3976A (B!, syn.) & Bomole Peak, *Peter* 14026 (B!, K!, syn.), 21616 (B!, K!, syn.) & Tanga District: Mlinga Peak, *Peter* 19389 (B!, syn.)
- Mariscus taylorii* C.B. Clarke var. *groteanus* (Kük.) Napper in J. E.A. Nat. Hist. Soc. 28, no. 124: 14 (1971)
- M. taylorii* C.B. Clarke var. *udigensis* (Kük.) Napper in J. E.A. Nat. Hist. Soc. 28, no. 124: 14 (1971)

NOTE. *C. oblongoincrassatus* var. *groteanus* has spikes 50–60 × 12–14 mm; spikelets 7 × 2 mm; and up to 12 primary branches up to 12 cm long; its synonymy is provisory (HB).

118. *Cyperus endlichii* Kük. in F.R. 21: 327 (1925); Kük. in E.P. 4, 20 (101): 106 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 188, fig. 366 (1983). Type: Tanzania, Kilimanjaro, Kibo heights, *Endlicher* 778 (B, holo.)

Perennial up to 75 cm tall, fairly robust, with a very slightly swollen culm-base emitting ± 1 mm thick scale-covered stolons; culms few, 40–60 cm long, 1–2 mm in diameter, trigonous, glabrous. Leaves up to 40 cm long; leaf sheath green to dark brown, 4–11 cm long; leaf blade linear, flat to folded, 10–34 cm long, 2.3–6.4 mm wide, scabrid at least on margin, apex acuminate. Involucral bracts leaf-like, erect or spreading, 3–4, lowermost 15–30 cm long, 3–6 mm wide. Inflorescence a simple anthela, primary branches 3–6, 1.5–9 cm long; spikelets in loose clusters at the end of primary branches, linear-lanceolate, 6.2–13 mm long, 1–1.9 mm wide, rachilla straight; glumes golden to reddish-brown, 2.2–3.9 mm long, 1.6–1.9 mm wide, keel green, apex obtuse to shortly mucronate. Stamens 3; filaments 3.3–3.5 mm long; anthers 1.1–1.7 mm long. Nutlet reddish-brown, ellipsoid, trigonous, 0.8–0.9 mm long, ± 0.4 mm wide, almost smooth.

TANZANIA. Tanga District: W Usambaras, near Momba (?), 6 June 1914, *Peter* 4429 & Pare District: S of Pangani near Buiko, 28 May 1915, *Peter* 10340! & km 284 Lembeni to Lame, 23 June 1915, *Peter* 11405!

DISTR. T 2, 3; not known elsewhere

HAB. In grassland and wooded grassland; 400–900 m (see note)

CONSERVATION NOTES. Needs information on almost everything, as all collections are almost 100 years old.

NOTE. A smaller version of *C. rotundus* with smaller and narrower spikelets and smaller glumes. The altitude of the type is not given, but must be very high, possibly 4000 m – can this be correct?

119. *Cyperus amauropus* Steud. in Syn. Pl. Glum. 2: 33 (1854); Haines & Lye, *Sedges & Rushes E. Afr.*: 213, figs. 428, 429 (1983) & Fl. Somalia 4: 138 (1995) & Fl. Eth. 6: 466 (1997). Type: Ethiopia, Mt Schoata, *Schimper* 1391 (P, holo.; K, iso.)

Perennial, fairly robust, succulent, up to 70 cm tall, with a slightly swollen pseudobulb, up to 1 cm in diameter, with a short rhizome and sometimes with 1–5 cm long stolons; culms tufted, 15–60 cm long, 1–3 mm wide, trigonous, glabrous. Leaves many at the base, up to 40 cm long; leaf sheath uncoloured or pale brown, sometimes partly purplish, 3–8 cm long; leaf blade linear, often inrolled or folded, 16–34 cm long, 1.3–5.1 mm wide, scabrid on margin, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–4, lowermost 3–12 cm long, 1.2–3 mm wide. Inflorescence a simple anthela, sometimes very loosely capitate, primary branches 0–4, 0–3.7 cm long; spikelets in loose clusters, sessile and at the end of primary branches, 3–10 per



FIG. 36. *CYPERUS AMAUROPUS*— 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 4$; 3, glume, $\times 10$; 4, flower, $\times 10$; 5, nutlet, $\times 16$. 1 & 5 from Faden, Faden & Evans 74/635, 2–4 from Carter & Stannard 648. Drawn by Juliet Williamson.

cluster, spreading or reflexed, linear-lanceolate, 5.8–24 mm long, 1.6–3.7 mm wide, rachilla straight; glumes pale to dark reddish-brown, ovate-oblong, 3.1–4.2 mm long, 1.4–1.9 mm wide, keel green to reddish-brown, with 4–8 slender veins on either side, apex rounded to acuminate. Stamens 3; filaments 2.8–4.3 mm long; anthers 1.7–2.5 mm long. Nutlet brown, oblong-ellipsoid, trigonous, 1.6–2.1 mm long, 0.5–0.8 mm wide, densely papillose. Fig. 36, p. 238.

UGANDA. Karamoja District: Amedat, 27 May 1939, *Thomas* 2832!; Kigezi District: Shumba Hills, N Ruhiga, Aug. 1949, *Purseglove* 3092!; Ankole District: Nyabushozi, Kyibega km 115, 3 Oct. 1970, *Katende* 613!

KENYA. Nairobi District: below High Commission Headquarters, Nairobi, 22 Apr. 1961, *Polhill* 377!; Narok District: Aitong enclosure, 19 Apr. 1961, *Glover et al.* 681!; Voi District: Tsavo National Park, Voi Gate–Sobo Road, km 14.5, 20 Dec. 1966, *Greenway & Kanuri* 12802!

TANZANIA. Arusha District: Mogasen Hill, 20 Mar. 1966, *Greenway & Kanuri* 12449!; Handeni District: between Turiani & Handeni, between 10–20 km SW of Kideleko, 24 Mar. 1975, *Hooper et al.* 970!; Iringa District: O'Horo Flats, 10 Dec. 1961, *Richards* 15528!

DISTR. U 1, 2; K 1–4, 6, 7; T 1–7; Rwanda, Sudan, Eritrea, Ethiopia, Somalia, Zambia

HAB. In grassland and wooded grassland, on rocky hills, and on shallow soil covering rocks; 450–2100 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus leptophyllus* Steud., Syn. Pl. Glum. 2: 33 (1854), in synonymy; Kük. in E.P 4: 20 (101): 548 (1936)

Mariscus leptophyllus (Steud.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 589 (1894) & in F.T.A. 8: 385 (1902)

M. concinnus C.B. Clarke in J. Bot. 34: 224 (1896) & in F.T.A. 8: 374 (1902). Type: Kenya, Nakuru District: Nagut R., *Gregory* 46 (BM, holo., Aluka!)

Cyperus ibeensis K. Schum. in P.O.A. C: 120 (1895); C.B. Clarke in F.T.A. 8: 369 (1902). Types: Uganda, *Wilson* 751 (K?, not found); Kenya, Kitui, *Hildebrandt* 2657 (B, syn.)

C. concinniformis Kük. in E.P. 4, 20 (101): 548 (1936), *nomen novum* for *Mariscus concinnus* C.B. Clarke, non *C. concinnus* R. Br.

C. leptolepis Kük. in E.P 4: 20 (101): 550 (1936). Type: Tanzania, Tabora District: Ngulu, E of Malongwe towards Tura, km 730–722, *Peter* 34779b (B!, holo.), **syn. nov.**

C. leptophyllus Steud. var. *deliciosus* Kük. in E.P. 4, 20 (101): 549 (1936). Types: Tanzania, Mwanza District: Kagehi, *Fischer* 632 & Lushoto District: W Usambara, Makuyuni, Gomba peak, *Peter* 15486 & Pori, Buiko, *Peter* 41185 (B, syn.)

C. leptophyllus Steud. var. *friesii* (Kük.) Kük. in E.P. 4, 20 (101): 549 (1936). Types: Zimbabwe, Kalombo, *Fries* 1384; Tanzania, Dodoma District: Ugogo, Mt Dodoma, *Peter* 33069 & Saranda, *Peter* 33476 (B, syn.)

C. leptophyllus Steud. var. *ibeensis* (K. Schum.) Kük. in E.P. 4, 20 (101): 550 (1936)

Mariscus amauropus (Steud.) Cufod. in B.J.B.B. 40 (Suppl.): 1448 (1970)

NOTE. *C. leptolepis* is brought into synonymy here; it only differs from typical *C. amauropus* in the rather tighter heads, and the long stolons.

120. *Cyperus tomaiophyllus* K. Schum. in P.O.A. C: 122 (1895); C.B. Clarke in F.T.A. 8: 392 (1902); Kük. in E.P. 4, 20 (101): 429 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 207, fig. 414 (1983); Lye in Fl. Eth. 6: 457 (1997). Type: Tanzania, Kilimanjaro, Rua Stream, *H. Meyer* 272 (B, lecto)

Perennial, very robust, up to 150 cm tall, with a branching, scale-covered woody rhizome up to 2 cm in diameter; culms few, the base covered with brown scales and old leaf bases split by the new culms arising in their axil, culms 45–140 cm long, 3.7–7.8 mm wide, trigonous, glabrous. Leaves up to 100 cm long; leaf sheath dark brown to almost black at base, brown higher up, 5–14 cm long; leaf blade linear, flat or v-shaped, 35–90 cm long, 6–15 mm wide, scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, erect to spreading, 6–12, lowermost 26–50 cm long, 9–19 mm wide. Inflorescence a simple anthela, primary branches 7–15, 1.5–9 cm long; spikelets in long, crowded clusters, sessile and at the end of primary branches, many per cluster, linear-oblong, 5.6–13.5 mm long, 1.2–2.5 mm wide, rachilla straight, falling off

entire when mature; glumes pale brownish with uncoloured margin, oblong-lanceolate, 4–6.7 mm long, 1.8–2.1 mm wide, keel with 5–7 slender veins on each side, apex acute. Stamens 3; filaments 5.2–7 mm long; anthers 2.8–3.4 mm long. Nutlet brown, oblong, trigonous, 2.2–3.5 mm long, 0.6–0.7 mm wide, minutely papillose.

UGANDA. Kigezi District: Virunga Mts, between Sabinio and Thaghina, *Eggeling* 1081 & Karaba Gap, 1.6 km Kabale side of PWD camp, 10 Sept. 1952, *Norman* 1811; Mbale District: Sipi Falls, near Kapchorwa, 27 June 1961, *Haines* 4153!

KENYA. Nandi District: near Kapsabet area, 14 June 1984, *Siemens* 501; South Nyeri District: S slope of Mt Kenya, 1st bridge after Castle Forest Station, 14 Dec. 1966, *Wood* 7791; Londiani District: Nyanza Province, Tinderet Forest Reserve, Camp 2, 22 July 1949, *Maas Geesteranus* 5124!

TANZANIA. Moshi District: Mt Kilimanjaro, Mandara Hut area, 15 Nov. 1993, *Grimshaw* 93/959!; Morogoro District: S Uluguru Forest Reserve, Lukwangule Valley, Mar. 1955, *Semsei* 2064!; Mbeya District: Kikondo Camp, Poroto Mts, 20 Jan. 1961, *Richards* 13967!

DISTR. U 2, 3; K 3–6; T 2, 6, 7; Nigeria, Cameroon, Congo-Kinshasa, Rwanda, Ethiopia

HAB. Montane swamps, wet places in forests, forest edges, damp grassy slopes; 1800–2900 m

CONSERVATION NOTES. Least Concern (LC)

SYN. *Cyperus alpestris* K. Schum. in P.O.A. C: 122 (1895). Type: Tanzania, Kilimanjaro, Mawenzi, Ruasi stream, *Volkens* 872 (B, holo.)

Mariscus tomaiophyllus (K. Schum.) C.B. Clarke in F.T.A. 8: 392 (1902)

M. alpestris (K. Schum.) C.B. Clarke in F.T.A. 8: 401 (1902)

M. magnus C.B. Clarke in E.J. 38: 134 (1906). Type: Tanzania, Lushoto District: Usambara, Kwai, *Albers* 145 (B, holo.)

Cyperus tomaiophyllus K. Schum. var. *magnus* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 429 (1936). Types: 8 specimens mentioned, including *Fries* 1904, 2212, *Schantz* 827, *Peter* 614, 967, *Albers* 145, *Mildbraed* 1670 (B, syn.)

C. tomaiophyllus K. Schum. var. *alpestris* (K. Schum.) Kük. in E.P. 4, 20 (101): 430 (1936). Types: Tanzania, Kilimanjaro, Mawenzi, *Volkens* 872 & Moshi District: Useri, *Haarer* 1702 (B, syn.)

121. ***Cyperus impubes*** Steud. in Syn. Plant. Glum. 2: 45 (1854); Kük. in E.P. 4, 20 (101): 492 (1936); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 209, fig. 419 (1983) & *Fl. Eth.* 6: 457, fig. 212.102 (1997). Type: Ethiopia [Abyssinia], *Schimper* s.n. (B, holo.)

Perennial to 80 cm, rather robust; culms clustered or slightly spaced from a thick horizontal rhizome, triangular, 40–80 cm long, 1.5–3 mm thick, glabrous. Leaves with sheaths 2–10 cm long, pale reddish brown; blade 10–50 cm long, 3–7 mm wide, scabrid on margins and midrib, apex acute to acuminate. Involute bracts 4–8, erect or spreading, the lowermost 11–30 cm long. Inflorescence simple, with 1 sessile and 5–9 stalked spikes, the stalks to 5 cm long; spikes cylindrical, 12–55 × 7–17 mm, with many densely set spikelets; spikelets spreading, linear-lanceolate, 5–9 × 1–1.3 mm, falling off entire when mature, rachilla winged; glumes red-brown to dark red-brown, oblong-elliptic, 3–4 mm long, many-veined and with pale green midrib. Stamens 3, anthers 2 mm long. Stigma 3-branched. Nutlets whitish (or not seen mature?), oblong, 1.3–2.1 × 0.5–0.7 mm, triangular, ± smooth.

KENYA. Northern Frontier District: Mathews Range, Mandasion, Dec. 1960, *Kerfoot* 2565! 2566!; Trans Nzoia District: Cherangani E of Kitale, May 1949, *Maas Geesteranus* 4701!; Embu District: Kiangombe, Nov. 2000, *Smith, Beentje & Muasya* 280!

TANZANIA. Musoma District: Moru kopjes, Apr. 1962, *Greenway, Turner & van Rensburgh* 10584! & Klein's Camp, Nov. 1953, *Tanner* 1806!; Kilimanjaro, Legumishera Hill, Dec. 1993, *Grimshaw* 93/1314!

DISTR. K 1, 3–5; T 1, 2, ?3 (see note); Eritrea, Ethiopia, Somalia; Soqotra

HAB. Stream sides, forest clearings and -margins, secondary vegetation derived from forest, rocky sites; 1350–2250 m

CONSERVATION NOTES. Least concern

SYN. *Mariscus impubes* (Steud.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28: 12 (1971)

Cyperus impubes Steud. var. *brevispiculosus* Kük. in N.B.G.B. 9: 306 (1925) & in E.P. 4, 20 (101): 492 (1936). Type: Kenya, Kisumu-Londiani District: Lumbwa, Gwonongween, *Fries & Fries* 2766 (B, holo., not found)

NOTE. Haines & Lye state this is very rare in Uganda, and cite is *Haines* 4473 from Uganda, Sebei, Bukwa. I (HB) have not seen any specimens from Uganda.

Kükenthal in E.P. 4, 20 (101): 492 (1936) includes *Mariscus procerus* A. Rich. as a synonym; he specifically excludes *Cyperus procerus* Rottb. He includes a specimen from Tanzania not seen by me, HB (Usambaras, *Holst* 306a). He also has *C. rohlfssii* as a variety of this taxon; we have that as a species in its own right!

122. ***Cyperus turrillii*** Kük. in F.R. 29: 199 (1931); Haines & Lye, *Sedges & Rushes E. Afr.*: 201, fig. 402 (1983). Type: Angola, Benguella, country of the Ganguellas and Ambuellas, *Gossweiler* 3723 (B, BM!, K!, syn.); Zimbabwe, *Wilde* 81, 83; Botswana, *Kaessner* 2061 (B, syn.)

Perennial, fairly robust, up to 60 cm tall with a short creeping rhizome; culms rather crowded, 30–50 cm long, 1–2.1 mm wide, basal part bulbous, 6–8 mm in diameter, trigonous, glabrous. Leaves up to 38 cm long; leaf sheath grey to pale reddish-brown, thin, only at the very base torn into fibres, 4–7.5 cm long; leaf blade linear, flat, 15–31 cm long, 2.3–5.1 mm wide, scabrid at least along the margin, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–4, lowermost 3–12 cm long, 2–4.5 mm wide. Inflorescence a simple anthela, primary branches 1–5, 1.5–8 cm long; spikelets in loose clusters, sessile and at the end of primary branches, 4–15 per cluster, sometimes reflexed, linear to narrowly ovate, 4.7–9.2 mm long, 2.4–3.3 mm wide, spreading when nutlets mature, spikelet falling off as a unit, rachis straight; glumes green, golden or reddish-brown, ovate, spreading, 3.2–4.6 mm long, 1.7–2 mm wide, keel with 3–4 strong veins on either side, apex acute to acuminate. Stamens 3; filaments 4–5 mm long, anthers 1.3–1.5 mm long. Nutlet brown to brownish black, ellipsoid to obovoid, strongly trigonous, 2.1–2.8 mm long, 1.1–1.4 mm wide, minutely papillose.

TANZANIA. Songea District: ± 5 km E of Gumbiro, 25 Jan. 1956, *Milne-Redhead & Taylor* 8422! & just E of R. Mtandazi W of Gumbiro, 26 Jan. 1956, *Milne-Redhead & Taylor* 8547!

DISTR. T 8; Congo-Kinshasa?, Angola, Zambia

HAB. In *Brachystegia* woodland on sand; 800–900 m

CONSERVATION NOTES. Least concern - this is a common habitat.

SYN. *Mariscus laxiflorus* Turrill in K.B. 1914: 171 (1914). Type as for *C. turrillii*, as there were already two *Cyperus laxiflorus*.

NOTE. Easy to recognize by its lax-flowered spikelets and few, often reflexed, spikelets per spike.

123. ***Cyperus schimperianus*** Steud. in Syn. Pl. Glum. 2: 34 (1854); C.B. Clarke in F.T.A. 8: 358 (1902); Kük. in E.P. 4, 20 (101): 84 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 184, fig. 355 (1983) & Fl. Eth. 6: 447 (1997). Type: Ethiopia, near Adua, *Schimper* 57 (P, holo.; K, iso.)

Perennial, robust, up to 105 cm tall, with a woody rhizome covered in brown to blackish scales; culms 56–94 cm long, 2–4 mm wide, trigonous, sometimes almost rounded near the apex, slightly longitudinally ridged, smooth. Leaves up to 30 cm long; leaf sheath grey to reddish-brown, 10–21 cm long, fairly wide and loosely surrounding the culm; leaf blade linear, flat, glabrous to slightly scabrid, 4–10 cm long, 1.5–3 mm wide, apex acute to acuminate, slightly scabrid. Involucral bracts leaf-like, spreading, 4–6, lowermost 19–30 cm long, 2–6 mm wide. Inflorescence simple, primary branches 4–9, 2–9 cm long; spikelets in loose clusters at the end of primary branches, 6–14 per cluster, linear-lanceolate, 9.5–22 mm long, 1–2.5 mm wide; glumes reddish-brown, sometimes pale, ovate-lanceolate, glabrous, 1.3–2.5 mm long, 0.6–1.6 mm wide, keel flat, apex rounded. Stamens (2–)3: filaments 1.3–2.4 mm long; anthers 0.8–1.8 mm long. Nutlet grey-brown, (narrowly) ellipsoid-obovoid, 0.9–1.6 mm long, 0.3–0.6 mm wide, smooth to slightly papillose in longitudinal rows.

UGANDA. Acholi District: Gulu, R. Aswa, 10 Nov. 1945, *Thomas* 4336!

KENYA. West Suk District: Suam River, Kacheliba, 1 Jan. 1937, *Thomas* 2117!; Nairobi District: Nairobi National Park, 19 June 1949, *Bogdan* 2488!; Machakos District: Bushwhackers Safari Camp, Masaleni, 23 Apr. 1969, *Napper & Kanuri* 2061!

TANZANIA. Ufipa District: Rukwa, Muse River, 14 June 1956, *Robinson* 1651!; Iringa District: near Great Ruaha River, 9 km W of Kidatu Bridge, 13 July 1970, *Thulin & Mhoro* 404!; Mbeya District: Road Mbeya–Chimale 32 km from Mbeya, 30 Aug. 1964, *Richards* 19091!

DISTR. U 1; K 2, 4; T 4, 7; Cameroon, Congo-Kinshasa, Sudan, Ethiopia

HAB. On sandy or stony river banks, near or in water; 450–1600 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

NOTE. Easy to recognize with its wide leaf sheaths and short leaf blades.

124. *Cyperus tenuiculmis* Boeck. in *Linnaea* 36: 286 (1870); Haines & Lye, *Sedges & Rushes E. Afr.*: 196, figs. 388, 389 (1983). Types: Sierra Leone, *Afzelius* s.n.; Nigeria, Nupe, *Barter* s.n.; E India, Khasia Hills, *Hooker?* s.n.; Indonesia, Batavia, *Junghuhn* s.n.; Sri Lanka, *Thwaites* s.n.; Philippines, Luzon, *Haenke* s.n., *Meyen* s.n. (B, syn.)

Perennial, medium-sized to robust, up to 150 cm tall, with a rather thick creeping rhizome and swollen stem-bases; culms 34–116 cm long, 0.8–5 mm wide, trigonous to triquetrous, smooth to scabrid, sometimes only scabrid just below the inflorescence. Leaves up to 65 cm long; leaf sheath green to brown, 2.5–10 cm long; leaf blade sometimes rather stiff, linear, flat, 12–55 cm long, 2.5–11 mm wide, with multiple major veins, scabrid on margins and major veins, apex acute to acuminate. Involucral bracts leaf-like, erect to spreading, 2–5, lowermost 6.5–28 cm long, 2–6.4 mm wide. Inflorescence simple (sometimes compound), primary branches 3–10, 2.5–25 cm long; spikelets in loose clusters, at the end of primary (sometimes secondary) branches, 2–11 per cluster, linear-lanceolate, 15–46 mm long, 1.6–2.2 mm wide, rachilla strongly zig-zag when glumes are shed; glumes pale brown to dark reddish brown, ovate, 2.7–4.1 mm long, 1.6–2.2 mm wide, keel green, sometimes excurrent, apex rounded, acute to acuminate. Stamens 3; filaments 1.9–4.1 mm long; anthers 0.6–1.4 mm long. Nutlet dark reddish-brown to almost black, obovoid-ellipsoid, trigonous, 1.6–2 mm long, 0.8–1.1 mm wide, minutely papillose.

1. Culms 1.3–5 mm wide, scabrid; leaf blade 2.5–11 mm wide; glumes excurrent a. var. *schweinfurthianus*
Culms 0.8–2 mm wide, smooth; leaf blade 3–4.8 mm wide; glumes not or slightly excurrent 2
2. Glumes pale or yellowish-brown; nutlet 1.6–1.9 mm long b. var. *tenuiculmis*
Glumes reddish brown; nutlet 1.9–2 mm long c. var. *guineensis*

a. var. *schweinfurthianus* (Boeck.) *Hooper* in K.B. 26: 578 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 197, fig. 390 (1983). Type: Sudan, Seriba Ghattas, *Schweinfurth* 2318 (K!, iso.)

Culm 1.3–5 mm wide, scabrid. Leaf blade 2.5–11 mm wide. Glumes pale to yellowish-brown, excurrent. Nutlet 1.6–1.9 mm long.

UGANDA. Kigezi District: Buambara, Nov. 1950, *Purseglove* 3504!; Busoga District: near Namatumba, July 1926, *Maitland* 1098!; Mubende District: Singo County, SW of Biko Hill, 4 Mar. 1970, *Lye et al.* 5138!

TANZANIA. Kigoma District: Mwangi Market, near junction of Kasulu and Ujiji roads, 15 June 1980, *Hooper & Townsend* 1988!

DISTR. U 1–4; T 4; widespread through west tropical and central Africa

HAB. In dry or damp grasslands, ditches, marshy ground and swamp; 1050–1450 m

CONSERVATION NOTES. Least Concern (LC) due to its common habitat and wide distribution

SYN. *Cyperus schweinfurthianus* Boeck. in *Flora* 62: 553 (1879); C.B. Clarke in F.T.A. 8: 361 (1902) *C. zollingeri* Steud. var. *schweinfurthianus* (Boeck.) Kük. in E.P. 4, 20 (101): 134 (1936)

NOTE. This variety is distinguishable from var. *tenuiculmis* by its coarse habit and its excurrent keel on the glumes. It has been accepted with some doubt, as there are some intermediates between var. *tenuiculmis* and var. *schweinfurtianus*; specimens with a coarse habit, glabrous culms, and slightly excurrent glumes.

b. var. **tenuiculmis**

Culm 0.8–2.2 mm wide, smooth. Leaf blade 3–4.8 mm wide. Glumes pale to yellowish-brown, not or slightly excurrent. Nutlet 1.6–1.9 mm long.

UGANDA. Mengo District: Entebbe ferry, 2 Dec. 1955, *Langdale-Brown* 1633! & km 21 Entebbe Road, Jan. 1938, *Chandler* 2119!; Masaka District: Bugabo, SW of Lake Nabugabo, 1 Jan. 1969, *Lye et al.* 1786!

TANZANIA. Mwanza District: Nyakato, near Mwanza, Apr. 1935, *Gillman* 255!; Tabora District: 20 km from Chagu towards Kaliua, 20 June 1980, *Hooper & Townsend* 2093!; Masasi District: Chidya, Kambona Forest Reserve, 12 Mar. 1991, *Bidgood et al.* 1923!

DISTR. U 4; T 1, 3–5, 8; widespread through west tropical and central Africa, to Angola and Malawi; S and SE Asia

HAB. Seasonally wet grassland, seepage areas, road margins and drainage ditches, usually on sandy soil; 650–1250 m

CONSERVATION NOTES. Least Concern

SYN. *Cyperus zollingeri* Steud. var. *longiramulosus* Kük. in E.P. 4, 20 (101): 135 (1935). Types from West Africa, Congo-Kinshasa and Angola, plus Tanzania, Kigoma District: Machaso near Kigoma, *Peter* 37039 (B, syn.)

c. var. **guineensis** (*Nelmes*) *Hooper* in K.B. 26: 583 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 198 (1983). Type: Liberia, Western Province, Vonjama, *Baldwin* 9901 (K!, holo.)

Culms 1.5–1.7 mm wide, smooth. Leaf blade 2.5–3.2 mm wide. Glumes (dark) reddish-brown, keel slightly excurrent. Nutlet 1.9–2 mm long.

UGANDA. Masaka District: Sese, Bugala Island, 19 Feb. 1933, *Thomas* 807!

DISTR. U 4; Guinea, Burkina Faso, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon

HAB. Waste ground; 1190 m

CONSERVATION NOTES. Least Concern due to wide distribution

SYN. *Cyperus guineensis* *Nelmes* in K.B. 6: 165 (1951)

125. ***Cyperus nutans*** *Vahl*, Enum. Pl. 2: 363 (1806). Type: India E, *Königs.n.* (C, holo.)

Perennial, fairly robust, up to 72 cm tall, with a thick, sometimes nodular, creeping rhizome and many crowded roots; culms few, 36–60 cm long, 2–3.8 mm wide, trigonous, glabrous. Leaves up to 60 cm long; leaf sheath greenish, yellow or reddish-brown, 4–21 cm long, rather wide; leaf blade linear, flat, w-shaped, 19–45 cm long, 2.9–8 mm wide, scabrid on margin and primary vein, at least near apex, apex acuminate. Involucral bracts leaf-like, spreading, 3–6, lowermost 22–34 cm long, 4.3–8 mm wide. Inflorescence a simple to compound anthela, primary branches 4–7, 2–9 cm long; spikelets in crowded spikes, sessile and at the end of primary branches, many per spike, ovoid, 5.1–8.3 mm long, 2–3.3 mm wide, rachilla straight; glumes reddish brown, margins pale, concave, 1.9–2.8 mm long, 1.3–1.6 mm wide, keel strongly excurrent, with prominent lateral veins on either side, apex mucronate. Stamens 3; filaments 1.7–2.9 mm long. Nutlet dark brown, obovoid-oblong, trigonous, 1.4–1.7 mm long, 0.6–0.8 mm wide, minutely papillose.

var. **eleusinoides** (*Kunth*) *Haines* in Bot. Bihar Orissa 5: 898 (1924); Haines & Lye, *Sedges & Rushes E. Afr.*: 198, figs. 393, 394 (1983) & Fl. Eth. 6: 453, fig. 212.95 (1997). Type: India, East, *Wallich* 3346B (K!, holo.)

UGANDA. Acholi District: Lamwo County, 6–8 km SE of Palabek, 18 Feb. 1969, *Lye & Lester* 2135!; Karamoja District: Napenyenya, River Nakwanyet, 6 Jan. 1937, *Thomas* 2185!; Mbale District: Sebei, km 62 on Mbale to Great River road, 17 Jan. 1955, *Norman* 248!

KENYA. Trans-Nzoia District: 24 km E of Kitale, Cherangani Hills, Nov. 1961, *Bogdan* 5308!

TANZANIA. Biharamulo District: 11 km W of Ushirombo, Jan. 1962, *Boaler* 472!

DISTR. U 1, 3; K 3; T 1; Nigeria, Sudan, Eritrea, Ethiopia, Mozambique; Asia and Australia

HAB. Stream sides and swampy grassland; 1000–1950 m

CONSERVATION NOTES. Least concern

SYN. *Cyperus eleusinoides* Kunth, Enum. Pl. 2: 39 (1837); C.B. Clarke in F.T.A. 8: 350 (1902); Kük. in E.P. 4, 20 (101): 144 (1936)

Cyperus nutans Vahl subsp. *eleusinoides* (Kunth) T. Koyama, Gard. Bull. Singapore 30: 136 (1977)

126. *Cyperus digitatus* Roxb., Hort. Bengal.: 81 (1814) & Fl. Ind. 1: 205 (1832); Kük. in E.P. 4, 20 (101): 55 (1936)

Perennial, robust, up to 2 m high, with a thick woody creeping, scale-covered rhizome, 1–1.5 cm in diameter; culms spaced in a row on the horizontal rhizome, 77–153 cm long, 0.5–1 cm wide, triquetrous, sometimes ± winged, smooth to scabrid on the margins. Leaves few, up to 100 cm long; leaf sheath reddish to yellowish-brown, 10–30 cm long; leaf blade 18–85 cm long, 0.7–1.9 cm wide, linear 2 main veins next to primary vein, flat, scabrid on the veins and margins, apex acuminate. Involucral bracts 2–4, leaf-like, spreading, lowermost 15.5–67 cm long, 1–1.9 cm wide. Inflorescence simple to compound, primary branches 3–8, 2.7–12 cm long, prophylls 1.5–2.5 cm long; spikelets in crowded clusters on elongated axis, sessile and at the end of primary and secondary branches, 20–many per cluster, 4.5–13.5 mm long, 0.6–0.9 mm wide, linear, terete or angular; glumes reddish brown to golden, elliptic to obovate, 1.9–2.4 mm long, 0.7–1.3 mm wide, keel green, acute, 3–4-veined, apex (shortly) mucronate. Stamens 3; filaments 2–2.6 mm long; anthers 0.9–1.6 mm long. Nutlet dark grey, narrowly ellipsoid-oblong, trigonous-triquetrous, 1.3–1.6 mm long, 0.3–0.4 mm wide, minutely papillate in longitudinal rows.

subsp. *auricomus* (*Spreng.*) Kük. in Bot. Notis. 1934: 65 (1934); Kük. in E.P. 4, 20 (101): 57 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 178 (1983) & Fl. Eth. 6: 443, fig. 212.75 (1997). Type: 'Aegypt. infer.' (ubi?)

UGANDA. Kigezi District: Kisisi road, 1.6 km from Kabale–Mbarara road junction, 26 Mar. 1952, *Norman* 99!; Busoga District: Lumbuye swamp crossing, 6.5 km SE of Nawaikoke, Bulamogi Co., 15 May 1953, *Wood* 983! & Nawange Swamp, *Lind* 175!

KENYA. Naivasha District: Lake Naivasha, 23 Mar. 1947, *Bogdan* 440! & in front of Lake Hotel, 7 June 1976, *Kahurananga & Kibui* 2840!; Nairobi District: 13 km N of Nairobi, 13 May 1949, *Bogdan* 2456!

TANZANIA. Mbulu District: Karatu Swamp, 18 June 1946, *Greenway* 7781!; Ufipa District: Kale Plain near Lake Sundu, 24 Nov. 1960, *Richards* 13613!; Songea District: ± 8 km W of Songea by R. Wuwawezi, 9 Feb. 1956, *Milne-Redhead & Taylor* 8730!

DISTR. U 2–4; K 3, 4, 6; T 1–5, 7, 8; widespread in west, central, and southern Africa

HAB. In swamps or near water, seasonally wet grasslands, on black alluvial soil; 350–2250 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus auricomus* Spreng. in Syst. Veg. 1: 230 (1824); C.B. Clarke in F.T.A. 8: 373 (1902)

C. aureorufus Boeckeler in Linnæa 38: 369 (1874). Type: Ethiopia, Silen-Uha, *Schimper* 1403 (B, holo.)

127. *Cyperus exaltatus* Retz. in Observ. Bot. 5: 11 (1788); C.B. Clarke in F.T.A. 8: 370 (1902); Kük. in E.P. 4, 20 (101): 64 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 179, fig. 342 (1983) & Fl. Somalia 4: 120 (1995) & Fl. Eth. 6: 444 (1997). Type: India, Tranquebar, *König* s.n. (LD, holo.)

Perennial, very robust, up to 180 cm tall, with crowded culms on a short woody rhizome, 1 cm in diameter, the scales of the rhizome breaking up in fibrous remains; culms crowded, 40–150 cm long, 3–15 mm wide, trigonous, glabrous, the base slightly swollen. Basal leaves many; leaf sheath green to purple, 7–15 cm long; leaf blade linear, flat, up to 64–140 cm long, 8–35 mm wide, scabrid on margins and primary vein, apex acuminate. Involucral bracts leaf-like, spreading, 5–9, lowermost 20–75 cm long, 8–28 mm wide. Inflorescence a simple to compound anthela, primary branches 7–11, 5–29 cm long; spikelets in dense, elongate clusters, sessile and at the end of primary and secondary branches, 15–120 per cluster, 3.4–12 mm long, 1–1.7 mm wide, rachilla straight; glumes reddish-brown to golden with darker reddish-brown margin, ovate-elliptic, 1.2–2.9 mm long, 1.1–1.5 mm wide, keel green, with 2–3 veins on either side, apex acuminate to mucronate. Stamens 3; filaments 1.3–2.7 mm long; anthers 0.7–0.8 mm long. Nutlet greyish, ellipsoid, trigonous, 0.6–1 mm long, 0.4–0.6 mm wide, almost smooth.

var. **exaltatus**

Culms 3–10 mm wide; leaf blade 8–12 mm wide. Involucral bracts 8–12 mm wide; spikelets 6–12 mm long. Glumes 1.8–2.9 mm long.

UGANDA. Karamoja District: Napyenenya, at base of Mt Kadam [Debasien], Jan. 1936, *Eggeling* 2561! & Dam 'Lomasiruk', 12 Feb. 1957, *Dyson-Hudson* 156! & Napak, 26 June 1966, *Haines* 4175! KENYA. Machakos District: Nairobi–Taka Market, km 40, 30 Mar. 1969, *Napper & Greenway* 1985!; Tana River District: 2 km S of Ngao, 1 Mar. 1977, *Hooper & Townsend* 1128! & Tana River National Primate Reserve, Mchelelo, 11 Mar. 1990, *Kabuye et al.* 113!

TANZANIA. Morogoro District: between Mvomero and Turiani, 23 Mar. 1975, *Hooper et al.* 939!; Mikindani District: Mtwara–Lindi Road, 32 km from Mtwara, 11 Mar. 1963, *Richards* 17821!

DISTR. U 1, 3; K 4, 7; T 3, 6, 8; widespread in tropical west and central Africa, down into Angola; S and SE Asia, Australia, Central and S America

HAB. Along water edges, in swamps and in open water; sea-level to 1800 m

CONSERVATION NOTES. Least Concern (LC)

var. **dives** (*Del.*) *C.B. Clarke* in Journ. Linn. Soc. 21: 187 (1884) & in F.T.A. 8: 370 (1902). Type: Egypt (ubi?)

Culms 5–15 mm wide; leaf blade 13–35 mm wide. Involucral bracts 14–28 mm wide; spikelets 3.4–7 mm long. Glumes 1.2–1.7 mm long.

UGANDA. Kigezi District: Kashamba near Kinkisi Junction, 7 June 1952, *Norman* 129!; Mbale District: Bukwa, 22 Jan. 1966, *Haines* 4058!; Mengo District: Entebbe, Oct. 1922, *Maitland* 249!

KENYA. Machakos District: Kiboko Tsetse Fly Expt. area, Lesser Kiboko River, 22 Feb. 1949, *Bogdan* 2390!; Kiambu District: Kabete, 17 Apr. 1947, *Bogdan* 508! & S side of Thika River, 15 Dec. 1968, *Faden* 68/925!

TANZANIA. Musoma District: Mara River, 24 km above Mara River, Guard Post, 5 Oct. 1961, *Greenway & Turner* 10259!; Masai District: Ngorongoro Crater, SE side, 5 July 1966, *Greenway & Kanuri* 12544!; Pare District: River Ruvu, 5 Nov. 1955, *Milne-Redhead & Taylor* 7050!; Zanzibar: Mahonda swamp, Feb. 1962, *Faulkner* 3345!

DISTR. U 2–4; K 1, 3, 4, 6, 7; T 1–3, 7; Z; Senegal, Ivory Coast, Nigeria, Congo-Kinshasa, Rwanda, Burundi, Sudan, Eritrea, Ethiopia, Somalia, Zambia, Malawi, Mozambique, Botswana; Egypt

HAB. In swamps, on river-banks and in open water; sea-level up to 2450 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution

SYN. *Cyperus dives* Delile in Descr. Egypte, Hist. Nat.: 149, fig. 3 (1813); Kük. in E.P. 4, 20 (101): 68 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 180, figs. 344, 345 (1983) & Fl. Somalia 4: 120 (1995) & Fl. Eth. 6: 444 (1997)

C. immensus C.B. Clarke in J.L.S. Bot. 20: 294 (1883) & F.T.A. 8: 371 (1902); Kük. in E.P. 4, 20 (101): 67 (1936). Type: Madagascar NE, *Pervillé* 483 (P, holo.)

C. petherickii C.B. Clarke in F.T.A. 8: 371 (1902). Type: Sudan, White Nile, banks of the Nile in Dinka Territory, *Petherick* s.n. (K!, P!, iso.)

C. immensus C.B. Clarke var. *taylori* C.B. Clarke in F.T.A. 8: 372 (1902). Types: Kenya, Rabai Hills, *Taylor* s.n. & Zanzibar, *Taylor* s.n. (BM, syn.)

C. immensus C.B. Clarke var. *petherickii* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 67 (1935)

NOTE. *C. dives* has been kept separate based on more many and more crowded spikelets and slightly shorter glumes (1.2–1.7 mm instead of 1.8–2.9 mm). These are gradual rather than qualitative characters, and I (HB) have decided to re-instate varietal status for *dives*. The taxa occur in the same area and in the same type of habitat.

Also close to *C. alopecuroides*, which differs in glumes with rounded keel and flattened nutlets.

128. ***Cyperus kwaleensis*** *Lye* in Nordic Journ. Bot. 3: 221 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 186, fig. 361 (1983). Type: Kenya: Kwale District: near Taru between Samburu and Mackinnon Road, *Drummond & Hemsley* 4204 (BR, holo.; EA, K!, iso., Aluka!)

Perennial, robust, tussocky, with a short woody rhizome; culms tufted, 35–50 cm long, 1.5–2.5 mm wide, trigonous, glabrous. Leaves many from the base, with leaf sheath pale reddish brown; blade linear, channelled, stiff, 20–40 cm long, 1–5 mm wide, scabrid on margin. Involucral bracts leaf-like, spreading, 3–5, lowermost 20–35 cm long. Inflorescence a simple to compound anthela 8–15 cm in diameter, with 1–2 (sub-)sessile spikes and 5–7 stalked spikes on stalks 2–12 cm long and consisting of 12–22 spikelets; spikelets in loose clusters, at the end of primary and secondary branches, linear, rather turgid, 10–25 mm long, 1.5–2 mm wide, rachis straight; glumes reddish-brown, margin \pm uncoloured, ovate, 3–3.5 mm long, keel green, with 4–6 obscure veins on each side, apex acute. Stamens 3. Style 3-branched. Nutlet ellipsoid, trigonous, \pm 1.4 mm long, \pm 0.6 mm wide, apiculate, minutely papillose.

KENYA. Kwale District: near Taru between Samburu and Mackinnon Road, 1953, *Drummond & Hemsley* 4204!

DISTR. K 7; known only from the type

HAB. On shallow sandy soil over outcropping rocks; \pm 360 m

CONSERVATION NOTES. Needs information on current status of habitat.

NOTE. Similar to *C. rotundus*, but not producing stolons, and larger and tussocky; also the spikelets are slightly longer.

129. ***Cyperus maranguensis*** *K. Schum.* in P.O.A. C: 120 (1895); C.B. Clarke in F.T.A. 8: 359 (1902); Kük. in E.P. 4, 20 (101): 128 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 194, figs. 381, 382 (1983) & Fl. Eth. 6: 448 (1997). Type: Tanzania: Kilimanjaro, Marangu, *Volkens* 649 (B, holo.; K!, iso.)

Perennial, up to 125 cm tall, with slightly swollen stem base from a short woody nodular rhizome; culms few, 25–109 cm long, 1.4–4 mm wide, trigonous with longitudinal grooves, smooth. Leaves up to 84 cm long; leaf sheath pale brown to greenish, often papery, 3–16 cm long; leaf blade linear, flat or plicate, 15–68 cm long, 5–12 mm wide, scabrid on margins and veins, apex acute to acuminate. Involucral bracts leaf-like, spreading, 3–6, lowermost 10.5–58 cm long, 5–11 mm wide. Inflorescence simple to compound, primary branches 5–8, 2–19 cm long; spikelets in loose clusters on elongated axis, at the end of primary and secondary branches, 14–25 per cluster, linear, 12–34 mm long, 1.1–2.4 mm wide; glumes olive green to bluish grey, ovate, 2.1–3 mm long, 1.1–1.8 mm wide, keel indistinct, apex acute. Stamens 3; filaments 1.6–2.9 mm long; anthers 0.8–1.1 mm long. Nutlet brown, ellipsoid-oblong to obovoid, 1.4–1.8 mm long, 0.5–0.65 mm wide, papillose in longitudinal rows.

UGANDA. Mbale District: Sebei, Mt Elgon, Chesoweri, near Nyalit River, 4 July 1971, *Lye & Katende* 6423!; Mengo District: Kampala, Makerere Hill, 11 Jan. 1966, *Haines* 4023! & km 9.5 Bombo road, Oct. 1930, *Herb. staff* 2309!

KENYA. Northern Frontier District: Marsabit Forest, Aug. 1957, *Verdcourt* 1825!; Machakos/Masai District: Chyulu Hills, Main Forest N camp 3; 17 Feb. 2001, *Luke et al.* 7351!; Teita District: Sagala Hills, E side on road to Sagala, 1 May 1981, *Gilbert & Gilbert* 6108!

TANZANIA. Arusha District: Ngurdoto National Park, Ngurdoto Crater Forest Shade, 5 May 1965, *Richards* 20348!; Lushoto District: Lushoto–Magamba Road, 26 June 1965, *Semsei* 3949!; Morogoro District: Uluguru Mts, on hillside E of Morningside, 21 Mar. 1975, *Hooper & Townsend* 917!

DISTR. U 3, 4; K 1, 4, 6, 7; T 2, 3, 6, ?7; Ethiopia

HAB. Grassland, swampy grassland, weed of cultivations, roadsides; 800–2150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

130. *Cyperus renschii* Boeck. in *Flora* 65: 11 (1882); C.B. Clarke in *F.T.A.* 8: 345 (1902); Kük. in *E.P.* 4, 20 (101): 206 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 161, figs. 300, 301 (1983). Type: Comoro Islands, Anjouan [Johanna], *Hildebrandt* 1740 ('Herb. Rensch', not found at B)

Perennial, robust, up to 1 m tall, with thick woody rhizome, 1–1.5 cm in diameter; culms tufted, 70–83 cm long, 4–8 mm wide, trigonous to slightly triquetrous, smooth. Leaves many, up to 140 cm long; leaf sheath reddish-purple near the base, 3–13 cm long; leaf blade linear, w-shaped, 68–130 cm long, 1–1.9 cm wide, scabrid on margins and major veins, apex acute. Involucral bracts leaf-like, spreading, 7–9, lowermost 40–90 cm long, 1.1–3 cm wide. Inflorescence compound, with primary, secondary and tertiary branching, primary branches few to many, 3.5–18 cm long; spikelets in small, crowded clusters, at the end of on secondary and tertiary branches, 3–9 per cluster, ovoid, 1.4–3.5 mm long, 0.8–1.9 mm wide; glumes reddish-brown, ovate-lanceolate, 1.3–1.6 mm long, 0.8–1 mm wide, keel green, apex strongly mucronate, recurved. Stamens 3; filaments 1–1.1 mm long; anthers 0.3–0.7 mm long. Nutlet brown, ellipsoid, 0.7–1.1 mm long, 0.5–0.6 mm wide, glabrous to sometimes minutely papillose. Fig. 37, p. 248.

UGANDA. Bunyoro District: Rabongo Forest, 8 May 1993, *Sheil* 1536!; Busoga District: Butembe Bunya, Kagoma L.F.R., 20 km N of Jinja, 25 July 1953, *Wood* 836!; Mengo District: Kipayo, Aug. 1914, *Dümmer* 1001!

KENYA. Masai District: Lebetero Hills, Nguruman Range, Jan. 1961, *van Someren* 12230!; Kwale District: Shimba Hills, Mwele, 1 Dec. 1958, *Moomaw* 1063! & Shimba Hills, Pengo Hill area, 19 Feb. 1965, *Magogo & Glover* 135!

TANZANIA. Bukoba District: Minziro Forest Reserve, ± 2 km E of Kabwoba, 22 Nov. 1999, *Gereau et al.* 6331!; Kigoma District: Gombe Stream Reserve, Kasakela Valley, 10 Feb. 1964, *Pirozynski* 386!; Kilosa District: Mikumi National Park, 30 Apr. 1968, *Renvoize & Abdallah* 1820!

DISTR. U 2–4; K 6, 7; T 1–4, 6, 7; P; widespread in west and central Africa, down into Angola; Comoro Is.

HAB. In forests, forest swamps, along forest streams, occasionally in grassland or roadside; (0–)150–2300 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus deremensis* Engl. in *Abh. Königl. Ges. Wiss.* 39: 50 (1894) & *P.O.A. C.* 119 (1895). Type: Tanzania, Lushoto District: Derema [Nderema], *Holst* 2257 (B, holo.)

C. ochrocarpus K. Schum. in *P.O.A. C.* 122 (1895). Type: Tanzania, Moshi District: Marangu, *Volkens* 903 (B, holo.)

C. renschii Boeck. var. *scabridus* Lye in *Nordic Journ. Bot.* 3: 229 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 162, fig. 302 (1983). Type: Uganda, Toro District: Ntandi, *Haines* 4227 (MHU, holo.; Kl, iso.)

NOTE. Similar to *C. laxus* but much bigger, with smaller spikelets. Plants found in open vegetation have narrower leaves.

131. *Cyperus penzoanus* Pic. *Serm.* in *Miss. Stud. Lago Tana* 7(1): 183 (1951); Haines & Lye, *Sedges & Rushes E. Afr.*: 177, fig. 338 (1983) & *Fl. Eth.* 6: 443 (1997). Type: Ethiopia, border of Lake Tana near Scimbit, *Pichi-Sermollii* 1986 (FT, holo.; Aluka!)

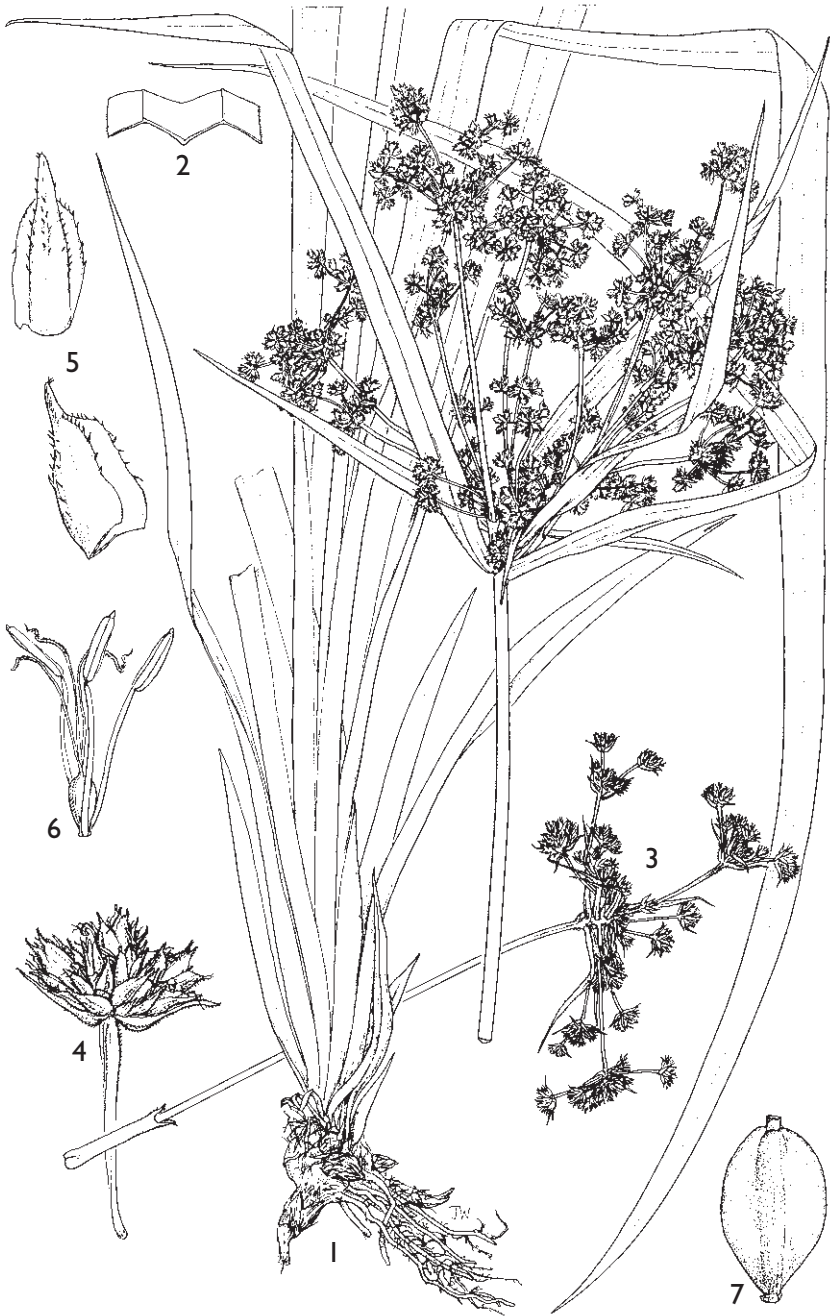


FIG. 37. *CYPERUS RENSCHII* — 1, habit and inflorescence, $\times \frac{2}{3}$; 2, leaf detail, $\times 2$; 3, primary inflorescence branch, $\times 1$; 4, spikelet, $\times 5$; 5, glumes, abaxial and side view, $\times 16$; 6, flower, $\times 16$; 7, nutlet, $\times 20$. 1–2 & 7 from Richards 8327, 3–6 from Mwangoka & Kayombo 85. Drawn by Juliet Williamson.

Perennial with thick woody rhizome; culms closely set on rhizome, 1–3 m long and 1–2 cm thick, sharply triangular to almost winged, glabrous. Leaves reduced to 5–10 cm long blades produced from dark reddish brown sheaths (not fleshy). Involucral bracts green fading to brown, 8–12, leaf-like, suberect, lowermost 8–20 cm long, 1–2 cm wide, glabrous. Inflorescence a compound anthela to 40 × 40 cm, primary branches 15–30, 5–35 cm long, triangular to flattened, at the base of the branches with green tubular prophylls 2–4 cm long; primary branches ending in simple umbels of 1–10 spikes, these spikes 2–4 × 1–2 cm, with many spreading spikelets; spikelets cylindric, 5–9 × 0.7–1.5 mm; glumes pale or reddish brown, sometimes with green midrib, ovate, 1.5–2 mm long, obtuse or with excurrent midrib. Stamens 3. Style 3-branched. Nutlets rarely developing.

UGANDA. Kigezi District: Kashambya, Sept. 1953, *Lind* 213!

KENYA. Naivasha District: E shore of Lake Naivasha, Jan. 1973, *K. Thompson* 23a! & b!

TANZANIA. Kilimanjaro, Mboloti swamp, Mar. 1914, *Peter* 2719!; Pare District: Igoma-Same swamp, Sept. 1987, *Ruffo* 2579!

DISTR. U 2; K 3; T 2, 3; Ethiopia

HAB. Swamps; 1650–1850 m

CONSERVATION NOTES. Data deficient due to rather unclear taxonomy.

NOTE. Haines & Lye state this is intermediate between *C. papyrus* and *latifolius* in most characters – and may represent a hybrid.

132. *Cyperus distans* L.f. in Suppl. Pl.: 103 (1781/1782); C.B. Clarke in F.T.A. 8: 349 (1902); Kük. in E.P. 4, 20 (101): 137 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 200, fig. 398 (1983); Lye in *Fl. Somalia* 4: 132 (1995) & *Fl. Eth.* 6: 455 (1997). Type: India, Linn 70.42 (LINN, lecto.)

Perennial, rarely described as annual, (15–)30–150 cm tall, with a short thick rhizome; stems tufted, usually set in a row, or solitary, trigonous to triangular, green and shiny, 1.5–5 mm in diameter, glabrous, the basal part covered with leaf sheaths. Leaves with leaf sheath grey to dark purple, black on old culms; leaf blade green above, linear, slightly channeled, 5–45 × 0.2–1 cm, scabrid on margin and primary vein, attenuate. Involucral bracts 3–5, leaf-like, erect or spreading, the longest to 33 cm long. Inflorescence a compound umbel-like anthela to 25 cm in diameter, with 5–15 primary branches to 15 cm long; secondary and tertiary branches a few cm long or spikelets sessile; spikelets rather laxly set, often at right angles to axis, brown to pale brown, sometimes tinged with green, 6–20 × 0.5–2 mm; rachilla straight to zig-zag when glumes are spreading, with wide transparent wing on two sides, the spikelet often breaking at base with glumes and nutlets persistent on the rachilla; glumes laxly placed, red-brown with green keel, oblong-elliptic, 1.7–2.6 mm long, 3–5-veined, apex obtuse. Stamens 3. Style with 3 branches, white. Nutlet yellowish when young, grey with metallic shine when mature, narrowly ellipsoid, 1.4–1.7 × 0.4–0.5 mm, minutely papillose in longitudinal rows.

UGANDA. Karamoja District: Nakyranyet R., Jan. 1937, *A.S. Thomas* 2186!; Ankole District: Queen Elizabeth National Park, between Kaizi and Rwempuno Rs., June 1970, *Lye & Katende* 5499!; Mengo District: near Entebbe airport, May 1953, *Lind* 157!

KENYA. Kitui District: 16 km from Mutha on Enyali road, Jan. 2005, *Kirika, Muthoka & Mbale* NMK 461!; Masai District: Ngerendei, Apr. 1961, *Glover, Gwynne & Samuel* 453!; Tana River District: Tana River National Primate Reserve, Baomo, Mar. 1990, *Kabuye et al.* TPR 145!

TANZANIA. Bukoba District: Minziro Forest Reserve, path from Minziro to Mtukula, Mar. 2001, *Festo & Francis* 1043!; Bagamoyo District: Bana Forest reserve, Aug. 1968, *Shabani* 170!; Chunya District: Rungwe Game reserve 1 km W of Itigi–Mbeya road, Jan. 1969, *Chabwela* in CAWM 4007!; Zanzibar, 1868, *Kirk* s.n.!

DISTR. U 1–4; K 2–7; T 1–8; Z; widespread in Africa, Asia and the Americas

HAB. Streambanks, permanently or seasonally swampy or moist sites in shade (within dry bushland/wooded grassland/woodland/forest zones), moist sites in cultivated land, forest margins; 0–1800(–2100) m

CONSERVATION NOTES. Widespread; least concern (LC)

- SYN. *C. distans* L.f. var. *niger* C.B. Clarke in Durand & Schinz, *Consp. Fl. Afric.* 5: 559 (1894), *nom. nud.* & in F.T.A. 8: 350 (1902); Kük. in E.P. 4, 20 (101): 140 (1936). Type: Malawi, Fwambo, *Carson* 14 (K, syn.!) & Ethiopia, *Schimper* 1255 (B!, syn.)
- Mariscus longibracteatus* Cherm. in Bull. Mus. Hist. Nat. Paris 25: 407 (1919). Type: Madagascar, Analamazaotra, *Perrier* 6330 (P, lecto.)
- M. rubrotinctus* Cherm. in Bull. Mus. Hist. Nat. Paris 25: 407 (1919). Types: Madagascar, Mevatanana, *Perrier* 929 (P, lecto.)
- Cyperus keniensis* Kük. in N.B.G.B. 9: 306 (1925), as *keniaensis*. Type: Kenya, N Nyeri District: Liki R., *Fries & Fries* 1476 (B, holo., not found; K!, iso.)
- C. longibracteatus* (Cherm.) Kük. in F.R. 26: 250 (1929) & in E.P. 4, 20 (101): 413 (1936); Lye in Fl. Eth. 6: 455, fig. 212.98 (1997)
- C. longibracteatus* (Cherm.) Kük. var. *rubrotinctus* (Cherm.) Kük. in F.R. 26: 250 (1929) & in E.P. 4, 20 (101): 413 (1936)
- C. distans* L. var. *pseudonutans* Kük. in E.P. 4, 20 (101): 140 (1936). Types: many cited, including Tanzania, Lushoto District: Usambara, *Holst* 2764 (B!, syn.) & *Peter* 23684 (B!, syn.); Tabora District: Ngulu, Malongwe, *Peter* 34632 (B!, syn.) & 45882 (B!, syn.); Bukoba, *Stuhlmann* 3728 (B, syn.)
- C. distans* L.f. var. *crassispiculosus* R. Groß & Kük. in E.P. 4, 20 (101): 141 (1936). Type: Sudan, Gondokoro, *Mearns* 3074 (B, holo.)
- C. longibracteatus* (Cherm.) Kük. var. *subdistans* Kük. in F.R. 26: 250 (1929). Type: Tanzania, Lushoto District: Amani, *Warnecke* 384 (B, not found; K!, iso.)
- Mariscus keniensis* (Kük.) Hooper in J. E.A. Nat. Hist. Soc. 28, no. 124: 12 (1971) & K.B. 26: 579 (1972)
- Cyperus distans* L.f. subsp. *longibracteatus* (Cherm.) Lye in Nordic Journ. Bot. 3: 231 (1983) & in Sedges & Rushes E. Afr.: 201, figs. 399–400 (1983)
- C. distans* L.f. subsp. *longibracteatus* (Cherm.) Lye var. *rubrotinctus* (Cherm.) Lye in Nordic Journ. Bot. 3: 231 (1983) & in Sedges & Rushes E. Afr.: 201, fig. 401 (1983)
- C. distans* L.f. subsp. *longibracteatus* (Cherm.) Lye var. *niger* (C.B. Clarke) Lye in Nordic Journ. Bot. 3: 231 (1983)

NOTE. A widespread and variable species, recognizable by its narrow spikelets in a lax umbel-like compound anthela.

The subspecies *longibracteatus* was considered distinct in its longer involucre bracts and 'slightly larger glumes', with the spikelets falling off entire; these differences are quite gradual, and not enough (I believe) to warrant subspecific status. I hereby put this taxon in the synonymy of *distans* sensu lato. The variety *rubrotinctus*, considered distinct in 'shorter involucre bracts and more reddish spikelets'; and var. *niger*, distinct in 'very dark spikelets and slightly longer glumes' undergo the same fate, for the same reason.

133. ***Cyperus kilimandscharicus*** Kük. in F.R. 21: 326 (1925); Kük. in E.P. 4, 20 (101): 106 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 184, figs. 357, 358 (1983) & Fl. Eth. 6: 448 (1997). Type: Tanzania, Kilimanjaro, Ol Molog, *Endlich* 122 (B, holo.)

Perennial up to 95 cm tall, with a thick creeping woody nodular rhizome, covered by fibrous remains of old scales; culms tufted, 40–72 cm long, 2–2.9 mm wide, trigonous, almost glabrous. Leaves up to 62 cm long; leaf sheath green to pale brown, 3.5–10 cm long; leaf blade linear, flat, 14–52 cm long, 3–4.7 mm wide, scabrid on primary vein, apex acute to acuminate. Involucre bracts leaf-like, erect to spreading, 3–4, lowermost 9.5–38 cm long, 2.9–4.4 mm wide. Inflorescence a compound anthela, primary branches 4–7, 0–6 cm long; spikelets in loose, rather distant spikes, sessile and at the end of primary branches, 3–21 per spike, linear-lanceolate, 4.5–17 mm long, 2.4–3.7 mm wide, rachilla straight; glumes dark reddish-brown to almost black, ovate, 2.7–3.8 mm long, 1.6–1.8 mm wide, keel yellowish to green, slightly excurrent, apex slightly mucronate. Stamens 3; filaments 2.5–3.7 mm long; anthers 1.5–2 mm long. Nutlet greyish, obovoid, trigonous, 1.3–1.7 mm long, 0.5–0.8 mm wide, reticulate with raised cell walls, often in transversely wrinkled pattern.

KENYA. Nairobi District: Njiro Farm, 19 km E of Nairobi, 21 June 1951, *Bogdan* 3086! & Nairobi South, 20 May 1973, *Magogo* 1562!; Machakos District: 65 km from Nairobi on Mombasa road, 25 June 1971, *Lye & Katende* 6301!

TANZANIA. Musoma District: Serengeti, Seronera, 21 Mar. 1961, *Greenway* 9871 & Mbulu District: Mbulumbul, Block AG, 23 June 1944, *Greenway* 6929!; Arusha District: Makuyuni-Arusha road, km 27 from Makuyuni, 31 May 1996, *Faden et al.* 96/3!

DISTR. **K** 4; **T** 1, 2; Ethiopia

HAB. In swamps, seasonal pools, wet grassland and on black cotton soil; 1100–1700(–2450?) m
CONSERVATION NOTES. Widespread; least concern (LC)

SYN. *Cyperus kilimandscharicus* Kük. var. *chlorilepis* Peter & Kük. in E.P. 4, 20 (101): 106 (1935).
Type: Tanzania, Dodoma District: Turu, near Itigi, *Peter* 33786 (B!, lecto, B!, isolecto., chosen by ?) & 33936 (B!, EA!, syn.)

NOTE. Easy to recognize by its nodular rhizome and dark, almost black inflorescence.

134. ***Cyperus flavoculmis*** *Lye* in Nordic Journ. Bot. 3: 223 (1983) & Haines & Lye, Sedges & Rushes E. Afr.: 179, fig. 343 (1983). Type: Kenya, Machakos District: 65 km from Nairobi on Mombasa road, *Lye* 6300 (MHU, holo.; Kl, iso.)

Perennial up to 140 cm tall, fairly robust, with a 3–8 mm thick erect woody rhizome; culms 90–120 cm long, 3–7 mm wide, trigonous, almost smooth, yellow at least in lower half. Leaves many at base, up to 70 cm long; leaf sheath green and yellow with a wide transparent margin, the base dark purplish, 3–12 cm long; leaf blade linear, flat, 40–60 cm long, 6–10 mm wide, scabrid on margins and major veins, apex acuminate. Involucral bracts leaf-like, erect to spreading, 5–6, lowermost up to 50 cm long, up to 9 mm wide. Inflorescence a compound anthela, primary branches 7–8, up to 13 cm long; spikelets in loose clusters on an elongate branch, sessile and at the end of primary and secondary branches, 6–30 per cluster, linear-lanceolate, 20–35 mm long, 1.8–2.5 mm wide, rachis straight; glumes reddish-brown with a narrow transparent margin, obovate, 2.6–3.3 mm long, 1.8–2 mm wide, keel green, excurrent, apex excurrent. Stamens 3; filaments 2.6–3.2 mm long; anthers 1.1–1.5 mm long. Nutlet immature.

KENYA. Machakos District: 65 km from Nairobi on Mombasa road, 25 June 1971, *Lye* 6300!

DISTR. **K** 4; known from the type only

HAB. Edge of seasonal pool; 1650 m

CONSERVATION NOTES. Needs information on current status of population.

NOTE. Haines & Lye state this is related to *C. exaltatus* but differs in yellow culm, larger spikelets & glumes, and more reddish brown colour of the glumes.

135. ***Cyperus imbricatus*** *Retz.* in Observ. Bot. 5: 12 (1788); Kük. in E.P. 4, 20 (101): 69 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 180, figs. 346, 347 (1983) & Fl. Eth. 6: 445 (1997). Type: India, Tranquebar, *König* s.n. (LD, holo.)

Perennial up to 135 cm tall, fairly robust, with a short woody rhizome; culms few, 26–60 cm long, 2.9–4.3 mm wide, trigonous, smooth. Leaves few, up to 50 cm long; leaf sheath pale brown and purple, 3.5–17 cm long; leaf blade linear, flat, 22–33 cm long, 4.2–7 mm wide, scabrid on margin and primary vein, apex acuminate. Involucral bracts leaf-like, spreading, 5–8, lowermost 27–48 cm long, 5–8 mm wide. Inflorescence a compound anthela, primary branches 4–8, 2.5–6 cm long; spikelets in very dense spikes, spikes elongate, 2–3.5 cm long, 0.3–0.8 cm wide, spikelets 30–80 per spike, ovoid-lanceolate, 3–6.2 mm long, 1–1.5 mm wide, rachilla straight; glumes pale brown or golden with or without purplish streaks, ovate, 0.9–1.4 mm long, 0.8–1 mm wide, keel green, excurrent, apex shortly mucronate. Stamens 3; filaments 1.1–1.4 mm long; anthers 0.3–0.4 mm long. Nutlet reddish-brown, ellipsoid, trigonous, 0.5–0.7 mm long, 0.4–0.5 mm wide, smooth or irregularly pitted.

UGANDA. Toro District: Katwe, Queen Elizabeth National Park, 11 Dec. 1966, *Haines* 4228!

TANZANIA. Morogoro District: Turiani, on Morogoro Road at Wami R. crossing, 23 Nov. 1955, *Milne-Redhead & Taylor* 7364!; Rufiji District: Zombe, near Utete, Rufiji River, 9 Oct. 1954, *Anderson* 988!; Iringa District: Msembe, 11 Dec. 1962, *Richards* 17364!

DISTR. U 2; T 4, 6–8; widespread in tropical west Africa, central Africa, Chad, Sudan, Ethiopia, down into South Africa; S and SE Asia and South America

HAB. In swamps, along streams and rivers, at forest edges, often in sandy habitats; sea-level to 1200 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution.

SYN. *Cyperus radiatus* Vahl, Enum. Pl. 2: 369 (1805); C.B. Clarke in F.T.A. 8: 369 (1902), *nom. illegit.* [based on the same *König* type]

C. flexifolius Boeck. in Flora 62: 549 (1879); C.B. Clarke in F.T.A. 8: 375 (1902). Type: Congo-Kinshasa, island off Ponte da Lenha, *Naumann* 143, 150 (B, syn.)

SPECIES WITH INADEQUATE DATA

136. *Cyperus aster* (*Cherm.*) *Kük.* in E.P. 4: 20 (101): 551 (1936)

var. **biflorus** *Peter & Kük.* in E.P. 4, 20 (101): 551 (1936). Type: Tanzania, Morogoro District: Uluguru Mts, between Schlesien Mission and Lugongo, *Peter* 39156 (B!, K!, isosyn.)

Perennial, up to 90 cm tall, rhizomatous; culms tufted, 68–89 cm long, 1.1–1.6 mm wide, trigonous, with longitudinal ridges, glabrous. Leaves up to 35 cm long; leaf sheath reddish-brown, 5–12 cm long; leaf blade linear, flat, 8.5–27 cm long, 1–1.7 mm wide, glabrous to minutely scabrid on margins, apex acuminate. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 5–13 cm long, 1.3–1.6 mm wide. Inflorescence capitate or a simple anthela, primary branches 0–2, 0–1.5 cm long; spikes sessile and at the end of primary branches, 8–10 mm long, 4–6 mm wide; spikelets linear-lanceolate, 4–5 mm long, 1–1.5 mm wide, rachilla straight; glumes pale reddish-brown, oblong-elliptic, \pm 2 mm long, 1.3–1.5 mm wide, apex obtuse to mucronate. Stamens 3. Nutlet not seen.

TANZANIA. Lushoto District: W Usambara, from Madara to Mombo, 3 May 1914, *Peter* 4305!; Morogoro District: Uluguru Mts, between Schlesien Mission and Lugongo, Mar. 1926, *Peter* 39156!

DISTR. T 3, 6; not known elsewhere

HAB. On rocks or hanging from rocks; 450–1200 m

NOTE. This description based on two collections; specimens without many floral characters, so lots of data missing.

137. *Cyperus baronii* *C.B. Clarke*

var. **interpositus** *Kük.* in E.P. 4, 20 (101): 202 (1936). Types: several from Cameroon, Rwanda, Malawi & from Tanzania: Morogoro District: Uluguru, *Stuhlmann* 8814 (not found at B) & Mahenge, Massagati, *Schlieben* 1186 (B!, syn.)

The specimen I have seen keys to *C. exaltatus*. It has inflorescence axes densely scabrid and rather spaced glumes. The whole look of the inflorescence is much less tidy than in *exaltatus* and the culm is much narrower, too. It also does not seem to agree with the Madagascan *C. baronii* specimens. This might represent a new taxon but the specimen is rather poor.

138. *Cyperus leucocephalus* *Retz.* Observ. 5: 11 (1789); *Kük.* in E.P. 4, 20 (101): 278 (1936). Type: India, Tchandranconae Mts, *König* s.n. (LD, holo.)

A species from W Africa, Sudan, S Asia and Australia, with three specimens cited for our area: Kenya, Lamu District: between Lamu and Witu, *Whyte* s.n.; Tanzania, Pare District: Ngulu, between Malongwe and Nyahua, *Peter* 34498! & Malongwe, *Peter* 34445!

The B specimens lack basal parts except for a single sheet of *Peter* 34445, which has very small glumes (\pm 1.1 mm long) with obtuse apex and pale brown flattened nutlets. The base is not thickened and the root system seems to point to an annual or short-lived plant.

139. *Cyperus obtusiflorus* Vahl var. *membranaceus* Kük. in E.P. 4, 20 (101): 287 (1936). Type: Tanzania, Tanga District: Kigomba–Tangata road, *Peter* 39728 (B!, holo.)

Quite different from *C. obtusiflorus* (= *C. niveus*) in its heads; but as the basal parts are missing from the type, I cannot come to any decision regarding this taxon.

140. *Cyperus pilosulus* (*C.B. Clarke*) Kük. in E.P. 4, 20 (101): 551 (1936). Type: Tanzania, between Zanzibar & Uyui, *Taylor* s.n. (BM!, holo.)

Protologue: whole plant pubescent-pilose; rhizome short; culms several, 25–35 cm high, trigonous, base quasi-bulbous; leaf sheaths dark brown, leaves longer than culms, 3–4 mm wide. Involucral bracts 3–5, the longest to 12.5 cm long. Inflorescence capitate; spikes 5–7, sessile, 10–16 mm long and 5 mm wide, densely set with spikelets; spikelets obliquely spreading, oblong, 3 × 1 mm, subacute, subterete, 2–3-nutleted; glumes cinnamon-yellowish, elliptic, obtuse, multiveined, the lowest empty glume often with a setaceous arista. Style short, 3 short arms. Nutlet small, trigonous, oblong-ellipsoid.

TANZANIA. “between Zanzibar & Uyui”, *Taylor* s.n.!– as Uyui is in Tabora District, this could be T 6, T 5 or T 4

DISTR. T (district unclear); known from the type only

HAB. No data

SYN. *Mariscus pilosulus* C.B. Clarke in Durand & Schinz., *Consp. Fl. Afr.* 5: 591 (1894), *nom. nud.* & in F.T.A. 8: 384 (1902)

Cyperus pilosulus K. Schum. in P.O.A. C: 122 (1895), *nom. nudum*

NOTE. Possibly close to *C. neoschimperi*.

SPECIES WHICH I HAVE NOT SEEN

141. *Cyperus cremeomarisus* Lye in *Nordic Journ. Bot.* 3: 218 (1983) & Haines & Lye, *Sedges & Rushes E. Afr.*: 223, fig. 455 (1983). Type: Tanzania, Ufipa District: 12 km S of Sumbawanga, *Robinson* 4822 (K, holo.; not found)

Perennial, slender, up to 32 cm tall, with a swollen culm base covered by 1–2 cm long, thick, reddish brown old basal leaf sheaths looking like scales, with prominent pale veins or fibres, the whole forming a bulb-like structure; each bulb producing one fertile culm and later in the season one to several leafy shoots; culms 15–30 cm long, 0.6–1.2 mm wide, trigonous, almost glabrous. Leaves with reddish brown sheath 1–2 cm long; blade linear, on fertile culm 2–4 cm long, ± 2 mm wide, on leafy shoots up to 5 cm long, ± 2 mm wide, probably longer later in season. Involucral bracts 3, leaf-like, reflexed, lowermost 1–3 cm long, 2 mm wide. Inflorescence capitate; spikelets in a solitary globose to hemispherical head 9–10 mm in diameter, individual spikelets linear-lanceolate, 4–4.5 mm long, 0.8–1 mm wide, one-flowered; glumes yellowish-white, lower glume ovate, 2.5–3 mm long, many-veined, apex concave, upper glume ovate-lanceolate, convolute, 4–4.5 mm long, entirely covering the nutlet. Stamens 2. Style 3-branched. Nutlet dark brown, ellipsoid, trigonous, 2.2–2.4 × 0.7–0.8 mm, minutely papillose.

TANZANIA. Ufipa District: 12 km S of Sumbawanga, *Robinson* 4822

DISTR. T 4; known only from the type

HAB. Dry upland grassland; 2000 m

NOTE. Protologue: superficially similar to *Kyllinga microbracteata* Lye, but differs in 3-branched style, triangular and larger nutlet, larger glumes. HB: there is not much I can do about this unless the material resurfaces!

142. **Cyperus juncelliformis** *Peter & Kük.* in E.P. 4, 20 (101): 352 (1936). Type: Tanzania, Kigoma District: Uvinza, Malagarasi stream, *Peter* 36328 (B, holo., not found)

Rhizome short; culms several, flaccid, 20–30 cm high, compressed with obtuse angles. Leaves with long purplish sheath, without a blade or the uppermost with a short narrow blade. Involucre bracts 2, longer than the anthela, the lowermost erect as if continuing the culm. Inflorescence a simple anthela with 2–4 branches 0–2 cm long, each with 5–10 spikelets; spikelets compressed, 12–16 × 2 mm, 14–26-flowered; rachilla straight; glumes densely imbricate, straw-brown, ovate, 2 mm long, with a chestnut-brown obtuse apex and a green keel and hyaline margins. Stamens 2. Style 2-branched. Nutlet deep reddish brown, obovoid-oblong, ± 1 mm long, biconvex, obtuse, minutely punctulate.

TANZANIA. Kigoma District: Uvinza, Malagarasi stream, *Peter* 36328

DISTR. T 4; known only from the type

HAB. Streamside; 990 m

143. **Cyperus microumbellatus** *Lye* in Nordic Journ. Bot. 3, 2: 223 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 171, fig. 325 (1983). Type: Kenya, Kwale District: Shimba Hills, Longo Mwangandi, *Magogo & Glover* 323 (EA, holo.; K, iso., not found)

Perennial, slender, with a 3–5 cm long horizontally creeping rhizome; culms few, 10–15 cm long, 1–2 mm thick, triquetrous, glabrous or slightly scabrid immediately below the inflorescence. Leaves with sheath straw-coloured, brown or purplish; leaf blade absent on some culms, when present linear, flat, 10–20 × 0.3–0.5 cm, scabrid on margins and major veins, attenuate. Involucral bracts leaf-like, erect to somewhat spreading, 5–10, lowermost 5–13 cm long, 4–6 mm wide. Inflorescence a simple to sometimes compound anthela, primary branches 7–15, 2–11 cm long; spikelets in digitate clusters at the end of primary (and secondary) branches, 2–6 per cluster, linear, 3–9 mm long, 1–1.5 mm wide, rachis straight; glumes yellowish to reddish-brown, ± 1.5 mm long, keel green, apex shortly mucronate. Stamens 3. Nutlet immature.

KENYA. Kwale District: Shimba Hills, Longo Mwangandi, Mar. 1968, *Magogo & Glover* 323

DISTR. K 7; known only from the type

HAB. In swampy area; 380 m

NOTE. Not seen; based on Haines & Lye, who say intermediate between *prolifer* and *haspan-* group, and probably a hybrid.

144. **Cyperus minutus** (*C.B. Clarke*) *Kük.* in E.P. 4, 20 (101): 326 (1936). Type: Kenya, Teita District: Ngulia [Ongalea] Mts, *Gregory* ?14 (BM, holo., Aluka!)
Juncellus minutus C.B. Clarke in J. Bot. 34: 224 (1896) & in F.T.A. 8: 309 (1902)

Annual herb; culm 2–4 cm long, trigonous, the base slightly widened. Leaves all basal, few, 2–8 cm long, ± 1 mm wide. Involucral bracts 2, leaf-like, suberect to spreading, to 2.5 cm long. Inflorescence a single sessile head of ± 8 spikes; spikelets compressed, reddish-blotched, 4 × 1 mm, 6-flowered; glumes boat-shaped, with green keel and narrow hyaline margins. Stamen 1 with small ellipsoid anthers. Style 1–2-branched. Nutlet black, obovoid to subpyramidal, flattened on one side; papillose.

KENYA. Teita District: Ngulia [Ongalea] Mts, 1893, *Gregory* ?14!

DISTR. K 7; known only from the type

HAB. no data

NOTE. A det slip by Karen Wilson says “surely a *Bulbostylis*”. Does not key to anything else; I cannot get enough measurements from the Aluka image, and I am not even sure about generic placing. When the BM collections are accessible again this will have to be decided upon by a cyperologist.

145. **Cyperus verrucinus** C.B. Clarke in E.J. 38: 132 (1906). Types: Tanzania, Lushoto District: Usambara Mts, Kwai, *Albers* 227 & *Eick* 112 (B, syn., not found)

Protologue: with horizontal rhizome and dense culms. Leaves 40–50 cm long, 5–6 mm wide. Inflorescence bracts 2–3. Inflorescence of a simple umbel of spikes, or a congested head, with spikelets of 12 × 3 mm, 8–12-flowered; glumes blackish. Style 3-branched. Nutlet ovoid, trigonous to pyramidal, papillose-reticulate.

TANZANIA. Lushoto District: Usambara Mts, Kwai, *Albers* 227 & *Eick* 112

DISTR. T 3; known from the type only

HAB. Moist sites in grass- and bushland; ± 1600 m

NOTE. Clarke says closest to *C. tenax* Boeck. but differing in the much narrower spikelets 'and the nutlet'

146. **Cyperus zanzibarensis** C.B. Clarke in Durand & Schinz., *Consp. Fl. Afr.* 5: 581 (1894), *nom. nudum* & in F.T.A. 8: 323 (1902); Kük. in E.P. 4, 20 (101): 278 (1936). Type: Kenya, Mombasa, *Taylor* s.n. (BM, holo.)

Perennial, up to 25 cm tall, with bulbous base; culms tufted. Leaves with sheath black and 'torn'; blade 8–16 cm long, 'narrow'. Inflorescence bracts 3–4, the lowest 5–7.5 cm long. Head single, 1.6 × 1.2 cm, dense, white, of very many spikelets; spikelets linear-oblong, 8 × 3–4 mm, compressed, 6–10-flowered; glumes oblong, obtuse, many-veined. Stamens 3. Style 3-branched. Nutlet half the length of the glume, oblong, brown.

KENYA. Mombasa, *Taylor* s.n.

DISTR. K 7; known only from the type

HAB. No data

NOTE. K. Schum. in P.O.A. C: 122 (1895) published this as *C. sansibarensis*, also a *nom. nudum*.

SPECIES OF DOUBTFUL OCCURRENCE

Cyperus cancellatus Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 131 (1883); C.B. Clarke in F.T.A. 8: 327 (1902). Types: Angola, Pungo Andongo, *Welwitsch* 6916 & *Miege* R., *Welwitsch* 6917 (BM, syn.)

NOTE. C.B. Clarke and Kük. in E.P. 4, 20 (101): 245 (1936) record this species from Kenya, Kilifi District: Rabai Hills, near Mombasa, *Taylor* s.n. I (HB) have not seen this specimen.

Cyperus congensis C.B. Clarke in Durand & Schinz, *Études Fl. Congo*: 285 (1896); C.B. Clarke in F.T.A. 8: 364 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 200, fig. 397 (1983). Type: Congo-Kinshasa, Bussindi, *Hens* 391 (BR!, holo?, Pl, iso.)

NOTE. I have seen no East African specimens. Haines & Lye say this is "only known from Kigoma and Iringa Districts" in our area, but cite no specimens. It otherwise occurs from Senegal to Gabon and Congo-Kinshasa, in seasonally wet habitats. I classify it here as a taxon of doubtful occurrence.

Cyperus conglomeratus Rottb. in *Descr. Icon. Rar. Pl.*: 21 (1773); C.B. Clarke in F.T.A. 8: 324 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 263, fig. 536 (1983) & *Fl. Somalia* 4: 125 (1995) & *Fl. Eth.* 6: 463 (1997). Type: Arabia, Gorab & Ghunsudam, *Forsskahl* s.n. (C, holo.)

NOTE. Haines & Lye: "in East Africa only known from a very young specimen from northern Kenya." They do not cite this specimen. The species is otherwise known from drier northern Africa and from Senegal to Somalia, so it is possible that it does occur in our area; as there seem to be no authenticated specimens, I place it in 'species of uncertain occurrence'.

Cyperus fertilis Boeck. in E.J. 5: 90 (1884). Type: Sierra Leone, Mungo R., Sept. 1874, *Naumann* s.n. (B!, holo.)

NOTE. Reported to occur in East Africa by Kükenthal in E.P. 4, 20 (101), based on Toro District: Ruwenzori Mts, *Stuhlmann* 2225. Otherwise occurs in Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, Cameroon, Equatorial Guinea, Gabon, Congo and Angola, in damp places in forests. I have not seen the specimen, and it does not seem to be at B; Haines & Lye did not see it, either. It is a tufted annual with basal leaves that are narrowly obovate, so should be easily recognizable. I place it in species of uncertain occurrence.

Cyperus fissus Steud. in Flora 25: 593 (1842); Engl., Hochgebirgsfl.: 140 (1892); C.B. Clarke in F.T.A. 8: 368 (1902); Kük. in E.P. 4, 20 (101): 105 (1936). Type: Ethiopia, Simen Mts, Gessgessa, *Schimper* 992 (B!, holo. or iso.)

NOTE. Cited by Kükenthal as occurring on the Sabaki R. (*Gregory* 102). Specimen not seen.

Cyperus margaritaceus Vahl var. *karlschumannii* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 285 (1936).

C. karlschumannii C.B. Clarke in K.B. add. ser. 8: 5 (1908). Type: Togo, *Kersting* 659 (B, holo.)

NOTE. Kükenthal cites two *Peter* specimens from Tanzania, which I have not seen.

Cyperus marginatus Thunb. in Prodr. Pl. Cap.: 18 (1794); C.B. Clarke in F.T.A. 8: 339 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 264, figs. 537, 538 (1983). Type: South Africa, *Thunberg* s.n. (UPS, holo.)

NOTE. Haines & Lye based their inclusion of this taxon on *Magogo* 1454 from Marsabit area. The species is said to be very close to *C. conglomeratus* but differs in no leaves or only very short leaves; it occurs in Namibia, South Africa, Leshoto, Swaziland. HB: not much I can do about this unless the specimen *Magogo* 1454 resurfaces.

Cyperus pennatus Lam., Tab. Enc. Meth. 1 (1792). Type: Indonesia, Java, *Commerson* s.n. (P-LAM, holo.)

NOTE. Kükenthal in E.P. 4, 20 (101): 477 (1936) mentions this as occurring in Kenya, Teita District: Taita, *Hildebrandt* 2437, but has not seen the specimen. I would say this is of doubtful occurrence; the species is otherwise found in Madagascar and Asia, Polynesia and S America.

Mariscus albescens Gaud. in Freycinet, Voy. Uranie: 415 (1829); C.B. Clarke in F.T.A. 8: 397 (1902)

NOTE. Clarke says this occurs in Taita Hills (*Hildebrandt* 2437); the species is otherwise known from Indian Ocean islands and SE Asia. I (HB) have not seen the *Hildebrandt* specimen.

Mariscus dregeanus Kunth, Enum. 2: 120 (1837); C.B. Clarke in F.T.A. 8: 374 (1902)

NOTE. Clarke says this occurs in Zanzibar, Usambara, Dar es Salaam. I have seen no specimens.

Mariscus microcephalus J. & C. Presl, Reliq. Haenk. 1: 182 (1827); C.B. Clarke in F.T.A. 8: 402 (1902)

NOTE. Clarke says this occurs on Kilimanjaro. I have seen no specimens.

EXCLUDED SPECIES

C. atractocarpus Ridl. – not known in FTEA area, though it occurs in adjacent parts of Zambia

C. firmipes (C.B. Clarke) Kük., synonym *Mariscus firmipes* C.B. Clarke in F.T.A. 8: 382 (1902). Type: Malawi, Zomba and plains, Whyte s.n.

NOTE. Clarke mentions the lack of basal parts on the specimen. Kükenthal cites five more specimens, all from Tanzania, and says this is probably the same as *C. submacropus* [in this treatment included in *C. mollipes*]; but a taxon described on upper stem and inflorescence alone must remain very doubtful as to status.

C. rhynchosporoides Kük. – not known in FTEA area

17. COURTOISINA

Soják in Cas. Nár. Mus., Odd. Prír. 148: 193 (1979 publ. 1980)

Courtoisia Nees in Wight, Contr. Bot. Ind.: 92 (1834), non March (1830); C.B. Clarke in F.T.A. 8: 403 (1902), nom. illegit.

Cyperus L. subgen. *Courtoisia* (Nees) Lye in Nordic J. Bot. 3: 230 (1983) & in Haines & Lye, Sedges & Rushes E. Afr.: 174 (1983)

Cyperus L. subgen. *Courtoisina* (Soják) Lye in Lidia 3(2): 52 (1992)

Annuals with curry-like odour, with slender to minute rootsystem. Culms scapose. Leaves eligulate. Involucral bracts leaf-like. Inflorescences terminal, anthelate, with primary and secondary branches, terminating into 1 to several clusters of spikelets (spikes). Spikelets ovoid, laterally flattened, 1–10-flowered, disarticulating in one piece above the two basal empty glumes; glumes persistent on rachilla, distichous, boat-shaped with winged midrib, mucronate. Flowers bisexual. Stamens 3. Stigma 3-branched. Nutlet trigonous, narrowly oblong to linear-lanceolate, minutely papillose.

A genus of 2 species, occurring from E and South Africa to SE Asia.

- | | |
|---|-------------------------|
| Involucral bracts 2–4; spikes consisting of 5–9 spikelets; spikelets 4.4–11 mm long, 3–8-flowered; nutlet 2.5–2.7 mm long | 1. <i>C. assimilis</i> |
| Involucral bracts 4–7; spikes consisting of 20–many spikelets; spikelets 3.8–5.9 mm long, 1–2-flowered; nutlet 2.7–4 mm long | 2. <i>C. cyperoides</i> |

1. ***Courtoisina assimilis*** (Steud.) Maquet in B.J.B.B. 58: 265 (1988) & in Fl. Rwanda 4: 435 (1988). Types *: Ethiopia, Gapdia, *Schimper* 1252 (syntype seen by C.B. Clarke but not seen by Lye) & *Schimper* 1208 (P, lecto.; HAL, K!, UPS, isolecto)

Annual, slender to fairly robust with a minute root system, up to 55 cm tall; culms tufted, 8–45 cm long, 1.6–3.2 mm wide, trigonous, almost smooth. Leaves up to 48 cm long; leaf sheath green to brown, 3–6.5 cm long; leaf blade linear, flat, flaccid, 10–36 cm long, 3.2–6 mm wide, scabrid on margins and primary vein, apex acuminate. Involucral bracts leaf-like, spreading to somewhat erect, 2–4, lowermost 12–25 cm long, 3–5.5 mm wide. Inflorescence a simple to compound anthela, primary branches 5–7, 1.5–7 cm long; spikelets in loosely digitate spikes, sessile and at the end of primary and secondary branches, 5–9 per spike, ovoid, several-flowered, strongly flattened, falling off entirely when mature, 4.4–11 mm long, 1–2.4 mm wide,

* Steudel's original collections are now in Paris; the lectotype was chosen by Lye.



FIG. 38. *COURTOISINA ASSIMILIS* — 1, habit; 2, spikelet; 3, glume; 4–5, glume and part of rachilla, respectively mature nutlet and flower; 6, nutlet. 1 from *Robinson* 1306, 2–6 from *Ngoni* 386. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

rachis straight; glumes loosely imbricate, (yellowish-)brown, lanceolate, winged, 3.1–4.3 mm long, 1.9–2 mm wide, keel green, acute to excurrent, apex with a slightly recurved mucro. Stamens 3; filaments 2.9–3.7 mm long. Nutlet reddish-brown, linear-oblong, trigonous, base cuneate, style-base persistent, 2.5–2.7 mm long, 0.6–0.7 mm wide, minutely papillose. Fig. 38, p. 258.

UGANDA. Karamoja District: 4 km N of Lotome on main road, 10 June 1970, *Lye* 5597; Mbale District: Mt Elgon, Kapchorwa, 7 Sept. 1954, *Lind* 236!; Masaka District: 5 km S of Sembabula, 17 May 1971, *Lye* 6107!

KENYA. Baringo District: on roadside on way to Eldoret, 2 Nov. 2000, *Smith, Beentje & Muasya* 130!; Laikipia District: Waso Narok River on Kisima farm, 40 km N of Rumuruti, 13 Nov. 1977, *Carter & Stannard* 353! & 75 km N of Rumuruti on Marakal Road, 14 Nov. 1977, 377!

TANZANIA. Musoma District: Serengeti, Seronera National Park, 24 Apr. 1965, *Richards* 20263!; Ufipa District: swamp 1 km N of Sumbawanga, 1 June 1980, *Hooper & Townsend* 1783!; Iringa District: 20 km on Iringa–Mbeya road, 10 June 1996, *Faden et al.* 96/119!

DISTR. U 1–4; K 3, 4, 6, 7; T 1–7; Rwanda, Congo-Kinshasa, Ethiopia, Malawi, Zimbabwe, Botswana, Namibia, South Africa

HAB. Streamsides, ditches, seasonal pools in up to 20 cm of water, often on black cotton soil or in rocky areas; 250–2100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cyperus assimilis* Steud. in *Flora* 25: 584 (1842) & *Syn. Pl. Glum.* 2: 13 (1855); A. Rich., *Tent. Fl. Abyss.* 2: 486 (1850); Boeck. in *Linnaea* 35: 579 (1868); Engl., *Hochgebirgsfl.* 140 (1892); C.B. Clarke in *F.T.A.* 8: 404 (1902); Kük. in *P.R.* 4, 20, 1: 499, t. 32A–E (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 174, figs. 332, 333 (1983); Lye in *Fl. Eth.* 6: 440, fig. 217.72 (1997)

C. assimilis Steud. var. *depressa* Steud. in *Flora* 25: 585 (1842). Type: Ethiopia, near Adoa, *Schimper* 1974 (P, holo.; seen by C.B. Clarke)

Courtoisia assimilis (Steud.) C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 596 (1895) & in *F.T.A.* 8: 404 (1902)

Mariscus assimilis (Steud.) Podl. in *Mitt. Bot. Staatss. München* 3: 523 (1960); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 28 (124): 10 (1971)

NOTE. This species is easy recognized by its yellowish green colour, which is visible even from a distance. When dried the spikelets tend to fall off easily. It can be distinguished from *C. cyperoides* (Roxb.) Soják by its less congested spikes of spikelets, and having several-flowered spikelets.

2. ***Courtoisia cyperoides* (Roxb.) Soják** in *Cas. Nar. Muz. Prague* 148: 193 (1980); Gordon-Gray in *Strelitzia* 2: 209 (1995). Type: India; no locality or collector given

Annual herb 12–80 cm tall, yellowish green, with slender rootstock; culms tufted, 11–80 cm long, 1.3–3.1 mm wide, trigonous, with longitudinal ridges, glabrous. Leaves up to 40 cm long; leaf sheath greenish-brown, rather loose and thick below, 2.5–6 cm long; leaf blade linear, flat, 15–40 cm long, 2–6 mm wide, scabrid on margins and primary vein, apex acuminate. Involucral bracts leaf-like, spreading, 4–7, lowermost 12–30 cm long, 4.2–6.3 mm wide. Inflorescence a simple to compound anthela, primary branches 4–8, 2.5–6 cm long; spikelets in digitate to globose spikes, sessile and at the end of primary and secondary branches, 20 to many per spike, ovoid, 3.8–5.9 mm long, 1.8–2.2 mm wide, 1–2-flowered, falling off entirely when mature, rachis straight; glumes yellowish grey, 3.5–4.8 mm long, 1.8–3.2 mm wide, keel green, strongly winged, apex mucronate, slightly recurved. Stamens 3; filaments 2.2–3.2 mm long. Nutlet reddish-brown, oblong-lanceolate, trigonous, 2.7–4 mm long, 0.4–0.7 mm wide, minutely papillose.

KENYA. Northern Frontier District: 75 km N of Rumuruti on Maralal road, 14 Nov. 1977, *Carter & Stannard* 377!; Laikipia District: Uaso Narok R. on Kisima Farm, 40 km N of Rumuruti, 13 Nov. 1977, *Carter & Stannard* 353!

TANZANIA. Tabora District: 15 km on Tabora–Sikonge road, 11 May 2006, *Bidgood et al.* 5874!; Dodoma District: Manyoni, 38 km on Itigi–Rungwe road, 25 May 2006, *Bidgood et al.* 6196!; Rungwe District: Itungi Port, 28 June 1996, *Faden et al.* 96/456!

DISTR. **K** 1, 3; **T** 1, 4–8; Chad, Zambia, Malawi, Zimbabwe, Botswana, Namibia, Swaziland, South Africa; Madagascar, India

HAB. Dense riverine vegetation, marshes and boggy grassland, seasonal ponds on black cotton soil, rice fields and wet depressions in cultivations; 70–1850 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Kyllinga cyperoides* Roxb. in Fl. Ind. 1: 182 (1820)

Mariscus cyperoides (Roxb.) Dietr., Sp. Pl. ed. 6, 2: 438 (1832); Gordon-Gray in Strelitzia 2: 129 (1995)

Courtoisia cyperoides (Roxb.) Nees in Wight, Contrib. Bot. Ind.: 92 (1834) & in Linnaea 9: 286 (1834); Benth. in Ic. Pl.: t. 1341 (1881); Boeck. in Flora 44: 335 (1861) & in Linnaea 35: 434 (1868); Ridl. in J.L.S. Bot. 20: 334 (1883); C.B. Clarke in Fl. Brit. India 6: 625 (1894) & in Bull. Herb. Boiss. 4 App. 3: 31 (1896) & in F.T.A. 8: 404 (1902)

C. cyperoides Roxb. var. *africana* C.B. Clarke in Durand & Schinz, Consp. Fl. Afric. 5: 596 (1894), *nom. inval.*

Cyperus pseudokyllingioides Kük. in E.P. 4, 20 (101): 501 (1936), *nomen novum* for *Courtoisia cyperoides*; Haines & Lye, Sedges & Rushes E. Afr.: 175, figs. 334, 335 (1983)

C. pseudokyllingioides Kük. var. *africanus* Kük. in E.P. 10(4) 20: 501 (1936). Type: Tanzania, Ulanga District: Mahenge, *Schlieben* 2389 (B, lecto., chosen by Vorster from the 15 syntypes)

Mariscus cyperoides (Roxb.) Dietr. subsp. *africanus* (Kük.) Podl. in Mitt. Bot. Staats. München 3: 523 (1960)

NOTE. This species is a close relative to *C. assimilis* (Steud.) Maquet, but has more globose spikes which have more spikelets, and only 1 or 2 flowering glumes per spikelet.

Vorster has annotated several Kenya specimens previously determined as *C. cyperoides* as *C. assimilis*. Both C.B. Clarke and Haines & Lye have thrown doubt on whether or not they should be treated as specifically distinct. None of the references to a var. *africanus* made by C.B. Clarke includes a description so do not validate the name which must date from Kükenthal, who put (C.B. Clarke) Kük. as if it were a new combination – which it is not.

18. REMIREA

Aubl., Hist. Pl. Guian. 1: 45, t. 16 (1775)

Perennial strand plant with long creeping rhizome bearing ± distant erect culms. Culms with many nodes, hidden in leaf sheaths. Leaves crowded, thick; ligule 0. Inflorescence capitate of several congested cymes, subsessile among the leaves. Spikelets with distichous glumes, the basal 3 glumes empty, and a pseudoterminal bisexual flower. Perianth absent. Stamens 3; anthers distinctly apiculate. Ovary gradually drawn out into the style which is 3-branched at apex. Nutlets ellipsoid to linear-oblong, trigonous, smooth, clasped by enlarged corky upper rachilla internode.

A monotypic genus, widely distributed throughout the tropics on dunes and sea shores.

Remirea maritima Aubl., Hist. Pl. Guian. 1: 45, t. 16 (1775); Boeck. in Linnaea 35: 435 (1868); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 165 (1884); C.B. Clarke in Fl. Brit. India 6: 677 (1893) & in Durand & Schinz, Consp. Fl. Afr. 5: 665 (1894); Rendle in Cat. Afr. Pl. Welw. 2: 132 (1899); C.B. Clarke in F.T.A. 8: 486 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 294, fig. 610 (1983). Type: “arenosis maritimis Caiennae et Guianae”, *Aublet* s.n. (P-JRR, Hb. Denaiff Vol. 1 no. 56, holo.) (see Lanjouw & Uittien in rec. Trav. Bot. Neerl. 37: 156 (1940))

Perennial strand plant with long creeping rhizome 1–3 mm thick and internodes 3–6 cm long with brown membranous acute sheaths; stems trigonous, 3–12 cm long, 1–2 mm thick. Leaves 4–5 mm wide basally, canaliculate, scabrid on upper margins, with stiff sharp tip. Involucral bracts 3–5(–8), up to 8 cm long; spikes ovoid or ellipsoid, 8–15 mm long, 7–10 mm wide; spikelets sessile, crowded, 4–5 mm long,

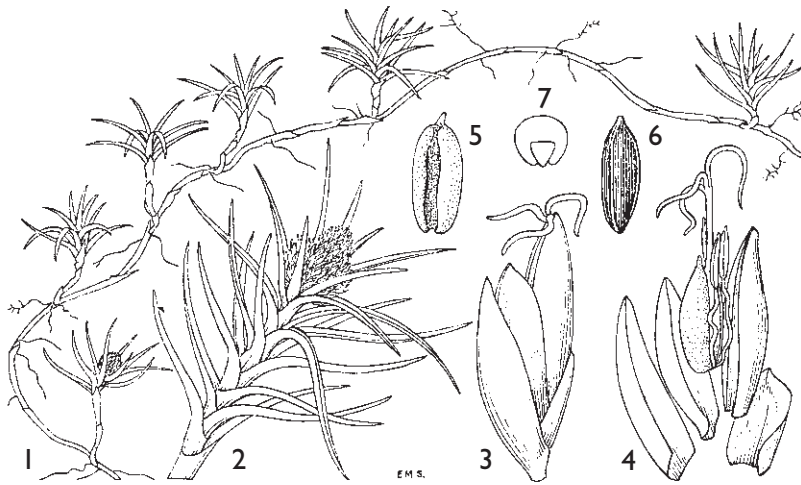


FIG. 39. *REMIREA MARITIMA* — 1, habit, $\times \frac{1}{3}$; 2, flowering shoot, $\times 1$; 3, spikelet, $\times 12$; 4, spikelet dissected (bract, prophyll, lower glume, upper glume, flower), $\times 8$; 5, thickened section of rachilla with vestigial glume, $\times 8$; 6, nutlet, $\times 8$; 7, transverse section of rachilla and nutlet, $\times 18$. 1 & 3–7 from *Williams* 149, 2 from *Melville & Hooker* 153. From *Flora of West Tropical Africa* 3, t. 407. Drawn by Margaret Stones.

1.5–2 mm wide, 1-flowered, falling as a whole; glumes broadly ovate, many-veined, the lower three 2–3 mm long, the 4th flower-bearing one 3.5–4.5 mm long. Nutlet chestnut to blackish, 2.5 mm long, 0.75 mm wide. Fig. 39.

KENYA. Kwale District: Galu beach, 11 Sept. 1983, *Robertson* 3675!

TANZANIA. ?Pangani District: 11 km NNE of Sadani, Mbuyuni Kitopeni, 25 Nov. 1975, *Wingfield* 3266!; Uzaramo District: Bongoyo Is. (off Leopard's Cave), 18 May 1969, *Batty* 5171!; Zanzibar: Marahubi, 18 Mar. 1952, *R.O. Williams* 149! & 150!

DISTR. K 7; T 3, 6; Z; widely distributed throughout the tropics

HAB. Sandy sea shores just above the high tide level

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Remirea pedunculata* R. Br., *Prodr.*: 236 (1810). Type: Australia, "littora Novae Hollandiae", *Banks* s.n. (BM, holo.)

Cyperus pedunculatus (R. Br.) Kern in *Acta Bot. Neerl.* 7: 798 (1958) & in *Fl. Mal.* 7: 644, fig. 65 (1974), where very extensive synonymy is given

NOTE. Due to several localities of the same name it is not clear if *Wingfield* 3266 came from Pangani or Bagamoyo District.

19. SPHAEROCYPERUS

Lye in *Bot. Not.* 125: 214 (1972)

Perennial herb with stout rhizomes, giving off tough horizontal stolons. Culms scapose, bulbous at the base. Lower leaves reduced to sheaths; ligule 0. Involucral bracts several, leaf-like. Inflorescence a pale globose cluster of many spikelets, tightly congested; rachillae above base persistent, upper part together with spikelet deciduous. Spikelets lanceolate, laterally flattened; axis persistent; glumes distichous, the lower empty, the apical one enclosing a fertile flower. Flowers bisexual. Perianth segments 0. Stamens 3 with long filaments, anthers linear, obtuse. Style very long, thickened at base, 3-branched. Nutlets elongate-ellipsoid, compressed-subtrigonal, somewhat attenuate at base, densely punctulate; style-base not persistent.

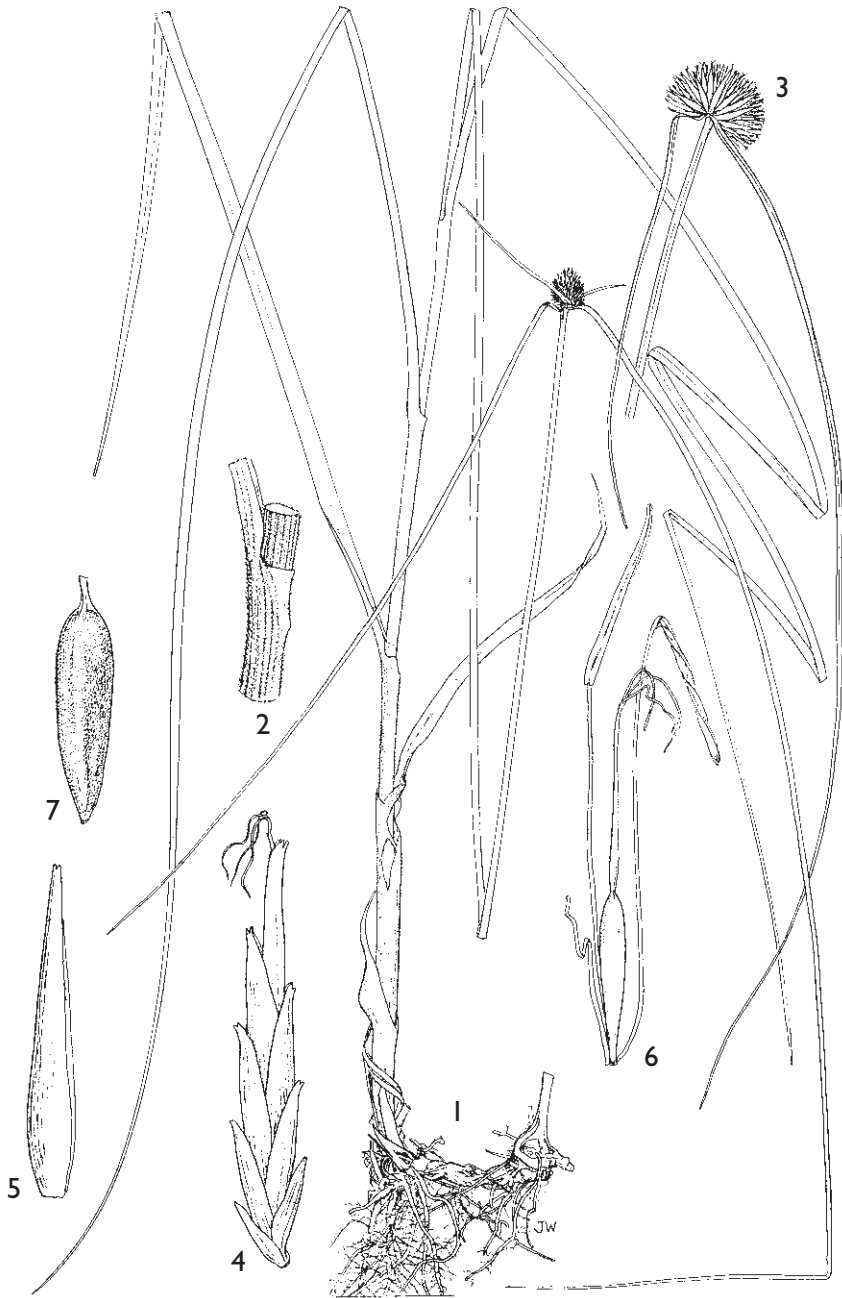


FIG. 39. *SPHAEROCYPERUS ERINACEUS* — 1. habit, $\times \frac{2}{3}$; 2. detail of leaf sheath, $\times 2$; 3. inflorescence, $\times \frac{2}{3}$; 4. spikelet, $\times 6$; 5. upper glume, $\times 6$; 6. flower, $\times 8$; 7. nutlet, $\times 8$. 1, 2, 4 & 7 from Milne-Redhead & Taylor 10366, 3 & 5–6 from Wingfield 803. Drawn by Juliet Williamson.

A monotypic genus for a species which has been placed in four separate genera, and which occurs from S Tanzania to Angola. *Sphaerocyperus* differs from *Rhynchospora* (in which genus it is placed most often) by having distichously arranged glumes, a 3-branched style and a nutlet without persistent swollen stembase.

Sphaerocyperus erinaceus (Ridl.) Lye in Bot. Not. 125: 214 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 293, fig. 609 (1983). Type: Angola, Huilla near Monina and Mupanda streams, Welwitsch 6788 (BM!, holo.)

Stout rhizomatous perennial 0.6–1.2 m tall with persistent bulb-like swellings at base of old culms, with creeping, scale-covered stolons; culms obtusely angled near base but trigonous above, 61–120 cm long, 1.6–2 mm wide, glabrous, fistular, closely striate. Leaves few, rigid, shorter than the stems; sheaths brownish straw-coloured, 13–24 cm long, ultimately breaking into fibres; leaf blade linear, flat, 33–51 cm long, 3.3–5.1 mm wide, rather stiff, acuminate, minutely papillose. Involucral bracts leaf-like, reflexed, 2–3, lowermost 15–30 cm long, 2.3–3 mm wide. Inflorescence capitate, whitish, globose, 2–2.5 cm in diameter, densely compact, made up of many linear-lanceolate acuminate spikelets 8.7–12.3 mm long; glumes (5–)7–8, whitish, accrescent from the base, lower 6–7 empty, largest glume 6.4–9.1 mm long, 1.6–1.9 mm wide, subacute to acuminate, several-veined. Stamens 3; filaments 8–10.3 mm long; anthers 3.1–4.2 mm long. Nutlet straw-coloured, narrowly oblong, trigonous, 3.8–4.3 mm long, 0.8–1.3 mm wide, minutely punctulate. Fig. 39, p. 262.

TANZANIA. Ufipa District: Kito Hill, 3 Apr. 1960, *Vesey-FitzGerald* 2742; Mbeya District: hill N of track between 2 big coffee farms below Mbeya Peak, 11 Apr. 1970, *Wingfield* 803!; Songea District: 2 km SW of Lipumba, 19 May 1956, *Milne-Redhead* & *Taylor* 10366!

DISTR. T 4, 5, 7, 8; Congo-Kinshasa, Angola, Zambia

HAB. *Brachystegia* and *Brachystegia-Uapaca* woodland on stony or red loam soil; 1200–2000 m

CONSERVATION NOTES. Least Concern (LC) due to its distribution and habitat.

SYN. *Schoenus erinaceus* Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 165, t. 23, figs. 5–9 (1884)

Rhynchospora erinacea (Ridl.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 654 (1894)

& in F.T.A. 8: 479 (1902); Robinson in Kirkia 1: 41 (1961); Napper in Journ. E. Afr. Nat.

Hist. Soc. 24, 5 (109): 42 (1964)

Cyperus erinaceus (Ridl.) Kük. in Boissera 7: 103 (1943)

Actinoschoenus erinaceus (Ridl.) Raymond in Mitt. Bot. Staats. München 10: 588 (1973)

NOTE. This species differs from from all *Cyperus* species by only having one fertile flower per spikelet and has small glumes at the base of the spikelet, which increase in size towards the apex.

20. ALINULA

J. Raynal in Adansonia ser. 2, 17: 43 (1977); Goetghebeur & Vorster in B.J.B.B. 58: 457–465 (1988)

Aliniella J. Raynal in Adansonia ser. 2, 13: 157 (1973), *non* Skvortzow (1969)

Marisculus Goetgh. in B.J.B.B. 47: 444 (1977)

Slender annuals. Culms scapose. Leaves eligulate. Involucral bracts leaf-like. Inflorescences congested with with few to several rays, rarely bisantherate [branched to 2 orders, roughly funnel-shaped]; spikes ovoid to subcylindric, with many spirally arranged spikelet bracts. Spikelets 10-flowered with 3 distichous scales, subhyaline (equivalent to 2 basal bracts plus a prophyll), upper one (glume) longer and clasping the flower, rarely utriculiform, rarely adaxial rachilla ± as long as the glume. Flowers bisexual. Stamens 1–2. Ovary rarely with a hyaline cupuliform hypogynium with truncate or scarcely lobed mouth; style trifold. Nutlet rounded-trigonous, shortly beaked.



FIG. 40. *ALINULA PARADOXA* — 1, habit, $\times \frac{2}{3}$; 2, spike, $\times 10$; 3, spikelet, $\times 45$; 4, glume and floret, $\times 50$; 5, glume and axis of spikelet, $\times 50$; 6–7, upper and lower spike bracts, $\times 40$; 8, prophyll, $\times 60$; 9, nutlet, $\times 40$. All from Reid 1027. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

As circumscribed by Goetghebeur and Vorster this genus, formerly described as monotypic, now includes four species occurring between Congo-Kinshasa and Ethiopia in the north and Namibia and Madagascar in the south.

NOTE: The Kew material has been on loan for a long time, and I have not been able to verify the specimen details; dates etc. are missing for this reason.

- | | |
|--|-----------------------------|
| 1. Inflorescence open, conspicuously bisantherate; spikelet rachilla present | 1. <i>A. paradoxa</i> |
| Inflorescence condensed; spikelet rachilla absent | 2 |
| 2. Inflorescence bright yellow; glume utriculiform, adaxially closed; fruit without disc | 2. <i>A. peteri</i> |
| Inflorescence red-brown; glume not utriculiform; fruit with hypogynous disc | 3. <i>A. lipocarphoides</i> |

1. **Alinula paradoxa** (Cherm.) Goetgh. & Vorster in B.J.B.B. 58: 461 (1988). Type: Madagascar, Stampika, *Perrier de la Bâthie* 2423b (P, holo.)

Annual 5–25 cm tall, with few basal leaves. Inflorescences laxly branched to 2 orders, roughly funnel-shaped with 5–many spikes; rays up to 3 cm long; spikes dark reddish brown, round to ovoid, 1–4 mm long; bracts many, densely spirally arranged, 0.6 mm long, each with a reduced lateral spikelet with prophylls 0.5 mm long, glume 1 mm long and rachilla 1.1 mm long. Stamens 2, lateral. Ovary with 3 style branches. Nutlets reddish brown, narrowly ellipsoid, slightly curved, \pm 1 mm long, densely minutely papillose. Fig. 40, p. 264.

KENYA. Kwale District: 50 km S of Mombasa, Gazi, *Coppejans* 5690

TANZANIA. Uzaramo District: Dar es Salaam, Msimbazi, *Haines* 4138 & Manzese pond 6 km

WNW of Dar es Salaam, June 1972, *Wingfield* 2023

DISTR. **K** 7; **T** 6; Mozambique, Namibia, South Africa; Madagascar

HAB. In and near ricefields; 0–30 m

SYN. *Lipocarpha paradoxa* Cherm. in Bull. Soc. Bot. Fr. 68: 425 (1922)

Mariscus paradoxus (Cherm.) Cherm. in Bull. Soc. Bot. Fr. 72: 169 (1925) & in Fl. Mad. 29: 28, fig. 2.8–10 (1937); Podlech in Mitt. Bot. Staatss. München 3: 525 (1960) & in Prodr. Fl. SW Afr. 165: 38 (1967); Haines & Lye in Bot. Not. 124: 477, f. 4 (1971)

Cyperus subparadoxus Kük. in E.P. 101: 525 (1936), *non C. paradoxus* Steud. (1855); Suess. & Merxm. in Mitt. Bot. Staatss. München 1: 164 (1952); Lye in Nordic J. Bot. 1: 60 (1982); Haines & Lye, Sedges & Rushes E. Afr.: 251, fig. 506 (1983)

C. fimbriatylodes Koyama in Bot. Mag. Tokyo 73: 438 (1960), *nom. superfl.*

2. **Alinula peteri** (Kük.) Goetgh. & Vorster in B.J.B.B. 58: 464 (1988). Type: Tanzania, Dodoma District: Uyansi, Chaya towards Kazikazi, km 675.5, *Peter* 34327a (B, syn.)

Small clustered annual 3–20 cm tall; stems not thickened basally, with a few pale grey to pinkish leaf-bases. Leaves $\frac{1}{2}$ – $\frac{3}{4}$ the length of the culms, up to 1 mm wide but usually inrolled with hyaline sparsely ciliolate margins. Inflorescences bright yellow, capitate with 1–8 spikes, the central one ovoid and 3–6 mm long, the laterals more globose and 2–5 mm long, with many densely spirally arranged bracts, each \pm 1 mm long with a reduced lateral spikelet with a small prophyll \pm 0.6 mm long and first glume \pm 1.8 mm long, utriculiform with apical split. Nutlets orange-brown, obovoid, trigonous, 1 mm long, the surface colliculate, the cells isodiametric hexagonal.

KENYA. Mt Elgon E side (fide Haines & Lye, Napper)

TANZANIA. Arusha District: Engare Nanyuki R., *Greenway* & *Kamuri* 13488; Tabora District:

Ngulu, Goweko, W of Igalula, km 789.5, *Peter* 34934a; Ufipa District: Sumbawanga, Lake Kwela, *Richards* 8758

DISTR. **K** 3; **T** 1, 2, 4, 5; Ethiopia, Zambia, Malawi

HAB. Bushland, sandy hollows near saline lake shore; 900–1950 m

SYN. *Ascolepis peteri* Kük. in F.D.-O.A. 1: 386 (1932) & Anhang: 124 (1936) & t. 90.1 (1937); Napper in J. EA Nat. Hist. Soc. 24(5): 37, fig. 18 (1964)

Marisculus peteri (Kük.) Goetgh. in B.J.B.B. 47: 444, fig. 5 (1977); Haines & Lye, Sedges & Rushes E. Afr.: 311, fig. 642 (1983)

Cyperus microaureus Lye in Lidia 3(4): 132 (1994), *nom. nov.* (1994) & in Fl. Eth. 6: 488, fig. 212.151 (1997). Type as for *Alinula peteri*; name chosen because *Cyperus peteri* Kük. already existed (1936)

3. **Alinula lipocarphoides** (Kük.) Raynal in Adansonia ser. 2, 17: 43 (1977); Goetghebeur in Genera Cyp.: 579, fig. 8.8.7 (1986); Goetghebeur & Vorster in B.J.B.B. 58: 463 (1988). Type: Tanzania, Mbulu District: Mangati, *Peter* 43922b (B!, holo. & iso.)

Slender annual 3–15 cm tall. Leaves few, basal, usually shorter than the culm, flat, ± glabrous; the sheaths reddish brown or purple. Involucral bracts 2–3, spreading or deflexed, the longest to 2.5 cm long. Inflorescence congested, 3–8 mm wide, of 2–6 sessile dark red-brown spikes, rarely with a single pedicelled spike; spikes ovoid, 2–5 mm long with many densely arranged bracts 0.8 mm long, each bearing a reduced lateral spikelet with a small prophyll 0.9 mm long and a glume 1.7–2 mm long with 3–4 distinct veins on each side of the excurrent green midrib. Stamens 2. Style 3-fid. Nutlets brownish, narrowly ellipsoid, triangular, 1.1–1.2 × 0.4 mm, almost smooth, enclosed at base in a white slightly lobed cup-like scale.

UGANDA. Sebei (fide Haines & Lye)

KENYA. Nakuru District: Molo, *Haines* 4607

TANZANIA. Mbulu District: Mangati, Mdungaru to Dareda, 11 Aug. 1926, *Peter* 43922b; Ufipa District: Mwimbi, *Robinson* 5108

DISTR. U 3; K 3; T 2, 4; Congo-Kinshasa, Ethiopia, Zambia

HAB. Wet rock crevices, seasonally wet grassland, temporary rocky marshes; 1500–2100 m

SYN. *Ficinia lipocarphoides* Kük. F. R. 40, 1, Anhang: 125, t. 87, 3 (1936/7) & in F.D.-O.A. Anhang: 125 (1936) and in main work: 398 (1937), as *lipocarphoides*

Raynalia lipocarphoides (Kük.) Sojak in Cas. Nár. Mus. Odd. Prir. 148: 193 (1929), *nom. superfl.*

Aliniella lipocarphoides (Kük.) Raynal in Adansonia ser. 2, 13: 157, t. 5, figs. 1–8 (1973)

Cyperus lipocarphoides (Kük.) Lye in Nordic J. Bot. 3: 230 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 250, fig. 504 (1983); Lye in Fl. Eth. 6: 488, fig. 212.150 (1997)

NOTE. Goetghebeur & Vorster mention *Richards* 15131 from Tanzania, but her field note book gives the locality as Sansia Falls on Kalambo road, which is in N Zambia. They also cite *Haines* 4607 under Uganda but Haines & Lye state 'drawn from *Haines* 4607 (Molo, near Eldoret, Kenya)'. It is actually not clear exactly where it was collected since Molo is in Nakuru District, and Eldoret is in Uasin Gishu District.

21. ASCOLEPIS

Steud. in Syn. Pl. Glum. 2, Cyp.: 105 (1855); Goetghebeur in Adansonia ser. 2, 19: 269–305 (1980)

Annual or perennial herbs. Culm scapose, often thickened at base. Leaves eligulate. Involucral bracts leaf-like. Inflorescence a compact single head of 1–few spikes of many spirally arranged densely imbricate spikelets; bracts 1 per spike. Spikelets 1-flowered, consisting of bract, glume (this often petal-like and sometimes enveloping the nutlet) sometimes with a small adaxial bristle-like scale, and sometimes a rachilla, and a flower. Flowers bisexual. Stamens 1–3(–5). Style 2–3(–5)-fid. Nutlet mostly obovoid and trigonous, dorsiventrally compressed, minutely papillose.

Genus of ± 20 species; tropical Africa, 1 in Madagascar and South America, 2 extending to Indochina.

- | | |
|---|-----------------------------|
| 1. Glumes linear, 10–30 mm long | 2 |
| Glumes lanceolate, narrowly ovate or tubular, less than
10 mm long | 3 |
| 2. Inflorescence heads 3–5 cm in diameter with involucre
bracts to 15 cm; rachilla present | 1. <i>A. pinguis</i> |
| Inflorescence heads 2–4 cm in diameter with involucre
bracts to 6 cm; rachilla absent | 2. <i>A. lineariglumis</i> |
| 3. Annuals with minute root system; glumes tubular, apex ±
truncate with central mucro | 4 |
| Perennials, with remnants of old leaf-bases near stem base;
glumes lanceolate or narrowly ovate, apex subobtusate to
subacute | 5 |
| 4. Main involucre bracts to 6 cm long; rachilla usually
present | 3. <i>A. pusilla</i> |
| Main involucre bracts to 3 cm long; rachilla absent | 4. <i>A. erythrocephala</i> |
| 5. Inflorescence reddish brown or bright yellow | 5. <i>A. protea</i> |
| Inflorescence white or pale yellow | 6 |
| 6. Plant with long slender stolons, these covered in scales;
style 3-branched | 6. <i>A. hemisphaerica</i> |
| Plant without stolons (sometimes present in <i>A. capensis</i>);
style 2-branched | 7 |
| 7. Glumes ovate; style 2-fid | 7. <i>A. capensis</i> |
| Glumes linear or narrowly ovate; style 3-fid | 8 |
| 8. Heads with tips of glumes rather lax, not densely packed;
apex of glume obtuse | 5. <i>A. protea</i> |
| Heads with tips of glumes tightly packed; apex of glume
acute | 8. <i>A. densa</i> |

1. ***Ascolepis pinguis*** *C.B. Clarke* in F.T.A. 8: 475 (1902); Goetghebeur in *Adansonia* ser. 2, 19: 295, t. 10.4–10 (1980); Haines & Lye, *Sedges & Rushes E. Afr.*: 303, fig. 625 (1983). Type: Congo-Kinshasa, Kitope, *Descamps* s.n. & Kalemie [Albertville], *Descamps* s.n. (BR, syn.)

Perennial herb, robust, tufted; stem bases bulbous, with a dense coat of old red-brown leaf sheaths, becoming fibrous; stem 20–100 cm tall, 0.8–2 mm across. Leaves many, 15–40 cm long, 1–4 mm wide. Involucre bracts greenish, the larger 2–4, spreading or reflexed, 4–15 cm long. Inflorescence white to yellowish, globose or hemispherical, 3–5(–8) cm across; spikelets densely and spirally imbricate on a conical axis; spikelet bract narrowly ovate-triangular, 3–3.5 mm long with 3–5 red-brown veins and hyaline wings, subacute; glumes elongated, laterally compressed, 10–30 mm long, 0.4 mm wide, subacute; rachilla 2–3 mm long, swollen near apex, enclosed by lower glume wings, ± persistent. Stamens 2–3. Style deeply 3-cleft. Nutlet pale brown, obovoid, 1–1.5 × 0.5–0.6 mm, sub-3-gonous.

TANZANIA. Ufipa District: 53 km on Sumbawanga–Mbeya road, June 1996, *Faden et al.* 96/406! & 4 km on Namanyere–Chala road, Mar. 1994, *Bidgood et al.* 2573!; Chunya District: 101 km S of Rungwe, N of Lupa swamp, Feb. 1974, *Bally & Carter* 16503!

DISTR. T 4, 7; Congo-Kinshasa, Burundi, Zambia

HAB. Swampy grassland; 800–1700 m

CONSERVATION NOTES. Least concern (LC)

2. ***Ascolepis lineariglumis*** *Lye* in *Nordic Journ. Bot.* 2: 561 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 304, fig. 626 (1983). Type: Zambia, near Kabwe-Bonanza, *Kornaš* 1559 (KRA, holo.; K!, iso.)

Tufted annual or perennial; stem bases enclosed in old fibrous leaf sheaths; stem 10–50 cm tall, 0.4–1.2 mm across, triangular or compressed. Leaves 15–25 cm long, up to $\frac{3}{4}$ the length of the stem, ± 1 mm wide, midrib clear on lower surface, margin with minute teeth. Involucre bracts up to 6 cm long. Inflorescence white, 2–4(–5) cm across; glumes white, usually with many small red dots, linear, equal, 10–18 \times 0.5 mm, long-persistent; spikelet bracts 1.5–2.5 mm long, long-acuminate. Stamens and style-branches 3. Nutlet dark purple, ovoid, ± 0.6 mm long, tuberculate.

UGANDA. Mbale District: Mbale–Kibale road, Oct. 1933, *Johnston* 1933!; Teso District: Soroti, July 1931, *Hancock* 2234! & Serere, June 1932, *Chandler* 759! (all Ugandan material seems to be pre-1935)

KENYA. N Kavirondo District: 8 km SE of Bungoma, June 1955, *Bogdan* 4058!

TANZANIA. Mwanza District: between Ibono Camp and Katungulu Agricultural Station, Apr. 1937, *B.D. Burt* 6481!; Tabora/Chunya District: 1 km W of Itigi–Mbeya road, Jan. 1969, *Ismail* in *C.A.W.M.* 4245!; Tunduru District: Nampungu bridge, Dec. 1956, *Semsei* 2620!

DISTR. U 3; K 5; T 1, 4, 7, 8; from Nigeria to Sudan and south to Angola, Zimbabwe and Mozambique

HAB. Moist or boggy grassland, said to be common in southern Tanzania; 300–1900 m
CONSERVATION NOTES. Least concern (LC).

SYN. *Ascolepis protea* Welw. var. *splendida* K. Schum. in Warburg, Kunene-Sambesi-Exped.: 177 (1903); Goetghebeur in *Adansonia* ser. 2, 19: 281 (1980). Type: Angola, Okachitanda R., *Baum* 158 (B!, holo.; BM!, K!, Z, iso.)

NOTE. *A. lineariglumis* Lye var. *pulcherrima* Lye is distinct in its bright orange glumes and more bulbous corm base; it is restricted to northern Zambia.

Many of our specimens were previously identified as *Ascolepis elata* Welw., a species from further south.

3. ***Ascolepis pusilla*** *Ridl.* in *Trans. Linn. Soc. ser. 2, Bot.* 2: 164, t. 23/10–14 (1884); C.B. Clarke in *F.T.A.* 8: 476 (1902); Goetghebeur in *Adansonia* ser. 2, 19: 297, t. 12.1–12 (1980); Haines & Lye, *Sedges & Rushes E. Afr.*: 308, fig. 636 (1983). Type: Angola, Huila, around Lopollo and Minono, *Welwitsch* 1678 & 6773 (BM, syn.)

Annual with small root-system; stem 1–20 cm long, 0.3–0.6 mm across, triangular or rounded with deep furrows. Leaves linear, 2–8 cm long (up to \pm half as long as the stem) and 0.5–1 mm wide, flat or channeled when dry, often with small reddish dots. Involucre bracts few, leaf-like, 1–6 cm long. Inflorescence yellowish brown or grey-brown, ellipsoid, 2–6 mm across, usually consisting of 2–5 clustered rounded spikes; glumes green and reddish brown, tubular with widening upper part, 1–2.3 mm long, apex \pm truncate with central triangular apex or 3-pointed, enclosing the nutlet; spikelet bracts hyaline, 1–2 mm long. Stamen 1, lateral. Style deeply 3-cleft. Nutlet triangular, obovoid, 0.7–1 \times 0.4 mm, minutely papillose.

TANZANIA. Mpanda District: 20 km on Mwese road from Mpanda–Uvinza road, June 2000, *Bidgood et al.* 4608!; Mbeya District: 14 km SW of Madibira, June 1996, *Faden et al.* 96/183!; Songea District: 6.5 km W of Songea, Apr. 1956, *Milne-Redhead & Taylor* 9941!

DISTR. U (see Note); T 4, 7, 8; from Senegal to Central African Republic and Congo-Kinshasa and south to Zimbabwe and Namibia

HAB. Boggy ground and seepage zones in woodland zone; 950–1800 m
CONSERVATION NOTES. Least concern (LC).

SYN. *Ascolepis pusilla* Welw. var. *microcuspis* Lye in *Nordic J. Bot.* 2: 564 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 308, fig. 637 (1983). Type: Zambia, Siamambo, Choma, *Robinson* 2815 (MHU, holo.; K!, iso.), **syn. nov.**

A. pusilla Welw. var. *cylindrica* S.S. Hooper in *K.B.* 37: 608 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 309 (1983). Type: Tanzania, Iringa District: just N of Iringa, *Milne-Redhead & Taylor* 11202 (K!, holo.), **syn. nov.**

A. pusilla Welw. var. *echinata* S.S. Hooper in *K.B.* 37: 607 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 309 (1983). Type: Tanzania, Ufipa District: 8 km N of Sumbawanga, *Hooper & Townsend* 1927 (K!, holo.; DAR, iso.), **syn. nov.**

NOTE. Haines & Lye say this taxon occurs in Uganda (Kapchorwa) but I have seen no specimens from there, and they do not cite any.

Several varieties are brought into synonymy here; the differences were based on the tip of the glumes: in var. *echinata* up to 1 mm long, in var. *microcuspsis* shorter than usual; I have seen specimens where in a single head the glume beak can differ from short (0.4 mm) to proper *echinata*-long (1 mm). I believe there is enough variability in this to merge the taxa. Var. *cylindrica* is similarly brought into synonymy as the difference with the main taxon is in the upper margin of the glumes being unthickened – this has only been seen in a single specimen.

4. ***Ascolepis erythrocephala*** S.S. Hooper in K.B. 37: 605 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 309, fig. 638 (1983). Type: Tanzania, Songea District: 6.5 km W of Songea, *Milne-Redhead & Taylor* 9940 (K!, holo.; BM, NY, P, iso.)

Annual with minute root-system; stem 3–10 cm long, 0.3–0.5 mm across, angular, glabrous. Leaves basal or near-basal, 1–4 cm long, to 0.5 mm wide, ± glabrous. Involucre bracts few, leaf-like, reflexed, to 3 cm long. Inflorescence reddish brown, terminal, solitary, 2.5–5 mm across, of a rounded to cylindrical spike, sometimes with a few smaller ones at its base; glumes 1–1.3 mm long, funnel-shaped with wider red-brown upper part and ending in a small pale mucro to 0.5 mm. Spikelet bracts pale or translucent, with reddish lines, 0.8–1.5 mm long. Nutlet dark brown to black, ellipsoid, 0.6–0.8 × 0.2–0.3 mm, minutely papillose.

TANZANIA. Iringa District: just N of Iringa township, July 1956, *Milne-Redhead & Taylor* 11203!;

Songea District: 6.5 km W of Songea, Apr. 1956, *Milne-Redhead & Taylor* 9940!; Tunduru

District: just E of Songea District boundary, June 1956, *Milne-Redhead & Taylor* 10659!

DISTR. T 7, 8; Zimbabwe

HAB. Boggy ground in grassland within woodland zone; 950–1500 m

CONSERVATION NOTES. Within Tanzania only known from the three specimens cited above; otherwise unknown (DD)

NOTE. Close to *A. pusilla*, but differs in the characters in the key, the darker inflorescence and the slightly differently shaped glumes.

5. ***Ascolepis protea*** Welw. in Trans. Linn. Soc. 27: 75 (1869); C.B. Clarke in F.T.A. 8: 474 (1902); Goetghebeur in *Adansonia* ser. 2, 19: 275, t. 1–4 (1980); Haines & Lye, *Sedges & Rushes E. Afr.*: 304 (1983); Lye in *Fl. Eth.* 6: 491 (1997). Type: none indicated

Note: the 'type' cited in some publications for this taxon: Angola, Pungo Andongo, Tunda Quilombo, *Welwitsch* 1667 (BM, holo.; K!, iso.) is a specimen cited in the protologue for var. *kyllingoides* (A. Rich.) Welw. which differs from the description given for the main taxon, *protea*. Goetghebeur states on a det. slip on the K sheet of this specimen that this sheet, the isotype of what he calls forma *kyllingoides*, is the 'lectotype of *protea* var. *protea*'. I don't believe this can be true.

Perennial slender ± tufted herb without runners; stem obscurely 3-angled, 5–60 cm high, 0.5–2.3 mm across, the base sometimes swollen and often covered by fibrous remains of leaf sheaths. Leaves filiform, 7–26 cm long, with inrolled margins at least when dry, apex attenuate. Involucral bracts 5–10, spreading, 0.5–8 cm long. Inflorescence globose or flattened, 5–40 mm in diameter; glumes equal or unequal, narrowly ovate, 3–10 mm long, obtuse. Nutlets dark brown to black, 0.6–1.2 × 0.3–0.6 mm.

1. Inflorescence bright yellow or bright orange, flattened, with
thick marginal glumes b. var. *anthemiflora*
Inflorescence white, pale yellow, orange or red, globose or
hemispherical 2

2. Inflorescence white; involucre bracts 1–13 cm long; glumes 3–5.5 mm long; below 1300 m a. var. *protea*
 Inflorescence white, pale yellow, orange or red; if white, glumes 4–10 mm long and involucre bracts less than 8 cm long; 1100–2150 m 3
3. Inflorescence 10–40 mm across; glumes white or pale yellow, 4–10 mm long c. var. *bellidiflora*
 Inflorescence 8–20 mm across; glumes pale yellow, orange or red, up to 3.5 mm long d. var. *ochracea*

NOTE. While most specimens can be keyed quite easily, intermediates do occur. Because of the rather feeble differences and the geographical and ecological overlap, varieties are better in this case than the subspecies that Lye uses.

a. var. **protea**; Goetghebeur in *Adansonia* ser. 2, 19: 275, t. 1–4 (1980)

Perennial slender ± tufted herb; stem 5–30 cm high, 0.5–1 mm across, the base ± swollen and covered by fibrous remains of leaf sheaths. Leaves 8–24 cm long, 0.5 mm across; margins scabridulous near apex; basal sheaths with red glandular dots. Involucre bracts 2–5 per head, filiform, 1–1.3 cm long, up to 2.5 mm wide at base, attenuate, red-dotted. Inflorescence globose with a median dimple, 5–8(–10) mm in diameter; glumes ± equal, white, 3–5.5 mm long, tips of the outer strongly bent upwards at anthesis, spreading or patent in fruit. Nutlets dark brown to black, 0.7–0.8 × 0.3–0.4 mm.

TANZANIA. Kigoma District: Uvinza–Mpanda road km 42, Nov. 1962, *Verdcourt* 3436! & Kasye Forest, Mar. 1994, *Bidgood et al.* 2986!; Iringa District: 56 km N of Iringa, Nyangolo, Feb. 1962, *Polhill & Paulo* 1339!

DISTR. T 4, 7, 8; from Senegal to Ethiopia and south to Congo-Kinshasa, Zambia and Malawi
 HAB. Miombo woodland in seepage zones or along streams; 950–1300 m

CONSERVATION NOTES. I have seen 4 specimens from Tanzania; but due to the wide distribution area, this must be Least concern (LC).

SYN. *Ascolepis protea* Welw. subsp. *protea*; Haines & Lye, *Sedges & Rushes E. Afr.*: 304 (1983)

b. var. **anthemiflora** (Welw.) Goetgh. in *Adansonia* ser. 2, 19: 277, t. 2.5–2.9 (1980), as *anthemidiflora*; Lye in *Nordic J. Bot.* 2: 566 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 305, fig. 629 (1983). Type: Angola, *Welwitsch* 1669 (BM, holo.; K!, LISU, iso.)

Tufted perennial herb, single- or few-stemmed, stem 10–60 cm tall, obscurely 3-angled, 0.5–2 mm across, bases ± swollen and with dense bundles of fibrous leaf-bases; rhizome short, creeping or erect. Leaves 7–23 × 0.1–0.2 cm, bases dark brown. Involucre bracts pale green, 1.5–10 cm long. Inflorescence ± flattened, (8–)15–25 mm in diameter; glumes bright or golden yellow, 3–10 mm long, the marginal ones elongated and 5–10 mm long, their tips dorsiventrally flattened, apex broadly rounded, central glumes hardly elongated and 3–5 mm long. Nutlets metallic grey, obovoid, 0.6–1.2 × 0.3–0.6 mm, tuberculate.

TANZANIA. Ufipa District: Msangu, Jan. 1961, *Vesey-FitzGerald* 2850! & 5 km on Namanyere–Karonga road, Mar. 1994, *Bidgood et al.* 2608!; Iringa District: Ruaha National Park, 25 km SW of Magangwe Ranger post near Kimbi stream, Dec. 1972, *Bjornstad* 2351a!

DISTR. T 4, 7; Congo-Kinshasa, Angola, Zambia, Malawi

HAB. Swampy grassland; 1500–2200 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Ascolepis anthemiflora* Welw. in *Trans. Linn. Soc.* 27: 78, t. 24.9–13 (1869); C.B. Clarke in *F.T.A.* 8: 475 (1902)

Ascolepis protea Welw. subsp. *chrysocephala* Lye in *Nordic Journ. Bot.* 2(6): 564 (1983). Type: Tanzania, Ufipa District: 28 km S of Sumbawanga, *Robinson* 4893 (K!, holo.)

c. var. **bellidiflora** Welw. in *Trans. Linn. Soc.* 27: 76 (1869); C.B. Clarke in *F.T.A.* 8: 475 (1902); Goetghebeur in *Adansonia* ser. 2, 19: 279, t. 3 (1980); Lye in *Fl. Eth.* 6: 491, fig. 212.155 (1997). Type: Angola, Barraneos de Catete, *Welwitsch* 1668 (BM, lecto.; K!, iso.)

Perennial herb (once called annual by *Milne-Redhead & Taylor*), tufted, with slender rhizome; stem 7–50 cm tall, 0.6–1.5 mm across, occasionally bulbous at base, at base with fibrous remains of old leaf sheaths, these sometimes looking like discrete 1–6 mm long black narrowly triangular scale-like structures. Leaves pale green, 5–20 × 0.2–0.3 cm, less than half the length of the culm. Involucral bracts pale green, (3–)5–6(–10), filiform from a base to 2 mm wide, 0.5–15 cm long, often with red glandular dots. Inflorescence subglobose or hemispherical, 10–40 mm in diameter, several times described as ‘daisy-like’; glumes white or pale yellow, 4–10 mm long, marginal glumes spreading to slightly recurved and elongated, central glumes shorter than outer. Nutlet dark reddish brown, obovoid, 0.8–0.1.4 × 0.3–0.5 mm, papillose to densely tuberculate.

TANZANIA. Ufipa District: Sumbawanga, near Mpuu, Mar. 1957, *Richards* 8769!; Manyoni District: Kazikazi, Apr. 1933, *B.D. Burt* 4655!; Iringa District: Iringa College of National Education, Apr. 1972, *Pedersen* 984!

DISTR. T 4, 5, 7; from Nigeria to Sudan and Ethiopia, and south to Angola, Zimbabwe and Mozambique

HAB. Swampy grassland, streamsides; 1100–2150 m

CONSERVATION NOTES. Due to the wide distribution, least concern (LC); in our area not really common.

SYN. *Ascolepis protea* Welw. var. *santolinoides* Welw. in *Trans. Linn. Soc.* 27: 77 (1869); Haines & Lye, *Sedges & Rushes E. Afr.*: 305, fig. 627 (1983). Type: Angola, Pungo Andongo, near Catete, *Welwitsch* 1664 (BM, lecto.; K!, isolecto., chosen by *Goetghebeur*)

A. bellidiflora (Welw.) Cherm. in *Arch. Bot. Caen* 4 (7): 29 (1931)

A. protea Welw. var. *transiens* Kük. in *F.D.-O.A., Descr.*: 123 (1936). Types: Tanzania, *Peter* 34240, 37151 (both B!, syn.); *Goetghebeur* has chosen (on the B label) one of the sheets as 34240 as lectotype

A. protea Welw. var. *tuberosa* Kük. in *F.D.-O.A., Descr.*: 124 (1936). Type: Tanzania, *Peter* 38801 (B!, holo. & iso.)

A. protea Welw. subsp. *bellidiflora* (Welw.) Lye in *Nordic Journ. Bot.* 2: 566 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 305, fig. 628 (1983); Lye in *Fl. Eth.* 6: 491, fig. 212.155 (1997)

Ascolepis protea Welw. subsp. *rhizomatosa* Lye in *Nordic Journ. Bot.* 2(6): 562 (1983). Type: Tanzania, Ufipa District: 25 km S of Sumbawanga, *Robinson* 4890 (K!, holo.)

d. var. *ochracea* (*Meneses*) *Goetgh.* in *Adansonia ser.* 2, 19: 277, t. 1.6–11 (1980). Type: Angola, Benguela, country of Ganguellas and Ambuellas, *Gossweiler* 3469 (LISJC, holo.; K!, iso.)

Perennial herb, tufted, without runners; stem 15–60 cm tall, (0.7–)1–2.3 mm in diameter, at base with dark fibrous remains of old leaf sheaths. Leaves to 26 cm long, less than half the length of the culm. Involucral bracts 5–9, narrowly triangular from a base to 5 mm wide, 0.5–5 cm long, with upper margins scabrid. Inflorescence yellowish to orange or red, very rarely pale yellow or whitish, ± globose, 8–20 mm across. glumes ± equal, elongated, to 3.5 × 0.5 mm, acute. Nutlets whitish, obovoid, 1.2 × 0.6 mm.

TANZANIA. Ufipa District: 20 km from Kawimbe, Jan. 1957, *Richards* 8045! & 20 km S of Mpuu, Jan. 1962, *Robinson* 4912! & 2 km W of Mkowe on Chapota road, Nov. 1994, *Goyder et al.* 3771!

DISTR. T 4; Congo-Kinshasa, Angola, Zambia

HAB. Seasonal floodplain, seasonally moist depression; 1550–1700 m

CONSERVATION NOTES. Only four specimens from our area; otherwise Least concern (LC)

SYN. *Ascolepis speciosa* Welw. var. *ochracea* *Meneses* in *Garcia de Orta* 4(2): 260 (1957)

A. protea Welw. subsp. *atropurpurea* Lye in *Nordic Journ. Bot.* 2: 563 (1983). Type: Zambia, Mbala [Abercorn], *Richards* 8350 (K!, holo.)

6. *Ascolepis hemisphaerica* *Goetgh.* in *Adansonia ser.* 2, 19: 283, t. 5.10–13 (1980); Haines & Lye, *Sedges & Rushes E. Afr.*: 307, fig. 633 (1983). Type: Burundi, Ujiji, *Peter* 38250 (B!, holo.; B!, K!, P, iso.)

Slender perennial (the specimens from our area look annual!), with slender underground runners; stem 3–40 cm tall, 0.5–1.2 mm across, glabrous, base slightly thickened with remnants of leaf sheaths. Leaves 5–15 cm long, 1–2 mm wide. Involucre bracts 2–6, leafy, to 9 cm long. Inflorescence white, globose to



FIG. 41. *ASCOLEPIS CAPENSIS* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence, $\times 3$; 3–5, 1-flowered spikelet front (twice, the second higher up in inflorescence) and back view, $\times 12/8/8$; 6, enclosed nutlet, $\times 18$. 1 from Richards 7681, 2 from Vesey-Fitzgerald 2863, 3–6 from Goyder *et al.* 3769. Drawn by Juliet Williamson.

hemispherical, 8–13 mm across; spikelet bracts whitish hyaline, narrowly triangular, 2.5–3.5 mm long; glumes whitish, lanceolate, 3–4 mm long, lower part slightly enclosing flowering parts and nutlet, upper part thickened, subacute. Stamens 2–3. Style 3-branched. Nutlet dark purple-brown, obovoid, 1 mm long.

TANZANIA. Ufipa District: Matai–Nkove road km 14, June 1996, *Faden et al.* 96/348!; Mbeya District: base of Pungaluma hills 1 km E of Muvwa, Jan. 1991, *Gereau et al.* 3488!

DISTR. **T** 4, 7; Burundi

HAB. Moist roadside ditch and bank, seasonally inundated grassland; 1250–1700 m

CONSERVATION NOTES. Possibly undercollected, with the three known localities so far apart; the type was collected in the 1920s. Data deficient (DD).

NOTE. *Gereau & Kayombo* 3927 (Tanzania, Iringa District: Livingstone Mts near source of Ngolo R., Feb. 1991) and *Lovett* 1153 (Iringa District: Ngwazi swamp) are very similar but stolons are not visible – but the basal parts are incomplete, so they are likely to be this taxon. The habitat is wet grassland at 1830–1860 m.

7. *Ascolepis capensis* (*Kunth*) *Ridl.* in *Trans. Linn. Soc. ser. 2, Bot. 2: 164* (1884); *C.B. Clarke* in *F.T.A. 8: 477* (1902); *Goetghebeur* in *Adansonia ser. 2, 19: 291, t. 8* (1980); *Haines & Lye, Sedges & Rushes E. Afr.: 310, fig. 641* (1983); *Lye* in *Fl. Eth. 6: 492, fig. 212.157* (1997). Type: South Africa, *Drège* 4389 (B, holo., not found; K, P, iso.)

Perennial herb, tufted, with short rhizome, often with slender underground runners; stem 20–80 cm long, 0.3–1.3 mm across, slightly compressed, glabrous or slightly scabrid on the faint ridges, at base with black or vinous red remnants of leaf sheaths. Leaves grey-green, 10–30(–70) cm long, 1–3 mm wide, inrolled and filiform when dry, glabrous. Involucre bracts few, leaf-like, to 5(–12) cm long. Inflorescence white, rounded, 6–10 mm long, of 1–4 spikes; receptacle conical with spirally arranged spikelets; spikelet bracts whitish, 1–3.5 mm long; glumes white with reddish or purple streaks near base, 3–5.5 mm long, dorsiventrally flattened and broadly winged, obtuse. Stamens 2–3. Ovary elongate; style 1–2 mm long, 2-branched. Nutlet dark violet to black, ellipsoid, 1–2.5 mm long, falling enclosed in the glume. Fig. 41, p. 272.

UGANDA. Acholi District: between Atanga and Achwa River, Feb. 1969, *Lye & Lester* 2032!; Teso District: Soroti, Sept. 1954, *Lind* 396!; Masaka District: Lake Nabugabo, Jan. 1971, *Kabuye & Mayanja* 310!

KENYA. Trans-Nzoia District: 8 km S of Kitale, June 1952, *Bogdan* 3440! & Saiwa Swamp National Park, Mar. 1977, *Hooper & Townsend* 1400!; N Kavirondo District: 8 km SE of Bungoma, June 1955, *Bogdan* 4051!

TANZANIA. Ufipa District: 2 km W of Mkowe on Chapota road, Nov. 1994, *Goyder et al.* 3769!; Iringa District: Mufindi, Ngwazi, Mar. 1989, *Kayombo & Kayombo* 10!; Njombe District: near Igesi, crossing of Njombe–Kipengere road, Apr. 1970, *Wingfield* 590!

DISTR. **U** 1, 3, 4; **K** 3, 5; **T** 4, 6–8; from Mali and Ivory Coast to Sudan and Ethiopia and south to South Africa

HAB. Swamps, boggy grassland, temporarily wet grassland; (250–)1050–2250 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution.

SYN. *Platylepis capensis* *Kunth*, *Enum. 2: 269* (1837)

8. *Ascolepis densa* *Goetgh.* in *Adansonia ser. 2, 19: 285, t. 6.4–6* (1980); *Haines & Lye, Sedges & Rushes E. Afr.: 307, fig. 634* (1983). Type: Zambia, Siamambo, Choma, *Robinson* 2814 (SRGH, holo.; K!, P, iso.)

Slender perennial herb 10–40 cm tall; stem 0.3–1 mm across, ± glabrous, base bulbous, with the dark brown or purple remnants of leaf sheaths. Leaves basal and sub-basal, to 8 cm long, 0.5–1 mm wide, glabrous or slightly scabrid. Involucre bracts few, to 6 cm long. Inflorescence white or cream, globose, 5–8 mm across; spikelets

densely spirally imbricate; spikelet bracts narrowly triangular, white-hyaline, 1.5–2.3 mm long; glumes concave, hyaline, 1.8–3.4 mm long, enclosing the floral parts by its wings, with a triangular mucro. Stamens 2, lateral, filament to 2 mm long, anther 0.6–1 mm. Style 1.5 mm long, 3-fid. Nutlets dark red-brown, obovoid-subtrigonal, 0.5–0.6 × 0.2 mm, papillose.

TANZANIA. Chunya District: North Lupa Forest Reserve, Feb. 1963, *Boaler* 847!

DISTR. T 7; Congo-Kinshasa, Angola, Zambia, Zimbabwe

HAB. Seasonally waterlogged depression; 1400 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution; in our area only known from the cited specimen.

22. PYCREUS

P. Beauv. in Fl. d'Oware et Benin 2: 48, t. 86 (1807)

Cyperus L. pro parte

Cyperus subgen. *Pycreus* (P. Beauv.) Miq. in Flora Indiae Batavae 3: 254 (Dec. 1861)

Cyperus sect. *Pycreus* (P. Beauv.) Boeck. in Linnaea 35 (1868)

Annuals or perennials, rhizomatous or stoloniferous. Culms usually scapose. Leaves basal (except in *P. mundtii* Nees – leaves up the culm), rarely without blade; ligule 0. Involucral bracts one to several, leaf-like, sometimes ± bract-like. Inflorescence terminal or less often pseudolateral, capitate or anthelate, with primary, and sometimes secondary branches terminating in one or more or digitate clusters of spikelets, sometimes the spikelets more spaced out on an elongated axis. Spikelets linear to oblong or ellipsoid to ovate, laterally flattened; axis persistent; glumes few to many, 2-ranked, keel obtuse to mucronate. Flowers bisexual. Perianth segments 0. Stamens 1–3. Stigma 2-branched (3 in *P. nigricans*); style continuous with ovary. Nutlets laterally biconvex, with one margin facing the spikelet axis, sometimes almost rounded.

100 species; pantropical.

1. Annual, whole or at least partially submerged, neither leaves nor culm able to support themselves out of the water 2
 - Annual or perennial, selfsupporting, not submerged 3
2. Annual, submerged entirely; all leaves basal; single spikelets on pedicels 1. *P. waillyi* p.277
 - Annual, partially submerged; leaves up the culm; spikelets in clusters 2. *P. demangei* p.278
3. Slender annual, with delicate root system, maximum height 25–30 cm 4
 - Perennial, or annual over 25 cm high 12
4. Glumes golden brown, dark brown to black; nutlet papillose to strongly transversely wrinkled 5
 - Glumes yellow to brown, sometimes reddish-brown; nutlet minutely papillose 8
5. Spikelets 1–1.5 mm wide; glumes 1–1.3 mm long; nutlet papillose to ± wrinkled-muricate 4. *P. melas* p.279
 - Spikelets 1.7–4 mm wide; glumes 1.4–3.2 mm long; nutlet almost smooth to strongly transversely wrinkled 6

6. Involucral bracts spreading; glumes brown to almost black 3. *P. zonatissimus* p.278
 Lowermost involucral bract \pm erect, the inflorescence appearing lateral; glumes golden brown to brown, sometimes with dark brown margin 7
7. Spikelets 2.6–4 mm wide; glumes 3–3.2 mm long, golden brown to brown with a dark brown margin 5. *P. pauper* p.279
 Spikelets 1.7–2.4 mm wide; glumes 1.4–1.7 mm long, brown, no contrasting-coloured margin 6. *P. sp. 1* p.280
8. Involucral bracts 2, largest one erect, second bract very short, glume-like 9
 Involucral bracts (2–)3–7, all leaf-like; glumes golden yellow, brown or reddish-brown 10
9. Largest involucral bract 3–6.5 cm; spikelets 1–6 per head; glumes 2.9–3 mm long; **U** 1 7. *P. melanacme* p.280
 Largest involucral bract 5.5–13.5 cm; spikelets 8–30 per head; glumes 1.3–1.7 mm long; **U** 3, **K** 3, **T** 1, 7, 8 11. *P. capillifolius* p.284
10. Axis of spikelet zigzag; nutlet 0.9–1.1 mm long, 0.6–0.9 mm wide, flattened 8. *P. pelophilus* p.280
 Axis straight or slightly curved; nutlet 0.4–0.8 mm long, 0.2–0.4 mm wide, not flattened 11
11. Spikelets narrowly linear, 0.7–1.7 mm wide; glumes closely overlapping, apex acute 9. *P. hildebrandtii* p.281
 Spikelets oblong-ellipsoid, sometimes ovoid, 1.3–2 mm wide; glumes imbricate when immature, spreading and showing the nutlet during maturation, apex strongly mucronate 10. *P. pumilus* p.283
12. Glumes furrowed on both sides of the keel 13
 Glumes without such furrows 14
13. Perennial often with extensive stoloniferous growth; leaves up the flowering culm 12. *P. mundtii* p.284
 Annual or perennial, without stolons; leaves only at the base of the plant 13. *P. sanguinolentus* p.287
14. Plants annual or short-lived perennial 15
 Plants perennial 20
15. Lower part of culm covered by broad membranous reddish-brown leaf bases; glumes with a distinct white hyaline margin 14. *P. macrostachyos* p.288
 Lower part of culm not covered by membranous leaf bases; glumes without a white hyaline margin 16
16. Spikelets 0.8–1.8 mm wide, axis straight to zigzag; nutlet oblong-ovate, minutely papillose to punctate 15. *P. polystachyos* p.289
 Spikelets 1.8–4.5 mm wide, axis straight to curved; nutlet obovoid, orbicular to ellipsoid, biconvex, almost smooth to transversely wrinkled 17
17. Glumes 3.5–4 mm long, 2.6–3 mm wide, apex acuminate to mucronate; nutlet 1.5 mm long, 1.4 mm wide 16. *P. xantholepis* p.291
 Glumes 1.5–2.8 mm long, 1.2–2.2 mm wide, apex acute to obtuse; nutlet 0.7–1.2 mm long, 0.4–0.7 mm wide 18

18. Inflorescence capitate; nutlet smooth, reddish brown 17. *P. lanceolatus* p.291
 Inflorescence capitate or simple; nutlet transversely wrinkled, (reddish) black to reddish brown 19
19. Inflorescence capitate or simple; nutlet reddish black to black 18. *P. flavescens* p.292
 Inflorescence always simple; nutlet reddish brown 19. *P. intermedius* p.295
20. Perennial, slender and small, densely tufted, the base swollen and surrounded by many dark brown fibres 21
 Perennial, slender to robust, not densely tufted, the base not or with only a few dark fibres (for the last, see couplet 27) 23
21. Inflorescence pale brownish yellow 20. *P. scaettae* p.296
 Inflorescence pale brown, red-brown or black 22
22. Culms 6–11 cm long; spikelets 2–2.5 mm wide 21. *P. fibrillosus* p.296
 Culms 10–34 cm long; spikelets 2.5–5 mm wide 22. *P. sumbawangensis* p.297
23. Inflorescence capitate, glumes dull white 23. *P. fluminalis* p.298
 Inflorescence capitate or open, simple or compound; glumes various colours except dull white 24
24. Nutlet strongly muricate 25
 Nutlet smooth, papillose, punctuate or (slightly) wrinkled, but not strongly muricate 26
25. Inflorescence simple, open, not capitate; glumes golden brown to reddish brown 24. *P. muricatus* p.298
 Inflorescence capitate; glumes dark reddish-brown to almost black 25. *P. macranthus* p.299
26. Plant-bases surrounded by at least some fibrous remains of old leaf sheaths 27
 Plant-bases not surrounded by remains of old leaf sheaths, or when surrounded by these remains, at least not fibrous 28
27. Spikelets 2–3 mm wide 26. *P. permutatus* p.300
 Spikelets 0.8–1.5 mm wide 27. *P. atribulbus* p.301
28. Slender or short lived perennial, often producing small stolons 29
 Robust perennial, with or without stolons 36
29. The basal part of the culms surrounded/covered by loose leaf sheaths, sometimes thick and blackish 30
 The basal part of the culms not surrounded/covered by such structures 31
30. The basal part of the culms surrounded by thick, blackish leaf sheaths; leaf blade folded or channelled, 1.2–3.8 mm wide; glumes brown-black, 1–1.3 mm wide 28. *P. aethiops* p.301
 The basal part of the culm surrounded by loose brown leaf sheaths, not thick; leaf blade folded, 3.4–4.7 mm wide; glumes red-brown, 0.8–1 mm wide 29. *P. nuereensis* p.302
31. Nutlet narrowly oblong-ovoid to ellipsoid-oblong, 0.3–0.4 mm wide 32
 Nutlet ellipsoid, obovoid or orbicular, 0.5–1 mm wide 33

32. Plant slender; leaves flattish or plicate; inflorescence capitate or simple; glume apex obtuse to acute 15. *P. polystachyos* p.289
 Plant robust; leaves canaliculate, ± tough and succulent; inflorescence compound; glume apex long-acuminate 30. *P. laxesplicatus* p.303
33. Spikelet 3.5–8(–14.5) mm long, 1.6–2 mm wide; glumes black with pale keel 31. *P. elegantulus* p.303
 Spikelet 8–35 mm long, 2.4–5 mm wide; glumes yellow-brown, golden brown or pale reddish brown to almost black 34
34. Inflorescence capitate; nutlet reddish-brown to brown, biconvex 17. *P. lanceolatus* p.291
 Inflorescence simple; nutlet brown, grey or greyish-black, not biconvex 35
35. Glumes pale reddish brown to almost black .. 32. *P. longistolon* p.304
 Glumes yellow-brown 33. *P. uniolooides* p.305
36. Inflorescence compound; spikelets 1.4–1.5 mm wide; nutlet narrowly ellipsoid-oblong, 0.3–0.4 mm wide 30. *P. laxesplicatus* p.303
 Inflorescence capitate or simple; spikelets 2.5–5 mm wide; nutlet ± obovoid, 0.5–0.9 mm wide 37
37. Culm sometimes set with small, spine-like teeth; leaf blade 1.8–3.5 mm wide; inflorescence capitate, the spikelets in ovoid-globose, sessile clusters 34. *P. nigricans* p.305
 Culm smooth; leaf blade 2.5–8.6 mm wide; inflorescence simple, spikelets in ovoid, digitate clusters, sessile or at the end of primary branches 38
38. Spikelets 13–35 mm long; glumes reddish brown to almost black; nutlet 1.3–1.6 × 0.6–1 mm .. 32. *P. longistolon* p.304
 Spikelets 8–16 mm long; glumes yellow-brown to deep brown; nutlet 0.8–1.1 × 0.5–0.9 mm .. 35. *P. nitidus* p.307

1. *Pycrus waillyi* Cherm. in Bull. Soc. Bot. Fr. 85: 366 (1938). Type: Mali, Gao to Berra, *De Wailly* 5340 (P, holo.)

Annual to 33 cm long, slender, completely submerged under water; culm ± 25 cm long, ± 0.7 mm wide, trigonous, smooth. Leaves up to 20 cm long; leaf sheath straw-coloured yellow, 2.5–4 cm long; leaf blade linear, flat, ± 8–18 cm long, 1 mm wide, acuminate, glabrous. Involucral bracts 2–3, leaf-like, 10–11 cm long, 0.8–1.2 mm wide. Inflorescence of one sessile spikelet and 4–5 stalked spikelets, pedicels 5–8.5 cm long; spikelets linear-oblong, 8–12 mm long, 1.7–2 mm wide, axis straight to ± curved; glumes ovate, reddish-brown, 1.8–2.1 mm long, 1.4–1.6 mm wide, keel rounded, apex rounded to obtuse, glabrous. Stamens 2. Stigma 2-branched. Nutlet shiny black, orbicular, biconvex, 1.1–1.2 mm long, 0.9–1 mm wide, minutely papillose.

TANZANIA. Njombe District: stream crossing Njombe-Kipenge Road, 1.6 km beyond Igosi, 26 Apr. 1970, *Wingfield* 586!

DISTR. T 7; Mali, Congo-Kinshasa

HAB. Submerged in stream; 2150 m

CONSERVATION NOTES. Data Deficient (DD). Very few collections throughout tropical Africa.

Probably data deficient due to its habitat and therefore undercollected. There is no information about the status of the habitats in which the plants occur.

SYN. *Cyperus waillyi* (Cherm.) R.W. Haines & Lye, *Sedges & Rushes E. Afr.*: 291, fig. 604 (1983)

2. *Pycreus demangei* Raynal in K.B. 23: 314 (1969). Type: Mali, plain of Sorédina, *Demange* 3114 (P, holo.; K!, iso.)

Annual up to 30 cm high with submerged leaves and emergent inflorescence, neither leaves nor culm able to support themselves out of the water; culms tufted, 10–18 cm long, 0.4–0.5 mm wide, rounded to trigonous, smooth. Leaves up to 13 cm long, leaves high up the culm; leaf sheath 1–2.5 cm long, pale brown, sometimes reddish-brown; leaves narrowly linear to filiform, flat or inrolled, 7–10.5 cm long, 0.5–1 mm wide, acuminate, glabrous. Involucral bracts leaf-like, spreading, 3–4, the lowermost 6–9 cm long, 0.7–0.8 mm wide. Inflorescence simple, primary branches 3–4, 1–4 cm long; spikelets in clusters, sessile and at the end of primary branches, 1–4 per cluster, linear-oblong, 5.2–10.5 mm long, 1.5–2 mm wide, axis straight; glumes reddish-brown with narrow translucent marginal border, ovate, 1.2–1.7 mm long, 0.9–1.2 mm wide, keel rounded and pale green to yellow, apex obtuse, glabrous. Stamens 2; filaments 0.9–1.4 mm long. Style 2-branched. Nutlet rounded to obovoid, 0.6–0.7 mm long, 0.5–0.6 mm wide, minutely papillose to ± wrinkled, greyish-black.

TANZANIA. Dodoma District: Chaya Lake, S of Itigi–Tabora track, 16 km W of Kazikazi, 2 July 1996, *Faden et al.* 96/518!; Chunya District: Lupa N Forest Reserve, 153 km on Mbeya–Itigi road, 3 June 1963, *Boaler* 979!; Songea District: Hanga Farm, 27 June 1956, *Milne-Redhead & Taylor* 10915!

DISTR. T 5, 7, 8; Mali, Zambia

HAB. In seasonal pools and flooded plains; 1000–1400 m

CONSERVATION NOTES. Data Deficient (DD). Very few collections throughout tropical Africa. Probably data deficient due to its habitat and also undercollected.

SYN. *Cyperus demangei* (Raynal) Lye in *Nordic Journ. Bot.* 3(2): 231 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 284, fig. 584 (1983)

NOTE. This species is only partially submerged, and has its inflorescence and part of the leaves above the waterlevel. This is in contrast with *P. waillyi* Cherm., which is completely submerged except for its spikelets. *P. waillyi* also has only one spikelet per primary branch (therefore calling it a pedicel), whereas *P. demangei* can have 1 up to 4 spikelets per primary branch.

3. *Pycreus zonatissimus* Cherm. in *Bull. Soc. Bot. Fr.* 74: 605 (1928). Type: Madagascar, Antsirabé, *Perrier* 13061 (P, holo.)

Annual, up to 35 cm high; culms tufted, 10–30 cm long, 0.6–1 mm wide, trigonous to rounded, smooth. Leaves up to 21 cm long; leaf sheath brown, 1.7–4.5 cm long, often with a purplish base; leaf blade narrowly linear, folded, 4.7–16.5 cm long, 0.8–1.1 mm wide, acute, glabrous. Involucral bracts leaf-like, ± spreading, 1–2, lowermost 3.8–9.5 cm long, 0.7–1.5 mm wide, glabrous to minutely scabrid. Inflorescence loosely capitate, spikelets ± sessile, 2–5(–11) per head, ovoid, sometimes oblong-ovoid, 10–15.5 mm long, 2.8–3.8 mm wide, axis straight; glumes brown to almost black, broadly ovate, 2.3–2.8 mm long, 2.5–2.6 mm wide, keel rounded, pale yellowish green, 2–3-veined, apex obtuse, glabrous. Stamens 3; filaments 2.1–2.5 mm long; anthers 0.4–0.5 mm long. Stigma 2-branched. Nutlet black, ± obovoid to rounded, 0.9–1.2 mm long, 0.9–1.2 mm wide, strongly transversely wrinkled.

KENYA. Kisumu-Londiani District: near Londiani, 25 July 1951, *Bogdan* 3193!

TANZANIA. Ufipa District: Mwimbi, 21 Apr. 1962, *Robinson* 5104! & Matai–Nkowe Road, km 14, 22 June 1996, *Faden et al.* 96/333!; Mbeya District: Mbeya–Tunduma Road, between Mbimba & Karashi villages, 14 June 1996, *Faden et al.* 96/191!

DISTR. K 5; T 4, 7; Zambia, Madagascar

HAB. In seasonally moist depression, (heavily grazed) wet grassland and in ditches at roadsides; 1000–1400 m, in Kenya up to 2300 m

CONSERVATION NOTES. Least Concern (LC) due to distribution and habitat.

SYN. *Pycrus zonatus* Cherm. in Bull. Soc. Bot. Fr. 67: 328 (1921). Type as for *P. zonatissimus*
Cyperus zonatissimus (Cherm.) Kük. in E.P. 4, 20 (101): 395 (1936); Haines & Lye, Sedges
 & Rushes E. Afr.: 285, fig. 587 (1983), *non Cyperus zonatus* Kük. in F.R. 12: 93 (1913)

4. ***Pycrus melas*** (Ridl.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 538 (1895) & in F.T.A. 8: 302 (1902). Type: Angola, Pungo Andongo, Mutollo, *Welwitsch* 7154 (BM!, syn.) & Mutollo, *Welwitsch* 6914 (BM!, syn.); Pungo Andongo, *Welwitsch* 6913 (BM!, syn.); Huilla, Morro de Sopollo, *Welwitsch* 6871 (BM!, syn.)

Slender annual up to 20(–35) cm high, with a minute rootsystem; culms tufted, 6–19(–32) cm long, 0.3–0.5 mm wide, trigonous to rounded, smooth. Leaves up to 10 cm long; leaf sheath reddish-brown to brown, 1.4–2.3 cm long; leaf blade narrowly linear-filiform, folded or sometimes ± channeled, 1.4–7.5 cm long, 0.6–1.2 mm wide, acute, glabrous. Involucral bracts 2, leaf-like, erect or ± spreading, the lowermost 2.6–8.2 cm long, 0.8–1.2 mm wide. Inflorescence loosely capitate, primary branches 0–2, 0–0.9 cm long; spikelets sessile or in digitate clusters at the end of very short primary branches, 3–7 per primary branch, or up to 30 in a head, linear-oblong, 7.5–11 mm long, 1–1.5 mm wide, in fruit elongating up to 16 mm long, axis straight, sometimes slightly curved; glumes ovate to obovate, brown to almost black, with membranous, transparent margins, 1–1.3 mm long, 0.9–1.1 mm long, keel acute to rounded, 2–3-veined, pale brown, glabrous. Stamens 2: filaments 0.5–1 mm long. Stigma 2-branched. Nutlet brown to dark greyish-brown, obovoid to obtriangular, somewhat flattened, 0.5–0.6 mm long, 0.3–0.4 mm wide, minutely papillose, punctuate to ± wrinkled-muricate.

TANZANIA. Ufipa District: Sumbawanga, Mwinbi, 21 Apr. 1962, *Robinson* s.n.!; Tunduru District: just E of Songea District boundary, 6 June 1956, *Milne-Redhead & Taylor* 10654!; Songea District: by R. Luhira near Mshangano fish ponds, 18 Mar. 1956, *Milne-Redhead & Taylor* 1982!
 DISTR. T 4, 8; Ghana, Togo, Central African Republic, Congo-Kinshasa, Angola, Zambia, Malawi
 HAB. In sandy, boggy grasslands, at edges of pools and as weed in rice fields; 900–1050 m
 CONSERVATION NOTES. Least Concern (LC) due to distribution and habitat.

SYN. *Cyperus melas* Ridl. in Trans. Linn. Soc. Ser. II. 2: 127 (1884); Kük. in E.P. 4, 20 (101): 357 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 286, figs. 590, 591 (1983)

NOTE. This species is easily recognized by its small, annual habit and its narrow brown to almost black spikelets.

5. ***Pycrus pauper*** (A. Rich.) C.B. Clarke in Th. Durand & Schinz, Consp. Fl. Afr. 5: 540 (1895) & in F.T.A. 8: 291 (1902). Type: Ethiopia, Walcha in Sana province, 6 Aug. 1841, *Schimper III* 1602 (P, holo.; H, HAL, K!, UPS, iso.)

Annual, up to 25 cm high; culms ± 23 cm long, ± 0.6 mm wide, trigonous, smooth. Leaves few, up to 17 cm long; leaf sheath brown, sometimes with a purplish base, ± 2.5 cm long; leaf blade narrowly linear, folded, 14.5–15.5 cm long, 0.6–0.8 mm wide, acute to acuminate, glabrous to minutely scabrid. Involucral bracts leaf-like, 2; lowermost bract ± erect, continuing in the direction of the culm, the inflorescence therefore appearing ± lateral, 5–8 cm long, 0.9–1 mm wide, glabrous. Inflorescence capitate, spikelets 1–3 per head, elliptic-ovate to ovate, 8–15 mm long, 2.6–4 mm wide, axis straight; glumes golden brown to brown, margins dark brown, ovate, 3–3.2 mm long, 2.8–3.3 mm wide, keel rounded, 3-veined, greenish yellow, apex acute. Stamens 3: filaments 2.5–2.8 mm long; anthers 0.4 mm long. Stigma 2-branched. Nutlet black, orbicular, 1.3–1.4 mm long, 1.3–1.4 mm wide, strongly transversely wrinkled.

TANZANIA. Songea District: by R. Luhira near Mshangano fish ponds, 18 Mar. 1956, *Milne-Redhead & Taylor* 1956!
 DISTR. T 8; Nigeria, Cameroon, Central African Republic, Ethiopia, Zambia

HAB. In swamps, roadside ditches and seasonally moist depressions; 1050–1700 m
 CONSERVATION NOTES. Least Concern (LC) due to distribution and habitat.

SYN. *Cyperus pauper* A. Rich. in Tent. Fl. Abyss. 2: 478 (1850); Haines & Lye, Sedges & Rushes E. Afr.: 286, figs. 588, 589 (1983); Lye in Fl. Eth. 6: 484, fig. 212.146 (1997)

6. *Pycreus* sp. 1

Small, delicate annual, up to 22.5 cm high; culms 5.8–19 cm long, 0.3–0.6 mm wide, trigonous, smooth. Leaves up to 9.8 cm long; leaf sheath brown, 0.5–2.3 cm long, the base sometimes reddish; leaf blade narrowly linear to filiform, flat, 3.6–7.5 cm long, 0.6–1 mm wide, acute, glabrous to minutely scabrid. Involucral bracts leaf-like, 1–2, spreading, the lowermost somewhat erect, 2.2–7 cm long, 0.6–1.2 mm wide, glabrous to minutely scabrid. Inflorescence capitate, spikelets 1–9 per head; spikelets ellipsoid to ovoid, 4.9–7.6 mm long, 1.7–2.4 mm wide, axis straight; glumes brown, ovate, 1.4–1.7 mm long, 1.2–1.4 mm wide, keel acute, 2–3-veined, apex obtuse to acute. Stamens 2(–3); filaments 0.7–1.5 mm long; anthers 0.3–0.4 mm long. Stigma 2-branched. Nutlet brown to black, obovoid, sometimes slightly irregularly so, 0.6–1 mm long, 0.4–0.7 mm wide, almost smooth to (weakly) transversely wrinkled.

TANZANIA. Singida District: Itigi–Singida road, 23 km from Singida, 28 Mar. 1965, *Richards* 19941A!; Iringa District: Mufindi, Idetero House, 11 Mar. 1987, *Lovett* 1710!; Rungwe District: Kymbila, N of Lake Nyasa, 13 May 1912, *Stolz* 1263!

DISTR. T 5, 7; not known elsewhere

HAB. Damp grassland, base of granite rocks; 1500 m

CONSERVATION NOTES. Data Deficient (DD)

NOTE. These 3 specimens were identified as *P. pauper* (A. Rich.) C.B. Clarke, but do not have the characteristic dark brown margin of the glume; they could represent a new species.

7. *Pycreus melanacme* *Nelmes* in K.B. 10: 91 (1955). Type: Zambia: Mpulungu–Mbala [Abercorn] Road close to Tsetse control, *Richards* 725 (K!, holo.)

Slender annual, up to 17 cm high; culm 16 cm long, 0.4 mm wide, trigonous, smooth. Leaves up to 15 cm long; leaf sheath 1.5–2.5 cm long, (reddish-)brown; leaf blade narrowly linear, folded, 8.5–12.5 cm long, 0.8 mm wide, acute, glabrous. Involucral bracts 2: lowermost leaf-like, ± erect, 3.2–6.5 cm long, 0.8 mm wide; second glume-like. Inflorescence capitate; spikelets 1–6 per head, broadly ovoid, 5–7 mm long, 3–4 mm wide, axis straight; glumes bright yellow, apex black, broadly ovate, papery, 2.9–3 mm long, 2.6–3 mm wide, keel acute, 2-veined, apex acute to acuminate. Stamens 2–3; filaments 2.1–2.7 mm long; anthers 0.4 mm long. Stigma 2-branched. Nutlet brown, obovoid, ± biconvex, 1.3 mm long, 0.9 mm wide, coarsely papillose in longitudinal rows.

UGANDA. Karamoja District: Moroto, May 1963, *Kertland* s.n.!

DISTR. U 1; Congo-Kinshasa, Zambia

HAB. In shallow pools, damp places, at water edges; 1350–1650 m

CONSERVATION NOTES. Probably Least Concern (LC) due to its distribution and habitat.

NOTE. *P. melanacme* is characterized by the striking yellow glume with black apex.

8. *Pycreus pelophilus* (*Ridl.*) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 540 (1895); C.B. Clarke in F.T.A. 8: 298 (1902). Type: Angola, Bemposta, *Welwitsch* 7025 (BM!, lecto.)

Annual up to 32 cm high, slender, solitary or crowded; culm 4.5–28 cm long, 0.5–1.1 mm wide, trigonous, smooth. Leaves up to 20 cm long; leaf sheath (pale) brown, sometimes purplish at base, 1–4.5 cm long; leaf blade linear, flattish-plicate, 3.2–15(–22) cm long, 1.2–3 mm wide, acuminate, scabrid. Involucral bracts leaf-like,

spreading, (2-)3-6, 7-16 cm long, ± scabrid. Inflorescence simple, sometimes partially compound, primary branches 3-8, 1-7 cm long; spikelets in loose digitate clusters, sessile and at the end of primary branches, when inflorescence partially compound also clusters on secondary branches; spikelets 4-15 per cluster, linear-lanceolate, 7.5-20 mm long, 1.5-3 mm wide; glumes spreading during maturation, golden yellow to brown, broadly ovate, the base becoming more narrow, 1.7-2 mm long, 1.2-1.8 mm wide, keel acute and green, 3-5-veined, keel mucronate. Stamens 2; filaments 1-1.6 mm long; anthers 0.2 mm long. Stigma 2-branched. Nutlet light to dark brown, somewhat shiny, the margins almost black, obovoid, obtriangular to obcordate, flat, 0.9-1.1 mm long, 0.6-0.9 mm wide, minutely papillose in longitudinal rows.

UGANDA. Karamoja District: Bokora County, 4 km N of Lotome, 10 June 1970, *Lye & Katende* 5594!; Busoga District: Inik, W of Udiko Hill, 25 May 1951, *Wood* 167!; Mbale District: Tororo, near Kenyan border, 2 July 1967, *Haines* 4238!

TANZANIA. Tanga District: Lwengera Valley, 6.5 km E of Korogwe, 20 July 1953, *Drummond & Hemsley* 3396!; Dodoma District: Manyoni, 24 Apr. 1962, *Polhill & Paulo* 2165!; Songea District: ± 4 km W of Songea, 10 May 1956, *Milne-Redhead & Taylor* 9139!

DISTR. U 1, 3; T 1-8; Congo-Kinshasa, Burundi, Sudan, Somalia, Angola, Zambia, Malawi, Botswana, South Africa

HAB. Pool edges, swamps, wet depressions in cultivated area, recently disturbed silt on riverbanks, 0-1650 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus pelophilus* Ridl. in Trans. Linn. Soc. Bot., Ser. 2. Bot. 2: 129 (1884); Kük. in E.P. 4, 20 (101): 364 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 289, figs. 599, 600 (1983)

NOTE. This species is easily recognized by its small habit, strong zigzag axis, mucronate glumes and flattened nutlets.

9. ***Pycreus hildebrandtii*** C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 538 (1895), *nom. nud.* & in F.T.A. 8: 299 (1902). Type: Zanzibar, Oct. 1873, *Hildebrandt* 1071 (K!, syn., BM!, syn.); Kenya: Lamu District, Ozi, 1892, *Gregory* s.n. (BM!, syn.) & Kenya: Kilifi District: Rabai Hills, near Mombasa, *Taylor* (BM!, syn.)

Annual up to 25-30 cm high; culms tufted, 4.2-20 cm long, 0.5-1.3 mm wide, trigonous, sometimes grooved near the base, smooth. Leaves up to 21 cm long; leaf sheath membranous, reddish-brown to sometimes purplish brown, 1-2.2 cm long; leaf blade narrowly linear, flat, glabrous, 5-19 cm long, 1.3-2 mm wide, acuminate, glabrous to sometimes minutely scabrid. Involucral bracts leaf-like, 3-7, 3-14.5 cm long, 1.2-2.4 mm wide. Inflorescence simple, primary branches 4-8, 0.5-4 cm long; spikelets loosely arranged in digitate clusters, sometimes on an elongated axis, situated at the end of primary branches, often at least one cluster sessile; spikelets 7-32 per cluster, linear, 4-12 mm long, 0.7-1.7 mm wide, axis straight; glumes closely overlapping, ovate, (yellowish) red, 0.9-1.4 mm long, 0.6-1 mm wide, keel rounded, (yellowish) green, grooved, no obvious veins, apex acute. Stamens 1-2; filaments 0.8-1.1 mm long; anthers 0.25-0.7 mm long. Style 2-branched. Nutlets oblong-cylindrical, sometimes obovoid, 0.6-0.8 mm long, 0.2-0.4 mm wide, papillae in longitudinal rows, shiny deep grey-brown. Fig. 42, p. 282.

KENYA. Machakos District: Bushwackers Safari Camp, 23 Apr. 1969, *Napper & Kamuri* 2059!; Tana River District: Kurawa, 48 km S of Garsen, 20 Sept. 1961, *Polhill & Paulo* 518!; Kwale District: Shimba Hills, Valley S of Mwele Mdogo Forest, 7 Feb. 1953, *Drummond & Hemsley* 1166!

TANZANIA. Tanga District: Tanga Province, Mikochoeni, Mkwaja, 12 June 1957, *Tanner* 3547! & Kipumbwi, Mwera, Pangani, 9 August 1955, *Tanner* 2041!; Uzuramo District, Dar es Salaam, 10 km W of city centre, N of Mabibo Primary School, 6 June 1996, *Faden et al.* 96/31!

DISTR. K 4, 7; T 3, 6; Z; not known elsewhere

HAB. Swamps, riverbeds, seasonal pools, along salty creeks, on sandy soils; 0-800 m

CONSERVATION NOTES. Least Concern (LC) due to range of habitat.



FIG. 42. *PYCREUS HILDEBRANDTII* — 1. habit, $\times \frac{2}{3}$; 2. digitate cluster, $\times 2$; 3. spikelet, $\times 5$; 4. part of spikelet, $\times 8$; 5. glume, $\times 20$; 6. anther and filament, $\times 20$; 7. ovary and style, $\times 120$; 8. nutlet, $\times 50$. 1 & 5 from *Faden et al.* 96/31, 2-4 & 6-8 from *Tanner* 2041. Drawn by Juliet Williamson.

- SYN. *Cyperus polystachyus* Rottb. var. *ferruginea* Boeck in Linnaea 35: 479 (1867) pro parte
C. polystachyus Rottb. var. *micans* C.B. Clarke in J.L.S. 21: 54 (1886) pro parte
C. hildebrandtii K. Schum. in P.O.A. C: 118 (1895)
Pycrus minimus C.B. Clarke in F.T.A. 8: 302 (1902). Type: Kenya, Kilifi District, Rabai Hills,
 Dec. 1885, Taylor s.n. (BM!, holo.?, K!, iso.?)
Cyperus pseudo-hildebrandtii Kük. in E.P. 4, 20 (101): 366 (1936); Haines & Lye, Sedges &
 Rushes E. Afr.: 290, fig. 601 (1983)

NOTE. This species resembles *Pycrus pumilus* Domin var. *patens* (Vahl) Kük. in its small and delicate habit. Differences can be found in the spikelets, which are narrowly linear in *P. hildebrandtii*, with closely overlapping glumes, while *P. pumilus* var. *patens* has wider, oblong-ellipsoid to ovoid spikelets, with the glumes spreading when mature, showing the nutlet.

To some extent this species also shows resemblance with *Pycrus polystachyos* (Rottb.) P. Beauv., especially when it has a somewhat bigger habit; the glumes of *P. hildebrandtii* however are more often reddish.

10. *Pycrus pumilus* Domin in Biblioth. Bot. 85: 417 (1916)

Annual up to 25 cm high with delicate roots; culms tufted, 14.5–17.5 cm long, 0.4–1 mm wide, triquetrous, smooth. Leaves up to 17 cm long; leaf sheath brown, 0.5–2 cm long, sometimes almost absent; leaf blade narrowly linear, flat, 2.4–15 cm long, 1–2 mm wide, acuminate, glabrous to minutely scabrid. Involucral bracts 3–4(–5), leaf-like, spreading, 3.5–9.5(–17.5) cm long, 1.2–1.5(–2) mm wide. Inflorescence capitate or simple, primary branches 0–4, 1.1–4.5 cm long; spikelets loosely arranged in digitate clusters, sometimes on an elongated axis, the clusters at the end of the primary branches, often 1 or more clusters sessile; spikelets 6–12 per cluster, oblong-ellipsoid, sometimes ovoid, flattened, 5–14(–20) mm long, 1.3–2 mm wide, axis straight to sometimes slightly curved; glumes imbricate when young, spreading, sides infolding and showing the nutlet during maturation, yellow to brownish red, (broadly) ovate, 0.9–1.3 mm long, 0.7–1.1 mm wide, keel acute, 3–5-veined, green to reddish brown, apex (strongly) mucronate. Stamens 1(–2), lateral; filaments 0.8–1.2 mm long; anthers 0.2–0.3 mm long. Style 2-branched. Nutlet deep grey(-brown) with a metallic shine when mature, obovoid (sometimes obovoid-oblong), 0.4–0.6 mm long, 0.3–0.4 mm wide, minute tubercles in longitudinal rows.

var. *patens* (Vahl) Kük. in E.P. 4, 20 (101): 378 (1936). Type: “French Guinea”, Thonning s.n. (C, holo.)

UGANDA. Teso District: Soroti town, 23 March 1969, Haines 289! & Serere, at Tira, July 1926, Maitland 1319!

KENYA. Machakos District: Emali, Makueni, 12 Apr. 1969, Napper & Mwangangi 2006!; Lamu District: Bader Water Pan, 3 km inland from Kiunga on road to Mararani, 5 Apr. 1980, Gilbert & Kuchar 5900!; Kwale District: Kaya Puma, 18 July 2000, Luke et al. 6324!

TANZANIA. Dodoma District: Itigi Region, Chunya–Itigi road 38 km from Itigi, 25 Mar. 1965, Richards 19857!; Rungwe District: Itungi Port, 28 June 1996, Faden et al. 96/452!; Songea District: road Luhira, near Mshangano fish ponds, 5 May 1956, Milne-Redhead & Taylor 9985a!

DISTR. U 3; K 4, 7; T 1–8; P; Z; widespread in tropical Africa

HAB. Along drainage channels, in seasonal wet hollows in grassland, stream sides, riverbeds and swamps; 0–2100 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus nitens* Retz. Obs. 5: 13 (1789). Type: India, Tranquebar, König s.n. (LD, holo.)

C. patens Vahl in E.P. 2: 334 (1805)

Pycrus nitens (Retz.) Nees in Nav. Act. Nat. Cur. 19, Suppl. 1: 53 (1843); C.B. Clarke in F.T.A. 8: 295 (1902)

P. patens (Vahl) Cherm. in Arch. Bot. 4, Mém. 7: 11 (1931)

Cyperus pumilus L. var. *patens* (Vahl) Kük. in E.P. 4, 20 (101): 378 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 290, figs. 602, 603 (1983)

NOTE. See note under *Pycrus hildebrandtii*.

11. ***Pycreus capillifolius*** (A. Rich.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 535 (1895) & in F.T.A. 8: 300 (1902); Hutchinson in F.W.T.A. 2 (2): 490 (1936). Type: Ethiopia, Kouaieta, *Quartin Dillon* s.n. (P, holo.)

Annual, up to 33 cm high; culms tufted, 12–31.5 cm long, 0.4–1 mm wide, trigonous, smooth. Leaves up to 20 cm long; leaf sheath 2–4.5 cm long, brown; leaf blade narrowly linear to filiform, folded or canaliculate, glabrous, 5–17 cm long, 0.6–1.2 mm wide, apex acuminate, glabrous to minutely scabrid. Involucral bracts leaf-like, canaliculate, the lowermost 5.6–13.5 cm long, 0.6–1.2 mm wide, glabrous, continuing in the direction of the culm, the inflorescence therefore appearing lateral. Inflorescence capitate; spikelets sessile, 8–30 per head, linear-oblong to ellipsoid-oblong, 6–19.5 mm long, 1.3–2 mm wide, axis straight; glumes ovate, glabrous, golden yellowish-brown, somewhat translucent, to dark (reddish-)brown, 1.3–1.7 mm long, 1–1.4 mm wide, keel rounded to acute, yellowish-green, 2–3-veined, apex obtuse. Stamens 2: filaments 0.7–1 mm long. Stigma 2-branched. Nutlet obtriangular, flattened but thicker over the shoulders, 0.6–1.1 mm long, 0.4–0.7 mm wide, minute tubercles in longitudinal rows, metallic reddish brown or greyish-black.

UGANDA. Mbale District: Kapchorwa, 10 Sept. 1954, *Lind* 315!; Teso District: Bukedea County, $\frac{1}{2}$ km NW of Bukedea, 9 May 1970, *Lye & Katende* 5366!; Mbale District: Bukedi, Pallisa, 2 km E of Budaka, 18 Aug. 2001, *Lye & Namaganda* 25270!

KENYA. Trans Nzoia District: Kitale, \pm 10 km Eldoret–Kitale, 8 Oct. 1981, *Gilbert & Mesfin* 6478 & 6486B!; Baringo District: 2.6 km on Kabarnet–Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 139!

TANZANIA. Bukoba District: Minziro Forest Reserve, Muhangu subvillage, in public area and forest margin on hill, 22 May 2001, *Festo* 1511!; Njombe District: Great North Road, 3 km W of Inkigula near Makumbaka, 18 Mar. 1975, *Hooper & Townsend* 383!; Songea District: Lupembe Hill, 27 May 1956, *Milne-Redhead & Taylor* 10466!

DISTR. U 3; K 3; T 1, 7, 8; Senegal, Guinea, Sierra Leone, Liberia, Ghana, Nigeria, Central African Republic, Congo-Kinshasa, Burundi, Sudan, Ethiopia, Zambia, Malawi, Angola; Madagascar

HAB. In damp grassland and swampy area, often on rock outcrops, 1100–2040 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus capillifolius* A. Rich. in Tent. Fl. Abyss. 2: 475 (1851); Kük. in E.P. 4, 20 (101): 357 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 287, figs. 594, 595 (1983); Lye in Fl. Eth. 6: 484, fig. 212.145 (1997)

NOTE. *P. capillifolius* is a very distinct species, and does not seem closely related to any other species in the Flora area. It is one of few species with an apparently lateral inflorescence, due to the lowermost involucral bract, which continues in the direction of the culm. Although several other species have an erect involucral bract as well, they do not show it as prominently as *P. capillifolius*.

12. ***Pycreus mundtii*** Nees in *Linnaea* 10: 131 (1836); C.B. Clarke in F.T.A. 8: 294 (1902); Hutchinson in F.W.T.A. 2 (2): 490 (1936). Type: South Africa, Zwelendani W George, *Mundt* s.n. (B, holo.)

Perennial up to 35 cm high, with stolons up to 2 m long, rooting copiously at each node and ending in an inflorescence; culm trigonous, smooth, sometimes \pm grooved, the non-bearing leaf part 3–29 cm long, 0.7–2.5(–5) mm wide. Leaves up to 21 cm long, spread along the flowering culm; leaf sheath yellow-brown, sometimes greenish, often with a red-purple coloured triangle at the side opposite the leaf, 1–4(–7) cm long; leaf blade (narrowly) linear, \pm plicate, 2.2–16.5 cm long, 1–5.5(–7.2) mm wide, acute to acuminate, the apex often \pm minutely scabrid. Involucral bracts leaf-like, 2–6, spreading, lowermost 1.8–10.5 cm long, 1–4.8 mm wide, apex almost glabrous to \pm scabrid. Inflorescence capitate or simple, when simple primary branches (0–)2–12, (0–)0.5–6.5 cm long; spikelets crowded in digitate, ovoid clusters, sometimes on slightly elongated axis, sessile and at the end of primary branches; spikelets 2–13 per cluster, ovoid-lanceolate to (broadly) ovoid,



FIG. 43. *PYCREUS MUNDTII* — 1. habit, $\times \frac{2}{3}$; 2, inflorescence, $\times \frac{2}{3}$; 3, spikelet, $\times 8$; 4, glume, $\times 12$; 5, flower, $\times 12$; 6, nutlet, $\times 20$. 1 from Morrison 25, 2–5 from Haines 71. Drawn by Juliet Williamson.

flattened or sometimes almost conical, the glumes loosely to densely compressed, 1.3–11.5 mm long, 1–4 mm wide, axis straight; glumes from almost yellow to (pale) brown to black, ovate, 1.8–2.6 mm long, 1.1–2.2 mm wide, keel acute to rather broad, furrowed on both sides of the keel, not always distinct, 0–3-veined, apex obtuse to almost acute. Stamens 2–3; filaments 2–3.1 mm long; anthers 0.7–1.7 mm long. Stigma 2-branched. Nutlet dark (greyish-)brown, obovoid, sometimes almost oblong, biconvex, 0.7–1.1 mm long, 0.4–0.6 mm wide, almost glabrous to minutely papillose to somewhat wrinkled. Fig. 43, p. 285.

NOTE. *Pycreus mundtii* is easy to recognize as it has leaves up the flowering culm, which separates it from almost all other species in the Flora area. Another good character for this species are the glumes having furrows on each side of the keel, a character which is shared with *P. sanguinolentus* Vahl. These two species can be easily separated based on habit.

Although this species is easily recognizable, it is also very variable. The habit can range from very delicate stolons, leaves and culms to more robust ones; the inflorescence can also vary between specimens, e.g. capitate or simple inflorescences, and the number and length of primary branches, or the size and in shape of the spikelets. Most specimens have ovoid-lanceolate spikelets, but some have spikelets which are more obviously ovoid, with loosely arranged glumes and somewhat curved axis, or almost rounded spikelets, not flattened as most *Pycreus* species, with a low number of glumes which are very densely compressed.

In the past, an number of varieties and separate species were described, based on some of these characters. In the FTEA region quite a large number of the specimens can be divided in three groups, according to previous varieties or species. However, quite a distinct number of specimens show characters shared by more than one group, or coincide with each other, and therefore are impossible to identify further than species level; I do believe that varieties can be recognized in this species to a certain level; this distinction will not work on all specimens.

- | | |
|--|--------------------------------|
| 1. Glumes dark brown to black | b. var. <i>uniceps</i> |
| Glumes yellow to pale brown to brown-red, sometimes
yellow with brown-red dots and margins | 2 |
| 2. Spikelets 5.5–11.5 mm long, 2.5–2.8 mm wide, axis straight | a. var. <i>mundtii</i> |
| Spikelets 4.5–5 mm long, 2.2–4 mm wide, axis somewhat
curved, the cluster seemingly twisted, glumes loosely
arranged on the axis | c. var. <i>densispiculosus</i> |

a. var. **mundtii**

Spikelets 5.5–11.5 mm long, 2.5–2.8 mm wide, axis straight; glumes yellow to brown-red, sometimes yellow with brown-red dots and margins.

UGANDA. Mengo District: Namanve, Kiagwe, Sept. 1932, *Eggeling* 508! & Entebbe, near Kampala, 12 May 1966, *Haines* 130! & 0.5 km E of Port Bell Pier, 16 Jan. 1969, *Lye* 1191!

KENYA. Kisumu-Londiani District: Kisumu, Feb. 1915, *Dummer* 1828! & Kisumu, Dhow Pier, 25 May 1953, *Verdcourt* 931!

TANZANIA. Songea District: ± 5 km E of Songea, by R. Luhira, 15 Jan. 1956, *Milne-Redhead* & *Taylor* 8246!; Lindi District: Lake Lutamba, 26 June 1935, *Schlieben* 6560!; Mwanza District, 10 Oct. 1953, *Tanner* 1653!

DISTR. U 2–4; K 5; T 1–4, 6–8, P, Z; widespread in tropical Africa and South Africa; Mediterranean, West Indies

HAB. In wet habitats such as swamps, lake edges, wet grasslands, riverine forests, also frequently floating, sometimes forming a continuous thick turf on the water surface “giving way but not breaking under the weight of crocodiles and monitor lizards”; sea-level–2100 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Cyperus mundtii* (Nees) Kunth in Enum. Pl. 2: 17 (1837); Kük. in E.P. 4, 20 (101): 380 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 270 (1983); Lye in Fl. Eth. 6: 479, fig. 212.136 (1997)

NOTE. This is the most common and widespread variety. It is recognized by its often rather coarse habit and the simple inflorescence with many and long primary branches.

b. var. **uniceps** (*C.B. Clarke*) *Napper* in Journ. E. Afr. Nat. Hist. Soc. 28 (124): 3 (1971). Type: Zimbabwe, Inyanga, Niarawe stream, *Swedish Exped. Afr. aust. et Rhod. austr. 1930–1931* 2494 (S, holo.)

Spikelets 4.3–8 m long, 2.5–3.5 mm wide, axis straight; glumes brown to black.

UGANDA. Kigezi District: Kachwekano Farm, June 1951, *Purseglove* 3642! & Muko, 4 Jan. 1962, *Morrison* 25! & Kashambya, Kisisi Road, 9 May 1952, *Norman* 108!

KENYA. Kiambu District: Nairobi River, near Kabete, 5 Nov. 1950, *Bogdan* 2843! & Ondiri Swamp, Kikuyu, Feb. 1951, *Verdcourt* 427!; Masai District: Amboseli Reserve, 14 Sept. 1954, *Bally* 9875!

TANZANIA. Rungwe District: Kandete, just W of Mwakeleli, 17 Mar. 1975, *Hooper & Townsend* 869!; Arusha District: Arusha National Park, floor of Ngurdoto Crater, 3 Feb. 1970, *Richards* 25335!; Lushoto District: West Usambaras, Mkuzi, 6 km NE of Lushoto, 21 Apr. 1953, *Drummond & Hemsley* 2171!

DISTR. U 1, 2; K 4, 6; T 2, 3, 4, 7; Chad, Congo-Kinshasa, Ethiopia, Angola, Zambia, Malawi, Botswana

HAB. In wet habitats such as swamps, lake shores, local depressions, damp grasslands and swamp forest; 600–2300 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Cyperus distichophyllus* Steud. in Flora 15: 582 (1842). Type: Ethiopia, Tigre Province, Adua, *Schimper* 745 (P, holo.; BHAL, K!, iso.)

C. sanguinolentus Vahl var. *uniceps* C.B. Clarke in E.J. 38: 132 (1906)

C. mundtii (Nees) Kunth var. *uniceps* (C.B. Clarke) Kük. in Bot. Notis. 69 (1934) & in E.P. 4, 20 (101): 381 (1936)

C. mundtii (Nees) Kunth var. *distichophyllus* (Steud.) Kük. in Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped. 1911–1912 & in E.P. 4, 20 (101): 381 (1936)

NOTE. *Pycrus mundtii* var. *uniceps* shows much resemblance with var. *mundtii*, but differs in having a smaller habit, the inflorescence often capitate or simple with short primary branches and almost black glumes. It also shows much resemblance with *Pycrus sanguinolentus* (Vahl) Nees, but the two differ in their growth habits: *P. sanguinolentus* has tufted culms, with all the leaves originating from the base, while *P. mundtii* var. *uniceps* is stoloniferous, with extensive growth, rooting at each node on the stolon and ending in an inflorescence, the leaves spread along the flowering culms.

c. var. **densipiculatus** (Kük.) *Hoenselaar comb. nov.* Type: Tanzania, Tabora, *Stuhlmann* 520 (B, holo.; K!, iso.)

Spikelets 4.5–5 mm long, 2.2–4 mm wide, axis somewhat curved, the cluster seemingly twisted, glumes loosely arranged on the axis; glumes yellow to (pale) brown.

TANZANIA. Ufipa District: Sumbawanga–Mbale Road, ± 5 km W of Wsanzi, 2 June 1980, *Hooper & Townsend* 1810!; Mbeya District: top of Chimala Escarpment, 5 Dec. 1963, *Richards* 18572!; Iringa District: Soa Hill, 29 Oct. 1947, *Greenway & Brenan* 8279!

DISTR. T 4, 7; not known elsewhere

HAB. Swamps; 600–1700 m

CONSERVATION NOTES. Only known from four locations, but needs information on habitat status.

SYN. *Cyperus mundtii* (Nees) Kunth var. *densipiculatus* Kük. in E.P. 4, 20 (101): 381 (1936)

NOTE. Easily be recognized by its (pale) brown spikelets, with loosely arranged glumes on a sometimes slightly curved axis.

13. **Pycrus sanguinolentus** (*Vahl*) *C.B. Clarke* in F.T.A. 8: 293 (1902). Type: “India orientalis” in Vahl, ex Herb. Lamarck (P-LA, holo.)

Annual or short-lived perennial; culms tufted, 21–65 cm long, 0.8–2.5 mm wide, trigonous to sometimes triquetrous, smooth, lower part with several nodes. Leaves up to 27 cm long; leaf sheath yellowish brown to green to sometimes reddish, 2.8–10.7 cm long; leaf blade narrowly linear, flattish or plicate, 8–17 cm long, 1–4 mm wide,

acuminate to acute, sometimes \pm scabrid. Involucral bracts 3–5, leaf-like, spreading, lowermost 7.4–18.5 cm long, 1.4–3.8 mm wide, often \pm scabrid. Inflorescence \pm capitate or simple; primary branches (0–)3–5, 1–3.3 cm long; spikelets crowded in digitate, ovoid clusters, sessile or at the end of primary branches; spikelets 3–20 per cluster, narrowly oblong-ovoid, 8–18 mm long, 2–2.8 mm wide, axis straight; glumes pale brown to reddish- or purplish-brown, broadly ovate (sometimes \pm obovate), 2.1–2.2 mm long, 0.9–1.8 mm wide, keel rather broad, often distinctly furrowed on both sides of keel, 3–5-veined, green, apex obtuse. Stamens 3; filaments 1.3–2.4 mm long, anthers 0.5–1 mm long. Style 2-branched. Nutlets grey-black, broadly obovoid, 1.5–2.2 mm long, 0.9–1.8 mm wide, minutely papillose-punctuate to \pm wrinkled, sometimes \pm glaucous.

KENYA. Laikipia District: 30 km N of Rumuruti, 7 Nov. 1978, *Hepper & Jaeger* 6656! & Uaso Narok River on Kisima Farm, 40 km N of Rumuruti, 13 Nov. 1977, *Carter & Stannard* 351!; Nairobi District: Golf Range, between Wilson Airport and Army Barracks, just outside National Park, *Gilbert* 4986!

TANZANIA. Mpanda District: Kapapa, 11 km on road to Sitalike, 17 Sept. 1970, *Richards & Arasuluhu* 25961!; Dodoma District: Manyoni, 24 Apr. 1962, *Polhill & Paulo* 2161!; Singida District: 27 km on Manyoni–Singida road, 3 July 1996, *Faden et al.* 96/537!

DISTR. K 1, 3, 4, 6; T 1, 2, 4, 5, 7; Eritrea, Ethiopia, Zambia; Mediterranean, Asia, Australia

HAB. Along streams, in riverbeds, ditches and waterholes, wet grassland, or on thin soil over rocks; 950–1800 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus sanguinolentus* Vahl, Enum. Pl. 2: 351 (1806); Kük. in E.P. 4, 20 (101): 385 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 270, fig. 549 (1983); Lye in Fl. Eth. 6: 480 (1997) *C. eragrostis* Kunth, Enum. Pl. 2: 7 (1807). Type: mentions specimens from E India, Mauritius, Tingis (N Africa) & Delagoa Bay; also mentions *C. sanguinolentus* Vahl, ?*nom. invalid.* *C. neurotropis* Steud. in Flora 15: 583 (1842). Type: Ethiopia, Gagdia, *Schimper* 765 (B, holo.; BM!, iso.)

Pycrus sanguinolentus (Vahl) Nees subsp. *nairobiensis* Lye in Nordic Journ. Bot. 1(5): 617 (1982). Type: Kenya, Nairobi city, *Lye* 6379 (EA, holo.; MHU, K!, UPS, iso.)

Cyperus sanguinolentus Vahl subsp. *nairobiensis* (Lye) Lye in Sedges & Rushes of East Africa, App. 3: 2 & in main work: 271, fig. 550 (1983)

NOTE. The combination by Nees in Linnaea 9: 283 (1835) was not validly published.

In "The Sedges and Rushes of East Africa" (1983) Lye recognizes two subspecies within *P. sanguinolentus*, subsp. *sanguinolentus* and subsp. *nairobiensis*. The latter was based on having a slender culm, narrow spikelets and leaves, and wrinkled nut; these characters do not seem to be consistent, and the subspecies are not recognized here.

14. *Pycrus macrostachyos* (Lam.) Raynal in K.B. 13: 314 (1969). Type: Africa, 'Ex-Africa' Herb. Lamarck (P-LA, holo.)

Robust annual, up to 100 cm high; culms solitary or tufted, 26–82 cm long, 1.6–6.2 mm wide, trigonous, sometimes almost triquetrous, smooth, the lower part covered by broad membranous reddish-brown leaf bases. Leaves up to 60 cm long; leaf sheath pale brown to dark brown, 2–13 cm long, the base often reddish-purple; leaf blade linear, 15–50 cm long, 2.6–9 mm wide, acuminate, apex scabrid. Involucral bracts spreading, leaf-like, 3–5, 12.5–58 cm long, 2.4–12 mm wide, scabrid. Inflorescence simple, or sometimes \pm compound, spikelets in clusters on elongated axis at the end of primary branches, at least one cluster sessile, primary branches 2–8, 1–15.5 cm long, at the base with a conspicuous tubular, (pale) red-brown prophyll; spikelets 10–30 up to many per cluster, linear-lanceolate, 8.7–25 mm long, sometimes elongating up to 35 mm long in fruit, 1.7–2.5 mm wide, the glumes spreading in fruit, then up to 3 mm wide; glumes (golden-)yellow, (golden-) brown to reddish brown, with a distinct white hyaline margin, obovate, 2–2.8 mm long, 1.1–2 mm wide, keel rounded to acute, 2–3-veined, pale green, apex obtuse to sometimes \pm acute. Stamens (2–)3; filaments 1.8–2.6 mm long; anthers 0.4–0.9 mm long. Stigma 2-branched. Nutlet greyish-black, brownish-black to black, oblong to obovoid, flattened, 1.5–1.9 mm long, 0.6–1.3 mm wide, with minute papillae in longitudinal rows.

UGANDA. Teso District: Soroti, Moroti Road, 15 Sept. 1954, *Lind* 380! & Kaberamaido, Omunyal Swamp W of Atiriri, 16 Aug. 2001, *Lye & Namaganda* 25209!; Mubende District: Singo County, ½ km W of Kasanda trading, 10 Aug. 1974, *Katende* 2256!

KENYA. Machakos District: Makueni, Kyemole, 1–2 km from Kyemole shopping centre, along the road to Kathozweni, 24 Jan. 2002, *Kirika et al.* NMK 257! & Emali–Makueni km 9, 12 Apr. 1969, *Napper & Mwangangi* 2011!; Kitui District/Tana River District: Katumba Hill, 92 km on the Garissa–Nairobi Road, 14 May 1978, *Gilbert & Thulin* 1710!

TANZANIA. Mpanda District: Katusunga, 1949, *Pêtre* 18!; Mbeya District: Pungaluma Hills, 21 May 1990, *Lovett & Kayombo* 4658!; Songea District: Kwamponjore Valley, 14 Mar. 1956, *Milne-Redhead & Taylor* 9162!

DISTR. U1–4; K 3, 4, 7; T 1, 2, 4–8; Z; widespread in Africa; Madagascar, (sub)tropical America
HAB. In seasonal lakes and ponds, at river edges, sometimes in rice fields; sea-level up to 1400 m
CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus macrostachyos* Lam. in Tab. Encycl. 1: 147 (1791); Haines & Lye, *Sedges & Rushes* E. Afr.: 288, figs. 596, 597 (1983)

C. tremulus Poir. in Lam., Encycl. Bot. 7: 264 (1806); Kük. in E.P. 4, 20 (101): 361 (1936).
Type: Madagascar, *du Petit-Thouars* s.n. (P, holo.)

Pycrus albomarginatus Nees in Mart., Fl. Bras. 2, 1: 9 (1842); C.B. Clarke in F.T.A. 8: 305 (1902). Type: Brazil, Bahia, Joazeiro, *Martius* s.n. (M, holo.)

Pycrus tremulus (Poir.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 542 (1895) & in F.T.A. 8: 306 (1902)

P. macrostachyos (Lam.) Raynal subsp. *tremulus* (Poir.) Lye in *Nordic Journ. Bot.* 1(5): 622 (1982)

Cyperus macrostachyos Lam. subsp. *tremulus* (Poir.) R.W. Haines & Lye, *Sedges & Rushes* E. Afr.: 289, fig. 598 (1983)

NOTE. This species is the most robust annual in the Flora area, easy recognized by the white hyaline glume margin.

15. ***Pycrus polystachyos*** (*Rottb.*) *P. Beauv.* in Fl. Oware 2: 48, t. 86.2 (1816); C.B. Clarke in F.T.A. 8: 296 (1902). Type: None indicated; possibly India, "In regione Malabarica", *König* s.n. (C, holo.)

Annual or short-lived perennial, sometimes producing small stolons; culms tufted, 18–68 cm long, 1–3 mm wide, trigonous to sometimes slightly triquetrous, smooth. Leaves up to 57 cm long; leaf sheath pale yellowish-brown, sometimes with reddish or purplish base, 3–12 cm long; leaf blade narrowly linear, flattish plicate, 8–48 cm long, 1–4.5 mm wide, acute to acuminate, apex sometimes ± scabrid. Involucral bracts 3–7, leaf-like, spreading, the lowermost 6.8–35 cm long, (1.4–)2–5.2 mm wide, often folded, sometimes scabrid. Inflorescence capitate or simple, when simple, primary branches (0–)4–9, (0–)2.7–8 cm long; spikelets crowded in dense digitate clusters, sessile or at the end of primary branches, or spikelets clustered at end of primary branch on elongated axis; spikelets 5–30 per cluster, narrowly linear-lanceolate to ovoid-lanceolate, or sometimes narrowly ovoid, 6–19 mm long, 0.8–1.8 mm wide, axis straight to zigzag; glumes golden yellow-brown to brown-red, (elliptic-)ovate, 1.3–2.3 mm long, 0.6–1.3 mm wide, keel acute or flat to rounded, (0–)1–3-veined, yellowish-brown to green, apex acute to obtuse. Stamens 2–3; filaments 0.6–2 mm long; anthers 0.3–0.6 mm long. Style 2-branched. Nutlet dark brown, sometimes shiny, or grey-brown to dark metallic grey, narrowly oblong to sometimes narrowly oblong-ovoid, 0.7–1.1 mm long, 0.3–0.4 mm wide, minutely punctuate or papillose.

1. Inflorescence simple or capitate; spikelets in digitate clusters, sessile or at the end of primary branches, primary branches 0–3(–5) cm long a. var. *polystachyos*
2. Inflorescence simple; spikelets clustered at end of primary branches on elongated axis, primary branches 2.7–8 cm long b. var. *laxiflorus*

a. var. *polystachyos*

Annual or short-lived perennial producing small stolons; culms 26–66 cm long, 1–3 mm wide, trigonous. Leaves up to 42 cm long; leaf sheath 4–12 cm long; leaf blade 8–30 cm long, 1–4.5 mm wide. Involucral bracts 3–5, lowermost 7.5–21 cm long, (1.4–)2–3.6 mm wide. Inflorescence capitate or simple; primary branches 0–6, 0–3(–5) cm long; spikelets crowded in dense digitate clusters, sessile or at the end of primary branches; spikelets 5–30 per cluster, narrowly linear-lanceolate, sometimes narrowly ovoid, 6–19 mm long, 0.8–1.3 mm wide; glumes (elliptic-)ovate, golden yellow-brown to brown-red, 1.4–1.7 mm long, 0.6–1 mm wide, keel acute (sometimes acute-rounded), 1–3-veined, apex acute. Stamens 2; filaments 0.6–1.6 mm long, anthers 0.3–0.6 mm long. Nutlets dark brown, sometimes shiny, 0.8–1 mm long, 0.3–0.4 mm wide, minutely punctuate or papillose.

UGANDA. Mengo District: Busiro Country, N of Kisi near Entebbe, 31 Aug. 1969, *Lye* 3659!; Busoga District: E boundary of Makoka A.L.G. Plantation, E of Kamuli, 28 Apr. 1953, *Wood* 695!; Mengo District: Makerere College, July 1953, *Lind* 180!

KENYA. Kilifi District: Ngomeni Natural Forest, 14 Mar. 1969, *Padwa* 13!; Kilifi District: Arabuko Sokoke Forest Reserve, edge of Mida Creek, 24 Oct. 1994, *Robertson et al.* 7003!; Tana River District: Kitwa Pemba Hill and vicinity, July 1974, *Faden & Faden* 74/1078!

TANZANIA. Lushoto District: Amani, Rest House, 25 Mar. 1975, *Hooper & Townsend* 987!; Tanga District: Nyamaku, 20 July 1958, *Faulkner* 2159!; Singida District: Itigi–Singida road 23 km from Singida, 28 Mar. 1965, *Richards* 19948!

DISTR. U 1/2, 3, 4; K 7; T 1–6, 8; Z, P; widespread in tropical Africa; Mediterranean, Asia, Americas

HAB. Wet grassland, lakeshores and swamps, mangrove; 0–1500 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus polystachyos* Rottb. in Descr. Pl. Rar.: 39 (1772); Kük. in E.P. 4, 20 (101): 367 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 279, figs. 571, 572 (1983); Lye in *Fl. Eth.* 6: 482, fig. 212.142 (1997)

C. chlorostachys Boeck. in Peters, *Reise Mossamb.* 2: 540 (1864) & in *Linnaea* 36: 293 (1870). Type: Mozambique, *Peters* s.n. (B, holo.)

C. polystachyos Ridl. var. *chlorostachys* (Boeck.) Kük. in E.P. 4, 20 (101): 371 (1936)

NOTE. *Pycrus polystachyos* var. *polystachyos* differ from var. *laxiflorus* by having a more congested, capitate inflorescence, and the spikelets crowded in digitate clusters; the glumes of var. *polystachyos* are more distinctly acute and have a more prominent acute keel.

In a small number of herbarium specimens the spikelets are clustered in dense digitate clusters, with a number of these clusters sessile and a number on long primary branches, longer than 3 cm. These are still seen as var. *polystachyos* because of the dense digitate clusters of spikelets.

b. var. *laxiflorus* (Benth.) C.B. Clarke in *Fl. Brit. India* 6: 592 (1894) & in *Consp. Fl. Afr.* 5: 540 (1895) & in *F.T.A.* 8: 297 (1902); Kük. in E.P. 4, 20 (101): 370 (1936). Type: Australia, *F. Mueller* s.n. (BM, holo.)

Annual or short-lived perennial; culms 18–68 cm long, 1–3 mm wide, trigonous to sometimes slightly triquetrous. Leaves up to 57 cm long; leaf sheath 3–8.5 cm long; leaf blade 10–48 cm long, 2–4.5 mm wide. Involucral bracts 3–7, lowermost 6.8–35 cm long, 2.4–5.2 mm wide. Inflorescence simple; primary branches 4–9, 2.7–8 cm long; spikelets clustered at the end of primary branches on an elongated axis; spikelets 5–23 per cluster, narrowly ovoid-lanceolate, sometimes narrowly ovoid, 8–15 mm long, 0.9–1.8 mm wide; glumes ovate, golden yellow-brown, 1.3–2.3 mm long, 0.8–1.3 mm wide, keel flat to rounded, (0–)1–3-veined, yellow-brown to green, apex obtuse to acute. Stamens 2–3; filaments 0.7–2 mm long, anthers 0.35–0.6 mm long. Nutlets dark grey-brown to dark metallic grey, 0.7–1.1 mm long, 0.3–0.4 mm wide, minutely punctuate.

UGANDA. Mengo District: near Kampala, Gayaza Road, June 1931, *Greenway* 1509! & Entebbe, swamp near Ferry, Dec. 1955, *Lind* 901! & near Entebbe airport, Makerere College, Apr. 1953, *Lind* 135!

KENYA. Kwale District: valley S of Mwele Mdogo Forest, Shimba Hills, 7 Feb. 1953, *Drummond & Hemsley* 1163! & Shimba Hills, Mwalunganje, Mar. 1999, *Luke et al.* 5719! & Apr. 1999, *Luke et al.* 5727!

TANZANIA. Bagamoyo District: coastal region, 10 Aug. 1968, *Shabani* 165!; Uzaramo District: University of DSM, at Kijito–Nyame stream, 24 Feb. 1971, *Wingfield* 1140!; Tunduru District: Songea–Tunduru Road, 97 km from Tunduru, 3 Mar. 1963, *Richards* 17706!

DISTR. U 4; K 7; T 6, 8; Z, P; pantropical

HAB. Swamps, lake shores and short grassland with standing water; 0–1200 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus polystachyos* Rottb. var. *laxiflorus* Benth. in *Flora Austral.* 7 (1878)

C. polystachyos Rottb. subsp. *laxiflorus* (Benth.) Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: App. 3: 2 & in main work: 280, fig. 573 (1983); Lye in *Fl. Eth.* 6: 483, fig. 212.144 (1997)

16. ***Pycreus xantholepis*** *Nelmes* in K.B. 6 (3): 319 (1951). Type: Angola: District of Moxico, Ikula Hot Springs, *Milne-Redhead* 4213 (K!, holo.)

Annual up to 42 cm high, with delicate rootsystem; culms tufted?, 23–38 cm long, 1.1 mm wide, triquetrous, smooth. Leaves up to 20 cm long; leaf sheath pale brown, 2.2–3.5 cm long, sometimes ± purplish at base; leaf blade linear, plicate, 10–17 cm long, 1.2–1.6 mm wide, acuminate, apex scabrid. Involucral bracts leaf-like, 2–3, the lowermost 8.5–16 cm long, 1.8–2 mm wide, scabrid. Inflorescence simple, primary branches 1–2, 2–5.3 cm long; spikelets in loosely digitate clusters at the end of primary branches, at least one cluster sessile; spikelets 3–5 per cluster, ovoid, 12.5–15 mm long, 4.5 mm wide, elongating in fruit/after fruiting up to 34 mm long, axis straight to curved after fruiting; glumes yellow to golden brown, elliptic-ovate, somewhat spreading during fruiting, 3.5–4 mm long, 2.6–3 mm wide, keel acute, 2–3-veined, sometimes purplish, apex acuminate to mucronate, giving the spikelet a serrate appearance. Stamens 3: filaments 2 mm long; anthers 0.4 mm long. Stigma 2-branched. Nutlet greyish-black, obovoid to obcircular, biconvex, 1.5 mm long, 1.4 mm wide, ± wrinkled.

TANZANIA. Tabora District: Kaliua, near Station, 16 June 1980, *Hooper & Townsend* 1998! & Forest Kapapa off the Sitalike Road, 19 Sept. 1970, *Richards* 25929!

DISTR. T 4; Congo-Kinshasa, Angola, Zambia

HAB. Swamp, rice fields; 950–1350 m

CONSERVATION NOTES. Least concern due to distribution and habitat.

17. ***Pycreus lanceolatus*** (*Poir.*) *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 538 (1894). Type: Madagascar, *Petit-Thouars* s.n. (P, holo.)

Perennial up to 52 cm high, sometimes appearing to be annual; culms tufted, 14–51 cm long, 0.9–1.6 mm wide, trigonous, smooth, the base covered with reddish-brown to purplish bladeless sheaths. Leaves up to 36 cm long; leaf sheath reddish-brown to brown, 2–8 cm long; leaf blade linear, flattish or plicate, 7–28 cm long, 1–2.5 mm wide, acuminate, apex scabrid. Involucral bracts 2–3, leaf-like, stiffly spreading, 7–22 cm long, 1.3–2.4 mm wide, scabrid. Inflorescence capitate, spikelets in a dense, digitate, globose cluster; spikelets 8–30 to many per head, oblong-ellipsoid to ovoid, 8–20(–28) mm long, 2.6–3.8 mm wide, axis straight; glumes golden brown, elliptic-ovate, 2–2.8 mm long, 1.5–2.2 mm wide, keel flat to acute, weakly 2–3-veined, keel acute to obtuse. Stamens 2; filaments 1–3.1 mm long; anthers 0.4–0.5 mm long. Stigma 2-branched. Nutlet reddish-brown to brown, ellipsoid to obovoid, sometimes ± irregular, biconvex, 0.8–1.2 mm long, 0.5–0.7 mm wide, smooth to sometimes almost slightly wrinkled, apex strongly apiculate.

UGANDA. Teso District: Arabaka Dam, 16 km on Soroti–Moroto road, 30 July 1967, *Kabuye* 89!; Masaka District: Buddu County, Lake Kayanja, eastern side, 25 Apr. 1969, *Lye* 1665!; Mengo District: Kampala, 16 km S of Entebbe road, 27 Mar. 1966, *Haines* 80!

KENYA. Trans-Nzoia District: 8 km S of Kitale, 5 Sept. 1952, *Bogdan* 3593!

TANZANIA. Tabora District: sand pits ± 6.5 km from Urambo, 17 June 1980, *Hooper & Townsend* 2029!; Uzaramo District: Dar–Kilwa road, 17 km S of Dar es Salaam, 30 July 1972, *Wingfield* 2077!; Tunduru District: granite rocks 97 km from Masasi, 19 Mar. 1963, *Richards* 17939!

DISTR. **U** 1–4; **K** 3; **T** 4, 6, 8; **P**; **Z**; widespread in tropical Africa; Madagascar, tropical America
 HAB. Wet grassland, swamps, river edges; 0–1850 m
 CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus lanceolatus* Poir. in Lam. Encycl. 7: 245 (1806); Kük. in E.P. 4, 20 (101): 349 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 276, figs. 563, 564 (1983); Lye in Fl. Eth. 6: 482, fig. 212.141 (1997)

Pycreus propinquus Nees in Mart. Fl. Bras. 2 (1): 7 (1842); C.B. Clarke in F.T.A. 8: 300 (1902). Type: Brazil, Villa Rica, Gardner 714 (?M, hol.)

NOTE. Although this species looks like *Pycreus flavescens* (L.) Rchb. it differs in its more coarse and perennial habit, and it always has a capitate inflorescence with golden-brown spikelets.

18. ***Pycreus flavescens* (L.) Rchb.** in Fl. Germ. excurs. 72 (1830); C.B. Clarke in F.T.A. 8: 290 (1902). Type: “In Germaniae, Helvetiae, Galliae, paludosis” Lectotype: Herb. Burser I: 81 (UPS), chosen by Kukkonen in Taxon 53: 178 (2004)

Annual, small to medium-sized, up to 55 cm high; culms tufted, 5–52 cm long, 0.3–1.7 mm wide, trigonous to somewhat rounded, smooth. Leaves up to 28 cm long; leaf sheath pinkish brown, pale brown to (pale) reddish-brown, sometimes tinged with purple, 1–6 cm long; leaf blade linear to filiform, flat to plicate, 2–22 cm long, 0.3–3 mm wide, acute to acuminate, apex (\pm) scabrid. Involucral bracts leaf-like, 1–4, the lowermost 3–14.7 cm long, 0.9–3 mm wide, apex scabrid to glabrous. Inflorescence capitate or simple, primary branches (0–)1–5, (0–)2.2–7 cm long, sometimes at the base with a tubular purplish prophyll; spikelets in digitate clusters, sessile and at the end of primary branches; spikelets 3–14 per cluster, 15–40 in a head, linear-oblong to linear-ovoid to ovoid, 6–20 mm long, 1.8–2.9 mm wide, axis straight, sometimes curved; glumes sometimes becoming almost transparent when nutlet is maturing, golden-yellow to golden-brown, reddish-brown to brownish-black, ovate, boatshaped, 1.5–2.2 mm long, 1–1.9 mm wide, keel 2–3-veined, pale brown to green, sometimes with reddish dots, apex obtuse. Stamens 3; filaments 0.9–2 mm long; anthers 0.2–0.5 mm long. Stigma 2-branched. Nutlet (reddish-)black, obovoid to ellipsoid, biconvex, 0.7–1.1 mm long, 0.4–0.9 mm wide, almost smooth to (white) transversely wrinkled. Fig. 44, p. 293.

NOTE. This species is highly variable, and quite a number of species and varieties have been described in the past as a consequence. Many of these are based on only a small number of specimens. After careful examining of the material, three subspecies and one variety are upheld, although the boundaries are not always clear. Most specimens can, however, be assigned without much problem.

- | | |
|--|------------------------------|
| 1. Glumes 1.6–1.7 mm long; nutlet 0.7 mm long | b. subsp. <i>microglumis</i> |
| Glumes 1.6–2.8 mm long; nutlet 0.7–1.1 mm long | 2 |
| 2. Plant up to 18 cm high; inflorescence loosely capitate,
without primary branches; Kenya, Tana River | d. subsp. <i>tanäensis</i> |
| Plant medium-sized, up to 50 cm high; inflorescence
simple, sometimes almost capitate, primary branches
(0–)1–4, (0–)1–7 cm long; widespread | 3 |
| 3. Glumes golden yellow to golden brown | a. subsp. <i>flavescens</i> |
| Glumes (pale) reddish brown | c. var. <i>castaneus</i> |

a. subsp. **flavescens**

Up to 50 cm high; culms 13–45 cm long, 0.7–1.4 mm wide. Leaves up to 23 cm long; leaf sheath 1–5.8 cm long, pinkish brown to (pale) reddish-brown; leaf blade linear, flat to plicate, 7–18 cm long, 1.2–3 mm wide, acute. Involucral bracts, the lowermost 6–13 cm long, 1.6–3 mm wide. Primary branches (0–)1–4, (0–)2.2–6.5 cm long, at the base a tubular purplish prophyll; spikelets 5–13 per cluster, 20–35 in a head, 6.9–16 mm long, 1.8–2.7 mm

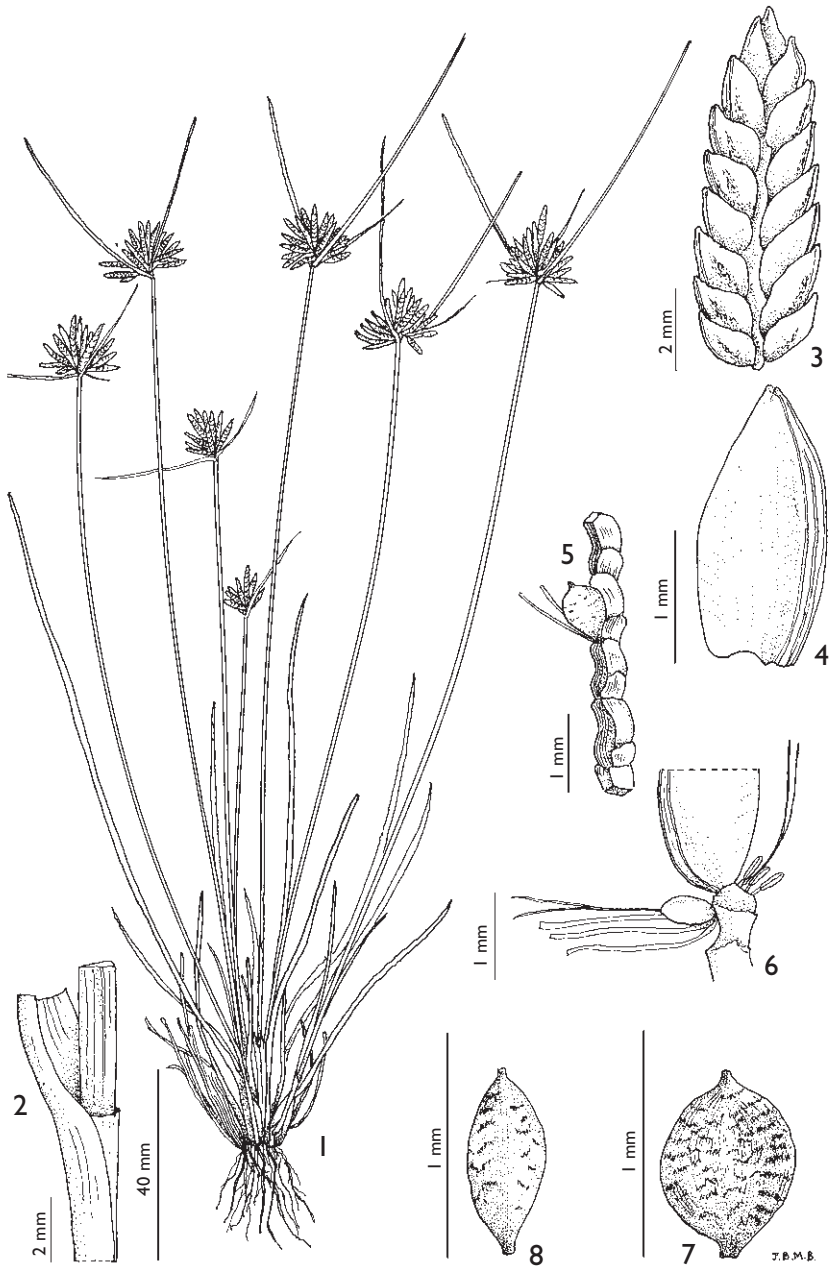


FIG. 44. *PYCREUS FLAVESCENS* — 1, habit; 2, sheath apex; 3, spikelet; 4, glume lateral view; 5, portion of rachilla; 6, apex of rachilla (2 glumes removed); 7–8, nutlet, face and side view. 1 from *Richards* 8165, 2–8 from *Robinson* 2198. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

wide, axis straight, the glumes much compressed; glumes golden-yellow to golden-brown, 1.5–2.2 mm long, 1–1.9 mm wide, keel green, sometimes with reddish dots. Filaments 0.9–1.7 mm long; anthers 0.3–0.4 mm long. Nutlet (reddish-)black, 0.8–1.1 mm long, 0.4–0.7 mm wide, almost smooth to transversely wrinkled.

UGANDA. Karamoja District: Mt Kadam [Debasien], stream Namojongotyang, *Eggeling* 2640! Mbale District: Tororo, 4 June 1967, *Haines* 4224!; Teso District: Serere, 22 Sept. 1962, *Brown* 187B!

KENYA. Laikipia District: ± 30 km N of Rumuruti, 7 Nov. 1978, *Hepper & Jaeger* 6655!; Nairobi, 2 Sept. 1947, *Bogdan* 1145!; Fort Hall District: Thika, hillside W of Blue Post Hotel, 29 Aug. 1967, *Faden* 67689!

TANZANIA. Bukoba District: Kagera, Minziro Forest reserve SW of Minziro Village, 6 Apr. 2001, *Festo et al.* 1220B!; Ufipa District: Sumbawanga–Mbala [Abercorn], Ufipa Plateau, 4 June 1951, *Bullock* 3946!; Iringa District: just N of township, 15 July 1956, *Milne-Redhead & Taylor* 11095!

DISTR. U 1, 3, 4; K 3, 4, 7; T 1–8; pantropical, Europe

HAB. Swamps, river-sides and lake shores, seepage over rock; 800–1850 m

CONSERVATION NOTES. Due to its wide distribution and common habitat least concern (LC)

SYN. *Cyperus flavescens* L. in Sp. Pl. 1: 46 (1753); Kük. in E.P. 4, 20 (101): 398 (1936); *Haines & Lye*, Sedges & Rushes E. Afr.: 282, figs. 576, 577 (1983); *Lye* in Fl. Eth. 6: 485, fig. 212.148 (1997)

Pycreus fallaciosus Cherm. in Arch. Bot., Caen. 7; Mem. 4: 7 (1936). Type: Senegal, Manasadella, *Trochain* 3538 & 3545 (P. syn.)

Cyperus fallaciosus (Cherm.) Raymond in Natur. Canad. 91: 129 (1964)

Pycreus flavescens (L.) Reichenb. subsp. *fallaciosus* (Cherm.) *Lye* in Nordic Journ. Bot. 1: 622 (1982)

Cyperus flavescens L. subsp. *fallaciosus* (Cherm.) *Lye* in Sedges & Rushes of East Africa, App. 3: 2 & in main work: 282 (1983)

NOTE. *Haines & Lye* cite *Cyperus overlaetii* (Hooper & Raynal) *Lye* from Tanzania, Ruaha National Park, based on *Bjørnstad* 2600 – otherwise this taxon is only known from Congo. I believe this is a misidentification of a specimen belonging to the above taxon.

b. subsp. **microglumis** *Lye* in Nordic Journ. Bot. 1: 621 (1982). Type: Uganda, Masaka District: 2–3 km S of West Mengo border on Kampala–Mbarara road, *Lye & Katende* 6542B (O, holo.; UPS, iso.)

Up to 30 cm high; culms 11–27 cm long, 0.5–0.6 mm wide. Leaves up to 20 cm long; leaf sheath (pale) brown, 1.8–2.2 cm long; leaf blade linear-filiform, flat, 8–18 cm long, 1–1.3 mm wide, apex acuminate. Involucral bracts, the lowermost 6.8–6.9 cm long, 0.9–1.2 mm wide. Primary branches (0–)2–3, 2–3.6 cm long; spikelets 3–7 per cluster, when in a head up to 20, 7.5–15 mm long, 2–2.2 mm wide, axis straight; glumes golden brown, 1.6–1.7 mm long, 1.2–1.8 mm wide. Filaments 1.5–1.7 mm long; anthers 0.2–0.3 mm long. Nutlet brown to black, 0.7 mm long, 0.5–0.6 mm wide, transversely wrinkled.

UGANDA. Masaka District: Kalungu county, 2–3 km S of West Mengo border, 11 July 1971, *Lye & Katende* 6452! & Bukoto county, swamp E of Sunga, 13 July 197, *Lye* 6497!

DISTR. U 4; ?Zimbabwe

HAB. On bare soil or in wet grassland, in edge of swamp; 0?–1140 m

CONSERVATION NOTES. Data deficient – it is unclear whether the Zimbabwe specimens are indeed this taxon.

SYN. *Cyperus flavescens* L. subsp. *microglumis* (*Lye*) *Lye* in Sedges & Rushes of East Africa: 282, figs. 579, 580 (1983)

c. var. **castaneus** *Lye* in Nordic Journ. Bot. 1: 621 (1982). Type: Kenya, Fort Hall District, *Lye et al.* 6369 (EA, holo.)

Up to 48 cm high; culms 13–43 cm long, 0.6–1.7 mm wide. Leaves up to 28 cm long; leaf sheath (pale) reddish-brown, sometimes tinged with purple, 1.5–6 cm long; leaf blade narrowly linear to filiform, 3.5–22 cm long, 0.7–2.2 mm wide, acute to acuminate. Involucral bracts, the lowermost 5–14.7 cm long, 1.1–2.7 mm wide. Primary branches 1–5, (0–)1–7 cm long; spikelets

3–20 per cluster, up to 40 in a head, 6–20 mm long, 1.8–2.9 mm wide, axis straight to sometimes ± curved; glumes reddish-brown, sometimes pale, 1.6–2.2 mm long, 1.2–1.9 mm wide, keel green. Filaments 1.5–2 mm long. Nutlet black, 0.8–1.1 mm long, 0.6–0.9 mm wide, (almost smooth to) transversely wrinkled.

UGANDA. Mbale District: Sipi, Bugishu, 31 Aug. 1932, *A.S. Thomas* 450 & Kapshorwa, 10 Sept. 1954, *Lind* 316!

KENYA. Fort Hall District: Thika, N side of Thika River, E of the Nairobi–Fort Hall Road, 11 July 1971, *Kabuye* 367!; Nairobi National Park, near Impala point, 21 Jan. 1962, *Verdcourt* 3246!; Uasin Gishu District: 25 km S of Eldoret on road to Nakuru, 14 Oct. 1981, *Gilbert* 6763!

TANZANIA. Ufipa District: 1 km N of Sumbawanga, 1 June 1980, *Hooper & Townsend* 1781!; Ufipa District: Mwimbi, 21 Apr. 1962, *Robinson* 5101!; Rungwe District: ± 2 km beyond Kiwira, on Mbeya–Tukuyu road, 17 Mar. 1975, *Hooper & Townsend* 853!

DISTR. U 3; K 3, 4; T 4, 7; Cameroon, Belgian Congo–Kinshasa, Angola, Mozambique, South Africa

HAB. Swamps, river-sides, seasonally swampy grassland; 1300–2350 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Pycrus rehmannianus* C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 542 (1894), *nom. nud.* & in *Fl. Cap.* 7: 156 (1897) & in *F.T.A.* 8: 291 (1902). Type: South Africa, Transvaal, *Rehmann* 5651 (K, holo.)

Cyperus rehmannianus (C.B. Clarke) Kuntze, *Rev. Gen. Pl.* 3, 2: 334 (1898); Kük. in *E.P.* 4, 20 (101): 397 (1936)

C. rehmannianus (C.B. Clarke) Kuntze var. *rigidiculmis* Kük. in *E.P.* 4, 20 (101): 398 (1936). Types: Tanzania, Kigoma District: Ujiji, Mkuti stream near Msosi, *Peter* 37204 & Buha District: Msosi [Mchaji], *Peter* 46228 & Njombe District: Lupembe, Msima, *Schlieben* 1044 (B, syn.)

C. flavescens L. var. *castaneus* (Lye) Lye in *Sedges & Rushes of East Africa*, App. 3: 2 & in main work: 282, fig. 578 (1983).

d. subsp. *tanaënsis* (Kük.) Lye in *Nordic Journ. Bot.* 1: 622 (1982). Type: Kenya, Tana District: along River Tana, *Gregory* 87 (BM!, holo.; K!, part of holo.; from BM)

Annual, up to 18 cm high; culms 5–18 cm long, 0.3–0.7 mm wide. Leaves up to 12 cm long; leaf sheath brown, up to 1.2 cm long; leaf blade linear, 2–10 cm long, 0.3–1 mm wide, acuminate, glabrous. Involucral bracts 1–2, erect or spreading, the lowermost 3–8 cm long, 1 mm wide. Inflorescence loosely capitate, spikelets in a sessile lax digitate cluster; spikelets 15 per head, ellipsoid-ovoid, 6–10 mm long, 2 mm wide, axis straight to slightly curved; glumes reddish-brown to black, 1.7–2 mm long, 1.4 mm wide, keel acute to flat, pale brown. Filaments 1.8–1.9 mm long. Nutlet black, broadly ovoid, 0.7–0.8 mm long, 0.7–0.8 mm wide, with large elongate surface-cells, with faint to strong transverse wrinkles.

KENYA. Tana District: along River Tana, *Gregory* 87!

DISTR. K 7; Angola, Zambia

HAB. In seasonally wet sites; altitude unclear

CONSERVATION NOTES. This taxon is only known from one location in the Flora area, and two other collections in respectively Zambia and Angola. Data deficient (DD).

SYN. *Pycrus debilissimus* C.B. Clarke in *J. B.* 34: 224 (1896) & in *F.T.A.* 8: 291 (1902). Type as for subsp. *tanaënsis*

Cyperus tanaënsis Kük. in *E.P.* 4, 20 (101): 397 (1936)

C. flavescens L. subsp. *tanaënsis* (Kük.) Lye in *Sedges & Rushes of East Africa*, App. 3: 2 & in main work: 283 (1983)

19. *Pycrus intermedium* (Steud.) C.B. Clarke in *F.T.A.* 8: 290 (1902). Type: Ethiopia, Tigre, Dschomara, *Schimper* 1267 (P, holo.; BM!, K, iso.)

Annual, medium-sized, up to 40 cm high; culms ± tufted, trigonous, smooth, 16–34 cm long, 0.8–1.2 mm wide. Leaves up to 16 cm long; leaf sheath brown, 2.2–3.5 cm long; leaf blade linear, flat to plicate, often folded, 10–14 cm long, 1.5–2 mm wide, acute, glabrous. Involucral bracts 2, leaf-like, sub-erect to spreading, 10–12 cm

long, 1.2–2 mm wide. Inflorescence simple, primary branches 1–3, 0.5–5.5 cm long; spikelets in digitate clusters, sessile and at the end of primary branches; spikelets 2–8 per cluster, up to 40 in a head, linear-oblong to lanceolate, 6–14.5 mm long, 2.3–3 mm wide, axis straight; glumes brown, ovate, boatshaped, margins membranous, 1.9–2.2 mm long, 1.5–1.8 mm wide, keel 2–3-veined, green, apex acute to obtuse. Stamens 2–3; filaments 1.8 mm long; anthers 0.4–0.7 mm long. Stigma 2-branched. Nutlet reddish-brown, obovoid, ± biconvex, 1 mm long, 0.6 mm wide, transversely wrinkled.

TANZANIA. Ulanga District: Mlahi, 17 May 1977, *Vollesen* 4582!

DISTR. T 6; Ethiopia, Angola

HAB. Small temporary waterhole in wooded grassland, in ± 10 cm water; 275 m

CONSERVATION NOTES. Widespread, possibly Least Concern (LC).

SYN. *Cyperus intermedius* Steud. in *Flora* 25: 581 (1842)

Pycrus lanceolatus C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 538 (1894); Rendle in *Cat. Afr. Pl. Welw.* 2: 107 (1899), *non Cyperus lanceolatus* Poir.

Cyperus subintermedius Kük. in *E.P.* 4, 20 (101): 390 (1936) & Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: 283 (1983), *nomen novum* for *C. intermedius* Steud.

Pycrus flavescens (L.) Rchb. subsp. *intermedius* (Steud.) Lye in *Nordic Journ. Bot.* 1: 622 (1982) & in *Fl. Eth.* 6: 487 (1997)

NOTE. Differences from *P. flavescens* (and especially with var. *castaneus*) are difficult to find; this taxon is therefore questionable and requires more study.

20. ***Pycrus scaettae*** Cherm. in *Rev. Zool. & Bot. Afr.* 24: 295 (1934) & in B.J.B.B. 13: 278 (1935). Type: Congo-Kinshasa, Kisantu, *Vanderyst* 34470; Kasebeye, *Scaetta* 2418 & Mubeza, *Scaetta* 58M (all three BR, syn.); Congo, Brazzaville, *Chevalier* 4170 (P, syn.); Gabon, between Bangavi & Bounzotrou, *Le Testu* 7452 (P, syn.)

Perennial, densely tufted, up to 20 cm high; culms tufted, 10.5–16 cm long, 0.3–0.5 mm wide, swollen base, trigonous, smooth. Leaves up to 16 cm long; leaf sheath 3.5–6 cm long, old sheaths turn into tough brownish-black fibres, surrounding the base of the culms and leaves; leaf blade 7–10 cm long, 0.7–0.8 mm wide, acute, glabrous to minutely scabrid at the apex. Involucral bract 1, leaf-like, erect or spreading, 5.7–7.6 cm long, 0.7–0.8 mm wide, glabrous, followed by 1 or few spikelets, than a second (and sometimes third) involucral bract. Inflorescence loosely capitate, spikelets in a loose digitate cluster; spikelets 5–7 per cluster, ellipsoid-ovoid, 8–11.5 mm long, 2.2–2.8 mm wide, axis straight; glumes elliptic-ovate, glabrous, pale brownish-yellow, 2.6–2.9 mm long, 1.4–1.8 mm wide, keel flat to acute, 2–3-veined, green, keel acute to ± shortly acuminate. Stamens 3; filaments 2.2–2.6 mm long; anthers 1.3 mm long. Stigma 2-branched. Nutlet absent.

var. ***katangensis*** Cherm. in B.J.B.B. 13: 279 (1935). Type: Congo-Kinshasa, Kafubu, Don Bosco farm, *Quarré* 884 (BR, syn.); Kafubu, Granat farm, *Quarré* 768 (BR, syn.); Elakat, Marie-José farm, *Quarré* 1480 (BR, syn.)

TANZANIA. Mpanda District: Mahali Mts, Utahya, 30 Sept. 1958, *Newbould & Jefford* 2791!

DISTR. T 4; Ghana, Nigeria, Cameroon, Congo-Kinshasa, Zambia

HAB. On hard packed path in *Brachystegia*-woodland; 1080 m

CONSERVATION NOTES. The distribution area is wide, therefore least concern (LC)

SYN. *Pycrus katangensis* Cherm. in *Contr. Fl. Katanga*, 5: 11 (1933), *nom. nud.*

NOTE. According to several authors *Pycrus scattae* Cherm is a synonym for *Pycrus fibrillosus* (Kük.) Cherm. After comparing original descriptions and examining specimens from Africa, I have decided to treat these species as separate.

21. ***Pycrus fibrillosus*** (Kük.) Cherm. in *Rev. Zool. & Bot. Afr.* 12: 63 (1932). Type: Zambia, Kalungwisi R. *Fries* 1142 (UPS, holo)

Perennial, densely tufted, the base of the culms surrounded by many thick black fibres from old leaf-sheaths, up to 16 cm high; culms tufted, 6–11 cm long, 0.6–0.7 mm wide, rounded to somewhat trigonous, smooth. Leaves up to 10.5 cm long; leaf sheath brownish-black, sometimes somewhat green, 3 cm long; leaf blade linear, folded or canaliculate, glabrous, 7.5 cm long, 1.1 mm wide, acute to acuminate, often the tips burned and black, glabrous. Involucral bract 1, leaf-like, spreading, 4.2–5.7 cm long, 0.8–0.9 mm wide, glabrous, followed by 1 or few spikelets, than a second (and sometimes third) involucral bract. Inflorescence loosely capitate, spikelets, in a loose digitate cluster; spikelets 4–7 per head, ovoid, appearing sometimes dentate due to the spreading of the glumes, 6.3–8.5 mm long, 2–2.5 mm wide, axis straight; glumes pale brown, red-brown to black, elliptic-ovate to elliptic-oblong, 3.2 mm long, 2.7 mm wide, keel flat to rounded, sometimes pale brown, 2–3-veined, keel obtuse to rounded. Stamens 3; anthers 1.4 mm long. Stigma 2-branched. Nutlet not seen.

TANZANIA. Ufipa District: 8–9 km W of road from Sumbawanga to Mbala (Zambia) on road to Safu, 3 Nov. 1992, *Gereau et al.* 4998!

DISTR. T 4; Zambia

HAB. In rocky secondary hillside miombo; 1600 m

CONSERVATION NOTES. Data Deficient (DD); there is still a lot of confusion in the species delimitation.

SYN. *Cyperus fibrillosus* Kük. in *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.*: 1 (1921) & in *E.P.* 4, 20 (101): 347 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 278, fig. 569 (1983), *non Pycreus fibrillosus*

NOTE. Description based on only one specimen, which seems to be immature. It looks very similar to the picture of *Cyperus fibrillosus* Kük. in *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.* 1911–12 (1): 1 (1921).

22. ***Pycreus sumbawangensis* Hoenselaar sp. nov.** *P. fibrillosi* similis sed statura maiore, spiculis latioris, glumis porphyreis vel nigris ab ea differt. Typus: Tanzania, Ufipa District: Sumbawanga, *Richards* 3452A (K!, holo.)

Perennial up to 35 cm high, densely tufted, the base of the culms surrounded by many thick black fibres from old leaf-sheaths; culms tufted, 10–34 cm long, 0.4–1 mm wide, rounded to somewhat trigonous, smooth. Leaves up to 18 cm long; leaf sheath brownish-black, sometimes somewhat green, 2–7 cm long; leaf blade linear, folded or canaliculate, 6–11 cm long, 0.5–1.5 mm wide, acute to acuminate, often the tips burned and black, glabrous. Involucral bract 1, leaf-like, spreading, 2.9–7.2 cm long, 0.5–1.5 mm wide, glabrous, followed by 1 or few spikelets, than a second (and sometimes third) involucral bract. Inflorescence loosely capitate, spikelets in a loose digitate cluster; spikelets 3–11 per head, ovoid, sometimes appearing squarrose due to the spreading of the glumes, 6–13 mm long, 2.5–5 mm wide, axis straight; glumes red-brown to black, elliptic-ovate to elliptic-oblong, 2.5–4.3 mm long, 1.7–2.6 mm wide, keel flat and sometimes pale brown, 2–3-veined, obtuse to rounded. Stamens 3; filaments 1.8–3.2 mm long; anthers 1.3–2.6 mm long. Stigma 2-branched. Nutlet grey to greyish-black, obovoid, sometimes obtriangular, 0.9–1.3 mm long, 0.8–0.9 mm wide, minutely papillose.

TANZANIA. Kigoma District: 58 km S of Uvinsa, 31 Aug. 1950, *Bullock* 3268!; Ufipa District: 25 km S of Sumbawanga, 3 Jan. 1962, *Robinson* 4887!; Mbeya District: World's End viewpoint on Mbeya–Chunya road, 25 Dec. 1969, *Wingfield* 510!

DISTR. T 4, 7; Burundi, South Africa

HAB. On grassland, seasonally flooded, 1500–2500 m

CONSERVATION NOTES. Data Deficient (DD); there is no information about the status of the habitats.

NOTE. This species shows most similarity with *P. fibrillosus*, but that species is smaller, its spikelets are somewhat more narrow and the glumes vary between pale brown to red-brown, while those of *P. sumbawangensis* are red-brown to black. When comparing the specimens, they look quite different. *P. sumbawangensis* also shows some resemblance with *P. permutatus*, which also has a fibrous base and often dark brown to black glumes. *P. sumbawangensis* however is more slender than *P. permutatus*, and its base is much more dense and fibrous. The inflorescence of *P. permutatus* can be capitate or simple, and has 2 or more involucre bracts, while *P. sumbawangensis* always has a (loosely) capitate head with only one true involucre bract. Specimens have been placed close to *P. nigricans*, due to its capitate inflorescence and almost black glumes; *P. nigricans* however has almost always 3 style branches, while *P. sumbawangensis* only has 2. Again the number of involucre bracts is different, but most obvious is the thick fibrous base of *P. sumbawangensis* which *P. nigricans* lacks.

23. ***Pycreus fluminalis*** (Ridl.) Troupin in Fl. Spermat. Parc Nat. Garamba 1: 126 (1956). Type: Angola, District Pungo Andongo, Candumba, Welwitsch 6897 (LISU, BM!)

Perennial up to 42 cm high, sometimes with a rhizome; culms tufted, 21–39 cm long, 1.6–2.3 mm wide, trigonous, smooth. Leaves many at base of plant, up to 21 cm long; leaf sheath pale brown, 1–4.5(–8) cm long; leaf blade stiff, linear, plicate, 11.5–16.5 cm long, (1.4–)2–3.8 mm wide, acuminate, apex scabrid. Involucre bracts leaf-like, spreading, 4–5, 6.5–12.3 cm long, (1.3–)2–3.8 mm wide, ± scabrid. Inflorescence capitate, spikelets sessile, many per head; spikelets linear-lanceolate to elliptic-lanceolate, 6.8–13.3 mm long, 1.7–2.2 mm wide, axis straight to sometimes ± curved; glumes dull white, ovate, 1.5–2 mm long, 1–1.6 mm wide, keel rounded to acute, whitish-green, 2–3-veined, keel obtuse to acute. Stamens 2; filaments 0.9–1.7 mm long; anthers 0.4–0.5 mm long. Stigma 2-branched. Nutlet pale to dark brown, obovoid, sometimes almost round, biconvex, 0.7–0.9 mm long, 0.5–0.7 mm wide, almost smooth, ± punctuate to (weakly) transversely wrinkled.

UGANDA. Mengo District: near Bugombe on Kome Island, 27 Oct. 1968, Lye 75!; Masaka District: Bukasa Island, 26 Feb. 1933, Thomas 896! & Bukasa Island, 27 Feb. 1945, Greenway & Thomas 7202!

TANZANIA. Bukoba District: Maruku, Feb. 1932, Haarer 2500! & Bukoba airfield, 21 June 1934, Gillman & Marshall 73!

DISTR. U 4; T 1; Sierra Leone, Mali, Ivory Coast, Nigeria, Cameroon, Congo Brazzaville, Congo-Kinshasa, Zambia

HAB. Seasonally wet grassland, lake-shores and swamp edges; 1100–1300 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Pycreus monocephalus* (Baker) C.B. Clarke var. *longiflorus* Cherm. in Bull. Soc. Bot. Fr. 80: 506 (1933). Type: Gabon, Haut-Ogooué, Le Testu 7423 (BM!)

Cyperus fluminalis Ridl. in Trans. Linn. Soc. 2, Ser. 2: 127 (1884); Haines & Lye, Sedges & Rushes E. Afr.: 278, figs. 567, 568 (1983)

Pycreus smithianus sensu C.B. Clarke in F.T.A. 8: 301 (1902), non C.B. Clarke sensu stricto
Cyperus smithianus sensu Kük. in E.P. 4, 20 (101): 349 (1936), non C.B. Clarke sensu stricto

NOTE. All the examined specimens were wrongly named *P. smithianus* (Ridl.) C.B. Clarke; the two species are very similar, but *P. smithianus* has somewhat thicker and coarser leaves and glumes, and is only found in the Congo region.

24. ***Pycreus muricatus*** (Kük.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28(124): 6 (1971). Type: Malawi, Mt Zomba, Dec. 1846, Whyte s.n. (K!, syn.)

Fairly robust perennial up to 85 cm high, often tussocky, stoloniferous; culms 38–82 cm long, 0.9–1.1 mm wide, trigonous to rounded, smooth. Leaves up to 49 cm long; leaf sheath (reddish-) brown, 3.2–7 cm long; leaf blade linear, plicate to sometimes crescentic, often folded, 15.5–42 cm long, 2.1–3 mm wide, acuminate to acute, apex ± scabrid. Involucre bracts leaf-like, erect or spreading, 2–3, the lowermost 6.5–11 cm long, 1.1–2.6 mm wide. Inflorescence simple, open, primary branches 1–5, 1.5–5 cm long, with a red to dark purple tubular prophyll at the base;

spikelets in loose digitate clusters, sessile and at the end of primary branches; spikelets 3–10 per cluster, ellipsoid-ovoid to ellipsoid-oblong, 8.5–18.5 mm long, elongating up to 27 mm when in fruit, 3.3–3.6 mm wide, axis straight; glumes brown, sometimes yellowish- to golden brown, elliptic-ovate, 2.5–3.7 mm long, 1.3–2.4 mm wide, keel somewhat acute, 3-veined, apex obtuse. Stamens 3; filaments 2.5–3.2 mm long; anthers 1.2–1.6 mm long. Stigma 2-branched. Nutlet brown with whitish wrinkles, obovoid, with prominent apiculus, 0.8–1 mm long, 0.5–0.8 mm wide, strongly muricate-zonate.

TANZANIA. Ufipa District: Mpuu, Lake Kwela, 15 Mar. 1959, *Webster* c24!; Songea District: ± 12 km E of Songea, 28 Dec. 1955, *Milne-Redhead & Taylor* 7936!; Tunduru District: ± 1.5 km E of R. Mawese, 19 Dec. 1955, *Milne-Redhead & Taylor* 7820!

DISTR. T 4, 7, 8; Zambia, Malawi, South Africa

HAB. In boggy grassland, lake shores, stream-sides; 450–1850 m

CONSERVATION NOTES. Least Concern (LC) due to distribution and habitat.

SYN. *Cyperus muricatus* Kük. in F.R. 12: 92 (1913) & in E.P. 4, 20 (101): 395 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 284, figs. 585, 586 (1983)

NOTE. *P. muricatus* is easily recognizable by its strongly muricate-zonate nutlet. It shares this character with *P. macranthus* but these 2 species are easily distinguished. *P. muricatus* has a simple, more open inflorescence, while the inflorescence of *P. macranthus* is capitate; the glumes of *P. macranthus* are also much darker reddish brown than those of *P. muricatus*, and the latter only occurs in the south of Tanzania.

25. ***Pycreus macranthus*** (Boeck.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 538 (1895) & in F.T.A. 8: 293 (1902). Type: South Africa, Durban [Port Natal], *Drège* 4394 (B, holo.; B, iso.)

Perennial up to 40 cm high, stoloniferous, growing in small tussocks; culm 13–39 cm long, 0.5–1 mm wide, trigonous to ± rounded, smooth. Leaves up to 25 cm long; leaf sheath brown, 2–6 cm long, often splitting into thin fibres when older; leaf blade narrowly linear, folded, glabrous, 6–21 cm long, 1.1–2 mm wide, acute, apex scabrid. Involucral bracts 2, leaf-like, 2–9.8 cm long, 0.8–1.7 mm wide, often scabrid. Inflorescence (sometimes loosely) capitate; spikelets 4–15 per head, ellipsoid-ovoid (to ± ellipsoid-oblong), 10–18.5 mm long, 2.8–4.5 mm wide, axis straight; glumes dark reddish-brown, elliptic-ovate, 2.8–4 mm long, 1.2–2.2 mm wide, often becoming successively smaller above, keel somewhat acute, 3–5-veined, keel obtuse. Stamens 3; filaments 1.5–3.8 mm long; anthers 1.1–1.9 mm long. Stigma 2-branched. Nutlet brown, obovoid, sometimes almost spherical, with a distinct apiculus, 0.8–1.1 mm long, 0.4–0.8 mm wide, muricate.

UGANDA. Masaka District: Bugabo, Sept. 1963, *Tallantire* 632!; Masaka District: Lwera, 35 km Masaka–Kampala Road, 11 Feb. 1971, *Kabuye* 326!; Bunyoro District: Bunyoro, Kuyandongo, Mar. 1943, *Purseglove* 1330!

KENYA. Uasin Gishu District: Eldoret, 26 Apr. 1951, *Williams* 140!; Trans-Nzoia District: Kitale–Endebess Road, 8 km, 21 May 1969, *Napper* 2142!; Kisumu-Londiani District: Tinderet Forest Reserve, 14 June 1949, *Maas Geesteranus* 4924!

TANZANIA. Iringa District: Ruaha National Park, at Magangwe Ranger Post, 14 Dec. 1972, *Björnstad* AB 2086!; Njombe District: Lihogoda Swamp near Njombe, 18 Jan. 1957, *Richards* 7904!; Songea District: ± 12 km E of Songea by Nonganonga Stream, 27 Dec. 1955, *Milne-Redhead & Taylor* 7918!

DISTR. U 2, 3, 4; K 3; T 7, 8; Congo-Kinshasa, Burundi, Ethiopia, Angola, Zambia, Malawi, Botswana, South Africa

HAB. Swamps, seasonally damp grassland; 950–2150 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus lanceus* Thunb. var. *macrostachya* Kunth in *Enum. Pl.* 2: 8 (1837). Type: none indicated
C. macranthus Boeck. in *Linnaea* 35: 462 (1867–68); Kük. in E.P. 4, 20 (101): 388 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 280, figs. 574, 575 (1983); Lye in *Fl. Eth.* 6: 487, fig. 212.149 (1997)

- C. lanceus* Thunb. var. *angustifolius* Ridl. in Trans. Linn. Soc. 2, Bot. 2, 7: 126 (1884). Type: Angola, District Pungo Andongo, *Schimper* 6938 (BM!)
Pycrus macranthus (Boeck.) C.B. Clarke var. *angustifolius* (Ridl.) Rendle in Cat. Afr. Pl. Welw. 2: 107 (1899); C.B. Clarke in F.T.A. 8: 293 (1902)
P. segmentatus C.B. Clarke in K.B. Add. Ser. 8: 1 (1908). Type: Malawi, Dec. 1846, *Whyte* s.n. (K!, syn.)
Cyperus macranthus Boeck. var. *angustifolius* (Ridl.) Kük. in E.P. 4, 20 (101): 389 (1936)

NOTE. This species can sometimes be confused with *P. nigricans* due to its dark brown to almost black glumes, but *P. nigricans* is the only *Pycrus* species that can have a 3-branched style; also *P. nigricans* is only found at altitudes above 1800 m, where as *P. macranthus* does not occur above 1400 m; and *P. macranthus* is much more slender.

P. macranthus shares its muricate nutlet with *P. muricatus*, however also these 2 species are easily recognized by their differences in inflorescence, headlike in *P. macranthus* and simple in *P. muricatus*; and the colour of the glumes.

A number of specimens are intermediate between *P. macranthus* and *P. muricatus* regarding inflorescence structure. The glumes are very dark brown to almost black, suggesting *P. macranthus*; but the spikelets are not in a capitate head but in a more open simple inflorescence, as in *P. muricatus*. Further study on these specimens is required.

26. ***Pycrus permutatus*** (Boeck.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28 (124): 6 (1971). Type: South Africa, 'Transkei District', *Drège* 4398 & 4399 (B, syn.)

Perennial up to 75 cm high, with massive base of one or more slightly swollen culm-bases; culms tufted, 23.5–70 cm long, 1–1.7 mm wide, trigonous to somewhat rounded, smooth; the base surrounded by stiff leaf sheaths and tough usually blackened fibres through which the roots penetrate. Leaves up to 32(–49) cm long; leaf sheath light brown to brown-black, 1–6.5 cm long; leaf blade linear, flat or folded and stiff, 9–26(–43) cm long, 1.6–3 mm wide, acute to acuminate, apex glabrous to minutely scabrid. Involucral bracts leaf-like, (2–)3, the lowermost 4–14.5 cm long, 1.5–2.7 mm wide, glabrous to sometimes minutely scabrid. Inflorescence capitate or simple, when simple primary branches(0–)1–4, (0–)0.5–5 cm long; spikelets arranged in digitate clusters or on an elongated axis, sessile and at the end of primary branches; spikelets 5–15 per cluster, when in a head 20 to many, ellipsoid-lanceolate, 9.2–17.5 mm long, 2–3 mm wide, axis straight; glumes red-brown to brown-black, elliptic-ovate, 2.2–3 mm long, 1.4–1.9 mm wide, keel acute, 2–3-veined, pale brown to yellowish green, apex acuminate to mucronate. Stamens 3; filaments 1.8–2.7 mm long; anthers 1–1.8 mm long. Stigma 2-branched. Nutlet brown, obovoid, sometimes ± ellipsoid-obovoid, ± biconvex, 0.6–1.2 mm long, 0.3–0.7 mm wide, almost smooth to minutely papillose to somewhat wrinkled.

UGANDA. Masaka District: Kabula County, Lyantonde, 26 Oct. 1969, *Lye & Rwaburindore* 4634!; Mengo District: 24 km S of Nakasongola, 27 Feb. 1956, *Langdale-Brown* 1948!; Ankole District: Rushoshi Dam, Nov. 1954, *Lind* 504!

KENYA. Kisumu-Londiana District: Tinderet Forest Reserve, 26 June 1949, *Maas Geesteranus* 5224! & Kijaur to Sotik, 16 Mar. 1951, *Bogdan* AB 2966!; Nakuru District: Molo Forest Station, 3 July 1971, *Katende* K1112!

TANZANIA. Bukoba District: Minziro Forest Reserve, Lyakatoba Forest, Kigazi place near border of Uganda and Tanzania, 12 Sept. 201, *Festo* 1836!; Ufipa District: Sumbawanga–Mpande road, 8 km N of Sumbawanga, Fiengalezia Village, 10 June 1980, *Hooper & Townsend* 1923!; Iringa District: Ruaha National Park, at Magangwe Ranger Post, 14 Dec. 1972, *Bjørnstad* AB2073!

DISTR. U 1–4; K 3–5; T 1, 4, 7; Congo-Kinshasa, Zambia, South Africa

HAB. Swamps, seasonally wet grassland; 950–1900 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution.

SYN. *Cyperus lanceus* Thunb. var. *mucronatus* Kunth in Enum. Pl. 2: 8 (1837), as *mucronata*. Type: none indicated

C. permutatus Boeck. in Linnaea 35: 477 (1868); Haines & Lye, Sedges & Rushes E. Afr.: 275, figs. 560, 561 (1983)

C. macranthus Boeck. var. *mucronatus* (Kunth) Kük. in E.P. 4, 20 (101): 389 (1936)

27. ***Pycrus atribulbus*** (Kük.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28(124): 5 (1971). Type: Mozambique, Dondo near Beira, *Schlechter* 12254 (B, BR, PRE, syn.) & Tanzania, without locality, *Busse* 749 (B, syn.)

Robust perennial up to 90 cm high, with thick, somewhat bulbous stem-bases surrounded by the fibrous remains of old sheaths, sometimes a short rhizome present; culms tufted, 30–80 cm long, 1–2.3 mm wide, trigonous, smooth. Leaves many, crowded near the base of the culm, up to 45 cm long; leaf sheath pale green to brown, 2–6 cm long; leaf blade linear, plicate, 12–40 cm long, 2–3.8 mm wide, acuminate, apex scabrid. Involucral bracts leaf-like, spreading, the lowermost 13–29 cm long, 2.4–4.2 mm wide, scabrid. Inflorescence simple to compound, primary branches 3–9, 1–10 cm long; spikelets in loose clusters on elongated axis at the end of primary or secondary branches; spikelets up to 30 per cluster, linear, 8–18(–25) mm long, 0.8–1.5 mm wide, axis straight, sometimes slightly curved; glumes golden yellow, turning olive green in patches, elliptic, 1.7–2.3 mm long, 0.8–1.1 mm wide, keel rounded, 3-veined, green, apex obtuse. Stamens 3; filaments \pm 1.1 mm long; anthers 0.8–1.2 mm long. Stigma 2-branched. Nutlet black, narrowly ellipsoid-obovoid, 1.2 mm long, 0.5 mm wide, minutely papillose.

TANZANIA. Tanga District: Lwengera Valley, 4 km E of Korogwe, 20 July 1953, *Drummond & Hemsley* 3401!; Tunduru District: Songea–Tunduru Road, 32 km from Tunduru, 4 Mar. 1963, *Richards* 17740!; Songea District: \pm 12 km E of Songea, 28 Dec. 1955, *Milne-Redhead & Taylor* 7939!

DISTR. T 3, 6, 8; Zambia, Malawi, Mozambique, South Africa

HAB. Seasonally wet grasslands and river-sides; 300–1050 m

CONSERVATION NOTES. Least Concern (LC) due to distribution and habitat.

SYN. *Cyperus atribulbus* Kük. in E.P. 4, 20 (101): 363 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 279, fig. 570 (1983)

NOTE. This species has similarities with *P. polystachyos* var. *laxiflorus*, but *P. atribulbus* is more robust, with often fibrous remains of old sheaths surrounding its base, which *P. polystachyos* var. *laxiflorus* misses.

28. ***Pycrus aethiops*** (Ridl.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 534 (1895) & in F.T.A. 8: 297 (1902). Type: Angola, District Huilla, *Welwitsch* 6875 (BM!, syn.), Angola, *Welwitsch* 7025 (LISU, lecto.; BM!, iso.) [Haines & Lye only mention the last one, which could be taken as a lectotypification]

Perennial up to 90 cm high, slender to robust, with slightly swollen base and many 1–2 mm thick roots; culms tufted, 21–82 cm long, 0.8–2.2 mm wide, trigonous, smooth, the basal part surrounded by wide blackish leaf sheaths. Leaves up to 45 cm long; leaf sheath brown, 4–9.5 cm long; leaf blade linear, folded, sometimes channelled, stiff, 18–37 cm long, 1.2–3.8 mm wide, acute to acuminate, apex \pm scabrid. Involucral bracts leaf-like, 2–3, 8–12.2 cm long, 1.2–3.2 mm wide, often folded and stiff. Inflorescence simple (to compound), primary branches 2–4, 1–3 cm long; spikelets loosely to densely arranged in digitate clusters, sometimes on an elongated axis, the clusters sessile and at the end of primary branches; spikelets 8–20 to many per cluster, narrowly linear-lanceolate to narrowly ovoid, 7.2–15 mm long, 1.5–1.9 mm wide, axis straight to curved; glumes brown-black, linear-lanceolate to elliptic, 2.1–2.5 mm long, 1–1.3 mm wide, keel \pm acute, (yellowish) green, grooved, 2-veined, apex acute to sometimes \pm obtuse. Stamens 3; filaments (0.9–)1.4–1.7 mm long; anthers 0.6–1.3 mm long. Stigma 2-branched. Nutlet grey, often shiny, oblong-cylindrical to ellipsoid, 0.9–1.1 mm long, 0.3–0.4 mm wide, minute tubercles in longitudinal rows.

KENYA. Naivasha District: Aberdares, Kinangop Forest station, *Fries & Fries* 2911

TANZANIA. Ufipa District: Nsanga, 11 Jan. 1956, *Vesey-FitzGerald* 2862!; Mbeya District: top of Chimala Escarpment, 5 Dec. 1963, *Richards* 18576!; Songea District: by Kimarampaka stream, 7 Jan. 1956, *Milne-Redhead & Taylor* 8150!

DISTR. **K** 3; **T** 4, 7, 8; Cameroon, Congo-Kinshasa, Sudan, Ethiopia, Angola, Zambia, Botswana, South Africa

HAB. Swampy grassland; 900–2200 m

CONSERVATION NOTES. Least concern (LC) although not widespread in the Flora area, the species is fairly wide distributed, and occurs in a common habitat.

SYN. *Cyperus aethiops* Ridl. in Trans. Linn. Soc. 2 (2): 129 (1884); Haines & Lye, Sedges & Rushes E. Afr.: 276, fig. 562 (1983); Lye in Fl. Eth. 6: 482, fig. 212.140 (1997)

C. aethiops Ridl. var. *aberdarensis* Kük. in E.P. 4, 20 (101): 367 (1936). Type: Kenya, Naivasha District: Aberdares, Kinangop Forest station, *Fries* & *Fries* 2911 (B, hol.).

NOTE. The species closest related to *P. aethiops* seems to be *P. nuerensis*. The most obvious differences can be found in the width of the leaves and involucre bracts, the size and colour of the glumes, and the number of stamens per glume.

29. **Pycreus nuerensis** (Boeck.) S.S. Hooper in Napper in Journ. E. Afr. Nat. Hist. Soc. 28 (124): 5 (1971) & in K.B. 26 (3): 579 (1972). Type: Sudan, Bahr el Ghazal, terr. Nuer, *Schweinfurth* 1172 (B, hol.).

Perennial up to 60 cm high, slender or robust, with or without stolons, with many roots; culms tufted, 23–54 cm long, 1.6–2.4 mm wide, trigonous, smooth, the basal part covered with loose leaf sheaths. Leaves up to 37 cm long; leaf sheath brown, 3–9 cm long; leaf blade linear, plicate, stiff, 17–31 cm long, 3.4–4.7 mm wide, acute to acuminate, apex scabrid. Involucre bracts leaf-like, 3–5, 11.3–17 cm long, 3–5.2 mm wide, apex scabrid. Inflorescence simple to compound, primary branches 2–8, 0.5–7 cm long; spikelets loosely to densely arranged in digitate clusters, sometimes on an elongated axis, the clusters sessile and at the end of primary branches; spikelets many per cluster, narrowly linear-lanceolate, 5.7–11.5 mm long, 1.1–1.5 mm wide, axis straight to curved; glumes linear-lanceolate, glabrous, red-brown, 1.5–2.1 mm long, 0.8–1 mm wide, keel rounded, sometimes ± acute, (yellowish) green, grooved, 2-veined, apex obtuse to sometimes almost acute. Stamens 2: filaments 1.8–2 mm long; anthers 0.4–0.5 mm long. Stigma 2-branched. Nutlet brown to grey, often shiny, oblong-cylindrical, 1–1.2 mm long, 0.3–0.4 mm wide, minute tubercles in longitudinal rows.

UGANDA. West Nile District: Koboko, June 1938, *Hazel* 595!

KENYA. Trans-Nzoia District: 8 km S of Kitale, 5 Sept. 1952, *Bogdan* 3592! & 16 km S of Kitale, 27 July 1961, *Bogdan* 5177!

TANZANIA. Ufipa District: Sumbawanga, Kito Mt, 21 Apr. 1961, *Richards* 15045; Dodoma District: Bereko, Kurasini plain, 25 Feb. 1974, *Richards* & *Arasululu* 28907!; Mbeya District: Mboosi Circle, Msumbi Estate, 13 Jan. 1961, *Richards* 13901!

DISTR. **U** 1; **K** 3; **T** 4, 5, 7; Sierra Leone, Nigeria, Cameroon, Central African Republic, Rwanda, Sudan

HAB. Swamps, ditches and moist grassland; 1500–1800 m

CONSERVATION NOTES. Least concern (LC); although not widespread in the Flora area, the species is fairly widely distributed, and occurs in a common habitat.

SYN. *Cyperus nuerensis* Boeck. in Flora 62: 555 (1879); Haines & Lye, Sedges & Rushes E. Afr.: 275, figs. 558, 559 (1983)

Pycreus globosus (All.) Rchb. var. *nilagirica* sensu C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 537 (1894), *nom. nud.* & in F.T.A. 8: 299 (1902), *non* Steud.

Cyperus polystachyos (Rottb.) P. Beauv. var. *sanguineus* Kük. in E.P. 4 (20): 371 (1936). Type: Central African Republic, Keyorede–Zubingui, *Tisserant* 2262; & Gboyo, *Tisserant* 2308 (P, syn.)

C. globosus All. var. *nuerensis* (Boeck.) Kük. in E.P. 4, 20 (101): 356 (1936)

Pycreus globosus (All.) Rchb. var. *nuerensis* (Boeck.) Troupin in Explor. Parc Natl. Garamba 4: 126 (1956)

NOTE. This species is quite similar to *P. aethiops*, but differs in the colour of the glumes, brown to red-brown in *P. nuerensis* and brown-black in *P. aethiops*. The glumes also vary in size, those of *P. nuerensis* are larger than those of *P. aethiops*. The leaves and involucre bracts are also wider in *P. nuerensis*, and *P. nuerensis* has two stamens, while *P. aethiops* has 3.

30. *Pycreus laxesplicatus* (Kük.) Hoenselaar comb. nov. Type: Zambia, Msombo at N side of Lake Bangweulu, Fries 1052 (B, holo.)

Stoloniferous perennial, up to 67 cm high; culms densely tufted, 57 cm long, 2.5 mm wide, trigonous to rounded, smooth. Leaves up to 30 cm long; leaf sheath brown to brownish-black, 6 cm long; leaf blade linear, canaliculate, ± tough and succulent, 24–25 cm long, 4–5 mm wide, acute, apex ± scabrid. Involucral bracts 3, leaf-like, spreading, folded, 11–31 cm long, 3–5 mm wide. Inflorescence compound, primary branches 6–8, 4–9.5 cm long, with a basal tubular prophyll; spikelets on elongated axis on secondary branches; spikelets 9–16 per cluster, narrowly linear-ellipsoid, 6.8–10 mm long, 1.4–1.5 mm wide, axis straight to ± curved, more curved when the glumes are shed; glumes (pale reddish-)brown, elliptic-ovate, 2.6–2.8 mm long, 1.2–1.4 mm wide, keel acute, 2–3-veined, apex long-acuminate. Stamens 3; filaments 1.7–2.2 mm long; anthers 0.9–1.1 mm long. Stigma 2-branched. Nutlet metallic grey, narrowly ellipsoid-oblong, 1–1.1 mm long, 0.3–0.4 mm wide, minute papillae in longitudinal rows.

TANZANIA. Tunduru District: ± 5 km E of Mawese road, 19 Dec. 1955, *Milne-Redhead & Taylor* 7821!

DISTR. T 8; Zambia, Malawi

HAB. Boggy grassland at edge of small peaty stream; 450 m

CONSERVATION NOTES. Data Deficient (DD); known from one collection in our area, and two collections outside, this is considered data deficient because there is still a lot of confusion in the species delimitation.

SYN. *Cyperus laxesplicatus* Kük. in *Wiss. Ergebn. Schwed. Rhod.-Kongo-Exped.* 1911–12 (1): 3 (1921); Kük. in *E.P.* 4, 20 (101): 332 (1936)

31. *Pycreus elegantulus* (Steud.) C.B. Clarke in *Consp. Fl. Afr.* 5, 194: 536 (1895) & in *F.T.A.* 8: 302 (1902). Type: Ethiopia, Simen, Demerki, *Schimper* 574 (P, holo.; HAL, Kl., UPS, iso.)

Perennial, up to 75 cm high, with slender stolons, sometimes appearing annual when stolons are not developed; culms tufted, 24–69 cm long, 1.1–3 mm wide, trigonous, smooth. Leaves up to 40 cm long; leaf sheath (pale) brown, 2.5–10.5 cm long; leaves 2–4 per culm, linear, flattish-plicate, 10–35 cm long, 2–4.7 mm wide, (acute to) acuminate, apex scabrid. Involucral bracts leaf-like, spreading, 3–5, 11–31 cm long, 2.1–4 mm wide, scabrid. Inflorescence capitate or simple, when simple primary branches 1–5, 1–5.5 cm long; spikelets in dense clusters, sessile and at the end of primary branches; spikelets 7–35 per cluster, up to many in a head, ovoid, 3.5–8(–14.5) mm long, 1.6–2 mm wide, axis often curved; glumes (dark brownish-) black, ovate, 1.4–1.8 mm long, 1.2–1.7 mm wide, keel acute, pale yellowish-brown, 2–3-veined, apex obtuse, less often ± acute. Stamens 2; filaments 0.8–2 mm long; anthers 0.2–0.5 mm long. Stigma 2-branched. Nutlet pale (metallic) grey, ellipsoid, ± biconvex, 1–1.4 mm long, 0.5–0.7 mm wide, minutely papillose.

UGANDA. Kigezi District: Kanaba Gap, Dec. 1938, *Chandler* 2436! & Butongu I., 3 km below Kanaba Gap, 6 Jan. 1962, *Morison* 19! & Mukerere, Mgahinga Saddle, Sept. 1946, *Purseglove* 2204!

KENYA. Northern Frontier District: Marsabit, Mt Kulal, 3 km N of Gatab, 18 Nov. 1978, *Hepper & Jaeger* 6914!; South Nyeri District: Kirinyaga, Thiba River crossing 3 km above fishing camp, 10 Nov. 1971, *Robertson* 1621!; Masai District: Narok, Ol Choro Orogwe Ranch, 3 July 1961, *Glover et al.*, 2004!

TANZANIA. Lushoto District: 28 Feb. 1972, *Faulkner* 4695!; Kigoma District: ± 0.4 km S of Kasangazi, along path Mahale Mts, 24 July 1958, *Jefford et al.* 206!; Njombe District: Kipengere Range, 14 Jan. 1957, *Richards* 7786!

DISTR. U 2; K 1, 3, 4, 6, 7; T 1–4, 6–8; Nigeria, Cameroon, Congo-Kinshasa, Rwanda, Burundi, Sudan, Eritrea, Ethiopia, Zambia, Malawi, Zimbabwe, South Africa; tropical America

HAB. Swamps, riverine edges, wet forest margins, wet grasslands; 1100–3050 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus elegantulus* Steud. in Flora 15: 583 (1842); Kük. in E.P. 4, 20 (101): 342 (1936); Lye in Fl. Eth. 6: 480, fig. 212.137 (1997)

C. elegantulus Steud. var. *submelanostachyus* Kük. in E.P. 4, 20 (101): 343 (1936). Type: Tanzania, Bukoba District: Ihangiro, *Stuhlmann* 3342 (B, holo.)

Pycrus niger (Ruiz. & Pav.) Koyama subsp. *elegantulus* (Steud.) Lye in Nordic Journ. Bot. 1(5): 622 (1982)

Cyperus niger Ruiz & Pav. subsp. *elegantulus* (Steud.) Lye in Sedges & Rushes E. Afr.: App. 3: 2 & in main work: 271, fig. 551 (1983)

32. ***Pycrus longistolon*** (Peter & Kük.) Napper in Journ. E.Afr. Nat. Hist. Soc. 28 (124): 6 (1971). Type: Tanzania, without locality, *Jaeger* 62; Iringa District: Kidete, *Peter* 32801B; Dodoma District: Ugogo, near Bahi, *Peter* 33354 & Uyansi on Lake Chaya, *Peter* 34151 & 34253 & Itigi, Turu, *Peter* 33742 & Rift valley near Saranda, *Peter* 33638; Ufipa District: Unyanyembe, Malongwe, *Peter* 34453 (all B, syn.)

Perennial up to 1 m high, slender to more robust, with long stolons; culms 36–77 cm long, 1.2–3.3 mm wide, trigonous, smooth. Leaves up to 45 cm long; leaf sheaths pale yellow-brown to brown, 2–10 cm long, often spongy; leaf blade linear; plicate, 16–34 cm long, 2.6–7 mm wide, acute, apex almost glabrous to scabrid. Involucral bracts leaf-like, 3–5, 11–39 cm long, 2.3–7 mm wide, spreading. Inflorescence simple, slender to quite robust, primary branches 1–8, 1.1–15.5 cm long, at the base with a somewhat conspicuous tubular red-brown prophyll; spikelets in clusters on elongated axis, sessile and at the end of primary branches; spikelets 5–13(23) per cluster, lanceolate, sometimes almost oblong, 13–35 mm long, 2.4–5 mm wide, axis straight or sometimes somewhat curved; glumes imbricate when young, spreading, sides slightly infolding and showing the nutlet during maturation, (pale) reddish-brown, sometimes almost purplish to almost black, elliptic-ovate, 2.6–4.2 mm long, 1.1–2.1 mm wide, keel acute, 2–3-veined, veins often yellow, apex acute to mucronate. Stamens 3; filaments 1.1–4 mm long; anthers 1–2.2 mm long. Style 2-branched. Nutlet brown to grey, often shiny, obovoid, 1.3–1.6 mm long, 0.6–1 mm wide, almost glabrous to minutely papillose, papillae in longitudinal rows.

KENYA. Trans-Nzoia District: Kitale, ± 10 km Eldoret–Kitale, 8 Oct. 1981, *Gilbert & Mesfin* 6484!; Nairobi, Golf Range, between Wilson Airport and Army Barracks, 7 June 1981, *Gilbert* 6266!; Machakos District: Kitani Hill, Mtitio Andei, 20 Mar. 1969, *Napper & Jones* 1971!

TANZANIA. Ufipa District: near Tumba, 26 Jan. 1951, *Bullock* 3630!; Dodoma District: base of Imagi Hill, 1.6 km S of Dodoma, 29 Jan. 1962, *Polhill & Paulo* 1293; Shinyanga District: Nindo Division, Jan. 1972, *Stefanescu & Zikamboda* 102!

DISTR. K 3, 4; T 1, 2, 4, 5, 7; Zambia

HAB. Wet depression in grassland, lake shores, bushland, sometimes on or at base of rocky outcrops; 900–1850 m

CONSERVATION NOTES. Least concern (LC); although the distribution area is not large, the habitat is very common

SYN. *Cyperus longistolon* Peter & Kük. in E.P. 4, 20 (101): 333 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 274 (1983)

Pycrus longistolon (Peter & Kük.) Napper subsp. *atrofusca* Lye in Nordic Journ. Bot. 1(5): 618 (1982). Type: Tanzania, Masai District: Malanyo [Malanja] depression, *Newbould* 6057 (EA, holo.)

Cyperus longistolon Peter & Kük. subsp. *atrofuscus* (Lye) Lye in Sedges and Rushes East Afr.: 274, figs. 556, 557 (1983)

NOTE. This species is sometimes confused with *Pycrus nitidus*, but that is a more robust plant with the base of the plants massive, bearing scales and (old) leafbases. Also, the glumes of *P. longistolon* have a mucronate apex, while the apex of *P. nitidus* can vary from obtuse to acute. As mentioned in the description, the sides of the glumes of *P. longistolon* fold inwards during maturation of the nutlet, a character that is not shared with *P. nitidus*. This character is shared with *P. pumilis* var. *patens*; however this species is easily recognized by its small habit.

Lye described two subspecies for *P. longistolon*, subsp. *longistolon* and subsp. *atrofusca*, based on differences in size and colour of the spikelets. The spikelets of subsp. *atrofusca* are supposed to be slightly wider (3–5 mm in subsp. *atrofusca* and 2.5–3 mm in subsp. *longistolon*) and darker than in subsp. *longistolon*. I am unable to distinguish these in the material studied, and no subspecies are recognized here.

33. ***Pycreus unioloides*** (*R. Br.*) *Urb.* in *Symb. Antill.* 2: 164 (1900). Type: Australia: Victoria, *Brown* 5900 (K!, holo.)

Short-lived perennial up to 85 cm high, with short rhizome soon dying off; culms tufted, 36–78 cm long, (0.9–)1.4–3 mm wide, triquetrous, sometimes ± trigonous, smooth, often scabridulous above, scaly below. Leaves up to 55 cm long; leaf sheath (dark) reddish-brown, 3–10 cm long; leaf blade linear, flattish-plicate, sometimes folded, 21–45 cm long, 1.8–4.5 mm wide, acute, apex often scabrid. Involucral bracts leaf-like, 2–4, the lowermost 6.5–41 cm long, 2–5 mm wide. Inflorescence simple, open or congested, spikelets in digitate clusters or on an elongated axis, sessile or at the end of primary branches; primary branches 3–6, 2.5–7.5 cm long, with a purple tubular prophyll at its base; spikelets 7–22 per cluster, sometimes ± many, lanceolate to ellipsoid-ovoid, 10–18 mm long, 3–4.6 mm wide, elongating when in fruit, axis straight; glumes ± imbricate, yellow-brown, ovate-lanceolate to ovate-elliptic, sides chartaceous, 2.7–4 mm long, 1.4–2.4 mm wide, keel acute, sometimes green, 3-veined, apex acute. Stamens 3: filaments 2.5–3.5 mm long; anthers 0.6–2.5 mm long. Stigma 2-branched. Nutlet shiny greyish-black, broadly ellipsoid to obovoid-orbicular, 0.7–1.5 mm long, 0.6–1 mm wide, minutely punctuate to ± wrinkled.

UGANDA. Karamajo District: Nakapiririt, Pian County, July 1965, *J. Wilson* 1715!; Mbale District: Bukwa–Kapchorwa, 30 Jan. 1966, *Haines* 4139!; Mengo District: 3 km N of Kakoga, 21 Dec. 1955, *Langdale-Brown* 1793!

TANZANIA. Ufipa District: Sumbawanga, Chapota Swamp, 6 Mar. 1957, *Richards* 8532!; Dodoma District: Bereko, Karasini Plain, 25 Feb. 1974, *Richards & Arasululu* 28914!; District unclear: Mweinda's-Rweinda's, Usina Swamp, 28 Nov. 1933, *Michelmore* 783!

DISTR. U 1, 3, 4; T 4, 5, 7, 8; pantropical

HAB. Open swamp and grassland, on riverbanks and in ditches; 300–1950 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution and habitat.

SYN. *Cyperus unioloides* *R. Br.* in *Prodr. Fl. Nov. Holl.*, 216 (1810); Kük. in *E.P.* 4, 20 (101): 338 (1936); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 273, fig. 555 (1983); *Lye* in *Fl. Eth.* 6: 481 (1997)

C. mertonii sensu *Haines & Lye*, *Sedges & Rushes E. Afr.*: 277, figs. 565, 566 (1983), *non* S.S. Hooper

NOTE. A single specimen from Teso had been identified as *Cyperus mertonii* S.S. Hooper by Hooper herself; this was the basis of the inclusion of this taxon in *P. unioloides* by *Haines & Lye*. I believe this was a misidentification and that *C. mertonii* is not distributed in the Flora area; its type is from Ghana.

34. ***Pycreus nigricans*** (*Steud.*) *C.B. Clarke* in *Trans. Linn. Soc.* 2, Bot 4: 53 (1894) & in *F.T.A.* 8: 292 (1902). Type: Ethiopia, Gonder Region, Enjedcap in Semien, *Schimper* 1373 (P, holo.; BM!, HAL, K!, UPS, iso.)

Robust perennial, forming very dense tussocks with many crowded leaves; root system of closely packed tough woody rhizomes and thick roots bearing persistent hard dark polished leafbases, the new shoots springing intravaginally from their axils; culms tufted, 35–90 cm long, 1–1.8 mm wide, trigonous to slightly triquetrous, sometimes with distinct grooves, smooth, the angles sometimes set with small spine-like teeth. Leaves up to 82 cm long; leaf sheath brownish-red (old ones black), 6–8 cm long; leaf blade narrowly linear, folded, stiff, 22–74 cm long, 1.8–3.5 mm wide, acute (sometimes acuminate), apex scabrid. Involucral bracts, 2–3, leaf-like, spreading, sometimes the lowermost overtopping the inflorescence,



FIG. 45. *PYCREUS NITIDUS* — 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 3$; 3, rachilla, $\times 8$; 4, glume lateral view, $\times 16$; 5, gynoecium, $\times 10$; 6, nutlet, $\times 6$. All from *Browning* 163. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

6–17 cm long, 2–3.6 mm wide, often folded. Inflorescence capitate, with a tar-like smell; spikelets crowded in sessile, ovoid-globose clusters, sometimes viviparous in lowermost part of spikelets; spikelets 5–25 per cluster, ovoid, 8–17 mm long, 2.5–5 mm wide, axis straight to sometimes slightly curved; glumes closely imbricate, (reddish-) black, ovate, 3.2–4.9 mm long, 2.1–2.8 mm wide, keel yellow-brown, acute, rather broad, 2–4-veined, apex acute. Stamens 3; filaments 3.7–4.7 mm long, anthers 1.5–2.6 mm long. Style 2–3-branched. Nutlets (silvery) brown-grey to brown-black, obovoid(-ellipsoid), biconvex, 1.2–1.7 mm long, 0.5–0.9 mm wide, glabrous with protruding cell-walls to wrinkled-punctate.

UGANDA. Kigezi District: Elephant Valley, 25 Aug. 1938, *Thomas* 2491! & Virunga Mts, W slope of Muhavura, 19 Nov. 1954, *Stauffer* 865! & Muchoya Fen Bamboo Reserve, 5 Jan. 1962, *Morrison* 7!

KENYA. Nakuru District: Nyahururu [Thomsons Falls] to Nakuru km 32, 14 Aug. 1952, *Bogdan* 3527! & 27 km from Olokurto on the road to Elburgon, 14 May 1961, *Glover et al.* 1046!; Kiambu District: Lari Swamp, 8 June 1976, *Kahurananga & Kibui* 2873!

TANZANIA. Njombe District: Elton Plateau, Ndumbi River, 11 Jan. 1957, *Richards* 7687!; Morogoro District: Lukwangule Plateau, above Chenzema Mission, Uluguru Mts, 13 Mar. 1953, *Drummond & Hemsley* 1543!; Kilimanjaro, Mar. 1894, *Volkens* 2014!

DISTR. U 2; K 3, 4, 6; T 2, 6, 7; Ethiopia, Malawi; Madagascar

HAB. Forming large tussocks on marshy ground, in swamps and bogs; 1800–3600 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution.

SYN. *Cyperus nigricans* Steud. in *Flora* 15: 584 (1842); Kük. in *E.P.* 4, 20 (101): 336 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 272, fig. 554 (1983); Lye in *Fl. Eth.* 6: 481, fig. 212.139 (1997)

Pycrus nyasensis C.B. Clarke in *F.T.A.* 8: 304 (1902). Type: Malawi, Mt Zomba, *Whyte* s.n. (K, holo.)

Cyperus nigricans Steud. var. *firmior* Kük. in *F.R.* 12: 94 (1913) & in *E.P.* 4, 20 (101): 337 (1936). Type: Ethiopia, NE Sidamo, *Ellenbeck* 1861 (P, holo.)

Pycrus nigricans (Steud.) C.B. Clarke var. *firmior* (Kük.) Cherm. in *Bull. Soc. Bot. Fr.* 82: 337 (1935)

NOTE. The inflorescence of this species is characterized by its very dark, almost black colour, and its strong tar-like smell. Although this smell can be detected in other species as well, it is not as prominent as in *P. nigricans*.

35. *Pycrus nitidus* (Lam.) J. Raynal in *K.B.* 23: 314 (1969). Type: India, no further indication, Herb. Lamarck (P-LA, holo.)

Robust perennial, with long stolons, the base of the plants massive, bearing scales and (old) leafbases; culms 24–71 cm long, 1.3–2.9 mm wide, trigonous to triquetrous (sometimes almost rounded), soft, smooth. Leaf sheath pale yellowish-brown, brown to almost black, 2.5–14 cm long; leaf blade linear, flattish plicate, 18–70 cm long, 2.5–8.6 mm wide, acute to acuminate, apex glabrous to minutely scabrid. Involucral bracts 3–7, leaf-like, spreading, 6–30 cm long, 3–8 mm wide. Inflorescence simple, spikelets in ovoid, digitate clusters, sessile or at the end of primary branches, primary branches 4–9, (0–)2.5–10 cm long, at the base with a conspicuous tubular red-brown prophyll; spikelets 5–30 per cluster, ovoid(-oblong), 8–16 mm long, 3–4.3 mm wide, axis straight to sometimes slightly curved; glumes imbricate, yellow-brown, brown to deep brown, ovate, 2.5–4 mm long, 1–2.4 mm wide, keel pale yellowish-green, acute, 2–3-veined, apex obtuse to acute. Stamens 3; filaments 2.1–3.2 mm long, anthers 1.2–2.4 mm long. Style 2-branched. Nutlets red-brown to black, obovoid, sometimes almost obtriangular, biconvex, 0.8–1.1 mm long, 0.5–0.9 mm wide, smooth to minutely papillose-punctuate to slightly wrinkled. Fig. 45, p. 306.

UGANDA. Kigezi District: Lake Mutanda, May 1950, *Purseglove* 3392!; Busoga District: Bugabula, at the N side of Mbulamuti A.L.G. Plantation, 13 km SW of Kamuli, 28 Apr. 1953, *Wood* 697!; Mengo District: Makerere College, 9.5 km Fort Portal Road, Apr. 1953, *Lind* 129!

KENYA. Trans-Nzoia District: Kitale, 8 Apr. 1953, *Bogdan* 3707!; Kiambu District: Ondiri Swamp, 4 Feb. 1951, *Bogdan* 2894!; Kavirondo District: Kavirondo Gulf, 11 June 1970, *Terry* 14741!

TANZANIA. Arusha District: Ngurdoto Crater, 11 Jan. 1971, *Greenway & Kamuri* 14835!; Njombe District: 29 Nov. 1931, *Lynes* 4! & Lihogosa Swamp, near Njombe, 18 Jan. 1957, *Richards* 7906!

DISTR. U 2–4; K 3–5; T 1, 2, 4, 6, 7; widespread in northeast and southeast tropical Africa, South Africa; Madagascar, India

HAB. Swamps, burned areas, forming large stands; (80–120)1000–2150 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution.

SYN. *Cyperus nitidus* Lam. in *Tabl. Encycl.* 1: 145 (1791) and *Ill. Gen.* 1: 145 (1791); Haines & Lye, *Sedges & Rushes E. Afr.*: 272, figs. 552, 553 (1983); Lye in *Fl. Eth.* 6: 481, fig. 212.138 (1997)

- C. lanceus* Thunb. in Prod. Pl. Cap.: 18 (1794); Kük. in E.P. 4, 20 (101): 333 (1936). Type: none mentioned
- Pycreus umbrosus* Nees in Linnaea 10: 130 (1835); C.B. Clarke in F.T.A. 8: 303 (1902). Type: South Africa, Olifantsrivier & Brackfonteyn, *Ecklon* s.n. (?B, holo.)
- Cyperus melanopus* Boeck. in Flora 62: 545 (1879). Type: Sudan, Bahr el Ghazal, terr. Nuer, *Schweinfurth* 1219 (B, holo.)
- C. lanceus* Thunb. var. *grantii* C.B. Clarke in J.L.S. 21: 66 (1884); Kük. in E.P. 4, 20 (101): 335 (1936). Types: Uganda, Ruwenzori, *Scott Elliot* 7516 (K, syn.); ?Tanzania, Urundi at Lake Tanganyika, *Carson* 54 (?K, syn.); Tanzania, Dodoma District: Ngulu, Mgunda-Mkhali, *Speke & Grant* 605 (K!, syn.)
- Pycreus lanceus* (Thunb.) Turrill in K.B. 1925: 67 (1925)
- Cyperus lanceus* Thunb. var. *melanopus* (Boeck.) Kük. in E.P. 4, 20 (101): 335 (1936)
- Pycreus nitidus* (Lam.) J. Raynal var. *grantii* (C.B. Clarke) J. Raynal in K.B. 23: 314 (1969)

NOTE. This species is easily recognized by its wide leaf blade and wide involucre bracts; the red, tubular prophylls at the base of the primary branches of the inflorescence are also distinct.

23. QUEENSLANDIELLA

Domin in Bibl. Bot. 85: 415 (1915)

Mariscopsis Cherm. in Bull. Mus. Hist. Nat. Paris 25: 60 (1919)

Cyperus subgen. *Queenslandiella* (Domin) Govindara in Reinwardtia 9: 194 (1975)

Annual tufted herb with pungent odour of curry or fenugreek, long persistent in dried specimens; rooting system shallow; culms scapose. Leaves eligulate. Involucral bracts leaf-like. Inflorescence anthelate. Spikelets falling entire, the broadly winged rachilla with distichous persistent glumes, each subtending a flower. Flowers bisexual. Stamens 2. Style 2-branched. Nutlets ± oblong in outline, compressed laterally.

A monotypic genus extending from the East African coast to N Queensland (Australia).

Queenslandiella hyalina (Vahl) Ballard in Hook. Ic. Pl. t. 3208 (1933). Type: India, *Roettler* s.n. (C, holo.)

Tufted annual 5–40 cm tall; culms 5–30 cm long. Leaves basal, flat, 5–15 cm long, 2–6 mm wide, glabrous save for scabrid margins and midrib; sheaths grey to reddish brown. Involucral bracts 3–6, similar to leaves, 6–25 cm long, 1.5–6 mm wide. Inflorescence a simple umbel or with 1–few sessile spikes and 1–8 stalked spikes; rays up to 12 cm long; spikes 0.8–1.8 cm long, 0.7–1.7 cm wide with 8–15 ovate to ovate-elliptic compressed spikelets 4–9 × 1.5–2.5 mm; glumes 3–9, yellow or greenish yellow, lanceolate-ovate or ovate, 2–3.5 mm long, keeled, prominently 3–4-veined, with scabrid margins, the green midrib excurrent with recurved tips. Nutlet dark grey or brown, 1.3–1.5 mm long, 1–1.2 mm wide, rounded, truncate or slightly emarginate at the apex, finely densely papillate. Fig. 46, p. 309.

KENYA. Mombasa, 19 Nov. 1961, *Bogdan* 5353!; Kilifi District: Malindi, 7 Aug. 1971, *Schlieben* 12140!; Lamu District: Kiunga archipelago, 21 July 1961, *Gillespie* 14!

TANZANIA. Uzaramo District: near Dar es Salaam, 31 May 1966, *Haines* 4185!; Mikindani District: Mtwara–Mikindani road, 11 Mar. 1963, *Richards* 17837!; Zanzibar: Fumba, 10 Jan. 1962, *Faulkner* 2975!

DISTR. **K** 7; **T** 6, 8; **Z**; Mozambique; Mauritius, Madagascar, Maldives, India, Sri Lanka, Malesia, Australia

HAB. Grassland, bushland on coral rag, also as a weed in coastal lawns, sisal plantations and under coconut palms; sea-level–30 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Cyperus hyalinus* Vahl, Enum. 2: 329 (1806); Kük. in E.P. 4, 20 (101): 498 (1936); Kern in Fl. Males. 7: 655, fig. 68 (1974); Haines & Lye, Sedges & Rushes E. Afr.: 293, fig. 608 (1983)



FIG. 46. *QUEENSLANDIELLA HYALINA* — 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 5$; 3, glume, $\times 10$; 4, flower, $\times 12$; 5, young nutlet, $\times 10$. 1 & 3–5 from Schlieben 12140, 2 from Kirika & Muthoka NMK 729. Drawn by Juliet Williamson.

- C. pumilus* sensu Nees in Wight, Contr.: 74 (1834) pro parte excl. syn., *non* L.
Pycrus pumilus sensu Nees in Linnaea 9: 283 (1834) pro parte, *non* (L.) Domin.; C.B. Clarke
 in F.T.A. 8: 296 (1902)
Queenslandiella mira Domin in Bibl. Bot. Heft 85: 416, t. 11 figs 7–13 (1915). Type:
 Australia, Queensland, near Chillagoe, *Domin* 1598 (PR, holo.; K, photo!)
Pycrus hyalinus (Vahl) Domin in Bibl. Bot. Heft 85: 417 (1915) adnot.
Mariscus suaveolens Cherm. in Bull. Mus. Hist. Nat. Paris 25: 60 (1919). Type: Madagascar
 N, *Bernier* 33 (P, syn.) & Zanzibar, *Boivin* s.n. (P, syn.)
M. hyalinus (Vahl) Ballard in K.B. 1932: 457 (1932)

24. KYLLINGA

Rottb., Desc. et Ic.: 12, t. 4 (1773)

- Cyperus* L. subgen. *Kyllinga* (Rottb.) Suringar, Gesl. Cyperus Mal. Archip.: 42 (1898);
 Kük. in E.P. 4, 20 (101): 566 (1936); Haines & Lye, Sedges & Rushes E. Afr.:
 224–250 (1983)

Note: occasionally the spelling *Kyllingia* is encountered (as in de Jussieu, Nees and Steudel) but the original and correct spelling is without the ‘i’.

Annual or perennial herbs, often with rhizomes or stolons. Culms scapose to few-noded, usually triangular. Leaves sometimes reduced to sheaths only; ligule 0. Involucral bracts leaf-like. Inflorescence a single ovoid or globose spike, or a complex head with smaller lateral spikes at base of main spike; these laterals flower and fruit later than the main one. Spikelets narrowly ovoid, 1–6-flowered, with 2 sterile basal glumes and several larger fertile glumes; upper flowers sometimes male only; glumes in 2 rows, usually ovate and hooded, keel sometimes winged. Stamens 1–3, usually 3. Style with 2 branches. Nutlet oblong or ellipsoid, compressed laterally.

About 60 species, mostly in Africa but some in southern Asia and the Americas.

Note: Many of the Kew types have been on loan for several years. Despite polite requests for access I was unable to study these types. This, combined with a shortage of time (caused by FTEA completion deadline) have made this treatment less good than I would have wished, as well as incomplete in parts – including a number of indeterminates. Such indets are usually a source of both key improvements and range extensions, and sometimes even of new records or taxa. This is not how I like to work, and I apologize to the users of the treatment and the key!

- | | |
|---|-------------------------------|
| 1. Inflorescence dark red or purple to blackish
(at least on glume tips) | 2 |
| Inflorescence white to yellow or pale brown | 5 |
| 2. Culms distant from each other | 3 |
| Culms dense, on a short rhizome; stem base
swollen | 4 |
| 3. Culms regularly spaced along rhizomes;
involucral bracts 2–3, the lower and largest
2–6(–10) cm long; head of a single spike. . . | 1. <i>K. brevifolia</i> p.313 |
| Culms at ends of stolons; involucral bracts 2–5,
the lower and largest 3–15 cm long; head of a
main spike usually with 1–3 smaller subsidiary
spikes | 2. <i>K. pulchella</i> p.316 |
| 4. Involucral bracts 1–3(–4); stem base aromatic;
glumes without teeth | 3. <i>K. nervosa</i> p.317 |
| Involucral bracts 3–4(–12); plants not aromatic;
glumes with toothed keel | 4. <i>K. peteri</i> p.317 |

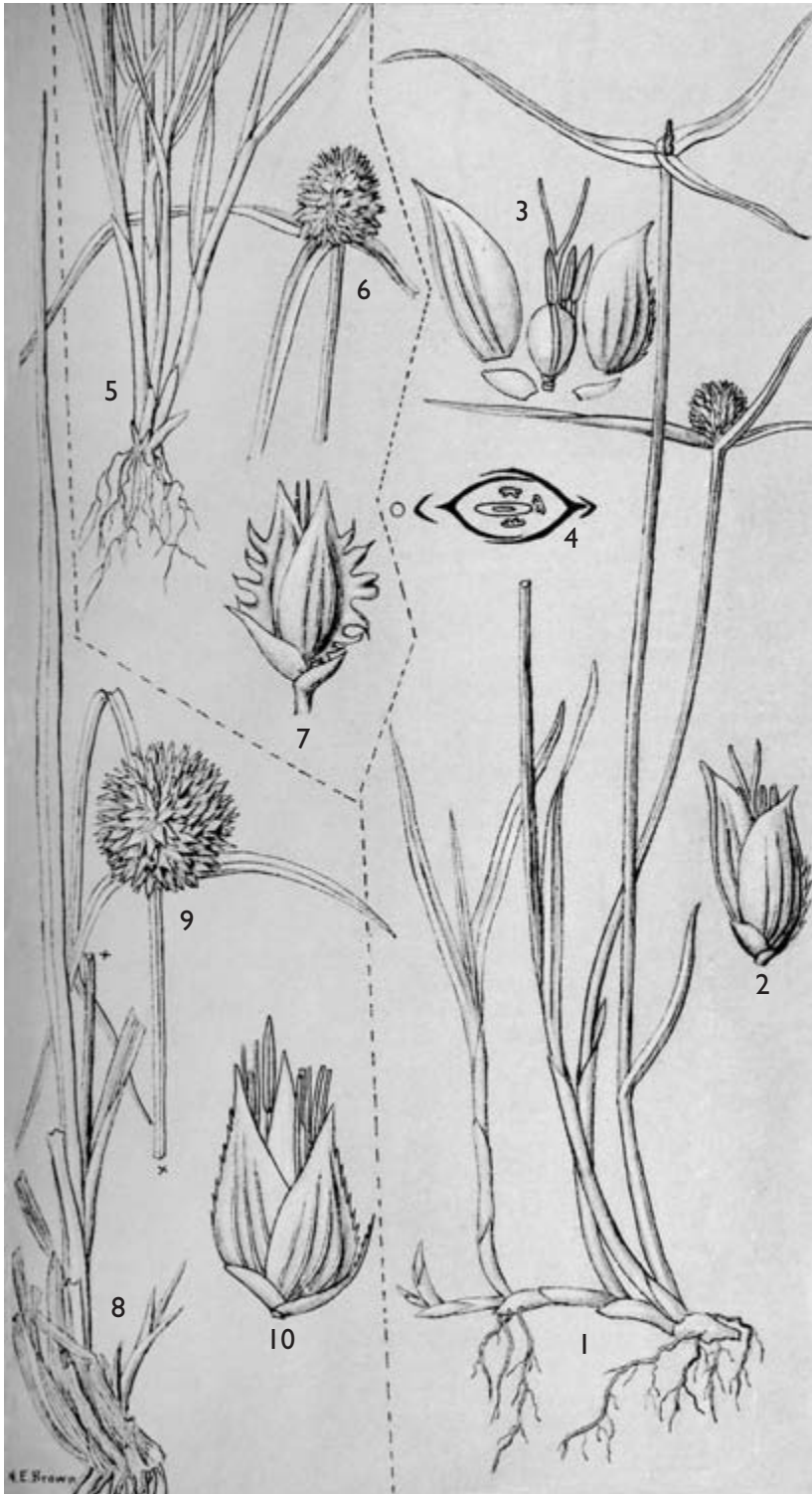
5. Glumes and inflorescence golden yellow, sometimes with a touch of green 6
 Glumes and inflorescence white, cream, very pale yellow, pale brown or pale green 13
6. Involucral bracts 5–9 5. *K. polyphylla* p.318
 Involucral bracts 1–4 7
7. Rhizome erect; spike single with 6–15 spikelets; spikelets 4–7 mm long 6. *K. pauciflora* p.319
 Rhizome creeping; spikes with many densely set spikelets; spikelets 2–4 mm long 8
8. Culm base bulbous; leaves 0.8–1 mm wide ... 7. *K. ugogensis* p.320
 Culm base cylindrical or slightly swollen (in *K. erecta*); leaves > 1.2 mm wide 9
9. Longest involucral bract erect 1. *K. brevifolia* p.313
 All involucral bracts spreading to reflexed 10
10. Heads bright yellow, drying orange, of central and several subsidiary spikes 8. *K. chrysantha* p.320
 Heads golden yellow or greenish yellow 11
11. Culms densely set in a row along the long-creeping rhizome 12
 Culms ± tufted, surrounded by fibres, on a short oblique rhizome 9. *K. flava* p.322
12. Culm bases swollen, higher up 0.8–2 mm across 10. *K. erecta* p.322
 Culm bases not swollen, 1.5–3 mm across higher up 11. *K. melanosperma* p.323
13. Plant without rhizomes, stolons or basal buds 14
 Plant with rhizomes or stolons, or spreading by basal buds 21
14. Glumes with conspicuous winged and toothed keel 15
 Glumes without winged keel or teeth 17
15. Base of plant bulbous; stamens 3 12. *K. robinsoniana* p.325
 Base of plant cylindrical; stamens 1–2 16
16. Inflorescence of 1 central and 1–2 lateral spikes; spikelets 2–2.5 mm long 13. *K. pumila* p.325
 Inflorescence of a single spike; spikelets 2.5–4 mm long 14. *K. squamulata* p.326
17. Culms solitary; nutlet black; **T** 7, 2440 m ... 15. *K. afropumila* p.327
 Culms tufted; nutlet brown (or only known immature); found below 2100 m 18
18. Central spike 3–4 × 2.5–3 mm; spikelets 1–1.3 mm long; nutlet 0.9 mm long; Kenya only 16. *K. microstyla* p.327
 Central spike usually larger; spikelets 1.5–3 mm long; nutlet 1–1.7 mm long 19
 (Central spike ± 10 × 7 mm; spikelets 3.5–4 mm long; nutlet not known; **T** 4 17. *K. sp.* A p.328
19. Inflorescence white, of a single spike; **T** 2 only 18. *K. microbulbosa* p.328
 Inflorescence of 1 central and 2 lateral spikes 20
20. Inflorescence light reddish brown; glumes smooth; **K** 1 only 19. *K. brunneoalba* p.329
 Inflorescence white or cream; glumes with strongkeel; widespread. 20. *K. tenuifolia* p.329
21. Glumes with conspicuous wing, this wing beset by teeth 22
 Glumes without wing or teeth 28

22. Coastal plant, found below 50(–200) m; plant aromatic; rhizomes/stolons 3–5 mm in diameter; culms to 73 cm long; involucre bracts to 30(–45) cm long 21. *K. cartilaginea* p.330
 Inland plants, found above 450 m 23
23. Inflorescence 5–18 mm wide; plant aromatic, with swollen culm base surrounded by fibres; spikelets 3.3–6.5 mm long 22. *K. alba* p.331
 Inflorescence < 12 mm wide; plants not aromatic, with cylindrical culm base; spikelets < 4.5 mm long (except *K. petersianus* and *K. alba* var. *purpurea*, up to 5.5 mm) 24
24. Culms solitary, with stolons; leaves 1–2 mm wide; involucre bracts 2–3, to 7 cm long 23. *K. albogracilis* p.334
 Culms spaced along rhizomes; leaves 2–5 mm wide; involucre bracts 3–6, the longest 5–20 cm long 25
25. Inflorescence globose 26
 Inflorescence longer than wide 27
26. Inflorescence 10–12 mm across; lower involucre bract 5–6 cm long; spikelets 4.5–5.5 mm long; T 4, 2000 m 24. *K. alba* var. *purpurea* p.334
 Inflorescence 3–8 mm across; lower involucre bract 8–18 cm long; spikelets 2–2.5 mm long; found below 1200 m 25. *K. nemoralis* p.335
27. Leaves 2–10 cm long; involucre bracts 5–6; inflorescence ovoid, 8–15 × 4–8 mm 5. *K. polyphylla* p.318
 Leaves 5–25 cm long; involucre bracts 3–4(–12); inflorescence ovoid, 10–15 × 6–10 mm 4. *K. peteri* p.317
28. Stolons present, with plants growing at end but not regularly spaced along 29
 Stolons absent; rhizomes present, or plant spreading by basal buds 32
29. Inflorescence of a single spike 30
 Inflorescence of a central spike and several smaller lateral ones 31
30. Base of culm bulbous; leaves 0.5–1 mm wide; glumes pale yellow to greenish 26. *K. albiceps* p.335
 Base of culm thickened but not bulbous; leaves 2–5 mm wide; glumes white (sometimes with brown dots) 27. *K. bulbosa* p.336
 27. *K. bulbosa* p.336
31. Glumes whitish; terminal spike 6–15 × 7–17 mm
 Glumes pale brown with green midrib; terminal spike narrower, 14–20 × 6–7 mm 28. *K. kilianii* p.337
32. Leaves and involucre bracts pilose; longest involucre bract 0.6–1.6 cm long; T 8 29. *K. microbracteata* p.337
 Leaves and involucre bracts scabrid on margin only, not pilose; longest involucre bract usually much longer 33
33. Involucre bracts erect to spreading; inflorescence viviparous, with young plants sprouting 6. *K. pauciflora* (and a pale form of 1. *K. brevifolia*) p.319
 Involucre bracts spreading to deflexed, never erect; inflorescence not viviparous 34

34. Glumes yellow to straw-coloured; involucre bracts 5–9 5. *K. polyphylla* p.318
 Glumes white, cream or very pale brown to straw-coloured, sometimes with green keel; involucre bracts 2–5 35
35. Culm scabrid near its apex; culms tufted; inflorescence usually of several spikes 36
 Culm glabrous or with a few minute hairs 37
36. Glume glabrous; leaves 3–5 mm wide 30. *K. comosipes* p.338
 Glume hairy or ciliate; leaves 5–7 mm wide .. 31. *K. platyphylla* p.339
37. Spikelets 5–8 mm long, 3–5-flowered 32. *K. eximia* p.339
 Spikelets 1.8–4.8 mm long, 1–3-flowered 38
38. Plants with basal buds, culms tufted; leaves 1.5–7 mm wide 33. *K. odorata* p.340
 Plants without basal buds, culms spaced along the rhizome; leaves 1–4 mm wide 39
39. Longest involucre bract 7–16(–30) cm long; glumes acute 40
 Longest involucre bracts 1–10 cm long; glumes acuminate to mucronate to subulate 41
40. Leaves 1.5–2.6 mm wide; inflorescence globose, 4–10 mm across; spikelets 2-flowered; widespread 34. *K. crassipes* p.342
 Leaves 3.5–4 mm wide; inflorescence ovoid, 10–11 × 8–10 mm; spikelets 1-flowered; T 7 only 35. *K. uniflora* p.342
41. Inflorescence of a single spike; leaves 1–2 mm wide 42
 Inflorescence of a main spike with smaller lateral spikes; leaves 2–4 mm wide 43
42. Lower culm terete; spikelets 4–4.8 mm long.. 36. *K. songeensis* p.343
 Whole culm triangular; spikelets 2.5–3.5 mm long 37. *K. tanzaniae* p.343
43. Culm base bulbous; involucre bracts 2–3, the lower 3–4 cm; inflorescence spikes 9–14 mm wide; glumes glabrous 38. *K. pseudobulbosa* p.344
 Culm base not thickened; involucre bracts 4–5, the lower to 10 cm 44
44. Inflorescence spikes 4–5 mm wide; glume keel hairy with straight apex 39. *K. oblonga* p.344
 Inflorescence spikes to 7 mm wide; glume glabrous with recurved apex 40. *K. ruwenzoriensis* p.345

1. *Kyllinga brevifolia* Rottb. in Descr. Icon. Rar. Pl.: 13, t. 4 fig. 2 (1773); C.B. Clarke in F.T.A. 8: 273 (1902). Type: India, König s.n. (C, holo.)

Perennial with a thin creeping rhizome; culms solitary and spaced along the rhizome, 5–55 cm long, 0.5–1.2 mm wide, triangular, glabrous. Leaves up to 23 cm long; leaf sheath reddish to purplish, 1–7 cm long; leaf blade linear, grooved along midrib, 3–23 cm long, 1.2–3 mm wide, scabrid on margins and midrib. Involucre bracts leaf-like, 2–3, the longest erect, the other(s) spreading or reflexed, lowermost 2–6(–10) cm long. Inflorescence a yellowish to dark brown or blackish small globose or ovoid head 4–10 × 4–8 mm; spikelets in a single spike, many and dense, narrowly ovoid, 2.2–4.2 × 0.6–1.3 mm; glumes yellow-green with



green keel or dark golden brown to grey-green or blackish, ovate, 2–3.7 mm long, keel green, apex acuminate or the keel excurrent. Stamens 3; filaments to 2.6 mm long; anthers 1–1.3 mm long. Nutlet black when mature, broadly (ob-)ovoid and flattened, 1.1–1.4 × 0.7–0.9 mm, minutely papillose. Fig. 47: 1–4, p. 314.

var. **brevifolia**

Inflorescence a yellow-green or yellow-brown small globose or ovoid head 4–9 × 4–8 mm; glumes yellow-green with green keel, ovate, 2–3 mm long.

UGANDA. West Nile District: Arua, May 1938, *Hazel* 589!; Kigezi District: Kachwekano Farm, May 1951, *Purseglove* 3612!; Mengo District: Kampala, Kawanda, Sept. 192, *E.S. Brown* 173b!

KENYA. Trans Nzoia District: Kitale–Endebess km 8, May 1969, *Napper* 2144!; Nairobi: between Wilson Airport and Army barracks, May 1980, *Gilbert* 5948!; N Kavirondo District: Kimilili, Kamukuywa, Aug. 1975, *Bauer* 492!

TANZANIA. Bukoba District: Minziro Forest Reserve SW of Minziro village, Apr. 2001, *Festo, Bayona & Francis* 1221!; Lushoto District: Mkuzi, Apr. 1953, *Drummond & Hemsley* 2252!; Songea District: Kimarampaka stream 12 km W of Songea, Dec. 1955, *Milne-Redhead & Taylor* 7975!

DISTR. U 1–4; K 3–6; T 1–4, 6, 8; widespread in tropical Africa; Indian Ocean Islands, S Asia, Australia, Americas

HAB. Seasonally swampy grassland, secondary grassland, forest margins, stream- and lake-sides; may be carpet-forming; 150–2100 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus brevifolius* (Rottb.) Hassk. subsp. *brevifolius* (Rottb.) Hassk. in Cat. Hort. Bogor.: 24 (1844); Kük. in E.P. 4, 20 (101): 600 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 236 (1983)

Kyllinga intricata Cherm. in Bull. Mus. Paris 25: 211 (1919). Type: Madagascar, Imerina, *Hildebrandt* 3788 (P. holo.)

Cyperus erectus (Schumach.) Mattf. & Kük. var. *intricatus* (Cherm.) Kük. in E.P. 4, 20 (101): 590 (1936)

Kyllinga colorata sensu Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 20 (1971)

K. aurata sensu Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 21 (1971), *non* Nees
Cyperus brevifolius (Rottb.) Hassk. subsp. *intricatus* (Cherm.) Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & main work: 236, fig. 475 (1983); Lye in Fl. Eth. 6: 473, fig. 212.128 (1997)

NOTE. I have been unable to separate material on whether the involucre bracts are ‘shaped like a cross’ (with one erect and two spreading, as *intricata*) or ‘more flaccid’ (as in *brevifolia*); this is not easy in dried and arranged herbarium material! The colour differences between these two also seem more gradual than abrupt: ‘paler’ greenish or straw-coloured, or golden yellow. I have therefore merged these two for this Flora treatment, but a final decision of course needs to be made on a world-wide basis.

The protologue of *K. brevifolia* does not specify a colour of the inflorescence, apart from “fiores grysei cum margine utroque viridissimus” (grey with green margins) which does not really help; subsp. *brevifolia* and *intricata* were distinguished on, respectively, greenish to straw-coloured and golden yellow inflorescences.

var. **lurida** (Kük.) *Beentje*, **comb. nov.** Type: Kenya, Mt Kenya, Coles Mill & Forest station, *Fries & Fries* 1074 (UPS, syn.) & 367 (B!, UPS, syn.); Tanzania, Mt Kilimanjaro, between the lakes, 1400 m, *Uhlig* 696 (B, syn.)

Inflorescence a dark golden brown to blackish small globose or ovoid head 6–10 × 6–8 mm; glumes dark golden brown to grey-green or blackish, ovate, 2–3.7 mm long.

FIG. 47. KYLLINGA BREVIFOLIA — 1, habit, × 1; 2, spikelet, × 8; 3, spikelet dissected, × 8; 4, spikelet, diagrammatic. KYLLINGA SQUAMULATA — 5, habit, × 1; 6, inflorescence, × 1; 7, spikelet, × 6. KYLLINGA EXIMIA — 8, habit, × 1. 9, inflorescence, × 1; 10, spikelet, × 4. 1–4 from *Griffith* 6250; 5–7 from *Schimper* 89; 8–10 from *James & Thripp* s.n. Reproduced from C.B. Clarke (1909) Illustrations of Cyperaceae. Drawn by N.E. Brown.

KENYA. Uasin Gishu District: 53 km on Eldoret–Ainabkoi road, Nov. 2000, *Smith, Beentje & Muasya* 218!; Naivasha District: South Kinangop, June 1961, *R. Polhill* 426!; Masai District: Nasampolai Valley, May 1971, *Greenway & Kanuri* 1486!;

TANZANIA. Arusha District: Mt Meru, Nasolo to Tulusia Hill, Apr. 1968, *Greenway & Kanuri* 13297!; Moshi District: Kilimanjaro, road between Lemosho and Shira Plateau, Jan. 1970, *Lye & Katende* 4864!; Mbeya District: Elton Plateau, Jan. 1961, *Richards* 14158!

DISTR. **K** 3, 5, 6; **T** 2, 3, 7; not known elsewhere

HAB. Montane grassland, forest clearing, streamsides and seasonally swampy sites; (1600–)1900–2900 m

CONSERVATION NOTES. Several collections from protected areas; least concern (LC)

SYN. *K. erecta* Schumach. var. *lurida* Kük. in N.B.G.B. 9: 300 (1925)

Cyperus erectus (Schum.) Mattf. & Kük. var. *luridus* (Kük.) Kük. in E.P. 4, 20 (101): 590 (1936)

Kyllinga aurata Nees var. *lurida* (Kük.) Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 21 (1971)

K. colorata (L.) Druce var. *lurida* (Kük.) Lye in Bot. Notis. 125: 218 (1972)

Cyperus brevifolius (Rottb.) Hassk. subsp. *luridus* (Kük.) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 237 (1983)

NOTE. I have made this into a variety, as the differences with the other taxa within *brevifolia* are based on a single character, and the distribution areas overlap.

2. **Kyllinga pulchella** *Kunth* in Enum. Pl. 2: 137 (1837); C.B. Clarke in F.T.A. 8: 284 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 23 (1971). Type: South Africa, Cape of Good Hope, *Drège* 7384 (B!, holo.)

Short-lived perennial, 12–50 cm tall, with long rhizome or long slender stolons, easily broken off during collecting; culms tufted, 10–50 cm long, 0.6–1.4 mm wide, 3-angled to almost terete, glabrous. Leaves up to 30 cm long; leaf sheath pale red-brown, 2–4.5 cm long; leaf blade linear, slightly channelled, 7–30 cm long, 1.6–3 mm wide, scabrid near the very apex only. Involucral bracts leaf-like, usually reflexed, 2–5, lowermost 3–15 cm long, to 3.5 mm wide. Inflorescence dark red, of a cylindrical central spike and 1–3 smaller lateral ones, rarely a single one, to 10 mm long and 5–6 mm across and sometimes 1–2 stalked for 15 mm; spikelets many, oblong-ovoid, 2–3 mm long, 1–1.3 mm wide, 2–3-flowered, all bisexual; glumes dark brown to red-brown or blackish, with green keel, ovate, 2–3 mm long, glabrous or with a few spines, apex mucronate and slightly recurved. Stamens yellow, 3; filaments to 3 mm long; anthers 1.3–1.4 mm long. Nutlet pale (immature?), ellipsoid and flattened, 0.8 mm long, 0.4–0.5 mm wide, minutely papillose.

KENYA. West Suk/Elgeyo District: 0.5 km E of Cherangani village, Nov. 2000, *Smith, Beentje & Muasya* 190!; Fort Hall District: Thika Road House, Apr. 1951, *Verdcourt* 493!; Masai District: south end Ngong Hills, Oct. 1964, *Gillett* 16296!

TANZANIA. Mbulu District: Mbulumbul block AG, June 1944, *Greenway* 6935!; Lushoto District: 5 km NE of Lushoto on Mkuzi road, Apr. 1953, *Drummond & Hemsley* 2136!; Kondoa District: 24 km N of Kondoa on Great North Road, Jan. 1962, *Polhill & Paulo* 1135!

DISTR. **K** 2–4, 6; **T** 1–3, 5; Eritrea, Ethiopia, South Africa

HAB. Seasonally swampy grassland, seepage zone on rock, black clay soils, streamsides; 1350–3400 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus teneristolon* Mattf. & Kük. in E.P. 4, 20 (101): 574 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 233, fig. 470 (1983), *nomen novum* for *K. pulchella* [new name to stop homonym with *Cyperus pulchellus* R. Br.]

C. transitorius Kük. in E.P. 4, 20 (101): 35, 574 (1935). Type: Tanzania, Dodoma District: Saranda, *Peter* 33396 & 33587 (B, syn., website!)

Kyllinga anomala Kük. in E.P. 4, 20 (101): 35 (1935). Type as for *C. transitorius*

NOTE. *C. transitorius* was distinct, according to the protologue, in the few stalked spikes, otherwise like *teneristolon/pulchellus*; several ‘mixed’ collections exist, e.g. *Verdcourt* 493 and *Bogdan* 3023b, both by experienced collectors; I think this proves the condition can vary within the population.

Lye in Fl. Eth. 6: 472, fig. 212.125 (1997) uses the names *Cyperus bracheilema* (Steud.) Mattf. & Kük. [*Kyllinga bracheilema* Steud. (1842)] for this taxon. The type for this taxon is from Ethiopia, and the name is more recent than *K. pulchella*.

3. ***Kyllinga nervosa*** Steud. in Flora 25: 597 (1842); C.B. Clarke in F.T.A. 8: 279 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 20 (1971). Type: Ethiopia, Wadi Schoata, *Schimper* 1375 (B, holo.; not found)

Perennial, tufted, with a short rhizome and swollen stem base, often surrounded by fibres from desintegrated leaf bases; stem base aromatic (smelling of eucalyptus, or ginger); culms tufted, 7–46 cm long, 0.8–1.5 mm wide, trigonous, glabrous. Leaves up to 35 cm long; leaf sheath pale brown, more reddish near base, 1–6 cm long, the lowermost sometimes leafless, 1–6 cm long; leaf blade linear, flat or grooved, 7–35 cm long, 1–2.5 mm wide, scabrid near apex. Involucral bracts leaf-like, spreading or recurved, 1–3(–4), lowermost 3–11 cm long. Inflorescence capitate, a single yellowgreen turning dark brown to black conical to cylindrical spike 5–10(–12) × 5–8 mm (rarely with a small subsidiary spike); spikelets many, 2.2–3.5 mm long, 0.9–1 mm wide, 2–3-flowered; glumes with yellow margins, green keel, blackish tips, ovate, 1.8–3.2 mm long, acuminate to awned, with very distinct veins. Stamens 3; filaments 1.2–2.5 mm long; anthers 1.2 mm long. Nutlet violet-black, 1–1.2 mm long, 0.6 mm wide, minutely papillose.

UGANDA. Teso District: 0.5 km N of Bukedea, May 1970, *Lye & Katende* 5364! & Kachumbala rock, Oct. 1996, *Lye & Katende* 22004!; Mbale District: Chesoweri near Nyalit R., July 1971, *Lye & Katende* 6424!

KENYA. Embu District: Kiangombe northern slopes, Nov. 2000, *Smith, Beentje & Muasya* 266!; Nairobi, State House Avenue, Apr. 1971, *Kabuye* 347!; Masai District: Chyulu Hills, Ol Doinyo Wuas lodge, May 1997, *Luke & Luke* 4626!

TANZANIA. Musoma District: Kampi ya Pofu, Feb. 1968, *Greenway & Kanuri* 13350!; Masai District: 40 km on Arusha–Nairobi road, Mar. 1966, *Leippert* 6403!; Njombe District: 3 km W of Ikingula near Makumbako, Mar. 1975, *Hooper & Townsend* 878!

DISTR. U 3; K 3, 4, 6; T 1, 2, 5–7; Eritrea, Ethiopia, Somalia

HAB. Shallow soil over rock, seepage zones, seasonally swampy grassland, especially on black cotton soil; 750–2150(–2950) m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus costatus* Mattf. & Kük. in E.P. 4, 20 (101): 575 (1936); Lye in Fl. Eth. 6: 473, fig. 212.127 (1997)

C. oblongus (C.B. Clarke) Kük. subsp. *nervosus* (Steud.) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 & main work: 235 (1983)

USES. Roots eaten by herd boys.

4. ***Kyllinga peteri*** (Kük.) Lye in Nordic Journ. Bot. 1: 746 (1981 publ. 1982). Type: Tanzania, *Peter* 33394a!, 34101!, 34142!, 34236!, 34444!, 34723! (with label 'after this sheet the drawings in F.D.-O.A. have been made'), 34868!, 45845! (B, syn.); lectotype: Nhulu, E of Malongwe towards Tura, km 723, *Peter* 34723 (chosen here)

Perennial, fairly robust, up to 62 cm tall, with a short thick rhizome; culms several closely together on short rhizome, 20–60 cm long, 1.3–2 mm wide, trigonous, glabrous. Leaves up to 25 cm long; leaf sheath grey to brown, 1–6 cm long, many at base but only slightly splitting up into fibres; leaf blade linear, flat or folded, 5–25 cm long, 2–4 mm wide, scabrid on margin. Involucral bracts leaf-like, spreading, 3–4(–12), lowermost 6–12 cm long. Inflorescence a cylindrical spike 1–1.5 cm long, 6–10 mm wide; spikelets ovoid, 3–5.5 mm long, 1.5–2 mm wide, 2–3-flowered but perfecting 1–2 nutlets only; glumes pale reddish-brown but somewhat blackish at apex, ovate, 3–4.5 mm long, keel slightly excurrent with a few teeth [not visible in plate!], 3 veins on either side, apex acuminate. Stamens ? 2. Nutlet almost black, ellipsoid, flattened, ± 2 mm long, ± 0.8 mm wide, minutely papillose.

TANZANIA. Tabora & Dodoma District: Ngulu, E of Goweko, Km 775.5, Jan. 1926, *Peter* 34868!
& Lake Tschaya margins, Jan. 1926, *Peter* 34142! & near Saranda, Dec. 1925, *Peter* 33394a!

DISTR. T 4, 5; Zambia

HAB. Swamps and lake margins; 1100–1250 m

CONSERVATION NOTES. Not enough data to make an assessment; all the collections from Tanzania are more than 70 years old

SYN. *Cyperus petersi* Kük. in E.P. 4, 20 (101): 575 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 235, fig. 474 (1983)

5. ***Kyllinga polyphylla*** Kunth in Enum. Pl. 2: 134 (1837); C.B. Clarke in F.T.A. 8: 276 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 22 (1971). Type: Mauritius, *du Petit Thouars* s.n. in Willd. Herb. 1441 (B-W, holo.; website!)

Perennial, robust, up to 92 cm tall, with a creeping rhizome to 4 mm in diameter, covered in pinkish red scales, fairly thick; culms green, densely set along the rhizome, (4–)25–90 cm long, 1–3.5 mm wide, triangular to almost winged, to 4 mm across, glabrous, with swollen base covered with brownish or purplish membranous sheaths. Leaves up to 20 cm long; leaf sheath reddish brown to purplish, 2–10 cm long, the lowermost without blades, one upper one with blade; leaf blade linear, flat, 2–20 cm long, 3–5 mm wide, scabrid on margins and midrib, apex acute. Involucral bracts leaf-like, spreading, (4–)5–9, lowermost 6–20 cm long, 3–7 mm wide. Inflorescence capitate, a green to yellow-brown irregular hemispheric to ellipsoid head to 8–15 × 4–9 mm with a central spike and usually several smaller lateral spikes; spikelets many, olive green in flower, turning yellow-brown in fruit, narrowly ovoid, 2.5–4 mm long, 0.8–1 mm wide, 1–2-flowered, when 2-flowered the upper one male or bisexual; glumes yellowish, golden yellow or straw-coloured, narrowly ovate, 2–3.5 mm long, keel green, frequently with dark brown dots or streaks, sometimes with 3–4 teeth, 2–5 veins on either side, apex shortly acuminate and slightly recurved. Stamens 3; filaments ± 1.5 mm long; anthers 1.4–1.6 mm long, yellow. Style white. Nutlet dark red-brown to blackish, flattened ellipsoid, 1–1.5 mm long, 0.6–0.9 mm wide, minutely papillose.

var. ***polyphylla***

Culms densely set along the rhizome, glabrous. Head hemispheric to globose, 9–10 × 6–9 mm; glumes rarely with teeth.

UGANDA. Teso District: Soroti [Seroti], Mar. 1969, *Haines* 281!

KENYA. N Kavirondo District: Kakamega Forest near Lugushida R. bridge, Mar. 1977, *Hooper &*

Townsend 1474!; Kilifi District: Mwatsuma R. E of Mariakani, June 1971, *Lye & Katende* 6274!;

Kwale District: Shimba Hills, Longo Mwangandi, Mar. 1968, *Magogo & Glover* 353!

TANZANIA. Tanga District: Maramba Ward, Hai street, Oct. 1999, *Kindeketa* 160!; Mpanda District:

Ngolima R., Kapapa, Nov. 1972, *Mbano* 125!; Uzaramo District: Mzinga R. 13 km S of Dar es

Salaam on Kilwa road, Mar. 1971, *Wingfield* 1245!; Zanzibar, Mkokotoni, Apr. 1960, *Faulkner* 2527!

DISTR. U 3; K 5, 7; T 3, 4, 6, 8; Z; P; widespread in West, central and northeast Africa, down into Angola and South Africa; Mauritius

HAB. Moist sites in grassland, river- lake- and stream-sides, swamp edges; 0–1250(–1500?) m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga aromatica* Ridl. in Trans. Linn. Soc. London, Bot. 2: 146 (1884). Type: Angola, Pungo Andongo, *Welwitsch* 6801 (BM, holo.)

Cyperus aromaticus (Ridl.) Mattf. & Kük. in E.P. 4, 20 (101): 581 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 239, fig. 480 (1983); Lye in *Fl. Somalia* 4: 142 (1995)

C. aromaticus (Ridl.) Mattf. & Kük. var. *repens* Kük. in E.P. 4, 20 (101): 583 (1936). Type: Tanzania, ?Lushoto District: between Kalekwa and Gumbo, *Peter* 18031 (B!, holo.; B!, iso.)

C. aromaticus (Ridl.) Mattf. & Kük. var. *brachyrhizomatosus* Kük. in E.P. 4, 20 (101): 583 (1936). Type: Tanzania, Morogoro District: Uluguru Mts, Fisigo valley, *von Brehmer* 450, 453!, 454!, 455 (B, syn.)

Kyllinga erecta K. Schum. var. *polyphylla* (Kunth) S.S. Hooper in K.B. 26: 580 (1972)

var. **elatior** (Kunth) Kük. in N.B.G.B. 9: 300 (1925), as *Kyllingia*. Type: South Africa, between Cape and Durban [Port Natal], *Drège* 4384 (B!, holo.)

Culms spaced along the rhizome, scabrid or glabrous. Head ellipsoid, central spike 8–15 mm long, 4–8 mm wide; glumes often with teeth.

UGANDA. Kigezi District: Kachwekano Farm, May 1949, *Purseglove* 2791!; Mubende District: Kivulumba, Oct. 1970, *Katende* 634!; Mengo District: Kampala, Makerere Hill, Jan. 1966, *Haines* 4053!

KENYA. South Nyeri District: Sagana R., Githi, Dec. 1963, *Kibui* 21!; Nairobi, Kabete, Apr. 1947, *Bogdan* 522!; Machakos District: Machakos, Maruba R., Oct. 1947, *Bogdan* 1263!

TANZANIA. Bukoba District: Minziro Forest reserve, Muhangu, May 2001, *Festo* 1501!; Morogoro District: Uluguru Mts, Mgeta R. above Bunduki, Jan. 1975, *Wingfield* 2994!; Rungwe District: 2 km beyond Kiwira on Mbeya–Tukuyu road, Mar. 1975, *Hooper & Townsend* 856!

DISTR. U 2, 4; K 4, 5; T 1–4, 6, 7; Cameroon, Ethiopia, Congo-Kinshasa, Rwanda, Zimbabwe, South Africa

HAB. Stream-sides, moist grassland, swampy sites, forest margin; (0–)950–1950(–2400) m
CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllingia elatior* Kunth. in Enum. Pl. 2: 135 (1837); C.B. Clarke in F.T.A. 8: 275 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 21 (1971)

Cyperus aromaticus (Ridl.) Mattf. & Kük. var. *elatior* (Kunth) Kük. in E.P. 4, 20 (101): 582 (1936)

Kyllingia pinguis C.B. Clarke in E.J. 38: 131 (1906). Types: Tanzania, Kwai, *Stern* 235 (B!, syn.); Uganda, Entebbe, *E. Brown* 26 (K!, syn.); Nairobi, *Linton* 7 (K!, syn.)

Cyperus pinguis (C.B. Clarke) Mattf. & Kük. in E.P. 4, 20 (101): 583 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 239, fig. 481 (1983); Lye in Fl. Eth. 6: 475, fig. 212.130 (1997)

NOTE. The type seems to differ from that of *polyphylla* mainly in the slightly scabrid (not glabrous) culm; and in the more distant culms and a more ellipsoid head; otherwise, the two are pretty similar. In most of the material with ellipsoid heads the culms are glabrous – unlike the type! I here follow Kükenthal in varietal status.

6. **Kyllingia pauciflora** Ridl. in Trans. Linn. Soc. London, Bot. 2nd ser., 2: 147 (1884); C.B. Clarke in F.T.A. 8: 273 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 21 (1971). Type: Angola, between Ferrao da Salo and Catumba, *Welwitsch* 6811 (BM, holo.)

Perennial, fairly robust, up to 40 cm tall, with an erect rhizome; culms densely clustered, 10–40 cm long, 0.8–1.2 mm wide, triquetrous, glabrous, when producing viviparous spikelets often decumbent. Leaves up to 15 cm long; leaf sheath purplish to reddish-brown, 1–12 cm long; leaf blade linear, flat?, 8–15 cm long, 1–2 mm wide, scabrid on margin and primary vein. Involucral bracts leaf-like, erect to spreading, 3–4, lowermost 4–10 cm long. Inflorescence a solitary spike \pm 5 mm across, of 6–15 spikelets; spikelets narrowly ovoid, 4–7 mm long, 1–1.5 mm wide, usually 2-flowered but often with leafy young plants arising from spikelets; glumes golden to straw-coloured, ovate, 4–7 mm long, keel green, excurrent, apex mucronate. Stamens 3; filaments to 3 mm long; anthers 2.2–2.5 mm long. Nutlet yellowish-brown, ovoid, flattened, only seen very immature.

TANZANIA. Ufipa District: Tatanda Mission, June 1980, *Hooper & Townsend* 1908!; Songea District: 1.5 km E of Songea, Feb. 1956, *Milne-Redhead & Taylor* 8601!

DISTR. T 4, 8; Angola, Malawi, Zimbabwe, South Africa

HAB. Swampy stream-side; 1050–1900 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus ridleyi* Mattf. & Kük. in E.P. 4, 20 (101): 599 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 237, fig. 476 (1983); type as for *K. pauciflora*, *nomen novum* as a *C. pauciflora* existed already

NOTE. Closely related to *K. brevifolia* but distinct in viviparous spikelets.

7. *Kyllinga ugogensis* (Peter & Kük.) Lye in Bot. Notis. 125: 218 (1972). Type: Tanzania, Dodoma District: Ugogo, Kitalalo Steppe, Peter 33267a (B!, K!, syn.) & 33327 (B!, syn.)

Perennial, small, up to 20 cm tall, with a bulbous culm-base and probably a creeping rhizome or stolon; culms tufted, 2–18 cm long, 0.4–0.6 mm wide, triangular, glabrous. Leaves up to 12 cm long; leaf sheath brownish, 0.8–1.5 cm long; leaf blade linear, flat or folded, 4–12 cm long, 0.8–1 mm wide, scabridulous on margins near apex. Involucral bracts 1–3, leaf-like, the lowermost longest and ± erect, the others (if present) spreading or reflexed, lowermost (1.3–)1.8–6 cm long. Inflorescence capitate, a single ± globose spike, 4.5–7 mm across; spikelets ovoid, 2–2.6 mm long, 0.9–1.1 mm wide, producing 2–3 nutlets; glumes golden with green keel, ovoid, 2–2.6 mm long, apex mucronate and slightly recurved. Stamens 3; filaments to 3 mm long; anthers 1–1.2 mm long. Nutlet pale brown (immature?), ellipsoid and flattened, ± 1 mm long, 0.4 mm wide, minutely papillose.

TANZANIA. Mbulu District: Lake Manyara S of Chem Chem river, no date, *Greenway & Kirrika* 11076!; Singida District: Lake Singida, Apr. 1962, *Polhill & Paulo* 2202!; Chunya District: Mbangala, Dec. 1963, *Richards* 18675!

DISTR. T 2, 5, 7; not known elsewhere

HAB. In boggy soil or wet sandy hollows on lake shores, or on thin soil over rock; 750–1550 m

CONSERVATION NOTES. Only known from the four cited specimens; data deficient (DD), as no data are known about threats

SYN. *Cyperus ugogensis* Peter & Kük. in E.P. 4, 20 (101): 572 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 237, fig. 477 (1983)

Kyllinga ferruginea Peter in E.P. 4, 20 (101): 572 (1936), *nom. nudum*

NOTE. Rather similar to *K. brevifolia*, but different in culm base and even more slender habit.

8. *Kyllinga chrysantha* K. Schum. in P.O.A. C: 123 (1895); C.B. Clarke in F.T.A. 8: 284 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 23 (1971). Type: Tanzania, Bukoba District, Ihangiro in Karagwe, *Stuhlmann* 901 (B!, K!, syn.) & 3227 (B, syn.)

Perennial, up to 32 cm tall, with a creeping rhizome (frequently hidden by masses of roots and fibres from old leaf-bases), stolons very rare and brownish when present; culms densely tufted, the base often swollen and bulb-like, 5–30 cm long, 0.5–1.5 mm wide, trigonous, glabrous. Leaves up to 22(–25) cm long; leaf sheath pale brown, translucent, 1.3–6 cm long, a few of the lower sheaths without blades, old sheaths frequently breaking up into fibres, covering the base of the culm; leaf blade linear, flat, canaliculate or incurved, 5–22(–35) cm long, 1.6–2(–3) mm wide, scabrid on main and primary vein, especially above. Involucral bracts leaf-like, strongly reflexed, 3–4, lowermost 3–13 cm long. Inflorescence capitate, an irregular yellow head, pleasantly scented, 5–10 mm long, 5–13 mm wide, spikes 1–4, usually 1 central rounded spike and 2 well-developed lateral spikes; spikelets narrowly ovoid, 3–4 mm long, 0.5–1 mm wide, 2(–3)-flowered, with short prophyll at base, 2–3 fertile glumes and one short empty terminal glume; glumes bright yellow, lanceolate, 2.5–4 mm long, keel glabrous or with spine-like hairs, with 2–5 lateral veins on either side, acute or obtuse. Stamens 3; filaments to 2.5–3 mm long; anthers 1.2–1.7 mm long. Nutlet dark brownish-black, ellipsoid to slightly obovoid, flattened, 1.5–1.7 mm long, 0.5–0.6 mm wide, minutely papillose.

UGANDA. Busoga District: Dagusi Island, June 1953, *G.H.S. Wood* 771!; Mengo District: Lake Victoria, Kaazi, Nov. 1969, *Lye* 4688!; Masaka District: 1.5 km on Katera–Kiebbe road, Oct. 1953, *Drummond & Hemsley* 4509!

KENYA. Meru District: Mughwango swamp, May 1972, *Ament & Magogo* 325!; Kitui District: Endau, Nov. 1979, *Gatheri, Mungai & Kamuri* 79/89!

TANZANIA. Bukoba District: Minziro Forest Reserve, Muhango, May 2001, *Festo* 1513!; Mwanza District: between Geita and Issaka camp, Apr. 1937, *B.D. Burt* 6503! & Dunachari Island, Jan. 1962, *Carmichael* 852!



FIG. 48. *KYLLINGA ERECTA* — 1, habit, $\times \frac{2}{3}$; 2, flower, $\times 10$. From Flora of West Tropical Africa 3, t. 408. Drawn by W. Trevithick.

DISTR. U 1, 3, 4; K 4; T 1; Rwanda, Burundi

HAB. Lake or streamside grassland, grassland on hardpan or on thin soil overlying rock, seasonally swampy grassland; 600–1900 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus aureostramineus* Mattf. & Kük. in E.P. 4, 20 (101): 573 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 229, fig. 461 (1983). Type as for *K. chrysantha* as this was a *nomen novum* – there already was a *Cyperus chrysanthus* Boeck.

NOTE. Distinct in its bright yellow heads; only *Cyperus boreochrysocephalus* is similar in colour, as are some *Ascolepis* species and *Cyperus chrysocephalus*.

Cyperus aureostramineus Mattf. & Kük. var. *decolorans* Kük. is now a synonym of *K. comosipes*.

9. **Kyllinga flava** C.B. Clarke in F.T.A. 8: 281 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 20 (1971). Type: Kenya, Teita District: Mbuyuni, *Scott Elliot* 6233 (K, holo., out on loan; B!, iso.)

Perennial; rhizome oblique, short, stout, covered by torn sheaths; culms 2.5–6.5 cm long, not bulbous at base. Leaves to 15 cm long, 3 mm wide. Involucral bracts 3, spreading, leaf-like, the lower 6.5 cm long. Inflorescence of a single cylindrical yellow spike, 12+ mm long, 5 mm wide, dense; spikelets lanceolate, 2.5 mm long, each perfecting 1 nutlet; glumes golden yellow, acuminate, with wingless keel, smooth, excurrent in a longish mucro, 3–4-veined on each side.

KENYA. Teita District: Mbuyuni, 1893?, *Scott Elliot* 6233!

DISTR. K 7; known only from the type

HAB. no data

CONSERVATION NOTES. Data deficient (DD) – possibly extinct but needs looking for

SYN. *Kyllinga nervosa* Steud. var. *flava* (C.B. Clarke) Lye in Bot. Notis. 125: 218 (1972)

K. nervosa Steud. subsp. *flava* (C.B. Clarke) Lye in Nordic Journ. Bot. 1: 747 (1981 publ. 1982)

Cyperus oblongus (C.B. Clarke) Kük. subsp. *flavus* (C.B. Clarke) Lye in Haines & Lye, Sedges & Rushes E. Afr.: 234 (1983) & App. 3: 2 (1983)

NOTE. Glume smooth [though Haines & Lye say frequently spiny-ciliate!].

10. **Kyllinga erecta** K. Schum. in Beskr. Guin. Pl.: 42 (1827); C.B. Clarke in F.T.A. 8: 274 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 22 (1971). Type: Guinea, *Thonning* s.n. (C, holo.)

Perennial with creeping rhizome 2–5 mm thick; culms single but densely set in a single row along the rhizome, the bases swollen, 12–45(–70) cm long, 0.8–2 mm wide, triangular, glabrous. Leaves up to 20 cm long; leaf sheath purplish red, the basal ones without leaves, 0.5–9 cm long; leaf blade (rarely completely absent) linear, flat or channeled, 2–20 cm long, 2–4 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 2–7(–11) cm long. Inflorescence a solitary ovoid or subglobose head 5–12 × 5–8 mm; spikelets many, narrowly ovoid, 2.5–3.5 mm long, 0.8–1 mm wide, 1–2-flowered; glumes golden yellow with green keel, 2–3.5 mm long, keel, apex acuminate and somewhat recurved, 3–5 veins on each side. Stamens ?3; filaments to 1.8 mm long; anthers 1–1.2 mm long. Nutlet dark grey to dark brown, flattened ellipsoid, 1.1–1.4 mm long, 0.6–0.7 mm wide, minutely papillose. Fig. 48, p. 321.

UGANDA. no certain ones; possibly Mengo District: Entebbe Ferry, Dec. 1955, *Langdale-Brown* 1634! (lacks basal parts); Haines & Lye cite Teso District: Soroti, *Haines* 4281

KENYA. Embu District: Kindaruma Dam, Dec. 2000, *Smith, Beentje & Muasya* 3061; N Kavirondo District: Kakamega Forest, near Forest station, Oct. 1981, *Gilbert & Mesfin* 6636!; Lamu District: Bada water pan 3 km inland from Kiunga, Apr. 1980, *Gilbert & Kuchar* 5896!

TANZANIA. Lushoto District: Korogwe, Apr. 1970, *Faulkner* 4353!; Morogoro District: Nguru Mts 5 km SSE Maskati Mission, Feb. 1991, *Manktelow, Pocs & Swenson* 91/362!; ?Rungwe District: Mbeya–Tukuyu road, 5500', Feb. 1970, *Nicholson* 151!

DISTR. U 3, 4; K 4, 5, 7; T 3, 5–8; widespread in tropical Africa

HAB. Wet depressions, (seasonal) swamps, lake/pool/dam fringes; 0–1900 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga erecta* Schumach. var. *intercedens* Kük. in F.R. 12: 91 (1913), as *Kyllingia*. Type: Malawi, Mt Zomba, 1200–1800 m, *Whyte* s.n. (ubi.?)

Cyperus erectus (Schumach.) Mattf. & Kük. subsp. *erectus*; Mattf. & Kük. in E.P. 4, 20 (101): 588 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 238, fig. 478 (1983); Lye in *Fl. Eth.* 6: 474, fig. 212.129 (1997)

C. erectus (Schumach.) Mattf. & Kük. var. *intercedens* Kük. in E.P. 4, 20 (101): 589 (1936)

Kyllinga erecta Schumach. subsp. *albescens* Lye in *Nordic Journ. Bot.* 1: 745 (1982). Type: Congo-Kinshasa, Popokaba territory, *Pauwels* 3001 (BR, hol.)

Cyperus erectus (Schumach.) Mattf. & Kük. subsp. *albescens* (Lye) Lye in Haines & Lye, *Sedges & Rushes E. Afr. App.* 3: 2 & main work: 238, fig. 479 (1983)

NOTE. Lye separated his subsp. *albescens* on “fewer and shorter leafblades and involucre bracts as well as whitish glumes and spikelets”. As regards the leaf size there is plenty of variation, none of it discontinuous; for East Africa, I have not seen any white-headed specimens of this species.

11. *Kyllinga melanosperma* Nees in *Wight, Contr. Bot. India*: 91 (1834); C.B. Clarke in *F.T.A.* 8: 277 (1902); Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 22 (1971). Type: India, *Wight* 1850b, 1851, 2880 (?K, syn.–not found)

Perennial with long(ish) creeping branched rhizome 3–5 mm across; culms solitary from each node, but set close to each other, 12–100 cm long, 1.5–3 mm wide, triangular (rarely 6-angular, in var. *hexalata*), glabrous. Leaves few per culm, or one from uppermost sheath, or hardly any blade developed; leaf sheath reddish or purple, 1.5–17 cm long; leaf blade linear, flat, 2–12(–17) cm long, 3–4 mm wide, scabrid on margins and midrib, apex acute. Involucral bracts leaf-like, spreading or reflexed, 3–4, the largest 2 almost equal in size and the third subequal, lowermost 2.5–8(–10) cm long, 2–5 mm wide. Inflorescence a green to golden yellow globose to ovoid head of a single spike 7–12 × 6–10 mm; spikelets many, sessile, narrowly ovoid, 3–4 mm long, 0.7–1.5 mm wide, 2-flowered; glumes green to golden, ovate, 2.6–4 mm long, keel green and rarely with a few scabrid teeth, apex acute to almost spiny. Stamens 3; anthers 1.3–1.4 mm long. Nutlet (apparently few developing – very few specimens with mature seed!) dark, almost black, obovoid and slightly flattened, 1.1–1.3 mm long, 0.5–0.8 mm wide, minutely papillose. Fig. 49, p. 324.

var. *melanosperma*

Leaves mostly well-developed.

UGANDA. West Nile District: Madi, Dec. 1862, *Speke & Grant* 693!; Bunyoro District: Kiryandongo, Mar. 1943, *Purseglove* 1333!; Busoga District: Makoka Plantation E of Kamuli, Apr. 1953, *G.H.S. Wood* 694!

KENYA. Uasin Gishu District: 25 km S of Eldoret on Nakuru road, Oct. 1982, *Gilbert & Mesfin* 6759!; Nairobi, Kabete, May 1947, *Bogdan* 532!; Masai District: 79 km from Narok on Masai Mara road, Mar. 1977, *Hooper & Townsend* 1582!

TANZANIA. Biharamulo District: Lusahunga, Oct. 1960, *Tanner* 5219!; Dodoma District: Bereko, Feb. 1973, *Richards* 28548!; Iringa District: 9 km SW of Iringa on Mbeya road, June 1996, *Faden et al.* 96/111!

DISTR. U 1–3; K 3–6; T 1, 2, 5, 7; Nigeria to Congo-Kinshasa, south to the Cape; Madagascar, India, Sri Lanka, China, Malasia

HAB. Seasonally swampy grassland, streamside grassland, roadside ditches; 950–1900 m

CONSERVATION NOTES. Least concern (LC)



FIG. 49. *KYLLINGA MELANOSPERMA* — 1, habit, $\times \frac{1}{2}$; 2, culm and inflorescence, $\times \frac{2}{3}$; 3, spikelet, $\times 15$; 4, part of spikelet opened out, $\times 20$; 5, achene, $\times 23$. All from *Browning* 240. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

SYN. *Cyperus melanospermus* (Nees) Suringar in *Cyp. Mal. Arch.*: 50, t. 2 fig. 8 (1898); Kük. in *E.P.* 4, 20 (101): 583 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 240 (1983)

C. plurifolius Cherm. in *Bull. Mus. Paris* 25: 209 (1919). Type: Madagascar, 'Betsileo', *Hildebrandt* 4019 (P, holo.)

C. melanospermus (Nees) Suringar var. *plurifolius* (Cherm.) Kük. in *E.P.* 4, 20 (101): 585 (1936)

var. **hexalata** Lye in *Nordic Journ. Bot.* 1: 746 (1981 publ. 1982). Type: Uganda, Mbale District: 2–3 km N of Busoba, *Lye* 3174 (MHU, holo.)

Culms strongly 6-angular, almost winged. Leaves reduced to purplish sheaths, except for the uppermost which has an erect green blade 1–2 cm long; sheath margins prominently corrugated.

UGANDA. Mbale District: 2–3 km N of Busoba, May 1969, *Lye* 3174

DISTR. U 3; not known elsewhere

HAB. Grassland at edge of thicket; ± 1200 m

CONSERVATION NOTES. Data deficient (DD) – needs information about possible threats

SYN. *Cyperus melanospermus* Nees var. *hexalatus* (Lye) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) and main work: 240, fig. 482 (1983)

NOTE. Haines & Lye state this is close to *K. pinguis* (= *K. petersi*, when that taxon is short-leaved) but differs in long dark purple leaf sheaths without much blade, globose heads and 3–4 involucre bracts only, plus denser culms and thicker rhizome.

Kük. in E.P. 4, 20 (101): 586 (1936) has *Cyperus obtusatus* (Presl.) Mattf. & Kük., a taxon from South America, with a variety *africanus* Kük. in E.P. 4, 20 (101): 586 (1936); one of the synonyms Kükenthal mentions is *K. pungens*, occurring in East Africa (according to Kükenthal Tanzania, Ujui, *Taylor* s.n.; Kombe near Usinge, *Peter* 45977 – not found at B) which are probably mis-identifications for what I call *K. melanosperma*, or of *brevifolia*.

I (HB) am unable to find any real differences between *K. erecta* and *K. melanosperma*. Haines and Lye key the taxa out on glume keel teeth in *melanosperma*, but that is a very inconstant character; most specimens do not show these. Their second character is the number of involucre bracts, but there is continuous variation in these, and distinction based on this seems spurious to me. The Kew types have been out on loan for a long time and were, sadly, not available for consultation; but several Indian sheets annotated as *melanosperma* by C.B. Clarke lack the glume teeth. It is possible the two species are synonymous, but without access to the types I am unable to pronounce judgement.

12. ***Kyllinga robinsoniana*** *Mtot.* in *Nordic Journ. Bot.* 9: 637, fig. 1 (1990). Type: Zambia, Chishimba falls, *Robinson* 4357 (K, holo., out on loan; GHS, iso.)

Perennial, up to 20 cm tall, without rhizomes or stolons; culms densely tufted, 6–8 per plant, 6–19 cm long, 1–1.5 mm wide (protologue says cm!), subtriangular, strongly ridged; bases bulbous, surrounded by dense old leaf fibres. Leaves up to 17.5 cm long; leaf sheath light green to whitish, 1.5–3 cm long; leaf blade linear, 6–17.5 cm long, 1.5–2 mm wide. Involucre bracts leaf-like, spreading, usually 3, lowermost 6–9.5 cm long, 1.8–2.5 mm wide. Inflorescence with a central light green to dirty white spike 7–9 × 3.5–5 mm, and 2 smaller lateral spikes; spikelets many, ovoid, 1.2–2.8 mm long, 2-flowered, the upper usually vestigial; glumes ± translucent, ovate, keel densely ciliate, winged, not dentate, apex shortly acuminate; 1–2-veined on each side. Stamens 3; anthers 0.8–1 mm long. Nutlet light brown, ovoid-oblong, 2.5–3.5 mm long, papillose.

KENYA. Turkana District: Karasuk near Chementerit, no date, *Lye* 9181; West Suk District: 7 km S Kongelai, Aug. 1978, *Gilbert & Thulin* 1111

TANZANIA. Mbeya District: Mbeya–Chunya road km 9, *Hoooper, Townsend & Nicholson* 816

DISTR. K 2; T 7; Zambia, Mozambique, Angola

HAB. Pond edge or grassland within *Acacia* bushland; 1400–2000 m

CONSERVATION NOTES. Least concern (LC)

NOTE. Related to *K. pumila* from which it differs in small stature, densely fibrous bases, longer and narrower leaves, densely ciliate glume keels, equal glumes and 3–4 mm long prophyll, densely ciliate on keel.

13. ***Kyllinga pumila*** *Michx.* in *Fl. Bor.-Amer.* 1: 28 (1803); C.B. Clarke in *F.T.A.* 8: 281 (1902); Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 22 (1971). Type: North America, “in Shavanensium regione, ad amnem Scioto”, *Michaux* s.n. (P-Michaux, holo.)

Short-lived plant or annual, 8–47 cm tall, with a slender rootsystem, the whole plant sweet-scented; culms rather densely tufted, 8–45 cm long, 0.7–1.2 mm wide, trigonous, ridged, glabrous. Leaves up to 20 cm long; leaf sheath reddish or purple, more upper

ones green, 1–9 cm long, the lower ones covering the base of the culm and bladeless; leaf blade linear, flat or channeled near midrib, 7–25 cm long, 2–3.2 mm wide, scabrid on midrib and margins. Involucral bracts leaf-like, erect to spreading, 3–5, lowermost 4–14 cm long. Inflorescence an irregular greenish head consisting of a central ovoid spike, 5–8 mm long, 4–6 mm wide, and 1–2(?3) smaller lateral spikes, with spikelets on narrow receptacle; spikelets narrowly ovoid, 2–2.5 mm long, 0.6–0.9 mm wide, 1-flowered; glumes pale brown to transparent, narrowly ovate, 1.5–2.5 mm long, keel green and ± winged, sometimes with many minute reddish dots, with 2–4 veins on either side, keel with a few minute teeth, apex acute. Stamens 1–2; filaments to 1.8 mm long. Nutlet pale to dark brown, ellipsoid, flattened, 1–1.2 mm long, 0.6–0.7 mm wide, minutely papillose; endosperm liquid.

UGANDA. West Nile District: Koboko, June 1938, *Hazel* 596!; Ankole District: 2.5 km SW of Kyibega, Apr. 1970, *Lye & Katende* 5209!; Mengo District: Entebbe, June 1935, *Chandler* 1414! KENYA. Northern Frontier District: 16 km W of Mado Gash, Dec. 1977, *Stannard & Gilbert* 860!; S Nyeri District: CRS Tebere, Feb. 1974, *Robertson* 1993!; N Kavirondo District: Kakamega Forest, near Lugushida R. bridge, Mar. 1977, *Hooper & Townsend* 1484!

TANZANIA. Kilimanjaro, Marangu, Mar. 1971, *Pedersen* 605!; Mpanda District: Kapapa marsh, Sept. 1970, *Richards & Arasululu* 25875!; Songea District: 8 km W of Songea by Wuwawesi R., Feb. 1956, *Milne-Redhead & Taylor* 8663!

DISTR. U 1–4; K 1, 4, 5; T 2–4, 6, 8; pantropical

HAB. Stream-sides, ditches, boggy hollows, sandy river-beds or sandbanks; 250–1500(–2000) m

CONSERVATION NOTES. Least concern (LC) due to wide distribution

SYN. *Cyperus densicaespitosus* Mattf. & Kük. in E.P. 4, 20 (101): 597 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 243, figs. 487, 488 (1983); Lye in *Fl. Eth.* 6: 476, fig. 212.133 (1997). Same type as for *K. pumila* – *nomen novum*, as there was an earlier *C. pumila*

14. ***Kyllinga squamulata*** Vahl in Enum. Pl. 2: 381 (1806); C.B. Clarke in F.T.A. 8: 270 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 19 (1971). Type: Guinea, *Thinning* s.n. [– possibly 547 but that is in different ink] (B, holo.)

Annual or short-lived herb, 6–37 cm tall, with slender root-system, lacking rhizomes or stolons; culms 2–36 cm long, 0.5–0.8 mm wide, trigonous or terete near base, glabrous. Leaves up to 20 cm long; leaf sheath pinkish to red, 1–6 cm long; leaf blade linear, flat or slightly channelled, 4–20 cm long, 1–2.5 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading or reflexed, 3(–4), lowermost (2.5–)6–15 cm long, with conspicuous transparent wings near base. Inflorescence a small sessile irregular head of a single spike; spikelets many, broadly ovoid, 2.5–4 mm long, 1.3–1.8 mm wide, 1-flowered with 2 glumes and an elongated stalk with 2 minute bracts; glumes translucent to whitish or yellow, often with minute reddish dots, with green keel, ovate, 2–2.9 mm long, keel winged with coarse teeth, apex acuminate. Stamens 2. Nutlet dark brown, flattened subcircular, 1.3–1.5 mm long, 1.2–1.3 mm wide, minutely papillose. Fig. 47: 5–7, p. 314.

UGANDA. Mengo District: Entebbe, Aug. 1909, *Fyffe* 12! & Kipayo, Aug. 1915, *Dummer* 868!; Mbale District: Tororo, June 1967, *Haines* 4205!

TANZANIA. Mwanza District: Mwanza, Feb. 1952, *Tanner* 637!; Kigoma District: Gombe National Park, HQ to Linda Valley, May 1992, *Mbago* 1083!; Morogoro District: just above Morogoro Agriculture campus, Apr. 1973, *Wingfield* 2413!

DISTR. U 3, 4; T 1, 4, 6, 8; from Senegal to Ethiopia and Mozambique; Madagascar, India

HAB. Weed of cultivation (maize, sorghum, yam), stream-banks and lake-shores, open grassland; 700–1200 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga metzii* Steud., Syn. Pl. Glumac. 2: 70 (1855). Type: India, *Hohenacker* 199 (B, holo., not found; or P?)

Cyperus metzii (Steud.) Mattf. & Kük. in E.P. 4, 20 (101): 612 (1935); Haines & Lye, *Sedges & Rushes E. Afr.*: 250, figs. 502, 503 (1983); Lye in *Fl. Eth.* 6: 478, fig. 212.135 (1997)

15. **Kyllinga afropumila** Lye in Nordic Journ. Bot. 1: 741 (1981, published 1982). Type: Tanzania, Mbeya District: track from Kawetire to Mbeya Peak, *Wingfield* 754 (DAR, holo.; K, iso., out on loan)

Perennial, rather slender, up to 26 cm tall, with a slightly swollen base, coated with the fibrous remains of old leaf sheaths; culms solitary, 10–25 cm long, 0.5–1 mm wide, trigonous, glabrous. Leaves up to 10 cm long; leaf sheath straw-coloured to brownish; leaf blade linear, 10 cm long, 1–2.5 mm wide, scabrid on margin. Involucral bracts leaf-like, spreading, 2–3, lowermost 4–10 cm long. Inflorescence capitate, 5–8 × 3–4 mm, of a single large central spike, usually with two smaller laterals spikes; spikelets many per head, ellipsoid, 1.5–1.8 mm long, 0.6–0.7 mm wide, 1-flowered; glumes whitish, often with purplish dots, 1–1.5 mm long, keel with 3–4 veins on either side. Stamens not seen. Nutlet almost black, ellipsoid, 1.2–1.4 mm long, ± 0.6 mm wide, minutely papillose.

TANZANIA. Mbeya District: track from Kawetire to Mbeya Peak, *Wingfield* 754

DISTR. T 7; known only from the type

HAB. Short grassland at track-side; ± 2440 m

CONSERVATION NOTES. Data deficient (DD) – needs information on possible threats

SYN. *Cyperus afropumilus* (Lye) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 244, figs. 489, 490 (1983)

NOTE. Similar to *K. pumila* and *K. odorata* var. *cylindrica*, but with even smaller spikelets and glumes; and a fibrous culm-base.

16. **Kyllinga microstyla** C.B. Clarke in K.B. 1895: 229 (1895) & in F.T.A. 8: 281 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 23 (1971). Type: Somalia, *Lort-Phillips* s.n. (K, holo., out on loan)

Perennial tufted sedge (once described as annual by Napper); culms 4.5–18 cm long, 0.3–0.5 mm wide, triangular, glabrous, with a thickened base often covered in dark brown leaf sheath fibres. Leaves up to 10 cm long; leaf sheath pale brown, 0.5–1.5 cm long; leaf blade linear, slightly channelled, 2–10 cm long, 1–1.8 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading, 2–3, lowermost 2–6 cm long. Inflorescence capitate, usually consisting of 3 globose or ovoid spikes, the central one 3–4 mm long, 2.5–3 mm wide; spikelets ovoid, 1–1.3 mm long, 0.6 mm wide, 1-flowered; glumes cream or whitish, ovate, ± 0.8 mm long, keel scabridulous with short spine-like teeth, apex apiculate. Stamens ?3 (protologue says 2–1); filaments 0.7–0.8 mm long; anthers not seen. Style very short, 0.1–0.2 mm long with very short branches. Nutlet pale brown, ellipsoid, flattened, 0.9 mm long, 0.4–0.6 mm wide, minutely papillose.

KENYA. Mandera District: War Gedud, May 1978, *Gilbert & Thulin* 1275!; Kitui District: 53 km on Kitui–Kibwezi road, Mar. 1969, *Napper* 1938!; Kwale District: 1.5 km on Samburu–MacKinnon road, July 1971, *Faden & Evans* 71/628!

DISTR. K 1, 4, 6, 7; Ethiopia, Somalia

HAB. Seasonally wet shallow soil over rock, also in bushland or scattered tree grassland; 300–1000 m

CONSERVATION NOTES. ?Least concern (LC)

SYN. *Cyperus microstylus* (C.B. Clarke) Mattf. & Kük. in E.P. 4, 20 (101): 578 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 230, fig. 463 (1983); Lye in Fl. Eth. 6: 471, fig. 212.122 (1997) & in Fl. Somalia 4: 142, fig. 70 (1995)

NOTE. Similar, say Haines & Lye, to *K. tenuifolia* and *microbulbosa*, but differs in smaller spikelets and glumes; and the inflorescence usually has 3 spikes.

17. *Kyllinga* sp. A

Cyperus inauratus (Nees) Mattf. & Kük. in E.P. 4, 20 (101): 573 (1936) var. *laevicarinatus* Kük. in E.P. 4, 20 (101): 573 (1936). Type: Tanzania, Tabora District: Ngulu area, Malongwe bridge, *Peter* 34597 (B!, holo.)

The main taxon comes from South Africa, *Kyllinga inaurata* Boeck. in *Linnaea* 35: 406 (1868), *Cyperus inauratus* (Boeck.) Mattf. & Kük. in E.P. 4, 20 (101): 573 (1936) = *Kyllinga tetragona* Nees

Possibly annual, to 20 cm high, without visible rhizome or stolons; culms solitary or 2–3 close together, 12–20 cm long, 1.2 mm across, \pm trigonous, glabrous; base slightly widened and surrounded by a few fibrous remnants of older leaf sheaths. Leaves to 20 cm long; sheath pale brown, darker nearer base, to 3.5 cm long; blade linear, 6–20 cm long, 2–2.5 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, reflexed or spreading, lowermost to 10 cm long. Inflorescence capitate, white, a broadly ovoid main spike usually with 2 smaller basal ones; spikelets narrowly ovoid, 3.5–4 mm long, 2-flowered; glumes whitish with green keel, 2–3.2 mm long, keel unwinged, smooth, with 2–3 veins on either side, apex long-acuminate and recurved. Stamens 3, anthers 1.25 mm long. Nutlet not seen.

TANZANIA. Tabora District: Ngulu area, Malongwe bridge, 10 Jan. 1926, *Peter* 34597!

DISTR. T 4; known only from the type

HAB. In ditch; 1180 m

NOTE. On a pencil-written label (in German) it says that the glumes have a serrate keel, but this is not visible in the material – the keel is quite smooth. It is not Kükenthal's handwriting – I think it is Peter's. The same handwriting says '*Kyllingia serrata* n. spec.' (unpublished name) but obviously Kükenthal found the keel to be smooth too, seeing the name he gave it: *laevicarinatus* means smooth-keeled!

This is most likely a *Kyllinga* – even though I have not seen the nutlets. It does not seem to be related to *K. inaurata* and there might be more closely allied taxa just over the border in Congo-Kinshasa. It does not seem to be very close to any of the East African taxa.

18. *Kyllinga microbulbosa* Lye in Bot. Notis. 125: 217 (1972). Type: Tanzania, Masai District, Kaitokoi Pools, *Vesey-FitzGerald* 4926 (EA, holo.)

Perennial, slender, up to 22 cm tall, with a swollen culmbase, brown, \pm 2 mm thick, sometimes with the previous year's base persisting besides the new culm bases and forming colonies; culms loosely to densely tufted, 7–20 cm long, 0.3–0.9 mm wide, triangular, glabrous. Leaves up to 12 cm long, blade linear, flat, –12 cm long, 0.5–2 mm wide, scabrid on margin and primary vein. Involucral bracts leaf-like, spreading to reflexed, 2–3, lowermost 1–6 cm long. Inflorescence a globose white head, sometimes irregular in outline, 3–8 mm across; spikelets 2–3 mm long, 1–3-flowered; glumes white, ovate, 2–2.5 mm long, obtuse. Stamens ?2. Nutlet only seen immature (by Lye), ellipsoid, flattened, 1–1.2 mm long, 0.4–0.5 mm wide.

TANZANIA. Masai District, Kaitokoi Pools, *Vesey-FitzGerald* 4926

DISTR. T 2; known only from the type

HAB. On shallow damp soil on edge of rock basin; 1150 m

CONSERVATION NOTES. DD

SYN. *Cyperus microbulbosus* (Lye) Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & main text 229, fig. 462 (1983)

NOTE. Most closely related to *K. ugogensis*, but differs in white (not golden) head and slightly larger head with more spikelets; and to *K. microstyla*, but differs in solitary spikes and different stem-base.

19. **Kyllinga brunneoalba** Lye in Nordic Journ. Bot. 1: 741 (1981 publ. 1982). Type: Kenya, Northern Frontier District: El Wak, *Gilbert & Thulin* 1244 (UPS, holotype).

Perennial, fairly slender, up to 27 cm tall, with swollen culm-bases surrounded by blackish leaf-sheath fibres; culms crowded, 12–25 cm long, 0.5–0.8 mm wide, trigonous, glabrous. Leaves up to 15 cm long, only from the basal part of the culm; leaf sheath reddish brown, the upper more straw-coloured; leaf blade linear, 5–15 cm long, 1–2 mm wide, scabrid on margin and midrib. Involucral bracts leaf-like, reflexed, 3–4, lowermost 2–10 cm long. Inflorescence capitate, a terminal broadly ovoid to globose brownish white spike, 7–10 mm long, 6–10 mm wide, with one large central spike and usually 1–3 smaller ones at its base; spikelets ovoid, 2.5–3 mm long, \pm 1 mm wide, usually 3-flowered but one perfecting 1 nutlet only; glumes pale reddish-brown below, whitish above, 2–2.5 mm long, keel smooth, with 4 veins on either side. Stamens not seen. Nutlet when immature pale brown, ellipsoid, flattened, \pm 1.2 mm long, 0.5 mm wide.

KENYA. Northern Frontier District: El Wak, *Gilbert & Thulin* 1244

DISTR. K 1; known only from the type

HAB. Shallow soil over limestone rocks; \pm 420 m

CONSERVATION NOTES. Data deficient (DD) – needs information about possible threats

SYN. *Cyperus brunneoalbus* (Lye) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & in main work: 228, fig. 459 (1983)

NOTE. Somewhat similar to *K. tanzaniae* but differs in fibrous culm bases, brownish-white inflorescence, and slightly smaller spikelets and glumes (say Haines & Lye); the rather rounded and hardly keeled smooth glume midrib is characteristic.

20. **Kyllinga tenuifolia** Steud. in Syn. Pl. Glum. 2: 69 (1855). Type: Senegal, no further information

Perennial, tufted, with swollen culm bases which are densely covered with old leaf sheaths; old bases persisting; culms tufted, 5–32 cm long, 0.4–1 mm wide, triangular, glabrous. Leaves up to 20 cm long; leaf sheath brown, more pinkish towards base, 1–8 cm long; leaf blade linear, flat, slightly channeled, often with small longitudinal purple marks, 5–20 cm long, 0.9–3 mm wide, scabrid on primary vein and margins. Involucral bracts leaf-like, spreading, 2–3, lowermost 2.5–10 cm long. Inflorescence capitate, an irregular white to cream head, often triangular, 5–12 mm long, 5–12 mm wide, consisting of one to several (usually 3) spikes; spikelets many per spike, narrowly and sometimes asymmetrically ovoid, 1.5–2.5 mm long, 0.7–0.8 mm wide, 1-flowered, slightly gaping at maturity; glumes whitish or cream to pale yellow with or without brown spots near midrib, ovate, 1–2.2 mm long, keel greenish or cream, with 1–4 veins on either side. Stamens 1–3; filaments 1–2 mm long; anthers 0.8–1 mm long. Nutlet brown, ellipsoid, flattened, 1–1.7 mm long, 0.6–1.1 mm wide, minutely papillose.

var. **tenuifolia**

Culms tufted, 5–32 cm long, 0.7–1 mm wide. Leaf sheath brown, more pinkish towards base, 1–8 cm long; leaf blade 1.5–3 mm wide. Inflorescence 6–12 mm long, 6–12 mm wide; spikelets narrowly ovoid, 2–2.5 mm long, 0.7–0.8 mm wide, slightly gaping at maturity; glumes whitish or cream with or without brown spots near midrib, 1.5–2.2 mm long, keel greenish, with 3–4 veins on either side, apex hooded (upper) to slightly excurrent (lower). Stamens 1–3; filaments 1.5–2 mm long; anthers 0.8–1 mm long. Nutlet 1.5–1.7 mm long, \pm 1.1 mm wide, minutely papillose.

UGANDA. Karamoja District: Kidepo Park, June 1967, *Haines* 4210!

KENYA. Baringo District: 2.6 km from Kabarnet on Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 131!

TANZANIA. Ufipa District: just S of Gorodwe village on Kalambo Falls road, June 1996, *Phillips & Muasya* in *Faden* 96/390!; Iringa District: Mt Imagi, Dec. 1961, *Richards* 15654!; Songea District: 6.5 km W of Songea, Jan. 1956, *Milne-Redhead & Taylor* 8372!

DISTR. U 1; K 3, 7; T 2, 4, 6–8; widespread in the Old World tropics, though not very common anywhere

HAB. Streamsides and seasonally swampy sites; 450–2100 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga triceps* Rottb. in *Descr. Icon.*: 14, t. 4 fig. 6 (1773), *nom. illegit.* (see note); C.B. Clarke in *F.T.A.* 8: 280 (1902); Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 22 (1971). Type: India, *König* s.n. (C, holo.)

Cyperus triceps (Rottb.) Endl. in *Cat. Hort. Vindo.* 1: 94 (1842); Kük. in *E.P.* 4, 20 (101): 578 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 231, fig. 466 (1983); Lye in *Fl. Eth.* 6: 471, fig. 212.123 (1997)

Kyllinga triceps (Rottb.) Endl. var. *obtusiflora* Boeck. in *Linnaea* 35: 414 (1868). Type: Ethiopia, Matamma, *Schweinfurth* 2051 (B, holo., not found)

Cyperus triceps Endl. var. *obtusiflorus* (Boeck.) Kük. in *E.P.* 4, 20 (101): 579 (1936)

NOTE. Kukkonen's (Taxon 44: 626; 1995) proposal to conserve *K. triceps* has not been approved (see Taxon 47: 864; 1998). The 'protologue' cited *Scirpus glomeratus* L. in synonymy, and therefore was both superfluous and illegitimate.

var. *ciliata* (Boeck.) *Beentje comb. nov.* Type: Mozambique, Tete, *Peters* s.n. (B, holo.)

Culms tufted, 5–20 cm long, 0.4–0.8 mm wide. Leaf sheath brown, 1–3 cm long; leaf blade 0.9–2 mm wide. Inflorescence 5–8 mm long, 5–9 mm wide; spikelets asymmetrically ovoid and flattened, 1.5–2 mm long, 0.7–0.9 mm wide; glumes translucent whitish or pale yellow, 1–1.8 mm long, keel ciliate, with 1–2 veins on either side, apex slightly excurrent. Stamens ?2–3; filaments 1–1.2 mm long. Style 0.4–0.5 mm long. Nutlet 1–1.2 mm long, 0.6 mm wide, minutely papillose.

UGANDA. Karamoja District: Kacheliba, May 1940, *A.S. Thomas* 3394! & 50–80 km N of Kacheliba, May 1953, *Padwa* 104!

KENYA. Northern Frontier District: Ol Lolokwe, Mar. 1978, *Gilbert* 5013!; Embu District: 1.5 km on Kiritiri on Kiva road, Dec. 2000, *Smith, Beentje & Muasya* 297!; Tana River District: Tana River National Primate Reserve, Mar. 1990, *Kabuye et al.* TPR 332!

TANZANIA. Pare District: Mkomazi near turnoff to town from Korogwe–Same road, Mar. 1975, *Wingfield* 2909!; Uzaramo District: Kunduchi ruins, Apr. 1972, *Wingfield* 1958!

DISTR. U 1; K 1, 2, 4, 7; T 3, 6; Mauritania, Senegal, Ivory Coast, Burkino Faso, Nigeria, Chad, Cameroon, Ethiopia, Somalia, Angola, Zimbabwe, Namibia

HAB. *Acacia* scrub or grassland, usually along drainage lines or in seasonally wet sites; 0–1400 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga triceps* Rottb. var. *ciliata* Boeck. in *Peters, Reise Mossam.*: 535 (1864)

K. welwitschii Ridl. in *Trans. Linn. Soc. London, Bot.* 2: 147 (1884); Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 23 (1971). Type: Angola, Cuanza Norte near Calemba, *Welwitsch* 6779 (BM, holo.)

Cyperus triceps Rottb. var. *ciliatus* (Boeck.) Kük. in *Engler, E.P.*, IV, 20 (101): 579 (1936) pro parte

C. welwitschii (Ridl.) Lye in *Haines & Lye, Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & main work: 232, fig. 467 (1983); Lye in *Fl. Eth.* 6: 471, fig. 212.124 (1997)

21. ***Kyllinga cartilaginea*** *K. Schum.* in *P.O.A. C.* 123 (1895); Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 20 (1971). Type: Tanzania, Tanga, *Holst* 2082 (B!, holo.; K!, iso.)

Perennial, 15–60 cm tall, with 3–5 mm thick scale-covered stolons or rhizomes; roots smelling aromatic, of cinnamon or cough medicine; culms spaced or dense, 15–50(–73) cm long, 1.2–3 mm wide, triangular, glabrous. Leaves up to 55 cm long; lower leaf sheaths purple to red, 1–12 cm long; leaf blade linear, keeled, 20–55 cm long, 1.5–5 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading, 4–5, lowermost 10–30(–45) cm long. Inflorescence a sessile white globose or ovoid head 8–18 × 9–14 mm; spikelets many and densely packed, narrowly ovoid,

4–5.8 mm long, 1.1–1.3 mm wide, 2-flowered; glumes white or off-white, ovate, 3.3–5 mm long, apex acute (lower) or almost tubular and obtuse (upper), keel with a few to many minute teeth. Stamens 3, anthers yellow, 2–2.5 mm long. Nutlet blackish, slightly obovoid and slightly flattened, 1.8–2 mm long, 0.7–0.8 mm wide, minutely papillose, containing oil (liquid even 50 years after collection).

KENYA. Lamu District: Boni Forest, Mararani, Sept. 1961, *Gillespie* 325!; Kilifi District: Jilore Forest Station, Nov. 1973, *Spjut & Muchai* 3838!; Kwale District: Kaya Puma, July 2000, *Luke, Mbinda & Mududu* 6341!

TANZANIA. Lushoto District: Kitivo–Mlalo, Aug. 1955, *Semsei* 2384!; Bagamoyo District: near Bana Forest Nursery, Aug. 1968, *Ruffo* 85!; Uzaramo District: Dar es Salaam, Oyster Bay, May 1975, *Wingfield* 3142!; Zanzibar, Unguja: Chwaka, Sept. 1959, *Faulkner* 2349!

DISTR. **K** 7; **T** 3, 6; **Z**; Mozambique; Madagascar

HAB. Lowland forest, coconut groves, beach crest, dunes, *Brachystegia* woodland, occasionally more inland in riverine situations; 0–50(–200) m

CONSERVATION NOTES. Least concern (LC) because of a fairly common habitat

SYN. *Cyperus cartilagineus* (K. Schum.) Mattf. & Kük. in E.P. 4, 20 (101): 608 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 246, fig. 493 (1983)

NOTE. The variety *Kyllinga alba* Nees var. *laevissima* Cherm. in Bull. Soc. Bot. Fr. 82: 334 (1935). Type: Congo-Kinshasa, Biega Mts E of lake Kivu, *Humbert* 7594 & 7666b (P, syn.) = *Cyperus cartilagineus* (K. Schum.) Mattf. & Kük. var. *laevissimus* (Cherm.) Kük. in E.P. 4, 20 (101): 609 (1936) comes from a much higher altitude (2400–2700 m) and is distinct in having no teeth on the glumes. I do not think it can belong under *cartilaginea*.

Similarly *Cyperus cartilagineus* (K. Schum.) Mattf. & Kük. var. *serratangulus* Peter & Kük. in E.P. 4, 20 (101): 609 (1936). Type: Tanzania, Dodoma District: Chaya [Tschaya by Tschaya lake], *Peter* 45780 (B, holo.) is from 1240 m. The culm is scabrid near its apex; spikes are 1 cm long; the glumes have purple glands (?) on the keel, and are narrowly winged, but (fide protologue) ‘hardly setulose-ciliate’. I have been unable to find the type at B, and therefore am unable to decide on the proper status of this taxon.

Similarly, *Cyperus cartilagineus* (K. Schum.) Mattf. & Kük. var. *angustatus* Peter & Kük. in E.P. 4, 20 (101): 609 (1936). Types: Tanzania, Ngulu near Malongwe towards Tura, *Peter* 34725 (B!, syn. – someone has stuck a ‘lectotypus’ label on one of the two sheets, the one that says the drawings in F.D.-O.A. were made from this) / 34935a (B!, syn.) / 33985 (B!, syn.) / 34233a (B!, syn.) / 34314a (B!, syn.) / 35492 (B!, syn.) / 35357 (B!, syn.) = *Kyllinga comosipes* (Mattf. & Kük.) Napper var. *angustata* (Peter & Kük.) Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 24 (1971). This also comes from higher altitudes, in this case 1100–1250 m. Its leaves are much narrower (1–2 mm) than in *K. cartilaginea* sensu stricto, there are up to 3 spikes in the inflorescence, and the glumes lack teeth. It feels and looks out of place under *K. cartilaginea*. In the key it would key out near *K. bulbosa* but the leaves are much shorter than in that species. More work is needed on this taxon.

22. *Kyllinga alba* Nees in *Linnaea* 10: 140 (1836); C.B. Clarke in F.T.A. 8: 271 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 20 (1971). Type: South Africa, Zwarte Key R., probably *Drège* s.n. (B? – not found)

Perennial, up to 60 cm tall, with short rhizome and aromatic base; culms spaced or in dense tussocks, 5–60 cm long, 0.7–1.8 mm wide, triangular, glabrous or with a few hairs just below the inflorescence; culm-base swollen and covered by old leaf sheaths. Leaves up to 37 cm long; leaf sheath pale brown to reddish, 1–9(–14) cm long; leaf blade linear, flat or channelled, 5–25(–37) cm long, 2–6 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading or reflexed, (2–)3–4, lowermost 3–10(–15) cm long. Inflorescence a single sessile whitish, yellowgreen or pale yellow globose head (6–)9–18 mm long and 5–18 mm wide; spikelets many per spike, ovoid, 3.3–6.5 mm long, 1–3 mm wide, 2-flowered; glumes white or yellow and often with minute brown spots, narrowly ovate, 3.5–6.5 mm long, keel winged (wing up to 1 mm wide) and with ciliate teeth, apex acuminate. Stamens 3; filaments to 4.7 mm long. Nutlet black, flattened ellipsoid, 1.3–1.8 mm long, 0.6–0.8 mm wide, minutely papillose. Fig. 50, p. 332.

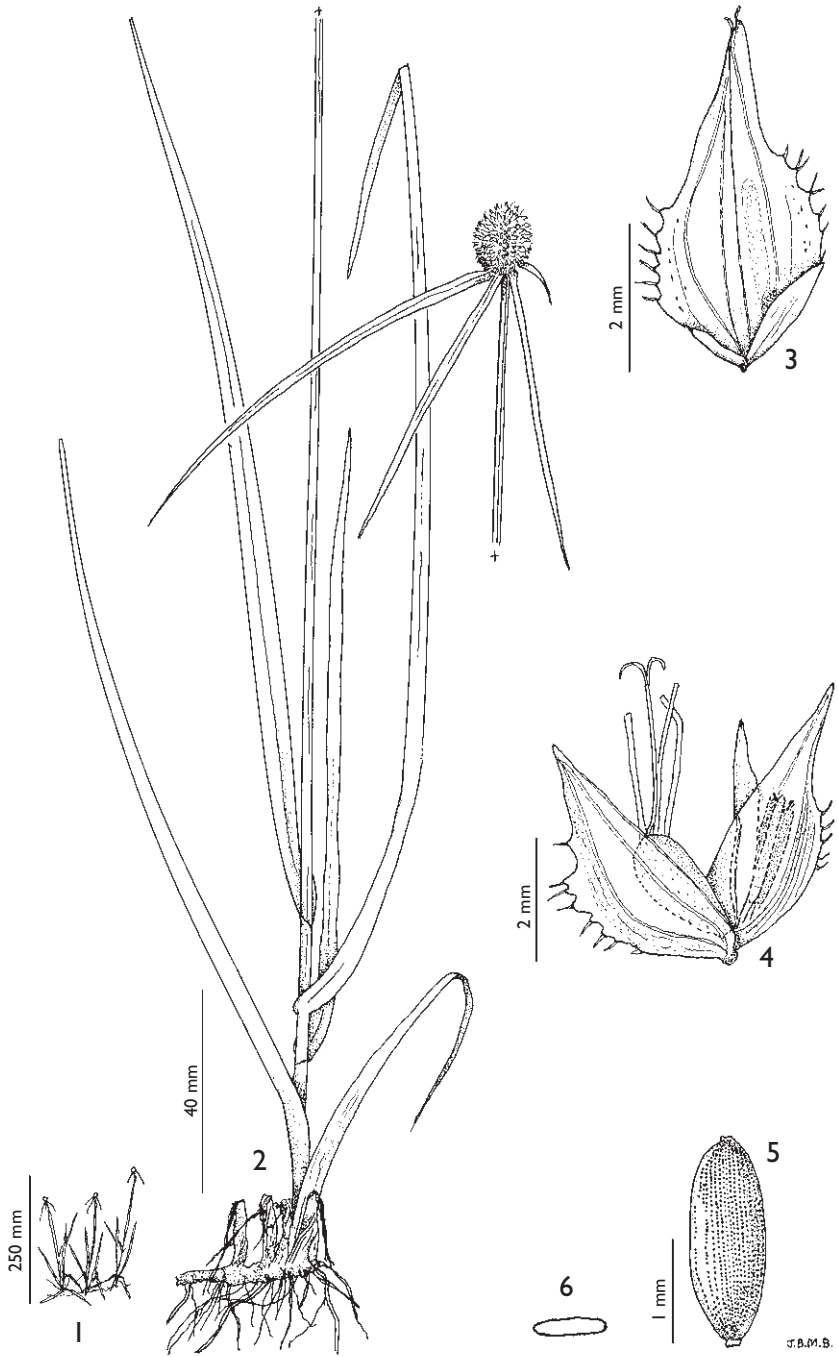


FIG. 50. *KYLLINGA ALBA* — 1, habit; 2, habit; 3, spikelet; 4, spikelet, 2 lower glumes removed, rest opened up; 5-6, nutlet, face and transverse view. From *Robinson 55 & 2972*. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

var. **alba**

Culms spaced or in dense tussocks, 15–60 cm long. Leaves 5–25 cm long, 2–6 mm wide. Involucral bracts 3(–4). Inflorescence a single sessile whitish globose head (6–)9–18 mm long and wide; spikelets 4–6.5 mm long, 2–3 mm wide; glumes white and often with minute brown spots, fading to pale brown, narrowly ovate, 3.5–6.5 mm long. Nutlet black, flattened ellipsoid, 1.5–1.8 mm long, 0.7–0.8 mm wide, minutely papillose.

UGANDA. Karamoja District: Moruangabeni, Aug. 1960, *J. Wilson* 1053! & Lodoketeminit, May 1963, *Kerfoot* 4918! & escarpment S of Kapendongor, June 1970, *Lye & Katende* 5582!

KENYA. Northern Frontier District: Dandu, Apr. 1952, *Gillett* 12760!; West Suk District: N of Kongelai escarpment, May 1969, *Napper & Tweedie* 2124!; Embu District: lower slopes of Kiangombe, Nov. 2000, *Smith, Beenje & Muasya* 272!

TANZANIA. Masai District: 19.5 km S of Nduruma clinic, Mar. 1964, *Welch* 554!; Kondo District: Mangoloma village, Mar. 1928, *B.D. Burt* 1827!; Iringa District: Lower Ndumbi valley, Dec. 1986, *Lovett & Congdon* 1101!

DISTR. U 1; K 1–4, 7; T 2, 3, 5–7; Togo, Somalia, Angola, Malawi, Mozambique, Zimbabwe, Botswana, South Africa

HAB. Grassland on sandy soil, woodland, open or dense bushland on sand, thin soil over rock; 450–2000 m

CONSERVATION NOTES. Least concern (LC) due to its wide distribution

SYN. *Kyllinga cristata* Kunth, Enum. Pl. 2: 136 (1837). Type: South Africa, Klipplaatrivier & Los-Tafelberg en Wildschutberg, *Drège* 3930 & 7385 (both B!, syn.)

Cyperus cristatus (Kunth) Mattf. & Kük. in E.P. 4, 20 (101): 609 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 248, fig. 499 (1983)

C. nigripes (C.B. Clarke) Kük. var. *grandiceps* Kük. in E.P. 4, 20 (101): 572 (1936). Types: Tanzania, Pare District: near Mkomazi, *Peter* 10703! & 10831!; Pangani District: N of Buiko, *Peter* 10426! & 10466!; 10390!; Lushoto District: W Usambara between Manolo & Mtai, *Peter* 4188! (all B!, syn.)

C. alatus (Nees) F. Muell. subsp. *albus* (Nees) Lye in *Lidia* 3, 5: 172 (1995)

NOTE. Kükenthal in E.P. cites several East African specimens for his *C. cristatus* var. *nigritanus* Kük. [= *Kyllinga nigritana* C.B. Clarke in F.T.A. 8: 272 (1902)] in E.P. 4, 20 (101): 610 (1936).

The types of this are from Nigeria and Congo-Kinshasa, and the differences with *K. alba* do not seem very significant.

var. **alata** (Nees) C.B. Clarke in F.T.A. 8: 272 (1902). Type: South Africa, Korgakamma ravine in Zwartkops R., no collector indicated, nr. 883 *B!, syn.); near Pauli Maré, probably *Drège* s.n. (B?)

Plant with smell of ginger or camphor; culms 5–45 cm long. Leaves 5–37 cm long, 2.5–4 mm wide. Involucral bracts (2–)3–4. Inflorescence an ovoid or globose yellowgreen or pale yellow head 6–15 × 5–12 mm; spikelets 3.3–5.5 × 1–1.5 mm; glumes yellowgreen or golden yellow, often with green keel. Nutlet 1.3 × 0.6 mm, minutely papillose.

UGANDA. reported by Haines & Lye for Karamoja District: Moroto, *Haines* 4215!

KENYA. Northern Frontier District: Mt Nyiru, 5 km S of Tuum, Oct. 1978, *Gilbert, Gachathi & Gatheri* 5191!; West Suk District: Marich Pass near Ortum, Nov. 1977, *Carter & Stannard* 310!; Masai District: Olepolos on Nairobi–Magadi road, Jan. 1973, *Hansen* 846!

TANZANIA. Mbulu District: Kitingi, Jan. 1965, *Huku* 10!; Ufipa District: Mpui, Jan. 1962, *Robinson* 4904!; Mbulu/Singida District: Yaida Valley, Jan. 1970, *Richards* 25090!

DISTR. U 1; K 1–4, 6; T 2, 4, 5; Somalia, Angola, Namibia, South Africa

HAB. Dry bushland or woodland, seasonally damp grassland, often around rock outcrops; 800–1900 m

CONSERVATION NOTES. Least concern (LC) due to the habitat, which is widespread

SYN. *Kyllinga alata* Nees in *Linnaea* 10: 139 (1835/36), as *allata*, sphalm.; Napper in *J. EA Nat. Hist. Soc. & Nat. Mus.* 28, 124: 19 (1971)

Cyperus alatus (Nees) F. Muell. in *Fragm.* 8: 272 (1874); Kük. in E.P. 4, 20 (101): 611 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 249, figs. 500, 501 (1983); Lye in *Fl. Somalia* 4: 143 (1995)

C. alatus (Nees) F. Muell. var. *serratus* Peter & Kük. in E.P. 4, 20 (101): 611 (1936). Type: Tanzania, Dodoma District: Turu, E of Itigi near Bangayega, km 618, *Peter* 33888 (B!, holo.)

NOTE. I fully agree with C.B. Clarke that this is so close to *K. alba* that varietal status is better than specific. Nees, in the protologue, already wrote "an var.?" when discussing the differences between *alata* and *alba*.

Lye gave a new name to this taxon, as far as the East African plants were concerned; he believed they differed from the South African type. This new species is *Cyperus aureoalatus* Lye in *Lidia* 3(5): 171 (1995) & in *Fl. Eth.* 6: 478 (1997). Type: Uganda, Karamoja District: Moroto, *Haines* 4215 (NLH, holo.; K, MHU, iso.)

A subspecies, subsp. *ascolepidioides* (Cherm.) Lye is known from the Congo and might occur in W Tanzania; it differs in pale reddish brown glumes.

23. ***Kyllinga albogracilis*** Lye in *Nordic Journ. Bot.* 1: 742 (1981, publ. 1982). Type: Zambia, Old Mpulungu Road below Venning's Farm, *Richards* 4223 (K!, holo.)

Perennial, slender, up to 42 cm tall, with short rhizomes and 2 mm thick scale-covered stolons; culms solitary, arising from the end of rhizomes and stolons, 5–40 cm long, 0.5–0.8 mm wide, trigonous, glabrous. Leaves up to 20 cm long; leaf sheath greyish green to pale reddish-brown, 6 cm long; leaf blade linear, flat or folded, 2–20 cm long, 1–2 mm wide, scabrid on margin and primary vein. Involucral bracts leaf-like, reflexed, 2–3, lowermost 3.5–7 cm long. Inflorescence capitate, spherical, 5–10 mm in diameter, of a single spike; spikelets lanceolate, 2.5–4.3 mm long, 1–1.8 mm wide, flattened, mostly 2-flowered, but perfecting one nutlet only; glumes whitish, ovate, 2–3.5 mm long, keel pale yellow brown, winged and toothed in the largest glumes, with 2–3 veins on either side, apex acute. Stamens ?2; filaments to 3 mm long; anthers 1–1.1 mm long. Nutlet brown to almost blackish, ellipsoid, flattened, 1.7–2 mm long, 0.6–1 mm wide, minutely papillose.

TANZANIA. Ufipa District: Mpui, Lake Kwela, Mar. 1959, *McCallum Webster* C18!

DISTR. T 4; Zambia

HAB. Dry sandy ground at base of termite hills; ± 1750 m

CONSERVATION NOTES. Lye states this is 'fairly widespread' in Zambia; presumably Least Concern, then (LC)

SYN. *Cyperus albogracilis* (Lye) Lye in *Haines & Lye, Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & main work: 230, fig. 465 (1983)

24. ***Kyllinga albapurplea*** Lye in *Nordic Journ. Bot.* 1: 743 (1981 publ. 1982), as *alba-purpurea*. Type: Tanzania, Ufipa District: Sumbawanga, Nsangu Forest area, *Robinson* 4863 (K, holo.; out on loan)

Perennial, up to 30 cm tall, with a 2–6 mm thick curving rhizome; culms solitary per rhizome node, 25–30 cm long, 1–2 mm wide, triangular, glabrous. Leaves up to 12 cm long; leaf sheath brown or reddish brown, the upper greenish; leaf blade linear, flat, 8–12 cm long, 3.5–4.5 mm wide, scabrid on midrib and margin. Involucral bracts leaf-like, reflexed, 3–4, lowermost 5–6 cm long, 3–4 mm wide. Inflorescence a solitary white with reddish tinge (turning straw-coloured or purplish) globose head 10–12 mm across, of a single spike; spikelets to 100 per spike, narrowly ovoid, 4.5–5.5 mm long, 1.5–2.5 mm wide, 1–2-flowered; glumes white to reddish brown, lanceolate and concave, 4–5 mm long, prominently keeled and toothed, 2–4-veined on each side of the midrib. Stamens 2. Nutlet only seen immature (by Lye), ± 2 mm long.

TANZANIA. Ufipa District: Sumbawanga, Nsangu Forest area, Jan. 1962, *Robinson* 4863

DISTR. T 4; known only from the type

HAB. Seasonally damp ground at foot of rocky outcrop; ± 2000 m

CONSERVATION NOTES. 'Very rare' in its single locality; data deficient (DD) as no information exists on threats

SYN. *Cyperus alba-purpureus* (Lye) Lye in *Haines & Lye, Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & in main work: 248, fig. 498 (1983)

NOTE. Maybe related to *K. alba*, but different in rhizome and glume colour.

25. *Kyllinga nemoralis* (J.R. Forst. & G. Forst.) Hutch. in F.W.T.A. 2: 487 (1936); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 20 (1971). Type: no type indicated (see Note); lectotype: J.R. & G. Forster, Char. Gen. Pl.: t. 65 (iconotype)

Perennial, up to 30 cm tall, with branching horizontal rhizome; culms rather spaced along rhizome, or sometimes dense, 8–24 cm long, 0.8–1.5 mm wide, triangular, glabrous. Leaves up to 21 cm long; leaf sheath pale to mid-brown, 1–6 cm long; leaf blade dark green, linear, flat, 10–21 cm long, 2–4 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 8–18 cm long. Inflorescence a globose or ovoid sessile head of a single spike (rarely with 1–2 smaller spikes) 3–8 mm across; spikelets many, narrowly ovoid, 2–2.5 mm long, 0.6–1 mm wide, 1–2-flowered; glumes whitish, fading to pale red-brown, 2–2.5 mm long, keel winged (sometimes not very prominent) with minute teeth, apex acuminate; 2–4 veins on each side of midrib. Stamens 3. Nutlet black, oblong and flattened, 1–1.3 mm long, 0.7–0.9 mm wide, minutely papillose.

UGANDA. Kigezi District: Maramagambo Forest 1.5 km N of Rwampuro R., Dec. 1969, *Lock & Haines* 4303!; Busoga District: Lubani Hill area, Sept. 1952, *G.H.S. Wood* 389!; Mengo District: Mulange, June 1919, *Dummer* 4199!

TANZANIA. Bukoba District: Minziro Forest Reserve, Itara Hill, Apr. 2001, *Festo, Bayona & Wibard* 1436!; Lushoto District: Sigi Singali, Apr. 1950, *Verdcourt* 167! & Segoma Forest Reserve, May 1987, *Iversen et al.* 87/286!

DISTR. U 2–4; T 1, 3, ?6 (see note); West Africa, Congo-Kinshasa, Mozambique; Madagascar, Indian Ocean Islands, India, Sri Lanka and SE Asia

HAB. Forest where canopy is opened, forest clearings; 450–1200 m

CONSERVATION NOTES. Least concern (LC), though uncommon in our area

SYN. *Thryocephalon nemorale* J.R. Forst. & G. Forst., Char. Gen. Pl.: 130, t. 65 (1776)

Cyperus kyllingia Endl. in Cat. Hort. Acad. Vindob. 1: 94 (1842); Kük. in E.P. 4, 20 (101): 606 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 247, fig. 497 (1983)

NOTE. Cited by Kükenthal for T 6 (Uluguru, *Stuhlmann* 8889) but I have not seen any specimens from there (including at B).

The Forsters' protologue has no details about the species at all, no specimen or origin mentioned, no description – but the name is validated by the 'descriptio generico-specifica' (Code, art. 42.1) as the genus *Thryocephalon* is described by the Forsters, and *nemorale* is the only species therein. I have therefore chosen the plate as the type.

Haines & Lye cite both *Kyllinga nemoralis* and *Kyllinga monocephala* Rottb. as synonyms of their *Cyperus kyllingia* Endl.; the latter name dates from 1842 and so has no priority. The second one, however, dates back to 1773: *K. monocephala* Rottb., *Descr. Icon. Pl.*: 13, t. 4 fig. 4 (1773); L. f., *Suppl. Pl.*: 104 (1781); P.O.A. C: 123 (1895); C.B. Clarke in F.T.A. 8: 272 "excl. certain syns." (1902). No type mentioned; referring to several pre-Linnean names. The plate should probably be the type. I am uncertain about which name should be used, but here follow Napper; there are no fewer than six other taxa named *K. monocephala*, though the Rottbøll name is the oldest.

26. *Kyllinga albiceps* (Ridl.) Rendle in Hiern, *Cat. Afr. Pl.* 2: 106 (1899); C.B. Clarke in F.T.A. 8: 286 (1902). Type: Congo, *Christian Smith* s.n. (BM, holo.)

Perennial, slender, up to 42 cm tall, with a bulbous culm base emitting long slender stolons; culms solitary, 20–40 cm long, triangular, smooth. Leaves few; leaf blade linear, 0.5–1 mm wide. Involucral bracts leaf-like, erect to spreading, 2–3, lowermost –10 cm long. Inflorescence capitate, a single rounded to ovoid head, 4–10 mm in diameter, lanceolate-ellipsoid, ± 3.5 mm long, 2–4-flowered; glumes straw-coloured to greenish, ovate-lanceolate, ± 2.5 mm long, keel with 7 indistinct veins, apex obtuse to stunted. Stamens 3; anthers 1–1.5 mm long. Nutlet brownish, ellipsoid, flattened, ± 1.2 mm long.

TANZANIA. Ufipa District: near Sumbawanga, *Robinson* 4759 (fide Haines & Lye)

DISTR. **T** 4; Togo, Nigeria, Cameroon, Congo-Kinshasa, Angola, Malawi, Mozambique, Namibia, Botswana

HAB. no data

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus albiceps* Ridley in J. Bot. 22: 16 (1884)

Kyllinga merxmülleri Podlech in Mitt. Bot. Staats. München 3: 525 (1960). Type: Namibia, Okavango territory 24 km E of Runtu, *Merxmüller & Gies* 2136 (M, holo.; PRE, WIN, iso.)

Cyperus merxmülleri (Podlech) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 230, fig. 464

NOTE. Haines & Lye state this is distinct in its long slender stolons, narrow leaves and greenish/straw-coloured inflorescence. Related to *pulchella* but with much paler spikelets.

27. ***Kyllinga bulbosa*** P. Beauv. in Fl. Oware 1: 11 (1805); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 24 (1971). Type: Ethiopia, Tchélatchékannè, *Quartin Dillon* s.n. (P, holo.; P, iso.)

Perennial, 5–40 cm tall, with long slender whitish stolons or rhizomes, 0.5–2 mm in diameter, at first covered with delicate sheaths, but these soon rotting leaving a few short fibres to mark the nodes, with a few roots from each node; culms solitary, swollen at the base, 5–40 cm long, 0.7–1.5 mm wide, trigonous, ridged, glabrous or with a few spine-like hairs below the inflorescence. Leaves to 30 cm long, basal sheaths without blades; leaf sheath pale brown, 1–8 cm long, older ones darkening, covering the base of the culm; leaf blade linear, ± flat, 4–25 cm long, 2–5 mm wide, scabrid on margins and midrib, especially above. Involucral bracts leaf-like, spreading, 2–5, lowermost 2–8 cm long. Inflorescence capitate, a dense irregular or spherical to ovoid head of one to several spikes, when several-spiked often triangular in outline, 5–15 mm long, 5–17 mm wide; spikelets narrowly ovoid, 2.5–4.5 × 1–1.7 mm, with 1–5 flowers per spikelet, usually 3 nutlets developing; glumes whitish, occasionally with brownish dots, ovate, the largest one 2.5–3 mm long, keel green, with 2–4 veins on either side, apex acute. Stamens 2–3; filaments 2.4–3 mm long; anthers 1.2–1.8 long. Nutlet pale-coloured to dark brown, ellipsoid to obovoid, flattened, 1–1.6 × 0–0.7 mm, minutely papillose.

UGANDA. Toro District: Fort Portal, Nov. 1931, *Hazel* 3!; Mbale District: Bulucheke, Feb. 1950, *Forbes* 219!; Masaka District: Bukakata, Mar. 1971, *Lye* 5923!

KENYA. Nandi District: 6 km E of Kapsabet, Mar. 1977, *Hooper & Townsend* 1528!; Kiambu District: Limuru, Oct. 1947, *Bogdan* 1410!; N Kavirondo District: Kakamega Forest near Forest Station, Oct. 1981, *Gilbert & Mesfin* 6639!

TANZANIA. Arusha District: Lekuruki, Dec. 1969, *Richards* 24888!; Kigoma District: Lukoma, May 1975, *Kahurananga, Kibuwa & Mungai* 2700!; Rungwe District: 2 km beyond Kiwira on Mbeya–Tukuyu road, Mar. 1975, *Hooper, Townsend & Leedal* 854!

DISTR. **U** 1–4; **K** 3–5; **T** 1–4, 7; widespread in western and central Africa down to Mozambique

HAB. Grassland in damp sites, a weed in lawns, roadsides; 600–2150 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga macrocephala* A. Rich., Tent. Fl. Abyss. 2: 491 (1850); C.B. Clarke in F.T.A. 8: 286 (1902). Type: Ethiopia, Tacazze R., Tchélatchékannè, *Quartin Dillon* s.n. (P, holo.) – possibly an illegitimate name, if the type is the same as for *K. bulbosa*

Cyperus richardii Steud., Syn. Pl. Glumac. 2: 8 (1855); Kük. in E.P. 4, 20 (101): 568, fig. 61 a–c (1936); Haines & Lye, Sedges & Rushes E. Afr.: 227, fig. 457 (1983); Lye in Fl. Eth. 6: 470, fig. 212.120 (1997), *nomen novum* for *K. macrocephala* as a *Cyperus macrocephalus* already existed; so type the same as for *K. macrocephala*

Kyllinga sphaerocephala Boeck. in Flora 58: 258 (1875); C.B. Clarke in F.T.A. 8: 274 (1902). Type: “Zanzibar”, *Speke & Grant* s.n. (K, holo.; out on loan)

K. macrocephala A. Rich. var. *angustior* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 529 (1895) & in Etud. Fl. Congo 1: 279 (1896). Type: Congo-Kinshasa, *Hens* 14 (BR, holo.)

Cyperus richardii Steud. var. *angustior* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 568 (1936)

C. purpureoglandulosus Mattf. & Kük. in E.P. 4, 20 (101): 570 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 228, fig. 458 (1983); Lye in Fl. Somalia 4: 140 (1995). Type: Somalia, Ali Javio, *Senni* 103 (FT, syn.); Uganda: Bunyoro District: Unyoro, *Speke & Grant* s.n. (K, syn.); Kenya, Aberdare Mts, *Fries & Fries* 2202 (B, syn.) & Angola, Humpata, *Newton* 1 (K, syn.)

NOTE. Haines & Lye felt *K. bulbosa* was very similar to *purpureoglandulosus* but "has more than one spike per inflorescence, thinner stolons and larger spikelets with more flowers; (...) atypical plants of *purpureoglandulosus* with several spikes can be identified by its spikelet producing one nutlet only". Napper thought *sphaerocephalus* was a synonym, and so do I: quite a few specimens (e.g. *Hazel* 3; *Hooper & Townsend* 1528; *Tanner* 4083; *Coe* 705; *Parnell* 2002; *Richards* 24888; *Wingfield* 86c) seem to have both species' characteristics in a single collection.

28. ***Kyllinga kilianii*** *Muasya & D.A. Simpson* in K.B. 51: 183, fig. 1 (1996). Type: Kenya, Elgeyo District: Tambach, *Muasya & Simpson* 910 (EA, holo.; K, iso., out on loan)

Perennial, up to 22 cm tall, with stolons \pm 1 mm across; culms 19–22 cm long, 0.6–0.9 mm across, trigonous, glabrous, the base slightly bulbous. Leaves up to 18 cm long; leaf sheath pale brown, 2.5–4.3 cm long, becoming somewhat fibrous with age; leaf blade linear, \pm flat, 12–18 cm long [note protologue has mm], 2–3 mm wide, scabrid on margins. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 6–10 cm long, 2–3 mm wide. Inflorescence capitate, greenish brown, with a terminal spike 14–20 \times 6–7 mm and 1–3 smaller lateral spikes; spikelets many, dense, pale olive green, lanceolate-ovoid, 3.5–4 \times 1–1.3 mm, acute; glumes 3–5 per spikelet, pale brown with green midrib, lanceolate, 2.6–3 mm long, 0.5–0.9 mm wide, keel unwinged, acute to shortly mucronate and sometimes recurved, smooth to sparsely scabrid; several-veined. Stamens 3; filaments 5 mm long; anthers 0.9–1.2 mm long. Nutlet only seen immature, oblong, biconvex, to 1 mm long.

KENYA. Elgeyo District: Tambach, Feb. 1995, *Muasya & Simpson* 910; Nandi District: Cherbarbar, Kaboen R., Nov. 1993, *Muasya* 75; Kericho District: Kericho, June 1994, *Muasya* 493

DISTR. K 3, 5; not known elsewhere

HAB. Seepage areas, margins of permanent swamps; \pm 2000 m

CONSERVATION NOTES. Data deficient (DD) – needs information on possible threats

NOTE. Close to *pulchella* but that has lateral spikes frequently stalked and dark purple to blackish glumes, and longer anthers.

29. ***Kyllinga microbracteata*** *Lye* in Nordic Journ. Bot. 1: 744 (1981 publ. 1982). Type: Tanzania, Songea District: \pm 16 km W of Songea, *Milne-Redhead & Taylor* 8025 (K, holo.; K, iso., both out on loan)

Perennial, slender, up to 31 cm tall, with short rhizome and small swollen culm-bases covered by fibrous remains of old leaf sheaths; culms 15–30 cm long, 0.3–0.7 mm wide, bluntly triangular, glabrous below, minutely hairy above. Leaves 2–3 per culm, up to 8 cm long; leaf sheath green to reddish-brown, villous; leaf blade linear, 1–8 cm long, 1–2 mm wide, densely hairy on lower surface and along margin. Involucral bracts leaf-like to bract-like, spreading, 2, lowermost 0.6–1.6 cm long, minutely hairy particularly along the margin and on midrib below. Inflorescence a small white (tinged with pale green or purplish) globose head 4–6 mm in diameter, of a single spike; spikelets lanceolate, 2.5–3 mm long, 0.6–0.8 mm wide, 2–3-flowered; glumes whitish, ovate, 2.3–2.6 mm long, keel slightly excurrent, hairy, with \pm 3 veins on either side. Stamens not seen. Style 2–3-branched almost to base. Nutlet ellipsoid to obovoid, flattened, 1.5–1.7 mm long, 0.6–0.8 mm wide, minutely papillose.

TANZANIA. Songea District: \pm 16 km W of Songea, Jan. 1956, *Milne-Redhead & Taylor* 8025

DISTR. T 8; known only from the type

HAB. Miombo woodland on red loam; \pm 1080 m

CONSERVATION NOTES. Data deficient (DD) – needs information on possible threats

SYN. *Cyperus microbracteatus* (Lye) Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: App. 3: 2 (1983) & main work: 232, fig. 468 (1983)

NOTE. Similar to *K. tanzaniae* but distinct in its hairy leaves, culm and glumes.

The branching of the style can be in 2 or in 3, and the nutlet flattened or slightly triangular; hence, the taxon can be seen as intermediate with *Cyperus* section *Bulbocaulis*.

30. ***Kyllinga comosipes*** (Mattf. & Kük.) Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 24 (1971). Type: Tanzania, Uyanzi District [? Dodoma District], 4068 feet, *Speke* & *Grant* s.n. (K, holo., out on loan)

Perennial, up to 52 cm tall, with short rhizome and culm-bases covered by the fibrous remains of old torn leaf sheaths; culms tufted, 15–50 cm long, 0.5–2 mm wide, sharply triangular, with 1–3 longitudinal ridges on each of the three sides, densely scabrid at least on ridges above. Leaves up to 20 cm long; leaf sheath red-brown; leaf blade linear, 10–20 cm long, 3–5 mm wide, strongly scabrid on margins. Involucral bracts leaf-like, spreading to reflexed, 2–4, lowermost 3–15 cm long. Inflorescence capitate, white, globose or somewhat irregular in outline, 7–15 mm in diameter, with a solitary spike or more commonly with 1–3 lateral spikes surrounding the central spike; spikelets 3.5–6 mm long, 2–4-flowered; glumes whitish, 3–4 mm long, glabrous, keel unwinged, with many prominent veins on either side. Stamens 3. Nutlet yellow when young, obovoid-oblong, flattened, 1.5–2 mm long, 0.5–0.8 mm wide, minutely papillose.

var. ***comosipes***

Lateral spikes small, inconspicuous; main spike 8–15 mm in diameter, dirty white. Nutlet 1.5–1.7 mm long, 0.7–0.8 mm wide.

TANZANIA. Kükenthal states this occurs in Dodoma District: Ugogo, *Peter* 30020; Turu, between Itigi & Bangayeka, *Peter* 33898b; between Chaya [Tschaya] & Tura, *Peter* 34233b & 45801a; Saranda, *Peter* 33395, 33597; and Lushoto District: W Usambara, Lushoto [Wilhelmstal], *Peter* 4021; none of these seem to be in B anymore

DISTR. T 3?, 5?; Ethiopia, ?Somalia, Zambia, Zimbabwe, South Africa

HAB. No data

CONSERVATION NOTES. Least concern (LC)

SYN. *K. aurea* T. Thoms. in *Speke, Journ. Discov. source Nile, append. G: 654* (1863), *non K. aurea* Nees. Type as for *K. comosipes*

K. leucocephala Boeck. in *Flora* 58: 257 (1875); C.B. Clarke in *F.T.A.* 8: 287 (1902), *non K. leucocephala* Baldw. *nec Cyperus leucocephala* Retz. Type as for *K. comosipes*

Cyperus comosipes Mattf. & Kük. in *E.P.* 4, 20 (101): 568 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 228 (1983); Lye in *Fl. Eth.* 6: 470 (1997)

Kyllinga chrysantha K. Schum. var. *comosipes* (Mattf. & Kük.) J.-P. Lebrun & Stork, *Énum. Pl. Fl. Afr. Trop.* 3: 191 (1995)

HAB. Haines & Lye say this is very rare in Uganda (Karamoja), but do not cite specimens; they also say it is more widespread in Kenya (Nairobi and central region) and Tanzania (central) – but again, nothing is cited! Napper states central Kenya, widespread in Tanzania, Uganda: Mengo; but does not cite any specimens.

Said to differ from *K. bulbosa* by the lack of stolons, and presence of dense fibrous sheath remains around culm bases.

var. ***decolorans*** (Kük.) Lye in Haines & Lye, *Sedges & Rushes E. Afr. Appendix 3: 2* (1983) & main work: 228, fig. 460 (1983). Type: Tanzania, Iringa District: Uhehe plateau, *Mrs. Magdal. Prince* s.n. (B!, lecto., chosen here)

Differs in more prominent lateral spikes; spike pure white, 7–10 mm across. Nutlet 2 × 0.5 mm.

TANZANIA. Iringa District: Uhehe plateau, 1899, *Prince* s.n.!

HAB. no data

DISTR. T 7; known only from the type

CONSERVATION NOTES. Data deficient (DD) – needs information on possible threats

SYN. *K. chrysantha* K. Schum. var. *decolorans* Kük. in F.R. 12: 92 (1913). Types: Uganda, Masaka District: Bugalla Islands, *Godman & Godman* 98 (not found); Tanzania, Iringa District: Uhehe high plateau, *Prince* s.n. (B!, syn.)

Cyperus aureostramineus Mattf. & Kük. var. *decolorans* (Kük.) Kük. in E.P. 4, 20 (101): 574 (1936)

NOTE. Similar to *K. chrysantha* but differs in glume colour and more rounded spikes.

The type of *decolorans* has been identified as *K. ruwenzoriensis* by C.B. Clarke himself, indicating the confusion in this group! Though it was described in *Cyperus aureostramineus* (= *K. chrysantha*) the colour of the head is not golden yellow at all. In the drawing on the *Prince* sheet by Clarke the glumes are ciliate – but they are not.

31. ***Kyllinga platyphylla*** K. Schum. in E.J. 30: 270 (1901); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 24 (1971). Type: Tanzania, Mbeya District: Mbeya [Mbeye] peak, *Goetze* 1449 (B!, holo.; EA, iso.)

Perennial, up to 52 cm tall, stolons absent but short rhizome present; culms densely tufted, the bases covered in dark brown fibres, 15–50 cm long, 1.3–2 mm wide, sharply 3-angled, scabridulous. Leaves up to 17(–33) cm long; leaf sheath pale brown, darker at base, 1.5–8 cm long; leaf blade linear, recurved and channelled, 2–17(–33) cm long, 5–7 mm wide, scabrid on margin and primary vein. Involucral bracts leaf-like, reflexed, 3–5, lowermost 3–12.5 cm long. Inflorescence a hemispheric white or cream (occasionally greenish yellow) head consisting of 1–3 spikes, 8–15 mm in diameter; spikelets narrowly ovoid, 4–4.8 × 1.2–1.5 mm wide, 2-flowered; glumes whitish, narrowly ovate, 3–4 mm long, keel hairy to ciliate, apex acuminate. Stamens 3; filaments 2–2.4 mm long; anthers ± 1.3 mm long. Nutlet brown, obovoid and somewhat flattened, 1.5–1.7 × 0.7 mm, minutely papillose.

TANZANIA. Ngara District: Bugarama, Bushubi, Dec. 1960, *Tanner* 5638!; Ufipa District: Lake Sundu, Dec. 1958, *Richards* 10280!; Mbeya District: Mbeya town, Dec. 1969, *Wingfield* 494c!

DISTR. T 1, 4, 7, 8; Angola, Zambia, Malawi, Mozambique

HAB. Grassland (dry or wet), wooded grassland, woodland; 900–2100 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus ciliatopilosus* Mattf. & Kük. in E.P. 4, 20 (101): 571 (1936); Haines & Lye, *Sedges & Rushes* E. Afr.: 245, fig. 492 (1983). Type as for *K. platyphylla* as this was a *nomen novum*

32. ***Kyllinga eximia*** C.B. Clarke in F.T.A. 8: 287 (1902). Type: Ethiopia, Harradigit, *James & Thrupp* s.n. (K, holo.; K, iso., both out on loan)

Perennial, robust, up to 42 cm tall, with a short horizontal rhizome covered by the fibrous remains of old basal leaf sheaths; culms tussocky, 30–40 cm long, 1.5–2 mm wide, trigonous, glabrous, the base slightly swollen. Leaves up to 20 cm long; leaf sheath pale red-brown, 4–9 cm long; leaf blade linear, 10–20 cm long, 3–8 mm wide, scabrid at least on margin and primary vein. Involucral bracts leaf-like, reflexed or spreading, 3–4, lowermost 10–17 cm long, 3.5–7 mm wide. Inflorescence capitate, a single white globose head 13–20 mm in diameter; spikelets many per cluster, ovoid, 5–8 × 2 mm, 3–5-flowered but sometimes only the 2 lower flowers perfecting into nutlets; basal two glumes and flowers separated on a ± 0.8 mm long spikelet axis; glumes whitish with a pale brownish tinge, 4.5–7 mm long, keel smooth or scabrid, unwinged, with ± 5 veins on either side, apex attenuate. Stamens 3. Nutlet pale red-brown, ovoid, trigonous, 1.9 × 0.9 mm, minutely papillose. Fig. 47: 8–10, p. 314.

KENYA. Northern Frontier District: Isiolo, Dec. 1932, *unknown collector* 1924/70!; Embu District: Kiangombe, Nov. 2000, *Smith, Beentje & Muasya* 274!; Machakos District: 68 km on Mutomo–Kibwezi road, Nov. 1979, *Gatheri, Mungai & Kanuri* 79/157!

TANZANIA. Shinyanga District: Shinyanga near Igaramhuri rocks, Jan. 1936, *Burt* 5528!; Mbulu District: Ngorongoro crater rim, May 1989, *Chuuwa* 2748! & road to Burungi Lake near Tarangire ranger camp, Feb. 1970, *Richards* 25466!

DISTR. K 4, 7; T 1, 2; Ethiopia, Somalia

HAB. Grassland or thinly wooded grassland, abandoned cultivations; (90-)1050-1350(-2350) m
CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus eximius* (C.B. Clarke) Mattf. & Kük. in E.P. 4, 20 (101): 567 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 244, fig. 491 (1983); Lye in *Fl. Eth.* 6: 470, fig. 212.121 (1997)

NOTE. Distinct from the rather similar *comosipes* by the wider leaves and larger inflorescence; but the key in Haines & Lye does not work, as it says 'glumes 2.5-3 mm- *comosipes*, glumes 3.5-5 mm- *eximius*' while the text gives the glume length as 3-4 mm for *comosipes*.. Other differences reported are:

- | | |
|---|------------------|
| 1. Culms 0.7-1.5 mm thick; leaf 1-4 mm wide; head of 2-3 rounded spikes; largest involucre bracts 2-8 mm; spikelets 3-4 × 1-3 mm; moist sites | comosipes |
| 2. Culm 1.5-2 mm thick; leaf 3-8 mm wide; head single, globose; largest involucre bracts 10-17 mm; spikelets 5-8 × 2 mm; grassland | eximia |

This obviously needs a decision involving the types, which I was unable to study.

33. *Kyllinga odorata* Vahl in Enum. Pl. 2: 382 (1805). Type: 'America meridionalis', von Rohr s.n. & Richard s.n. (ubi?, syn.)

Tufted perennial, rhizome present or absent, spreading with basal buds; culms in tight groups, 15-70 cm long, 1-2.3 mm across, triangular, glabrous, aromatic. Leaves up to 50 cm long; sheaths pinkish to dark red, 1-10 cm long; leaf blade linear, 4-50 cm long, 1.5-6(-7) mm wide, scabrid on margins and midrib. Involucre bracts leaf-like, deflexed or spreading, 2-4, the longest 3-18(-30) cm long. Inflorescence a whitish or greenish white ovoid or ellipsoid head of 1-3 spikes, 5-22 × 4-18 mm; spikelets many, narrowly ovoid, 2-4.5 × 0.6-1.6 mm, 1-2-flowered; glumes whitish with green keel and often with minute reddish dots, ovate, 2-4 mm long, acuminate or with excurrent midrib; veins 2-5 on each side of the midrib. Stamens 2; filaments to 3.8 mm long; anthers 0.8 mm long. Nutlets brown to black, ovoid and flattened, 1.2-1.7 × 0.8-1.1 mm, minutely papillose.

- | | |
|--|---------------------------|
| 1. Leaf < 3 mm wide; spikelets 2-3 mm long | c. var. cylindrica |
| Leaf > 3 mm wide; spikelets 3-4.5 mm long | 2 |
| 2. Glume keel glabrous | b. var. major |
| Glume keel spiny | a. var. odorata |

a. var. **odorata**; Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 23 (1971)

Reported by Haines & Lye (1983) for Uganda, Kenya and Tanzania; close to "subsp. *appendiculatus*" [= var. *major*] but differing in having the glume keel with slender spine-like teeth. Napper stated "widespread in Uganda, also in W Kenya and in Tanzania". I have only been able to find two specimens with this character. It is possible var. *odorata* and var. *major* should be united.

KENYA. Trans Nzoia District: Saiwa Swamp National Park, Mar. 1977, *Hooper* & *Townsend* 1412!
TANZANIA. Kilimanjaro, 1800 m, Feb. 1934, *Schlieben* 4716!

SYN. *Kyllinga sesquiflora* Torr. in Ann. Lyc. New York 3: 287 (1836). Type: U.S.A., Florida, *Chapman* s.n.

Cyperus sesquiflorus (Torr.) Mattf. & Kük. subsp. *sesquiflorus*; Mattf. in E.P. 4, 20 (101): 591 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 241, fig. 483 (1983)

b. var. **major** (C.B. Clarke) *Chiov.* in Fl. Somalia 2: 432 (1932); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 23 (1971). Type: Tanzania, Kilimanjaro, *Johnston* 75 (K!, holo.)

Tufted perennial, rhizome ?absent or short and vertical, spreading with basal buds; culms in tight groups, 18–70 cm long, triangular, glabrous. Leaves up to 50 cm long; sheaths pinkish to dark red, 1–10 cm long; leaf blade linear, 10–50 cm long, 3–6(–7) mm wide. Involucral bracts 2–3, the longest 5–18(–30) cm long. Inflorescence a whitish or greenish white ovoid head of 1–3 spikes, 8–22 × 7–18 mm; spikelets many, narrowly ovoid, 3–4.5 × 0.6–1.6 mm, 2-flowered; glumes 3–4 mm long. Filaments to 3.8 mm long.

UGANDA. Kigezi District: Kachwekano Farm, May 1949, *Purseglove* 2884!; Mbale District: Kapkwata Forest Station, Jan. 1969, *Lye* 1588! & Bukwa–Kapchorwa, Jan. 1966, *Haines* 4003!
KENYA. Northern Frontier District: Mt Nyiru, Mar. 1995, *Bytebier et al.* 711!; Elgeyo District: 26 km from Cherangani village on Iten road, Nov. 2000, *Smith, Beentje & Muasya* 196!; S Nyeri District: Menja, Githi location, Dec. 1963, *Kibui* 36!
TANZANIA. Kilimanjaro, Bismark Hill, Feb. 1934, *Greenway* 3859!; Lushoto District: Mkuzi, Apr. 1953, *Drummond & Hemsley* 2179!; Rungwe District: Livingstone Mts, Bumbigi trail N of Isalala R., Mar. 1991, *Gereau & Kayombo* 4219!
DISTR. U 2, 3; K 1, 3–5; T 2–4, 6, 7; Togo, Cameroon, Equatorial Guinea, Congo-Kinshasa, Rwanda, Ethiopia, Somalia
HAB. Open forest or forest margin, bamboo zone, woodland, usually in at least partial shade, less often in open grassland; (1200–)1600–3000 m
CONSERVATION NOTES. Least concern (LC)

SYN. *Kyllinga appendiculata* K. Schum. in E.J. 24: 338, t. 4 (1897). Type: Cameroon, W of Buea, *Preuss* 923 (B!, holo.; B!, iso.)
K. cylindrica Nees var. *major* C.B. Clarke in F.T.A. 8: 283 (1902)
Cyperus sesquiflorus (Torr.) Mattf. & Kük. var. *major* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 594 (1936)
K. odorata Vahl subsp. *appendiculata* (K. Schum.) Lye in Nordic Journ. Bot. 1: 746 (1981 publ. 1982)
Cyperus sesquiflorus (Torr.) Mattf. & Kük. subsp. *appendiculatus* (K. Schum.) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 242, figs. 485, 486 (1983); Lye in Fl. Somalia 4: 140 (1995) & in Fl. Eth. 6: 475, fig. 212.131 (1997)
Kyllinga odorata Vahl var. *fallax* Kük. in N.B.G.B. 9: 299 (1925). Types: Kenya and Tanzania, *Fries & Fries* 499 (B!, syn.), 500, 2273; *Peter* 8950 (B!, syn.)
Cyperus sesquiflorus (Torr.) Mattf. & Kük. var. *fallax* (Kük.) Kük. in E.P. 4, 20 (101): 595 (1936)

c. var. *cylindrica* (Nees) Kük. in J. Straits Branch Roy. Asiat. Soc. 76: 80 (1917). Type: Nepal, Himalaya, Kunawur, *Nees* in herb. *Royle* 39 (B!, holo.)

Perennial with secondary basal buds or with rhizome; culms in tight little groups, 15–45 cm long, triangular with blunt angles, glabrous, aromatic. Leaves up to 26 cm long; sheaths pinkish, turning brown when dead, 1–5 cm long; leaf blade linear, flat and grooved or channeled, 4–26 cm long, 1.5–2.6 mm wide. Involucral bracts 3–4, the longest 3–10(–16) cm long. Inflorescence a white or greenish-cream ovoid or ellipsoid spike, sometimes with two much smaller basal spikes, main spike 5–14 × 4–10 mm; spikelets many, ovoid, 2–2.9 × 1.3–1.5 mm, 1(–2)-flowered; glumes 2–2.7 mm long. Filaments to 1.7 mm long.

UGANDA. West Nile District: Paida rest camp, Sept. 1953, *Chancellor* 227!; Toro District: Fort Portal, Dec. 1966, *Haines* 4219!; Teso District: Serere, July 1932, *Chandler* 779!
KENYA. Trans Nzoia District: Kitale, Sept. 1952, *Bogdan* 3584! & same locality, Oct. 1964, *Leippert* 5145! & Suam sawmills, May 1969, *Napper & Tweedie* 2136!
TANZANIA. Ngara District: Bukikiro, Bushubi, Apr. 1960, *Tanner* 4843!; Dodoma District: Rungwa Game Reserve 9 km W of Bagamoyo (Sulanji), Jan. 1969, *Chabwela* in CAWM 3947!; Songea District: 1.5 km E of Songea, Feb. 1956, *Milne-Redhead & Taylor* 8609!
DISTR. U 1–4; K 3; T 1, 2, 4–8; Sierra Leone to Congo-Kinshasa; India, China, SE Asia
HAB. (Seasonally) swampy grassland, post cultivation grassland, ruderal grassland; 950–1900 (–2100) m
CONSERVATION NOTES. Least Concern (LC)

SYN. *Kyllinga cylindrica* Nees in Wight, Contr. Bot. India: 91 (1834); C.B. Clarke in F.T.A. 8: 282 (1902)
Cyperus sesquiflorus (Torr.) Mattf. & Kük. var. *cylindricus* (Nees) Kük. in E.P. 4, 20 (101): 593 (1936)

- C. sesquiflorus* (Torr.) Mattf. & Kük. var. *cylindricus* (Nees) Kük. forma *globosus* Kük. in E.P. 4, 20 (101): 594 (1936). Types: Tanzania, Kigoma District: Machoso near Kigoma, *Peter* 37076 (B!, syn.); India, Konkan, Castle Rock, *Meebold* 9509 (not at B)
- C. sesquiflorus* (Torr.) Mattf. & Kük. subsp. *cylindricus* (Nees) Koyama in Bot. Mag. Tokyo 83: 187 (1970); Haines & Lye, Sedges & Rushes E. Afr.: 241, fig. 484 (1983); Lye in Fl. Eth. 6: 476, fig. 212.132 (1997)
- Kyllinga odorata* Vahl subsp. *cylindrica* (Nees) T. Koyama in Gard. Bull. Singapore 30: 161 (1977)

34. ***Kyllinga crassipes*** Boeck. in Flora 42: 444 (1859) & in Linnaea 35: 427 (1868), as *Kyllingia*; K. Schum. in P.O.A. C: 123 (1895); C.B. Clarke in F.T.A. 8: 275 (1902); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 22 (1971). Type: Mozambique, no locality or date, *Peters* s.n. (B!, holo.)

Perennial with short creeping rhizome; culms densely crowded along the rhizome, 10–50 cm long, 0.8–1.5 mm wide, triangular, glabrous or with a few hairs just below the head, the base slightly bulbous. Leaves up to 36 cm long; leaf sheath pinkish to purplebrown, 1.5–8 cm long; leaf blades several per culm, very short on basal sheaths, larger higher up, green and often with minute reddish dots, linear, slightly channeled, 10–36 cm long, 1.5–2.6 mm wide, scabrid on margins and midrib. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 7–16(–30) cm long. Inflorescence a single white globose head 4–10 mm across, of one spike; spikelets many, narrowly ovoid, 1.8–3.8 mm long, 0.5–0.7 mm wide; flowers 2, the lower hermaphrodite, the upper male; glumes very pale brown with minute reddish dots, narrowly ovate, 2–3.3 mm long, apex acute to obtuse, with several veins on each side. Stamens 3; filaments to 2 mm long; anthers yellow, 0.8–0.9 mm long. Nutlet dark grey, flattened ellipsoid, 1.5–1.7 × 0.5–0.9 mm, minutely papillose.

UGANDA. Ankole District: Lubare ridge, Bunyaruguru, Feb. 1966, *Haines* 4069!; Busoga District: 1.5 km E of Nankoma Hill, Apr. 1953, *G.H.S. Wood* 686!; Masaka District: Bugabo, SW of Lake Nabugabo, Feb. 1969, *Lye et al.* 1845!

KENYA. Kilifi District: Mtwapa, Oct. 1958, *Bogdan* 4703!

TANZANIA. Lushoto District: New Korogwe, May 1966, *Semsei* 4032!; Mpanda District: Kapapa, Sept. 1970, *Richards & Arasululu* 25987!; Kilwa District: Kingupira, Mar. 1975, *Vollesen* MRC 1926!; Zanzibar: Massazine, Dec. 1959, *Faulkner* 2444!

DISTR. U 2–4; K 7; T 1, 3, 4–8; Z; Congo-Kinshasa, Sudan, Angola, Zambia, Malawi, Mozambique, Zimbabwe

HAB. Seasonally wet grassland, old cultivations, clearings in woodland, lawns; 0–1200 m

CONSERVATION NOTES. Least concern (LC)

SYN. *Cyperus bulbipes* Mattf. & Kük. in E.P. 4, 20 (101): 587 (1936), *nomen novum*; Lye in Haines & Lye, Sedges & Rushes E. Afr.: 247, fig. 496 (1983). Type as for *Kyllinga crassipes*

C. bulbipes Mattf. & Kük. var. *pallescens* Kük. in E.P. 4, 20 (101): 588 (1936). Type: Tanzania, many syntypes: *von Brehmer* 124, *Engler* 334, *Holst* 2018, *Peter* 3861! & 4309! & 6948! & 31524! & 31843! & 46565!, *Prittwitz* 217, *Volkens* 67 (all Peter specimens seen at B!, syn.)

NOTE. Often confused with *K. bulbosa* but distinct in the close-set culms on the rhizome; *bulbosa* has the culms distant on stolons.

35. ***Kyllinga uniflora*** *Mtot.* in Nordic Journ. Bot. 9: 640, fig. 4 (1990). Type: Tanzania, Njombe District: Njombe–Songea road, *Mhoro* 3934 (K, holo., out on loan; DAR, iso.)

Perennial, up to 60 cm tall, with short creeping rhizome; culms solitary but quite closely spaced on the rhizome, 40–60 cm long, acutely triangular, glabrous; slightly bulbous at base. Leaves 3–4 per culm, up to 38 cm long; leaf blade linear, 21–38 cm long, 3.5–4 mm wide, scabrid on margins. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 8–10.5 cm long, 3–4 mm wide. Inflorescence a light brown

ovoid head 10–11 × 8–10 mm; spikelets ovoid, light brown, 3–3.5 × 0.8–1.1 mm, 1-flowered; glumes light brown to whitish, ovate, 2.5–3 mm long, keel smooth, apex acute; 3–4-veined on each side. Stamens not seen. Nutlet light brown, 1.8–2 mm long, minutely papillose.

TANZANIA. Njombe District: Njombe–Songea road, *Mhoro* 3934

DISTR. T 7; known only from the type

HAB. Thickets within miombo woodland; altitude unknown

CONSERVATION NOTES. Data deficient (DD), as information on possible threats is needed

NOTE. Similar to *K. peteri* but differs in spike colour, spikelet size (3–3.5 not 3–5.5 mm), being 1-flowered (not 2-flowered) and with pale brown nutlets (not black); generally less robust than *peteri*.

36. ***Kyllinga songeensis*** Lye in Bot. Notis. 125: 218 (1972). Type: Tanzania, Songea District, R. Luhimba ± 28 km N of Songea, *Milne-Redhead* & *Taylor* 10106 (K, holo.; out on loan)

Perennial, up to 40 cm tall, with short horizontal rhizomes; culms crowded on the rhizome, their bases bulbous, 18–40 cm long, 0.4–1 mm wide, terete except near apex where bluntly triangular, glabrous; basal parts covered by fibrous old leaf sheaths. Leaves up to 15 cm long; leaf sheath pale to dark brown, 1–6 cm long; leaf blade linear, flat or folded, 5–15 cm long, 1–2 mm wide, scabrid on margin and midrib. Involucral bracts leaf-like, spreading or reflexed, 3–4, lowermost 1–7 cm long. Inflorescence a single whitish globose spike 6–12 mm across; spikelets many, narrowly obovoid, 4–4.8 mm long, 1–1.2 mm wide, 1–2-flowered; glumes whitish, narrowly ovate to narrowly obovate, 3.5–4.5 mm long, unwinged, apex acuminate; ± 5-veined on each side of the midrib. Stamens ?; anthers 0.7 mm long. Nutlet only seen immature, brown, flattened-ellipsoid, 1.3 mm long, 0.5 mm wide.

TANZANIA. Songea District: 65 km W of Songea, Jan. 1956, *Milne-Redhead* & *Taylor* 8374! & R.

Luhimba ± 28 km N of Songea, *Milne-Redhead* & *Taylor* 10106

DISTR. T 8; not known elsewhere

HAB. Boggy grassland on sandy soil; 990 m

CONSERVATION NOTES. Data deficient (DD), as information on possible threats is needed

SYN. *Cyperus songeensis* (Lye) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & in main work: 246, figs. 494, 495 (1983)

37. ***Kyllinga tanzaniae*** Lye in Bot. Notis. 125: 217 (1972). Type: Tanzania, Ufipa District: Rukwa Escarpment, Namwele, *Robinson* 4783 (K, holo.; K, iso., both out on loan)

Perennial, medium-sized, up to 42 cm tall, with a thickish horizontal or curved rhizome; culms solitary or somewhat crowded, 15–40 cm long, 4–8 mm wide (?), trigonous, glabrous. Leaves up to 8 cm long; blade linear, flat, 3–8 cm long, 1–2 mm wide, scabrid on margin and primary vein. Involucral bracts leaf-like, reflexed or spreading, 2–3, lowermost 2–4 cm long. Inflorescence capitate, a single white or cream ovoid to globose spike, 5–8 mm long, 5–7 mm wide; spikelets 2.5–3.5 mm long, 1–2-flowered; glumes whitish or cream, 2–3.5 mm long, keel unwinged, smooth, with 3–5 veins on either side, apex acuminate. Nutlet dark brown to blackish, obovoid, flattened, 1.8–2 mm long, 0.9–1.2 mm wide, minutely papillose.

TANZANIA. Ufipa District: Rukwa Escarpment, Namwele, *Robinson* 4783; also, fide Haines & Lye, from Songea and Njombe Districts

DISTR. T 4, 7, 8; not known elsewhere

HAB. Well-drained grassland, often in miombo zone; altitude unknown

CONSERVATION NOTES. Data deficient (DD), as information on possible threats is needed

SYN. *Cyperus tanzaniae* (Lye) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 233, fig. 469

NOTE. Related to *K. albiceps* but distinct in thicker rhizome, and absence of long stolons.

38. ***Kyllinga pseudobulbosa*** Mtot. in Nordic Journ. Bot. 9: 638, fig. 2 (1990). Type: Tanzania, Mbeya District: *Pedersen* 643 (K, holo., out on loan; DAR, iso.)

Perennial, up to 17 cm tall, with short thick woody rhizome; culms solitary, 10–16.5 cm long, 1.5–2 mm wide, subtriangular, glabrous; with bulbous base covered by fibrous remains of leaf sheaths. Leaves 6–8 per culm, up to 11 cm long; leaf sheath light green, to 5 cm long; leaf blade linear, flat, 8–11 cm long, 3–4 mm wide, apex obtuse. Involucral bracts spreading or reflexed, 2–3, lowermost 3–4 cm long, 2–3 mm wide. Inflorescence whitish to sulphur yellow, with 1–3 spikes, 10–14 × 9–14 mm, the laterals smaller than the central one; spikelets many and densely set, lanceolate, 3–4 × 1–1.2 mm, 1-flowered; glumes greenish white, ovate, keel not winged, apex mucronate, glabrous; 2–3-veined on each side. Stamens 2–3. Nutlet not described in protologue.

TANZANIA. Mpanda District: on Ikala–Mpanda road, Jan. 1959, *Richards* 11732; Mbeya District: *Pedersen* 643

DISTR. T 4, 7; not known elsewhere

HAB. Grassland on sandy soil, garden lawn; 1050–1600 m

CONSERVATION NOTES. Data deficient (DD), as information on possible threats is needed

NOTE. Related to *K. bulbosa* but lacks stolons, obtuse leaves, and has asymmetric spikes and 1-flowered spikelets

39. ***Kyllinga oblonga*** C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 530 (1895) & in F.T.A. 8: 284 (1902). Type: Kenya, Nyika region, Jimba [= Shimba], 14 Jan. 1906, *Taylor* s.n. (BM, holo., seen on Aluka; K, out on loan)

Perennial with short woody rhizome, covered by black scales (fide protologue); culms densely set in a row along the rhizome, 30 cm long, not thickened at base, presumably glabrous. Leaves up to 30 cm long, 1.7–3 mm wide, flaccid. Involucral bracts 4–5, spreading, leaf-like, the lower to 10 cm long. Inflorescence of 1–3 spikes, the central one oblong, dense, 10–12 × 4–5 mm; spikelets ovoid, compressed, 2.5–3 mm long, 1–2-flowered; glumes straw-coloured, ovate-elliptic, with green hispid-ciliate non-winged keel and long subulate excurrent apex, 2–3-veined on each side. Stamens 3, linear, shortly acute at apex. Style 2-fid. Nutlet black, half the size of the glume, apex obtuse.

KENYA. cited by Clarke are Rabai Hills, *Taylor* s.n.; ?Shimba Hills [Jimba], Jan. 1906, *Taylor* s.n.!: Machakos/Masai District: Ngulia [Ongalea] Mts, *Gregory* 13

DISTR. K 7 - though Kükenthal also cites T 3, Tanga District: Udigo, *Peter* 39533 (not seen)

HAB. no data

CONSERVATION NOTES. Data deficient (DD), as information on habitat and possible threats is needed

SYN. *Cyperus oblongus* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 580 (1936); Haines & Lye, Sedges & Rushes E. Afr.: 234 (1983)

NOTE. There has been confusion about the taxa *nervosa* and *oblonga*. I believe *oblonga* and *nervosa* are distinct enough to be treated as species in their own right - though I have not seen the type, or any authenticated specimens, of *oblonga*, yet; this material has been out on loan for several years, and I was not able to get it back for study.

- | | |
|--|-----------------------|
| 1. Head greenish black; involucral bracts 1–3(4); spike 1; glume hairless and smooth. Type: Ethiopia, Wadi Schoata | 3. <i>K. nervosa</i> |
| 2. Head green-white; involucral bracts 4–5; spikes usually 3; glume hispid-ciliate. Type: Kenya, Mombasa | 41. <i>K. oblonga</i> |

Haines & Lye treated these as subspecies of one taxon, sometimes under *nervosa* (Lye in 1972 and 1981), sometimes under *oblonga* (Haines & Lye, 1984). *nervosa* is the older name, and the first combination was made under *nervosa* as well; I am unsure why the reversal into *oblonga* was brought about.

Clarke said his *K. oblonga* was allied to *K. cylindrica* (in FTEA treated as *K. odorata* var. *cylindrica*) and said it differed in the hispid-ciliate keel to the glumes.

40. **Kyllinga ruwenzoriensis** C.B. Clarke in F.T.A. 8: 283 (1902). Type: Uganda, Toro District: Kivata, *Scott Elliot* 7554 (K, holo., out on loan; B!, iso.)

Perennial, rhizome 2.5 cm long, thick; culm 5–10 cm long, thick, not bulbous at base. Leaves 5–10 cm long, 3–4 mm wide; leaf sheaths entire, reddish. Involucral bracts 4, spreading, leaf-like, the lower to 6.3 cm long. Inflorescence of 1–3 spikes, dusky white with yellow tinge, the central one cylindrical, 1.3 cm long, to 7 mm wide, dense; spikelets to 3.5 mm long, 2–3-flowered, often perfecting 2 nutlets; glumes ovate, keel wingless, smooth [though Haines & Lye say with a few spine-like teeth], excurrent into a recurved short bristle, 2–3-veined on each side. Style very short, 2-fid. Nutlet straw-coloured or pale brown, ellipsoid, over half the glume length.

UGANDA. Toro District: Kivata, May 1893/4, *Scott Elliot* 7554!

DISTR. U 2; known only from the type

HAB. unclear; 'up to 2400 m'

CONSERVATION NOTES. Data deficient (DD), as information on habitat and possible threats is needed

SYN. *Cyperus oblongus* (C.B. Clarke) Kük. var. *ruwenzoriensis* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 580 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 234 (1983)

Kyllinga nervosa Steud. var. *ruwenzoriensis* (C.B. Clarke) Lye in Bot. Notis. 125: 218 (1972)

NOTE. Clarke says this is perhaps allied to *K. erecta*, from which it differs in 'being stouter with larger spikes, and the glumes with recurved points. The greater number of flowers might be due to luxuriance maybe.' The type was said to be "common up to 8000 feet" (2400 m), fide *Taylor*: HB: also differs from *K. erecta* in non-bulbous culm base, and found at higher altitude. They seem to be ? intermediate between *nervosa* and *oblonga*.

I am assuming the culm is glabrous, as I was stupid enough not to check this at B; if the culm is scabrid near its apex, this would key to *K. comosipes*. A specimen at B (Tanzania, Iringa District: Uhehe, 1899, *Prince* s.n.) has been identified as *K. ruwenzoriensis* by C.B. Clarke himself— but a det slip by Kükenthal says '*Kyllinga chrysantha* var. *decolorans*'— and this taxon is now a subspecies of *K. comosipes*.

SPECIES OF UNCERTAIN OCCURRENCE

Kyllinga chlorotropis Steud. in *Flora* 25: 598 (1842); C.B. Clarke in F.T.A. 8: 279 (1902). Type: Ethiopia, Gondar, Shoata, *Schimper* 1377 (P, holo.; BR, K, M, P, WAG, iso.)

Perennial, up to 21 cm tall, with creeping rhizome, base of culm swollen; culms tufted, 3–20 cm long, trigonous, glabrous. Leaves up to 10 or 20 cm long; older leaf sheath fibrous and covering the culm-base; leaf blade (protologue: 5–10 cm long, as long as culms) 1–4 mm wide. Involucral bracts leaf-like, mostly reflexed, 3–4. Inflorescence capitate, of one terminal cylindrical spike and 1–4 lateral spikes; spikelets 2–3 mm long, 1–3-flowered; glumes dark purple or brownish black, keel green, glabrous, excurrent. Stamens 3. Nutlet brownish, minutely papillose.

SYN. *Cyperus chlorotropis* (Steud.) Mattf. & Kük. in E.P. 4, 20 (101): 576 (1936); Haines & Lye, *Sedges & Rushes E. Afr.*: 234, fig. 471 (1983); Lye in *Fl. Eth.* 6: 472, fig. 212.126 (1997)

NOTE. Haines & Lye state this occurs on Mt Moroto in Uganda, and is more widespread in Kenya and Tanzania. They do not cite any specimens from any of these countries, except *Haines* 4261 from Kenya, Eldoret (not seen by me). Haines and Lye say *chlorotropis* is very close to *teneristolon* (= *pulchella*) but differs in lacking stolons & being tufted.

I am unable to decide on the status, as I have not seen any specimens.

Kyllinga elata Steud., Syn. Pl. Glumac. 2: 70 (1854); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 28, 124: 21 (1971). Type: Comoro Islands, *Boivin* s.n. (?P, holo.; not at B)

Haines & Lye include *K. elata* as a subspecies of *melanospermus*, but as *elata* specimens have a large number of involucre bracts, I do not think that can be correct. The type is a *Boivin* specimen from the Comoros, presumably in P. The specimens identified as this taxon at Kew seemed to me to be *K. polyphylla*.

SYN. *Cyperus aromaticus* (Ridl.) Mattf. & Kük. var. *elatus* (Steud.) Kük. in E.P. 4, 20 (101): 582 (1936)
Kyllinga polyphylla Kunth var. *elata* (Steud.) Lye in Bot. Notis. 125: 218 (1972)

Cyperus melanospermus (Nees) Suringar subsp. *elatus* (Steud.) Lye in Haines & Lye, Sedges & Rushes E. Afr.: App. 3: 2 (1983) & main work: 240 (1983)

Kyllinga melanosperma Nees subsp. *elata* (Steud.) Lye in Nordic Journ. Bot. 1: 747 (1981) publ. 1982)

K. melanosperma Nees var. *elata* (Steud.) J.-P. Lebrun & Stork, Énum. Pl. Fl. Afr. Trop. 3: 191 (1995)

Kyllinga leucocephala Boeck. var. *pluriceps* Kük. in F.R. 12: 92 (1913). Type: Cameroon, *Ledermann* 4612

= *Cyperus sesquiflorus* (Torr.) Mattf. & Kük. var. *pluriceps* (Kük.) Kük. in E.P. 4, 20 (101): 595 (1936)

= *K. odorata* var. *stenocarpa* Kük. in N.B.G.B. 9: 299 (1925)

Kükenthal cites *Fries* & *Fries* 2184 from Aberdares, among others. The Berlin folder is empty, and only says 'Kamerun' on the outside. I believe Kükenthal's mention of this taxon for East Africa was based on a mistaken identification.

Kyllinga nigripes C.B. Clarke in F.T.A. 8: 285 (1902). Type: Malawi, *Buchanan* 1428 (B!, holo.)

SYN. *Cyperus nigripes* (C.B. Clarke) Kük. in E.P. 4, 20 (101): 572 (1936).

Kükenthal says this occurs in Tanzania: Usagara near Kidete, 3 Dec. 1925, *Peter* 32733 (B!) & 45633 (B!); W Usambara, Gamba near Makuyuni, *Peter* 15367 (B!); but the Tanzanian material looks different from the Malawi type of *K. nigripes*. The glumes on the type are quite acuminate; the glumes on the Tanzanian material are merely acute. It looks like the type might only have a single spike, but the head looks slightly damaged; the Tanzanian material usually has subsidiary spikes at the inflorescence base, as well. *Buchanan* 1425 (the B specimen) looks lacks the basal fibres which are much in evidence in the Tanzanian material; it looks very much like *alba*, but with the keel not or hardly winged. As the B specimen lacks much of its base, a decision will have to await the return of the K types, which are out on loan. It is possible there was a thin rhizome at one stage – but that might just be a root cut through, as well.

Which leaves the Tanzanian material cited by Kükenthal. This keys to *oblonga* or *crassipes*, but distinct in presence of many fine and dense fibres around culm base. *Peter* 32733 has some hairs at the base of the glume keel. Glumes 4–5, the lower two empty, the flowers bisexual (but the upper very small, maybe not maturing a fruit). Style 2-fid. As I have not seen any mature nutlets, I am not even sure whether the material represents a *Kyllinga* or a *Cyperus*.

EXCLUDED SPECIES

K. bulbocaulis Boeck. in Flora 58: 258 (1875). Type: Zanzibar, *Speke* & *Grant* s.n. (K, holo.; out on loan)

This taxon is treated in *Cyperus*, under *C. mollipes*.

25. LIPOCARPHA

R. Br. in Tuckey, Exped. Congo: 459 (1818); Goetghebeur & Borre in Wageningen Agric. Univ. Papers 89(1): 1–87 (1989)

Annuals or perennials. Culm erect, \pm cylindrical, scapose. Leaves basal; sheath closed, blade flat or inrolled; ligule 0. Involucral bracts leaf-like. Inflorescence terminal and head-like, with 1–many spikes. Spikes with many spikelet bracts set in a dense spiral, each bract subtending a highly reduced 1-flower spikelet with 2 minute scales, an empty prophyll, and a flower-bearing glume. Flowers bisexual. Stamens 1–3. Style 2–3-fid. Nutlet obovoid or ellipsoid, topped by small remnant of style-base.

35 species, mostly in Africa but some in Madagascar, Asia, Australia and America.

- | | |
|--|----------------------------|
| 1. Perennial with large subspherical head 15–20 mm across; spikelet bracts 5–12 mm long, with white apex 3.5–8 mm long | 1. <i>L. comosa</i> |
| Annual or perennial; heads not subspherical, usually smaller; spikelet bracts less than 4 mm long | 2 |
| 2. Longest involucral bract always stiffly erect; inflorescence with a single spike | 3 |
| Longest involucral bract spreading or reflexed; inflorescence with usually more than one spike | 4 |
| 3. Longest involucral bract to 16 cm long; spikelet bract with short apex, less than $\frac{1}{4}$ the length of the bract | 2. <i>L. hemisphaerica</i> |
| Longest involucral bract to 1.5 cm long; spikelet bract with long recurved apex \pm half the length of the bract | 3. <i>L. monostachya</i> |
| 4. Narrow apex of spikelet bract $\frac{1}{2}$ of the bract length, or more | 5 |
| Narrow apex of spikelet bract less than half of bract length | 7 |
| 5. Spikelet with 1–2 scales between spikelet bracts and flowers; bracts with recurved apex | 4. <i>L. nana</i> |
| Spikelet without such scales or such bract apices | 6 |
| 6. Style with 2 branches; nutlet flattened | 5. <i>L. kernii</i> |
| Style with 3 branches; nutlet triangular in cross-section | 6. <i>L. rehmannii</i> |
| 7. Style with 2 branches; nutlets flattened; T 4 | 7. <i>L. prieuriana</i> |
| Style with 3 branches; nutlets not flattened | 8 |
| 8. Annual, with filiform roots; T 4 | 8. <i>L. leucaspsis</i> |
| Perennial, with at least a few thickened roots | 9 |
| 9. Spikes confluent to a pale head; spikelet bract 1.8–3.9 \times 0.5–1.1 mm, narrow apex 0.6–1.4 mm long | 9. <i>L. albiceps</i> |
| Spikes clearly separate | 10 |
| 10. Spikes pale green or yellow-brown, with small apex ($< \frac{1}{3}$ of bract) | 10. <i>L. chinensis</i> |
| Spike base dark with pale tip, the apex $> \frac{1}{3}$ of bract | 11 |
| 11. Spikes thick, composed of closely packed broadly shouldered spikelet bracts; T 4 | 11. <i>L. abietina</i> |
| Spikes slender with narrower spikelet bracts with slightly recurved apex; T 6, 8 | 12. <i>L. atra</i> |

1. *Lipocarpa comosa* J. Raynal in Bull. Mus. Nat. Hist. Nat. sér. 2, 41: 974, fig. 1 (1969); Haines & Lye, Sedges & Rushes E. Afr.: 295, fig. 611 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 30, fig. 7 (1989). Type: Zambia, near Chakwenga, Robinson 6380 (P, holo.; K!, NY, iso.)

Perennial; rhizome/stolons slender, 1–3 mm across, covered by small red-brown cataphylls; stem 11–55 cm tall, obscurely triangular, 1–1.5 mm across. Lower leaf

sheaths empty, the upper two with leaves 10–28 cm long, 1.5–3 mm wide, subterete or inrolled. Involucral bracts 2–3, the largest 4–10 cm long. Inflorescence a spherical head of several confluent spikes, 15–20 mm across; spikelet bracts dark purple to violet with long cream apex, obovate, 5–12 × 0.4–1 mm, long-acuminate; prophyll and glume brown, 1–1.7 mm long. Stamens 3, anthers 1 mm long. Style 0.2–0.3 mm long, 3-branched. Nutlet reddish brown, obovoid, 1–1.2 × 0.5–0.6 mm, with small style base remnant, trigonous in cross-section, minutely papillose.

TANZANIA. Mbeya District: Mbozi, Nov. 1932, *Davies* 716! & Chunya escarpment, Jan. 1957, *Richards* 7946!

DISTR. T 7; Congo-Kinshasa, Zambia, Malawi

HAB. Probably miombo woodland; 1550–2250 m

2. ***Lipocarpha hemisphaerica*** (*Roth*) *Goetgh.* in Wageningen Agric. Univ. Papers 89(1): 37, fig. 13 (1989); *Lye* in *Fl. Eth.* 6: 490 (1997), as *hemisphaericus*. Type: India, 'India orientale', *Heyne* s.n. (B, holo.; mixed with *S. arcticus*, probably lost)

Tufted annual; roots reddish, thin; stem 2–15(–25) cm tall, rounded or angular, 0.2–0.5 mm across. Leaves usually one per stem, pale green, filiform, 1–9 cm long, 0.6 mm wide, half-circular; leaf-sheath purple-stained. Involucral bract 1, erect, to 10(–16) cm long. Inflorescence pseudolateral with a single globose to ovoid spikelet 1–7(–10) × 1–3 mm; spikelet bracts dark brown or red-brown, often with white or pale green midrib and tip, broadly obovate, 0.5–1 × 0.4–0.7 mm, acuminate to obtuse; prophyll and glume 0.5–0.7 mm long. Stamen 1, anthers 0.25 mm long. Style 0.1 mm or less, 2-branched. Nutlet grey-violet with silvery shine, obovoid, 0.5–0.8 × 0.2–0.3 mm, with small style base remnant, round or ellipsoid in cross-section. Fig. 51, p. 349.

UGANDA. Mbale District: Kaburoron, Dec. 1967, *Haines* 4218 or 4268!

KENYA. Trans-Nzoia District: 16 km S of Kitale, July 1961, *Bogdan* 5182! & 5 km below Mt Elgon Lodge, Oct. 1981, *Gilbert & Mesfin* 6549!

TANZANIA. Ufipa District: 46 km on Chala–Mpanda road, May 1997, *Bidgood et al.* 3857!; Mbeya District: 14 km SW of Madibira on Igawa track, June 1996, *Faden et al.* 96/179!; Songea District: 12 km W of Songea near Kimarampaka stream, Apr. 1956, *Milne-Redhead & Taylor* 9944!

DISTR. U 3; K 3; T 4, 7, 8; from Senegal to Ethiopia and south to South Africa; India, Thailand

HAB. Shallow soil over rock, swamp edge, seasonally inundated grassland, streamsides, rice fields; occurs in small colonies; 450–2000 m

SYN. *Scirpus hemisphaericus* Roth, Nov. Pl.: 29 (1821)

Isolepis hemisphaerica (Roth) A. Dietrich, Spec. Pl. 2: 109 (1832)

Hemicarpha isolepis Nees in *Edinb. N. Phil. J.* 17: 263 (1834); Kunth, Enum. Pl. 2: 268 (1837); Raynal & Raynal in *Adansonia* ser. 2, 7: 319 (1967). Type: India, *Wight* s.n. (ubi? holo.; C, GE, K!, LE, NY, iso.)

H. schraderi Kunth, Enum. Pl. 2: 268 (1837); A. Rich., Tent. Fl. Abyss. 2: 507 (1850), *nom. superfl.* Type: South Africa, Cape of Good Hope, no collector indicated (ubi?)

Scirpus isolepis (Nees) Boeck. in *Linnaea* 36: 498 (1870); C.B. Clarke in *F.T.A.* 8: 459 (1902); F.D.-O.A.: 393 (1937); Napper in *J. E.A. Nat. Hist. Soc.* 25: 14 (1965); Hooper in *F.W.T.A.* ed. 2, 3: 310 (1972)

Lipocarpha micrantha Peter in *Abh. Ges. Wiss. Göttingen*, n.F. 13 (2): 114 (1928), *nom. nud.* based on Tanzania, *Peter* 34934f & 35570 (B)

L. isolepis (Nees) *R.W. Haines* in *Bot. Notis.* 124: 476, fig. 3 (1971); *Goetghebeur* in *Adansonia* ser. 2, 19: 303 (1980); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 300, fig. 622 (1983)

NOTE. In *Bidgood et al.* from Tanzania T 4, Nkansi District, there is a single branched spike.

3. ***Lipocarpha monostachya*** *R. Gross & Mattf.* in *N.B.G.B.* 14: 189 (1938); *Napper* in *J. E.A. Nat. Hist. Soc.* 25: 23 (1965); *Haines & Lye*, *Sedges & Rushes E. Afr.*: 300, fig. 621 (1983); *Goetghebeur* in *Wageningen Agric. Univ. Papers* 89(1): 54, fig. 21 (1989). Type: Tanzania, Lindi District: near Masasi, *Schlieben* 6399 (B!, holo.; BM, BR, G, GENT, M, P, Z, iso.)

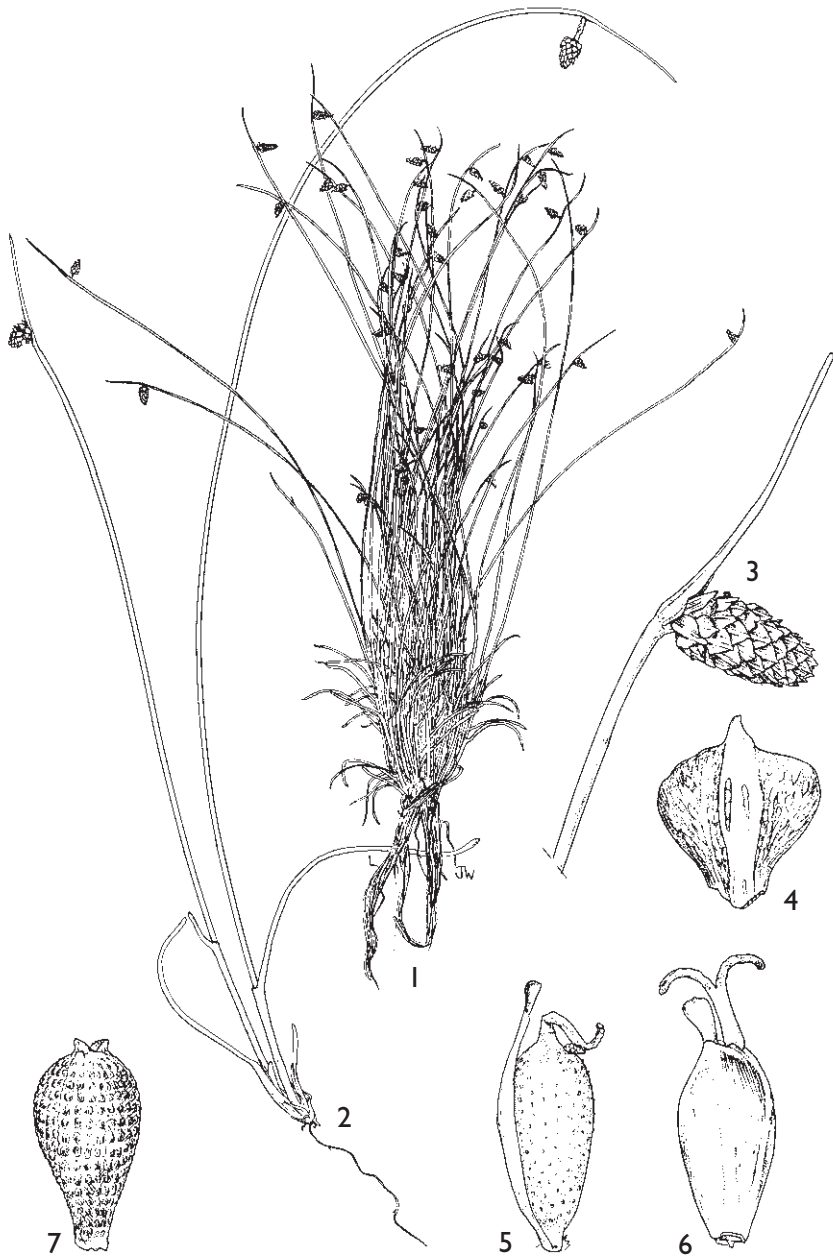


FIG. 51. *LIPOCARPHA HEMISPHAERICA* — 1, habit, $\times 1$; 2, small habit, $\times 2$; 3, spikelet, $\times 8$; 4, glume, $\times 50$; 5, flower, $\times 50$; 6, flower, $\times 50$; 7, nutlet, $\times 50$. 1 & 4 & 7 from Milne-Redhead & Taylor 9944, 3 & 5–6 from Richards 19108 2672. Drawn by Juliet Williamson.



FIG. 52. *LIPOCARPHA NANA* — 1, habit, $\times \frac{2}{3}$; 2, inflorescence, $\times 5$; 3, spikelet detail, $\times 12$; 4, spikelet bract, $\times 50$; 5, flower, $\times 60$; 6, nutlet, $\times 50$. 1 from Gilbert 4780, 2 & 6 from Chandler 1353, 3–5 from Kabuye 368. Drawn by Juliet Williamson.

Tufted annual; roots dark red, thin; stem 3–18 cm tall, 0.2–0.3 mm across. Leaves filiform, dull green, to 5 cm long, almost terete but with slight channel, to 0.5 mm wide; sheaths dark red or purple near base. Involucral bract 1, erect, to 1.5 cm long. Inflorescence pseudolateral with 1 ovoid spike 1.5–5.5 × 1–3 mm; spikelet bract dark brown or red-brown with paler midrib and apex, obovate, 1–1.6 × 0.4–0.6 mm, ± recurved-acuminate, smooth; prophyll and glume 0.3–0.5 mm long. Stamen 1, anthers ± 0.15 mm long. Style 0.1 mm long or less, 2-branched. Nutlets grey, obovoid, 0.3–0.7 × 0.2–0.3 mm, with small style base remnant, round in cross-section, papillose.

TANZANIA. Shinyanga District: Nindo division, Feb. 1973, *Stefanescu* 437!; Mpanda District: 19 km on Mpanda–Uvinza road, May 1997, *Bidgood et al.* 3925!; Mbeya District: Great North Road between Igawa and Iyayi, Apr. 1962, *Polhill & Paulo* 2006!

DISTR. T 1, 4–8; Congo-Kinshasa, Malawi, Zimbabwe

HAB. Seepage areas or damp to boggy ground, usually on sand, in the bushland/woodland zone; (70–)400–1400 m

NOTE. Often confused with *L. nana*, but differs in the 2-branched style and the smooth apex to the spikelet bract; also, *L. nana* rarely has only a single spike.

Luke & Luke 4651 from the Selous is from a much lower latitude than usual, 70 m.

4. *Lipocarpus nana* (A. Rich.) Cherm. in Bull. Soc. Bot. France 71: 142 (1924); E.P.A.: 1415 (1970); Hooper in F.W.T.A. ed. 2, 3: 328 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 299, fig. 618, 619 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 55, fig. 22 (1989); Lye in Fl. Eth. 6: 488, fig. 212.153 (1997). Type: Ethiopia, Shire, Kouaitea, *Quartin-Dillon* s.n. (P, holo.)

Tufted annual; roots red, thin; stem 2–40 cm tall, flattened, 0.3–0.8 mm across. Leaves pale green, 2–8 cm long, slightly channeled, to 1.2 mm wide; lower part of sheaths reddish purple. Involucral bracts (1–)2–3, green, the largest up to 6(–11) cm long. Inflorescence terminal, of 1–9 ovoid spikelets 2–8 × 1.5–4 mm; spikelet bracts recurved, dark brown to black with green midrib and acumen, obtrullate, 0.9–1.7 × 0.2–0.8 mm, long-acuminate, scabrid at apex; prophyll and glume 0.3–0.8 mm long, hyaline. Stamens 1–2, anthers 0.3–0.4 mm long. Style 0.15 mm or shorter, 3-branched. Nutlets obovoid, 0.5–0.8 × 0.2–0.4 mm, with small style base remnant, trigonous in cross-section, minutely tuberculate. Fig. 52, p. 350.

UGANDA. Mbale District: Kapchorwa, Sept. 1954, *Lind* 314!; Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1353!; Mengo District: 10 km E of Kakoge, Dec. 1955, *Langdale-Brown* 1681!

KENYA. Northern Frontier District: Ol Lolokwe, Apr. 1979, *Gilbert* 5380!; Baringo District: 2.6 km on Kabarnet–Eldoret road, Nov. 2000, *Smith, Beentje & Muasya* 138!; Fort Hall District: Thika, N side of Thika river E of main road, July 1971, *Kabuye* 368!

TANZANIA. Arusha District: Arusha National Park, Mt Meru foot, May 1968, *Renvoize & Abdallah* 2465a!; Ufipa District: 12 km on Sumbawanga–Mbeya road, June 1996, *Faden et al.* 96/404!; Dodoma District: 42 km on Itigi–Chunya road, Apr. 1964, *Greenway & Polhill* 11673!

DISTR. U 3, 4; K 1, 3–5; T 1–8; from Guinea to Sudan and Ethiopia and south to South Africa; Madagascar

HAB. Seepage areas on rock, seasonally wet grassland, moist depressions in the woodland and bushland zone, moist depressions on roadsides and overgrazed ground; sometimes in standing water; (250–)600–1900(–2400) m

SYN. *Fuirena nana* A. Rich., Tent. Fl. Abyss. 2: 497 (1850/1851)

Lipocarpus pulcherrima Ridl. in Trans. Linn. Soc. Bot. 2: 162 (1884); C.B. Clarke in F.T.A. 8: 473 (1902); F.D.-O.A.: 383 (1937); Napper in J. E.A. Nat. Hist. Soc. 25: 23 (1965); E.P.A.: 1415 (1970). Types: Angola, Catete, *Welwitsch* 6774 (BM, COI, syn.) & Quilange, *Welwitsch* 6774 (yes, again) (BM, syn.); Huila, *Welwitsch* 6775 (BM, syn.); Catete, *Welwitsch* 6785 pro parte (BM, syn.)

L. atropurpurea Boeck., Cyp. Nov. 1: 21 (1888). Type: Malawi, *Buchanan* 69 (B, holo.; K!, LE, NY, P, iso.)

L. tenera Boeck., Cyp. Nov. 1: 21 (1888). Type: Malawi, *Buchanan* 63 (B, holo.; K!, iso.)

Hybaelyptum pulcherrimum (Ridl.) K. Schum. in P.O.A. C: 127 (1895)

Cyperus persquarrosus Koyama in Bot. Mag. Tokyo 73: 438 (1960), non *Cyperus pulcherrimus* Kunth (1837). Type as for *Lipocarpha pulcherrima*
Lipocarpha nana (A. Rich.) J. Raynal in Adansonia ser. 2, 7: 84 (1967); Haines & Lye, Sedges & Rushes E. Afr.: 299, fig. 618–619 (1983), *comb. superfl.*
L. pulcherrima Ridl. forma *luxurians* Merxmüller in Mitt. Bot. Staats. München 1(5): 164 (1952). Type: Mozambique, *Schweickerdt* 2319 (M, holo.)

5. ***Lipocarpha kernii*** (Raymond) Goetgh. in Wageningen Agric. Univ. Papers 89(1): 42, fig. 15 (1989). Type: Senegal, *Berhaut* 4692 (MT, holo.; P, iso.)

Tufted annual; roots thin; stem 2–40 cm tall, 0.5–1.5 mm across. Leaves to 16 cm long, to 2 mm wide. Involucral bracts 2–5, the largest to 15 cm long. Inflorescence terminal with (1–)2–8 ovoid spikes 2–8 × 1.5–5 mm; spikelet bracts yellowgreen to pale brown with red dots and a yellow apex, ellipsoidal to obovate, 1.4–2.6 × 0.4–0.6 mm, long-acuminate, scabridulous at apex; prophyll and glume absent. Stamen 1, anthers 0.2–0.3 mm long. Style 0.1 mm or less, 2-branched. Nutlets obovoid, 0.4–0.7 × 0.3–0.4 mm, with small style base remnant, rhombic or elliptic in cross-section and dorsiventrally flattened, tubercular.

TANZANIA. Ufipa District: Sumbawanga town near boma, June 1980, *Hooper & Townsend* 1858!; Ulanga District: Selous, Ifakara, May 1976, *Vollesen* MRC 3634!; Ulanga/Kilwa District: near Rufiji, *Schlieben* 2391 (fide Goetghebeur)

DISTR. T 4, 6; from Senegal to Ethiopia and south to Zimbabwe

HAB. Swamp or regenerating woodland; 300–?1600 m

SYN. *Scirpus squarrosus* sensu C.B. Clarke in F.T.A. 8: 458, pro specim. *Schweinfurth* 2572 & 3003; F.P.S. 3: 366 (1956); E.P.A.: 1473 (1970), non L.

S. kernii Raymond, Natur. Canad. 86: 230 (1959); Raynal in Adansonia ser. 2, 8: 95, fig. 1.1–5 (1968); Hooper in F.W.T.A. ed. 2, 3: 310 (1972)

Isolepis kernii (Raymond) Lye in Bot. Notis. 124: 479 (1971)

Rikliella kernii (Raymond) J. Raynal in Adansonia ser. 2, 13: 155 (1973); Haines & Lye, Sedges & Rushes E. Afr.: 301, fig. 624 (1983)

6. ***Lipocarpha rehmannii*** (Ridl.) Goetgh. in Wageningen Agric. Univ. Papers 89(1): 64, fig. 29, 36f (1989); Lye in Fl. Eth. 6: 490, fig. 212.154 (1997). Types: South Africa, Natal, Griffinshill (East Court), *Rehmann* 7305 & 7315 (K!, Z, syn.); Angola, Lopollo, *Welwitsch* 6771 (BM, syn.)

Tufted annual; roots reddish, thin; stem obscurely triangular, 2–28 cm tall, 0.3–1.5 mm across. Leaves green, flat to canaliculate, to 10(–17) cm long, 0.7–1.5 mm wide; sheaths dark red to almost black at base. Involucral bracts (3–)4–9, the longest to 12 cm long. Inflorescence a dense head of 3–12 ovoid ± confluent spikelets 3–10 × 2–5 mm; spikelet bracts red-brown with green or yellow apex, ovate to obovate, 1.2–3.2(–3.5) × 0.2–1 mm, long-acuminate (1–2 mm), recurved, scabrid at apex; prophyll and glume absent. Stamen 1, anthers 0.2–0.4 mm long. Style 0.1–0.15 mm, 3-branched. Nutlets obovoid, 0.5–0.7 × 0.2–0.4 mm, with small style base remnant, rounded-trigonous in cross-section, tuberculate in longitudinal lines.

KENYA. Fort Hall District: Thika Road House, July 1951, *Verdcourt* 543! & near railway bridge over Thika R., May 1968, *Faden* 68/242! & N side of Thika R. near main road, July 1971, *Kabuye* 373!

TANZANIA. Rufiji District: Selous Game Reserve, opposite Sand Rivers Lodge, June 1997, *Luke & Luke* 4650!; Iringa District: Iringa College of National Education, May 1972, *Pedersen* 996!;

Tunduru District: just E of Songea District boundary, June 1956, *Milne-Redhead & Taylor* 10652! DISTR. K 4; T 6–8; Congo-Kinshasa, Angola to Zambia, Malawi and Mozambique and south to South Africa

HAB. Seasonally moist grassland, seepage areas; (70–)850–1750 m

SYN. *Scirpus rehmannii* Ridl. in Trans. Linn. Soc. ser. 2, 2: 159 (1884); Raynal in Adansonia ser. 2, 8: 97, t. 1, fig. 6–8 (1968)

Isolepis rehmannii (Ridl.) Lye in Bot. Notis. 124: 479 (1971)

Rikliella rehmannii (Ridl.) J. Raynal in Adansonia ser. 2, 13: 155 (1973); Haines & Lye, Sedges & Rushes E. Afr.: 301, fig. 623 (1983)

NOTE. The *Luke* & *Luke* specimen (the only one from T 6) is at much lower altitude than any of the others, but conforms to the description.

7. ***Lipocarpa prieuriana*** Steud. in Syn. Pl. Glumac. 2: 130 (1855); Boeck. in Linnaea 37: 118 (1871); C.B. Clarke in F.T.A. 8: 471 (1902); E.P.A.: 1415 (1970); Hooper in F.W.T.A. ed. 2, 3: 328 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 298, fig. 617 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 60, fig. 25, 36e (1989). Type: Senegal, *Leprieur* s.n. (P, holo.; G, L, iso.)

Tufted annual; roots thin; stem 5–60 cm tall, 0.5–1 mm across. Leaves ± flat, to 25 cm long, to 2 mm wide; leaf sheaths dark purple near base. Involucral bracts 2, the largest to 20 cm long. Inflorescence a congested head of (1–)3–5 ovoid spikes 3–10 × 2–4 mm; spikelet bracts pale brown to red-brown with green midrib and apex, broadly obovate, 1–1.5 × 0.7–1.2 mm, apex rounded and apiculate, ± cucullate, forming a roof over the nutlet; prophyll and glume red-brown spotted, 1–1.2 mm long, hyaline. Stamen 1, anthers 0.3–0.4 mm long. Style 0.1–0.2 mm long, 2-branched. Nutlets grey-black, obovoid, 0.9–1.1 × 0.6–0.7 mm, with small style base remnant, flattened-triangular in cross-section.

TANZANIA. Tabora District: 6.5 km from Urambo, June 1980, *Hooper* & *Townsend* 2023!

DISTR. T 4; from Senegal to Ethiopia and south to Zimbabwe

HAB. On damp sand; no altitude given, ? 1250 m

SYN. *L. schweinfurthiana* Boeck. in Flora 62: 567 (1879). Type: Sudan, Djur, *Schweinfurth* III.197 (B, holo. – not found; K, iso. – not found)

Cyperus prieurianus (Steud.) Koyama in Bot. Mag. Tokyo 73: 438 (1960)

8. ***Lipocarpa leucaspis*** *J. Raynal* in Bull. Mus. Nat. Hist. Nat. sér. 2, 41(4): 978, fig. 2 (1969); Haines & Lye, Sedges & Rushes E. Afr.: 299, fig. 620 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 44, fig. 16 (1989). Type: Burundi, near Kininya, *Michel* 3338 (BR, holo.; WAG, iso.)

Loosely tufted annual (Haines and Lye say possibly perennial with short rhizome); roots thin; stem ± terete, 5–40 cm tall, 0.5–1 mm across. Leaves 2–12 cm long, 1–3 mm wide. Involucral bracts 1–2, the largest to 4.5 cm long. Inflorescence terminal with (1–)2–3(–4) ovoid spikes 2–7 × 2–5 mm; spikelet bract brown or dark red with whitish midvein and apex, obovate, 1.6–2.1 × 0.7–0.8 mm, abruptly acuminate and scabrid at apex; prophyll and glume 1–1.3 mm long, hyaline. Stamens 1–2, anthers 0.4–0.8 mm long. Style 0.1–0.3 mm long, 3-branched. Nutlets brownish, obovoid, 0.9–1.1 × 0.3–0.5 mm, with small style base remnant, trigonous in cross-section, minutely papillose.

TANZANIA. Kigoma District: Ujiji, *Peter* 37009; Tabora District: Kapapa, Sept. 1970, *Richards* 25930!

DISTR. T 4; Nigeria, Congo-Kinshasa, Burundi

HAB. Muddy swamp; 975 m

SYN. *Lipocarpa barteri* sensu F.D.-O.A.: 384 (1937), non C.B. Clarke

NOTE. Often difficult to distinguish from well-developed specimens of *L. nana*, which has a smaller nutlet and the mucro of the spikelet bract is more often recurved. *Hooper* & *Townsend* 1971 is a mixed collection of the two. It is possible that *L. leucaspis* is a polyploid out of *L. nana*.

9. *Lipocarpus albiceps* Ridl. in Trans. Linn. Soc. ser. 2, 2: 163 (1884); C.B. Clarke in F.T.A. 8: 471 (1902); F.D.-O.A.: 383 (1937); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 25: 22 (1965); Haines & Lye, Sedges & Rushes E. Afr.: 295, fig. 612 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 21, fig. 2 (1989). Types: Angola, Praesidium, *Welwitsch* 6785 (BM, syn.) & Sansamande, *Welwitsch* 6786 (BM, syn.) & Catete, *Welwitsch* 6786 [sic] (BM, COI, syn.)

Perennial with short creeping rhizome; rhizome reddish brown, to 7 mm across, with in red-brown scales; stem round or elliptic in cross-section, 10–75 cm tall, 0.5–3 mm across. Leaves 10–28 cm long but usually much less, 0.5–2 mm wide, flat or inrolled; leaf sheaths reddish near base, glaucous green above, the lower sheaths without a blade, the median with short blades, the upper with long blades. Involucral bracts 2–3, the main one spreading and 2–13 cm long, the other(s) reflexed and shorter, glaucous green. Inflorescence a rather dense head of 1–6 confluent ovoid spikes, the terminal one 3–10(–15) × 3–7 mm, the lateral 2–6 × 1.5–4 mm; spikelet bracts dark reddish brown with creamy midrib and apex, obtrullate, 1.8–3.9 × 0.5–1.1 mm, apiculate; prophyll and glume 1.3–2.2 mm long. Stamens (2–)3, anthers yellow, 0.9–1.4 mm long. Style white, 0.5–1.4 mm long, 3-branched. Nutlets obovoid, 0.8–1.2 × 0.3–0.8 mm, with small style base remnant, rounded-trigonus in cross-section.

UGANDA. Bunyoro District: Kinyandongo, Mar. 1943, *Purseglove* 1329!; Teso District: Soroti, near Arabaka, June 1970, *Lye & Katende* 5698!; Mbale District: near Apoli, July 1971, *Lye & Katende* 6434!

KENYA. Trans-Nzoia District: Kitale–Endebess road km 8, May 1969, *Napper* 2139!

TANZANIA. Mpanda District: Kapapa Camp, Oct. 1959, *Richards* 11618!; Chunya District: near Mbangala, Feb. 1994, *Bidgood et al.* 2258!; Songea District: 12 km N of Songea, Dec. 1955, *Milne-Redhead & Taylor* 7942!

DISTR. U 2, 3; K 3; T 4, 7, 8; from Senegal to Chad and south to Angola and Zimbabwe

HAB. Boggy or seasonally wet grassland; 950–1900 m

SYN. *Hypaelyptum albiceps* (Ridl.) K. Schum. in P.O.A. C: 127 (1895)

10. *Lipocarpus chinensis* (Osbeck) Kern in Blumea suppl. 4: 167 (1958); Napper in J. EA Nat. Hist. Soc. & Nat. Mus. 25: 22, fig. 51 (1965); Haines & Lye in Bot. Notiser 124: 473, fig. 1 (1971); Hooper in F.W.T.A. ed. 2, 3: 328 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 296, fig. 613 (1983); Goetghebeur in Wageningen Agric. Univ. Papers 89(1): 27, fig. A (1989); Lye in Fl. Eth. 6: 489, fig. 212.152 (1997). Type: China, *Osbeck* s.n. (S, holo.)

Tufted perennial; stem round or obscurely angled, 15–80 cm tall, 0.5–2 mm across. Leaves glaucous or pale green, ± flat to inrolled, 10–40 cm long, 1–5 mm wide, margin and midrib scabrid with minute teeth; withered leaves persist around the base. Involucral bracts 2–3(–5), the largest up to 13(–18) cm long. Inflorescence a terminal irregular head with (1–)2–12 subequal ovoid spikelets 3–13 × 1.5–5 mm; spikelet bracts dull white, pale green or yellow-brown, often with green midrib and red dots, obtrullate, 1.5–2.4 × 0.4–0.8 mm, obtuse; prophyll and glume 1.2–2 mm long. Stamens 1–2, anthers 0.8–1 mm long. Style 0.2–0.8 mm long, 3-branched. Nutlets obovoid, 0.8–1.2 × 0.2–0.4 mm, with small style base remnant, trigonus in cross-section, tuberculate.

UGANDA. West Nile District: below Madi, Dec. 1862, *Speke & Grant* 684!; Mengo District: W of Kisubi, Jan. 1969, *Lye & Rwaburindore* 1115!; Masaka District: Lwera, Feb. 1971, *Kabuye* 341!

KENYA. Trans-Nzoia District: Saiwa Swamp National Park, Mar. 1977, *Hooper & Townsend* 1401!; Embu District: Kiang'ombe Hill, July 2005, *Kirika et al.* NMK 575!; Teita District: Tsavo East National Park, 40 km from Voi Gate, W of Lugard Falls, Jan. 1967, *Greenway & Kanuri* 13036!

TANZANIA. Ngara District: Keza, Bushubi, Nov. 1960, *Tanner* 5608a!; Ufipa District: Kigoma road 17 km from Sumbawanga, June 1996, *Faden et al.* 96/232!; Iringa District: Udzungwa Mountain National Park, point 221, Sept. 2001, *Luke et al.* 7874!; Zanzibar: Kama swamp, Sept. 1963, *Faulkner* 3271!

DISTR. U 1, 3, 4; K 3–5, 7; T 1, 2, 4, 6–8; Z; widespread in (sub-)tropical Africa; Asia, Australia
 HAB. Swamps, lake margins, stream-sides, wet ditches, moist depressions, seepage areas; may be locally common or a co-dominant; 0–2000 m

SYN. *Scirpus chinensis* Osbeck, Dagb. Ostind. Resa: 220 (1757)

S. senegalensis Lam., Tabl. Encycl. Méth. Bot. 1: 140 (1791). Type: Senegal, Rousillon s.n. (P-LA, holo.; G, P, iso.)

Hyphaelyptum argenteum Vahl, Enum. 2: 283 (1805), *nom. superfl. pro Scirpus senegalensis* Lam.

Lipocarpa argentea (Vahl) R. Br. in Tuckey, Narr. Exp. Congo app.: 477 (1818); Rendle, Cat. Afr. Pl. Welw. 2: 129 (1899); C.B. Clarke in F.T.A. 8: 469 (1902); F.D.-O.A.: 383 (1937), *nom. superfl.*

Hyphaelyptum senegalense (Lam.) K. Schum. in P.O.A. C: 127 (1895)

Lipocarpa senegalensis (Lam.) Th. & H. Durand, Syll. Fl. Congol.: 619 (1909); F.P.S. 3: 363 (1956)

11. ***Lipocarpa abietina*** *Goetgh.* in Wageningen Agric. Univ. Papers 89(1): 19, fig. 1 (1989). Type: Burundi, Michel 2487 (BR, holo.; K (not found), MO, NY, iso.)

Tufted perennial; roots to 1 mm across; stem 45–80 cm tall, 1.2–1.5 mm across. Leaves to 45 cm long, 1 mm wide, often inrolled. Involucral bracts 1–2, the largest to 4.5 cm long. Inflorescence ovoid to conical, with 4–7 spikes, 2.5–10 × 2–4.5 mm; spikelet bract red-brown with pale apex, broadly obtrullate, 1.5–2.1 × 1.3–1.6 mm, conspicuously shouldered, acuminate; prophyll and glume 1.2–1.5 mm long. Stamens 2, anthers 0.7–0.8 mm long. Style 0.1–0.3 mm long, with 3 branches. Nutlet obovoid, 0.9–1.1 × 0.3–0.5 mm, rounded-trigonus in cross-section.

TANZANIA. Buha District: Musosi [Mchaji] to Bugaga, *Peter* 37325!

DISTR. T 4; widespread from Senegal to Central African Republic, Chad and south to Congo-Kinshasa, Burundi, Angola and Botswana
 HAB. Swamp; 1150–1300 m

SYN. *L. triceps* (Roxb.) Nees var. *latinus* Kük. in F.R. 40, Anhang: 123 (1936). Type: Tanzania, Buha District: Musosi [Mchaji] to Bugaga, *Peter* 37325 (B!, holo.)

12. ***Lipocarpa atra*** *Ridl.* in Trans. Linn. Soc. ser. 2, 2: 162 (1884); C.B. Clarke in F.T.A. 8: 472 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 297, fig. 615 (1983); *Goetghebeur* in Wageningen Agric. Univ. Papers 89(1): 24, fig. 4 (1989). Types: Angola, Huilla, *Welwitsch* 6961 or 6981 (Haines & Lye) (BM, syn.) & Lake Ivantala, *Welwitsch* s.n. (BM, syn.)

Perennial, shortly rhizomatous or tufted; rhizome short, rarely elongate, roots reddish, to 1 mm in diameter; stem almost terete, 10–65 cm tall, 1–2 mm across, glabrous. Leaves from near the base only, 3–30 cm long, 1–2 mm wide, often inrolled; sheaths pinkish when young, dark brown near base later. Involucral bracts 1–3, the largest to 5 cm long. Inflorescence a terminal head of 3–12 ovoid to cylindrical-conical spikes, 3–13 × 2–4 mm; spikelet bracts dark red-brown with pale green midrib and tip, obovate to obtrullate, 1.2–2 × 0.6–1 mm, acuminate with a 0.3–0.5 mm triangular tip; prophyll and glume 1–1.2 mm long. Stamens 1–2, anthers yellow, 0.7–0.8 mm long. Style very short, with 3 branches. Nutlet reddish brown, obovoid, 0.6–1 × 0.2–0.5 mm, with small style base remnant, rounded-trigonus in cross-section.

TANZANIA. Kilosa District: Selous, Msolwa camp, Feb. 1977, *Vollesen* MRC 4454!; Songea District: Kimara–Mpaka stream, Jan. 1956, *Milne-Redhead* & *Taylor* 8149! & 6 km ENE of Kigonsera, Dec. 1973, *Mhoro* 1803!

DISTR. T 6, 8; Congo-Kinshasa, Angola, Zambia, Mozambique, Zimbabwe
 HAB. Boggy grassland, seepage in woodland; 250–1100 m

26. RHYNCHOSPORA

Vahl in Enum. Pl. 2: 229 (1805)

Haplostylis Nees in Linnaea, 9: 295 (1834) & in Edinburgh New Philos. J. 17(34): 265 (1834)

Annuals or perennials, rhizomatous or with a poorly developed rootsystem. Culms rounded to trigonous. Leaves with sheaths closed; ligule 0, or very inconspicuous (*R. gracillima*). Involucral bracts leaf-like or short. Inflorescence capitate, simple, corymbose or paniculate, then with clusters of spikelets on peduncles emerging from the axils of the leaves up the culm; clusters of spikelets often corymbose, few to many per cluster. Spikelets sessile or pedicellate; glumes spirally arranged or distichous, imbricate, few or many (*R. candida*); lower 2–3 glumes empty (sterile) and small, the remainder gradually larger, the uppermost glume often empty. Flowers either all bisexual, the upper ones not maturing the nutlet, or lower 1–few bisexual and upper ones staminate, or unisexual with the lowest pistillate and upper one(s) staminate. Perianth segments 0–6, bristle-like, upwardly scabrid. Stamens 2–3; filaments flattened. Style unbranched, slightly bifid or with 2 long branches. Nutlets biconvex, style base persistent, with or without pedicel.

250 species, especially in tropical South and Meso-America.

- | | |
|---|------------------------------|
| 1. Spikelets with many glumes, white | 1. <i>R. candida</i> |
| Spikelets with few to several glumes, golden to brown | 2 |
| 2. Plant a slender annual; inflorescence capitate with a single head | 2. <i>R. rubra</i> |
| Plant slender or robust, annual or perennial; inflorescence with several heads, paniculate with dense clusters of spikelets or with few to many-stalked spikelets | 3 |
| 3. Inflorescence capitate or simple, with several heads, sessile and at the end of primary branches | 3. <i>R. holoschoenoides</i> |
| Inflorescence paniculate | 4 |
| 4. Robust perennial; leaf blade 9–18 mm wide; inflorescence with several dense corymbs, many spikelets per corymb; style unbranched | 4. <i>R. corymbosa</i> |
| Perennial or annual, slender; leaf blade 0.2–5 mm wide; inflorescence paniculate, or when appearing corymbose only with a few spikelets; style with 2 branches | 5 |
| 5. Perianth bristles present | 6 |
| Perianth bristles absent | 7 |
| 6. Stem rounded, glabrous; spikelets 5–8(–12) mm long; perianth bristles equal of length, 3–3.5 mm long (longer than the nutlet) | 5. <i>R. angolensis</i> |
| Stem trigonous, often ± scabrid; spikelets 4–5 mm long; perianth bristles unequal of length, 0.6–1.5 mm long (shorter than the nutlet) | 6. <i>R. brownii</i> |
| 7. Annual, very small and slender, up to 20 cm high; nutlets smooth | 7. <i>R. brevirostris</i> |
| Annual, slender or perennial; nutlets not smooth | 8 |
| 8. Spikelets sessile in dense clusters; nutlet strongly rugose | 8. <i>R. perrieri</i> |
| Spikelets stalked, clusters less dense; nutlet strongly transversely wavy to finely rugose | 9 |
| 9. Leaves 1.5–5 mm wide, flat | 9. <i>R. eximia</i> |
| Leaves up to 0.3–1.2 mm wide, rolled in to canaliculate | 10. <i>R. gracillima</i> |

1. **Rhynchospora candida** (Nees) Boeck. in *Linnaea* 37: 605 (1873); C.B. Clarke in *F.T.A.* 8: 481 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 319 (1983). Type: Guyana, *Schomburgk* 685 (B†, holo.)

Perennial, leafy, culms solitary (rarely 2–3 together), on tough creeping stolons; culms rounded, often trigonous at the base of the inflorescence, with indistinct longitudinal ridges, 20–82 cm long, 0.5–1.5 mm wide, basally swollen and covered with stiff scales and old leaf sheaths, glabrous or sometimes with long transparent hairs. Leaves spread along the culm, up to 40 cm long; leaf sheath pale green to brown, 1.5–8 cm long; leaf blade linear, flat or v-shaped, stiff, 7–35 cm long, 2.1–4.5 mm wide, glabrous or the margins and midrib scabrid, both surfaces with long transparent hairs. Involucral bract 1, leaf-like, 1–3.5 cm long, 0.9–1.8 mm wide, with long transparent hairs. Inflorescence simple to compound, corymbose, 2–6 primary branches, 0.5–2.7 cm long; spikelets solitary, at the end of primary or secondary branches, ovoid, 5.5–12 mm long, 3–5.5 mm wide, with up to 50 glumes; glumes white, sometimes with brown dots at base; lower 6–8 glumes sterile, becoming successively larger upwards; upper 30–50 glumes (may appear to be much less when young spikelets are studied) fertile, with bisexual flowers, closely imbricate, ovate and concave, 4.6–6.4 mm long, 2–4.3 mm wide, with midrib ending in a short acumen, glabrous; spikelet axis with round projections, the glume bases intricately folded between them. Perianth absent. Stamens 3: filaments 3.8–5.3 mm long; anthers 2.1–3 mm long. Style with 2 branches. Nutlet whitish to yellowish brown (darker brown when immature), rounded, 1.4–1.7 mm long, 1.3–2.1 mm wide, transversely wavy, with a large overhanging spongy crown, whitish, 0.6–1 mm long, somewhat broader than the nutlet itself; not all nutlets of a single spikelet develop.

UGANDA. Masaka District: Bukakata Old Post, 8 Dec. 1951, *Norman* 77! & Mukoka, 17 May 1966, *Haines* 77! & Bugala Island, Kalangala, 26 Feb. 1945, *Greenway & Thomas* 7191!

TANZANIA. Uzaramo District: Fungoni Pond, 26 km SE of Dar es Salaam, 8 Sept. 1977, *Wingfield* 4118!; Mufindi District: Soa Hill–Madibiria track, Lugoda area, 19 km from turn off on main Iringa–Mbeya road, 12 June 1996, *Faden et al.* 96/165a!; Songea District: ± 11 km W of Songea in Ulamboni Valley, 31 Dec. 1955, *Milne-Redhead & Taylor* 8011!

DISTR. U 4; T 1, 4, 6–8; P (fide Luke) widespread in West and tropical Africa; S America

HAB. Seasonally wet to permanently flooded grasslands, lake shore and swamps; sea-level up to 1830 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Psilocarya candida* Nees in *Mart. Fl. Bras.* 2 (1): 117 (1842)

NOTE. This is an easily recognized species due to its solitary white spikelets. With its many glumes per spikelet it is rare among *Rhynchospora*, a genus often described as few-flowered.

2. **Rhynchospora rubra** (Lour.) Makino in *Botanical Magazine* (Tokyo) 17: 180, t. VII, figs 1C & B (1903)

Culms 25–100 cm high, 0.5–2.5 mm in diameter. Leaves basal, 2–3(–5) mm wide. Involucral bracts 2–8, the lowermost to 7.5 cm long. Inflorescence globose, dense, 1–1.5 cm across; spikelets 2–4-flowered, 2.2–10 mm long, compressed; lower flower female, upper one(s) male; glumes distichous, 6–8, red-brown, to 6 × 2 mm, keeled, acute or mucronulate, glabrous; bristles in female flower 3–6, thin, whitish, often ciliate or shortly plumose at base, usually shorter than nut, in the lowest male flower 0–3, absent from other flowers. Stamens (2–)3; anthers 1.8–3 mm long. Style shortly 2-fid; style base shortly pyramidal, broader than high, suddenly dilated at base, ± 0.5 mm wide. Nutlet dark red-brown, broadly obovoid, 1.2–1.8 × 1–1.5 mm, laterally compressed, minutely reticulate, hispid at apex.

SYN. *Schoenus ruber* Lour., *Fl. Cochinch.*: 52 (1790)

subsp. **africana** *J. Raynal* in *Adansonia* ser. 2, 7: 323 (1967); Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: 314 (1983). Type: Tanzania, Rufiji District: Mafia Island, *FitzGerald* 5217 (Kl, holo.)

Annual, slender, up to 60 cm high; culms 14–58 cm long, 0.5–0.6 mm wide, glabrous. Leaves up to 25 cm long; leaf sheath (pale) brown, 1.5–4 cm long; leaf blade linear 8.5–20 cm long, 1.1–1.7 mm wide, apex acuminate, glabrous, sometimes scabrid on the margins and apex. Involucral bracts 2–5, the lowermost 2–5.5 cm long, densely ciliate at the base. Inflorescence capitate, head dense cluster of spikes; spikelets many per spike, ovoid-lanceolate, 2.2–4.5 mm long, 0.7–1 mm wide, axis straight; glumes 5–6 per spikelet, the lowermost non-flower bearing glumes 0.9–1.5 mm long, flower bearing glumes 2.1–3.8 mm long, 1.4–1.9 mm wide, apex acute to acuminate. Perianth bristles absent or 3–6, with hairs near the base. Stamens 2; filaments 2.1–3.6 mm long; anthers 1.5–1.8 mm long. Style very long, unbranched, protruding from the spikelet. Nutlet brown, broadly ovoid, 1.5–1.8 mm long, 0.9–1.2 mm wide, transversely undulate and scabrid at least near the apex, crown on top shortly pyramidal, much broader than high.

TANZANIA. Uzaramo District; Fungoni pond, 26 km SE of Dar es Salaam, 8 Sept. 1977, *Wingfield* 4122! & 17 km SE of Dar es Salaam near Mgunvia River, 9 Sept. 1977, *Wingfield* 4143!; Rufiji District: Mafia Island, Irumbe, Liwali, 16 Aug. 1937, *Greenway* 5119!; Zanzibar, Apr. 1874, *Hildebrandt* 1275!

DISTR. T 6; Z; widespread in West Africa, Congo Brazzaville, Mozambique, South Africa

HAB. In brackish or freshwater swamps or seasonally swampy grasslands; sea-level up to 50 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Rhynchospora minor* Nelmes in K.B. 11 (1956): 533 (1957). Type: Tanzania, Rufiji District: Mafia Is., Dundani, *FitzGerald* 5217 (Kl, holo.; EA, iso.)

NOTE. This species is easily recognized by its slender habit and the capitate inflorescence.

3. **Rhynchospora holoschoenoides** (*Rich.*) *Herter* in *Rev. Sudamer. Bot.* 9: 157 (1953); Lye in Haines & Lye, *Sedges & Rushes E. Afr.*: 314 (1983). Type: French Guiana, Cayenne, *Le Blond* s.n. (P, holo.)

Perennial, 40–130 cm high, base rounded, covered by fibres formed from the older leaf-bases, set at the end of a short curving scaly stolon, and emitting new thick stolons; culms trigonous to triquetrous, 1.7–3.7 mm wide, glabrous. Leaves up to 70 cm long; leaf sheath pale green to brownish, 2–12 cm long; leaf blade linear, stiff and ascending but curved at the apex, 26–63 cm long, 2.5–7.4 mm wide, apex acuminate, glabrous or sometimes scabrid on the margins, midrib and apex. Involucral bract 1, leaf-like, 3–7 cm long, 1–3.5 mm wide, scabrid. Inflorescence capitate or simple, primary branches 0–5, 1–15.5 cm long; spikelets in dense globose clusters at the end of the primary branches, at least one cluster sessile, lanceolate, (3–)5–7 mm long, 1.2–2 mm wide, \pm 5 glumes per spikelet; glumes 1 and 2 sterile, 3 subtending a bisexual flower and 4 and 5 male flowers, glumes golden brown, elliptic-ovate, 3.2–5.2 mm long, 1.6–2.6 mm wide, apex acute to acuminate, glabrous. Perianth of 6 equal bristles, 2.2–3 mm long. Stamens 3; filaments 4.5–5 mm long; anthers 1.2–2.5 mm long. Style unbranched or minutely 2-branched. Nutlet, brown, obovoid, 2.1–2.5 mm long, 1.2–1.5 mm wide, bordered by thickened rims running into the shoulders, minutely punctate, crown on top of the nutlet yellowish, lanceolate, 1.3–1.5 mm long. Fig. 53, p. 359.

TANZANIA. Manyoni District: Chaya Lake, S of Itigi–Tabora track, 16 km W of Kazikazi, 2 July 1996, *Faden et al.* 96/523!; Rufiji District: Mafia Island, Mwakuni, 7 Aug. 1937, *Greenway* 5019!; Mbeya District: Mbeya–Iringa Road, \pm 100 km from Iringa (NE of Jane's Corner), 21 Jan. 1970, *Wingfield* 890!

DISTR. T 5–7; Senegal, Guinea, Ivory Coast, Gabon, Zambia, Botswana, South Africa

HAB. Permanent swamps and ponds; sea-level up to 1800 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Schoenus cyperoides* Sw. in *Prodr.*: 19 (1788), *nom. illegit.*

S. holoschoenoides L. Richard in *Act. Soc. Hist. Nat. Paris* 1:106 (1792), as *Schaenus holoschaenoides*

Rhynchospora cyperoides Mart. in *Denkschr. Konigl. Akad. Wiss. Munchen* 6: 149 (1820); C.B.

Clarke in *F.T.A.* 8: 479 (1902). Type unclear

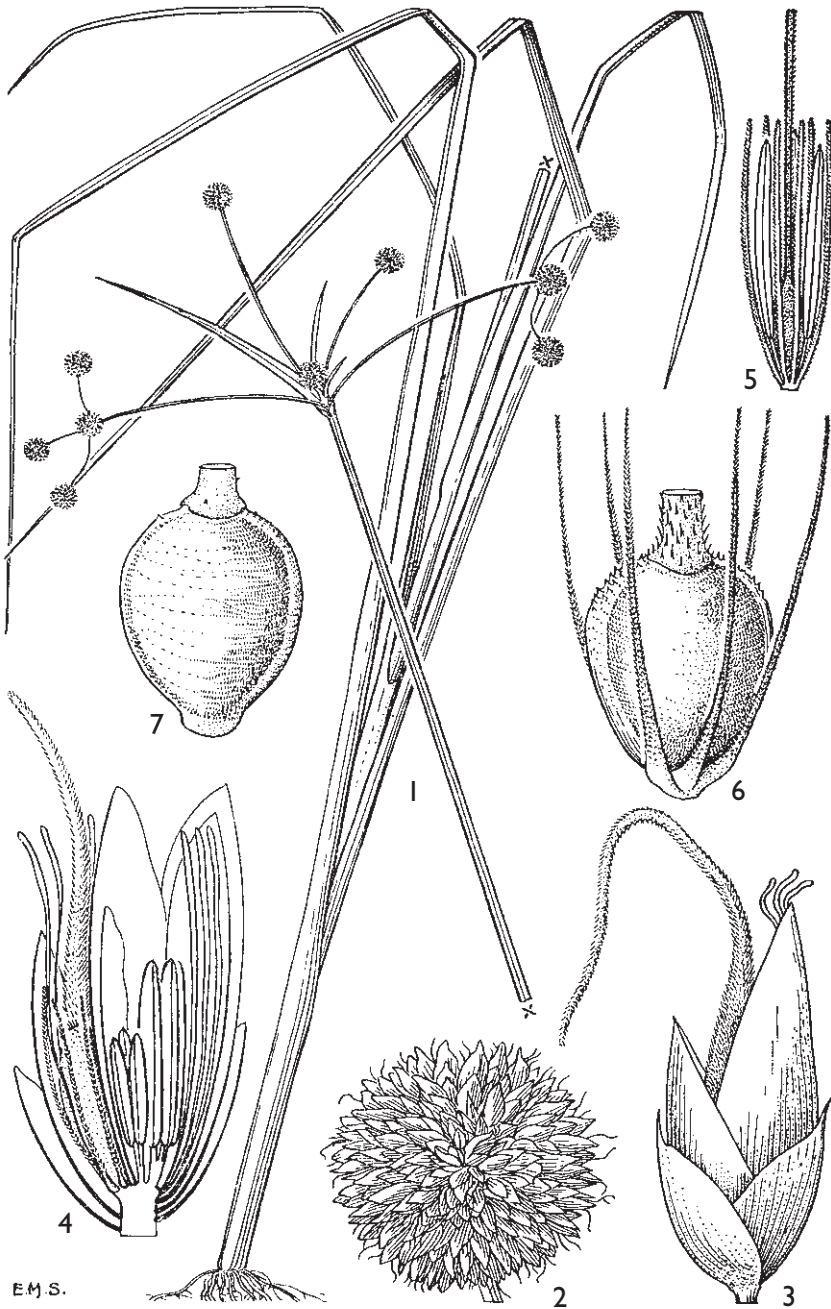


FIG. 53. *RHYNCHOSPORA HOLOSCHOENOIDES* — 1, habit, $\times 4$; 2, head of spikelets, $\times 4$; 3, spikelet, $\times 12$; 4, spikelet longitudinal section, $\times 12$; 5, young flower, $\times 12$; 6, nutlet with bristles, $\times 18$. 7, nutlet, $\times 18$. 1–4 from *Greenway* 5019, 5–6 from *Linder* 1471, 7 from *Deighton* 4383. From *Flora of West Tropical Africa* 3, t. 410. Drawn by Margaret Stones.

NOTE. *R. holoschoenoides* shares the globose shaped spikes with *R. rubra* subsp. *africana*, but always has at least some spikes on primary branches. *R. rubra* always has a capitate inflorescence without any branched spikes.

4. ***Rhynchospora corymbosa*** (L.) Britton in Trans. New York Acad. Sci. 11: 84 (1892); Lye in Haines & Lye, Sedges & Rushes E. Afr.: 313 (1983); Lye in Fl. Eth. 6: 493, fig. 212.159 (1997). Type: "Habitat in India"; lectotype: Herb. Linn. No. 71.48 (LINN), chosen by Gordon-Gray in *Strelitzia* 2: 150 (1995)

Robust perennial, leafy, up to 2 m high, with a thick creeping rhizome, at the base covered with closely imbricate tough leaf bases, split by scaly buds emerging forming new culms; culms trigonous, longitudinally grooved, 45–150 cm long, 0.4–1.2 cm wide, less wide near the inflorescence, glabrous. Leaves many, densely crowded; leaf sheath pale yellowish-green to brown, 5.5–15 cm long; leaf blade tough, linear, 45–96 cm long, triangular in dissection, 0.9–1.8 mm wide, apex acuminate, margins, midrib and apex (minutely) scabrid. Inflorescence consisting of one terminal and several lateral corymbs; leaves subtending the primary branches 20–56 cm long, 0.8–1.6 cm wide; primary branches several, 2.5–11 cm long, scabrid near the apex, ending in a corymb; spikelets in clusters at secondary branches, lanceolate, 7.5–10 mm long, 0.7–2.5 mm wide; 6–7 glumes per spikelet, orange-brown to reddish-brown, the basal ones empty, ovate, 2.2–5.2 mm long, 1.3–3 mm wide, apex awned, the upper 2 glumes with flowers, one bisexual flower and 1 male flower above, elliptic-lanceolate, tightly rolled in, 6–8.5 mm long, 2.5–3.8 mm wide, apex acuminate to awned, glabrous. Perianth bristles present, 6, subequal, 4–6.5 mm long. Stamens 3: filaments 4–9 mm long; anthers 1.8–3.5 mm long, apex apiculate. Style unbranched, long, projecting from the spikelet apex. Nutlet brown, obovoid, 2–4.4 mm long, 1.7–2.3 mm wide, minutely papillose, crown on top whitish, long-conical with one longitudinal groove on each of the two flattened sides, 3–6 mm long.

UGANDA. Mengo District: Bukasa, Sese, 26 Feb. 1933, *Thomas* 895! & Kome Island, Lake Victoria, 24 Sept. 1967, *Haines* 4263! & Namanve Plantation, 8 July 1953, *Lind* 174!

TANZANIA. Bukoba District: Bukoba, Aug. 1931, *Haarer* 2102!; Uzaramo District: Minala Lake near Kisarawe, Pugu Hills, 27 Nov. 1968, *Harris & Walker* 2628!; Songea District: Lukila Sivet, 21 Sept. 1956, *Semsei* 2487!; Zanzibar, Kisimbazi, 12 Oct. 1961, *Faulkner* 2925 & 3431!

DISTR. U 4; T 1, 4, 6–8; Z: widespread in West, tropical and southern Africa; India

HAB. Lake shores, riverbanks, shallow pools, swampy areas; sea-level to 1850 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat

SYN. *Scirpus corymbosus* L. in Cent. Pl. 2: 7; Amoen. Acad. 4: 303 (1760)

Rhynchospora aurea Vahl, Enum. Pl. 2: 229 (1805); C.B. Clarke in F.T.A. 8: 480 (1902); *nomen novum* for *Scirpus corymbosus*

NOTE. *R. corymbosa* looks like *Cladium mariscus* subsp. *jamaicense* in its coarse habit and wide and scabrid leaves. The spikelets in *C. mariscus* are much shorter though, and the branching pattern in the inflorescence is different.

5. ***Rhynchospora angolensis*** *Turrill* in K.B. 1914 (3): 136 (1914); Haines & Lye, Sedges & Rushes E. Afr.: 318 (1983). Type: Angola, Benguella, country of the Ganguellas and Ambuellas, *Gossweiler* 3268 (K!, holo. & iso.)

Perennial, slender, leafy, up to 105 cm high, with a short rhizome; culms many, crowded, rounded with longitudinal ridges, 24–90 cm long, 0.5–0.9 mm wide, glabrous, their bases covered with scales and old leaf bases split by the new shoots and some desintegrating into fibres. Leaves up to 40 cm; leaf sheath brown, 2.5–7.5 cm long; leaf blade linear, stiff, erect, flat or triangular, 22–34 cm long, 0.6–1.8 mm wide, glabrous, the margins and apex sometimes scabrid, apex acuminate. Inflorescence a slender panicle, 13–28 cm long, with main branches protruding from the upper leaf sheaths and ending in a few usually stalked and solitary spikelets; leaves subtending the primary branches; sheath 1.5–3.2 cm long, blade

1.5–5 cm long, 0.6–1 mm wide; spikelets ovoid, acute, 5–8(–12) mm long, 1.8–3.5(–5) mm wide; glumes orange-brown to brown, the lower 3–4 glumes sterile, upper 3–8 glumes frequently bisexual and producing nutlets, (broadly) ovate, 3–4.4 mm long, 2.5–3.8 mm wide, glabrous, keel protruding into an awned apex. Perianth of 6 equal bristles, 3–3.5 mm long. Stamens 2: filaments 2.1–4.5 mm long, becoming stiff and bristle-like in fruit; anthers \pm 1.3 mm long. Style with 2 long branches. Nutlet orange-brown to brown, ellipsoid, the adaxial side flattened, 1.7–3.1 mm long (including the 0.2–0.5 mm long pedicel), 1.2–1.9 mm wide, faintly transversely wavy, with many transparent hairs at its base, crown on top of the nutlet flattened-conical, 0.7–1.2 mm long, whitish.

UGANDA. Masaka District: W Lake Nabugabo, Aug. 1935, *Chandler* 1308! & Lake Nabugabo, 6 May 1966, *Haines* 127! & 1–2 km N of Bale, Lake Nabugabo, 1 Feb. 1970, *Lye & Haines* 5016!
TANZANIA. Bukoba District: June 1931, *Haarer* 2023!; Tunduru District: \pm 1.5 km E of R. Mawese near Pucha-Pucha, 19 Dec. 1955, *Milne-Redhead & Taylor* 7818!; Songea District: 11 km W of Songea, 11 Feb. 1956, *Milne-Redhead & Taylor* 8666!

DISTR. U 4; T 1, 8; Cameroon, Central African Republic, Congo-Kinshasa, Angola, Zambia, Mozambique

HAB. Swampy and boggy grassland; 450–1150 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habit.

SYN. *Rhynchospora africana* Cherm. in Arch. Bot., Caen, 4, Mem. 7: 44 (1931). Types: Central African Republic, *Tisserant* 1949, 2311, 4116 (P, syn.)

NOTE. *R. angolensis* is closely related to *R. brownii*, but it is easily distinguished by its glabrous, rounded culms, larger spikelets and longer perianth bristles.

6. ***Rhynchospora brownii* Roem. & Schult.** in Syst. Veg. 2: 86 (1817); *Lye* in *Haines & Lye, Sedges & Rushes E. Afr.*: 317 (1983). Type: no specimen or collector mentioned, “Nova Hollandia” = New Zealand (ubi?)

Perennial, slender, leafy, up to 80 cm high, with a short rhizome; culms trigonous with shallow longitudinal ridges, 30–70 cm long, 0.5–1.5 mm wide, often \pm scabrid on some of the ridges, the bases covered with scales and old leaf bases. Leaves up to 60 cm; leaf sheath pale green to brown, 1.5–10 cm long; leaf blade stiff, erect, linear, triangular in section, 12–50 cm long, 1–2 mm wide, flat or folded, the margins of young leaves sometimes scabrid, apex acuminate, minutely scabrid. Inflorescence a slender panicle, 6–21 cm long, with main branches protruding from the upper leaf sheaths and ending in small corymb-like clusters; leaves subtending the primary branches with sheath 0.7–3.2 cm long, blade 3–12.5 cm long, 1.1–2 mm wide; spikelets 2–9 per cluster, ovoid, 4–5 mm long, 1–2 mm wide, acute; glumes brown, the lower 3–5 glumes sterile, 0.8–2.2 mm long, 0.4–1.3 mm wide, upper 3–8 glumes carrying 1–3 bisexual flowers, each flower enclosed by its own glume and the glume above, (broadly) ovate, 2.7–3.7 mm long, 1.5–3 mm wide, glabrous, keel protruding into an awned apex. Perianth of 6 unequal bristles, 0.6–1.5 mm long. Stamens 2(–3): filaments (1.4–)2.3–3.4 mm long; anthers (0.9–)1.7–1.9 mm long. Style with 2 long branches, almost split to the base. Nutlet pale yellowish-brown to brown, with or without brownish dots, often shiny, ellipsoid to almost rounded, the adaxial side flattened, 1.4–1.7 mm long (excluding the 0.1–0.3 mm long pedicel), 1.3–1.7 mm wide, faintly transversely wavy, crown on top of the nutlet conical, 0.9–1.4 mm long, whitish.

UGANDA. Kigezi District: Kashambya Valley, near Mbali, 24 June 1967, *Haines* 235! & Kashambya Swamp, 1.6 km N of Mpalo, 6 Sept. 1952, *Norman* 157! & Kampala, King’s Lake, 7 Nov. 1935, *Chandler* 75!

KENYA. Mt. Kenya, Rumiku swamp, 2 Jan. 1997, *Wooller* s.n.!

TANZANIA. Bukoba District: Kikaramulo Road, 5 km, Aug. 1931, *Haarer* 2063!; Morogoro District: Uluguru Mts, Lukwangulu Plateau, 19 Sept. 1970, *Thulin & Mhoro* 1058!; Iringa District: Great North Road \pm 90 km SW of Iringa near Mafinga [Sao Hill], 18 Mar. 1975, *Hooper & Townsend* 891!

DISTR. U 2; K 4; T 1, 3, 4, 6–8; Ivory Coast, Nigeria, Cameroon, Congo-Kinshasa, Rwanda, Burundi, Ethiopia, Zambia, Malawi, Mozambique, Zimbabwe, South Africa; Asia and Pacific
 HAB. In grasslands, bogs, swamps, stream banks; 1200–2500 m
 CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habit.

SYN. *Rhynchospora glauca sensu* C.B. Clarke in F.T.A. 8: 482 (1912), *non* Vahl

NOTE. This species is very similar to *R. angolensis* but has a trigonous culm, which is sometimes scabrid, and has smaller spikelets and shorter perianth bristles shorter and unequal in length.

7. ***Rhynchospora brevirostris*** Griseb. in Cat. Pl. Cub. 246 (1866); Lye in Haines & Lye, Sedges & Rushes E. Afr.: 316 (1983). Type: Cuba W, *Wright* 3431 (GOET, holo.)

Annual, slender, with minute rootsystem, up to 20 cm high; culms trigonous, 6–11 cm long, \pm 0.5 mm wide, glabrous. Leaves up to 12 cm long; leaf sheaths green to brown, 0.7–2.5 cm long; leaf blade linear, 4.2–10.2 cm long, 0.3–1.2 mm wide, glabrous, apex acuminate. Inflorescence a slender panicle; leaves subtending the primary branches 2–3.3 cm long, 0.3–0.7 mm wide; spikelets 2–4 per cluster, spaced out over the panicle, lanceolate-ovoid, 3.8–4.3 mm long, 1–1.4 mm wide; glumes \pm 7 per spikelet, successively larger towards the apex, golden brown, ovate, 2.3–3.7 mm long, 1.2–1.4 mm wide, keel one-veined, ending in an awn, awn scabrid. Perianth segments absent. Stamens 2; filaments \pm 2 mm long; anthers \pm 0.4–0.5 mm long. Style with 2 branches. Nutlet golden with a grey centre to grey-black, shiny, broadly ovoid, 1.5–1.8 mm long, 1–1.3 mm wide, smooth, style-base depressed conic, narrower than the nutlet.

TANZANIA. Songea District: \pm 6.5 km W of Songea, 3 May 1956, *Milne-Redhead & Taylor* 9983! & Kwamponjore Valley \pm 9.5 km SW of Songea, *Milne-Redhead & Taylor* 10839!

DISTR. T 8; Senegal, Guinea, Mali, Nigeria, Cameroon, Congo-Kinshasa, Zambia, Botswana; tropical America

HAB. Seasonally wet soil, often on laterite outcrops; 950–1000 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habit.

SYN. *Rhynchospora barteri* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr 5: 653 (1894), *nom. nud.* & F.T.A. 8: 482 (1902). Type: Nigeria, Nupe, *Barter* 1010 (K, holo.)

NOTE. A very slender and small annual. Superficially it looks like *R. perrieri*, but is recognized by its smooth nutlet with small inconspicuous style-base, and slightly smaller spikelets.

8. ***Rhynchospora perrieri*** Cherm. in Bull. Soc. Bot. Fr. 69: 721 (1923); Haines & Lye, Sedges & Rushes E. Afr.: 319 (1983). Type: Madagascar, Andringitra Mts, *Perrier de la Bâthie* 14555 (P, holo.)

Annual, slender, rootsystem sparse, up to 45 cm high; culms trigonous, 2–22 cm long, 0.3–1 mm wide, glabrous. Leaves up to 40 cm long; leaf sheath brownish-green, 1.8–4 cm long; leaf blade linear, 7–38 cm long, 0.6–1.8 mm wide, apex acuminate, glabrous to scabrid. Inflorescence a slender panicle, with 3–4 clusters of spikelets; leaves subtending the primary branches with sheath 1–2 cm long, blade 2.3–30 cm long; spikelets 1–10 per cluster, sessile, lanceolate-ovoid, 3.5–5 mm long, 0.7–1.5 mm wide, 1–2-flowered; glumes 4–5 per spikelet, brown, ovate; non-flower bearing glumes 2.1–2.6 mm long, 1.2–1.5 mm wide; flower-bearing glume 3–4.4 mm long, 1.4–2 mm wide, glabrous, keel acute, 1-veined, apex long-acuminate to awned. Perianth bristles absent. Stamens 2; filaments 2.8–4 mm long; anthers 1.7–1.8 mm long. Style with 2 long branches. Nutlet (whitish-)grey, obovoid, 1.1–1.5 mm long, 1.2–1.4 mm wide, strongly transversely rugose, style-base decurrent, 0.2–0.7 mm long.

KENYA. Kwale District: Shimba Hills, Matuga to Kwale, 17 Nov. 1961, *Bogdan* 5347! & Buda Forest, 5 Oct. 1999, *Luke & Luke* 5992!

TANZANIA. Manyoni District: 13 km from Manyoni on Singida Road, 3 July 1996, *Faden et al.* 96/5311; Uzaramo District: 17 km WSW of Dar es Salaam to Kisarawe road, 2 km beyond Congolamboto, 8 May 1971, *Wingfield* 15571; Zanzibar: Kama Swamp, 11 Sept. 1963, *Faulkner* 32731

DISTR. **K** 7; **T** 5–8; **Z**; Senegal, Guinea, Burkina Faso, Sierra Leone, Liberia, Central African Republic, Congo-Kinshasa, Zambia, Botswana, Swaziland, South Africa; Madagascar

HAB. Swamp areas, roadside ditches, alongside streams and in damp places; sea-level up to 1700 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habit.

NOTE. This species is easy to recognize based on its characteristic nutlet, with its strong transversely wrinkled, rugose surface and its decurrent style-base.

9. *Rhynchospora eximia* (Nees) Boeck. in *Linnaea* 37: 601 (1873); Haines & Lye, *Sedges & Rushes E. Afr.*: 316 (1983). Type: Mexico, Hacienda de la Laguna, *Schiede* 864 (B, syn.) & Panama, *Seemann* s.n. (B, syn.)

Annual, up to 63 cm high; culms robust, rounded to trigonous, 18–34 cm long, 0.7–1.2 mm wide, with prominent longitudinal ridges, glabrous. Leaves up to 25 cm long; leaf sheath 1.5–7 cm long, brownish-green; leaf blade linear, flat, 9–21 cm long, 1.5–5 mm wide, apex acuminate, glabrous to scabrid. Inflorescence a panicle; leaves subtending the primary branches as basal leaves; spikelets pedicellate, solitary or in clusters of 2–3 per branch, ovoid, 6–10 mm long, 2.4–3.5 mm wide, with many glumes, many-flowered; glumes brown, ovate, 4–4.5 mm long, 1.7–2.3 mm wide, glabrous, keel acute, 1-veined, apex awned. Perianth bristles absent. Stamens 2; filaments 3.2–4.5 mm long. Style with 2 branches. Nutlet grey, orbicular, 1–1.4 mm long, 1.1–1.4 mm wide, strongly transversely wrinkled to transversely rugose, style-base decurrent, greyish-white, 0.2–0.4 mm long, pedicel 0.1–0.3 mm long.

TANZANIA. Mbeya District: Kyela, Itungi Port road, 16 km from junction on Mbeya–Malawi road, 28 June 1996, *Faden et al.* 96/4661

DISTR. **T** 7; Senegal, Guinea, Sierra Leone, Burkina Faso, Mali, Ivory Coast, Ghana, Nigeria, Cameroon, Central African Republic, Malawi; tropical America

HAB. Open marshy area of well-grazed grassland; 500 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habit.

SYN. *Spermodon eximius* Nees in *Seemann, Bot. Voy. Herald*: 222 (1854)

NOTE. There is only one collection known from the Flora area.

10. *Rhynchospora gracillima* *Thwaites*, *Enum. Pl. Zeyl.*: 435 (1864). Type: Sri Lanka, south, C.P. 3818 (ubi?)

Annual or perennial, with stems crowded on a short rhizome, old dead stems frequently persistent, up to 45 cm high; culms rounded to trigonous, 14–21 cm long, 0.2–1 mm wide, with slight longitudinal ridges, glabrous, basally with very few scales. Leaves up to 30 cm long; leaf sheath greenish-brown, 2–5 cm long; leaf blade linear, canaliculate, 13–26 cm long, 0.3–1.2 mm wide, ligule very thin and translucent, sometimes a distinct ridge, apex acuminate, minutely scabrid. Inflorescence a panicle, spread along the culm; leaves subtending the primary branches with sheath 1.5–2 cm long, blade 7–12 cm long, 0.3–0.8 cm wide; primary branches 2.5–8 cm long; spikelets in clusters at the end of primary branches, pedicellate, 1–5 per cluster, (ovoid-) lanceolate, 4.5–10 mm long, 0.8–2.2 mm wide, axis zigzag; glumes 6–7 per spikelet, brown, ovate, non-flower bearing glumes 2–3, 2.5–3.3 mm long, 1.4–1.8 mm wide, flower-bearing glumes 3–4, bisexual, 3.2–5.5 mm long, 1.9–3 mm wide; glabrous, keel acute, 1-veined, apex awned. Perianth absent. Stamens 2; filaments 3.3–4 mm long; anthers 1.6–1.8 mm long. Style with 2 branches. Nutlet white(-grey), broadly oblong-quadrangular, sometimes ± triangular, 0.9–1.8 mm long, 1–1.6 mm wide, transversely wavy, style base grey to almost black, 0.2–0.4 mm long, pedicel 0.1–0.2 mm long.

subsp. **subquadrata** (Cherm.) J. Raynal in *Adansonia*, ser. 2, 7: 321 (1967); Haines & Lye, *Sedges & Rushes E. Afr.*: 315 (1983) Type: Madagascar, Firingalava, *Perrier* 920; Toamasina [Tamatave], *Viguiier & Humbert* 397 (P, syn.)

UGANDA. Masaka District: Bukoto County, Lake Kayanja swamp, 27 July 1971, *Katende* 1178! & Nabugabo, near Masaba, 6 May 1966, *Haines* 96! & Kalungu County, 0.5 km S of West Mengo–Masaka border, 13 Dec. 1970, *Lye* 5849!

TANZANIA. Bukoba District: Maruku Road, Aug. 1931, *Haaver* 2092!; Ufipa District: ± 1.5 km S of Sumbawanga on Mbeya road, 4 June 1980, *Hooper & Townsend* 1837!; Songea District: ± 11 km W of Songea, 11 Feb. 1956, *Milne-Redhead & Taylor* 8669!

DISTR. U 4; T 1, 4, 8; Burkina Faso, Mali, Cameroon, Central African Republic, Congo-Brazzaville, Congo-Kinshasa, Ethiopia, Zambia, Zimbabwe, South Africa; Madagascar

HAB. Seasonally wet grasslands, bogs, swamp edges and depressions; 950–1250 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Rhynchospora subquadrata* Cherm. in *Bull. Soc. Bot. Fr.* 69: 720 (1922 publ. 1923); Lye in *Fl. Eth.* 6: 493 (1997)

NOTE. This delicate annual is recognizable by its remarkable almost quadrangular nutlet. Although the style base is persistent as in all other species, it is very short compared to many other species from the Flora area.

27. CLADIUM

P. Browne in *Civ. Nat. Hist. Jamaica*: 114 (1756)

Mostly robust perennial herbs with thick rhizomes, sometimes with stolons, up to several meters long. Culms hollow except for the nodes. Basal and cauline leaves present; leaves sheathing; ligule 0. Involucral bracts leaf-like. Inflorescence a long panicle, sometimes shortly corymbose, never umbellate. Spikes on short primary and secondary branches, composed of several spikelets. Spikelets composed of 4–11 spirally arranged, imbricate glumes, perfecting 1–3 (rarely more) nutlets, the lower 3–5 glumes sterile, the next glumes containing reduced and bisexual flowers perfecting a nutlet. Perianth segments absent, or rarely present, then very small. Stamens 2(–3). Style linear, branches 2–3, basally thickened. Nutlet small, usually bluntly trigonous, the base of the style persistent.

Five species, one confined to the old World, the others to the Americas.

Cladium mariscus (L.) Pohl in *Tent. Fl. Bohem.* 1: 32 (1810). Type: “Habitat in Europae paludibus”, *Herb. Linn.* No. 68.1 (LINN, lecto., chosen by Kukkonen in *Cafferty & Jarvis* (ed.), *Taxon* 53: 179 (2004))

Basionym: *Schoenus mariscus* L., *Sp. Pl.* 1: 42 (1753)

Large, leafy perennial, up to 5 m high, stoloniferous and with an erect woody rhizome, ± 1 cm in diameter; multiple stolons arising from one rhizome, 5–20 cm long, 5 mm thick, with many scales; culms rounded, sometimes very bluntly trigonous, up to 2.4 m long, 0.4–2.2 cm wide, glabrous, hollow except for the nodes; at the nodes of the stem sometimes vegetative shoots produced, breaking through the leaf sheath, often eventually falling off the culm. Basal leaves without leaf sheath, linear, plicate, with spine-like teeth on margins and midrib; leaves up the culm with brown leaf sheath 5–18 cm long; leaf blade linear, plicate, 59–225 cm long, 0.7–2.8 cm wide, apex acuminate, with spine-like teeth. Lowermost inflorescence bracts similar to topmost leaves. Inflorescence an up to 90 cm long panicle with long primary branches; secondary and tertiary branches 0.5–2 cm long; spikes clustered at the end of secondary and primary branches; spikelets 3–7 per spike, lanceolate, ellipsoid to ovoid, widening during maturation, 3.1–5.7 mm long, 0.6–1.3 mm wide; glumes spirally arranged, 5–7 per spikelet, the lower 3–5 empty, the following glume with 2



FIG. 54. *CLADIUM MARISCUS* — 1, inflorescence, $\times \frac{1}{2}$; 2, part of stem and leaf, $\times \frac{1}{2}$; 3, detail of leaf, $\times 1\frac{1}{2}$; 4, part of inflorescence, $\times 1$; 5, spikelet, $\times 12$; 6, spikelet longitudinal section, $\times 12$. 7, immature achene, $\times 12$. 1 & 5–7 from *Purseglove* 3482, 2 & 3 from *Bogdan* 2234, 4 from *Snowden* 1508. From *Flora of West Tropical Africa* 3, t. 412. Drawn by Margaret Stones.

stamens, and the top glume bearing bisexual flowers, all glumes pale to dark brown, ovate, increasing in size towards the apex of the spikelet, the longest 2.5–4 mm long, 1.5–2 mm wide, glabrous, keel 1-veined, narrow, apex obtuse, sometimes acute. Perianth absent. Stamens 2(–3) in both glumes; filaments 3.5–4 mm long; anthers 2.1–2.5 mm long. Stigma-branches 2–3. Nutlet pale brown, ovoid, 2.7–3 mm long, 1.1–1.8 mm wide, slightly or more strongly irregularly wrinkled, the base of the style persistent as a minute blackish knob or as a longer filiform apex. Fig. 54, p. 365.

subsp. **jamaicense** (Crantz) Kük. in F.D.-O.A.: 523 (1938); Hooper in F.W.T.A. ed. 2, 3: 333, t. 412 (1968); Haines & Lye, Sedges & Rushes E. Afr.: 323 (1983). Type from Jamaica (ubi?)

UGANDA. Kigezi District: Lake Bunyonyi, 2 Nov. 1942, *Germain* 1107! & 12 Oct. 1929, *Snowden* 1505! & Impalo, 21 Apr. 1941, *Thomas* 3750!

KENYA. Naivasha District: Nkunga, Crater Lake, 19 Jan 2001, *Luke et al.* 7221!; Machakos District: Kiboko Tsetse Fly Exp. Area, 15 Feb. 1949, *Bogdan* 2234!

TANZANIA. Kigoma District: [no locality on K specimen], 1 Nov. 1949, *Shabani* 55!; Iringa District: Mufindi, Brooke Bond Tea Estate, 5 km N of Ngwazi House, 12 Nov. 1988, *Gereau* & *Lovett* 2449!

DISTR. U 2, 4; K 3, 4; T 4, 7: Cape Verde, Cameroon, Congo-Kinshasa, Burundi, Ethiopia, Angola, Zambia, Malawi, Mozambique, Botswana, South Africa; Caribbean

HAB. In bogs, swamps, dry marshes and lake edges, 1000–2300 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and common habitat.

SYN. *Cladium jamaicense* Crantz in Inst. Rei Herb. 1: 362 (1766); C.B. Clarke in F.T.A. 8: 484 (1902)

NOTE. This species can be confused with *Rhynchospora corymbosa*. Differences can be found in spikelet size, and absence or presence of perianth bristles. The spikelets of *C. mariscus* are shorter than those of *R. corymbosa*.

28. CARPHA

R. Br. in Prod. Fl. Nov. Holl. p. 230 (1810)

Perennials, robust, rhizomatous, often mat-forming. Culms tufted, the base often covered with fibrous remains of old leaf sheaths. Leaves eligulate. Inflorescence a panicle with clusters of spikelets on peduncles emerging from the axils of the leaves up the culm. Spikelets solitary or few to many in dense clusters at the end of primary branches, lanceolate to ovoid, glumes distichous; glumes 3–7 per spikelet, 1–2 lowest glumes scale-like, followed by 3 empty, upper 1–2 glumes with bisexual flowers. Perianth segments 6, bristle-like, upwardly scabrid. Stamens (2–)3, conspicuously greenish yellow. Style with 3 branches. Nutlet lanceolate to elliptic, trigonous, style base and perianth bristles persistent.

15 species; Old World and Chile.

- | | |
|--|---------------------------|
| 1. Spikelets in very dense clusters; nutlet 2.4–2.7 mm long,
0.6–0.7 mm wide; Tanzania | 1. <i>C. glomerata</i> |
| Spikelets solitary or in clusters of 2–6; nutlet 2.8–3.8 mm
long, 0.6–1.2 mm wide; Uganda | 2 |
| 2. Spikelets 1-flowered; perianth bristles 3–7.2 mm long | 2. <i>C. eminii</i> |
| Spikelets 2-flowered; perianth bristles 2.2–3.2 mm long | 3. <i>C. angustissima</i> |

1. ***Carpha glomerata*** (Thunb.) Nees in Linnaea 7: 529 (1832); Haines & Lye, Sedges & Rushes E. Afr.: 322 (1983). Type: no type indicated

Perennial, robust, producing ± 3 mm thick stolons, up to 90 cm high; culms tufted, trigonous, 65–90 cm long, 1–2 mm wide, glabrous. Leaves up to 42 cm long; leaf sheath pale brown, 4–7 cm long; leaf blade linear, V-shaped, 35–80 cm long, 3.9–6 mm

wide, apex acuminate, scabrid. Bracts of inflorescence leaf-like; sheath 4–5.3 cm long; blade 7–14 cm long, 2.6–4.5 mm wide. Inflorescence a panicle, primary branches 3–4, 6–10.5 cm long; spikelets many in dense clusters, lanceolate, 4–6 mm long, 1–2 mm wide; 2 basal scales, 2 glumes and a single bisexual flower; glumes reddish-brown, narrowly elliptic, 4–5 mm long, 1.2–1.8 mm wide, glabrous, keel acute, apex long-acuminate. Perianth bristles 1.5–3 mm long. Stamens 3, greenish yellow, filaments 4–5 mm long; anthers 1.4–2 mm long. Nutlet reddish brown, ellipsoid, 2.4–2.7 mm long, 0.6–0.7 mm wide, the surface with isodiametric cells with raised cell-walls.

TANZANIA. Morogoro District: Uluguru Mts, Jan. 1935, *Bruce* 742!

DISTR. T 6; South Africa

HAB. Upland swamp; 2500 m

CONSERVATION NOTES. Abundant in South Africa, and therefore considered to be Least Concern (LC).

SYN. *Schoenus glomeratus* Thunb., Prod. Pl. Cap.: 17 (1794)

NOTE. The single collection seen from the Flora area bore the name *Carpha ulugurensis* Nelmes, presumably a *nomen nudum*.

2. ***Carpha eminii*** (*K. Schum.*) *C.B. Clarke* in F.T.A. 8: 483 (1902); A.V.P.: 55 (1957); Haines & Lye, *Sedges & Rushes E. Afr.*: 321 (1983). Type: Uganda, Ruwenzori Mts, July 1891, *Stuhlmann* 2439 (B, holo.)

Perennial, with a short rhizome, up to 116 cm long; culms tufted, rounded, sometimes compressed or almost trigonous, or with winged margin, indistinct longitudinal ridges, 30–80 cm long, 0.7–1.5 mm wide, somewhat scabrid in upper half, the base often enclose in the fibres of old leaves. Leaves up to 85 cm long; leaf sheath brown, 4–7 cm long; leaf blade linear, sometimes almost trigonous, 23–80 cm long, 1.1–4 mm wide, apex acuminate, glabrous to scabrid. Bracts of inflorescence leaf-like; sheath 1–4 cm long; blade 2.7–20 cm long, 0.7–3 mm wide. Inflorescence a narrow panicle, primary branches 1–4, 2.5–15 cm long; spikelets solitary or in dense clusters of 4–5, lanceolate, 6–8 mm long, 0.8–1.5 mm wide; glumes 4–6 per spikelet, brown, ellipsoid-lanceolate, only the uppermost glume bearing a single bisexual flower, non-flower-bearing glumes 3.5–6 mm long, 1–2 mm wide, flower-bearing glume 6–8.5 mm long, 1.5–2 mm wide, apex acute. Perianth bristles 3 short, 3 long, 3–7.2 mm long, the lower part of the long bristles compressed and with 0.1–0.3 mm long white hairs along the margins. Stamens 3, filaments 2.6–8 mm long; anthers 1.5–4.5 mm long. Nutlet yellow to (pale) brown, narrowly ovoid, 2.8–3.8 mm long, 0.6–1.2 mm wide, minutely papillose-reticulate, the stamens and perianth bristles persistent.

UGANDA. Toro District: Ruwenzori Mts, near Nyamileju Hut, 30 Dec. 1968, *Haines* 277! & Bujuku Valley, Aug. 1933, *Eggeling* 1270! & Kasese, Busongora County, above Bigo Camp, 21 Jan. 1981, *Katende* 3003!

DISTR. U 2; not known elsewhere

HAB. In mountain bogs, along streams and on wet rocks; 2700–3750 m

CONSERVATION NOTES. This species has restricted extent of occurrence and area of occupancy, but there is no information on threats.

SYN. *Oreogastis eminii* K. Schum. in P.O.A. C: 127 (1895)

NOTE. *C. eminii* is closely related to *C. angustissima*, but only has one fertile flower per spikelet, and the perianth bristles are much more hairy.

3. ***Carpha angustissima*** *Cherm.* in Bull. Soc. Bot. Fr. 82: 341 (1935); Haines & Lye, *Sedges & Rushes E. Afr.*: 322 (1983). Type: Congo-Kinshasa, Kahuzi Massif, W of Lake Kivu, *Humbert* 7722 (BR!, P, syn.) & Karisimbi Volcano, NE of Lake Kivu, *Humbert* 8586 (P, syn.)



FIG. 55. *CARPHA ANGUSTISSIMA* — 1. habit, $\times \frac{2}{3}$; 2. inflorescence detail, $\times 1.5$; 3. spikelets, $\times 5$; 4. glume, $\times 12$; 5. flower, $\times 12$; 6. nutlet with bristles, $\times 16$. All from *Katende 207B*. Drawn by Juliet Williamson.

Perennial, with a short or long rhizome and roots surrounded by a sheath of persistent root-hairs, up to 44 cm high; culms tufted, rounded, with distinct deep longitudinal ridges, 20–35 cm long, 0.5–0.6 mm wide, glabrous, the base surrounded by greyish or brown non-fibrous scales. Leaves up to 26 cm long; leaf sheath brown, 1.5–4 cm long; leaf blade linear, 14–25 cm long, 1.1–1.5 mm wide, V-shaped or with inrolled margins, apex acuminate, glabrous. First bract of the inflorescence leaf-like, sheath 1.1–1.3 cm long, blade 6.3–6.7 cm long, 0.8–1.2 mm wide. Inflorescence a slender panicle, primary branches few, distant, 2–6 cm long; spikelets solitary or in small clusters of 2–3 at the end of 1.4–2 cm long branches, ovoid, 5–6.5 mm long, 1.2–1.8 mm wide; glumes 5–6 per spikelet, brown, elliptic-lanceolate, the lower 2–3 empty, elliptic-lanceolate, 1.2–4.5 mm long, 0.8–2 mm wide, upper 2 glumes with bisexual flowers, 4–6 mm long, 1.7–2 mm wide, glabrous, apex obtuse to acute. Perianth bristles 3 short, 3 long, 2.2–3.2 mm long, occasionally with a few scattered hairs at the very base. Stamens 3, filaments 3.4–4.8 mm long; anthers 1.4–2.2 mm long. Nutlet pale brown, ellipsoid-lanceolate, 2.8–3.1 mm long, 0.8–1 mm wide, minutely papillose-reticulate. Fig. 55, p. 368.

UGANDA. Kigezi District: Mgahinga–Muhavura Saddle, Sept. 1946, *Purseglove* 2199! & Crater of Mgahinga, 24 Apr. 1970, *Katende* 2078!

DISTR. U 2; Congo-Kinshasa, Rwanda

HAB. In montane or afro-alpine bogs; 2400–3300 m

CONSERVATION NOTES. This species has a rather small extent of occurrence and area occupancy, but does not seem to be under threat.

SYN. *Carpha eminii* (K. Schum.) C.B. Clarke var. *angustissima* (Cherm.) Kük. in F.R. 47: 210 (1939)

NOTE. This species is closely related to *Carpha eminii*, but differs in its shorter and less hairy perianth bristles and having 2 fertile flowers in each spikelet.

29. MACHAERINA

Vahl, Enum. Pl. 2: 238 (1805)

Perennials with creeping rhizomes or stolons. Culms scapose or with a few nodes, compressed or terete. Leaves distichous, blade ensiform to terete; ligule 0. Involucral bracts leaf-like. Inflorescence paniculate with many spikelets. Spikelets with 2–10 distichous persistent glumes; lower glumes sterile, the larger subtending 1–2 bisexual flowers, the upper 1–2 flowers functionally male. Stamens 3. Style 3-fid, base not distinct, thickened. Nutlet beaked, 3-ribbed/winged.

50 species; Old and New World tropics and subtropics.

Machaerina flexuosa (Boeck.) J. Kern in Acta Bot. Neerl. 7: 266 (1959)

Perennial, stout, up to 150 cm tall, with rhizomes; culms tussocky, 90–120 cm long, 5–6 mm wide, glabrous. Leaves 6–12 mm wide, margins smooth, apex acuminate. Involucral bracts leaf-like. Inflorescence a relatively large panicle, 25–50 cm long, made up by 5–8 fascicles, each with 2–4 primary branches up to 7 cm long; spikes at the end of primary and secondary branches, 6–10 mm in diameter, consisting of 2–4 crowded (sub-)sessile spikelets 5–6 mm long, with at least the lower glumes distichously arranged, 6–12-flowered; glumes with short hairy margin. Stamens 3; the connective of the anthers ending in a long prominent point. Style with 3 long branches. Nutlet ovoid, rounded in section, strongly scabrid near the apex; the style-base persistent as an acute beak. Fig. 56, p. 370.

subsp. ***polyanthemum*** (Kük.) Lye in Nordic Journ. Bot. 3(2): 243 (1983). Type: Tanzania, Lindi District, Rondo Plateau, *Schlieben* 6139 (LISC!, EA! lecto. chosen by Lye)



FIG. 56. *MACHAERINA FLEXUOSA* — 1. habit, $\times \frac{2}{3}$; 2. spikes from top of inflorescence, $\times 3$; 3–4. glume, abaxial and side view, $\times 10$; 5. flower, $\times 10$; 6. young flower, $\times 8$; 7. anther, $\times 16$; 8. nutlet, $\times 16$. 1 from *Andriamahay & Rakotoarison* 1969, 2–7 from *Nussbaum et al.* 1103, 8 from *Ranivison* 642. Drawn by Juliet Williamson.

TANZANIA. Lindi District: Rondo Plateau, *Schlieben* 6139!

DISTR. T 8; Comoro Is., Madagascar

HAB. Growing in solitary tufts by a stream; 300–450 m

SYN. *Cladium flexuosum* (Boeck.) C.B. Clarke var. *polyanthemum* Kük. in F.R. 51: 160 (1942)

30. TETRARIA

P. Beauv. in Mem. Inst. Par. 1812 (2): 54 (1816)

Perennial herbs; stems scapose or few-noded. Leaves with conspicuous sheaths, sometimes with ligules, blades flat or more or less incurved. Inflorescence usually a narrow panicle. Spikelets several to many, 2– (rarely 1– to 4–)flowered with several–many persistent glumes; glumes 4–12, usually distichous, occasionally somewhat spirally arranged, lower 4–9 empty; flowers both typically bisexual (the lower functionally male), more rarely unisexual. Hypogynous bristles present or absent, when present soft, ciliate, rarely plumose. Stamens 3, less often 6–8; connective produced into a crest. Stigmas usually 3 but occasionally 4–9. Nutlet small, trigonous (very rarely 4-angular), often crowned or beaked by the persistent style.

50 species, almost entirely confined to South Africa.

- | | |
|---|---------------------------|
| Leaf blade more than 25 cm long; spikelets 5–10 mm long,
1.5–3.5 mm wide; glumes 8–10 per spikelet | 1. <i>T. usambarensis</i> |
| Leaf blade 10–20 cm long; spikelets 3.2–7.3 mm long,
0.5–1.2 mm wide; glumes 6–7 per spikelet | 2. <i>T. cuspidata</i> |

1. ***Tetraria usambarensis*** K. Schum. in P.O.A. C: 128 (1895); Lye in Sedges & Rushes E. Afr.: 320 (1983). Type: Tanzania, Usambara Mountains, *Holst* 131 (B†, holo)

Slender perennial, up to 60 cm tall; rounded base enclosed in black fibres, the remains of old leaf bases; culms tufted, rounded-trigonous, 10–50 cm long, 0.5–1.5 mm wide, with longitudinal ridges, glabrous. Leaves basal and up the stem; leaf sheaths blackened, 3.5–5 cm long; basal leaves shorter than culm; cauline leaves linear, involute, flexuous above, 27–33 cm long, 1.2–2 mm wide, some exceeding the culm, rigid, apex often blackened, acuminate, scabrid. Inflorescence a simple panicle, 5–15 cm long; spikelets 1–5 per cluster, ovoid, 5–10 mm long, 1.5–3.5 mm wide; glumes 8–11 per spikelet, distichously arranged, brown, lower 7–9 empty, ovate-elliptic, 4.5–5 mm long, 2.5–3.5 mm wide, awned, upper 2 subtending bisexual flowers, ovate, 5.5–7 mm long, 1.5–3 mm wide, keel 1-veined ending in the acuminate to awned apex. Perianth bristles 3–6, minute, scabrid. Stamens 3; filaments 5–6 mm long; anthers 4–4.5 mm long, with conspicuous flat elongate connectives far exceeding the anthers. Style long, flexuous, base pyramidal, hispidulous, persistent, branches 3, densely hairy. Nutlet brown, ovoid-ellipsoid to obovoid, 3–4 mm long, 1.5–1.8 mm wide, with 3 strong pale-coloured ribs, on a stalk ± 1 mm long.

TANZANIA. Lushoto District: West Usambara Mountains, Shagayu Forest Reserve, Kwashemhambu summit, 20 Nov. 1986, *Borhidi et al.* 86050!

DISTR. T 3; not known elsewhere

HAB. Dry sandy places; 1750 m

SYN. *Elynanthus usambarensis* Engl. in Abh. Preuss. Akad. Wiss. 59 (1894), *nom. nud.*

Tetraria circinalis C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 659 (1894), *nom. nudum* & F.T.A. 8: 485 (1902), *nom. illegit.*, type as for *T. usambarensis*

T. circinalis (Schräd.) C.B. Clarke var. *usambarensis* (K. Schum.) Kük. in F.R. Beih. 40: 528 (1938), *nom. illegit.*



FIG. 57. *TETRARIA CUSPIDATA* — 1, habit, $\times \frac{2}{3}$; 2, leaf sheath, $\times 3$; 3, lower sterile glume, $\times 14$; 4, spikelet, $\times 10$; 5, ovary, style and branches, $\times 8$; 6, nutlet, $\times 16$. 1–5 from *Hilliard & Burt* 17231; 6 from *Hilliard & Burt* 15712. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

2. *Tetraria cuspidata* (Rottb.) C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 660 (1895). Type: none mentioned

Annual, up to 60 cm long; culms rounded, 17–47 cm long, 0.4–1 mm wide, with (shallow) longitudinal ridges, glabrous, but with scale-like structures towards the inflorescence. Leaves up to 30 cm long; leaf sheath black at the base, upper part red, old leaf sheaths fibrous, 1.1–10 cm long; leaf blade narrowly linear, canaliculate, 10–25 cm long, 0.6–1.2 mm wide, margins scabrid near the base of the blade, less so

towards the apex, apex acuminate. Involucral bract leaf-like, sheath absent or ± 0.4 cm long; blade 3.5–8.5 cm long, 0.4–1 mm wide. Inflorescence a slender panicle, spikelets in clusters at the end of primary branches, primary branches 2–3, 0–1.3 cm long; spikelets 3–4 per cluster, branches at each division with a dark red-black surrounding sheath and scale, scale scabrid, as long as or overtopping the spikelet; spikelet narrowly lanceolate, 3.2–7.3 mm long, 0.5–1.2 mm wide, rachis straight; glumes 6–7 per spikelet, distichously arranged, increasing in size towards the apex, basal glume scale-like, awned, 1–2 mm long, upper two flower-bearing glumes reddish-brown, lanceolate-elliptic, 2.5–6.2 mm long, 1–1.4 mm wide, apex acuminate, glabrous. Perianth bristles seemingly absent or very inconspicuous. Stamens 3: filaments 3–4.2 mm long; anthers 2.7–4.2 mm long, with conspicuous flat elongate connectives exceeding the anthers. Style with 3 hairy branches. Nutlet only seen immature. Fig. 57, p. 372.

KENYA. Uasin Gishu District: Uasin Gishu Plateau, 19 July 1937, *Lynes* 1467!

DISTR. K 3; South Africa

HAB. no data

SYN. *Schoenus cuspidata* Rottb., *Descr. & Icon.*: 66, t. 18.3 (1773)

NOTE. This single collection was found in the Meise herbarium (BR); after careful examination it seemed to match the South African species *T. cuspidata*. Caution has to be taken, as the material is immature and especially the spikelets are not properly developed yet, making it impossible to compare flower and nutlet characters. The description is completed with data from South African material.

31. COLEOCHLOA

Gilly in *Brittonia* 5: 12 (1943); Nelmes in *K.B.* 8: 374 (1953)

Eriospora A. Rich. in *Tent. Fl. Abyss.* 2: 508 (1850)

Catagyna sensu Hutch. in *F.W.T.A.* 2: 490 (1936), *non* Lestib. (1819)

Perennial herbs, tufted or cushion-forming, with branched rhizome. Culms scapose or nearly so, compressed below, sometimes subcylindric. Leaves distichous; sheaths persistent, ligule a line of hairs; blades deciduous. Involucral bracts leaf-like. Inflorescence paniculate with clusters of spikelets on peduncles emerging from the axils of the leaves up the culm; spikes several to many in axillary and terminal, bracteate, peduncled fascicles, or these rarely (*C. virgata*) in sessile clusters, composed of several–many unisexual and bisexual spikelets; bracteoles glume-like, embracing or shortly sheathing at the base, aristate. Spikelets male or bisexual, composed of 4–5 distichous glumes, lower 2 empty and small, the upper 2–3 subtending male flowers, or 1–2 female and 1–2 male flowers. Male flower with 3 stamens (not always visible). Female flower parts loosely surrounded by a trigonous, sac-like membranous utricle, ovary basal, style situated in the upper beak-like portion of the utricle, stigmas 3, exerted. Perianth apically reduced to tufts of erect, hair-like structures surrounding the base of the utricle. Nutlet subcylindric or compressed-trigonous, long-beaked.

Seven species in Africa and Madagascar.

1. Culms developing from extravaginal shoots, the base (including leaf sheaths) 4–13 mm wide; leaf blades flat or conduplicate, rarely convolute-cylindric 2
- Culms (very) densely tufted, developing from intravaginal shoots, 1–3 mm wide (including leaf sheaths); leaf blades mostly convolute-cylindric 3

- | | |
|---|---------------------------|
| 2. Spikes (4–)5–9 mm long; spikelets 4–5.5 mm long; utricle 4–6.2 mm long, with curved beak | 1. <i>C. abyssinica</i> |
| Spikes 3–5(–6) mm long; spikelets 2.5–4 mm long; utricle 2–4 mm long, with straight beak | 2. <i>C. microcephala</i> |
| 3. Culms glabrous or sparsely to densely hairy; spikes lax and stalked | 3. <i>C. setifera</i> |
| Culms glabrous; spikes crowded and sessile | 4. <i>C. virgata</i> |

1. ***Coleochloa abyssinica*** (A. Rich.) Gilly in Brittonia 5: 14 (1943); Lye in Fl. Eth. 6: 500, fig. 212.170 (1997). Type: Ethiopia, Tigray, Mt Semaiaata, *Schimper* 233 (P, holo.; BM, BR!, FT, K!, iso.)

Perennial, up to 105 cm high, spreading by branching scaly stolons; culms densely tufted, basal part 4–13 mm wide, covered by old leaf sheaths, the sheaths sometimes fibrous, culms rounded, sometimes somewhat flattened, 16.5–44 cm long, 1–4.5 mm wide, glabrous. Leaves up to 70 cm long; leaf sheath basally reddish-brown, rest brownish-yellow, 3–12.5 cm long; ligule a very dense band of white hairs, 1–2 mm long; leaf blade set off from the stiff sheath by an abscission-plane, marked on the outer surface by a dark band, caducous, narrowly linear, folded, 29–59 cm long, 3–5.6 mm wide, margins and midrib sometimes scabrid, upper surface sparsely to densely villous, lower surface ± glabrous, apex acuminate. Leaves subtending the primary branches; sheath 2.5–14.5 cm long; blade 13–52 cm long, shape and surface as basal leaves. Inflorescence a diffuse panicle with 2–6 main branches protruding from the upper leaf sheaths; spikes pedicellate, in fascicles of 1–6, ovoid, (4–)5–9 mm long, 2–4.5 mm wide; spikelets many per spike, lanceolate, ellipsoid to oblong, 4–5.5 mm long, 1–1.5 mm wide; glumes very sparsely hairy, yellowish to pale to dark reddish-brown, elliptic to ovate; all glumes 3–4 mm long, 1–2 mm wide, apex (long) acuminate to mucronate. Male flower with 3 stamens; filaments 2.5–3.8 mm long; anthers 1.1–2.2 mm long. Female flower: sac-like utricle lanceolate, overtopping the glumes, 4–6.2 mm long, 0.4–0.9 mm wide, with a curved beak, stigmas often broken off, the basal hairs 2/3 to nearly as long as the nutlet. Nutlet linear, 1.3–2 mm long, 0.4 mm wide, glabrous, yellowish-brown.

UGANDA. Acholi District: SE Imatongs, Lomwago Mt, 5 Apr. 1945, *Greenway & Hummel* 7296!; Karamoja District: Napak, 28 May 1940, *Thomas* 3638!; Mbale District: Nomalu, 3 June 1967, *Haines* 4232!

TANZANIA. Lushoto District: Mtai–Sunga Road, Escarpment, 25 May 1953, *Drummond & Hemsley* 2758!; Ufipa District: Nsanga Mts, Malonje Plateau, 13 Mar. 1959, *Richards* 11200! & *Mmemya* Mt, 20 Feb. 1951, *Bullock* 3703!

DISTR. U 1, 3; T 3, 4, 6, 7; Cameroon, Congo-Kinshasa, Sudan, Eritrea, Ethiopia, Angola

HAB. On periodically wet rock surfaces and in mountain grassland; 1350–2600 m

CONSERVATION NOTES. Least Concern (LC) due to its wide distribution and fairly common habitat.

SYN. *Eriospora abyssinica* A. Rich., Tent. Fl. Abyss. 2: 508 (1851); C.B. Clarke in F.T.A. 8: 513 (1902)

Trilepis abyssinica (A. Rich.) Boeck. in Linnaea 39: 9 (1851)

Eriospora abyssinica A. Rich. var. *castanea* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 676 (1894), nomen, & F.T.A. 8: 512 (1902). Type: Ethiopia, Shire, *Quartin-Dillon & Petit* s.n. & Begemder, Gerra, *Schimper* 1262 & without locality, *Schimper* 690 (P, syn.)

Coleochloa abyssinica (A. Rich.) Gilly var. *castanea* (C.B. Clarke) Pic. Serm. in Webbia 7: 347 (1950); Nelmes in K.B. 8 (3): 377 (1953); Haines & Lye, Sedges & Rushes E. Afr.: 361 (1983)

NOTE. *Eriospora abyssinica* var. *castanea* is based on its deeper chestnut coloured glumes in comparison to var. *abyssinica*, which are, according to Nelmes (1953), fulvous to castaneous to bright reddish. According to C.B. Clarke (1894), Nelmes (1953) and Lye (1983) this variety occurs in the Flora area as well as north of the area. There does not seem to be a clear boundary between glume colour from the Flora area and neighbouring countries, and a lot of intermediate colour forms are found. For this area therefore, var. *castanea* will not be recognized.

2. *Coleochloa microcephala* Nelmes in K.B. 8 (3): 377 (1953). Type: Tanzania, Morogoro District, Uluguru Mts, Bunduki, *Bruce* 605 (K!, holo.; BM, iso.)

Perennial, up to 134 cm high; culms densely tufted, basal part of the culms 7–13 mm wide, culms rounded, sometimes somewhat flattened, 21–79 cm long, 1.5–4 mm wide, glabrous. Leaves up to 120 cm long; leaf sheath basally reddish-brown, rest brownish-yellow, 1.5–19.5 cm long; ligule a very dense band of white hairs, 1–2 mm long; leaf blade caducuous, linear, flat or folded, 27–100 cm long, 2–9 mm wide, midrib densely hairy, apex acuminate. Leaves subtending the primary branches; sheath 4.5–7 cm long; blade up to 42 cm long, shape and surface as basal leaves. Inflorescence a lax, usually pendulous panicle with 2–6 main branches protruding from the upper leaf sheaths; spikes pedicellate, pedicels 1–3 cm long, in fascicles of 5–8, ovoid, 3–5(–6) mm long, 2–3.5 mm wide; spikelets many per spike, lanceolate, ellipsoid to oblong, 2.5–4 mm long, 0.7–1 mm wide; glumes reddish-brown, the base often yellowish-brown, elliptic-ovate; non-flower bearing glumes 0.7–2.5 mm long, 1–1.6 mm wide; flower bearing glumes 2.7–3.9 mm long, 1–1.8 mm wide, almost glabrous to slightly hairy, apex acute, (long) acuminate to slightly mucronate. Male flower with 2–3 stamens; filaments 2.2–3 mm long; anthers 1–1.5 mm long. Female flower: sac-like utricle lanceolate, overtopping the glumes, 2–4 mm long, 0.5–0.8 mm wide, stigmas often broken off, the basal hairs 2/3 to nearly as long as the nutlet. Nutlet yellow, obovoid, 1.1–1.5 mm long, 0.3–0.7 mm wide, apex with knob.

TANZANIA. Morogoro District: Uluguru Mts, 19 Nov. 1925, *Peter* 32310! & Uluguru Mts, foothills of Mt Mindu, WSW of Morogoro, along the new highway, 11 Mar. 1972, *Pócs & Pócs* 6541/A!; Iringa District: Udzungwa Mts, Sanje, 25 July 1984, *Norbury* E34!

DISTR. T 6, 7; not known elsewhere

HAB. On shallow soil over rocks or in rock-crevices, in mist forest, 550–1600 m

SYN. *Eriospora abyssinica* A. Rich. var. *brevirostrata* Peter in F.R. 40: 142 (1938). Type: Morogoro District: NW Uluguru, Savana, *Schlieben* 3676 & 3167 (B!, syn.)

NOTE. This species looks very similar to *C. abyssinica* in habit. It differs in spike, spikelet, glume and nutlet size, which are all bigger in *C. abyssinica*. *C. microcephala* has a very restricted distribution area, only occurring in the Uluguru Mountains and the Ulunga/Iringa District in the T 6/7 area of the Flora area.

3. *Coleochloa setifera* (Ridl.) Gilly in Brittonia 5: 14 (1943); Haines & Lye, Sedges & Rushes E. Afr.: 363 (1983). Type: Madagascar, *Cowan, Hilsenberg & Bojer* s.n. (BM, holo.)

Perennial, up to 84 cm high, sometimes the whole plant villous; culms densely tufted, rounded to trigonous, 14–55 cm long, 0.4–1 mm wide, glabrous, or sparsely to densely hairy. Leaves up to 60 cm long; sheath sometimes blackened basally, brown to straw-yellow, 1–7 cm long, ligulate; leaf blade narrowly linear, convolute-cylindrical, 21–58 cm long, 0.1–0.2 mm wide, upper surface sparsely to densely villous, lower surface ± glabrous, apex acuminate. Leaves subtending the primary branches; sheath 1–3.5 cm long, blade 3.5–18.5 cm long, surface and shape as other leaves. Inflorescence paniculate, lax and slender, erect or slightly curved, primary and secondary branches slender, erect or nearly erect; spikes pedicellate, in fascicles of 1–3, ovoid to obovoid, 4–7 mm long, 2.5–5 mm wide; spikelets many per spike, lanceolate, ellipsoid to oblong, 2–4 mm long, 0.5–1.1 mm wide; glumes yellow, red to reddish-brown, elliptic to ovate; non-flower bearing glumes 1.2–1.8 mm long, 0.6–0.8 mm wide; flower bearing glumes 1.8–3.3 mm long, 0.9–1.6 mm wide, glabrous, sometimes very sparsely hairy, apex (long) acuminate to mucronate. Male flower with (2–)3 stamens; filaments 1.7–2.6 mm long; anthers 0.7–1.8 mm long. Female flower: sac-like utricle lanceolate, overtopping the glumes, 2.3–4.2 mm long, 0.4–0.9 mm wide, the basal hairs 2/3 to nearly as long as the nutlet. Nutlet yellowish-brown, obovoid, 0.9–2 mm long, 0.4–0.6 mm wide, glabrous, apex with knob. Fig. 57, p. 376.

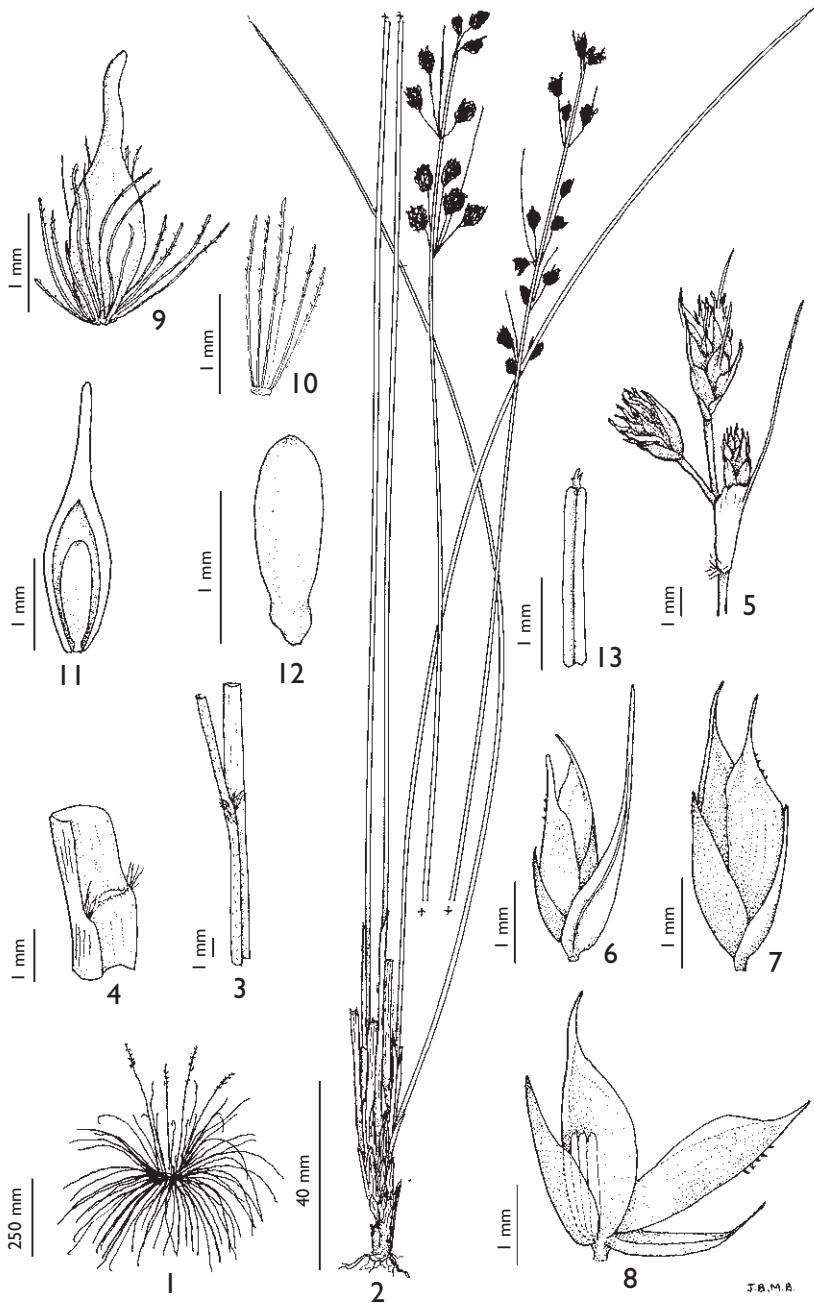


FIG. 57 *COLEOCHLOA SETIFERA* — 1, habit; 2, habit; 3–4, leaf sheath apex; 5, part of inflorescence; 6–7, spikelet respectively abaxial view with bract and adaxial view; 8, spikelet, glumes opened up, adaxial view; 9, nutlet; 10, nutlet bristles; 11, nutlet section; 12, seed; 13, mature anther. 1–8 from *Browning* 560, 11–13 from *Pawek* 13626a. Reproduced from *Flora Zambesiaca*. Drawn by Jane Browning.

NOTE. According to previous descriptions of *C. setifera* (e.g. Lye in Haines & Lye 1983), the culms are sparsely to densely hairy. After careful examination of the specimens from the Flora area, I discovered that all the Kenyan specimens have glabrous culms, while those of the Tanzanian specimens are at least sparsely hairy. Tanzanian specimens sometimes are villous on the culms, leaves and peduncles, noticeable with the bare eye.

Culms sparsely to densely villous; Tanzania a. var. *setifera*
 Culms glabrous (or nearly so); Kenya b. var. *glabrescens*

a. var. **setifera**

Culms sparsely to densely villous, sometimes plants densely villous all over.

TANZANIA. Ufipa District: New Sumbawanga–Mbala [Abercorn] Road, 32 km from Mbala, 25 Nov. 1960, *Richards* 13628!; Iringa District: Mpululu Hill, 11 Mar. 1970, *Greenway et al.* 14071!; Songea District: Matagoro Hills just S of Songea, 3 Feb. 1956, *Milne-Redhead & Taylor* 8594!
 DISTR. T 4, 7, 8; Congo-Kinshasa, Zambia, Malawi, Mozambique, Zimbabwe, Swaziland, South Africa; Madagascar

HAB. On shallow soil over rock, in rock crevices; 450–2150 m

CONSERVATION NOTES. Least Concern (LC) due its wide distribution

SYN. *Fintelmannia setifera* Ridl. in J.L.S. 20: 837 (1883)

Trilepis oliveri Boeck., Cyp. Novae 1: 38 (1888). Type: Malawi, *Buchanan* 25 (K, holo.)

Eriospora oliveri (Boeck.) C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 676 (1894) & F.T.A. 8: 513 (1902)

E. villosula C.B. Clarke in Trans. Linn. Soc. 2, Bot. 4: 54 (1894); C.B. Clarke in Consp. Fl. Afr. 5: 676 (1894) & in F.T.A. 8: 513 (1902); K. Schum. in P.O.A. C: 128 (1895). Type: Malawi, *Whyte* 68 (K, holo.)

Carex villosula (C.B. Clarke) Gilly in Brittonia 5: 14 (1943)

NOTE. This subspecies is common and widespread in the eastern and southern part of Africa.

b. var. **glabrescens** *Hoenselaar & D.A. Simpson* in K.B. 64, 4: 683 (2020). Type: Kenya, Machakos/Masai District: Chyulu Plains, Soitpus Hill, 30 July 2000, *Luke & Luke* 6406 (K, holo.; EA, iso.)

Culms glabrous or nearly so.

KENYA. Northern Frontier District: Ol Lolokwi, Ol Doinyo Sabachi, top of cliffs opposite Subata repeater Station, 14 Apr. 1979, *Gilbert* 5376!; Kitui District: A.I. Mission, 8 km N of Migwarti, 5 May 1960, *Napper* 1610!; Machakos/Masai District: Chyulu Plains, Soitpus Hill, 30 July 2000, *Luke & Luke* 6406!

DISTR. K 1, 4, 6, 7; not known elsewhere

HAB. On shallow soil over rock, in rock crevices; 450–1300 m

CONSERVATION NOTES. Data Deficient (DD). Although several specimens have been collected there is no information about the status of the habitats in which the plants occur.

NOTE. The glabrous culms of subsp. *glabrescens* are quite striking. They seem to be restricted to Kenya, whereas subsp. *setifera* is not found in Kenya, but has a more southern distribution pattern. Except for the indumentum, all other characteristics overlap, and therefore I have chosen to describe this as a variety.

4. ***Coleochloa virgata*** (*K. Schum.*) *Nelmes* in K.B. 8: 381 (1953); Haines & Lye, *Sedges & Rushes E. Afr.*: 363 (1983). Type: Tanzania, Arusha District, Mt Meru, *Fischer* 624 (B, holo.?)

Perennial, densely tufted, the base of the plants blackened, up to 80 cm high; culms round, 37–60 cm long, 0.8–1.6 mm wide, glabrous. Leaves up to 60 cm long; sheath blackened at base, higher up the culm yellow, 3–13.5 cm long; blade linear,

convolute-cylindric above, 27–55 cm long, 1.4–3 mm wide, upper surface densely minutely hispidulous, its midrib shortly villous, under surface glabrous, apex acuminate. Leaves subtending the primary branches; sheath 2.5–5.2 cm long, blade 11–19.5 cm long, 1–2.6 mm wide. Inflorescence an erect, dense but interrupted, slender panicle, situated on the upper 3.5–10 cm of the stem and composed of 1–2 secondary panicle of mostly sessile clustered spikes on slender peduncles; spikes few to many in each panicle, obovoid, oblong-ellipsoid, or shortly cylindric, 4.5–8 mm long, 1.2–4 mm wide; spikelets more or less oblong, 3–4 mm long, 1–2 mm wide; glumes dark reddish-brown, the base often yellow, lanceolate or oblong-lanceolate, mostly conduplicate, 3–6 mm long (including the long apex, often more than 1 mm long), 1.1–1.4 mm wide, glabrous to scurfy-hispidulous, apex long-acuminate to awned. Stamens 3: filaments 2.8–3.2 mm long, anthers 1.6–2.4 mm long. Utricles immature; basal bristles probably more than half as long as the mature utricle. Seed undeveloped.

TANZANIA. Arusha District: Mt Meru, *Fischer* 624

DISTR. T 2; also known from Mt Mlanje, Malawi, not known elsewhere

HAB. On shallow soil over rocks or in grassland; altitude unclear

SYN. *Eriospora virgata* K. Schum. in P.O.A. C: 128 (1895)

NOTE. This species is known only from the type specimen, and from locations in Malawi. Unfortunately the type specimen was destroyed in WW 2. The description above is therefore based on the protologue, the description of Nelmes in K.B. 8 (3): 381 (1953) and the specimens from Malawi. According to the protologue this species approaches the West African *E. pilosa* Hook f. and also the larger *E. abyssinica* Rich.; it differs from both in its coarse-sharpened glumes. According to Nelmes 'this remarkable species differs from all the others in *Coleochloa* by the densely hispidulous upper surface of the leaves and by its clustered and sessile spikelets'.

32. SCLERIA*

Berg. in Vet. Acad. Handl. Stockholm 26: 142 (1765); Robinson in K.B. 18: 487–551 (1966)

Annual or perennial herbs of very variable habit. Culms many-noded and leafy, the stem angles and leaf margins sometimes razor sharp. Leaves with sheaths closed, sometimes with a ligule, the throat margin sometimes extended as a tongue. Inflorescence paniculate with a terminal and usually 1–many lateral panicles from upper leaf sheaths or inflorescence glomerate-spicate and ebracteate with clusters of sessile spikelets. Spikelets bearing flowers of one or both sexes, the bisexual ones with one basal female and one to few male flowers above; female spikelet similar but upper part reduced to 1–2 empty scales or wanting; male spikelet lacking basal female flower and more many male flowers; flowers unisexual, solitary in the axils of spirally or distichously arranged glumes of which the lower 2–4 are empty. Male flowers with 1–3 stamens. Female flowers with 3-branched style, sometimes persistent. Nutlets ovoid to depressed globose, somewhat trigonous, shiny-smooth, reticulate, tuberculate or pitted; subtending hypogynium often dilated into a simple or 3-lobed disc, cup-like or almost absent.

A large genus of about 250 species in tropical and subtropical regions of both Old and New Worlds.

* By B. Verdcourt; Partly based on an incomplete typescript by Robinson cited as F.T.E.A. TS here but mainly on Robinson (1966) and on Haines & Lye (1983) (the key entirely so).

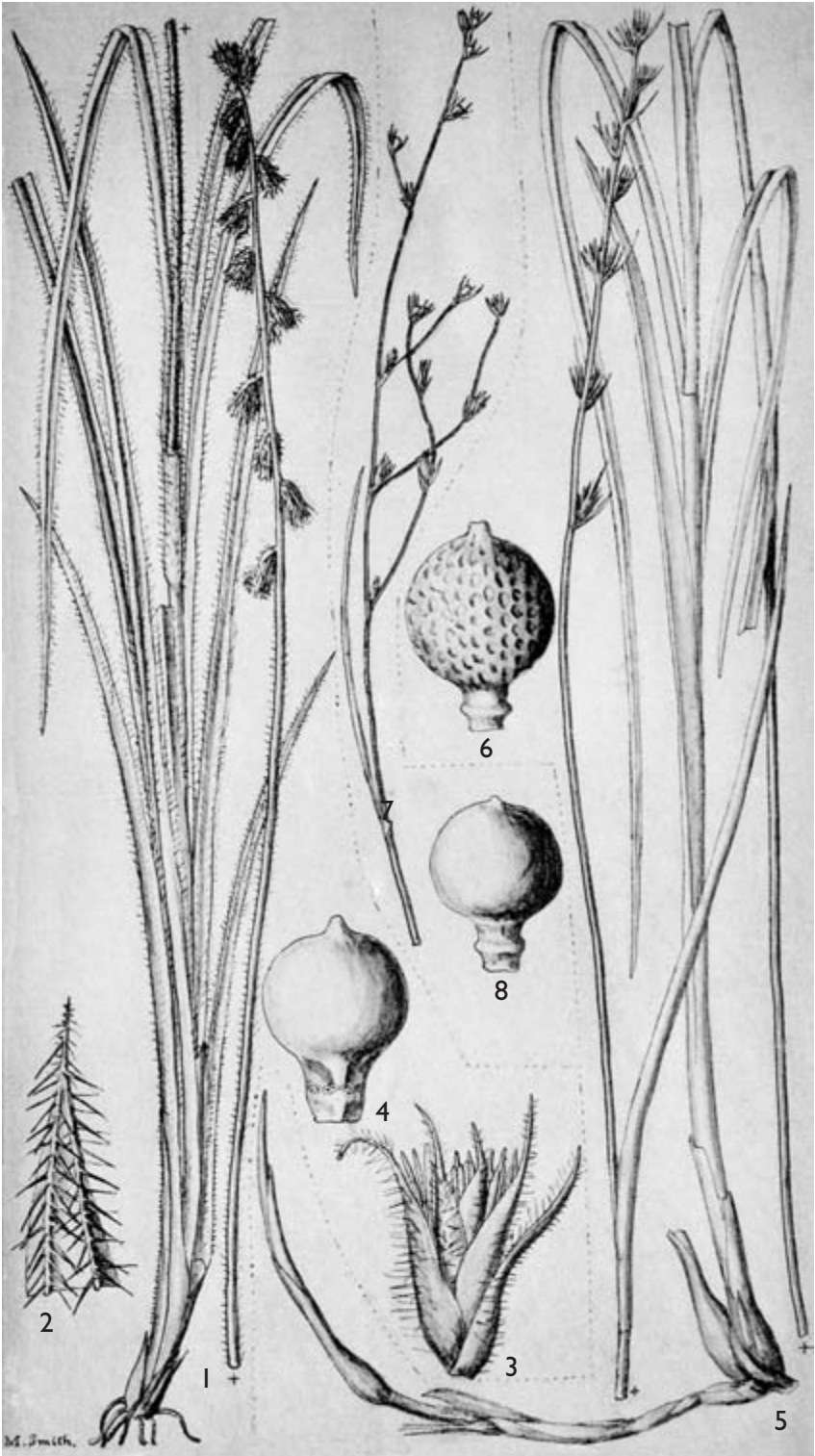
1. Hypogynium margin conspicuously ciliate, the lobes forming a cup holding the base of the nutlet; robust perennials to 4 m with leaves 1–3.5 cm wide (Sect. *Ophryoscleria*) 2
Hypogynium margin not ciliate 3
2. Nutlets smooth or nearly so; widespread 46. *S. racemosa* p.413
Nutlets with hairy tubercles; western species (U 2, 4, T 1) 47. *S. verrucosa* p.414
3. Inflorescence terminal only; bracts not leafy 4
Inflorescence terminal and lateral; bracts leafy 28
4. Inflorescence a terminal panicle 10–20 cm long 5–12 cm wide; stout perennial to 1.8 m and with leaves 1–4 cm wide; coastal (Sect. *Elatae*) 44. *S. poiiformis* p.412
Not as above; inflorescence glomerate-spicate or sometimes glomerules paniculate (Sect. *Hypoporum*) 5
5. Perennials with a well-developed rhizome 6
Annuals with minute root system 20
6. Stems strongly bulbous at the base, not usually tightly packed 3. *S. bulbifera* p.386
Stem-base not bulbous, or if so then tightly packed 7
7. Glomerules drooping; inflorescence unbranched 8
Glomerules not drooping; inflorescence branched or unbranched 9
8. Plants stoloniferous, rhizome absent 1. *S. catophylla* p.381
Plant with creeping rhizome 2. *S. distans* p.383
9. Stems rising in a ± straight series from a stiff, horizontally-extended rhizome at least 2 mm thick 10
Stems and rhizome not as above 14
10. Nutlets 3.5–4.5 mm long and at least 2 mm wide, inflorescence simply spicate 7. *S. longispiculata* p.388
Nutlets 1–2.5 mm long and less than 2 mm wide; inflorescence spicate or branched 11
11. Glumes hairy; inflorescence simply spicate or 1 glomerule stalked 6. *S. erythrorrhiza* p.387
Glumes glabrous (or hairy in *S. welwitschii*); inflorescence simply spicate or branched 12
12. Spikelets 4–7 mm long; inflorescence 6–25 cm long, simply branched 8. *S. welwitschii* p.388
Spikelets less than 5 mm long; inflorescence a solitary spike or simply or repeatedly branched, usually less than 10 cm long 13
13. Inflorescence 1.5–6 cm long; nutlets 1.2–1.4 mm long and 0.7–0.8 mm wide 10. *S. paupercula* p.389
Inflorescence 4–15 cm long; nutlets 1.5–1.8 mm long and 1–1.3 mm wide 9. *S. rehmannii* p.388
14. Largest leaves 4–7 mm wide 4. *S. veseyfitzgeraldii* p.386
Leaves 1–3 mm wide 15
15. Glumes hairy or hispidulous 16
Glumes glabrous (occasionally glabrous in *S. dregeana*) 18
16. Inflorescence compound, with many slender compound branches 12. *S. poooides* p.390
Inflorescence either spicate or, if branched, only simply so 17

17. Inflorescence clearly branched, with slender branches, glomerules distant (over 1700 m) ... 14. *S. richardsiae* p.392
 Inflorescence usually spicate, with occasional stout branches below; glomerules crowded 5. *S. flexuosa* p.387
18. Inflorescence always branched with distant glomerules 19
 Inflorescence simply spicate or shortly branched, glomerules usually crowded 11. *S. dregeana* p.389
19. Leaves 1–2.5 mm wide; 900–2000 m; widespread .. 13. *S. woodii* p.391
 Leaves to 1 mm wide; 1700–2400 m, southern Tanzania 14. *S. richardsiae* p.392
20. Inflorescence with branches up to 10 cm or more long 21. *S. glabra* p.397
 Inflorescence simply spicate, or only shortly branched towards the base 21
21. Glomerules reflexed; glumes hairy 15. *S. melanotricha* p.392
 Glomerules erect or spreading; glumes glabrous or hairy only on the midrib (hairy in *S. hispidus*) 22
22. Female glumes glabrous 23
 Female glumes hairy, at least on the midrib and awn 24
23. Spikelets 2–4 mm long; stems 8–15 cm long 19. *S. pulchella* p.394
 Spikelets 4–5 mm long; stems 15–40 cm long 20. *S. pergracilis* p.395
24. Plants densely hairy; female glumes hairy all over 16. *S. hispidior* p.393
 Plants sparsely hairy; female glumes glabrous except on the midrib 25
25. Spikelets 4–6 mm long; glomerules 3–4 2. *S. distans* p.394
 Spikelets 3–4 mm long; glomerules (2–)4–15 26
26. Mature nutlets dark red with 3 longitudinal ribs of more or less transparent tissue on the angles .. 18. *S. delicatula* p.394
 Mature nutlets grey to blackish, without such transparent tissue 27
27. Awn of bracteole with reddish bristles 17. *S. hispidula* p.394
 Awn of bracteole with whitish bristles 19. *S. pulchella* p.394
28. Nutlet strongly apiculate and hypogynium reduced to its stalk; robust plant with inflorescence composed of hundreds of male spikelets but few female spikelets, these lacking male rudiments; basal leaves stiff and closely imbricate (Sect. *Acriulus*) 45. *S. griegiifolia* p.412
 Not as above 29
29. Hypogynium scarcely developed; spikelets bisexual; base of nutlet where it fits into hypogynium disk with narrow annulus of chestnut brown; forest species (Sect. *Corymbosae*) 22. *S. lithosperma* p.397
 Hypogynium generally well developed; spikelets female or male or with rudiments of male lowers in female spikelets (Sect. *Scleria*) 30
30. Stems 3–10 m long, scrambling or climbing, in forest and forest edges 41. *S. boivinii* p.410
 Erect annual or perennial herbs, less than 2 m long 31
31. Plants annual with poorly developed root system 32
 Plants perennial with well-developed rhizome 41
32. Lateral panicles 2 or more arising from at least one of the nodes 33
 Lateral panicles solitary from the leaf sheaths or occasionally in pairs 36

33. Nutlets smooth; lateral peduncles pendulous 31. *S. gracillima* p.404
 Nutlets lightly pitted or striate-lacunose; peduncles
 erect or pendulous 34
34. Lateral peduncles erect; nutlet 3.5–4 mm long . . . 32. *S. hildebrandtii* p.405
 Lateral peduncles pendulous; nutlet 2–3 mm long 35
35. Nutlet hairy or glabrous; hypogynium distinctly
 3-lobed 27. *S. parvula* p.402
 Nutlet glabrous; hypogynium only faintly 3-lobed 30. *S. clathrata* p.404
36. Nutlets completely smooth, and glabrous, wider
 than long 23. *S. schimperiana* p.399
 Nutlet not entirely smooth, often pitted, glabrous
 or hairy 37
37. Nutlets hairy, nearly globose, 2.5–3 mm wide 28. *S. globonux* p.402
 Nutlets glabrous, or if hairy less than 2.2 mm wide 38
38. Lateral panicles borne on pendulous peduncles . . . 26. *S. bambariensis* p.401
 Lateral panicles borne on erect peduncles 39
39. Nutlet almost globose, minutely glandular 25. *S. mikawana* p.400
 Nutlet ovoid or ellipsoid, not glandular 40
40. Nutlet regularly and evenly pitted all over 29. *S. tessellata* p.403
 Nutlet coarsely pitted, smoother towards the tip 24. *S. foliosa* p.400
41. Male spikelets 8–13 mm long; nutlet 3.7–5 mm
 long, ovoid with dark-coloured apex, glabrous 43. *S. melanomphala* p.411
 Male spikelets 4–9 mm long; nutlet 2–3.5 mm
 long, glabrous or hairy 42
42. Nutlet only \pm 2 mm long and 1 mm wide 35. *S. laxiflora* p.406
 Nutlet at least 1.5 mm wide 43
43. Nutlets glabrous 44
 Nutlets hairy, at least below 45
44. Nutlet white or greyish with blackish blue apex . . . 39. *S. iostephana* p.409
 Nutlet yellowish brown or greyish brown without
 dark apex 40. *S. pachyrrhyncha* p.409
45. Nutlets smooth 46
 Nutlets distinctly or faintly pitted or lacunose 48
46. Nutlets less than 2.5 mm long; peduncles very short . . 42. *S. melaleuca* p.410
 Nutlets 2.5–3.5 mm long; peduncles often longer 47
47. Leaves and stems glabrous except for minute
 recurved hooks (scabrid) 37. *S. lagoensis* p.407
 Leaves and stems covered with short hairs 38. *S. adpresso-hirta* p.408
48. Peduncles 2–5 at each node, pendulous, to 25 cm
 long 49
 Only one peduncle at each node (or rarely 2),
 short and erect 33. *S. achtenii* p.405
49. Nutlet 2–2.8 mm long, male spikelets 4–5 mm long . . . 36. *S. unguiculata* p.407
 Nutlet 2.5–3.2 mm long; male spikelets 5–8 mm
 long 34. *S. nyasensis* p.406

1. *Scleria catophylla* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 670 (1895)* & in Fl. Cap. 7: 294 (1898) & in F.T.A. 8: 498 (1902) & Illustr. Cyper.: t. 122, fig. 1–4 (1909); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 33, fig. 3 (1964); Robinson in K.B. 18: 501 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 329, figs. 671, 672 (1983). Type: Angola, Huilla, *Welwitsch* 7143 (LISU, lecto.; BM, K!, iso.)

* This is not an illegitimate name as suggested, since C.B. Clarke refers to Ridley's validly described *S. hirtella* var. *aterrima* in synonymy.



Perennial herb 0.2–1.2 m tall with glabrous or hairy stems slightly swollen at base and producing up to 4 slender \pm fleshy stolons 1–2(–3) mm thick; roots pale brown or reddish. Leaves mostly produced at or near base of stem, 10–25 mm long, 2–5 mm wide, glabrous to densely hairy; ligule a dense rim of short hairs. Inflorescences spicate, 6–18 cm long, with many reflexed glomerules or 2–7 dark 4–6 mm long bisexual spikelets; glumes reddish brown to blackish, 3–5 mm long, the outer ending in a long awn densely covered with almost black hairs; hairs below the awn often white or reddish brown. Nutlet white, obovoid, (1.2–)1.5–1.7 mm long, 1–1.2 mm wide, smooth, with a minute cupule. Fig. 58: 1–4, p. 382.

UGANDA. Mbale District: Mukedi, W Budama, 5 July 1971, *Lye* 6439!; Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1369! & Lake Nabugabo, 1–2 km N of Bale, 1 Feb. 1970, *Lye* & *Haines* 5021!

TANZANIA. Uzaramo District: Dar es Salaam, 9 Sept. 1977, *Wingfield* 4166!; Songea District: 1.5 km E of Songea, 16 Mar. 1956, *Milne-Redhead* & *Taylor* 9923! & 12 km E of Songea, Nonganonga stream, 22 Apr. 1956, *Milne-Redhead* & *Taylor* 9935!

DISTR. U 3, 4; T 6, 8; Senegal to S Nigeria, Angola, Zambia, Malawi, Zimbabwe, South Africa
HAB. Seasonally wet grassland, bogs; (30–)1050–1200 m

SYN. *S. hirtella* Sw. var. *aterrima* Ridl. in Trans. Linn. Soc. Ser. 2, Bot. 2: 166 (1884). Type as for *S. catophylla*

S. aterrima (Ridl.) Napper in K.B. 25: 445 (1971) & in F.W.T.A. 3 (2): 344 (1972); Gordon-Gray in *Strelitzia* 2: 181, fig. 82c (1995)

NOTE. Napper's argument that *S. aterrima* is the correct name is fallacious and I am grateful to Dr. R.K. Brummitt for confirming this. Also her claim that the species occurs in America I have been unable to confirm.

2. *Scleria distans* Poir. in *Encycl. Meth. Bot.* 7: 4 (1806); Haines & Lye, *Sedges & Rushes of E. Afr.*: 330 (1983); Gordon-Gray in *Strelitzia* 2: 183 (1995); Lye in *Fl. Eth.* 6: 495, fig. 212. 160 (1997). Type: Puerto Rico, *Ledru* 110 p.p. (P, holo.)

Slender perennial 20–90 cm tall with many stems given off at 2–20 mm intervals from a creeping rhizome 2–4 mm thick and 10 or more cm long; hairy or \pm glabrous; stem bases sometimes swollen and bulbous. Leaves up to 18 cm long, 1–3 mm wide; lower leaf sheaths brown or pale reddish brown to purple, without blades; ligule an indistinct and \wedge -shaped rim the throat with a dense rim of hairs. Inflorescence a lax spike 5–10 cm long bearing 4–9 sessile drooping glomerules 5–6 mm long, 4–10 mm wide; spikelets (1–)2–8(–10), densely crowded, bisexual, a solitary female flower below the upper male flowers; glumes reddish brown to blackish, 3–6 mm long, the outer ending in a long awn densely set with spreading reddish brown hairs. Nutlet white greyish or pale violet tinged, 1.4–1.5 mm long, 0.9–1.2 mm wide, smooth or with strong transverse wrinkles or tubercles; cupule reddish or yellowish brown, triangular, 0.3–0.6 mm long. Fig. 59, p. 384 & 60: 8, p. 396.

var. *distans*; Haines & Lye, *Sedges & Rushes E. Afr.*: 330, fig. 673, 674 (1983)

Stems more spaced on the rhizome, not swollen and bulbous at base; leaf sheaths usually brown or pale reddish brown. Nutlets usually white, smooth or rarely with small wrinkles or tubercles.

UGANDA. Ankole District: Nsika, Buwezu, 25 Sept. 1957, *Lind* 2200!; Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1381!

FIG. 58. *SCLERIA CATOPHYLLA* — 1, habit, \times 1; 2, leaf apex, \times 6; 3, male spikelet, \times 6; 4, nutlet, \times 15. *SCLERIA BULBIFERA* — 5, habit, \times 1; 6, nutlet, \times 15. [*SCLERIA PURDIEI* — 7–8, not in FTEA]. 1–4 from *Barter* 1561; 5–6 from *Schimper* 327. Reproduced from C.B. Clarke (1909) Illustrations of Cyperaceae. Drawn by Matilda Smith.



FIG. 59. *SCLERIA DISTANS* — 1, habit, $\times \frac{2}{3}$; 2, leaf blade, $\times 4$; 3, tip of leaf blade, lower surface, $\times 12$; 4, inflorescence, $\times 1\frac{1}{2}$; 5, group of spikelets, $\times 9$; 6, spikelet detail, $\times 9$; 7–9, glumes: sterile $\times 6$, female $\times 6$ and male $\times 9$, respectively; 10, stamens, $\times 20$; 11, ovary and stigma, $\times 9$; 12, nutlet, $\times 9$. All from *Greenway* 3282. From *Flora of West Tropical Africa* 3, t. 415. Drawn by Dorothy Thompson.

KENYA. Trans-Nzoia District: 24 km E of Kitale, Cherangani Hills, 8 Nov. 1961, *Bogdan* 5313!; S Kavirondo/Kericho District: Kijaur to Sotik, 16 Mar. 1951, *Bogdan* 2968!; Masai District: Lolgorien, Sept. 1933, *Napier* 2918 in CM 5382!

TANZANIA. Bukoba District: Bukoba, June 1931, *Haaver* 2021!; Iringa District: Great North road 85 km S of Iringa, John's Corner, 11 Mar. 1962, *Polhill & Paulo* 1708!; Songea District: 55 km ENE of Songea, 28 Mar. 1956, *Milne-Redhead & Taylor* 9360!

DISTR. U 2, 4; K 3, 5, 6; T 1–4, 6–8; Nigeria, Cameroons, Congo-Kinshasa, Burundi, Ethiopia, Zambia, Malawi, South Africa; Mauritius, Madagascar; also in tropical America

HAB. Damp or rather dry grassland, permanent swamps, woodland with areas of grassland, sometimes as a weed in swamps and brought into cultivation; 1000–2500 m*

SYN. *S. nutans* Kunth, Enum. Pl. 2: 351 (1837); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 41 (1964); Robinson in K.B. 18: 502 (1966); Napper in F.W.T.A. ed. 2: 2: 344 (1972). Type: Venezuela, Cumana, *Humboldt* s.n. in Herb. Willd. 17336 (B-W!, holo.) (seen by Robinson)

S. enchroides Kunth, Enum. Pl.: 352 (1837). Type: South Africa, *Drège* s.n. (?B, holo.; K!, iso.)

S. hirtella Sw. var. *tuberculata* C.B. Clarke in Fl. Cap. 7: 294 (1898). Type: South Africa, Magalisberg, *Burke* 62 (K!, holo.)

S. hirtella auctt. mult., non Sw.

var. ***chondrocarpa*** (*Nelmes*) *Lye* in Nordic Journ. Bot. 3: 243 (1983); Haines & Lye in Sedges & Rushes E. Afr.: 330, fig. 675, 676 (1983). Type: Uganda, Masaka District: Sese Is., Bugala I., A.S. *Thomas* 95 (K!, holo.; KAW, iso.)

Stems crowded together, distinctly bulbous at the base; leaf sheaths usually crimson or purple and densely shortly reddish brown hairy. Nutlets often tinged pale violet or greyish, usually strongly transversely wrinkled.

UGANDA. Masaka District: Sese Is., Bugala I., Kalangala, 2 Mar. 1933, A.S. *Thomas* 933! & same locality, 24 Feb. 1945, *Greenway* & A.S. *Thomas* 7173!, & NW Bufumira I., 18 July 1951, *Norman* 23!

DISTR. U 4; T 1 (fide Lye, see note)

HAB. Moist grassland, forest edge grassland, marshy hollows near lake sides, pools on rocky outcrops; 1100–1300 m

SYN. *S. hirtella* Sw. var. *chondrocarpa* *Nelmes* in K.B. 10: 451 (1955)

NOTE. Lye mentions *Brown* 121 (Sese Is., Nov. 1904) has stalked glomerules with peduncles to 7 mm long but stalks are scarcely 2–3 mm long on that sheet. He also states the variety occurs in T 1 probably based on the *Haaver* sheet 2021 cited above under var. *distans* which does have a pencilled note var. *chondroides* (by *Nelmes*?) but this specimen is devoid of basal parts and impossible to confirm and so its inclusion under var. *distans* is uncertain.

var. ***glomerulata*** (*Oliv.*) *Lye* in Nordic Journ. Bot. 3: 243 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 331 (1983). Type: Uganda, Madi, *Grant* 668 (K, holo.)

Slender sweetly scented (fide *Grant*) perennial or perhaps annual with tufted stems; roots purple. Inflorescence 3–7 cm long with 3–4 glomerules. Nutlets white, obovoid to subglobose with very short beak, 2 mm long 1.5 mm wide, with transverse wrinkles.

UGANDA. Madi, Dec. 1862, *Grant* 668!

DISTR. U 1

HAB. Seasonally wet places among “debris of rocks” (fide *Grant*)

SYN. *Scleria glomerulata* *Oliv.* in Trans. Linn. Soc. 29: 170, t. 110B (1875); C.B. Clarke in F.T.A. 8: 496 (1902); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 32 (1964)

NOTE. More material is needed to assess the correct status of this.

* Robinson in his TS gives a lower limit of 100 m but I have seen no specimen from East Africa to substantiate this.

3. *Scleria bulbifera* A. Rich., Tent. Fl. Abyss. 2: 510 (1851); C.B. Clarke in F.T.A. 8: 500 (1902) & Illustr. Cyper., t. 122, fig. 56 (1909); F.P.N.A. 3: 277 (1955); Nelmes in K.B. 10: 438 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 32, fig. 2, 4 (1964); Robinson in K.B. 18: 503, fig. 3.10–12 (1966); Napper in F.W.T.A. 3 (2): 344 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 331, figs. 677, 678 (1983); Gordon-Gray in Strelitzia 2: 181, fig. 82E, 83 (1995); Lye in Fl. Eth. 6: 495, fig. 212. 161 (1997). Type: Ethiopia, Mt Scholoda, *Schimper* 1557 (P, holo.; BM, K!, iso.)

Rhizomatous or stoloniferous perennial 30–90 cm tall; stems somewhat distant to more crowded, with stem bases ± woody, thickened into bulb-like swellings 4–10 mm wide often covered with fibrous remains. Lower leaf sheaths usually reddish brown and without leaf-blades, upper with leaf-blades 15–30 cm long, 2–5 mm wide, ligule ± absent but throat of sheaths with rim of dense whitish hairs. Inflorescences spicate, 5–20 cm long, bearing (3–)6–20 sessile erect glomerules 3–12 mm long, 5–8 mm wide comprising few to many bisexual dark reddish spikelets; glumes 3–5 mm long usually with green scabrid midrib, glabrous or with short whitish hairs. Nutlets white, greyish brown or bluish grey, obovoid to subglobose, 1.5–2 mm long, 1–1.5 mm wide, smooth, slightly reticulate or tuberculate; hypogynium brownish, 0.4 mm long. Fig. 58: 5–6, p. 382.

UGANDA. Karamoja District: Napak, 26 June 1966, *Haines* 4669!; Toro District: Karangora, Aug. 1954, *Osmaston* 3960; Masaka District: Kyotera County, 1–2 km S of Mityabili, 21 Feb. 1971, *Lye* 3902!

KENYA. Uasin Gishu District: Kipkarren R. May 1957, *Dale* 16!; Machakos District: Chyulu North, 1 May 1938, *Bally* in CM 8092!; Kisumu-Londiani District: Tinderet Forest Reserve, camp 3, 26 June 1949, *Maas Geesteranus* 5188!

TANZANIA. Ngara District: Ngara, 18 Dec. 1959, *Tanner* 4666!; Buha District: Kasakela Reserve, 20 Nov. 1962, *Verdcourt* 3385!; Songea District: Songea, Kwamponjole Valley, 26 Apr. 1956, *Milne-Redhead & Taylor* 9926!

DISTR. U 1–4; K 3–6; T 1–8; widespread throughout tropical Africa from Senegal to Ethiopia and down to South Africa, also in Madagascar

HAB. From dry montane upland, open woodland and grassland to seasonally damp marshland; 200–2250 m

SYN. *S. atrosanguinea* Steud., Syn. Pl. Glum. 2, Cyper: 175 (1855). Type: Ethiopia, Scholoda Mt, *Schimper* 327 (B† holo.; BM, K!, iso.)

S. schweinfurthiana Boeck. in Flora 62: 570 (1879); C.B. Clarke in F.T.A. 2: 500 (1902). Type: Sudan, Seriba Ghattas, *Schweinfurth* 2193 (B†, holo.; K!, iso.)

S. mechowiana Boeck. in E.J. 5: 510 (1884); C.B. Clarke in F.T.A. 2: 498 (1902). Type: Angola, Malange, *Mechow* 345 (B†, holo.) (seen by C.B. Clarke)

S. buchananii Boeck., Cyper. Nov. 1: 33 (1888); C.B. Clarke in F.T.A. 2: 499 (1902). Type: Malawi, Shire Highlands, *Buchanan* 32 (B†, holo.; K!, iso.)

S. verdickii De Wild. in Rev. Zool. Afr. 14, Suppl. Bot.: 26 (1926). Type: Congo-Kinshasa, Shaba, Lukafu, *Verdick* 398 (BR, holo.) (seen by Robinson)

S. schliebenii Gross in N.B.G.B. 11: 657 (1932); F.D.-O.A. 1: 531 (1938). Type: Tanzania, Iringa District: Upper Ruhudje, Lupembe, Likanga, *Schlieben* 782 (B, holo.?) (seen by Robinson)

S. schliebenii Gross var. *ferruginea* Peter, F.D.-O.A. 1: 531 (1938) & Anlang: 142 (1938). Type: Tanzania, Buha District: Birira to Nisusi, *Peter* 37890 (B†, holo.)

S. bulbifera A. Rich. var. *hirsuta* Peter & Kük. in F.D.-O.A. 1: 531 (1938) & Anhang: 142 (1938). Types: Tanzania, Kigoma District: Uvinza, Lugufu, *Peter* 36432 (B†, syn., K!, isosyn.) & same locality, *Peter* 36611 (B†, syn., K!, isosyn.) & Uvinza, *Peter* 36455 (B†, syn.)

S. bulbifera A. Rich. var. *mechowiana* (Boeck.) Kük. in F.D.-O.A. 1: 530 (1938)

S. thomasi Piérart in B.S.B.B. 83: 405 (1951). Type: Congo-Kinshasa, Kundelungu Plateau, *R.L.X. Thomas* s.n. (BR, holo.) (seen by Robinson)

NOTE. The bulbs are eaten by the Wakamba (*Bally* in CM 8092).

4. *Scleria vesityfzgeraldii* E.A. Rob. in K.B. 18: 503, fig. 3/1–9 (1966); Haines & Lye, Sedges & Rushes of E. Afr.: 332, figs. 679, 680 (1983). Type: Zambia, banks of Kafue R., 11 km N of Chingola, *Robinson* 4220 (K!, holo.; B, EA, GC, M, MPR, MTJB, NY, PRE, SRGH, iso.)

Perennial tufted herb; stems robust, erect, up to 1 m tall, glabrous, 3-angled, 1–3 mm wide, somewhat thickened at the base, densely covered with withered sheaths. Leaves 2–7 mm broad, almost glabrous or densely hairy. Inflorescences usually simple spikes 5–12(–15) cm long formed of 4–8 sessile glomerules, rarely with branches, 2 cm long formed from basal glomerules; glomerules dense, multispiculate, up to 14 mm wide; spicules androgynous and male; glumes chestnut brown or blackish brown, with green keels, aristate, with black or pale hairs; female glumes 5–6 mm long (including arista). Nutlet grey, broadly obovoid, acutely trigonous, 2 mm long, 1.3–1.6 mm wide, distinctly reticulate-trabeculate, without a beak.

TANZANIA. Ufipa District: Kanyalakata, near Msanzi, 20 Jan. 1961, *Vesey-FitzGerald* 2917
DISTR. T 4; Zambia, Namibia
HAB. Seasonally wet or inundated grasslands or swamps; altitude unknown, ?1800 m

5. *Scleria flexuosa* Boeck., *Cyper. Nov.* 1: 33 (1888); Nelmes in K.B. 10: 431 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 36 (1964); Robinson in K.B. 18: 505 (1966) pro parte; Napper in K.B. 25: 444 (1971); Haines & Lye, *Sedges and rushes E. Afr.*: 332, figs. 681, 682 (1983). Type: Malawi, Shire Highlands, *Buchanan* 60 (B, holo.; E, K!, iso.)

Perennial 15–55 cm tall with a simple tuber 8–12 mm long, 4–8 mm wide, connected to the stem base by a fragile rhizome 2–4 cm long, ± 1 mm thick so plant can be mistaken for an annual if broken; stems erect, glabrous or hairy. Leaves 5–12.5 cm long, 1–2 mm wide, hairy. Inflorescences simply spicate or shortly (to 1 cm) branched in lower half, 3–12 cm long with erect or spreading glomerules of 2–11 spikelets; glumes chestnut brown, 3–4.5 mm long with white hairs or sometimes glabrous. Nutlets dark grey, broadly ovoid to subglobose, 1–1.5 mm long, ± 1 mm wide, strongly tuberculate-trabeculate.

TANZANIA. Southern Highlands (fide Haines & Lye); Songea District: NW corner of Matagoro Hills just SW of Songea, 2 May 1956, *Milne-Redhead & Taylor* 9977!
DISTR. T 7, 8; Guinea, Sierra Leone, Ivory Coast, Angola (see note), Zambia, Malawi, Zimbabwe, Lesotho
HAB. Exposed rock faces, in shallow pockets of soil; ± 1230 m

NOTE. Robinson (TS) was somewhat doubtful the Songea material cited belongs to *S. flexuosa* and also includes *S. dieterlenii* Turrill [K.B. 1914: 20 (1914). Type: Lesotho, Leribe, *Dieterlen* 749 (K!, holo.)] in synonymy. Nelmes and Napper both agreed the Songea material matched the type, *Buchanan* 60. Robinson also doubts if Napper's record (FWTA ed. 2: 344 (1972)) of *S. dieterlenii* from W Africa is justified by the inadequate material available. Haines & Lye mention that two other taxa *S. dieterlenii* Turrill and *S. lateritica* Nelmes (K.B. 10: 432 (1955)). Type: Zambia, Mwinilunga, Kalenda Dambo, *Milne-Redhead* 4568 (K, holo.) are closely related to *S. flexuosa*, the former having spikelets 4–5 mm long in more crowded glomerules and *lateritica* with 3–4 mm long spikelets with dark chestnut glumes. Robinson (1966) includes both in synonymy with *S. flexuosa*.

6. *Scleria erythrorrhiza* Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 167 (1884); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 670 (1895); Rendle in *Cat. Afr. Pl. Welw.* 2: 133 (1899); C.B. Clarke in *F.T.A.* 8: 499 (1902); Nelmes in K.B. 10: 437 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 32 (1964); Robinson in K.B. 18: 506 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 333, fig. 683 (1983). Type: Angola, Huilla, *Welwitsch* 7136 (LISU, holo.; BM!, iso.)

Rhizomatous perennial 0.3–1 m tall, producing erect stems at short intervals; rhizome usually reddish with reddish roots, woody, straight, 3–6 mm wide. Leaves 2–6 mm wide, glabrous, ligulate, hairy or hispid. Inflorescences simply spicate with many glomerules of 3–16 dark 5–6 mm long spikelets and occasionally a single glomerule produced on a short stalk in the axil of a leaf-like bract well below the

main spike; glumes chestnut, often dark red towards the apex and with a green midrib, 3–5 mm long, sometimes awned, densely hairy. Nutlets pale brown or pale grey with darker interangular stripes, sometimes tinged violet at apex, broadly ovoid, 2 mm long, 1–1.2 mm wide, apiculate, smooth; hypogynium clearly differentiated, white, ± spongy in texture when fresh.

TANZANIA. Songea District: Kwamponjore valley ± 9 km SW of Songea, Apr. 1956, *Milne-Redhead & Taylor* 9925!

DISTR. T 7, 8; Zambia, Congo-Kinshasa (Shaba), Angola

HAB. Boggy grassland near termite mounds; 1000 m

7. *Scleria longispiculata* Nelmes in K.B. 13: 150 (1958); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 32 (1964); Robinson in K.B. 18: 506 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 333, figs. 684, 685 (1983). Type: Tanzania, Songea District, Kitai, *Milne-Redhead & Taylor* 9739 (K!, syn., 3 sheets)

Stout rhizomatous perennial 0.6–1.2 m tall with long creeping woody rhizome 4–6 mm wide, producing erect stems at 0.5–2 cm intervals; stem bases slightly swollen. Leaves 2–5 mm wide, hairy or hispid. Inflorescences simply spicate 5–10 cm long with many glomerules 1–2 cm apart each of 2–6 greenish or pale brown minutely hispidulous spikelets 8–9 mm long; glumes chestnut with green midrib, hispidulous pubescent. Nutlets brown or light brown with interangular strips of darker brown, ovoid, 3.5–4 mm long, 2–2.5 mm wide, smooth; hypogynium black.

TANZANIA. Songea District: R. Mtanda ± 9 km SW of Songea, 25 Mar. 1966, *Milne-Redhead and Taylor* 9339! & same area, Kitai, 16 Apr. 1966, *Milne-Redhead & Taylor* 9739!

DISTR. T 8; Zambia and Namibia

HAB. Sandy ground in *Brachystegia-Uapaca* woodland; 900–1000 m

NOTE. Napper states inflorescence sparingly branched.

8. *Scleria welwitschii* C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 675 (1895); Rendle, Cat. Afr. Pl. Welw. 2: 133 (1899); C.B. Clarke in F.T.A. 8: 501 (1902); Nelmes in K.B. 10: 423 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 30 (1964); Robinson in K.B. 18: 506 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 334, fig. 686 (1983); Gordon-Gray in Strelitzia 2: 186, fig. 85A (1955). Type: Angola, Huilla, Catumba, *Welwitsch* 7138 (LISU, lecto., BM!, isolecto.) (chosen by Nelmes)

Slender perennial 0.3–1 m tall with a ± straight woody rhizome 3–4 mm wide bearing weakly erect stems spaced at 0.5–1.5 cm intervals. Leaves 1.5–3 mm wide, glabrous or hairy, ligulate. Inflorescences sparingly branched, up to 25 cm long with branches to 10 cm long, lax and ± drooping at maturity with glomerules of 2–6 spikelets, each 4.5–7 mm long; glumes dark chestnut or reddish, 3–4 mm long, long-acuminate, glabrous or hairy. Nutlets grey, ovoid to ellipsoid, 1.5–1.8 mm long, 1–1.2 mm wide, not or very shortly apiculate, smooth.

TANZANIA. Ufipa District: 25 km S of Sumbawanga, 3 Jan. 1962, *Robinson* 4885!; Njombe

District: Njombe–Kipengere road, Igosi, 26 Apr. 1970, *Wingfield* 767!

DISTR. T 4, 7; Angola, Zambia, Zimbabwe & South Africa

HAB. Perennial bogs and seasonally wet grassland; 1500–2400 m

SYN. *S. junciformis* Ridl. in Trans. Linn. Soc., ser. 2, Bot. 2: 168 (1884), *non* Thwaites, *nom. illegit.*

NOTE. Possibly not distinct from the Brazilian *S. spicata* (Spreng.) MacBride.

9. *Scleria rehmannii* C.B. Clarke in Fl. Cap. 7: 295 (1898) & in F.T.A. 8: 501 (1902); Nelmes in K.B. 10: 425 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 30, fig. 11 (1964); Robinson in K.B. 18: 507 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 334, fig. 687 (1983). Type: South Africa, Houtbosch, *Rehmann* 5626 (K!, holo.)

Slender perennial 0.3–1.5 m tall with long straight woody rhizome 3–4 mm wide, bearing erect stems 0.5–1.5 cm apart. Leaves 1–3 mm wide, \pm hairy, \pm ligulate. Inflorescence a stiffly erect simple panicle 4–12(–15) cm long with branches up to 7 cm but sometimes simply spicate with glomerules of 2–6, dark red 3.5–5 mm long spikelets; glumes shortly acuminate, glabrous. Nutlets grey or pale brown, irregularly globose or broadly ovoid, 1.5–1.8 mm long, \pm 1 mm wide, apiculate, generally smooth but sometimes slightly papillose or strongly tuberculate in transverse lines.

UGANDA. Mbale District: Tororo, Bukedi, 9 June 1966, *Haines* 4145!

TANZANIA. Songea District: Ulamboni Valley, \pm 11 km W of Songea, 1 Jan. 1956, *Milne-Redhead & Taylor* 7994! & Kwampanjore Valley, 9 km S of Songea, 7 Feb. 1956, *Milne-Redhead & Taylor* 8711!; Tunduru District: Puchapucha, 1.5 km E of R. Mawesi, 19 Dec. 1955, *Milne-Redhead & Taylor* 7812!

DISTR. U 3; T †4, †7, 8; Congo-Kinshasa (Shaba), Angola, Zambia, Malawi, Zimbabwe and South Africa

HAB. Seasonally or perennially wet grassland, sandy ground at edge of *Brachystegia-Uapaca* woodland, forest edge grassland; 450–1600(–2100) m

NOTE. Robinson (TS) notes “This species varies considerably with habitat; robuster forms with a strongly branched inflorescence arc characteristic of drier ground; in permanently waterlogged bogs much slenderer examples occur with the inflorescence much reduced but intermediate forms are common”.

10. *Scleria paupercula* *E.A. Rob.* in *K.B.* 18: 508, fig. 4 (1966); *Haines & Lye, Sedges & Rushes E. Afr.*: 335, figs. 688, 689 (1983). Type: Zambia, 8 km E of Kasama, *Robinson* 4723 (K!, holo.; B, EA, CG, M, MPR, MTJB, NY, PRE, SRGH, iso.)

Slender perennial 20–50 cm tall with long creeping, \pm straight juicy (woody when dry) rhizome 2–3 mm thick; entirely glabrous save for the mouths of the leaf sheaths and glumes sometimes slightly hairy; stems erect close or up to 1 cm apart, slender, 0.5–1 mm wide. Leaves under 1 mm wide with incurved margins. Inflorescence 1.5–6 cm long spicate or shortly branched with glomerules of 2–6 spikelets, each 3–4 mm long; glumes dark brown. Nutlets white to brownish, irregularly ovoid to ovoid-globose, 1.2–1.4 mm long, 0.7–0.8 mm wide, smooth; hypogynium brown, 0.4 mm long.

TANZANIA. Songea District: Valley of R. Halau, 3 km SE of Miyau, 12 Jan. 1956, *Milne-Redhead & Taylor* 8319!

DISTR. T 8; Zambia, Zimbabwe

HAB. Boggy grassland, dominant between tussocks of grasses and sedges; 1500 m

NOTE. Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 31 (1964) mentions this name but the description is in English.

11. *Scleria dregeana* *Kunth*, *Enum. Pl.* 2: 354 (1837); *Boeck.* in *Linnaea* 38: 443 (1874); *Ridl.* in *Trans. Linn. Soc. ser. 2, Bot.* 2: 167 (1884); *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 670 (1895); *K. Schum.* in *P.O.A. C.* 128 (1895); *C.B. Clarke* in *Fl. Cap.* 7: 295 (1898); *Rendle* in *Cat. Afr. Pl. Welw.* 2: 133 (1899); *C.B. Clarke* in *F.T.A.* 8: 499 (1902); *Nelmes* in *K.B.* 10: 426 (1955); *Napper* in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 32 (1964); *Robinson* in *K.B.* 18: 510 (1966); *Haines & Lye, Sedges and Rushes E. Afr.*: 336, figs. 690, 691 (1983); *Gordon-Gray* in *Strelizia* 2: 183, figs. 81A–C, 82G, J (1995). Type: South Africa, Cape of Good Hope, *Drège* s.n. (3934 fide *C.B. Clarke* who gives locality as Kat Berg) (B†, holo.; K!, iso.)

Perennial usually caespitose herb or sometimes with a rhizome 1–2 mm thick bearing closely placed slender stems 0.2–1 m tall. Leaves 1–2(–3) mm wide, glabrous or slightly hairy. Inflorescences 3–10 cm long, simply spicate or sparsely to strongly branched, the branches 3–5 cm long; glomerules close-set of 2–9 blackish 4.5–6 mm

long spikelets; glumes usually dark to pale brown or blackish with conspicuous green midrib, glabrous or hairy. Nutlets whitish to olive brown, ovoid, 1.4–2 mm long, 1.1–1.3 mm wide, apiculate, smooth or slightly tuberculate towards the apex, distinctly beaked.

UGANDA. Mbale District: W Budama, near Apoli, 5 km N of Malaba R., 5 Jan. 1971, *Lye & Katende* 6440!; Mengo District: Entebbe, 1910, *Fyffe* 52!

TANZANIA. Ufipa District: 12 km S of Sumbawanga, 30 Dec. 1961, *Robinson* 4817!; Iringa District: Dabaga Highlands, Kilolo, 9 Feb. 1962, *Polhill & Paulo* 1407!; Songea District: 40 km W of Songea, 10 Mar. 1956, *Milne-Redhead & Taylor* 9140!

DISTR. U 3, 4; T 4, 7, 8; Congo-Kinshasa (Shaba), Angola, Zambia, Malawi, Zimbabwe, Lesotho and South Africa

HAB. Seasonally or perennially wet grassland, valley bogs; 800–1900 m

SYN. *S. meyeriana* Kunth, Enum. Pl. 2: 354 (1837); Boeck. in *Linnaea* 38: 441 (1874); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 673 (1895) & in *Fl. Cap.* 7: 294 (1898); Rendle in *Cat. Afr. Pl. Welw.* 2: 133 (1899); C.B. Clarke in *F.T.A.* 8: 498 (1902). Type: South Africa, east coast, *Drège s.n.* (Pondoland, *Drège* 4364 fide C.B. Clarke). (B†, holo.) (seen by C.B. Clarke)

S. holcooides Kunth, Enum. Pl. 2: 354 (1837); Boeck. in *Linnaea* 38: 445 (1874); C.B. Clarke in *Fl. Cap.* 7: 296 (1908). Type: South Africa, east coast, *Drège s.n.* (between Umtentu R. and Umzimkulu R. *Drège* 4381 fide C.B. Clarke) (B†, holo.; K, iso.)

S. caespitosa Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 167 (1884). Type: Angola, Pungo Andongo, *Welwitsch* 7135 (LISU, holo.; K!, iso.)

S. setulosa Boeck., *Cyper. Nov.* 1: 3 (1888). Type: Malawi, Shire Highlands, *Buchanan* 36 (B†, holo.; K!, iso.)

S. bulbifera A. Rich. var. *hirsuta* sensu F.D.-O.A. 1: 531 (1938) quoad *Peter* 38937, non Peter & Kük.

NOTE. Robinson wrote some extensive notes about the difficulty in sorting out the various *Drège* specimens in his TS and also in his 1966 paper. For note on the type of *S. setulosa* see K.B. 18: 508 (1966). C.B. Clarke cites *Scott Elliot* 6409 from K 4 Ukamba as this species and annotated it as a form equivalent to *S. setulosa* Boeck.

12. *Scleria pooides* Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 170 (1884), as *poaeoides*; C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 674 (1895); Rendle in *Cat. Afr. Pl. Welw.* 2: 134 (1899); C.B. Clarke in *F.T.A.* 8: 502 (1902), as *poaeoides*; Nelmes in K.B. 10: 433 (1955), as *poaeoides*; Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 30 (1964), as *poaeoides*; Robinson in K.B. 18: 512 (1966); Napper in *F.W.T.A. ed. 2.* 2: 343 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 336, figs. 16B & 692 (1983). Type: Angola, Huilla, *Welwitsch* 7142 (LISU, holo.; K!, iso.)

Slender glabrous tufted perennial 30–80 cm tall, or with short creeping rhizome ± 1 mm thick. Leaves 1–2 mm wide. Inflorescence a spreading compound panicle 3–15(–20) cm long, the branches slender, compound; spikelets dark red axillary and pedicellate, up to 170 on one stem, 3–4(–5) mm long; glumes arranged ± distichously in the spikelet, the males 2–3 mm long, females 1.5–2 mm, hispidulous. Nutlets grey, ovoid to globose, 1–1.5 mm long, 0.8–1 mm wide, tuberculate.

KENYA. N Kavirondo District: 8 km SE of Bungoma, 27 June 1955, *Bogdan* 4055!

TANZANIA. Iringa District: Msima Stock Farm, 1932, *Emson* 335! & Mufindi road, Malakala, 13 Mar. 1962, *Polhill & Paulo* 1742!; Songea District: 12 km W of Songea, 19 Mar. 1956, *Milne-Redhead & Taylor* 9302!

DISTR. K 5; T 7, 8; Nigeria, Congo-Kinshasa, Angola, Zambia, Malawi, Zimbabwe; Madagascar

HAB. Perennially damp grassland and swamps; 900–1750 m

SYN. *S. multispiculata* Boeck., *Cyper. Nov.* 1: 36 (1888); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 673 (1895) (as *multispiculosa*); K. Schum. in *P.O.A. C.* 129 (1895); Rendle in *Cat. Afr. Pl.* 2: 134 (1899); C.B. Clarke in *F.T.A.* 8: 501 (1902). Type: Malawi, Shire Highlands, *Buchanan* 1 (B†, holo.; E, K, iso.)

S. prophyllata Nelmes in K.B. 10: 434 (1955). Type: Angola, Moxico District, Mumbala R., *Milne-Redhead* 3995 (K!, holo.)

13. *Scleria woodii* C.B. Clarke in Fl. Cap. 7: 295 (1898); Rendle in Cat. Afr. Pl. Welw. 2: 133 (1899); C.B. Clarke in F.T.A. 8: 501 (1902); Nelmes in K.B. 10: 428 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 31 (1964); Robinson in K.B. 18: 512 (1966); Napper in K.B. 25: 443 (1971); Haines & Lye, Sedges & Rushes E. Afr.: 336 (1983); Gordon-Gray, *Strelitzia* 2: 186 (1995); Lye in Fl. Eth. 6: 495 (1997). Type: South Africa, Zululand, Inyoni R., *Wood* 3994 (K, lecto., BOL, NH, iso.) (chosen by Gordon-Gray)

Perennial 25–75 cm tall from a single obliquely descending scented white or pink soft tuberous rhizome 5–8(–10) cm long, 2–3 mm thick, which eventually produces a new plant at its tip up to 10 cm from the parent which subsequently dies after flowering; internodes slightly swollen. Leaves 1–2(–3) mm wide, glabrous or hairy. Inflorescence a simple or compound panicle 5–14 cm long, 2–5 cm wide with short erect or extended branches up to 6(–10) cm long, slender and nodding with 10–30 glomerules of (1–)2–6 spikelets; glumes pale to blackish brown, 3–4(–5) mm long, glabrous. Nutlets grey with darker longitudinal stripes ovoid to globose, 1.5–1.7(–2) mm long, 1–1.4 mm wide, smooth, or faintly striate-tessellate to papillose or strongly tuberculate; cupula dark brown with whitish border 0.5 mm long, 0.3 mm wide, sometimes persistent.

var. **woodii**; Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 31 (1964); Haines & Lye, Sedges & Rushes E. Afr.: 336, fig. 693 (1983)

Nutlet strongly tuberculate or with transverse ridges; inflorescence with several simple branches from the lower clusters.

UGANDA. West Nile District: Valley 1.6 km NW of Maracha rest camp, 3 Aug. 1953, *Chancellor* 103!; Busoga District: Bugabule Co., 8 km E of Namasagali, close to Kamuli road, 11 June 1953, *G.H.S. Ward* 975!; Mengo District: Bugerere, 16 km N of Bale, 2 July 1956, *Langdale-Brown* 2140!

KENYA. Mt Elgon, May 1931, *Mrs. C. Lugard* 667B!

TANZANIA. Ufipa District: Mwazy Mission, 3 Jan. 1962, *Robinson* 4900!; Manyoni District: Musa Rungwa Game Reserve, 2 Mar. 1963, *Mdehwa* 23A!; Mbeya District: base of Pungaluma Hills ± 1 km E of Morwa, 5 Jan. 1991, *Gereau et al.* 3484!

DISTR. U 1–4; K 3; T 4, 5, 7; widespread in tropical and South Africa

HAB. Seasonally damp or inundated grassland, old termite mounds; 900–2050 m

SYN. *S. striatonux* De Wild. var. *lacunosa* Piérart in Lejeunia, Mém. 13: 30 (1953). Kenya, Mt Elgon, *Mrs C. Lugard* 667B (K!, lecto.) (chosen by Robinson in F.T.E.A. TS)

NOTE. *Wingfield* 896 (Mbeya–Iringa road, ± 12 km before John's Corner, 21 Jan. 1970) consists of several culms probably not all from one plant but very definitely some pieces with smooth nutlets and some with definitely tuberculate and strongly ridged. At least one can state the two varieties occur together.

var. **ornata** (*Cherm.*) *Schultze Motel* in Willdenowia 2: 504 (1960); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 31 (1964); Haines & Lye, Sedges & Rushes E. Afr.: 337, fig. 694 (1983). Type: Congo-Kinshasa, W of Lake Kivu, Kabare, *Scaetta* s.n. (P, holo.)

Nutlets quite smooth or almost so. Inflorescence more open, sometimes branched twice.

UGANDA. Mengo District: Nakasongola–Nabuswera, km 21.6, 25 Apr. 1956, *Langdale-Brown* 2083! & ? Namumba Hill, Oct. 1913, *Dummer* 363! and Namanve Swamp, June 1937, *Chandler* 1670!

KENYA. Trans-Nzoia District: 24 km S of Kitale, 8 Aug. 1953, *Bogdan* 3782! & Elgon, May 1931, *Mrs C. Lugard* 667A!

TANZANIA. Musoma District: Tabora Guard Post, 25 Feb. 1968, *Greenway & Myles Turner* 13334!; Lushoto District: E Usambaras, hills beyond Monga, 17 Apr. 1968, *Renvoize & Abdallah* 1553!; Njombe District: Msima Stock Farm, 1932, *Emson* 361!

DISTR. U 1 (fide Haines & Lye), 2 (fide Haines & Lye), 4; K 3; T 1, 3, 4, 7; West Africa, Congo-Kinshasa, Sudan, Zambia

HAB. Seasonal swamp edges, mixed grassland, *Imperata* grassland after cultivation, hillsides, rocky places; 1000–2100 m

SYN. *S. striatinux* De Wild. in Rev. Zool. Afr. 14 Suppl. Bot.: 22, fig. 5 (1926), as *striatonux*; Nelmes in K.B. 10: 429 (1955), as *striatonux*; F.P.N.A. 3: 277, t. 39 (1955), as *striatonux*; Napper in K.B. 25: 442 (1971), as *striatinux*, correcting according to article 73 of code) & in F.W.T.A. 3 (2): 343 (1972). Types: Congo-Kinshasa, *Bequaert* 3357, 3428, 5640, 4048, 6098 and *Vanderyst* 6245 (BR, syn.)

S. rehmannii C.B. Clarke var. *ornata* Charm. in B.J.B.B. 13: 283 (1935). Type: Congo-Kinshasa, Kabare, *Scaetta* 2373 (BR,holo.)

S. lelyi Hutch. & Dalz., F.W.T.A. ed. 1, 2: 493 (1936). Types: Nigeria, Jos Plateau, *Lely* P292 & Naraguta, *Lely* P299 K (anglice, *nom. invalid.*)

NOTE. Robinson has considered this species very variable and best not considered two species or even two varieties. The inflorescence characters are difficult. Napper (1964) stated inflorescence with several simple branches from the lower clusters of spikelets for var. *woodii* and inflorescence smaller and more compact for var. *ornata* but Haines and Lye say inflorescence a lax panicle usually branched once only and inflorescence more open which is occasionally branched twice. In her treatment for W Africa Napper considers *S. striatinux* a distinct species.

14. ***Scleria richardsiae*** E.A. Rob. in *Kirkia* 3: 9 (1962); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 31 (1964); Robinson in K.B. 18: 515, fig. 7 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 338, fig. 695 (1983). Type: Zambia, Nyika Plateau, near rest house, *Robinson* 4473 (K!, holo.; EA, M, MTJB, SRGH, iso.)

Perennial 0.6–1 m tall with rhizome formed from a knotty mass of hard fleshy (when fresh) stem-bases each \pm 3 mm thick; roots white and red; stems slender, weakly erect. Leaves \pm 1(–2) mm wide, glabrous or sparsely hairy. Inflorescence a simple condensed to very lax panicle 9–20 cm long, the branches up to 6 cm long; glomerules 1–2 cm apart more crowded towards the apex, with 2–4 spikelets, each 4–5 mm long; axes often with long hairs; glumes dark reddish brown to blackish, glabrous or minutely hairy. Nutlets grey or whitish with darker interangular stripes, ovoid, 1.4–1.8 mm long, \pm 1 mm wide, lightly to strongly trabeculate-reticulate, transversely wrinkled or pitted, or sometimes with raised cubic crystal-like tubercles, often cuspidate.

TANZANIA. Ufipa District: Molo, Nsangu, Sumbawanga, 1 Jan. 1962, *Vesey-FitzGerald* 3711!; Rungwe District: Tukuyu, Kiwira R., 7 Feb. 1961, *Richards* 14254!; Iringa District: Mafinga [Sao Hill], 97 km S of Iringa, 12 Mar. 1962, *Polhill & Paulo* 1716!

DISTR. T 4, 7; Zambia, Malawi

HAB. Grassy stream-sides in woodland; 1700–2400 m

NOTE. One of the few submontane species.

15. ***Scleria melanotricha*** A. Rich., *Tent. Fl. Abyss.* 2: 511 (1851); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 673 (1895) & in *F.T.A.* 8: 495 (1902); F.D.-O.A. 1: 529 (1938); Nelmes in K.B. 10: 452 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 33 (1964); Robinson in K.B. 18: 501 (1966); Napper in *F.W.T.A.* ed. 2, 3: 346 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 338, figs 696, 697 (1983); Lye in *Fl. Eth.* 6: 496, fig 212.162 (1997). Type: Ethiopia, Tigre, Guendepa [Gafta, Gaptia], *Schimper* II 830 (P, lecto.; BM, K!, iso., chosen by Robinson)*

Slender hairy annual 6–50 cm tall with erect stems, reddish at the base only, 0.5–1.5 mm wide. Leaves with lower sheaths brown, upper green, the blades up to 30 cm long, 1–3 mm wide, densely hairy. Inflorescences simple spikes 3–20 cm long

* By giving only this number Robinson (1966) effectively chose it as lectotype although in TS he mentions two syntypes, the other the Quartin Dillon specimen.

with 4–12(–15) sessile or very shortly stalked spreading or usually reflexed glomerules of 1–9(–12) dark 5–19 mm long spikelets; glumes pale green or reddish, 2–3 mm long (fide Robinson TS) but 4–7 mm (fide Lye), with dense brown or black hairs and prominently awned. Nutlets grey or yellow brown, ovoid, obovoid or subglobose, obtusely trigonous \pm 1 mm long(–1.5 mm fide Lye) 0.8 mm wide, tuberculate or trabeculate, sometimes with 3 darker longitudinal bands and stipe darker in colour, shortly apiculate.

TANZANIA. Kigoma District: N of Lugufu, Kigamba, 10 Feb. 1926, *Peter* 36679!; Mpanda District: 123 km on Mpanda–Uvinza road, 5 June 1975, *Kahurananga* et al. 2759!; Ulanga District: \pm 35 km S of Mahenge, Ngongo, 18 Mar. 1932, *Schieben* 2035!

DISTR. T 4, 6; Guinea, Ivory Coast, Mali, Ghana, Nigeria, Congo-Kinshasa, Burundi, Rwanda*, Ethiopia and Zambia

HAB. Seasonally or permanently damp grassland; 600–1700 m

SYN. *S. grata* Nelmes in K.B. 10: 453 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 33 (1964). Type: Zambia, Mbala [Abercorn], above Chilongowelo, *Richards* 1688 (K!, holo.)

S. melanotricha A. Rich. var. *grata* (Nelmes) Lye in Nordic J. Bot. 3: 243 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 339 (1983)

NOTE. Robinson (1966 & F.T.E.A. TS) synonymised *S. grata* without comment. Napper in her key (1964) separates *melanotricha* from *grata* by glomerules solitary sessile rather than glomerules mostly paired, shortly and distinctly pedunculate; and Haines & Lye state this variety only differs from var. *melanotricha* by having shortly pedunculate paired glomerules and a shorter (up to 1 mm long) mucro on the glumes but under *melanotricha* confusingly state “including *S. grata* Nelmes in Cyp. East Afr. 11” [i.e. Napper 1964]. *Peter* 36679 was first named *Aegopogon gracile* Peter nom. nud. (1928) (see F.T.E.A. Gramineae: (2) 392 (1974)).

Peter (F.D.O.-A.: 529) also mentions ‘Brit O. Afrika’ and Nyasaland perhaps due to misidentifications.

16. *Scleria hispidior* (C.B. Clarke) Nelmes in K.B. 10: 435 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 32 (1964); Haines & Lye, Sedges & Rushes E. Afr.: 339, fig. 698 (1983); Lye in Fl. Eth. 6: 496, fig. 212.163 (1997). Type: Ethiopia, Begemder, Debra Ari, *Schimper* 1278 (K!, holo.)

Slender annual 2–25 cm tall with red roots; stems 0.5–1 mm wide. Leaves densely hairy the sheaths green or brown; blades 4–15 cm long, 1–3.5 mm wide. Inflorescence spicate or narrow panicle (1–)3–10 cm long, 1–6 cm wide with 2–9 sessile or shortly pedunculate glomerules, the peduncles up to 1.5 cm, or more rarely with a few spreading or reflexed lateral branches 1–4 cm long, each with 2–4 sessile glomerules; spikelets 3–6 mm long; glumes light reddish brown to almost black with green midrib, 3–5 mm long with \pm dense spreading black or less often pale hairs; awn 1 mm long. Nutlets white to dark blackish brown, sometimes with 3 longitudinal smooth bands of darker colour, often marked on raised parts with dark dots or dashes, obovoid to globose, 1–1.5 mm long, \pm 1 mm wide, shortly apiculate.

UGANDA. Teso District: Kumi, 0.5 km NW of Bukedea, 16 Oct. 1996, *Lye & Katende* 21997!; Mbale District: Bugishu, Sipi, 31 Aug. 1932, A.S. *Thomas* 442! & Elgon, Kapchorwa, 8 Sept. 1954, *Lind* 274!

KENYA. Baringo District: on road to Eldoret, 2.6 km from Kabarnet, 2 Nov. 2000, *Smith, Beentje & Muasya* 127!

DISTR. U 1 (fide Haines & Lye), 3; K 3; Ethiopia

HAB. Damp grassland and shallow pools on rocks; 1100–2250 m

SYN. *S. hispidula* A. Rich. var. *hispidior* C.B. Clarke in F.T.A. 8: 492 (1902)

* Fide Robinson (F.T.E.A. TS) but not mentioned in Fl. Rwanda.

17. *Scleria hispidula* A. Rich., Tent. Fl. Abyss. 2: 511 (1851); Boeck. in Linnaea 38: 443 (1874); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 672 (1895); Engl., Hochgebirgsfl. Trop. Afr.: 150 (1892); C.B. Clarke in F.T.A. 8: 497 (1902); Nelmes in K.B. 10: 436 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 32 (1964); Robinson in K.B. 18: 498 (1966); Haines & Lye, Sedges & Rushes E. Afr. 340, figs 699, 700 (1983); Lye in Fl. Eth. 6: 496, fig. 212.164 (1997). Type: Ethiopia, Tigre, Guendepa [Gafta], *Schimper* II 1277 (P, holo.; BM!, K!, UPS, iso.)

Slender glabrous or hairy annual 5–30(–60) cm tall, the stems under 1 mm wide. Upper leaf sheaths green, lower brown or reddish brown, glabrous or hairy; blades up to 20 cm long, 1–3 mm wide, glabrous or sparsely hairy, scabrid on margins towards apex. Inflorescence simply spicate, 2–11 cm long or with 1–2 lower lateral branches 2 cm long, with 2–10 sessile glomerules of 2–6 spikelets, each 3–4 mm long; bracteoles 3–9 mm long, hispidulous; female glumes medium to blackish red with green midrib, 2–4 mm long, scabrid on midrib but otherwise glabrous, awned; males similar but darker and not awned. Nutlets greyish white, obovoid or globose, 1.2–1.6 mm long, 1–1.2 mm wide, finely reticulate, sometimes with 3 longitudinal smooth bands.

TANZANIA. Moshi District: Mpololo, Aug. 1928, *Haarer* 1525!; Singida District: Kiomboi, 28 Apr. 1962, *Polhill & Paulo* 2224!; Iringa District: 6 km N of Iringa, 6 Apr. 1962, *Polhill & Paulo* 2026!

DISTR. T 1 (fide Robinson F.T.E.A. TS), 2, 5, 7; Ethiopia, Eritrea, Zambia

HAB. Seasonally damp grassland; 1050–1900 m

NOTE. Robinson (F.T.E.A. TS) gives upper altitudinal limit to 2600 m but this probably for some Ethiopian locality.

18. *Scleria delicatula* Nelmes in K.B. 10: 448 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 31 (1964); Robinson in K.B. 18: 498 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 342, figs 701 & 702 (1983). Type: Zambia, Mbala District, Chilongwelo, Plain of Death, *Richards* 600 (K!, holo.)

Slender glabrous annual 15–45 cm tall. Leaves \pm 1 mm wide, glabrous or hairy. Inflorescence simply spicate, 3–13 cm long with glomerules of 1–8 spikelets, 2–5 mm long pale or reddish brown; glumes pale chestnut, often spotted with red. Nutlets dark red with raised parts translucent often with 3 longitudinal ridges of semitranslucent tissue on the angles, oblong-ellipsoid to broadly ovoid, \pm 1 mm long, muricate-trabeculate.

TANZANIA. Tabora District: Uyansi, Chaya W to Tura, 25 Jan. 1926, *Peter* 34255a

DISTR. T 4; Zambia

HAB. Seasonally damp shallow soil on rock outcrops, in seepage zone or pools; 900–1350 m

SYN. *S. spondylogona* Nelmes in K.B. 10: 448 (1955). Type: Zambia, Mbala District, Lunzua R., banks below the falls, *Bullock* 2871 (K!, holo.)

19. *Scleria pulchella* Ridl. in Trans. Linn. Soc., ser. 2, Bot. 2: 168 (1884); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 674 (1895); Rendle, Cat. Afr. Pl. Welw. 2: 134 (1999); C.B. Clarke in F.T.A. 8: 495 (1902); Nelmes in K.B. 10: 442 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24(109): 31 (1964); Robinson in K.B. 18: 496 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 341, fig. 703, 704 (1983). Type: Angola, Huilla, Empalanca, *Wekwitsch* 7141 (LISU, hol., BM!, K!, iso.)

Lemon-scented almost entirely glabrous annual 5–24 cm tall. Leaves 1–2 mm wide, glabrous or very sparsely hairy. Inflorescences simple, 1–4 cm long, or with some lower branches up to 1.5 cm long, with erect or spreading glomerules of 1–8 spikelets each 2–4 mm long, dark red, the upper glomerules crowded and \pm touching, the

lower up to 1 cm apart; glumes blackish red or green sometimes with reddish streaks, the midrib green in female, \pm 2 mm long, shortly awned. Nutlets grey brownish or blackish, globose, \pm 1 mm long, 0.8 mm wide, faintly transversely ridged or pitted.

TANZANIA. Ufipa District: Nsangu Mt, 13 Mar. 1959, *McCallum Webster* C35!; Mbeya District: junction of Mwatesi and Kaviro Rivers, S slopes of Poroto Mts, 18 Mar. 1932, *St Clair Thompson* 791!; Njombe District: 11 km S of Njombe, 8 July 1956, *Milne-Redhead & Taylor* 11005!

DISTR. T 4, 7; Congo-Kinshasa (Shaba), Angola, Zambia, Malawi, Zimbabwe

HAB. Seasonally damp places and shallow soils on rocks, swampy places and seepage zones; 1200–2200 m

SYN. *S. suaveolens* Nelmes in K.B. 10: 442 (1955). Type: Zambia, Mbala [Abercorn], Uninji Pans, *Richards* 847 (K!, holo.)

NOTE. The typical form has an unbranched or very shortly branched inflorescence and dark blackish red glumes. *S. suaveolens* was described as having a clearly branched inflorescence and pale green glumes slightly tinged with red but intermediates occur in Zambia.

20. ***Scleria pergracilis*** (Nees) Kunth, Enum. Pl. 2: 354 (1837); Boeck. in *Linnaea* 38: 438 (1874) & in *Flora* 62: 569 (1879); C.B. Clarke in *Fl. Br. India* 6: 685 (1894) & in *Durand & Schinz, Consp. Fl. Afr.* 5: 673 (1895) & in *F.T.A.* 8: 495 (1902) & *Illustr. Cyper.*, t. 121 (1909); Nelmes in K.B. 10: 445 (1955); Robinson in K.B. 18: 494 (1966); Napper in *F.W.T.A.* ed. 2, 3: 344 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 342, figs. 705, 706 (1983); Gordon-Gray, *Strelitzia* 2: 184, fig. 84, B, E (1995); Lye in *Fl. Eth.* 6: 497, fig. 212.165 (1997). Type: India, Silhet, *Wallich* 3406 (B†, holo.; K!, iso.)

Tufted annual 15–60 cm tall, entirely glabrous save for leaf sheaths sometimes sparsely hairy; stems slender. Leaves 1–2 mm wide. Inflorescences simply spicate or very shortly branched near base, 2–8(–18) cm long, with many erect or spreading glomerules of 1–3 spikelets, each 4–5 mm long dark red; bracteoles erect, 3–9 mm long, acuminate base; glumes pale brown to dark reddish black, paler at base and midrib pale green in female, 3–4(–5) mm long, acuminate to shortly mucronate. Nutlets grey, brownish or blackish, \pm globose, 1–1.5(–1.9) mm long, 1–1.5(–1.7) mm wide, tuberculate and with 3 longitudinal smooth bands the raised parts lighter in colour. Fig. 60: 1–5, p. 396.

TANZANIA. Mpanda District: Mpanda–Uvinza road, Uzondo Plateau, 29 May 2000, *Bidgood et al.* 4518!; Mbeya District: between Iyayi and Igawa, 15 April 1962, *Polhill & Paulo* 2007!; Songea District: 8 km W of Songea, 24 Apr. 1956, *Milne-Redhead & Taylor* 9904!

DISTR. T 4, 6–8; Senegal to Nigeria, Sudan, Ethiopia, Angola, Zimbabwe, Mozambique, South Africa; India, Sri Lanka and New Guinea

HAB. Seasonally or permanently damp grassland, seepage zones in woodland; 600–1700 m

SYN. *Hypoporum pergracile* Nees in *Edinb. New Phil. J.* 17: 267 (1834)

Scleria ustulata Ridl. in *Trans. Linn. Soc.*, ser. 2, Bot. 2: 168 (1894); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 625 (1895); Rendle in *Cat. Afr. Pl. Welw.* 2: 133 (1899); C.B. Clarke in *F.T.A.* 8: 497 (1902). Type: Angola, Pungo Andongo, banks of R. Cuanza, *Welwitsch* 7134 (LISU, holo., K!, iso.)

S. pergracilis (Nees) Kunth var. *major* Cherm. in *Bull. Soc. Bot. Fr.* 81: 268 (1934). Type: Togo, Sokodé area, *Mahoux* s.n. (P, holo.; K!, iso.)

S. pergracilis (Nees) Kunth var. *brachystachys* Nelmes in K.B. 10: 446 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 31 (1964). Type: Zimbabwe, Harare [Salisbury], *Brain* 3710 (K!, holo.)

NOTE. Over its Asiatic range *S. pergracilis* is remarkably constant in form. Most W African material is similar to the Asiatic, having the inflorescence up to 15(–18) cm and glumes reddish brown or chestnut, but in central and eastern Africa more variation is to be found. A form with larger spikelets and nutlets is represented by Ridley's species and Chermeson's variety; this occurs from Ghana to Angola. Another form with a shorter inflorescence and generally darker glumes (var. *brachystachys* Nelmes) tends to replace the longer-spiked forms

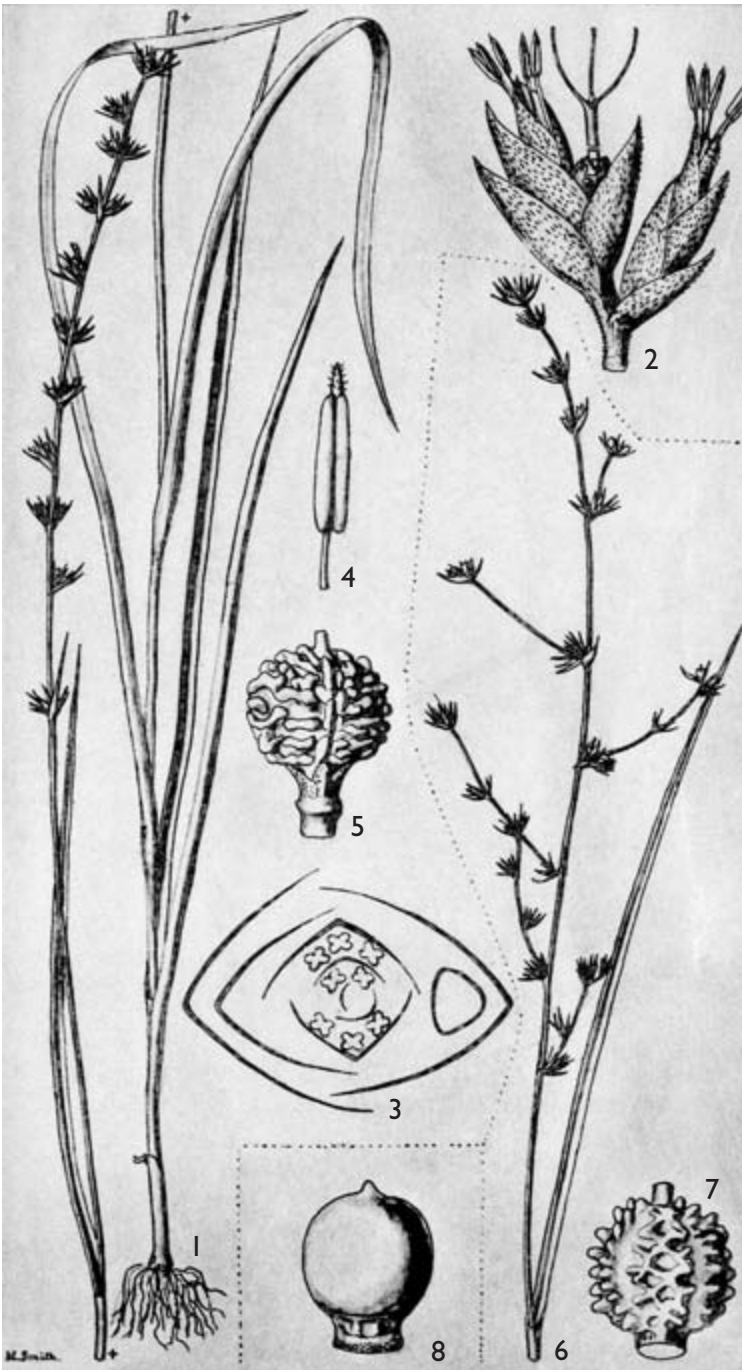


FIG. 60. *SCLERIA PERGRACILIS* — 1, habit, $\times 1$; 2, inflorescence, $\times 10$; 3, spikelet diagrammatic, $\times 8$; 4, stamen, $\times 20$; 5, nutlet, $\times 20$. [*SCLERIA LIEBMANNII* — 6–7, not in FTEA.] *SCLERIA DISTANS* — 8, nutlet, $\times 20$. 1–5 from Wallich 3406. Reproduced from C.B. Clarke (1909) Illustrations of Cyperaceae. Drawn by Matilda Smith.

in eastern Africa and the Zambesi basin. Examples that are intermediate between all these forms occur in many parts of central and west Africa (repeated almost verbatim from Robinson F.T.E.A. TS). Lye (1997) was doubtful if the Ethiopian specimen was really *S. pergracilis* since it differed in having hairy glumes but had been identified as such by Raynal. Robinson puts *S. ustulata* as a synonym in F.T.E.A. TS.

21. ***Scleria glabra*** Boeck., *Cyper. Nov.* 1: 35 (1888); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 671 (1895) & in F.T.A. 8: 497 (1902); Nelmes in K.B. 10: 435 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 30 (1964); Robinson in K.B. 18: 495 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 322, fig. 707, 708 (1983). Type: Malawi, Shire Highlands, *Buchanan* 2 (B, holo.; E!, K!, iso.)

Entirely glabrous annual with erect stems 0.25–1.2 m tall. Leaves 1.5–4(–6) mm wide. Inflorescence paniculate, 4–25 cm long, often twice branched from the lower part, the branches slender and often compound with many glomerules of 2–16 spikelets, each 3.5–5 mm long blackish, the upper glomerules closely placed, the lower up to 4 cm apart; glumes dark reddish black, paler at the base, all muticous or shortly mucronate, the female ones 2.5–3 mm long with green midrib, the males 2.5–4 mm long. Nutlets grey or black but raised parts appearing lighter in colour, ± globose, 1.2–1.5 mm long, ± 1 mm wide, trabeculate-tuberculate or shallowly pitted or transversely wrinkled, with 3 longitudinal smooth bands, shortly apiculate.

TANZANIA. Ufipa District: Mwimbi, 21 Apr. 1962, *Robinson* 5115!; Mbeya District: Mbozi, Tunduma–Sumbawanga road, Ikana, 14 June 1996, *Faden et al* 96/267!; Songea District: R. Luhira, N of Songea, 24 Apr. 1956, *Milne-Redhead & Taylor* 9914!
DISTR. T 4, 7, 8; Congo-Kinshasa (Shaba), Burundi, Malawi, Mozambique
HAB. Seasonally or permanently boggy grassland; 700–1800(–1950 fide Napper) m

22. ***Scleria lithosperma*** (L.) Sw., *Prodr. Veg. Ind. Occ.*: 18 (1788); Kunth, *Enum. Pl.* 2: 349 (1837); Boeck. in *Linnaea* 38: 454 (1874); C.B. Clarke in *Fl. Br. India* 6: 685 (1894) & in Dur. & Schinz, *Consp. Fl. Afr.* 5: 672 (1895); K. Schum. in *P.O.A. C.* 129 (1895); C.B. Clarke in *F.T.A.* 8: 502 (1902) & *Illustr. Cyp.*, t. 123 (1909); Nelmes in K.B. 10: 421 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 30 (1964); Haerdi in *Acta Trop. Suppl.* 8: 208 (1964); Robinson in K.B. 18: 503 (1966); Napper in *F.W.T.A. ed.* 2, 3: 343 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 343, fig. 709 (1983); Lye in *Fl. Eth.* 6: 497, fig. 212.166 (1997). Type: India, Rheed. *Hort. Mal.* 12: 89, t. 48 (1693) (icono.)

Tall slender often rather hairy perennial 30–90 cm high, with short rhizome; stems 1–2.5 mm wide, minutely scabrid, the stem-bases sometimes slightly swollen and forming a ± caespitose mass. Lower leaf sheaths brown, upper green, the blades up to 20 cm long, 2–5 mm wide, scabrid on margin at least near tip, otherwise glabrous or hairy. Inflorescence of 1 terminal and 2–3 lateral panicles the latter arising singly from leafy bracts with cluster of 1–3 spikelets, each 4–5 mm long green or brownish, all androgynous; glumes straw-coloured to pale green or light brown female often with green midrib, 3–5 mm long, scabrid at least on midrib and margins, otherwise glabrous. Nutlets olive-grey or olive-brown or pearly white, ovoid or obovoid, 2.5–3 mm long, 1.5–2 mm wide, ± trigonous, smooth, apiculate with 3 depressions near the base; hypogonium reduced to unlobed disc and base of nut where it sits with a narrow annulus of chestnut brown. Fig. 61, p. 398.

KENYA. Kwale District: Cha Simba Forest, 1 Feb. 1953, *Drummond & Hemsley* 1083! & Shimba Hills, 14 Jan. 1964, *Verdcourt* 3928! & 15 Mar. 1968, *Magogo & Glover* 449!
TANZANIA. Tanga District: Kange, 19 Jan. 1952, *Faulkner* 873!; Pangani District: Tongwe Mt, 22 Oct. 1940, *Greenway* 6027!; Mikindani District: 58 km on Mnazimoja–Mtwara road, 5 Mar. 1991, *Bidgood et al.* 1809!; Zanzibar: Kidichi, 27 Jan. 1961, *Faulkner* 2750!



FIG. 61. *SCLERIA LITHOSPERMA* — 1, habit, $\times 1$; 2, habit, $\times 1$; 3, nutlet, $\times 15$; 4, nutlet section; 5, nutlet of var. *roxburghii*, $\times 15$. 1–4 from Clarke 35476; 5 from Thwaites 2627. Reproduced from C.B. Clarke (1909) Illustrations of Cyperaceae. Drawn by Matilda Smith.

DISTR. **K** 7; **T** 3, 6–8; **Z**; **P**; Ivory Coast, Ghana, Nigeria, Congo-Kinshasa, Ethiopia, Zambia, Mozambique; also in tropical and subtropical Asia, Australia and America

HAB. Shady and open places in evergreen forest, forest and plantation edges, *Brachystegia* woodland, rocky outcrops in wooded grassland, termite mounds in woodland; 20–1050 m

SYN. *Scirpus lithospermus* L., Sp. Pl. ed. 1: 51 (1753)

Schoenus lithospermus (L.) L., Sp. Pl. ed. 2: 65 (1762)

Scleria puzzolanea K. Schum. in P.O.A. C: 129 (1895). Type: Tanzania, Tanga District: Amboni, *Holst* 2797 (B†, holo.; Kl, iso.)

NOTE. 'Though some irregularities in the surface of the nutlet may occasionally be observed, no African material that I have seen approaches the Indian var. *roxburghii* Nees with its distinctly trabeculate nutlet surface' (Robinson FTEA TS). Robinson also gives an extensive discussion of the two Linnean accounts pointing out they cover more than one entity but the ed. 2 reference cites the ed. 1 as well as other synonyms, which show Linnaeus had changed his concept of the species. The Hortus Malabaricus plate is, however, the holotype of the species and the reference to Morison Plant. Hist. Univ. Oxon. 3: 317, 8, t. 11 fig. 16 at the end of the description in Sp. Pl. ed. 1 is clearly for contrast rather than comparison.

23. ***Scleria schimperiana*** Boeck. in *Linnaea* 38: 466 (1874); Engl., *Hochgebirgsfl. Trop. Afr.*: 150 (1892); C.B. Clarke in Durand & Schinz. *Consp. Fl. Afr.* 5: 674 (1895) & in *F.T.A.* 8: 504 (1902); Robinson in *Kirkia* 2: 176 (1961); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 29 (1964); Robinson in *K.B.* 18: 524 (1966); Napper in *F.W.T.A.* ed. 2, 3: 343 (1973) (as *schimperana*); Haines & Lye, *Sedges & Rushes E. Afr.*: 344, fig. 710 (1983); Lye in *Fl. Eth.* 6: 497, fig. 212, 167 (1997). Type: Ethiopia, Begemeder, Senka Berr, *Schimper* 1235 (B†, holo.; BM, Kl, M, P, iso.)

Loosely tufted annual 35–70 cm tall, with shallow reddish root system; stems 1–3 mm wide, glabrous or hairy above. Leaf sheaths glabrous or hairy; blades up to 40 cm long, 3–8 mm wide, glabrous or hairy on margins and ribs. Inflorescence of one terminal and 1–2 lateral panicles, always solitary from leaf sheaths, 2–5 cm long, 1.5–2.5 cm wide, erect or ± pendulous on slender hairy peduncles up to 8 cm long; male spikelets 4–5 mm long with dark reddish brown glumes; female spikelets (5–)6–8 mm long, the glumes pale or dark reddish brown with green midrib. Nutlets pale duck-egg blue or green when fresh but whitish when dried, globose or depressed globose, 2.5–3 mm long, 3–3.5 mm wide, smooth and glabrous; hypogynium with 3 short yellow-brown rounded lobes.

UGANDA. Acholi District: Paloga, Apr. 1943, *Purseglove* 1362!; Busoga District: Iganga, 38 km E on Tororo road, 24 June 1966, *Haines* 4194!

TANZANIA. Uzaramo District: 10 km WNW of Dar es Salaam University, 5 Feb. 1971, *Wingfield* 1613!; Songea District: 1.5 km S of Gumbiro, 10 May 1956, *Milne-Redhead & Taylor* 10150!

DISTR. **U** 1, 3; **T** 6, 8; Nigeria, Congo-Kinshasa, Ethiopia, Zambia, Zimbabwe

HAB. Open swampy ground, seasonably wet depressions in grassland or wooded grassland; 60–1100 m

SYN. *S. hypoxis* Boeck. in *Linnaea* 38: 465 (1874). Type: Ethiopia, Gallabat, Matamma, *Schweinfurth* 2054 (B†, holo.; Kl, iso.)

S. dillonii Boeck. in *Flora* 61: 38 (1878). Type: Ethiopia, 'Shireh', *Quartin Dillon & Petit* s.n. pro parte (B†, holo.)*

S. schimperiana Boeck. var. *hypoxis* (Boeck.) C.B. Clarke in *F.T.A.* 8: 504 (1902)

* fide Robinson (1966) who gives K for this; C.B. Clarke put it in synonymy with *S. foliosa* and indicates he saw the specimen and Nelmes in an annotated copy of *F.T.A.* 8 which he used has put 'partim' against the specimen. In 1961 Robinson had also cited it in synonymy with *S. foliosa*. Lye (*Fl. Eth.*) does not mention it.

24. *Scleria foliosa* A. Rich. in Tent. Fl. Abyss. 2: 509 (1851); Boeck. in Linnaea 38: 455 (1874); Ridl. in Trans. Linn. Soc. Ser. 2, Bot. 2: 170 (1884); Engl., Hochgebirgsfl. Trop. Afr.: 150 (1892); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 670 (1895); K. Schum. in P.O.A. C: 128 (1895); Rendle in Cat. Afr. Pl. Welw. 2: 134 (1899); C.B. Clarke in F.T.A. 8: 503 (1902); Nemes in K.B. 11: 102 (1956); Robinson in Kirkia 2: 177 (1961); Haerdi in Acta Trop. Suppl. 8: 208 (1964); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 29 (1964); Robinson in K.B. 18: 525 (1966); Napper in F.W.T.A. ed. 2, 3: 343 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 344, figs 711, 712 (1983); Lye in Fl. Eth. 6: 498 (1997). Type: Ethiopia, Guendepa [Gafta], *Schimper* II 1232 (P, lecto., BM, K, isolecto) (chosen by Lye)

A robust loosely or densely tufted annual 0.2–2 m tall, with brown or reddish roots; stems 1–4 mm wide, glabrous or scabrid on the angles. Leaves and bracts ligulate, the sheath mouth extended into a tongue with dark brown margin; blades 6–40 cm long, 2–8 mm wide, glabrous but scabrid on margin and veins beneath. Inflorescence of a terminal and 1–3 lateral panicles, always single at the nodes of the upper leaves with mostly stiffly erect peduncles which may become ± pendulous after maturity, up to 2 cm long; panicles 1–6 cm long, 1–2 cm wide much shorter than the leafy bracts; bracteoles within the panicles rigid and erect 1–4 cm long, giving a characteristic prickly look to the fresh inflorescence but easily broken off when dry; male spikelets dark blackish red, 4–5 mm long; female glumes green to blackish red, 3–5 mm long, glabrous but midrib usually scabrid. Nutlets white, grey or sometimes dark, ovoid, 3.5–4 mm long, 2–2.5 mm wide, glabrous, lightly to moderately verrucose lacunose but smooth at apex; hypogynium with 3 whitish to pale yellowish brown stiff rounded lobes.

UGANDA. Bunyoro District, Aug. 1862, *Grant* s.n.; Teso District: Bukedea–Kumi road, km 41 from Mbale, 26 Sept. 1954, *Norman* 238!; Mengo District: N Mengo, Lwampanga, 14 Sept. 1954, *Langdale-Brown* 1284!

KENYA. Trans-Nzoia District: 13 km on Eldoret–Kitale road, 6 Oct. 1981, *Gilbert & Mesfin* 6506!; Nairobi District: Nairobi, Doonholm road, 18 Aug. 1958, *Kirrika* 447!; Kwale District: near Lunguma, 20 Aug. 1994, *Luke & Gray* 4058!

TANZANIA. Musoma District: near Campi ya Mpopu on Klein's Camp track, 30 Mar. 1962, *Greenway et al.* 10563!; Ufipa District: near Sumbawanga Post Office, 5 June 1980, *Mwasumbi* in *Hooper et al.* 1869!; Dodoma District: 36.3 km S of Itigi Station on the Chunya road, 17 Mar. 1964, *Greenway & Polhill* 11616!; Zanzibar: Kidichi, 9 July 1960, *Faulkner* 2629!

DISTR. U 2, 3, 4; K 3, 4, 7; T 1–7; Z; Senegal, Ivory Coast, Ghana, Ethiopia, Angola, Zambia, Malawi, Zimbabwe, Mozambique, South Africa; Madagascar, India

HAB. Swamp edges, seasonally damp areas in wooded grassland, sometimes in standing water, rice fields, seepage areas and small pools on rocky outcrops; 30–2050 m

SYN. S. no. 2, App. Speke's Journ.: 654 (1863)

S. foliosa A. Rich. var. *major* Oliv. in Trans. Linn. Soc. 29: 169 (1875). Type: Uganda, Unyoro [Bunyoro], *Grant* s.n. (K!, holo.)

S. dumicola Ridl. in Trans. Linn. Soc., ser. 2, Bot. 2: 169 (1884). Type: Angola, Pungo Andongo, between Quilanga and Pedras de Quinga, *Welwitsch* 7122 (LISU, holo.; BM, iso.)

S. perrieri Cherm. in Bull. Soc. Bot. Fr. 70: 297 (1923). Type: Madagascar, Benenitsa, *Perrier de la Bâthie* 12704 (P, holo.)

25. *Scleria mikawana* Makino in Bot. Mag. Tokyo 27: 57 (1913); Nemes in K.B. 11: 107 (1956); Robinson in Kirkia 2: 185 (1961) and in K.B. 18: 525 (1966); Napper in F.W.T.A. ed. 2, 3: 342 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 345, figs. 713, 714 (1983). Types: Japan, Mikawa, Hosoya-mura and near Futakawa in Atsumi-gōri, *Makino* s.n.; Takashi, *Makino* s.n., *Nagura* s.n. (MAK, syn.)

A robust loosely to densely tufted rather stiff annual 0.5–1.2(–2) m tall; roots brown, thick; stems 2–3 mm wide. Leaves up to 20 cm long, 3.7 mm wide, glabrous; lower leaf sheaths purplish without developed blades. Inflorescence of a terminal panicle and 2–3 laterals occurring singly at nodes, 2–5 cm long, 1–2 cm wide, on

erect peduncles usually not much exerted from the sheaths; male spikelets usually pale chestnut, (3–)4–5 (6) mm long with dark reddish pedicels 4–14 cm long; glumes straw-coloured with green midrib, glabrous. Nutlets white or cream or grey to pale brown with 3 darker longitudinal stripes, broadly ovoid to globose, 2.8–3.2 mm long, 2.2–2.4 mm wide, dull, glabrous but appearing minutely hairy due to many minute brownish glands, with rather regular lacunae arranged in longitudinal lines; hypogynium whitish with 3 well separated acute to obtuse lobes.

UGANDA. Masaka District: near Lake Nabugabo, 6 May 1966, *Haines* 4124!

DISTR. U 4; Senegal, Sierra Leone, Ivory Coast, Congo-Kinshasa, Burundi, Gabon, Angola, Zambia; widespread in Asia extending N to Japan

HAB. Swampy grassland or lake margin; 1140 m

SYN. *S. glabroreticulata* De Wild., Pl. Bequaert. 4: 230 (1927). Type: Congo-Kinshasa, Wombali, *Vanderyst* 2232 (BR, holo.)

26. ***Scleria bambariensis*** *Cherm.* in Arch. Bot. Caen 4, Mém. 7: 48 (1931); Robinson in *Kirkia* 2: 182 (1961); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 30 (1964); Robinson in K.B. 18: 527 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 346, fig. 716 (1983); Vollesen in *Opera Bot.* 59: 96 (1980). Type: Central African Republic, Yanguya, 40 km SE of Bambari, *Tisserant* 2693 (P, lecto.)*

Erect densely tufted glabrous or slightly hairy annual (20–)45–90(–100) cm tall. Leaves few, 1.5–5(–7) mm wide, hairy on both surfaces or sometimes entirely glabrous; sheaths with rounded or ± truncate brownish ligule. Inflorescence of a terminal and 1–3 lateral panicles usually single at the nodes on slender pendulous peduncles well exerted from the sheaths; male spikelets pale greenish to dark reddish brown, 3–4 mm long on 1–4 mm long pedicels; female spikelets 4–6 mm long, the glumes pales green to dark reddish or almost scarious with green midrib. Nutlets white, grey or blackish, ovoid to subglobose or oblong-ellipsoid, 2–2.5(–3.2) mm long, 1.6–2.3 mm wide, with moderate to deep lacunae arranged in straight rows; hypogynium yellowish to brownish, deeply 3-lobed the lobes rounded but sometimes with a whitish apical part which can be erose.

var. ***bambariensis***

Smaller in all parts than var. B.

KENYA. Kwale District: Buda Forest Reserve, 5. Oct. 1999, *Luke & Luke* 5993!

TANZANIA. Tanga District: Yilichini (? Yihirini) to Maramba, 24 Sept. 1918, *Peter* 24963!;

Uzaramo District: 10 km W of Dar es Salaam, Mabibo–Kisukoro road N of Mabibo school, 6 June 1996, *Faden et al.* 96/35!; Ulanga District, 10 km N of Mlahi, 14 May 1977, *Vollesen* in MRC 4544!

DISTR. K 7; T 3, 4, 6, 8; Central African Republic, Zambia; Madagascar, Tropical America (see note)

HAB. Swamps and seasonally wet grassland, seepage in miombo valley woodland; 60–1200 m

SYN. *S. clathrata* sensu Peter, F.D.-O.A. 1: 533 (1938) quoad *Peter* 24963, non A. Rich.

NOTE. Robinson states it is clear these African plants cannot be specifically separated from a widespread and polymorphic American species *S. reticularis* Michx. but it was not certain that was the correct name when he wrote and he chose to retain *S. bambariensis*. Later he annotated various specimens as *S. reticularis*. Haines and Lye still use the name *S. bambariensis* but say perhaps not specifically distinct from *S. reticularis* and give America in the distribution. Adams (Fl. Mesoamericana 6: 484 (1994)) does not hint at any Old World distribution in his treatment of *S. reticularis*.

* Chermeson originally cited *Tisserant* 2693 and 2694 as syntypes; Haines & Lye cite only the former and I have taken this as a lectotypification.

var. **B**; Robinson in K.B. 18: 528 (1966)

Larger in all its parts than typical *S. bambariensis*; stems up to 1 m; leaves 2–6 mm wide; male spikelets 3–4 mm long. Nutlets grey or nearly black, 3–3.2 mm long, 2–2.3 mm wide, glabrous or hairy.

TANZANIA. Tanga District: Hale to Mnyusi, no date, *Peter* 24275; Ufipa District: Sumbawanga–Mpanda road, 8 km N of Sumbawanga, Fiengalezia, 10 June 1980, *Hooper et al.* 1925!; Songea District: 8 km W of Songea, 24 Apr. 1956, *Milne-Redhead & Taylor* 9902!
DISTR. **T** 3, 4, 8; Senegal, Congo-Kinshasa, Zambia, Zimbabwe, Malawi
HAB. Shallow boggy soil on laterite, boggy grassland; 950–1800 m

NOTE. Robinson saw no reason to give this variety a name when that of the species was in doubt. He emphasised that the variety did not occur outside Africa.

27. *Scleria parvula* *Steud.*, Syn. Pl. Glum. 2: 174 (1855); Nelmes in K.B. 11: 105 (1956) pro parte; Robinson in *Kirkia* 2: 190 (1961) & in K.B. 18: 532 (1966); Napper in K.B. 25: 442 (1971) & in F.W.T.A. ed. 2, 3: 343 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 347, figs. 717, 718 (1983). Type: India, Nilgiri [Nilgherri Hills], *Hohenhacker* 1295 (B†, holo.; BM, K, M, P, UPS iso., all seen by Robinson)

Annual 30–60 cm tall, with simple stems or occasionally branched near the base. Leaves 2–5 mm wide, sparsely hairy. Inflorescence with lateral panicles 2–3 or rarely 4–5 (only single in small immature specimens) on pendulous peduncles; male spikelets pale or dark brown, 3–4(–5) mm long on pedicels 1–3 mm long; female glumes glabrous. Nutlets grey or grey-brown, ovoid to subglobose, 2–2.3 mm long, 1.5–1.7 mm wide, distinctly tessellate-lacunose, glabrous or minutely papillose (sometimes hairy fide Robinson); hypogynium 3-lobed ± rounded with scarious margin.

KENYA. Mombasa District: 16 km SW of Mombasa, 3 Dec. 1951, *Bogdan* 3344!

TANZANIA. Ufipa District: Mwimbi, 21 Apr. 1962, *Robinson* 5107A! & 5107B!

DISTR. **K** 7; **T** 4; Guinea, Sierra Leone, Ivory Coast, Zambia; tropical Asia north to Japan, Tropical America (according to Robinson but not mentioned by Adams in *Fl. Mesoamericana*)

HAB. Seasonally flooded grassland, swampy stream banks; 100–2100 m

SYN. *S. uliginosa* Boeck. in *Linnaea* 38: 471 (1874). Type as for *S. parvula*

S. fenestrata Franch. & Savat., Enum. Fl. Japon 2: 222 (1879). Type: Japan, probably Nippon I, collector ? (P?, holo.)

NOTE. Napper and Haines & Lye have accepted *Robinson* 5107A as *S. parvula* but Robinson determined it as *S. reticularis* and did not mention it under *S. parvula*. Napper determined *Robinson* 5107B as *S. parvula* and Robinson as *S. bambariensis*. Napper determined *Bogdan* 3344 as *S. parvula* but Robinson determined it as *S. reticularis* although citing it as *S. bambariensis* in 1961 and 1966 and also suggesting it might represent a distinct species. A revision of this group would involve detailed comparison of Asian, African and American material. I am following Haines & Lye for this account.

28. *Scleria globonux* *C.B. Clarke* in F.T.A. 8: 504 (1902); Nelmes in K.B. 11: 104 (1956); Robinson in *Kirkia* 3: 179 (1961); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 30, fig. 1, 5 (1964)*; Robinson in K.B. 18: 527 (1966); Napper in F.W.T.A. ed. 2, 3: 343 (1972); Haines & Lye, *Sedges & Rushes E. Afr.* 348, fig. 719 (1983). Type: Sudan, Bahr al Ghazal, *Schweinfurth* 2560 pro parte (K!, holo.; P, iso.) (see Robinson (1961) for discussion)

Sparingly hairy annual 0.5–1 m tall. Leaves up to 40 cm long, 3–9 mm wide, flat or plicate, scabrid on margins and ribs. Inflorescence of terminal panicle and 2–3 lateral panicles occurring singly at the nodes on long flexuous hairy peduncles; male

* The reference to perennial in Napper (1964) must be a slip.

spikelets dark reddish black, 3–5(–6) mm long on pedicels the same length or a little shorter; female 7–8 mm long, the glumes straw-coloured with or without reddish streaks, glabrous or hispidulous on the midrib. Nutlets white or ferruginous, globose, 2.8–3.2 mm long, 2.5–2.7(–3) mm wide, deeply lacunose-tessellate, the ridges with pale to bright ferruginous short hairs; hypogynium white or brownish, deeply 3-lobed, the lobes rounded at the apex.

UGANDA. Teso District: Soroti, Omunyal swamp, 14 Sept. 1954, *Lind* 369! & same place, *Makerere College* 640; Mengo District: East Mengo, recorded by Haines & Lye
DISTR. U 3, 4; Senegal, Guinea-Bissau, Sierra Leone, Liberia, Ghana, Nigeria, Congo-Kinshasa, Sudan, Zambia

HAB. Dry swamp edges; 1000–1200 m

SYN. *S. glandiformis* sensu F.W.T.A. ed. 1, 2: 493 (1936) pro parte, *non* Boeck.

29. *Scleria tessellata* Willd., Sp. Pl. 4: 315 (1805); C.B. Clarke in F.B.I. 6: 686 (1894); Nemes in K.B. 11: 108 (1956); Robinson in Kirkia 2: 178 (1961); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 29 (1964); Robinson in K.B. 18: 526 (1966); Napper in F.W.T.A. ed. 2, 3: 343 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 348, figs. 720, 721 (1983). Type: India, ?*König*, Herb. Willdenow 17323 (B-W, lecto.)*

Densely tufted annual 0.15–1 m tall with reddish roots. Leaves plicate, 2–6 mm wide, glabrous or more rarely shortly hairy. Inflorescence of lateral panicles borne singly at the nodes on short erect peduncles not or scarcely extended from the leaf sheaths; male spikelets pale green or chestnut, 4–5 mm long, sessile or with pedicels only 1–2 mm long; female glumes pale green or ± scarious with a green midrib. Nutlets grey or olive-grey with irregular often interrupted longitudinal lines of darker colour, cylindrical-ellipsoid to globose, 2.2–3.5 mm long, 1.2–2.5 mm wide, deeply lacunose-tessellate or striate-tessellate, glabrous or hairy; hypogynium yellow, 3-lobed, the lobes brown squarish at apex.

var. *tessellata*; E.A. Rob. in K.B. 18: 526 (1966)

Nutlets cylindrical-ellipsoid, 3.2–3.8 mm long, 1.5–2 mm wide, shiny, glabrous, lightly striate-lacunose.

TANZANIA. Songea District: ± 1.5 km S of Gumbiro, 10 May 1956, *Milne-Redhead* & *Taylor* 10149!; Lindi District: SW of Lindi, *Schlieben* 6404

DISTR. T 8; Senegal to Nigeria, Sudan, Zambia; also in Madagascar and India

HAB. Grassland with *Brachystegia* and *Acacia* on clay and gravel soil; ± 870 m

SYN. *S. glandiformis* Boeck. in Linnaea 38: 458 (1874); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 671 (1895) & in F.T.A. 8: 503 (1902); F.W.T.A. ed. 1, 2: 493 (1936) pro parte. Type: Nigeria, Nupe, *Barter* 1042 (K!, holo.)

var. *sphaerocarpa* E.A. Rob. in K.B. 18: 526 (1966). Type: Zambia, 100 km E of Kasama, *Robinson* 5080 (K!, holo.; B, EA, M, MPR, MTJB, NU, NY, PRE, SRGH, iso.)

Nutlets grey, globose, 2.7–3 mm long, 2.3–2.5 mm wide, glabrous or shortly hairy, deeply lacunose-tessellate.

TANZANIA. Ufipa District: 14 km from Sumbawanga on road to Mbala, edge of Kalambo ranch, 2 June 1980, *Hooper et al.* 1804A!

DISTR. T 4; Senegal, Ivory Coast, Ghana, Cameroon, Sudan, Angola, Zambia

HAB. Damp grassland; 2100 m

* C.B. Clarke excluded the Rumphius reference cited by Willdenow.

SYN. *S. glandiformis* sensu F.W.T.A. ed. 1, 2: 493 (1936) pro parte, *non* Boeck.
S. globonux sensu Nelmes in K.B. 11: 105 (1956) pro parte, *non* C.B. Clarke
S. ?tessellata × *globonux*; Robinson in Kirkia 2: 181 (1961)
S. sphaerocarpa (Robinson) Napper in K.B. 25: 441 (1971) & in F.W.T.A. ed. 2, 3: 342 (1972)

30. ***Scleria clathrata*** A. Rich., Tent. Fl. Abyss. 2: 510 (1851); Boeck in Linnaea 38: 472 (1874); Ridl. in Trans. Linn. Soc. ser. 2, Bot. 2: 170 (1884); Engl., Hochgebirgsfl. Trop. Afr.: 151 (1892); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 670 (1895); Rendle in Cat. Afr. Pl. Welw. 2: 134 (1899); C.B. Clarke in F.T.A. 8: 502 (1902); Nelmes in K.B. 11: 104 (1956); Robinson in Kirkia 2: 189 (1961) & in K.B. 18: 534 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 349, fig. 722 (1983); Lye in Fl. Eth. 6: 498 (1997). Type: Ethiopia, Walcha, *Schimper* 1603 (P, holo.; BM, iso.)

Slender annual 5–60 cm tall, glabrous or minutely scabrid or shortly hairy above. Leaves 3–40 cm long, 2–6 mm wide, flat, scabrid to shortly hairy on margins and main ribs near the apex; lower sheaths pale or brown, upper green, glabrous or minutely scabrid. Inflorescence with a terminal panicle and several lateral panicles usually 2–3 at each node on very unequal slender pendulous peduncles; male spikelets chestnut, 4–6 mm long; female spikelets 8–10 mm long; glumes pale to red-brown with prominent green keel, glabrous. Nutlets variable in colour, light grey, pinkish grey, light brown or red to almost black, ovoid- or oblong-ellipsoid, 2–3 (3.4–3.8 fide Robinson) mm long, 1.6–1.8 mm wide, lightly striate-lacunose; hypogynium yellow brown, 3-angled with 3 very indistinct lobes, the base drying to form a cylindrical stipe.

KENYA. Trans Nzoia District: 24 km E of Kitale, Cherangani Hills, 8 Nov. 1961, *Bogdan* 5310! 5311!

TANZANIA. Ufipa District: Murimbi, 21 Apr. 1962, *Robinson* 5103! & 14 km from Sumbawanga on road to Mbala, edge of Kalambo ranch, 2 June 1980, *Hooper et al.* 1804B!

DISTR. K 4; T 4; Ethiopia, Zambia, Mozambique

HAB. Newly cultivated swamps, weed in maize, damp grassland, seasonally moist depressions; 1500–1950 m

31. ***Scleria gracillima*** Boeck. in Flora 62: 570 (1879); C.B. Clarke in F.T.A. 8: 505 (1902); Nelmes in K.B. 11: 10 (1956); Robinson in Kirkia 2: 188 (1961); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 29 (1964); Robinson in K.B. 18: 534 (1966); Napper in F.W.T.A. 3: 343 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 349, fig. 723 (1983). Type: Sudan, Jur Ghattas, *Schweinfurth* 189 (B, holo.; K, iso.)

Entirely glabrous slender annual 25–55(–70) cm tall. Leaves 1–2 mm wide. Inflorescences with the lateral panicles single or in pairs at each node, few-flowered; peduncles foliform, pendulous; male spikelets straw-coloured, 3–4 mm long; pedicels up to 4 mm long; female glumes tinged with red. Nutlets whitish or grey with darker grey or blackish longitudinal stipes, oblong-cylindric, (2.2–)2.9–3.3 mm long, 1.7–1.8 mm wide, smooth and shiny; hypogynium pale greenish yellow with or without a dark reddish brown margin, not or only faintly lobed.

TANZANIA. Songea District: 8 km S of Songea–Mbamba Bay road, on road to Chipili, 2 June 1956, *Milne-Redhead & Taylor* 10477!

DISTR. T 8; Senegal, Ghana, Ivory Coast, S Nigeria, Central African Republic, Sudan and Zambia; also in Brazil

HAB. Boggy grassland; 900 m

SYN. *S. retroserrata* Kük. in E.J. 56, Beibl. 125: 21 (1921). Type: Brazil, Hylaea-Amazonas, Rio Branco, Surumu, Serra do Mel, *Ule* 8064 (B†, holo.)

32. *Scleria hildebrandtii* Boeck. in Flora 63: 454 (1880); C.B. Clarke in Durand & Schinz., Consp. Fl. Afr. 5: 671 (1895); K. Schum. in P.O.A. C: 129 (1895); C.B. Clarke in F.T.A. 8: 505 (1902); Nelmes in K.B. 11: 109 (1956); Robinson in Kirkia 2: 188 (1961); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 29 (1964); Vollesen in Opera Bot. 59: 96 (1980); Haines & Lye, Sedges & Rushes E. Afr.: 350, f. 724 (1983). Type: Kenya, mainland near Mombasa, *Hildebrandt* 2044 (B†, holo.; K!, iso.)

Loosely tufted annual 30–60 cm tall with red roots; stems 1–3 mm wide. Leaves up to 30 cm long, 4–8 mm wide, slightly scabrid on margins and midrib towards the apex; sheath glabrous. Inflorescence of one terminal and 2–4 lateral panicles, single or in pairs at each node; peduncles stout, erect, and when in pairs very unequal; male spikelets light brown, 4–6 mm long, the pedicels 1–3(–5) mm long; female glumes pale with reddish streaks or patches, 5–6 mm long. Nutlet whitish, cylindrical to oblong, bluntly trigonous, 3.5–4 mm long, 2.5–2.6 mm wide, with a rounded or minutely apiculate apex, almost smooth to slightly wrinkled or pitted, glabrous; hypogonium dark reddish brown above, obscurely 3-lobed.

KENYA. Kwale District: Buda Forest Reserve, 21 Aug. 1999, *Luke & Luke* 5964!; Mombasa District: mainland near Mombasa, Aug. 1977, *Hildebrandt* 2044!

TANZANIA. Uzaramo District: Dar es Salaam, 1 June 1966, *Haines* 186!; Kilwa District: Selous Game Reserve, Nangue Flood Plain, 23 June 1975, *Vollesen* MRC 2476!

DISTR. K 7; T 6, 8; Madagascar

HAB. Grassland on black cracking soil, weed in cultivation, grassland bordering lowland forest; 30–215 m

33. *Scleria achtenii* De Wild. in Rev. Zool. Afr., Suppl. Bot. 14: 16, fig. 1 (1926) & in Pl. Bequaert. 4: 219, fig. 1 (1927); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 28 (1964); Robinson in K.B. 18: 534 (1966); Napper in F.W.T.A. ed. 2, 3: 342 (1972); Haines & Lye, Sedges & Rushes E. Afr.: 350, figs 725, 726 (1983); Gordon-Gray in Strelitzia 2: 181, fig. 82 A, D (1995). Type: Congo-Kinshasa, Kinshasa [Leopoldville], *Achten* 97 (BR, holo.)

Perennial 0.4–1.3(–2) m tall; rhizome red, usually straight, 3–6 mm wide, with hairy stems arising from it at intervals of up to 1 cm with bases swollen. Leaves 30–60 cm long, 2.5–5 mm wide, glabrous above, hairy on the 5 principal veins beneath; sheaths hairy; ligulate. Inflorescence reddish, elongate totalling 20–85 cm, the terminal panicle up to 2.5 cm long; lateral panicles single at 2–3(–4) upper nodes on pendulous hairy peduncles exerted up to 18 cm from the sheaths; male spikelets 7–9 mm long, sessile on short pedicels, the glumes straw-coloured or reddish; female spikelets 5–7 mm long with straw-coloured or reddish glumes, glabrous. Nutlets grey, brownish-grey or violet-grey, obovoid to subglobose, 2.6–2.9 mm long, 1.9–2.1 mm wide, lightly irregularly pitted or transversely ridged, hairy on the ridges but sometimes smooth and hairless near the apex, also with microscopic papillae; hypogynium greyish white with 3 lobes terminating in a semi-scarious ligulate extension up to 1 mm long appressed to nutlet base.

UGANDA. Masaka District: Lake Nabugabo, 0.5–1 km S of Bale, 1 Feb. 1970, *Lye & Haines* 5013!; Mengo District: Entebbe, Dec. 1955, *Lind* 900! & km 16 on Entebbe road, June 1937, *Chandler* 1685!

KENYA. Kwale District: Buda Forest Reserve, 5 Oct. 1999, *Luke & Luke* 5994!

TANZANIA. Bukoba District: Gera Camp, 31 Aug. 1934, *Gillman* 138A! & Ngara District: Bushubi, Bugarama, 5 Oct. 1960, *Tanner* 5250!; Rufiji District: Mafia I., Kilindoni, 6 Aug. 1936, *FitzGerald* 5211/3!

DISTR. U 4; K 7; T 1, 6; Congo-Kinshasa, Zambia, South Africa

HAB. Perennially damp but not water-logged ground, *Loudetia* tussocks in marshes, occasionally in permanent water; 0–1500 m

- SYN. *S. substriato-alveolata* De Wild. in Rev. Zool. Afr. Suppl. Bot. 4: 23, 33, fig. 6 (1926) & in Pl. Bequaert. 4: 240, fig. 8 (1927). Type: Congo-Kinshasa, Wombali, *Vanderyst* 1060, 1890 & Kimpako, *Vanderyst* s.n. (BR, syn.)
S. subintegrifolia De Wild. in Pl. Bequaert. 4: 238 (1927). Type: Congo-Kinshasa, Katchaka, *Vanderyst* 2839 (BR, holo.)
S. nyasensis Nelmes in K.B. 11: 86 (1956) pro parte, non C.B. Clarke

NOTE. I am not certain of the identity of the Kenya specimen.

34. ***Scleria nyasensis*** C.B. Clarke in F.T.A. 8: 504 (1902); Nelmes in K.B. 11: 86 (1956) pro parte; Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 28 (1964); Robinson in K.B. 18: 535 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 351, figs 727, 728 (1983). Types: Malawi, Zomba, *Whyte* s.n. (K!, syn.) & Mt Malosa, *Whyte* s.n. (K!, syn.) & near Mt Sochi, *Kirk* s.n. (K!, syn.)

Erect perennial (0.45–)0.8–1.5(–2) m tall with short reddish brown rhizome and purple roots and crowded stems with swollen bases up to 5 mm wide, usually joined to form an irregular woody mass or clump up to a meter across. Leaves 20–30 cm long, 2–5(–7) mm wide, glabrous or hairy but sharply scabrid on margin and veins. Inflorescences 25–50(–100) cm long overall; lateral panicles rarely single, usually 3–5 (6) at 2–5 nodes, on slender pendulous glabrous or hairy peduncles exerted up to 20(–30) cm from the sheaths; male spikelets 5–7(–8) mm long with pedicels usually shorter but sometimes up to 11 mm long; female spikelets 7–9 mm long with glumes straw-coloured to pale brown, sometimes with dark purple patches and green keels. Nutlets white or greyish to brown or reddish brown, ovoid-ellipsoid, obovoid or subglobose, 2.5–3.6 mm long, 1.8–2.2 mm wide, distinctly regularly finely pitted with longitudinal rows of pits and the ridges with white hairs; hypogonium greyish white with 3 broadly triangular white or yellowish lobes usually extended into semiscarious sometimes bicuspidate apices adpressed to nutlet base.

UGANDA. Kigezi District: 19 km S of Kabale on Kigoro road, 23 June 1967, *Haines* 4234!; Mengo District: Kampala, King's Lake, 5 Dec. 1935, *Chandler & Hancock* 92! & Kyagwe, Namanve, Mar. 1932, *Eggeling* 244!

TANZANIA. Ufipa District: Mosi, 21 Apr. 1962, *Robinson* 5094!; Ulanga District: Lupembe, Upper Ruhudje, Apr. 1931, *Schlieben* 644!; Iringa District: Great North Road, 98 km S of Iringa, Mafinga [Sao Hill], 12 Mar. 1962, *Polhill & Paulo* 1718!

DISTR. U 2, 4; T 1, 4, 6–8; Congo-Kinshasa, Burundi, Zambia, Malawi, Zimbabwe

HAB. Permanent *Phragmites* and papyrus swamps, *Syzygium* swamp, sometimes in standing water; 70–1800 m

SYN. *S. schmitzii* Piéart in Lejeunia Mém. 13: 42 t. 2, fig. 7 (1953). Type: Congo-Kinshasa, Shaba, Kundelungu, *Schmitz* 3115 (BR, holo.)

NOTE. *Stolz* 1265 (Tanzania, Rungwe District, Mbaka, 13 May 1912) cited by Nelmes has the walls of the nutlet reticulation at least partly blackish.

35. ***Scleria laxiflora*** R. Gross in N.B.G.B. 11: 658 (1932); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 28 (1964); Robinson in K.B. 18: 524 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 352, fig. 729 (1983). Type: Tanzania, Njombe District: Lupembe, Ruhudji R., *Schlieben* 782 (B, holo.)

Slender glabrous perennial up to 1 m long or tall; stems with bases 3–4 mm wide, packed closely together to form a caespitose or ± straight row, the stems weakly erect or semi-prostrate, 1 mm wide, branched at several nodes. Leaves 0.5–1.5(–2) mm wide, glabrous, sparsely hairy or with spreading dense hairs on midrib and margin. Inflorescence elongate up to 50 cm long overall, of one terminal and several lateral panicles, usually single at nodes on slender peduncles exerted up to 8 cm from leaf sheaths; panicles spicate or very shortly branched near the base; spikelets 6–8(–9) mm long, all in effect unisexual although the females always contain an aborted male

flower; glumes straw-coloured, reddish brown or pale vinaceous. Nutlets dark grey or dark brown with raised parts of surface lighter, oblong to ellipsoid, distinctly trigonous, 2 mm long, 0.7–1 mm wide, minutely transversely rugulose, ± papillate; hypogynium much reduced, scarcely more than a dark ring.

TANZANIA. Iringa District: 38 km from Mafinga [Sao Hill] on Mbeya road, 30 Mar. 1988, *Bidgood et al.* 842!; Njombe District: N of upper Ruhudji R., Lupembe area, Apr. 1931, *Schlieben* 782! & Njombe–Kipengere road ± 1.6 km beyond Igosi, 26 Apr. 1970, *Wingfield* 756!; Songea District: Matengo Hills, 1.5 km N of Miyau, 2 Mar. 1956, *Milne-Redhead & Taylor* 8944!

DISTR. T 7, 8; Zambia, Congo-Kinshasa

HAB. Perennially wet bogs, where it may form dense masses of semiprostrate vegetation which dominate large areas; 900–2150 m

NOTE. Haines & Lye mistakenly say only recorded from Songea District, being confused by two localities called Lupembe. Napper has redetermined *Milne-Redhead & Taylor* 8944 (Songea District: Matengo Hills, 1.5 km N of Miyau 12 Mar. 1956) as *S. laxiflora* on the grounds of the very distinct close bulbous stem bases but the single nutlet is smooth and shining. Further material with more riper nutlets is required from Songea to confirm. It had previously been determined as *S. bequaertii* De Wild. var. *laevis* Piarart which has finely smooth fruit but stem bases not bulbous. Only more material will solve this problem.

36. *Scleria unguiculata* E.A. Rob. in K.B. 18: 536, fig. 14 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 352, figs 730, 731 (1983). Type: Zambia, Luwingu, Lwena Mission, *Robinson* 5056 (K!, holo.; M, MTJB, PRE, SRGH, iso.)

Tufted perennial to 1.3 m tall; stems erect, 1–2 mm wide, with thickened bases 3–4(–5) mm wide, the rhizome reduced to connections between these to form a subwoody mass. Leaves 2–4 mm wide, glabrous or sparsely hairy. Inflorescence up to 70 mm long with (1–)2–4(–5) panicles at each node, 1.5–3 cm long on pendulous peduncles up to 26 cm long; male spikelets 4–5 mm long on pedicels shorter or sometimes up to 10 mm long; female glumes straw-coloured or brown with green keel, 3.5–5 mm long, acuminate, glabrous. Nutlets grey or pale brown with darker longitudinal lines, ovoid to globose, 2–2.8 mm long, 1.7–2 mm wide, striate-lacunose with pits in longitudinal lines, shortly-beaked, with white or yellowish hairs; hypogynium brownish with 3 triangular lobes.

TANZANIA. Songea District: 40 km W of Songea, 10 Mar. 1956, *Milne-Redhead & Taylor* 9141!

DISTR. T 8; Togo, Central African Republic, Zambia

HAB. Swampy grassland; ± 1000 m

NOTE. Napper does not mention the species in F.W.T.A. ed. 2.

37. *Scleria lagoensis* Boeck. in Vidensk. Medd. Dansk. Naturhist. Foren. Kjobenh. 1869: 151 (1869); Robinson in K.B. 18: 538 (1966); Napper in F.W.T.A. ed. 2, 3: 342 (1972); Lye in Fl. Eth. 6: 499 (1997). Type: Brazil, Lagoa Santa, *Warming* s.n. (C, lecto.)*

Robust rhizomatous perennial 0.5–1.8 m tall, with stem-bases swollen, up to 5 mm wide, forming a ± shapeless knotty mass or sometimes extended into a ± straight row but true rhizome lacking; roots becoming cylindrical and tuberous at a distance of 3–10 cm from stem bases; stems 2–3 mm wide, scabrid. Leaves 20–50 cm long, 5–12 mm wide, usually sharply scabrid on margins and ribs but otherwise glabrous or hairy at base and on the winged sheaths; lower sheaths purplish, without blades, with thickened ligule. Inflorescence of 1 terminal and 3–6 lateral panicles 3–8(–12) cm long, rarely all single but mostly 2–3 to each node on erect or pendulous glabrous or scabrid peduncles up to 6 cm long; male spikelets 5–6 mm long with straw-coloured

* Robinson discusses the type material of this

glumes, sessile or pedicels very short; female spikelets 6–7 mm long the glumes straw-coloured or green, often strongly speckled with deep reddish brown and with green midrib. Nutlets green turning white or grey to brown, narrowly ovoid to ovoid-subglobose, 2.7–4.2 mm long, 2–2.5 mm wide, smooth or faintly striate-lacunose, hairy, more so towards the base, ± glabrous above; hypogynium yellowish brown with narrowly acuminate lobes or these sometimes almost or completely absent.

UGANDA. Acholi District: Chobe, Murchison Falls National Park, Oct. 1967, *Buzigye* 13! & 1.6 km NW of Chobe, 14 Mar. 1967, *Angus* 5972!; Lango District: Dokolo to Aqwala, 25 July 1935, *Johnston* 1004!

KENYA. Kwale District: Buda Forest Reserve, 21 Aug. 1999, *Luke & Luke* 5962!

TANZANIA. Lushoto District: E Usambaras, Monga, 19 July 1917, *Peter* 21332!; Buha District: Kwa Bikare towards Mkiyo, 15 Mar. 1926, *Peter* 38719!; Songea District: ± 3 km NE of Kigonsera by R. Mkuluzi, 14 Apr. 1956, *Milne-Redhead & Taylor* 9717!

DISTR. U 1; K 7; T 3, 4, 6–8; P (fide Napper); Senegal to Nigeria, Cameroon, Congo-Kinshasa, Sudan, Ethiopia, Angola, Zambia, Malawi, Zimbabwe, South Africa; Madagascar, Comoro Is.; also Brazil, Columbia and Venezuela

HAB. Grassland, *Terminalia-Combretum* and *Brachystegia-Uapaca* woodland, forest edge grassland; 750–1650 m*

SYN. *S. moritziana* Boeck. in *Linnaea* 38: 460 (1874). Type: Venezuela, 'Caripe Venezuelae', *Moritz* 645 b (BM, holo.)

S. canaliculato-triquetra Boeck. in *Flora* 62: 573 (1879); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 670 (1895); Rendle, *Cat. Afr. Pl. Welw.* 2: 135 (1899); C.B. Clarke in *F.T.A.* 8: 505 (1902); Hutch. & Dalz., *F.W.T.A.* ed. 1, 2: 493 (1936); *F.D.-O.A.* 1: 532 (1938); Nelmes in *K.B.* 11: 84 (1956); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 24 (1964). Type: Sudan, Jur Ghattas, *Schweinfurth* 2474 (B† holo.; K!, iso.)

S. djurensis Boeck. in *Flora* 62: 573 (1879). Type: Sudan, Jur [Djur], *Schweinfurth* 2389 pro parte (B†, holo.; K, P, iso.)

S. cervina Ridl. in *Trans. Linn. Soc. ser. 2, Bot.* 2: 171 (1884). Type: Angola, between Mutollo and Candumba, *Welwitsch* 7127 (LISU, holo.; BM!, iso.)

S. mayottensis C.B. Clarke in *K.B. addit. ser.* 8: 92 (1908). Type: Comoro Islands, Mayotte, *Boivin* 3043 (G, holo.)

S. canaliculato-triquetra Boeck. var. *clarkeana* Piérart in *Lejeunia Mém.* 13: 49, t. 2, figs. 20, 21 (1953). Type: Congo-Kinshasa, 10 syntypes from widely separated localities (BR, syn.)

S. lagoensis Boeck. subs. *canaliculato-triquetra* (Boeck.) Lye in *Nordic J. Bot.* 3: 243 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 353, fig. 732 (1983)

NOTE. Robinson suggests that some of the extensive variation may prove to be geographically correlated and that subspecies might be desirable, but more study throughout its range would be needed. Lye established subsp. *canaliculato-triquetra* but gave absolutely no reasons or distinctions in either reference and later, in *Fl. Eth.*, sunk the subspecies.

38. *Scleria adpresso-hirta* (Kük.) E.A. Rob. in *Kirkia* 3: 10 (1962); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 29 (1964); Robinson in *K.B.* 18: 540 (1966); Haines & Lye, *Sedges & Rushes E. Afr.*: 353, fig. 733 (1983). Type: Tanzania, Kigoma District: Ujiji, between Kandega and Lake Tanganyika, *Peter* 38957 a (B†, holo.; EA!, iso., K! fragment of EA iso.)

Shortly hairy perennial 50–90 cm tall; rootstock a knotty mass of swollen stem bases, the roots red becoming cylindrical and tuberous at a distance of 3–8 cm from the stem bases. Leaves appearing pale green when dried due to the dense hairs, 4–7 mm wide. Panicles 2–8 cm long, 1–2 cm wide, the laterals 1–2 at each of 1–3 nodes, the peduncles exerted 0.5–1.0 cm from the sheaths, shortly hairy; male spikelets straw-coloured to chestnut, 4–5.5 mm long, hispidulous, sessile or pedicels 1–3 mm long; female glumes straw-foloured with chestnut markings or entirely chestnut with green keel, 4.5–5 mm long, shortly hairy near apex and on keel but otherwise glabrous.

* If the record from Pemba in Napper (1964) is correct then the lower altitude will be near sea level.

Nutlets grey, yellowish- or brownish-grey, broadly ovoid-globose, globose or depressed globose, 2.5–2.8 mm long, 2.4–2.8 mm wide, smooth, shortly hairy below, glabrous above; hypogynium yellowish, light brown or chestnut, with 3 shortly acuminate lobes.

TANZANIA. Kigoma District: Ujiji, between Kandega and Lake Tanganyika, 21 Mar. 1916, *Peter* 38957a!

DISTR. T 4; widespread in Zambia

HAB. Perennially damp ground in grassland; 950 m

SYN. *S. canaliculato-triquetra* Boeck. var. *adpresso-hirta* Kük. in F.D.-O.A. 1: 533 & Anhang: 142 (1938)

NOTE. Peter cites 38957 in both places without an a; presumably this only appears on the EA duplicate. Robinson's date of collection as 21 Mar. 1961 is a slip.

39. ***Scleria iostephana*** *Nelmes* in K.B. 11: 94 (1956); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 28 (1964); Robinson in K.B. 18: 544 (1966); Napper in F.W.T.A. ed. 3, 3: 342 (1972); Haines & Lye, *Sedges & Rushes* E. Afr.: 354, figs 734, 735 (1983). Type: Uganda, Mengo, Kyewaga Forest, *Dawkins* 365 (K!, syn., EA, isosyn., ENT, isosyn.)

Robust perennial 0.6–2.1 m tall, the base swollen to 5–8 mm and forming an irregularly shaped knot or rarely stems in a straight line, 2–4 mm wide, ± glabrous below, hairy and usually with sharp scabrid angles. Leaves 30–60 cm long, 5–8 mm wide, scabrid on margins and ribs, sparsely to densely hairy beneath; sheaths hairy, scabrid on the angles, ligule with whitish or dark reddish brown dense hairs. Inflorescence of a terminal and 2–3 lateral panicles placed singly at the nodes, 3–7 cm long, 1.5–4 cm wide, on stiffly erect peduncles shortly exerted from the sheaths, up to 3 cm long; male spikelets 4–5 cm long, the glumes straw-coloured with dark reddish brown sides, hairy particularly on margin; female spikelets 5–7 mm long with glumes dark reddish brown with midrib and area near it straw-coloured or greenish, hairy on margin and midrib. Nutlets greyish white or whitish below, violet to blackish blue above or sometimes dark all over, broadly ovoid or ellipsoid, 3–4.2 mm long, 2.5–2.8 mm wide, smooth; hypogynium yellowish to reddish brown, with 3 distinct lobes with recurved margins.

UGANDA. Masaka District: Sese Islands, Sozi, Dec. 1922, *Maitland* 443! & Lake Nabugabo, July 1937, *Hancock & Chandler* 1766!; Mengo District: Gaba, July 1915, *Dummer* 2593!

TANZANIA. Bukoba District: Bugandika, Sept. 1931, *Haaver* 2185!; Ufipa District: 20 km E of Lake Tanganyika, N of Kalambo R., bank of Kawa R., 10 June 1961, *Robinson* 4701!; Ulanga District: 35 km S of Mahenge, Sali, 21 Mar. 1932, *Schlieben* 1934!

DISTR. U 4; T 1, 4, 6, 7; Ghana, Ivory Coast, Nigeria, Central African Republic, Congo-Kinshasa, Zambia

HAB. Rain forest, gallery forest, secondary rain-forest, dense or open woodland, grassland, boggy areas, river and lake banks, waterfalls; 950–1750 m

NOTE. Much of the East African material had been identified as *S. naumanniana* Boeck. by Piéart.

40. ***Scleria pachyrrhyncha*** *Nelmes* in K.B. 11: 99 (1956); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 28 (1964); Robinson in K.B. 18: 544 (1966); Haines & Lye, *Sedges and rushes* E. Afr.: 354, fig. 736 (1983). Type: Tanzania, Uluguru Mts, Bunduki, *E.M. Bruce* 669 (K!, holo.)

Perennial herb with horizontally creeping rhizome 3–5 mm thick covered with red striate scales and bearing glabrous stems at intervals of 3–7 cm, 0.3–2 cm long and base swollen to 7 mm wide. Leaves 5–11 mm wide, glabrous above, sparsely hairy beneath; sheaths hairy, ligule reddish, very hairy. Inflorescence of simple terminal panicle or terminal and lateral together up to 35 cm overall, terminal panicle 6–9 cm

long, 5–7(–9) cm wide, laterals 2.5–5 cm long, 1–4 cm wide, single or paired at one node, on erect peduncles exerted up to 10(–14) cm from the sheath; male spikelets brown, 5–6 mm long, sessile, hispidulous; female spikelets greenish or brown hairy. Nutlets yellowish, pinkish or greyish brown or green becoming blue at tip, broadly ovoid, obtusely trigonous with the angles often white, 5–4 mm long, 2.5–2.8 mm wide, smooth, strongly beaked; hypogynium reduced to a narrow brown collar, barely 3-lobed.

TANZANIA. Lushoto District: W Usambara Mts, Mazumbai Forest, 26 Mar. 1975, *Wingfield* 3091! & 22 Mar. 1975, *Hooper et al.* 10091!; Morogoro District: Uluguru Mts, E side of ridge from Bondwa Peak to Nziwane, 19 Jan. 2001, *Jannerup & Mhoro* 231!

DISTR. T 3, 6; Zimbabwe

HAB. Rain forest, rock faces and outcrops in *Berberis holstii*–*Hypericum* association; 1400–1850 m

41. *Scleria boivinii* *Steud.*, *Syn. Glum. Pl.* 2: 113 (1855); Napper in *K.B.* 25: 441 (1971) & in *F.W.T.A. ed. 2, 3*: 340 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 355, figs. 737, 738 (1983). Type: Madagascar, Nosy Boraha [St. Maria I.], *Boivin* 1643 (P, holo.; K!, iso.)

Scrambling herb 3–6(–10) m long, climbing in dense festoons up trees and bushes, often forming impenetrable tangles; stems branched, sharply triangular, glabrous or sparingly hairy, the angles with dense minute recurved hooks. Leaves many, 20–30 cm long, 1–6 mm wide, glabrous but with dense spine-like teeth on margins and midrib; mouth of leaf sheath transversely veined. Panicles solitary, terminal or with 1–2 lateral, in addition loosely triangular in outline, 3–7 cm long, 1–5 cm wide; peduncle up to 4 cm long, scabrid and sparsely to densely hairy; male spikelets 4–6 mm long with pale to dark reddish glumes; female spikelets 6–8 mm long, the glumes green or straw-coloured with dark reddish brown usually hairy margins. Nutlets pale to dark violet, ovoid to cylindrical-ovoid, 2.8–3.2 mm long, 2.3–2.5 mm wide, smooth or slightly wrinkled, sparsely to densely hairy; hypogynium yellowish brown with or without reddish spots, well developed but without lobes, wrinkled.

UGANDA. Masaka District: Sesse Is, Bugala, July 1945, *Purseglove* 1702!; Mengo District: Kyewaga Forest, 3 Sept. 1949, *Dawkins* 352! & Sezibwa Falls, Nov. 1914, *Dummer* 1079!

KENYA. Kwale District: Buda, Tiomin Kwale mine, 25 May 1999, *Luke et al.* 5920!

TANZANIA. Morogoro District: Mangala Forest Reserve, 20 Aug. 2000, *Mhoro* UMBCP 364!;

Iringa District: Msolwa, 7 Oct. 2001, *Luke et al.* 8191!; Pemba I., 17 Feb. 1929, *Greenway* 1458!

DISTR. U 4; K 7; T 6, 7; P; Senegal to Cameroon, Angola, Madagascar

HAB. Swamp forest, lowland forest; sea level to 1200 m

SYN. *S. barteri* Boeck. in *Linnaea* 38: 504 (1874); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 669 (1895) & in *F.T.A.* 8: 507 (1902); Hutch. & Dalz., *F.W.T.A. ed. 1, 2*: 403 (1936); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 28, fig. 10 (1964); Nelmes in *K.B.* 11: 92 (1956). Type: Nigeria, Onitsha, *Barter* 1786 (B, holo.; K, iso.)

S. reflexa sensu Benth in *Hook., Niger Fl.*: 555 (1849), *non* Kunth.

42. *Scleria melaleuca* *Schlechtend. & Cham.* in *Linnaea* 6: 29 (1831); Piérart in *Lejeunia, Mém.* 13: 57, t. 3, figs 1 & 2 (1953). Type: Surinam, Hacienda de la Laguna, *Weigelt* s.n. (B †, holo.)

Robust perennial 0.3–1.2 cm tall, with a shortly creeping rhizome 3–4 mm wide with very short internodes obscured by the swollen stem bases; stems 2.5–3 mm wide, sometimes slightly scabrid above on the angles. Leaves shorter or longer than the stems, 5–11 mm wide, scabrid on the margins and veins; sheaths glabrous to sparsely hairy, the basal ones ± without blades; ligule reddish hairy up to 6 mm long. Inflorescence of terminal and lateral panicles, the latter 2–3 single at the nodes, 2–7 cm long, 1–2 cm wide on peduncles scarcely or very shortly exerted from the

leaf sheaths; male spikelets 4–4.8 mm long; female glumes pale, usually with reddish streaks or completely reddish or blackish red above, ovate, 3.5–5 mm long with greenish sometimes produced midrib, acuminate. Nutlets white with reddish or bluish black apex, globose or ovoid-globose, sometimes obscurely trigonous, 2.2–2.5 mm long, 2–2.2 mm wide, smooth and shining, glabrous above, with small or very small tufts of fine whitish hairs below; hypogynium 3-lobed, the lobes ovate or rounded, 1 mm long.

TANZANIA. Moshi District (fide Napper); Ulanga District: Taweta, Feb. 1960, *Haerdi* 380/0!; Pemba: Tondooni, 14 Feb. 1929, *Greenway* 1437!

DISTR. T 2, 6; P; Senegal to Nigeria, Congo-Kinshasa; Madagascar and tropical America

HAB. Damp wooded places; 0–750 m

SYN. *S. pterota* Presl in *Isis* 21: 268 (1828), *nom. nudum, sine descr.*; Core in *Brittonia* 2: 91, t. 2, fig. 18 (1936); Nelmes in *K.B.* 11: 91 (1956); Haerdi in *Acta Trop. Suppl.* 8: 208 (1964); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 28 (1964) & in *F.W.T.A. ed. 2, 3*: 342 (1972); Haines & Lye, *Sedges & Rushes E. Afr.*: 356, figs. 739, 740 (1983). Based on: Martinique, *Sieber* 269 (PR)

S. longifolia Boeck. in *Flora* 65: 30 (1882). Type: Madagascar, Nosy Bé [Nossi-Bé], Lokobe [Loucou-Bé], *Hildebrandt* 2924 (B†, holo.)

S. congolensis De Wild. in *Rev. Zool. Suppl. Bot.* 14: 19, fig. 3 (1926); De Wild. in *Pl. Bequaert.* 4: 228, fig. 3 (1927). Types: Congo-Kinshasa, many specimens, mainly *Vanderyst* (BR, syn.)

43. *Scleria melanomphala* *Kunth*, *Enum. Pl.* 2: 345 (1837); *Ridl.* in *Trans. Linn. Soc. Ser. 2, Bot.* 2: 171 (1884); *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 672 (1895); *K. Schum.* in *P.O.A. C.* 129 (1895); *C.B. Clarke* in *Fl. Cap.* 7: 296 (1898); *Rendle*, *Cat. Afr. Pl. Welw.* 2: 134 (1899); *C.B. Clarke* in *F.T.A.* 8: 506 (1902); *Piérart* in *Lejeunia, Mém.* 13: 26, t. 1, figs. 26, 31 (1951); *Nelmes* in *K.B.* 11: 88 (1956); *Napper* in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 27 (1964); *Robinson* in *K.B.* 18: 546 (1966); *Napper* in *F.W.T.A. ed. 2* 3: 340 (1972); *Haines & Lye, Sedges & Rushes E. Afr.*: 356, figs. 741, 742 (1983); *Gordon-Gray* in *Strelitzia* 2: 184, figs. 81, E–G, 82L (1995). Type: South Africa, Cape of Good Hope, E Coast, *Drège* s.n. (B†, holo.); *Drège* s.n. sub *C.B. Clarke* 4369 (K, lecto., OXF, isolecto., fide *Gordon Gray*)

Robust tussock-forming perennial 0.6–2.4 m tall, from a thick rhizome 4–6 mm wide, with very short internodes; stems up to 1 cm wide across the leaf sheaths, glabrous but minutely to strongly scabrid on the angles. Leaves 20–60 cm long, 0.7–1.8(–2) cm wide, glabrous or hairy, scabrid on the margin and ribs; lower sheaths reddish with or without very short densely hairy blades and with a ligule up to 1 cm long. Inflorescence of 1 terminal and 5–9 lateral often drooping lanceolate panicles 2–10 cm long, 1–3 cm wide, borne singly or 2–3 at the nodes on pendulous peduncles exerted up to 30 cm from the sheaths; male spikelets 8–13 mm long, ± sessile; glumes straw-coloured with usually dark reddish brown margins and green scabrid produced midrib; female similar with glumes 10–12 mm long, hispidulous or hairy on the midrib. Nutlets white and shining but usually (but not always) with blue-black apex, ovoid, 3.7–4(–5) mm long, 2.7–3.2 mm wide, smooth, glabrous; hypogynium white or yellowish brown irregular but unlobed.

UGANDA. West Nile District: 0.4 km S of Mawacha Rest Camp, 27 July 1953, *Chancellor* 55!; Bunyoro District: Bugoma Forest, 26 June 1933, *Imp. Inst. Entom. Locust Research* 73!; Mengo District: Kampala, Kings Lake, 7 Nov. 1935, *Chandler & Hancock* 69!

KENYA. Meru District: 11.2 km E of Meru, 8 July 1953, *Bogdan* 3745!

TANZANIA. Bukoba District: Minziro Forest Reserve, Kakingo Village, 1 July 2001, *Festo et al.* 1584!; Mpanda District: Kungwe Mt, Kasoje, 17 July 1959, *Newbould & Harley* 4423!; Songea District: ± 6.5 km W of Songea, 30 Mar. 1956, *Milne-Redhead & Taylor* 9376!

DISTR. U 1–4; K 4; T 1, 4, 6–8; Guinea to Cameroun, and throughout tropical Africa to South Africa and Angola; also Madagascar and South America

HAB. Marshy grassland, river and lake edges, forest; 100–1750 m

- SYN. *S. macrantha* Boeck. in Flora 62: 572 (1879). Type: Sudan, Niamniam, Huuh [Hoo], Schweinfurth 3746 (B†, holo.; K, iso.), *non* Boeck. (1858) *nom. illegit.*
S. centralis Cherm. in Arch. Bot. Caen 4 Mém. 7: 50 (1931). Types: Central African Republic, Bria, *Le Testu* 2436 (P, syn.) & 10 km N of Moroubas, *Tisserant* 1233 (P, syn.)
S. longigluma Kük. in E.J. 56, Beibl. 125: 22 (1921). Type: Brazil, 'Hylaea – Amazonas', Rio Branco, Parime, Serra de Paracaima, *Ule* 8066 (B†, holo.)

44. *Scleria poiformis* Retz., Obs. Bot. 4: 13 (1786), as *poaeformis*; C.E.C. Fisher in Gamble, Fl. Madras 9: 1678 (1931) & in K.B. 1931: 265 (1931): 265 (1931) & in K.B. 32: 70 (1932), all as *poaeformis*; Nelmes in K.B. 11: 110 (1956), as *poaeformis*; Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 27 (1964), as *poaeformis*; Robinson in K.B. 18: 547 (1966), as *poaeformis*; Haines & Lye, Sedges & Rushes of E. Afr.: 357, fig. 743 (1983); Gordon-Gray in Strelitzia 2: 184, fig. 84c (1995). Type*: India, König s.n. (LD, holo.) (seen by Fischer)

Stout perennial 1.2–2.1 m tall, with a creeping rhizome 5–10 mm thick; stem 3–angled, 3–10 mm wide, rooting from submerged joints. Leaves tough, 1–4 cm wide, glabrous but scabrid on the veins and with saw-edged margins; sheaths becoming reddish towards the mouth. Inflorescence a single terminal ellipsoid panicle, 10–20 cm long, 5–12 cm wide with compound branches bearing very many spikelets; male spikelets 3.5–4.5 mm long; female glumes straw-coloured or brown, 3.5–5 mm long, glabrous or hispidulous. Nutlets whitish, broadly ovoid to subglobose, 3.5 mm long, 2.5–2.8 mm wide, smooth, glabrous; hypogonium small with 3 short triangular lobes.

TANZANIA. Uzaramo District: 26 km SE of Dar es Salaam, Fungoni pond, 8 Sept. 1977, *Wingfield* 4123!; Rufiji District: Mafia I., Mwakuni, 7 Aug. 1937, *Greenway* 5016!; Zanzibar: *Kirk* 4! (see notes); Pemba: Chwaka, Tumbe pond, 10 Oct. 1929, *Vaughan* 768!

DISTR. T 6; ?Z; P; Mozambique, South Africa; Tropical Asia and Australia

HAB. Shallow freshwater lakes, in water 30–40 cm deep; 25–50 m

- SYN. *S. oryzoides* Presl, Reliq. Haenk. 1: 201 (1828); Boeck. in Linnæa 38: 492 (1874) (as *orizoides*); C.B. Clarke in Fl. Br. India 6: 691 (1894) & in Durand & Schinz, Consp. Fl. Afr. 5: 673 (1895) & F.T.A. 8: 505 (1902). Type: Philippines, Luzon, *Haenke* s.n. (PR, holo.)
S. coriacea Bertol. in Rendiconti Accad. Bologna 1854: 34 (1854) & in Mem. Accad. Sci. Istit. Bologna, ser. 1, 5: 474, t. 27, fig. 1–3 (?1855) & Illustr. Piante Mozamb. Dissert. IV: 14, t. 5, figs 1–4 (1855), *non* Liebn. (1851), *nom. illegit.* Type: Mozambique, *Fornasini* s.n. (? BOLO, holo.)
S. bertolinii Martens in Flora 40: 570 (1857). Type as for *S. coriacea*

NOTE. According to Art 60.8 of the code compounds contrary to Rec. 60 G must be corrected so that *poaeformis* used by nearly all authors has to be changed.

It is not clear if *Kirk* 4 specimens were collected on the coastal mainland or on Zanzibar Island. There are specimens labelled with original Flora Zanguebarica labels received at Kew in April 1864 and Sept. 1868. The labels also state German East Africa added at a much later date – the mainland area did not become German East Africa until 1891, long after *Kirk* had left Zanzibar (which was never German territory). C.B. Clarke cites them as German East Africa in F.T.A.

45. *Scleria griegiifolia* (Ridl.) C.B. Clarke in F.T.A. 8: 509 (1902) (as *griegifolia*); Kern in Blumea 12: 43, fig. 1 (1963); Napper in Journ. E. Afr. Nat. Hist. Soc. 24(109): 27, fig. 6, 8 (1964); Robinson in K.B. 18: 546 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 358, figs. 744, 745 (1983); Gordon-Gray in Strelitzia 2: 183, fig. 82 K (1995). Type: Angola, Huila, marshes by R. Cacolobar, near Lake Ivantala, *Welwitsch* 6959 (LISU, holo.; BM, iso.)

* Both Robinson and Haines & Lye suggest the type was at Leipzig and destroyed. It was seen by C.E.C. Fischer who borrowed the whole König collection from Lund. His meticulous paper has been ignored by most people dealing with Retzius. Gordon-Gray gives it correctly.

Densely tufted perennial forming clumps 0.9–1.5 m tall, with long creeping rhizome 6–10 mm wide and loosely covered with brownish lanceolate scales; stems triangular, 2–6 mm wide, glabrous but scabrid on the angles, the base \pm swollen and surrounded by persistent leaf-bases, some breaking up into fibres. Leaves many, stiff, closely imbricate below, 50–80 cm long, 8–12 mm wide, the margins coarsely serrate, ribs scabrid; sheaths scabrid. Inflorescence of one terminal and many lax lateral copious panicles borne 4–7 at each node on slender pendulous scabrid straw-coloured to dark reddish peduncles up to 20 cm long; male spikelets much more many than the females, straw-coloured or chestnut above but reddish brown to almost blackish below, 4.5–5.5 mm long; females with some straw-coloured obtuse glumes below, and 3 mostly reddish black acuminate glumes above; upper with scabrid and ciliate margin and midrib, with stiff hairs on upper half of inner surface. Nutlets white with pinkish and often with dark violet blotches, broadly ovoid, 4–5 mm long, 2.8–3.8 mm wide, strongly apiculate, glabrous, smooth; hypogynium pale orange-brown, unlobed and disk-like or angular with obscure lobes.

UGANDA. Masaka District: Lake Nabugabo, Aug. 1935, *Chandler* 1335! & Bugabo, Sept. 1968, *Tallantire* 2000! & Lake Kayonje, 5 Nov. 1961, *Rose* 10260!

TANZANIA. Bukoba District: Bukoba, June 1931, *Haaver* 2025!; Njombe District: Njombe–Songea road, near Kifanja, 28 Feb. 1963, *Richards* 12682!; Songea District, Matengo Hills, Miyao, Nyoni R., 18 Nov. 1956, *Semsei* 2590!

DISTR. U 4; T 1, 7, 8; Congo-Kinshasa, Angola, Zambia, Malawi, Zimbabwe, South Africa; Madagascar

HAB. Channels in between grass clumps in *Cyperus papyrus* and *Loudetia-Miscanthus* swamps, margins of boggy areas and lake-side forest; 1150–1600 m

SYN. *Acriulus griegifolius* Ridl. in J.L.S. 20: 336 (1883) & in Trans. Linn. Soc. ser. 2, Bot 2: 166, t. 22, figs. 1–5 (1884); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 676 (1895); K. Schum. in P.O.A. C.: 128 (1895); Rendle in Cat. Afr. Pl. Welw. 2: 132 (1899)

A. madagascariensis Ridl. in J.L.S. 20: 336 (1883) & in Trans. Linn. Soc. ser. 2, Bot. 2: 166, t. 22, figs. 6, 7 (1884); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 676 (1895); K. Schum. in P.O.A. C.: 128 (1895), *non Scleria madagascariensis* Boeck. Types: Madagascar, Ambatolampy, *Baron* 1870 (K!, syn.) & Andrangaloaka, *Hildebrandt* 3751 (K!, syn.)

Scleria acriulus C.B. Clarke in F.T.A. 8: 509 (1902) (*nom. nov.* for *A. madagascariensis*)

Acriulus titan C.B. Clarke in K.B., Add. Ser. 8: 62 (1908). Type: Congo-Kinshasa, Mandimba, Djuma valley, *Gentil* s.n. (BR, holo.)

Scleria friesii Kük. in Wiss. Ergebn. Schwed. Rhodesia-Kongo Exped. Ergänzungsheft : 9 (1921). Type: Zambia, Lake Bangweolo, Mano, *Fries* 743 (UPS, holo.)

46. *Scleria racemosa* Poir., Encycl. Lam. 7: 6 (1806); Boeck. in Linnaea 38: 522 (1874); Oliv. in Trans. Linn. Soc. 29: 169, t. 111 (1875); C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 674 (1895); K. Schum. in P.O.A. C.: 129 (1895); Rendle in Cat. Afr. Pl. Welw. 2: 135 (1899); C.B. Clarke in F.T.A. 8: 50 (1902) & Illustr. Cyper. t. 131, fig. 5 (1909); Piérart in Lejeunia, Mém. 13: 58, t. 3, figs. 11, 12 (1953); F.P.N.A. 3: 278 (1955); Nelmes in K.B. 11: 76 (1956); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (109): 27, fig. 7 (1964); Robinson in K.B. 18: 540 (1966); Haines & Lye, Sedges & Rushes E. Afr.: 358, figs. 746, 747 (1983); Lye in Fl. Eth. 6: 499 (1997). Type: Madagascar, no locality, *du Petit-Thouars* (P, holo.; B-W 17319, iso.)

Perennial 1–3.5(–4) m tall with razor-sharp basal sheaths and leaf-margins; rhizome creeping, horizontal, \pm straight, 4–6 mm thick, scaly; stems 4–7 mm thick at base, glabrous. Leaves up to \pm 60 cm, 1–2.5(–3.5) cm wide, ligulate. Inflorescences of one terminal and 3–6 lateral panicles, single or double at the nodes, elliptic to

lanceolate in outline on erect minutely hairy peduncles; male spikelets 5–6 mm long, sessile or with very short pedicels; glumes straw-coloured with reddish brown dots and dashes, minutely hairy; female spikelets 7–9 mm long; glumes straw-coloured or pale brown with dark reddish marks, minutely hairy on margin and obscure midrib, the whole spikelet falling with fruit. Nutlet white with pinkish brown tinge, ovoid, 4–5 mm long (excluding style base and hypogonium), 3.5–4.5 mm wide, smooth, glabrous; style base persistent, dark brown, woody when dried 1–1.5 mm long; hypogonium yellowish brown above, dark reddish brown below, cupular, 3–4 mm long, 4–5 mm wide, smooth or wrinkled corky, the margin with many close-set whitish, yellow or reddish brown hairs.

UGANDA. Kigezi District: Malamagambo Forest, Feb. 1950, *Purseglove* 3283!; Mbale District: Samia–Bugwe, W Bugwe Forest Reserve, Nsolo River Valley Forest, 21 May 1951, *Wood* 133!; Mengo District: km 16 Entebbe road, June 1937, *Chandler* 1686!

KENYA. Kwale District: Shimba Hills Development Scheme, Kidango, 25 Dec. 1968, *Mwangangi* 1312! & 14 km SW of Kwale, Pengo Forest, 9 Feb. 1953, *Drummond & Hemsley* 1184! & Shimba Hills, Giriama Point, 27 Mar. 1968, *Magogo & Glover* 539!

TANZANIA. Tanga District: Korogwe area, Manta, 30 Aug. 1964, *Semsei* 3881!; Ufipa District: Kapozwa–Gorodwe road (Kalambo Falls road) just S of Gorodwe Village, 23 June 1996, *Faden et al* 96/391!; Morogoro District: Kibambawe, Sept. 1930, *Haarer* 1850!; Zanzibar: Kinyasini, 21 Jan. 1929, *Greenway* 1121!

DISTR. U 1–4; K 7; T 1, 3, 4, 6–8; Z; P; Congo-Kinshasa, Sudan, Ethiopia, Angola, Zambia, Malawi, Zimbabwe, Mozambique; Madagascar

HAB. By rivers and in swampy ground in forest, lake shores and swamps, muddy valley bottoms; sea level–1750 m

SYN. *S. ciliolata* Boeck. in *Flora* 65: 31 (1882). Type: Madagascar, Nosy Be [Nossi-bé], *Hildebrandt* 2921 (B†, holo.; K!, iso.)

S. palmifolia Ridl. in *Trans. Linn. Soc. Bot. ser. 2 Bot. 2*: 171 (1884), *non* Schlechtend. (1845)

S. verrucosa sensu C.B. Clarke in *F.T.A.* 8: 509 (1902) pro parte, *non* Willd. (see note)

NOTE. C.B. Clarke annotated *Hildebrandt* 1350 (Zanzibar, July 1674) as *S. verrucosa* having crossed out his original determination as *S. racemosa*. He notes in *F.T.A.* that examples of *verrucosa* with spinulose nutlets are easily distinguished but some material is scarcely separable. J. Hutchinson has confirmed the original determination of *racemosa* and I agree.

Robinson stated that further work on section *Ophryoscleria* will probably show that several species now considered distinct in Africa and America are better treated as conspecific with *S. racemosa* or treated as infraspecific taxa. The oldest name in the section is *S. verrucosa* Willd., although *S. racemosa* is better known.

47. *Scleria verrucosa* Willd., *Sp. Pl.* 4: 313 (1805); Kunth, *Enum. Pl.* 2: 344 (1837); Boeck. in *Linnaea* 38: 523 (1874); C.B. Clarke in *Durand & Schinz.*, *Consp. Fl. Afr.* 5: 675 (1895); K. Schum. in *P.O.A. C.* 129 (1895); C.B. Clarke in *F.T.A.* 8: 509 (1902); Nelmes in *K.B.* 11: 29 (1956); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (109): 27 (1964) & in *F.W.T.A. ed. 2, 3*: 340 (1972); Hepper, *W Afr. Herb. Isert & Thonning*: 142 (1976); Haines & Lye, *Sedges & Rushes E. Afr.*: 359, figs 748, 749 (1983). Type: Ghana, Akwapim, *Isert* s.n., *Herb. Willd.* 17317 (B, holo.; C, iso.)

Robust perennial 0.9–4.8 m tall, very similar to the last species, with thick creeping rhizome; stems 3–10 mm wide, glabrous or scabrid. Leaves up to 60 cm long, 1–3 cm wide, plicate, glabrous or hairy, scabrid on the margin and ribs; sheaths with green wings densely set with retrorse scabrid teeth making the edges razor sharp and dangerous to touch, ligulate. Inflorescence rather dense, made up of one terminal and 3–5 lateral elliptic to broadly lanceolate panicles subtended by leafy bracts; peduncles solitary, erect, scabrid or minutely hairy; male spikelets 4–4.5 mm long;

glumes reddish brown, usually minutely hairy on or near midrib; female spikelets (4–)5–6(–8) mm long; glumes reddish brown, or straw-coloured with many reddish brown marks, glabrous but with ciliate margins, the glumes falling with the nutlet. Nutlets whitish tinged yellowish or pale brown, broadly ovoid to subglobose, 3 mm long (excluding style-base), 2.5–3 mm wide, sparsely to densely verrucose, the warts with reddish bristles but smooth near apex around the dark reddish brown persistent conical style-base; hypogynium yellowish brown, cupular, 2 mm long, wrinkled, the margin with whitish or reddish tinged hairs.

UGANDA. Kigezi District: Ishasha Gorge, no date?, *Lock* 617!; Masaka District: Sese Is., Bugala, 3 June 1932, *A.S. Thomas* 24!; Mengo District: E Entebbe Bay, Kyewaga Forest, 3 Sept. 1949, *Dawkins* 349!

TANZANIA. Bukoba District: Bushasha, 1935, *Gillman* 334!

DISTR. U 2, 4; T 1; Senegal to Cameroon, Congo-Kinshasa

HAB. Swamp forest of *Raphia*, *Mitragyna*, *Macaranga* etc. the rhizomes usually rooting in shallow water, less often in soil; 1050–1200 m

SYN. *S. spinulosa* Boeck., *Cyp. Novae* 2: 30 (1890). Type: Congo-Kinshasa E, *C. Smith* (C, holo.; K, iso.)

33. DIPLACRUM

R. Br., *Prodr.*: 240 (1810)

Annuals or perennials. Culm scapose. Leaves without ligule. Involucral bracts leaf-like, sheathing. Inflorescence a sessile to shortly stalked cluster of spikelets. Spikelets unisexual, the laterals usually male, the terminal female, female spikelet often apparently 1-flowered; glumes 2 below the female flower. Male flowers with a few distichous glumes and 1 stamen. Nutlet ribbed, shortly beaked.

Seven species widely distributed in the Old World, plus one species in South America. This genus is closely related to *Scleria*.

Diplacrum africanum *C.B. Clarke* in *Durand & Schinz, Consp. Fl. Afr.* 5: 668 (1895), *nom. nudum* & in *F.T.A.* 8: 510 (1902); *Haines & Lye* in *Sedges & Rushes E. Afr.*: 360, fig. 750 (1983). Type: Nigeria, Nupe, *Barter* 1041 (K!, holo.)

Dwarf annual; roots red, minute; stems often purplish near base, 3–15 cm long, 0.5–1 mm thick, leafy throughout. Leaves pale green with minute reddish dots, linear, 2–4 × 0.2–0.4 cm, apex acuminate, margins scabrid; sheath without ligule. Inflorescence of 1–8 stalked axillary clusters of spikelets, protruding from leaf sheaths, with 1-flowered female spikelets above the several-flowered male ones; spikelets pale green or yellowgreen, narrowly ovoid, 2–3 mm long. Female flowers solitary, set between 2 glumes, and outgrowths from the receptacle margin gripping the nutlet; glumes yellowgreen, acuminate. Nutlet grey to blackish, ovoid, 0.5–0.7 × 0.5–0.6 mm, 3-angled, ± 15-ribbed, bluntly apiculate. Fig. 62, p. 416.

UGANDA. Reported from West Nile District (or Sudan?): Madi by *Haines & Lye* (no specimens seen by me)

KENYA. Kwale District: Buda Forest Reserve, Aug. 1999, *Luke & Luke* 5963!

TANZANIA. Mpanda District: 10 km on Mpanda–Inyonga road, May 1997, *Bidgood et al.* 3967!;

Ulanga District: Mahenge, *Schauri*, June 1932, *Schlieben* 2332!; Tunduru District: Litungura, June 1956, *Milne-Redhead & Taylor* 10599!

DISTR. U 1 (see above); K 7; T 4, 6, 8; Sierra Leone to Nigeria, Sudan, Zambia

HAB. On bare sand or mud in marshy grassland; (60–)400–1050 m



FIG. 62. *DIPLACRUM AFRICANUM* — 1, habit, $\times 1\frac{1}{2}$; 2, inflorescence, $\times 8$; 3, spikelet, $\times 10$; 4, glume and female flower, one glume removed, $\times 16$; 5, male flower, $\times 16$; 6, nutlet, $\times 32$. 1 from Luke & Luke 5963, 2–6 from Milne-Redhead & Taylor 10599. Drawn by Juliet Williamson.

34. SCHOENOXIPHIMUM

Nees in *Linnaea* 7: 581 (1832); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 12 (1963); Kukkonen in *Bothalia* 14: 819–823 (1983); Gordon-Gray in *Strelitzia* 2: 162 (1995)

Robust or slender rhizomatose or tufted perennials or slender grass-like plants (and easily confused with them). Culms scapose. Leaves ligulate. Involucral bracts leaf-like or short. Inflorescence a slender to large panicle with unisexual flowers or reduced to a single spike; main axis with a succession of bracts, each of the lowest subtending utricles enclosing a female floret; rachilla with an apical partial spikelet of several glumes each subtending a male floret; upper bracts of the main axis also subtending male florets to form a terminal male spikelet; the rachilla may not be developed into a male spikelet but reduced to a flattened scabrid remnant which protudes from the utricule mouth or so reduced that it does not protrude but is shorter than the ovary or so reduced as to be entirely lacking. Male flowers with 3 stamens. Female flowers with 3-fid style. Nutlet trigonous, often beaked.

About 12 species, mostly in southern Africa, a few extending to Ethiopia and 2 in Madagascar.

- | | |
|---|-------------------------|
| 1. Main inflorescence branches with 20–40 female flowers; leaves
6–9 mm wide | 4. <i>S. ludwigii</i> |
| Main inflorescence branches with 2–10 female flowers; leaves
1–5 mm wide | 2 |
| 2. Plants slender with lax slender inflorescences; utricles stipitate,
4–6 mm long with beak 1.5–28 mm | 1. <i>S. lehmannii</i> |
| Plants more rigid with more rigid compact inflorescences;
utricles 2–3 mm long with beak under 1 mm long | 3 |
| 3. Largest glumes subtending utricles 6–7 mm long including
3–4 mm long awn | 2. <i>S. sparteum</i> |
| Largest glumes subtending utricles 10–12 mm long including
7–9 mm long awn | 3. <i>S. caricoides</i> |

1. ***Schoenoxiphium lehmannii*** (Nees) Steud., *Syn. Pl. Glum.* 2 Cyp.: 245 (1855); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 13, fig. 45 (1963); Kukkonen in *Bothalia* 14: 823 (1983); Haines & Lye, *Sedges and Rushes E. Afr.*: 366, fig. 756–758 (1983); Gordon-Gray in *Strelitzia* 2: 168, fig. 72/J–L (1995); Lye in *Fl. Eth.* 6: 501, fig. 212.171 (1997). Type: South Africa, E slope of Table Mt, near Konstantia, *Ecklon & Zeyher* s.n. (S, lecto.) (chosen by Kukkonen)

Slender greenish yellow perennial 30–90 cm tall with slightly swollen base covered with fibrous remains of old leaf-bases. Leaves 15–40 cm long, 2–5 mm wide, flat, scabrid on margin and some veins; sheaths pale green to reddish, 1–2 cm long; ligule a distinct brownish or white rib. Inflorescences borne at most nodes with 1–2 branches, 6–20 mm long, the axes very scabrid; some male flowers at each branch tip with 2–5 female flowers below; lower female glumes 6 mm long including a 2–3 mm long awn, the upper 4–5 mm long equalling or shorter than utricule; male glumes smaller. Utricles brown with a green stripe on at least 2 faces, triangular, 4–6 mm long (including the 1.5–2 mm long beak), with very distinct longitudinal ridges, containing a yellowish triangular smooth nutlet 3 mm long and a flattened green scabrid axis which sometimes develops into a narrow club-like male spikelet up to 10 mm long.

UGANDA. Karamoja District: Moroto, *J. Wilson* 1153B

KENYA. Northern Frontier District: Marsabit, near Karantin summit, 28 June 1971, *Katende & Lye* 6338!; Nairobi District: Karura Forest, 15 May 1949, *Bogdan* 2447!; Masai District: Trans-Mara plateau on road to Kilgoris, ± 8 km beyond Lolgorien, 15 April 1961, *Glover et al.* 608! TANZANIA. Arusha District: Ngurdoto National Park, Longil, 7 Oct. 1965, *Greenway & Kanuri* 11981!; Lushoto District: W Usambaras, Shume to Wilhelmstal, 26 May 1914, *Peter* 4089; Iringa District: Mafinga [Sao Hill], 8 Jan. 1975, *Brummitt & Polhill* 13638!

DISTR. U 1; K 1, 3, 4, 6, 7; T 1–3, 7; Ethiopia to South Africa

HAB. Open areas of upland forest, upland grassland, mist forest, streamsides, termite mounds; 1050–2800 m

SYN. *Uncinia lehmannii* Nees in *Linnaea* 10: 206 (1836)

Carex uhligii C.B. Clarke in K.B. Addit. Series 8: 73 (1908). Type: Tanzania, Lushoto District: Usambara, *Uhlig* 856 (herbarium not indicated, holo.)

Schoenoxiphium sparteum (Wahlenb.) C.B. Clarke var. *lehmannii* (Nees) Kük. in E.P. IV. 20, Cyp.-Car.: 32, fig. 6, J, K, L (1909); F.D.-O.A. 1: 533 (1929)

Kobresia lehmannii (Nees) Koyama in J. Fac. Sci. Tokyo Bot. 8: 80 (1961)

NOTE. C.B. Clarke gives Schum. MS. for *C. uhligii* but whether he saw this at B or there was a duplicate at K is not known (not at K now).

2. *Schoenoxiphium sparteum* (Wahlenb.) C.B. Clarke in K.B. Addit. Ser. 8: 67 (1908); Kük. in E.P. IV. 20, Cyp.-Car. 31 (1909); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 13, figs. 42–44 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 367, fig. 759 (1983); Gordon-Gray in *Strelitzia* 2: 171, figs. 74 G–I, 75 (1995); Lye in *Fl. Eth.* 6: 501, fig. 212.172 (1997). Type: South Africa, without locality, *Thunberg* s.n. (UPS, holo.)

Erect tufted slender perennial 25–80 cm tall, with short base covered with fibrous leaf remains; stems ridged and scabrid. Leaves up to 40 cm long, 1–4 mm wide, flat, scabrid on margins and some ridges; leaf sheaths 1–4 cm long and all subtending pedunculate inflorescences, green or whitish on one face often purple dotted at base; ligule a distinct whitish or violet-dotted rim. Inflorescences with two main branches at different lengths, the peduncles 1–7 cm long, very scabrid; glumes yellow-green or tinged ochre-brown, green at edges, flowers crowded, a few males at branch tips, the female beneath; upper female glumes pale brown, sometimes with dark dots and green or white midrib, broadly triangular, 2–8 mm long, acute or subulate, scabrid; lower female glumes 6–7 mm long including 3–4 mm scabrid awn up to twice length of utricle, male glumes shorter and narrower. Utricles brown with green stripe on two sides, obtusely triangular with 3 flat ridges, 1.3 mm wide, (2–)2.5–3 mm long including 0.5–0.8 mm long beak, distinctly ridged. Nutlet yellowish, 2 mm long, slightly stipitate; style branches papillate, projecting from beak; reduced male axis slightly protruding, the enclosed part very scabrid. Fig. 63, p. 419.

UGANDA. Karamoja District: Mt Moroto, near F.D. Trials, 11 June 1970, *Katende & Lye* 403!; Toro District: Ruwenzori, May 1894, *Scott Elliot* 7455!; Kigezi District: near Kabale, Rubanda, 29 Apr. 1967, *Haines* 4204!

KENYA. Uasin Gishu District: 53 km S of Eldoret on main road to Ainabkoi, 9 Nov. 2000, *Smith, Beentje & Muasya* 223!; Naivasha District: S Kinangop, 3 June 1966, *Polhill* 436!; Kisumu-Londiani District: Tinderet Forest Reserve, ± 6 km SSE of Timboroa Station, 12 July 1949, *Maas Geesteranus* 5472!

TANZANIA. Mbulu District: between Babati and Berekò, Pienaars Heights (Dauar), 7 Jan. 1962, *Polhill & Paulo* 1085!; Mbeya District: Mbeya Mt, 'Catchment A', 11 Jan. 1963, *Napper* 1696!; Songea District: Matengo Hills, Lupembe Hill, 3 Mar. 1956, *Milne-Redhead & Taylor* 8966!

DISTR. U 1, 2; K 1, 3, 5; T 2–4, 7, 8; Congo-Kinshasa, Sudan, Ethiopia, Malawi, Zimbabwe, South Africa

HAB. Forest edges and damp upland grassland, grassland at edges of *Brachystegia* woodland; 1650–2800 m

SYN. *Carex sparteae* Wahlenb. in K. Vetensk.-Akad. Handl. Stockholm 24: 149 (1803); C.B. Clarke in *Fl. Cap.* 7: 304 (1897)

C. schimperiana Boeck. in *Linnaea* 40: 373 (1876); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 690 (1895); Engl., *Hochgebirgsfl. Trop. Afr.*: 152 (1892); C.B. Clarke in *F.T.A.* 8: 548 (1902). Type: Ethiopia, Dewra Tabor, *Schimper* 1318 (B†, holo.)



FIG. 63. *SCHOENOXIPHIMUM SPARTEUM* — 1, habit, $\times \frac{2}{3}$; 2, junction of leaf sheath and blade, $\times 6$; 3, tip of involucre bract, $\times 22$; 4, part of inflorescence, $\times 6$; 5, fertile utricule and glume, $\times 14$; 6, immature achene, $\times 16$. All from *Browning* 227. Reproduced from *Strelitzia* 2 (1995), with the kind permission of the South African National Biodiversity Institute, Pretoria. Drawn by Jane Browning.

C. ramosa sensu K. Schum. in P.O.A. C.: 129 (1895) pro parte, non Schkuhr.

Schoenoxiphium schimperianum (Boeck.) C.B. Clarke in K.B. Addit. Ser. 8: 67 (1908)

S. sparteum (Wahlenb.) C.B. Clarke var. *schimperianum* (Boeck.) Kük. in E.P. 4, 20 (Cyp.-Car.): 32 (1909)

S. sparteum (Wahlenb.) C.B. Clarke var. *lehmanii* sensu F.D.-O.A. 1: 534 (1929) pro parte quoad *Peter* 11955, non (Nees) Kük.

Kobresia sparteum (Wahlenb.) Koyama in J. Fac. Sci. Tokyo Bot. 8: 80 (1961)

3. *Schoenoxiphium caricoides* C.B. Clarke in K.B. Addit. Ser. 8: 67 (1908); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 13 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 367, fig. 260 (1983); Gordon-Gray in *Strelitzia* 2: 166, fig. 22, A–C (1995). Types: South Africa, Zwelendani, Zeyher 4440 (K!, syn.) & Alexandria, Drège (K!, syn.) & Tembuland, Baur 744 (K!, syn.)

Erect shortly rhizomatous perennial forming tussocks, 15–40 cm tall. Leaves yellow-green, 10–30 cm long, 2.5 mm wide, flat, densely scabrid on margins and ribs; leaf sheaths 2.4 cm long; ligule with distinct rib. Inflorescence branches usually borne singly at each node; partial units pyramidal with conspicuous bracts; branches 0.5–6 mm long, flattened, densely scabrid; the upper entirely hidden in the leaf sheaths; each spike with a few male flowers at top and 4–10 female flowers below; glumes greenish or light brown with a greenish midrib with or without dark reddish brown dots, and lines; largest female glumes 10–12 mm long including 7–9 mm densely scabrid awn but upper glumes with much shorter awn; male glumes 3–4 mm long with awn only 0.5–1 mm long. Utricles light reddish brown, ellipsoid, 2.7–2.8 mm long, 1.3–2 mm wide, not distinctly ridged; style branches dark reddish, 2.5–3 mm long. Nutlet reddish brown, densely papillose; male axis remnant flattened, scabrid or ciliate, shorter than nutlet (but sometimes reduced or undeveloped, fide Gordon-Gray)

UGANDA. Karamoja District: Mt Moroto, Tallantire 64/52 (fide Lye & Haines)

TANZANIA. Ufipa District: Rukwa Escarpment, Namwela, 28 Dec. 1961, Robinson 4765! and Rukwa Escarpment, Nsangu, 2 Jan. 1962, Robinson 4874!

DISTR. U 1; T ?2, 4; Zambia, South Africa

HAB. Secondary grassland; 2100 m

NOTE. Haines & Lye mention “Mbuli District” (Mbulu) for this species and this may refer to Polhill & Paulo 1085 which had been named *S. caricoides*. I have referred this specimen to *S. sparteum* but confirmation is needed. Of three utricles opened two seemed to have no rachilla and the third one nearly as long as utricule. Kukkonen (in *Bothalia* 14: 823 (1983)) includes *S. caricoides* under *S. sparteum*.

4. *Schoenoxiphium ludwigii* Hochst. in *Flora* 28: 764 (1845); Gordon-Gray in *Strelitzia* 2: 168, fig. 73 A–C (1995). Type: South Africa, Cape, no locality given, Ludwig s.n. (? TUB, holo.)

Robust perennial 60–80 cm tall. Leaves 20–36 cm long, 6–9 mm wide, scabrid, particularly towards apex on margins and midribs. Inflorescences fairly dark brown rather narrow panicles from each of the upper leaf sheaths, ± 5 cm long, 2.5 cm wide with peduncles 3–12 cm; spikelets 10 mm long, 2.5 mm wide, female glumes brown, 3–4 mm long with long scabrid awn 0.5–1.7(–3) mm long; male part of spikelet 6 mm long, the glumes glossy coppery brown, with hyaline margin, 3.5 mm long. Utricle greenish, 4.5–5.5(–6) mm long without a distinct beak. Nutlet pale 2.5–3 mm long, 2 mm wide without an invagination on the plane face and with symmetrical apex.

TANZANIA. Mbeya/Njombe Districts: Kitulo [Elton] Plateau, 24 Jan. 1961, Richards 14161b! & Kitulo Plateau, small tributary of Ndumbi R. just E of bridge on Matamba–Kitulo road, 14 Feb. 1989, Gereau *et al.* 3172!

DISTR. T 7; Zimbabwe, South Africa

HAB. Moist thickets on bank of small river, by streams in marsh; 2100–2600 m

SYN. *S. rufum* sensu Haines & Lye, Sedges and Rushes E. Afr.: 368 (1983) pro parte quoad ref. to Tanzania Southern Highlands

NOTE. Richards 14161b bears four determinations! *Kobresia lehmannii* (completely erroneous), *S. lanceum*, *S. rufum* det. Kukkonen in 1984 and *S. ludwigii* Hochst. det. Kukkonen in 1985. Gordon-Gray cites the Haines and Lye reference to *S. rufum* including their fig. 761 drawn from Robinson 3070 which was determined as *S. rufum* in 1984 and 1985. Kükenthal sinks *S. ludwigii* into *S. rufum* as also did Kukkonen in 1983.

35. CAREX*

L., Sp. Pl.: 972 (1753) & Gen Pl. ed. 5: 420 (1754); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 6–18 (1963); Haines & Lye, Sedges and Rushes E. Afr.: 368–384 (1983)

Perennial herbs, tufted or often with creeping rhizomes. Culm triangular or rarely rounded, usually scapose. Leaves ligulate, with prominent leaf-sheath. Inflorescences either solitary dense bisexual spikes or much branched often dense panicles with many short sessile or subsessile bisexual spikes of few spikelets, or much less branched, or a few sessile or pedunculate long spikes in which the sexual composition and position of the male and female spikelets varies. Spikelets always unisexual, the female 1-flowered consisting of an ovary contained in a bottle-shaped utricle and subtended by a glume; the male consisting of 1–3 stamens arising from a low receptacle subtended abaxially by a glume and actually represents 3 1-staminate flowers; style branches 2–3; anthers linear-oblong. Nutlet trigonous or flattened.

A very large genus of about 1500** species occurring throughout the world and extending to the limits of vegetation in the coldest parts; 30 occur in the Flora area.

The genus was monographed by Kükenthal [E.P. 4, 20 Cyperaceae-Caricoideae: 1–824 (1909)] who divided it into 4 subgenera: *Primocarex* Kük., *Vignea* (P. Beauv.) Nees, *Indocarex* Baill. and *Carex* and although these are still often used (e.g. by Haines & Lye) doubt on the naturalness of the first was first expressed in 1936 and now usually only *Carex* and *Vignea* are recognised. If the plant has several to many elongate sometimes sessile but usually pedunculate spikes as in Fig 66, p. 440. it is easiest to go direct to couplet 15 in the key.

- | | |
|---|----------------------------------|
| 1. Spike solitary, terminal | 2 |
| Spikes several to many | 4 |
| 2. Spike with 4–8 female flowers; glumes 2–5 mm
long; utricles 6–7 mm long | 3. <i>C. peregrina</i> p.426 |
| Spike with many female flowers; glumes 6–10 mm
long; utricles 3.5–4 mm long | 3 |
| 3. Culms angular, scabrid; glumes light brown with
broad hyaline margins; leaf-blades 10–30 cm
long | 1. <i>C. monostachya</i> p.424 |
| Culms terete, glabrous; glumes dark brown
without hyaline margins; leaf-blades ± absent | 2. <i>C. runssoroensis</i> p.424 |
| 4. Inflorescence dense, 0.8–3 cm wide; spikes sessile | 5 |
| Inflorescence open but spikes often dense,
usually over 2 cm wide; spikes pedunculate or
if sessile then long and cylindrical 2–3(–4) cm
long, 2–4 mm wide (<i>C. cognata</i> and allies) | 7 |
| 5. Plant forming dense pillar-like tussocks 1–1.5 m
tall and 0.4–1.5 m diameter***; roots mostly
distinctly reddish | 5. <i>C. erythrorrhiza</i> p.428 |
| Plants without such striking habit; roots not
reddish; rhizome creeping | 6 |

* By B. Verdcourt. Many of the descriptions are based almost entirely on those given by Haines and Lye. Dedicated to D.M. Napper 1930–1972.

** Jermy & Tutin, British Sedges (1968) suggest over 1800 species and Goethghebeur in Kubitzki (1998) gives 2000.

*** It is not clear how widespread this habit is; specimens with habit of *C. conferta* but reddish roots have been called *erythrorrhiza*; in Ethiopia the pillar-like habit does not appear to have been recorded.

6. Convex side of utricles with 2–3(–5) mostly indistinct ribs; leaves 2–8 mm wide 4. *C. conferta* p.426
 Convex side of utricles with 6–9(–14) very prominent longitudinal ribs; leaves (5–)7–12.5 mm wide 6. *C. lycurus* p.429
7. Inflorescence a much branched panicle with many sessile or shortly stalked spikes (or if with 2–3 branches at nodes then utricle 8–12 mm long) 8
 Inflorescence with 1–2 simple branches with spikes from each leaf-sheath or with 1–2(–6) lateral short sessile spikes from the base of the major spikes (utricle never so long) 14
8. Utricle 8–12 mm long 11. *C. johnstonii* p.434
 Utricle 3–6(–7) mm long 9
9. Glumes up to 5–6 mm long; utricles 5–6(–7) mm long 10
 Glumes 2–5 mm long; utricles 3.5–4.5 mm long (to 5.5 mm in *C. cognata*) 11
10. Leaf-blades 2–5.5 mm wide; lateral panicles not pendulous, quite dense; utricles glabrous 10. *C. macrophyllidion* p.434
 Leaf-blades 3–12 mm wide; lateral panicles often pendulous; utricles densely scabrid, less so in S Tanzania 13. *C. steudneri* p.435
11. Glumes 2–4 mm long, reddish brown, often quite dark 12
 Glumes 4–5 mm long, usually pale green to pale reddish brown 13
12. Whole inflorescence chestnut brown; utricles mostly dark brown, 4–4.5 mm long, usually strongly curved at maturity and scabrid on margins 12. *C. castanostachya* p.435
 Whole inflorescence greenish to reddish brown; utricles 3.5–4 mm long, only slightly curved; beak and upper part of utricle shortly scabrid hairy 8. *C. spicato-paniculata* p.431
 9. *C. chlorosaccus* p.432
13. Utricle 4–5.5 mm long with 1.5–2.2 mm long beak 7. *C. echinochloe* p.430
 Utricle (3–)3.5–4.5 mm long with 1–2 mm long beak 29. *C. sp.* C p.448
14. Inflorescence slender, ± 9 cm long with short sessile green spikes up to 1.5 cm long (Cherangani Hills) 15
 Inflorescence with spikes much longer 16
15. Spikes crowded, sessile to very shortly pedunculate 17
 Spikes more distant, often with long peduncles, particularly the basal ones 17
16. Spikes mostly dark brown; glumes 5.5–7 mm long, usually dark brown and densely scabrid 28. *C. phragmitoides* p.448
 Spikes mostly pale green; glumes 3–4.5 mm long, pale (dark in some varieties) 27. *C. cognata* p.446
17. Main spikes frequently with 1–3(–6) much shorter spikes at their base (i.e. at top of peduncle); 1–3 spikes per leaf sheath 18
 Main spikes without shorter spikes at their base or if rarely in *C. petitiana* then main spikes borne singly 20

18. Spikes darker, glumes usually longer than utricles; utricles usually with more erect shorter blunter teeth, less often divaricate (variable species from **T** 6, Uluguru Mts, Lukwangule Plateau) 26. *C. sp.* B p.446
 Not as above; utricles beaks with divaricate distinctly pointed teeth; spikes pale reddish-brown 19
19. Utricles strongly curved 22. *C. cyrtosaccus* p.444
 Utricles not strongly curved but beak sometimes bent 21. *C. vallis-rosetto* p.443
20. Utricles densely minutely but distinctly papillate; utricles beaks very short (0.2–0.5 mm) 21
 Utricles not papillate 22
21. Utricles compressed rounded ovate; style branches 2 (S Tanzania) 16. *C. papillosissima* p.438
 Utricles ellipsoid; style branches 3 (rarely in South Africa, flowers with 2 branched styles can occur fide Gordon-Gray) 15. *C. acutiformis* p.437
22. Spikes 6–9, dark brown, drooping, 4–16 cm long, the largest always over 8 cm long, 7–10 mm wide; glumes 4–9 mm long; utricles 3–4 mm long with short beak < 0.5 mm long 14. *C. bequaertii* p.436
 Spikes not as above, usually smaller but narrow pale long spikes up to 10 cm occur in *C. cyrtosaccus*; utricles 4–6 mm long including a prominent beak 1–1.8 mm long 23
23. Beak of utricles with small erect teeth or lobes, not distinctly divaricately two-toothed; **U** 2, Ruwenzori 24. *C. mildbraediana* p.445
 Beak of utricles with distinct teeth, (see also 23. *C. sp. A*, Poroto Mts) often almost 2-spinous 24
24. Peduncles 1–3 cm long; spikes brown, the glumes with 3 ribbed brown keel and hyaline edges; beak of utricles with long divaricate teeth up to twice as long as base of beak; **T** 7, Kitulo Plateau 27. *C. cognata* p.446
 Not as above, peduncles often much longer; glumes darker often with pale greenish or yellowish keel; teeth of beak shorter or equalling base of beak 25
25. Spikes all or at least basal ones arising singly from the sheaths* 26
 At least some lateral spikes arising in pairs 27
26. Spikes appearing very dark blackish brown, the glumes with only an obscure narrow pale midrib or ± entirely dark 17. *C. elgonensis* p.438
 Spikes and glumes paler, green and brown but keel area quite wide often yellowish or green enclosing the actual midrib and bounded by two veins 18. *C. petitiana* p.439
 (if from **U** 1 Imatong Mts see 19. *C. thomasi*)

* This is a difficult character used by all authors but actually of distinctly limited value; collectors should assess in the field and include information in field notes.

27. Spikes clearly variegated green and brown and glumes coppery reddish brown with broad green midrib; spikes 8–12 mm wide; probably in U 1, Imatong Mts 20. *C. thomasi* p.443
 Not as above 28
28. Spikes and glumes pale reddish or greyish brown with pale brown keel; species widespread in central Kenya, N, E and S Tanzania see couplet 19
 Spikes and glumes blackish brown 29
29. Glumes with very narrow pale yellowish keel; leaves narrow 4–6 mm wide 25. *C. mannii* p.445
 Glumes with broad yellowish or greenish keel area enclosing midrib and two lateral ribs; leaves narrow or wide, 4–12 mm wide 19. *C. simensis* p.442

1. **Carex monostachya** A. Rich., Tent. Fl. Abyss. 2: 512 (1850); K. Schum. in P.O.A. C: 129 (1895); C.B. Clarke in F.T.A. 8: 515 (1902); Kük. in E.P. 4, 20 (Cyp.-Car.): 74 (1909) & in N.B.G.B. 9: 311 (1925); A.V.P.: 58 (1957); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 9, figs. 13, 14 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 370, fig. 762 (1983); Lye in Fl. Eth. 6: 503, fig. 212.173 (1997). Type: Ethiopia, Simien, Mt Selki, *Schimper* II 687 (P, holo.; K!, UPS)

Perennial 12–70 cm tall with short creeping rhizome, the shoots shortly separated or forming dense tufts, the culms angular, scabrid. Leaves fine and narrow, 1–30 cm long, 1.5–4 mm wide, scabrid on margins; basal sheaths chestnut brown. Inflorescence bracts similar but with a longer green awn. Inflorescence a solitary terminal spike, reddish brown, 1–4 cm long, 2–8 mm wide with male flowers above and female below; glumes light to dark brown with paler midrib and marginal border, lanceolate, 6–9 mm long, tapering at the apex. Utricle narrowly obovoid, 3.5–4 mm long, 1.2–1.5 mm wide; ovary with 2-branched style. Nut narrowly ellipsoid, much narrower than the utricule; style red-brown, including the branches longer than the nut and conspicuously exserted.

KENYA. Trans-Nzoia District: E Mt Elgon, above Japata Estate, 23 Feb. 1948, *Hedberg* 1271; ? Naivasha District: Aberdare National Park, 22 Mar. 1972, *Lawton* 1727; North Nyeri District: Mt Kenya, Naromoru Track, 11 Dec. 1957, *Verdcourt* 2004! & 13 Dec. 1957, *Verdcourt* 2035!
 TANZANIA. Moshi District: Kilimanjaro, NE of Peter's (Horombo) Hut, 23 Feb. 1934, *Greenway* 3758! and between Kibo and Mawenzi, 23 June 1948, *Hedberg* 1346! and between Bismarck (Mandara) Hut and Peter's (Horombo) Hut, 21 Aug. 1965, *Leipert* 6092!

DISTR. K 3, 4; T 2; Ethiopia

HAB. Upper bamboo and *Hagenia* forest, grassland in ericaceous belt, swamps and lakes and streams near glaciers; (2400?–)2700–4500 m

SYN. *C. triquetrifolia* Boeck. in E.J. 7: 279 (1886). Type: Tanzania, Kilimanjaro, *Johnston* 120 (K!, holo.)

C. monostachya A. Rich. var. *triquetrifolia* (Boeck.) Kük. in E.P. 4, 20 (Cyp.-Car.): 74, fig. 16 (1909)

NOTE. C.B. Clarke points out that *C. parasitica* Kunze (Suppl. Schkuhr's Riedgräsern: 83 adnot. (1842)) is an earlier name but although he refers to *Uncinia digyna* Hochst., Herb. Abyss. II: 687 there is no word of description by Kunze nor on the Hochstetter label so it is a *nom. nudum*. See after next species for hybrids. A number of specimens are very short e.g. *Hedberg* 5021 (Mt Kenya, Nanyuki District, near Naramoro Lodge, 13 July 1971) and their status needs investigating.

2. **Carex runssoroensis** K. Schum. in P.O.A. C: 129 (1895); C.B. Clarke in F.T.A. 8: 516 (1902); Kük. in E.P. 4, 20 (Cyp.-Car.): 74 (1909); Turrill in K.B. 1910: 254 (1910); Robyns & Tournay, F.P.N.A. 3: 282, fig. 9, t. 40 (1955); A.V.P.: 57 (1957); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 9 (1963); Haines & Lye, Sedges and Rushes E. Afr.: 370, fig. 763 (1983). Type: Congo-Kinshasa, Ruwenzori, Butahu Valley, *Stuhlmann* 2454 (B†, holo.; K, iso.!)

Perennial forming tussocks 0.5–1 m tall and up to 1 m in diameter, the rhizome sometimes distinctly creeping; culms terete, glabrous. Leaves scarcely developed or sheaths with brown blades 0.5–2.5 (–5) cm long but never very long and narrow as in *C. monostachya*, smooth; basal sheaths dark chestnut brown. Inflorescence bracts similar, 0.5–1.5 cm long, often shortly awned. Inflorescence a solitary terminal spike, dark chestnut brown, 2–5 cm long, up to 1 cm wide with glumes spreading, with male flowers above and female below; glumes dark chestnut brown, often with paler midrib and sometimes paler margins, broadly lanceolate up to 10 mm long, and 3 mm wide, acute at the apex. Utricle brownish, oblong or obovoid, 3.5–5 mm long, 1.2 mm wide, compressed, the beak 0.75 mm long. Nut narrowly ellipsoid, much narrower than the utricle.

var. **runssorensis**; A.V.P.: 57 (1957)

Plant densely tufted. Bracts uniformly dark chestnut or minutely pale-edged.

UGANDA. Toro District: Ruwenzori, Bujuku Valley, 5 Jan. 1951, *G. Wood* 210! & Ruwenzori, near Bujuku Hut, June 1968, *Hamilton* 720!; Mbale District: Mt Elgon, in crater, Jan. 1918, *Dummer* 3361!

KENYA. Trans Nzoia District: Mt Elgon, eastern slopes, 7 Mar. 1954, *Bogdan* 3934!

DISTR. U 2, 3; K 3; Congo-Kinshasa

HAB. Swamps, bogs and lake sides, ericaceous belt and giant *Lobelia-Alchemilla* zone; 2700–4100 m

SYN. *Uncinia runssoroensis* (K. Schum.) Chiov. in *Il Ruwenzori* 1: 466, t. 31 [56] (1909)

var. **aberdarensis** Kük. in *N.B.G.B.* 9: 311 (1925); A.V.P.: 57 (1957); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 9 (1963). Type: Kenya, Aberdare range, Sattima, *Fries & Fries* 2500 (UPS, holo.; K!, iso.)

Rhizome shortly creeping. Bracts with whitish hyaline margins and not so dark chestnut.

KENYA. Naivasha District: above S Kinangop Forest Station, path towards 'The Elephant', 20 Sept. 1967, *Hedberg* 4327!; North Nyeri District: Mt Kenya, W slope along the Burguret Track, near Kampi ya Farasi, 23 Nov. 1967, *Hedberg* 4415! and upper part of Hausburg Valley, 9 Aug. 1948, *Hedberg* 1860!

DISTR. K 3, 4; not known elsewhere

HAB. Alpine moorland and ericaceous belt, often on exposed rocks and tarn shores; 3500–4400 m

NOTE. Haines & Lye (*Sedges & Rushes E. Afr.*: 371 (1983)), have suggested this variety is not worth recognising and it is true some specimens from Elgon e.g. *Liebenberg* 1714, below Madamgi, Apr. 1930 have pale margins and might perhaps be referred here. I suspect all var. *aberdarensis* will prove to have creeping rhizomes as clearly shown in *Hedberg* 4327, 443 and 1860 but much material has no or imperfect rhizomes and further field work is needed.

2a. *Carex monostachya* × *Carex runssoroensis*; Haines & Lye, *Sedges & Rushes E. Afr.*: 370; fig. 763 (1983)

Haines & Lye state that intermediates occur between these two species particularly on Mt Elgon; and that they probably represent hybrids; and that so many different forms are represented that the two probably form a hybrid swarm. The hybrids have terete scabrid stems and short green leaf-blades; the bracts are pale-edged.

KENYA. Trans Nzoia District: Mt Elgon, above Endebess, 10 June 1966, *Haines* 4156! & E slopes of Elgon, 12 Jan. 1962, *Bogdan* 5413!

DISTR. K 3

HAB. Swamps and damp hollows; 3000–3200 m

NOTE. I have not seen enough material to comment further on these field observations but future work needs to consider these hybrids in conjunction with true nature of var. *aberdarensis*.

3. *Carex peregrina* Link in Hort. Berol. 1: 334 (1827); Kük. in E.P. IV. 20 (38): 311 (1925); R.E. Fr. & T.C.E. Fr. in K. Vetensk.-Akad. Handl. Stockholm III, 25(5): 56 (1948); Nelmes in K.B.: 1955: 90 (1955) (adnot.); Thulin in Nordic Journ. Bot. 1: 521 (1981); Haines & Lye, Sedges & Rushes E. Afr.: 371, figs. 765, 766 (1983); Lye, in Fl. Eth. 6: 503, fig. 212.174 (1997). Type: Madeira, *Wormskiold* s.n. (B, holo.)

A very fine-leaved tufted perennial 20–30 cm tall; stolons slender \pm 0.5 mm wide. Leaves 1–20 cm long, 0.5–1.5 mm wide, appearing filiform when margins incurved, margins finely scabrid; basal sheaths brown. Inflorescence bracts 2, similar. Inflorescence a solitary loose terminal spike 2–3 cm long, 2–4 mm wide with male flowers above and 4–8 female flowers below; glumes \pm colourless with green midrib and yellowish brown margin above, oblong, 2–5 mm long, gradually diminishing in size upwards. Utricle narrowly lanceolate, 6–7 mm long (including beak) cuneate at base and apex, with 2 longitudinal ribs; beak very narrow, 2–2.5 mm long; edges sometimes not completely joined; style branches 2. Nut greyish brown, oblong, 3.2 mm long (including 0.3 mm long beak), 1.3–1.4 mm wide.

KENYA. West Suk District: N Cherangani Hills, Kapseis [Kapegis], 5 Aug. 1968, *Thulin & Tidigs* 112!; Aberdare Mts, 15 Mar. 1922, *R.E. & Th. C.E. Fries* 2650!; W Mt Kenya, 30 Jan. 1922, *R.E. & Th. C.E. Fries* 1289!

TANZANIA. Arusha District: Meru Crater, 17 July 1970, *Vesey FitzGerald* 6769!; Moshi District: Kilimanjaro, above Kilimanjaro Timbers, 27 July 1994, *Grimshaw* 94/669! & 95/664! & above Mandara Hut, 12 Oct. 1993, *Grimshaw* 93/787! & 93/796A!

DISTR. **K** 2–4; **T** 2; Azores, Madeira and Ethiopia

HAB. Montane forest with *Podocarpus* & *Hagenia*, mossy ground in giant heath zone, streamsides; 2300–3300 m

4. *Carex conferta* A. Rich., Tent. Fl. Abyss. 2: 512 (1851); Boott, *Carex* 2: 76, t. 208 (1860); Boeck. in Linnaea 39: 91 (1875); C.B. Clarke in F.T.A. 8: 516 (1902); Kük. in E.P. 4, 20 (*Cyp.-Car.*): 171 (1909) & in N.B.G.B. 9: 312 (1925); A.V.P.: 58 (1957); Lye in Fl. Eth. 6: 503, fig. 212.175 (1997). Type: Ethiopia, Simien, Enchetcap, *Schimper* II 576 (P, holo.; BM, K!, S, UPS, iso.)

Perennial herb with tufts 15–45 cm tall from a mostly long-creeping rhizome, usually well spaced and \pm slender. Leaves up to 35 cm, 2–8 mm wide with \pm rough margins and midrib near the apex; basal sheaths brownish. Inflorescences green and brown narrow panicles, 2–5 cm long, 1–1.5 cm wide, upper branches with solitary spikelets densely set, 2–5 lower branches with 2–10 spikelets each; main inflorescence bracts 0.6–1 cm long or up to 4 cm when long awned spikelets ovoid, 5–10 mm long, 3–10 mm wide, usually with female flowers below and male above; glumes pale brown with pale midrib 3 mm long. Utricle usually projecting beyond the glume 3.6–4 mm long, including the 1–2 mm long \pm curved scabrid beak with 2–3(–5) indistinct ribs on the convex side. Fig. 64, p. 427.

UGANDA. Toro District: Ruwenzori, \pm 1 km down the Mobuku Valley from Kichuchu, 30 July 193, *Osmaston* 3203!; Kigezi District: N slope of Mgahinga–Muhavura saddle, 24 Apr. 1970, *Lye & Katende* 5298!; Mt Elgon, bamboo zone, Jan. 1918, *Dummer* 3461!

KENYA. Naivasha District: S Kinangop, Hort. Polhill, 22 July 1961, *Polhill* 432!; N Nyeri District: N Mt Kenya, Kongoni R., 13 Feb. 1922, *R.E. & T.C.E. Fries* 1564!; Kisumu-Londiani District: Tinderet Forest Reserve, 6 km SSE of Timboroa Station, 12 July 1949, *Maas-Geesteranus* 5471!

TANZANIA. SW Kilimanjaro, Feb. 1928, *Haarer* 1157! & forest above Kilimanjaro Timbers, 28 May 1944, *Grimshaw* 94/525! & Kilimanjaro, 2700–3000 m, 1883*, *Thomson* s.n.

DISTR. **U** 2, 3; **K** 1, 3–5; **T** 2, 7 (fide Muasya); E Congo-Kinshasa, Rwanda, Ethiopia

HAB. Swamps, bogs, streamsides and moist ground in bamboo, *Hagenia*, *Hypericum* and *Erica* zones, moorland and upland forest, grassland with *Acacia*; 2250–3650(–?3750**) m

* Haines and Lye give the date as 9/84 but this is when the specimen arrived at Kew.

** *Mwangangi* 364 from Kenya, Mt Elgon give 12500' but the habitat is given as under the shade of *Podocarpus* plantation which makes the altitude suspect.



FIG. 64. *CAREX CONFERTA* — 1, habit, $\times \frac{2}{3}$; 2, spikelet, $\times 3$; 3, smaller partial spikelet, $\times 6$; 4, utricule, $\times 8$; 5, utricule cross-section, $\times 8$. All from Smith, Beentje & Muasya 60. Drawn by Juliet Williamson.

- SYN. *C. leptosaccus* C.B. Clarke in F.T.A. 8: 516 (1902). Type: Tanzania, Kilimanjaro, Thomson s.n. (K!, holo.)
C. koestlinii sensu Kük. in E.P. 4, 20 (Cyp.-Car.): 173 (1909) pro min. parte, non Steud.
C. conferta A. Rich. var. *leptosaccus* (C.B. Clarke) Kük. in N.B.G.B. 9: 312 (1925); Robyns & Tournay, F.P.N.A. 3: 284 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (102): 9, figs. 18, 19 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 372, fig. 768 (1983); Maquet in Fl. Rwanda 4: 429 (1988)
C. conferta A. Rich. var. *conferta*; Haines & Lye, Sedges & Rushes E. Afr.: 372, fig. 767 (1983) (see note).

NOTE. I have not kept up var. *leptosaccus*. Although there is undoubtedly a difference in beak-length, short in the type of *C. conferta* and distinctly longer in *C. leptosaccus*, a careful examination of all the material from Ethiopia and East Africa shows that it would be difficult to decide the name to be given to many specimens. Other characters of the beaks also vary such as marginal scabridity and curvature. Hedberg (A.V.P.: 58 (1957)), mentions Kükenthal's 1925 paper but does not follow it, citing all material as *C. conferta*. Haines & Lye cite and figure *Purseglove* 2971 (Uganda, Kigezi district, Mt Mgahinga, June, 1949) as var. *conferta* but the specimen and their figure have the long beak of var. *leptosaccus*; they also record it from E Congo-Kinshasa whereas Robyns and Tournay call the material var. *leptosaccus*. Out of all the East African material I have examined only the three specimens below are truly var. *conferta*: Friis & Hansen 2572 (Trans Nzoia District: 5 km above Kimilili Forest Station, 23 Apr. 1975); Hepper *et al.* 4868 (Mt Kenya, 3100 m without precise locality, 5 Apr. 1975) and Maas-Geesteranus 5471 (cited above).

5. *Carex erythorrhiza* Boeck. in Linnaea 39: 103 (1875); C.B. Clarke in F.T.A. 8: 517 (1902); Kük. in E.P. 4, 20 (Cyp.-Car.): 173 (1908); Haines & Lye, Sedges & Rushes E. Afr.: 373, fig. 770 (1983); Lye in Fl. Eth. 6: 504, fig. 212.176 & 212.185.7 (1997). Type: Ethiopia, Simien, Mt Bachit, near Demerki and Debreski, *Schimper* 170, 170B (B†, holo.; K!, syn.)

Perennial herb forming dense tussocks to over 1.5 m; rhizome not or shortly creeping, roots and rootlets usually bright brownish red; according to fieldnotes attached to *Kirk* in *Bally* 9887 and *Burt* 4361 the plant can form pillars to 1.5 m tall with an apical diameter of 45–60 cm and with a great tuft of culms and leaves at the apex (see photo, p. 429). Leaves very slender, ± 60 cm long, 1–3 mm wide or rarely to 5 mm with scabrid margins. Inflorescence a narrow dense panicle 4–7 cm long, 6–12 mm wide; lowest subtending bracts with blades 2.5–2.2 cm long; spikelets up to 12 mm long and 5–8 mm wide; glumes light to dark brown, 3–4 mm long with midrib produced. Utricles pale to dark brown, not projecting beyond the glumes, lanceolate-ovoid, 1.5–4 mm long including a smooth 1–1.5 mm long smooth beak with or without 3–5 distinct longitudinal ribs.

UGANDA. Mbale District: Mt Elgon, Gabaralome, 14 Dec. 1938, A.S. Thomas 2667! & Mt Elgon, Siti R., 16 Oct. 1997, *Wesche* 1947!

KENYA. Trans Nzoia District: E Mt Elgon, 12 Jan 1962, *Bogdan* 5425A!, 5425B!; Elgeyo District: Embotot Valley, 25 Sept. 1954, *de la Kirk* in *Bally* 9887! & Kamelogon/Kotwa area, 18 Oct. 1987, *Beentje* (sight record – photo.!)

TANZANIA. Masai District: Olomoti Volcano, Oldonyowass Camp, 16 Sept. 1932, B.D. *Burt* 4361! & Crater Highlands, Nainonoka, 30 July 1962, *Newbould* 6242! & same locality, pathway to the waterfall running from Olmoti Crater, 10 Oct. 1977, *Raynal* 19539!

DISTR. U 3; K 3; T 2; Ethiopia, E Congo-Kinshasa

HAB. On rocks, stream banks, heath zone; 2400–3500 m

SYN. *Carex koestlinii* Steud. var. *minor* Boott, *Illust. Carex* 2: 76, t. 206, t. 207 (1860). Type: Ethiopia, Demerki, *Schimper* 170a & *Derb'Eski*, *Schimper* 170 b (P, syn.)

NOTE. The status of many specimens is dubious, there being no rootstocks nor field observations. The well attested pillar-like habit does not appear to have been recorded for Ethiopia and may not always occur, the habit then being much like *C. conferta*. There is scope for much fieldwork here. Raynal suggests the tussocks can be up to 1.5 m wide.



Carex erythorrhiza – “pillar” habit in Cherangani Mts (photo: H. Beentje).

6. *Carex lycurus* K. Schum. in P.O.A. C.: 129 (1895); C.B. Clarke in F.T.A. 8: 517 (1902); Kük. in E.P. 4, 20 (Cyp.-Car.): 172 (1909); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 9, fig. 17 (1963). Type: Tanzania, Lushoto District: W Usambaras, Heboma, *Holst* 2554 (B†, lecto., K, isolecto!)*

Perennial herb 0.3–2 m tall with stout tufts from a creeping rhizome, the bases stout and triangular. Leaves up to 60 cm long, (5.5–)7–12.5 mm wide, slightly scabrid to smooth; basal sheaths pale brownish. Inflorescences green and brown, (3–)6–11.5 cm long, 1–3 cm wide, interrupted and ± lobulate, the stalk scabrid below the inflorescence; lower bracts 2–14 cm long in some specimens but often not developed; individual spikes 1.5–2.5 cm long, mainly female with some males at top; glumes chestnut with green margins and keel, thin, ovate, lanceolate, 3 mm long. Utricle greenish often dark or black with age (always?), ovoid-lanceolate, ± 4 mm long, drawn out into a narrow beak forming ± half the length of the utricle, convex side with 6–9(–14) prominent continuous ribs, the beak margins ± scabrid. Style branches 2. Nutlets dark, 2 mm long including persistent style-base.

subsp. *lycurus*

Plant more robust, up to 2 m. Leaves usually wider, up to 12.5 mm.

KENYA. Naivasha District: towards N Kinangop, Kipipiri, 31 Mar. 1957, *Verdcourt* 1770!; S. Nyeri District: Ragati Forest Station, 22 Dec. 1969, *Haines* 4318!; Masai District: Nasampolai, 13 Feb. 1971, *Greenway* & *Kanuri* 14843!

TANZANIA. Lushoto District: W Usambaras, Malindi–Shume road junction, 21 Sept. 1945, *Greenway* 7548!; Njombe District: Poroto Mts, Kitulo Plateau, Ndumbi Valley, 24 Mar. 1991, *Bidgood et al.* 2127!; Songea District: Matengo Hills, valley of R. Halau about 3 km SE of Miyau, 12 Jan. 1956, *Milne-Redhead and Taylor* 8229! & 4 Mar. 1956, *Milne-Redhead* & *Taylor* 8229a!

DISTR. K 3–6; T 2–4, 7, 8; Congo-Kinshasa, Cameroon, Zimbabwe

HAB. Stream banks, lake margins, swamps and seepage bogs in grassland or forest or woodland, sometimes growing in water; (1200*–)1500–3150(–3350) m

* K. Schumann cited two *Holst* numbers but Haines & Lye have given *Holst* 2554 as the type. All Cyperaceae were burnt at B except some *Cyperus* and *Eleocharis* types.

** *Faulkner* 4821 from W Usambaras, Soni is said to be from 4000'–the lowest altitude recorded

SYN. *C. conferta* A. Rich. var. *lycurus* (K. Schum.) Lye in Nordic Journ. Bot. 3: 244 (1983); Haines & Lye, Sedges & Rushes E. Afr.: 373, fig. 769 (1983)

NOTE. I feel certain this can be treated as a distinct species; it occurs over large areas of Tanzania. Only in W Kenya have I found specimens which might justify Haines & Lye's treatment. *Haines* 4154 (Trans-Nzoia District, Mt Elgon, above Endeless, 10 June 1966 at 3300 m) has many leaves narrower than 6 mm, shorter more slender stature but the immature utricles already have 6–7 prominent long complete ribs. On the other hand *Kindeketa et al.* 806 (Tanzania, Masai District, Kitumbeine Forest Reserve, 16 Feb. 2001, 2550 m) has the habit of *C. lycurus* and broad leaves (11.5 mm) but the utricles are those of *C. conferta*—possibly a true hybrid.

subsp. **scabrida** (Kük.) Verdc. **comb. nov.** Type: Kenya, W Mt Kenya, R.E. & T.C.E. *Fries* 677 (UPS, holo.; K, iso.)

Leaves 3–4(–5) mm wide, never up to 12.5 mm; plant usually 50–60 cm tall; utricle prominently ribbed as in typical *C. lycurus*.

UGANDA. Toro District: Ruwenzori, pass from Rwagimba to Kahuka, 1 Sept. 1951, *Osmaston* 1261! & Mt Ruwenzori, Aug. 1938, *Purseglove* 326!; Kigezi District: Virunga Mts, Mgahinga, 22 Nov. 1934, *G. Taylor* 1933!

KENYA. Mt Elgon, above Endeless, 10 June 1966, *Haines* 4154! & E Elgon, 7 Mar. 1954, *Bogdan* 3935!; W Mt Kenya, 3 Jan. 1922, R.E. & T.C.E. *Fries* 677!

DISTR. U 2, 3; K 3, 4; Cameroon, E Congo-Kinshasa, Rwanda

HAB. *Sphagnum* bogs, swampy grassland, by rivers in montane forest; 2350–3300 m

SYN. *Carex erythrorrhiza* Boeck. var. *scabrida* Kük. in N.B.G.B. 9: 313 (1925); Robyns & Tournay in F.P.N.A. 3: 286, t. 41 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 9, fig. 16 (1963)

C. lycurus sensu auct. incl. Napper in F.W.T.A. 3: 349 (1972), non K. Schum. sensu stricto

7. ***C. echinochloe*** *Kunze*, Suppl. Schkuhr's Riedgr.: 47, t.12 (1841); A. Rich., Tent. Fl. Abyss. 2: 513 (1850); Boott, Illustr. Carex 1: 62, t. 166 (1858) & in J.L.S. 7: 226 (1864); Boeck. in Linnaea 40: 340 (1876); C.B. Clarke in Durand & Schinz., Consp. Fl. Afr. 5: 683 (1895); Engl. Hochgebirgsfl. Trop. Afr.: 152 (1892); C.B. Clarke in F.T.A. 8: 519 (1902); Kük. in E.P. 4, 20 (Cyp.-Car.): 270 (1909); F.D.-O.A. 1: 535 (1938); Bruce in F.W.T.A. ed. 1, 2: 495 (1936) pro parte; Robyns & Tournay, F.P.N.A. 3: 288 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 10, fig. 27 (1963) & in F.W.T.A. ed.2, 3: 349 (1972); Maquet in Fl. Rwanda 4: 429, fig. 177.1 (1988); Lye in Fl. Eth. 6: 505, fig. 212.178 & 212.185.11–12 (1997). Type: Ethiopia, N Mt Selleuda (Scholoda), *Schimper* 26 (LZ†, holo.; K!, P, iso.)

Tufted perennial 40–90(–100) cm tall with shortly creeping rhizome; stems and inflorescence branches shortly hairy. Leaves 40–120 cm long, (5–)6–14 mm wide; sheaths brownish or dark, 2–6 cm long. Inflorescence a slender densely branched panicle, green and brown, (8–)20–50 cm long, 5 cm wide, often with one longer and one shorter branch at each node; upper bracts awned, the awn 3–8 mm long, scabrid, the lowest bracts long, leaf-like overtopping the panicle; spikelets 5–10 mm long, 5 mm wide, male above and female below; female glumes ovate, 4–5 mm long including the 1–2 mm long scabrid awn, acuminate, shortly aristate. Utricle ellipsoid, trigonous, (3–)3.5–4.5 mm long including the beak, with up to 18 (3–7 wide Haines & Lye) well marked ribs; beak 0.7–1 mm long, shortly two-toothed, scabrid. Filaments 3–4 mm long. Nutlet dark with pale angles, trigonous.

subsp. **echinochloe**; Haines & Lye, Sedges & Rushes of E. Afr.: 374, fig. 772 (1983).

Glumes pale brown, sometimes with a greenish midrib. Utricles green, 3.5–4 mm long including 1 mm long beak.

UGANDA. Acholi District: Imatong Mts, Apr. 1938, *Eggeling* 3533!; Kigezi District: Kachwekano Farm, Jan. 1950, *Purseglove* 3206!; Mengo District: Kampala, Kawanda, Dec. 1935, *Chandler* 1507!
 KENYA. Trans-Nzoia District: Kitale, 1 Sept. 1952, *Bogdan* 3571!; Embu District: Mt Kenya, Chogoria route, 28 Aug. 1996, *Knox & Muasya* 3137!; Kisumu–Londiani District: Tinderet Forest Reserve, 26 June 1949, *Maas Geesteranus* 5184!
 TANZANIA. Lushoto District: W Usambaras, Mtai–Sunga road, 25 May 1953, *Drummond & Hemsley* 2759!; Morogoro District: W slopes of Nguru Mts above Maskati, 17 Mar. 1988, *Bidgood et al.* 469!; Songea District: Matengo Hills, Miyau, 28 Feb. 1956, *Milne-Redhead & Taylor* 8896!
 DISTR. U 1–4; K 2–6; T 2–8; Guinea (Fouta Djallon), Bioko, Cameroon, Congo-Kinshasa, Rwanda, Burundi, Ethiopia, Sudan
 HAB. Grassland, thicket and secondary bushland in rocky places, bracken, seasonal *Papyrus* swamps, *Combretum* woodland, *Acacia lahai* woodland, montane forest of *Hagenia* and bamboo; also margins of cultivation and often on termite mounds; 900–2750 m
 SYN. *C. ramosa* sensu K. Schum. in P.O.A. C.: 129 (1895), *non* Schkuhr.

subsp. **nyasensis** (*C.B. Clarke*) *Lye* in *Nordic J. Bot.* 3: 244 (1983) & in Haines & Lye, *Sedges & Rushes of E. Afr.*: 375 (1983). Type: Malawi, Plains of Zomba, *Whyte* s.n. (K! lecto.)* (chosen by Nelmes)

Glumes more reddish brown; utricles green to brown, 4–4.5 mm with beak 1 mm long, glabrous or slightly scabrid; leaves 3.5–6.5(–9) mm wide.

TANZANIA. Ufipa District: Nsangu Mt, 13 Mar. 1959, *McCallum Webster* C37! & Mbizi Forest, 8 July 1957, *Whellan* 1337!; Songea District: Matengo Hills, Luwiri Kitesa, 5 Mar. 1956, *Milne-Redhead & Taylor* 8787!

DISTR. T 2 (see note) 4, 7, 8; Malawi

HAB. *Parinari-Brachystegia* woodland with termite mounds, upland pasture at edge of woodland, forest, riverine forest; 1200–2250 m

SYN. *Carex nyasensis* C.B. Clarke in *F.T.A.* 8: 519 (1902); Nelmes in K.B. 1940: 162 adnot. (1940)
C. echinochloe Kunze var. *nyasensis* (C.B. Clarke) Kük. in *E.P.* 4, 20 (*Cyp.-Car.*): 271 (1909)

NOTE. *Grimshaw* 93/371 (Tanzania, Mt Kilimanjaro, forest behind Kilimanjaro Timbers, 8 July 1993) has been determined as this variety by Haines & Lye but has green inflorescences quite unlike the material cited above.

8. ***Carex spicato-paniculata*** *C.B. Clarke* in Durand & Schinz, *Consp. Fl. Afr.* 5: 190 (1895), *nom. nud.* & in *Fl. Cap.* 7: 304 (1898) & in *F.T.A.* 8: 520 (1902); Kük. in *E.P.* 4, 20 (*Cyp.-Car.*): 269 (1909) & in *Z.A.E.*: 53 (1910); *F.D.-O.A.* 1: 537 (1938); Nelmes in K.B. 1940: 160 (1940); Robyns & Tournay, *F.P.N.A.* 3: 286 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 10, fig. 23 (1963); Haines & Lye, *Sedges & Rushes of E. Afr.* 374, fig. 771 (1983); *Lye* in *Fl. Eth.* 6: 505, fig. 212.177 & 212.185.9 (1997). Type: South Africa, Natal, Inanda, *J.M. Wood* 1170 (K! lecto.) (chosen by Nelmes)**

Perennial tussock-forming herb 0.5–1.2 m tall with short rhizome. Leaves 20–50 cm long, 5–13 mm wide, flat or plicate, scabrid on veins and margins. Panicles green and brown with densely pubescent axes and branchlets, up to 8 cm long, 3–5 cm wide; spikelets 5–10 mm long, 4–5 mm wide; glumes reddish brown, 3.5–4 mm long, awn 1–1.5 mm long, scabrid. Utricle ellipsoid, 3.5–4 mm long (including the beak), with up to 30 pale ribs, the beak \pm 1.5–2 mm long, 2-fid, the lobes linear; beak shortly hairy, the hairs extending down to the upper part of utricule.

KENYA. Nakuru District: Mau, 2100 m, Dec. 1893, *Scott Elliot* 6899!

* Haines & Lye overlooked that Nelmes had chosen a lectotype from the 5 syntypes from Malawi at Kew.

** Haines & Lye overlooked the fact that Nelmes had lectotypified this species long before they chose *Rehmann* 5627 (South Africa, Houtbosch) which Nelmes had already rejected since it was not mature.

TANZANIA. Tanga District: Mlinga Peak, 4 Dec. 1940, *Greenway* 6059!; Ufipa District: Namwele, 24 Feb. 1950, *Bullock* 2568!; Kondo District: between Kolo and Bereku on the Bereku ridge above Irangi scarp, 17 Jan. 1928, *B.D. Burt* 1161!

DISTR. **K** 3; **T** 3–5, 7; Congo-Kinshasa, Burundi (dark brown variant), ? Ethiopia, South Africa, Comoro Is., Mascarene Is.

HAB. Forest of *Podocarpus*, *Rapanea* etc., *Brachystegia* / *Myrsine* woodland, old termite mounds; 900–1950 m (see note)

NOTE. Several specimens e.g. *Bogdan* 4532 (Kenya, Kisumu-Londiani District: 32 km N of Muhoroni, 6 July 1958) have been determined as this species but the utricles are virtually glabrous and I would refer them to *C. echinochloë*. *Stolz* 1331 (Tanzania, Rungwe District, Kymbila, 6 June 1912) was sent from Berlin as *C. johnstonii* var. *brevisfructus* Kük. but although this name is mentioned in F.D.-O.A. 1: 539 (1938) it does not appear to have been published. The utricles are too short and curved for *C. johnstonii* and it appears to belong here. *Richards* 6791 also from Rungwe is the same variant and from 2790 m.

9. **Carex chlorosaccus** *C.B. Clarke* in J.L.S. 34: 298 (1899) & in F.T.A. 8: 519 (1902); Staner in Rev. Zool. Afr. 23: 211 (1933); F.D.-O.A. 1: 538 (1938); Robyns & Tournay, F.P.N.A. 3: 288 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 10, figs 25, 26 (1963) & in F.W.T.A. ed. 2, 3: 349 (1972); Haines & Lye, Sedges & Rushes of E. Afr. 375, fig. 773 (1983); Maquet in Fl. Rwanda: 429 (1988); Lye in Fl. Eth. 6: 505, fig. 212.179 & 212.185.10 (1997). Type: Bioko [Fernando Po], Clarence Peak, *Mann* 653 (K!, holo.)*

Perennial tussock plant 0.3–1. (1.2) m tall with woody rhizome; basal leaf sheaths dark red. Leaf-blades 50–90 cm long, 5–9 mm wide, scabrid on margins and veins. Inflorescences green slender much branched panicles 8–50 cm long, often with one short and one longer branch at the lower nodes; inflorescence axis and side branches densely pubescent; upper bracts 2 mm long with a 3–8 mm long awn, the lower ones leaf-like; spikelets 6–20 mm long, 3–5 mm wide, a few male flowers above and 5–10 female flowers below; glumes pale green turning pale brown or greyish, 4–5 mm long including 1.5–2 mm long awn, pubescent. Utricle green becoming pale brown, 4–5.5 mm long including 1.5–2.2 mm long glabrous or slightly scabrid beak, often ± curved, with several distinct ribs on each side and often short spine-like hairs below the beak. Fig. 65, p. 433.

UGANDA. Kigezi District: Impenetrable Forest, near Luhiza, 1 Oct. 1961. *F. Rose* 1156! & same forest; near Nyamabale, *Haines* 4200!; Mbale District: Bugishu, Bulago, 28 Aug. 1932, *A.S. Thomas* 361!

KENYA. West Suk District: Cherangani Hills, Kapkanyar Forest, near Muselelon, 16 Aug. 1978, *Lye* 9125!; Ravine District: Timboroa, Mau Summit road, 10 Sept. 1958, *Napper* 831!; Meru District: Nyambeni Hills, bottom of Kirima, 11 Oct. 1960, *Verdcourt* & *Polhill* 2965!

TANZANIA. Arusha District: E Slope of Mt Meru, Nasolo, 2 Apr. 1968, *Greenway* & *Kanuri* 13292!; Morogoro District: W slopes of Nguru Mts, above Maskati, 17 Mar. 1988, *Bidgood et al.* 536!; Iringa District: Dabaga Highlands, Kibengu, 28.8 km S of Dabaga, 13 Feb. 1962, *Polhill* & *Paulo* 1453!

DISTR. **U** 2, 3; **K** 2–6; **T** 2–4, 6–8; Bioko, E Congo-Kinshasa, Rwanda, Sudan, Ethiopia

HAB. Evergreen forest and forest edges including rain forest, riparian forest and bamboo, swamp edges extending up to *Erica* belt; 1300–3300 m

SYN. *Carex wahlenbergiana* Boott in J.L.S. 7: 225 (1864); Engl., Hochgebirgsfl. Trop. Afr.: 152 (1892); K. Schum. in P.O.A. C.: 129 (1895) pro parte; C.B. Clarke in Durand & Schinz, Consp. Fl. Afr. 5: 691 (1895) pro parte

C. ramosa K. Schum. in P.O.A. C.: 129 (1895) pro parte

C. echinochloë Kunze var. *chlorosaccus* (C.B. Clarke) Kük. in E.P. 4, 20 (Cyp.-Car.): 271 (1909); R.E.Fr., Wiss. Ergebn. Schwed. Rhod-Kongo Exp., Ergänzungsheft: 10 (1921); Kük. in N.B.G.B. 9: 313 (1925)

* Haines & Lye give Johnston from Kilimanjaro but C.B. Clarke in the 1899 reference clearly associates the word type with the Mann specimen.



FIG. 65. *CAREX CHLOROSACCUS* — 1, habit with inflorescence, $\times \frac{2}{3}$; 2, spikelet, $\times 3$; 3, male flower and tip of spikelet, $\times 8$; 4, glume from female flower, $\times 12$; 5, utricle, $\times 12$; 6–7, beak details, $\times 16$. 1 & 7 from *F. Rose* 1156, 2 from *Trelawny* AB4381, 3–5 from *Napper* 831, 6 from *Lye* 9125. Drawn by Juliet Williamson.

10. *Carex macrophyllidion* *Nelmes* in K.B. 1940: 161 (1940); Haines & Lye, *Sedges & Rushes of E. Africa*: 376, fig. 774 (1983). Type: Angola, Moxico District, by R. Mfumbu, *Milne-Redhead* 3971 (K!, holo.)

Slender perennial herb to 60 cm tall, forming large tufts from a short woody rhizome. Leaves v-shaped in section or \pm flat, 5–60 cm long, 2–5.5 mm wide, the upper overtopping the inflorescence, long-attenuate, scabrid, with long smooth basal sheaths which become blackish and fibrous. Panicle interrupted, 1.5–4 cm long, 1–2 cm wide; secondary panicles 5–6, the lower single, the upper paired, subpyramidal; the lower long-peduncled, the upper more shortly; rachis glabrous save for the scabrid angles; bracts leafy overtopping the inflorescence; spikes dense-flowered with male part shorter than female, 7–10 mm long; bracteoles long-aristate with hispidulous margins; glumes pale greenish brown, ovate-lanceolate, 5–6 mm long with a scabrid arista. Utricles yellow-green with green veins, equalling or longer than glumes, 5.5–6 mm long, glabrous, narrowed into a long bidentate \pm scabrid beak 1.5 mm long.

TANZANIA. Dodoma District: Bereko-Salanga Forest, 13 Jan. 1973, *Archbold* 28249 (number must be an error)!; Iringa District: Great North road between Matanana and Malangali, 134 km S of Iringa, 27 Mar. 1962, *Polhill & Paulo* 1889!; Njombe District: Elton Plateau, Jan. 1962, *Procter* 2051!

DISTR. T 4, 5, 7; Angola, Zambia, Zimbabwe

HAB. Short grassland under open *Isoberlinia-Brachystegia* woodland, montane grassland, open bushland, sometimes on termite mounds; 1650–2800 m

11. *Carex johnstonii* *Boeck.* in E.J. 7: 278 (1886); Oliv. in *Trans. Linn. Soc. ser. 2 Bot.* 2: 353 (1887); C.B. Clarke in *Durand & Schinz, Consp. Fl. Afr.* 5: 686 (1895); Engl., *Hochgebirgsfl. Trop. Afr.*: 151 (1892); K. Schum. in *P.O.A. C.*: 129 (1895); C.B. Clarke in *F.T.A.* 8: 521 (1902); Kük. in *E.P.* 4, 20 (*Cyp.-Car.*): 593, fig. 100 (1909); F.D.-O.A. 1: 539 (1938); Robyns & Tournay, *F.P.N.A.* 3: 290 (1955); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 10, fig. 30 (1963); Haines & Lye, *Sedges & Rushes of E. Afr.*: 377, fig. 777 (1983); Maquet in *Fl. Rwanda* 4: 429, fig. 177.3 (1988); Lye in *Fl. Eth.* 6: 507, fig. 212.181 (1997). Type: Tanzania, Kilimanjaro, *Johnston* s.n. (K!, holo.; B†, K!, iso.)

Tufted perennial 0.35–1.5 m tall with short creeping rhizome. Leaf-blades 25–40(–60) cm long, 4–8(–10) mm wide with scabrid margins and veins; basal leaf sheaths dark red or reddish brown, 1–4 cm long. Inflorescence a very narrow slender panicle, mostly unbranched or in robust specimens with 2–3 branches from each node; main bracts leafy; spikelets 1–4(–7) cm long, 5 mm wide; upper ones shortly stalked or sessile, lower ones with 5–20 cm long peduncles, with few male flowers above and 6–12 laxly arranged female flowers below; glumes pale brown with green midrib, glabrous save for scabrid midrib, acuminate. Utricle green, brown-speckled or sometimes darker reddish brown, with distinct veins on both sides, 8–12 mm long including the slightly scabrid 2–4 mm long beak, hairy mostly below the beak.

UGANDA. Toro District: Ruwenzori, between Kichuchu and Nyabitaba, Lake Mahoma, 9 Feb. 1974, *Lisowski* 10954!; Kigezi District: E side Mgahinga, 24 Apr. 1970, *Lye & Katende* 5264!; Mbale District: Mt Elgon, Bulambuli, 11 Nov. 1933, *Tothill* 2266!

KENYA. Elgeyo District: Cherangani Hills, Kaibwibich, Aug. 1968, *Thulin & Tidigs* 48!; Kiambu District: Uplands railway station, 15 Oct. 1950, *Bogdan* 2835!; Masai District: 32 km from Olokurto on road to Elburgon, 14 May 1961, *Glover et al.* 1005!

TANZANIA. Masai District: Lake Natron, Oct. 1961, *Newbould* 5883!; Moshi District: Kilimanjaro, forest above Manderu Hut, 15 Oct. 1993, *Grimshaw* 93939!; Morogoro District: Uluguru Mts, Lukwanguli, 8 Jan. 1934, *Michelmores* 881!

DISTR. U 2, 3; K 3–6; T 2, 6, 7; E Congo-Kinshasa, Ethiopia, Malawi

HAB. Giant heath zone, *Podocarpus*, *Hagenia* bamboo etc. forest and forest edges; (750–)2200–3300(–3600) m

SYN. *C. volkensii* K. Schum. in P.O.A. C.: 130 (1895). Type: Tanzania, Kilimanjaro, *Volkens* 1124 (B†, holo.; BM!, Kl, iso.!)

NOTE. *Luke et al.* 6905 (Iringa District: Udzungwa Mts, Luhomero Mt, 3 Oct. 2000) has very dark chestnut glumes and dark utricles with pale ribs densely shortly pubescent. The whole inflorescence appears dark brown. It may be a distinct taxon.

12. *Carex castanostachya* Kük. in E.P. 4, 20 (Cyp.-Car.): 276 (1909); Peter, F.D.-O.A. 1: 530 (1938); Napper in Journ. E. Afr. Nat. Hist. Soc. 24(106): 10, fig. 24 (1963); Haines & Lye, *Sedges & Rushes of E. Afr.*: 376, fig. 775 (1983). Type: Tanzania, Morogoro District: Uluguru Mts, *Stuhlmann* s.n. (B†, holo.)*

Tufted leafy perennial 0.6–1.5 m tall. Inflorescence brown fairly dense panicles consisting of many smaller delicate secondary panicles with a triangular outline; spikelets 4–10 mm long, ± 1 mm wide when young but wider when mature utricles spread; glumes chestnut brown with paler midrib, ovate-lanceolate, 2–4 mm long, the usually excurrent midrib scabrid. Utricles pale brown to chestnut brown, 4–4.5 mm long including the 1.5 mm long beak, 0.7–1 mm wide, usually distinctly curved at maturity, scabrid with long hairs at least on margin.

KENYA. Teita District: Mbololo Hill, Mraru Ridge, 17 Oct. 1970, *Faden & Githui* 70/736! & Kasigau, 18 Nov. 1994, *Luke* 4190!

TANZANIA. Lushoto District: Shume, Lomboza Forest Reserve, 12 Nov. 1968, *Ngoundai* 120! & Magamba Peak, 13 Sept. 1945, *Greenway* 7542!; Iringa District: Udzungwa Mountains National Park, above camp 232, 30 Sept. 2001, *Luke et al.* 8017!

DISTR. K 7; T 2 (see note), 3, 6, 7; not known elsewhere

HAB. Moist forest; (1500–)1850–2050 m

SYN. *C. filicina* Nees var. *ceylanica* sensu Peter, F.D.-O.A. 1: 530 (1938), *non* (Boeck.) Kük. (see note).

NOTE. Peter (F.D.-O.A. 1: 539 (1938)) cites his 9014 (S Pare Mts, Shengena Mt) as *C. filicina* Nees var. *ceylanica* (Boeck.) Kük. and separates it from *C. castanostachya* Kük. by having spikelets elongate as against ovoid, glumes red-brown not black-brown, utricles beak obliquely cut at apex finally slightly 2-toothed (as against strongly 2-toothed). Kükenthal uses the beak toothed to separate *C. filicina* and *C. castanostachya*. A duplicate of 9014 is at Kew and clearly the same as *C. castanostachya*. Haines & Lye, *Sedges & Rushes E. Afr.*: 376 (1983) states *C. castanostachya* is closely related to *C. filicina*. Peter also cites *Schlieben* 4188 from Kilimanjaro as *C. castanosperma* but Haines & Lye whose figure 775 is drawn from *Schlieben* 4188 give the locality as Nguru Mts and give T 3, 6 & 7 as only localities.

There is little doubt that *C. castanostachya* will have to be sunk into *C. filicina* Nees (in Wight, *Contr. Bot. Ind.*: 123 (1834)); Koyama in *Rev. Fl. Ceylon* 5: 375 (1985) (Type: India orientalis, *Wight* 1916 (K!, holo.)) but whereas the populations in Africa are ± uniform, *C. filicina* in India has been split into many infraspecific taxa and it and its relatives are very variable. Although *C. castanostachya* is very similar in inflorescence morphology and utricles structure it has a much less densely pubescent rachis than *Wight* 1916 and for the present purpose I have maintained it as distinct.

13. *Carex steudneri* Boeck. in *Linnaea* 40: 364 (1876); C.B. Clarke in Durand & Schinz, *Consp. Fl. Afr.* 5: 690 (1895) & in *J.L.S.* 34: 297 (1899) & in *F.T.A.* 8: 520 (1902); Haines & Lye, *Sedges & Rushes E. Afr.*: 376, fig. 776 (1983); Lye in *Fl. Eth.* 6: 506, fig. 212.180 (1997). Type: Ethiopia, Semien, Ghaba, *Steudner* 931 (B†, lecto.) (chosen by Haines & Lye)

Tufted rhizomatous perennial 0.4–1 m tall with stiff stems. Leaf-blades 5–30 cm long, 3–12 mm wide, flat, scabrid on margins and midrib. Inflorescence ± of several narrow dense often pendulous panicles, 1–2 from each of the uppermost leaf

* K. Schum. first mentions this name in P.O.A. A: 131(1895) and it appears to be from upper tree line on Kilimanjaro. Haines & Lye fig. 475 is drawn from *Schlieben* 4188.

sheaths; spikes brown, lanceolate, 6–15 mm long, 1–2 mm wide, bisexual, male above and a few female flowers below; glumes red-brown with paler midrib, 3–6 mm long (the upper always 5–6 mm). Utricle red-brown to dark brown sometimes with green ridges, lanceolate, 5–6(–7) mm long (including 2 mm long beak), pubescent or densely scabrid at least on beak and major ribs or \pm glabrous save for marginal or scattered scabrid hairs; beak with short erect teeth.

KENYA. Elgeyo District: Cherangani Hills, E slopes near "Flat Top", 11 Dec. 1959, *Bogdan* 4972!
TANZANIA. Mpanda District: Summit of Kungwe Mt, 27 July 1959, *Newbould & Harley* 4746!;
Iringa District: Ludema, Livingstone Mts, at and near summit of Ligala Mt, 12 Feb. 1991,
Gereau & Kayombo 3986!; Njombe District: Poroto Mts, Kitulo Plateau, Ndumbi Valley, 24 Mar.
1991, *Bidgood et al.* 2119!

DISTR. **K** 3; **T** 4, 7; Ethiopia, Sudan, Malawi and South Africa

HAB. Streamsides in montane grassland, montane bushland, forest edges, rock crevices, bamboo zone; 2300–3050 m

SYN. *C. condensata* C.B. Clarke in Fl. Cap. 7: 305 (1898) & in F.T.A. 8: 521 (1902), *non* Nees.

C. zuluensis C.B. Clarke in K.B. addit. series 8: 74 (1908); Schönland in Bot. Surv. S. Afr. 1: 70, t. 79 (1922); Hilliard & Burt in Ann. Kirstenbosch Bot. Gard. 15: 116 (1982); Gordon-Gray in Strelitzia 2: 43, fig. 15 J.-L. (1995). Type: South Africa, Tembuland, Bariya, *Baur* 1156 (K!, lecto.) (chosen by C. Reid on sheet).

C. huttoniana Kük. in E.P. 4, 20 (Cyp.-Car.): 271 (1909). Type: South Africa, Natal, *Mrs. Hutton* s.n. (B†, lecto., chosen here)

NOTE. I have taken a broad view of this species which probably will not be accepted in South Africa. The Cherangani Hills material with narrow lanceolate 7 mm long densely pubescent utricles undoubtedly agrees with typical Ethiopian *C. steudneri* and the lectotype of *C. zuluensis* also has similarly pubescent slightly shorter utricles (which are not like Gordon-Gray's figure). However much of the material from S Tanzania has smaller 5–6 mm long utricles which are glabrous save for a few scabrid hairs on the margins of the beak or scattered elsewhere. *Richards* 7705 (Tanzania, Njombe District, Kipengere Mts, Mtorwi Peak, 12 Jan. 1952 was annotated by Kukkonen in 1984 as *C. zuluensis*. A number of these **T** 7 specimens has been named *C. zuluensis* var. *glaberrima* Kük. but I have not traced this name. The name *zuluensis* was published too late to be included in Kükenthal's monograph. Haines and Lye do not mention *C. zuluensis* but record *C. steudneri* from S Tanzania. The **T** 4 material cited has small utricles 4 mm long and very few scabrid hairs. All the material however has the same habit and general appearance.

14. *Carex bequaertii* *De Wild.*, Pl. Bequaert. 4: 246 (1927); Nelmes in K.B. 1940: 135 adnot. (1940); Robyns & Tournay, F.P.N.A. 3: 290, t. 42 (1955); A.V.P.: 59 (1957); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 10, fig. 28 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 377 (1983); Maquet in Fl. Rwanda 4: 429 (1988); Lye in Fl. Eth. 6: 507, fig. 212.182 (1997); Type: Congo-Kinshasa, Ruwenzori, Lanuri Valley, *Bequaert* 4677 (BR, holo.)

A stout perennial with stems 0.6–2 m tall and short curved stolons, 2–5 cm long, 1 cm thick covered with hard shiny greyish scales. Leaf-blades up to 70–80 cm long, 1.2–1.5 cm wide, flat or slightly plicate, glabrous but minutely papillate, margins scabrid above; leaf sheaths 15–20 cm long with distinct rim-like ligule. Inflorescence of 6–9 long and usually pendulous dark brown spikes born singly at the nodes and often widely spaced; upper inflorescence bracts 5–15 mm long, the lower leafy; spikes 4–22 cm long, 7–10 mm wide (always some over 8 cm long); peduncles up to 15(–25) cm long; all spikes similar with few male flowers scattered amongst the predominantly female or upper spikes male and lower female; glumes brown with distinctly paler midrib, lanceolate-triangular, 4–9 mm long. Utricles green, yellowish brown or brown, with dark brown or reddish dots at maturity, ovoid, 3–4 mm long, 1.5 mm wide, with or without a short stalk-like base; beak very short, 0.5 mm long, glabrous, truncate or with short erect lobes not strongly bifid; utricles with 1 rib on one side and \pm 3 on the other.

var. **bequaertii**; Haines & Lye, *Sedges & Rushes E. Afr.*: 377, fig. 778 (1983)

Stems 0.6–1.2 m tall. Spikes 4–22 cm long, 7 mm wide; peduncles up to 15 cm long; glumes 4–8 mm long. Utricles with short stalk-like base.

UGANDA. Toro District: Ruwenzori, Bujuku Valley, near Nyamuleju, Aug. 1933, *Eggeling* 1271!; Kigezi District: Virunga Mts, saddle between Muhavura and Mgahinga, 8 Nov. 1954, *Stauffer* 716; Mbale District: Mt Elgon, Sasa Trail, 25 Mar. 1997, *Wesche* 1208!

KENYA. Mt Elgon, above Endeless, 10 June 1966, *Haines* 4165!; Naivasha District: Aberdares, towards N Kinangop, Kipiripiri, 31 Mar. 1957, *Verdcourt* 1769!; NW slopes Mt Kenya, 21 Aug. 1948, *Hedberg* 2015!

TANZANIA. Masai District: Crater Highland; Olomoti Crater, 6 Dec. 1956, *Greenway* 9115! & Nainokanoka, 30 July 1962, *Newbould* 6246!; Mbeya District: Poroto Mts, Ngozi Crater, 17 Oct. 1956, *Richards* 6577!

DISTR. U 2, 3; K 3, 4; T 2, 7; E Congo-Kinshasa, Rwanda, Ethiopia

HAB. Swamps, flushes and streambanks in montane grassland, montane forest, upper bamboo zone, *Hagenia* forest, lower alpine (ericaceous) zone, *Juniperus* forest, also mist forest and seepage zones in craters; 1950–3600 m

SYN. *C. petitiana* sensu Kük. in N.B.G.B. 9: 313 (1925) quoad *R.E. & T.C.E. Fries* 1388; F.D.-O.A. 1: 539 (1929) quoad *Schlieben* 4878; Staner in Rev. Zool. Bot. Afr. 23: 212 (1933); Chermeson in Bull. Soc. Bot. Fr. 82: 343 (1935), non A. Rich.

var. **maxima** Lye in Nordic J. Bot. 3: 244 (1983); Haines & Lye, *Sedges & Rushes E. Afr.*: 378, fig. 779 (1983). Type: Uganda, Karamoja District, Mt Morongole, *J. Wilson* 1012 (EA, holo.; K!, iso.)

Plant more robust with stems 1.5–2 m tall. Spikes 10–22 cm long, 10 mm wide; peduncles up to 25 cm long; glumes 6–9 mm long. Utricle without short stalk-like base.

UGANDA. Karamoja District: Mt Morongole, Apr. 1960, *J. Wilson* 1012!

DISTR. U 2; not known elsewhere

HAB. Buffalo wallow in montane forest; 2450 m

SYN. *C. mildbraediana* sensu Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, f. 34 (1963) pro parte fide Haines & Lye*

15. **Carex acutiformis** Ehrh. in Beitrag. Naturk. 4: 43 (1789); C.B. Clarke in Fl. Cap. 7: 307 (1898); Jermy & Tutin, *British Sedges*: 198, fig. 16 (1968); O. Nilsson in Fl. Turkey 9: 144 (1985); Haines & Lye, *Sedges & Rushes E. Afr.*: 378, fig. 780 (1983); Gordon-Gray in *Strelitzia* 2: 37, fig. 13 A–C (1995); Lye in Fl. Eth. 6: 507 fig. 212.183 (1997). Type: Germany, Brunswick-Lüneburg, *Ehrhardt* s.n. (MW?, holo.)

Tufted sedge 0.9–1.2(–1.7) m tall, stems ± scabrid with thick short scaly stolons. Leaves up to 8 cm long, 6–8(–12) mm wide, plicate with distinctly scabrid margins; leaf sheaths long, green or straw coloured or basal one sometime reddish. Inflorescence bracts with a dark brown rim opposite the blade. Inflorescence of 5–8 erect or drooping spikes 1.5–10.5 cm long, 4–5 mm wide, arising singly, the upper ± sessile, the lowest with peduncles 5–20 cm long; upper 2–3 spikes male with a few basal female flowers; lower spikes entirely female and some intermediate ones half of each; glumes dark brown with pale brown edges and midrib, 3–4 mm long (the basal ones 6–7 mm long including a 2 mm long awn) acute or acuminate. Utricles brownish with blackish raised dots, 3–4 mm long including a very short beak with very short apical teeth), densely papillate.

UGANDA. Kigezi District: Kanaba Gap, 1.6 km Kabale side of P.W.D. Camp, 10 Sept. 1952, *Norman* 184! & Echuwa Forest Reserve, *Hamilton* 155

TANZANIA. Masai District: Ololmoti Crater, 6 Dec. 1956, *Greenway* 9124!

* Napper does not actually cite the *Wilson* specimen but only *Wilson* 1012 fits.

DISTR. U 2; T 2; N & South Africa; Europe, Asia, N America
 HAB. Swamps and seepage bog; 2250–3000 m

NOTE. Gordon-Gray does not mention papillation of the utricles; she points out that some flowers can have 2-branched styles. The papillation does not occur throughout the wide distribution but some English specimens do show traces of it. Jermy & Tutin do not mention it. Material from T 7, Udzungwa Mts named *C. acutiformis* is not correctly named. The utricule beak is too long and has distinct teeth and the utricule is not papillate.

16. **Carex papillosissima** *Nelmes* in K.B. 1939: 158 (1939); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 10, fig. 29 (1963); Haines & Lye, Sedges & Rushes of E. Afr.: 379, fig. 781a, b & 782 (1983). Type: Tanzania, Iringa District, Mafinga [Sao Hill], *Staples* 416 (K!, holo.; EA!, iso.)

Tufted perennial 0.6–1.2 m with many basal leaves. Leaf-blades 20–80 cm long, 4–10 mm wide, scabrid at least near the tip. Inflorescence of single pedunculate slender spikes from the upper 3–5 leaf sheaths; uppermost usually male and basal 2–4 female, usually pendulous 4–11 cm long, 4–6 mm wide; glumes reddish brown with paler 3-veined midrib, elliptic to lanceolate, 3–4 mm long including the 1.5 mm long excurrent scabrid midrib. Utricles reddish brown, rounded ovate, ± flattened, 2–2.8 mm long (including a very short beak 0.2–0.5 mm long), 1.5–2 mm wide, densely papillate. Style branches 2 (the illustration fig. 782 in Haines & Lye shows 3 branches).

TANZANIA. Mbeya District: Poroto Mts, above Lake Nzambwe, 26 Apr. 1969, *Wingfield* 179!; Iringa District: Mafinga [Sao Hill], 29 Oct. 1947, *Greenway & Brenan* 8280! & 27 Oct. 1936, *Staples* 416!

DISTR. T 7; not known elsewhere

HAB. *Syzygium* relict forest patches in valley bottoms; 1650–2400 m

NOTE. According in Haines & Lye very closely related to *C. madagascariensis* Boeck.

17. **Carex elgonensis** *Nelmes* in K.B. 1938: 245 (1938); A.V.P.: 59 (1957); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, figs. 38, 39 (1963); Haines & Lye, Sedges & Rushes of E. Afr.: 381, fig. 786 (1983). Type: Kenya, Mt Elgon, *G. Taylor* 3474 (BM!, holo.; K!, fragment)

Rather slender perennial forming small tussocks 0.4–1.2 m tall with a creeping rhizome. Leaf sheaths brown to purple; leaf blades up to 50 cm long, 3–6 mm wide, flat or plicate with scabrid margins. Inflorescences of 4–6 erect or pendulous very dark blackish brown spikes arising singly from the leaf sheaths, the upper part ± sessile, the lower with peduncles 3–5 cm long; spike 1.5–4.5 cm long, 3–10 mm wide, the terminal one entirely male or with a few female spikelets at the base, the lower ones female; glumes dark blackish or reddish brown often with a very narrow obscure yellow keel but frequently entirely black, ovate-lanceolate, 5–7 mm long usually with excurrent midrib. Utricle green turning brown or blackish and sometimes with dense dark purple speckling at maturity, (3.5–)4–6(–7) mm long including (0.7–)1–2 mm long beak, scabrid at the margins and strongly divaricate-toothed.

UGANDA. Bugishu District: Mt Elgon, near Sasa Hut, 16 June 1970, *Lye, Katende & Swinscow* 5741! & Mt Elgon, caldera, 4 Dec. 1967, *Hedberg* 4555! & Sasa Trail, 21 March 1997, *Wesche* 1170!

KENYA. Mt Elgon, Suam Valley, 16 May 1948, *Adamson* 493!; Ravine District: Timboroa, 18 Dec. 1969, *Haines* 4317!; Mt Kenya, Naromoru Track, campsite at 3000 m, 11 Dec. 1957, *Verdcourt* 2005!

TANZANIA. Njombe District: Elton Plateau, Ipumi R., 8 Jan. 1957, *Richards* 7608!

DISTR. U 2; K 3, 4; T 7 (see note); not known elsewhere

HAB. Afro-alpine swamps and riversides in *Hagenia-Hypericum* and heath zones, margins of bamboo forest; 2400–3650 m

SYN. *C. mildbraediana* Kük. var. *friesiorum* Kük. in N.B.G.B. 9: 314 (1925). Types: Kenya, W Mt Kenya, R.E. & T.C.E. Fries 1228 (B†, syn., K!, UPS, isosyn.) & E. Aberdares, R.E. & T.C.E. Fries 2553 (B†, syn., K! fragment, UPS isosyn.) & Sattima, R.E. & T.C.E. Fries 2652 (B†, syn., UPS, isosyn.) & Kinangop, R.E. & T.C.E. Fries 2703 (B†, syn., UPS isosyn.) (syn. not mentioned by Nelmes)

NOTE. Haines & Lye state perhaps not specifically distinct from *C. mildbraediana* and Nelmes compared his species with this, but the distinctly divaricately toothed utricle beak is different from that of *C. mildbraediana*, a few utricles from the type of which are preserved at Kew. In T 7 there are specimens which could be referred to *C. petitiiana* or *C. elgonensis*, varying in spike colour. Some of these e.g. *Wingfield* 530, Kitulo Plateau, just left of Igoma-Kitulo road 1 km beyond Kikondo, 31 Dec. 1969, have the glumes spreading much longer than the utricle (4.5–8 mm) more obvious than in the Kenya material.

18. *Carex petitiiana* A. Rich., Tent. Fl. Abyss. 2: 514 (1850); Boott, Illustr. Carex 2: 88, t. 259 (1860); Boeck. in Linnaea 40: 411 (1876); Engl., Hochgebirgsfl. Trop. Afr.: 152 (1892); C.B. Clarke in Fl. Cap. 7: 306 (1898) & in F.T.A. 8: 522 (1902); Haines & Lye, Sedges & Rushes E. Afr.: 382, fig. 789 (1983); Maquet in Fl. Rwanda: 430 (1988); Lye in Fl. Eth.: 510, fig. 212.187 (1997). Type: Ethiopia, Wojerat [Ouodgerate], *Petit* s.n. (P!, holo.; K!, fragment)

Perennial tussock-forming herb 0.4–1.2 m tall and up to 90 cm wide with short to ± long creeping rhizome, glabrous. Leaf-blades 10–60 cm long, 3–10 mm wide, flat or plicate, scabrid at least on margins or ± smooth; leaf sheaths orange-brown or purplish. Inflorescence of 4–8 erect or drooping greenish or brown spikes, arising singly at the nodes, 2–7 cm long, 4–7(–10) mm wide; terminal spike entirely male or up to half female above the male flowers, lateral spikes progressively female with only few male flowers at the base or entirely female; peduncles 1–5(–14) cm long; glumes pale brown, coppery or reddish brown with broad pale or green midribs, 3–6 mm long including arista. Utricles green with dense dark speckling, (3.5–)4–6 mm long including 1–1.5 mm long beak, glabrous or scabrid; beak deeply bifid with distinct divaricate spine-like teeth. Fig. 66, p. 440.

UGANDA. Toro District; Mt Ruwenzori, Aug. 1938, *Purseglove* 325b!; Kigezi District: Mgahinga to Muhavuru Saddle, 24 Apr. 1970, *Lye* & *Katende* 5287!; Mbale District: Mt Elgon, near Sasa Stream, 22 Mar. 1951, *G. Wood* 121!

KENYA. E Mt Elgon, 4 Mar. 1956, *Bogdan* 4129!; Ravine District: Timboroa, 19 Dec. 1969, *Haines* 4316!; Masai District, NE end of Nasambulai Valley, 10 Mar. 1973, *Greenway* & *Kanuri* 15093!

TANZANIA. Moshi District: SW Kilimanjaro, Feb. 1928, *Haarer* 1159!; Arusha District: Meru Crater, Jan. 1967, *Procter* 3463! & Arusha National Park, the crater and E Mt Meru, 23 Apr. 1968, *Greenway* & *Kanuri* 13507!; Njombe District: Kipengere Mts, 9 Jan. 1957, *Richards* 7634!

DISTR. U 2, 3; K 3–6; T 2, 7; Cameroon, Congo-Kinshasa, Rwanda, Sudan, Ethiopia

HAB. Forest (bamboo, *Hagenia* etc.) and forest edges, grassland and heath by streams, *Stoebe-Myrsine* association; (2100–)2400–3450 m

SYN. *C. aethiopica* Schkuhr. var. *stolonifera* Boeck. in Linnaea 41: 286 (1877). Type: Ethiopia, near Gafat, near Debra Tabor, *Schimper* 1298 (B† holo.; K!, iso.) (determined as *C. cuprea* by Nelmes and *C. simensis* by C.B. Clarke)

C. fischeri K. Schum. in P.O.A. C: 130 (1895); C.B. Clarke in F.T.A. 8: 523 (1902); Robyns & Tournay, F.P.N.A. 3: 292 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, figs. 31, 32 (1963). Type: Kenya, Kiambu District, Abori, *Fischer* 640 (B†, holo.; K!, iso.)

C. longipedunculata K. Schum. in P.O.A. C.: 130 (1895); C.B. Clarke in F.T.A. 8: 522 (1902); Napper in J. E. Afr. Nat. Hist. Soc. 24 (106): 12 (1963). Type: Tanzania, Kilimanjaro near the Nobolu Cave, *Volkens* 2105 (B†, holo.; K!, iso.)

C. preussii K. Schum. in E.J. 24: 340 (1897); Napper in F.W.T.A. ed. 2, 3: 347 (1972). Type: Cameroon, Mt Cameroon by Mann's spring, *Preuss* 727 (B, holo.; K!, fragment)

C. simensis sensu C.B. Clarke in F.T.A. 8: 522 (1902), non A. Rich.

C. longipedunculata K. Schum. var. *preussii* (K. Schum.) Kük. in E.P. IV 20 Cyp.-Car.: 652 (1909)

C. simensis A. Rich. var. *stolonifera* (Boeck.) Kük. in E.P. 4, 20 (Cyp.-Car.): 654 (1909)

C. simensis A. Rich. var. *mauensis* Kük. in E.P. IV 20 Cyp. Car.: 654 (1909). Type: Kenya, Mau Plateau, *G.S. Baker* Berlin 4 (B†, holo.; K, fragment, EA, iso.)



FIG. 66. *CAREX PETITIANA* — 1, habit, $\times \frac{2}{3}$; 2, spike, $\times 1\frac{1}{3}$; 3, male flower, $\times 8$; 4, glume from female flower, $\times 8$; 5, utricle and stigmas, $\times 8$; 6, beak detail, $\times 16$; 7, nutlet, $\times 12$. 1 from *Fries & Fries* 405, 2–7 from *Greenway & Kanuri* 13666. Drawn by Juliet Williamson.

- C. longipedunculata* K. Schum. var. *ninagongensis* Kük. in E.P. 4, 20 (Cyp.-Car.): 767 (1909) & in Z.A.E.: 53 (1910); R.E. Fr., Wiss. Ergebn. Schwed. Rhod.-Kongo-Exp. 1 Ergänzungsheft: 10 (1921). Type: Congo-Kinshasa, Kissenyé, Ninagongo, *Mildbraed* 1338 (B†, holo.)
- C. longipedunculata* K. Schum. var. *ninagongensis* Kük. forma *recedens* Kük. in Z.A.E.: 53 (1910). Type: Congo-Kinshasa, Karisimbi, *Mildbraed* 1578 (B, holo.; K! fragment)
- C. vallis-rossetto* K. Schum. var. *heterostachya* Kük. in N.B.G.B. 9: 314 (1925). Type: Kenya, W Mt Kenya Forest Station, R.E. & T.C.E. *Fries* 769 (UPS., holo.; K!, iso.) (det. as *C. ninagongensis* by Nelmes)
- C. fischeri* K. Schum. var. *basiandra* Kük. in N.B.G.B. 9: 315 (1925). Types: Kenya, W Kenya, R.E. & T.C.E. *Fries* 1412 (B†, syn., K!, fragment) & Mt Aberdare, R.E. & T.C.E. *Fries* 2210 (UPS, syn., K!, fragment) & Uganda, Mt Elgon, *Dummer* 3465 (B, syn., K!, isosyn.)
- C. longipedunculata* K. Schum. subsp. *cuprea* Kük. in N.B.G.B. 9: 315 (1925). Types: Kenya: W Mt Kenya R.E. & T.C.E. *Fries* 659 (UPS, syn.) & Coles Farm, R.E. & T.C.E. *Fries* 943 (UPS, syn.) & Forest Station, R.E. & T.C.E. *Fries* 405 (UPS, syn., K! isosyn) & R.E. & T.C.E. *Fries* 734 (UPS, syn., K! isosyn.) & W Aberdares, R.E. & T.C.E. *Fries* 2763 (UPS, syn., K! fragment & K!, isosyn.)
- C. simensis* A. Rich. var. *ninagongensis* (Kük.) Kük. in N.B.G.B. 9: 316 (1925); Chermeson in Bull. Soc. Bot. Fr. 82: 345 (1935) pro parte; F.D.-O.A. 1: 540 (1938)
- C. cuprea* (Kük.) Nelmes in K.B. 1938: 247 (1938); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, fig. 36, 37 (1963)
- C. preussii* K. Schum. var. *camerunensis* Nelmes in K.B. 1938: 247 (1938). Type: Cameroon, Camerouns Mt, *Mann* 2099 (K!, holo.; K!, iso.)
- C. ninagongensis* (Kük.) Robyns & Tournay in F.P.N.A. 3: 292 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11 fig. 41 (1963)

NOTE. Haines & Lye have treated *C. fisheri*, *C. cuprea*, *C. ninagongensis* and *C. longipedunculata* as synonyms of *C. petitiiana* believing that characters such as spikes all androgynous, similar as opposed to upper 1–3 spikes usually male or almost entirely so cannot be used as separating characters; but state that much more research is needed. Napper makes great use of the sexual make-up of the spikes in her keys. Collectors should assess this in the field when finding populations which are by inspection clearly one species. My attempts to resurrect some of these previously recognised taxa perhaps at infraspecific level have not been very satisfactory. Plants with dull to bright greenish slim spikes 5–9 cm long, 5–6 mm wide with leaves up to 8 mm wide, match *C. fisheri*, widespread from the Kenya Highlands to N Tanzania; and have been so annotated by Nelmes, Alm and others without doubt e.g. *Bogdan* 5388, E Mt Elgon, 12 Jan. 1962; *Haines* 4316, Ravine District, Timboroa, 19 Dec. 1969; *Haarer* 1159, SW Kilimanjaro, Feb. 1928; *Hedberg* 2420, Arusha District, E Mt Meru, above Olkakola, 31 Oct. 1948. Very narrow leaved plants (2–3 mm) from the Virunga Mts, particularly between Mgahinga and Muhavura mountains and Mt Elgon, Sasa Stream, 22 Mar. 1951 have been determined as *C. ninagongensis*; Robyns & Tournay separate *C. ninagongensis* from *C. fisheri* by being less robust with leaves 3–5 mm wide, leaf sheaths purple and lateral spikes bisexual 2–4 cm long, 3–5 mm wide contrasting with more robust, leaves 4–8 mm wide, leaf sheaths brownish and lateral spikes female 4–6 cm long, 5–7 mm wide. Material from Kenya with short broad spikes, bright coppery glumes and broad leaves has mostly been called *C. cuprea* e.g. *Newbould* 3373 (Northern Frontier Province, Ndoto Mts, Siruan, 1 Jan. 1959 and *Bogdan* 3525, Nakuru District Thomsons Falls to Nakuru, 14 Aug. 1952. There are however many intermediates and the complicated variation patterns have persuaded me that Haines & Lye are correct. There is great scope for modern methods.

I have been unable to separate *C. preussii* from the East African material of the *cuprea* form of *C. petitiiana*. Since Kükenthal made it a variety of *C. longipedunculata* it would appear he more or less agreed. There are a number of confusing statements in the literature concerning the structure of the spikelets in *C. petitiiana*. Boott, *Carex* 2: 88, t. 259 clearly shows and describes the beak of the utricle as truncate and entire. C.B. Clarke (F.T.A. 8: 523 (1902)) states 'the characteristic feature is the minute subentire beak of the utricle'. This is contradicted by utricles at K taken by Nelmes from the type borrowed from P which have the beak clearly bifid with distinct teeth. Both P. Lowry and Lye have examined the type and confirm this but also state (in litt.) that the teeth have broken off in many cases which may have misled Boott; C.B. Clarke did not see the type. Nelmes has introduced some additional confusion; in a note on a cover he states that when examining type material of *C. petitiiana* he decided it represented two very distinct species; only one specimen of the some half a dozen on the type sheet represent *C. petitiiana* auctt. and that most of the material and the description refer to another species and is the true *C. petitiiana*. To make some sense of this I borrowed the specimen again. It is annotated by Nelmes (and he gives *C. longipedunculata* in synonymy on the label and also had separated a portion as *C. robusta* Hochst MS (*C. petitiiana* auct., non A. Rich.) which has since been removed and placed on the sheet to which it belongs.

Two specimens from Kenya (Nyeri District: Aberdare National Park, Chania waterfall, 9 April 1975, *Hepper & Field* 4954! & Aberdares, 1.6 km W of Kiandogoro Gate, Gikururu, 14 Oct. 1970, *Mabberley* 337!; habitat in shade in spray of waterfall, river bank; 2950–3050 m) have a lax look to the inflorescence, but this may be due merely to the maturity of the material, with most fruits fallen; and the finely reticulate dark nuts more obvious due to the same reason – obscure reticulation is present in less mature fruits.

19. *Carex simensis* A. Rich. in Tent. Fl. Abyss. 2: 514 (1850); C.B. Clarke in F.T.A. 8: 514 (1902); F.D.O.-A.: 540 (1938); Robyns & Tournay in F.P.N.A. 3: 294 (1955); A.V.P.: 60 (1957); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, fig. 40 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 383, fig. 790 (1983); Lye in Fl. Eth. 6: 508, fig. 212.86 (1997). Type: Ethiopia, Simien, Mt Buahit, *Schimper* II: 1180 (P, holo.; BM!, K!, S, UPS, iso.)

Tussock-forming rhizomatous perennial 15–60 cm tall; basal leaf sheaths short. Leaf blades 3–40 cm long, 3–12 mm wide, plicate and keeled, smooth or scabrid on the margins. Inflorescence of 3–9 erect or slightly drooping spikes born singly or paired at nodes, the upper ± sessile, the lower pedunculate, the stalks 1–10(–20) cm long; spikes 1–7(–10) cm long, 4–7 mm wide, the upper 1–2 male, the lower mostly female with few male flowers at base; glumes dark red-brown to ± black with green area consisting of midrib and extension on each side and often broadening at base, 5–8 mm long, shorter or equalling utricle or when long awned exceeding it. Utricle speckled, pale, 5–6.2(–7) mm long (including 1.5 mm long beak), glabrous, finely ribbed, typically somewhat stipitate; beak bifid with distinct teeth. Stigmas 2–3.

UGANDA. Kigezi District: between Muhavura and Mgahinga, Jan. 1933, *Eggeling* 1066 B!; Mbale District: Mt Elgon, Sebei path, W of Suam R., 22 May 1948, *Hedberg* 1043! & Mt Elgon, Sasa Trail, 1997, *Wesche* 1809!

KENYA. Mt Elgon, Feb. 1932, *Mrs. C. Lugard* 680!; Naivasha District: Aberdares, Kinangop, 13 July 1948, *Hedberg* 1546!; NW Mt Kenya, 18 Aug. 1948, *Hedberg* 1936!

TANZANIA. Moshi District: SW Kilimanjaro, Feb. 1928, *Haarer* 1156!; Iringa District: Udzungwa Mountains National Park, 24 Sept. 2001, *Luke et al.* 7766! & 12 Oct. 2002, *Luke et al.* 9118!

DISTR. U 2, 3; K 3, 4; T 2, 7; Congo-Kinshasa, Rwanda, Ethiopia

HAB. Swampy areas in upland grassland and moorland, montane forest, *Hagenia-Hypericum* alpine belt; 1850–3900 m

SYN. *C. simensis* A. Rich. var. *longistipitata* Kük. in N.B.G.B. 9: 316 (1925). Type: Kenya, W Mt Kenya, *R.E. & T.C.E. Fries* 1300 (B†, syn. (seen by Nelmes), BR, K!, iso.) & same locality, *R.E. & T.C.E. Fries* 1300a (UPS, syn.)

C. mildbraediana Kük. var. *alpicola* Kük. in N.B.G.B. 9: 315 (1925). Types: Kenya, Mt Aberdare, alpine region, *R.E. & T.C.E. Fries* 2671 (UPS, holo.; K!, fragment, K!, iso.)

C. simensis A. Rich. var. *lanuriensis* De Wild., Pl. Bequaert. 4: 247 (1927); Robyns & Tournay, F.P.N.A. 3: 294 (1955) pro parte. Type: Congo-Kinshasa, Ruwenzori, Lanuri Valley, *Bequaert* 4520 (BR, lecto., K!, S, isolecto.) (chosen by Robyns & Tournay)

C. karisimbiensis Chermeson in Bull. Soc. Bot. Fr. 82: 344 (1935). Type: Uganda/Rwanda, *Humbert* 8518 (P, syn.) & NE of Lake Kivu, *Humbert* 8557 (P, syn.)

NOTE. No one comments further (in print) on var. *longistipitata* but Nelmes' label on the isotype states one of the B sheets has a culm with 9 spikes (some branched) exactly like the sheet at BR. Kükenthal distinguishes the variety as having terminal spikes male, and laterals often paired mostly female with few basal male flowers, the utricles long-stipitate finely veined not exceeding the glumes. The base is certainly distinctly narrowed and the beak narrowed, the utricles being 5.5 mm long including the 1.5 mm long beak. The glumes are much paler than typical *simensis* and the synonymy is dubious.

Haines & Lye (Sedges & Rushes E. Afr.: 382 (1983) give *C. fisheri* as a synonym of *C. petitiiana* but Lye (Fl. Eth. 6: 508 (1997)) gives *C. fisheri* as a synonym of *C. simensis*.

The relationship of *C. simensis* to *C. petitiiana*, both described by A. Richard in 1850, is one of the problems needing solution. Specimens with dark blackish brown glumes with broad yellowish or green keels and broad leaves, paired spikelets and stipitate utricles match the type of *C. simensis* but some specimens annotated by Nelmes e.g. Toro District: Ruwenzori Mt,

Apr. 1932, *Oliver* 13 are not separable from *C. petitiana*, differing from *C. simensis* in having narrower leaves and glumes with dense coppery elongate spots rather than solid dark colour. *Hedberg* 1043 is very similar to the type. *Nelmes* said of *Haarer* 1156 'differs from *C. simensis* only in the longer awns'. The mucronate glumes are much longer than the utricles. The material from **T** 7 has very narrow leaves. The Ethiopian type has utricles 6.5 mm long and distinctly stipitate and leaves 1 cm wide.

20. ***Carex thomasi*** *Nelmes* in K.B. 1938: 245 (1938); F.P.S. 3: 330 (1956); Haines & Lye, *Sedges & Rushes E. Afr.*: 381, fig. 785 (1983); Lye in *Fl. Eth.* 6: 508, fig. 212.184 (1997); Friis & Vollesen, *Fl. Sudan Ug. Border* 2: 526 (2005). Type: Sudan, Imatong Mts, Lomuleng, A.S. *Thomas* 1794 (K!, holo.)

Robust tufted perennial 1–1.5 m tall; leaf sheaths purplish. Leaf-blades up to 70 cm long, 4–12 mm wide, flat or plicate, scabrid. Inflorescence of 8–11 drooping spikes usually paired at each leaf sheath but sometimes single, peduncles 2–6 cm long; spikes clearly variegated green and brown, 4–5.5(–8) cm long, 8–12 mm wide, the uppermost with male flowers in lower half, lower spikes often entirely female; glumes coppery reddish brown with broad pale green keel area enclosing midrib and bounded by ribs, narrowly lanceolate, 5–7 mm long, acuminate with excurrent midrib. Utricles green or speckled, 5–6 mm long (including 1.5 mm long narrow scabrid beak); beak distinctly bifid 2-toothed.

NOTE. Occurs in Sudan and Ethiopia; but must almost certainly occur in the Ugandan part of the Imatong Mts. Haines & Lye refer to *Eggeling* 1070 (Uganda, Kigezi District, between Mgahinga and Muhavura), saying it is very close to this species, but it has been named *C. mannii* as have several other specimens from this locality. *C. thomasi* is very close to the "cuprea" form of *C. petitiana* but with longer wider spikes usually in pairs; but *Newbould* 3373 (Kenya, Northern Province, Ndoto Mts, Siruan, 1 Jan. 1959) looks virtually identical with *C. thomasi* - but the spikes are single and the utricule beak shorter.

21. ***Carex vallis-rossetto*** *K. Schum.* in P.O.A. C: 130 (1895); C.B. Clarke in F.T.A. 8: 521 (1902); Kük. in E.P. IV 20 Cyp-Car.: 647 (1909) and in N.B.G.B. 9: 314 (1925); F.D.-O.A. 1: 539 (1938); *Nelmes* in K.B. 1938: 244 (1938); *Napper* in J. E.Afr. Nat. Hist. Soc. 24 (106): 9 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 381, fig. 787 (1983). Type: Tanzania, Lushoto District, W Usambaras, *Holst* 3832 (B†, lecto., K!, fragment) (chosen by *Nelmes*)

Tufted perennial with thick rhizome, 0.5–2 m tall; basal leaf sheaths dark purple. Leaf-blades 30–70 cm long, 6–10 mm wide, flat or plicate, scabrid at least at apex. Inflorescence medium brown, of 8–20 long and drooping spikes arising in pairs from the leaf sheaths, often branched with 1–6 much smaller spikes at base of the main spikes; main spikes 2–20 cm long, 4–8 mm wide, usually all male at top, longest peduncles 3–7 cm long; smaller spikes at base of main spikes up to 1.5 cm long; glumes brownish red with broad green midrib, obovate to ovate-lanceolate with excurrent scabrid midrib, 4–6 mm long. Utricles greenish to brown and often speckled dark reddish brown, 4–6 mm long including 1–1.5(–2) mm long scabrid beaks, distinctly longitudinally ribbed; beak distinctly toothed.

KENYA. Nakuru District: Aberdare Mts, 1905, *James* s.n. & Mt Aberdare, 20 Mar. 1922, *R.E. & T.C.E. Fries* 2533a!; S Nyeri District: Mt Kenya, W side R. Kamweti, near Kamweti Forest Station, 15 Jan. 1985, *Townsend* 2198!

TANZANIA. Moshi District: Kilimanjaro, forest above Mandara Hut, 15. Oct. 1993, *Grimshaw* 93/937! & Kilimanjaro, upper forest edge, Dec. 1932, *Geilinger* s.n.! & 4374!; Rungwe District: Poroto Mts, Ngozi, *Richards* 6573!

DISTR. **K** 3, 4; **T** 2, 3, 6, 7; not known elsewhere

HAB. Damp or swampy places in forest or forest edges of *Hagenia* bamboo etc, *Erica* zone, riverine forest; 1000–3300 m

- SYN. *C. vallis-rosetto* K. Schum. var. *purpurea* Kük. in E.P.IV. 20, Cyp-Car.: 647 (1909). Types: Tanzania, Kilimanjaro, Marangu, *Volkens* 1291 (B†, syn. K!, isosyn.) & foot of Kifinika Volcano, *Volkens* 1342 (B†, syn. K!, isosyn.) (Kük. N.B.G.B. 9: 314 (1925) sinks this variety back into the species)
- C. vallis-rosetto* K. Schum. forma *ramosa* Kük. in N.B.G.B. 9: 314 (1925); F.D.-O.A. 1: 540 (1938); Haines & Lye, Sedges & Rushes E. Afr.: 381 adnot. (1983). Type: Kenya, W Mt Kenya, R.E. & T.C.E. *Fries* 676 (UPS, syn.) & W Mt Kenya, near Forest Station, R.E. & T.C.E. *Fries* 1158 (UPS, syn., K!, iso.)
- C. greenwayi* Nelmes in K.B. 1938: 244 (1938). Type: Tanzania, Kilimanjaro, Bismarck Hill, *Greenway* 3840 (K!, holo.; EA, iso.)

NOTE. Nelmes suggested that the three specimens cited by K. Schumann in 1895 probably represented 2 or 3 species, having borrowed the original material from Berlin. Napper distinguishes *C. greenwayi* from *C. vallis-rosetto* by the former having a straight utricule and the latter having them conspicuously bent at the base of the beak; but there may be confusion with the closely related *C. cyrtosaccus* which has a bent utricule, although Napper does not mention it. I am not convinced *C. cyrtosaccus* and *C. vallis-rosetto* are distinct. See also sp. 22.

22. **Carex cyrtosaccus** C.B. Clarke in F.T.A. 8: 524 (1902); Kük. in E.P. IV 20 Cyp. Car.: 652 (1909); Nelmes in K.B. 1938: 244 (1938); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, fig. 35 (1963); Haines & Lye, Sedges & Rushes of E. Afr.: 382, fig. 788 (1983). Type: Malawi, Mt Mlanji, *Whyte* s.n. (K!, lecto.)*

Densely tufted perennial with thick rhizome, 0.4–1.7 m tall; leaf sheaths purple or spotted purple. Leaf-blades 20–80 cm long, 4–13 mm wide, flat or slightly plicate, ± scabrid. Inflorescence of 10–24 pale greyish brown spikes arising in pairs or threes (less often solitary) (3–)7–1(–10) cm long, 7–12 mm wide, sometimes with 1–3 smaller spikes at the base of the larger spikes; upper 1–3 spikes usually entirely male, the lower usually female with short male area at the tip; glumes reddish brown or speckled, with paler midrib, ovate-lanceolate, 4–6 mm long, with excurrent scabrid midrib. Utricule green often densely speckled dark purplish, 4–6 mm long (including the 1 mm long smooth or scabrid beak), strongly curved; beak with divaricate teeth.

TANZANIA. Lushoto District: Mkuzi Forest Reserve, 18 Oct. 1962, *Semsei* 3527!; Chunya District: Mbeya–Chunya road, just beyond top, 30 June 1969, *Wingfield* 316a!; Songea District: Luwira Kiteza Forest Reserve, 25 Oct. 1956, *Semsei* 2550!

DISTR. T 3, 7; Malawi

HAB. Bogs and streamside in montane forest (*Hagenia* etc.) and grassland; 1800–2700 m

NOTE. Many specimens from the Poroto Mts with the spikes arising singly from the lower leaf sheaths have been separated as sp. B; but this and *C. cyrtosaccus* may perhaps not be distinct from *C. vallis-rosetto*. Nelmes states that Kükenthal had written up sheets at Berlin as *C. vallis-rosetto* var. *cyrtosaccus* but this was apparently not published. The epithet *cyrtostachys* also appears in Fl. Br. India 6: 714 (1894) but is a typographical error for *C. cryptostachys* Brongn. 1828.

23. **Carex** sp. A

Tufted perennial 0.7–1 m tall; stoloniferous; leaf sheath longitudinally narrowly dark brown and yellow striped, later all dark brownish; dark brown stripes often dotted yellow. Leaves up to 90 cm long and 8(–12) mm wide, plicate, scabrid. Inflorescences pale brown, of 4–6 spikes borne singly and without short spikes borne at base of main spikes; spikes yellowish brown, 3.5–7 cm long, 8 mm wide, subsessile to pedunculate, peduncles 1–9 cm long; apical spikes all male or 1/3 female at tip or with some female flowers at base; mainly female spikes sometimes partly male at base;

* C.B. Clarke cited three *Whyte* specimens, one from Mt Mlanji, one from Mt Malosa and one from Mt Zomba; Haines and Lye give “the type” as Mt Mlanji, *Whyte* s.n. at K and this is taken as a lectotypification.

glumes with pale brown linear speckles at sides, with keel obscure and not markedly paler, long and narrow, spreading, usually exceeding utricles, 6 mm long. Utricles densely marked with linear brown speckles, 5 mm long including 1.5–2 mm long beak, often curved or bent; beak with very distinct divaricate teeth.

TANZANIA. Mbeya District: Poroto Mts, Igoma to Kitulo road, 31 Dec. 1969, *Wingfield* 563! & by tributary of Musambalizu stream, 0.5 km above Ugola–Simabmu road, 23 Dec. 1969, *Wingfield* 332b! & Livingstone Forest Reserve, 28 Sept. 1970, *Thulin & Mhoro* 1248!

DISTR. T 7; not known elsewhere

HAB. *Hagenia* forest and edges of *Podocarpus* and bamboo forest, swamps and marshes; 2100–2800 m

NOTE. *Hooper & Townsend* 1749 (Poroto Mts between Igoma and Kitulo, Kikonda camp, 29 May 1980) has particularly distinct teeth to the utricule beak. All the material of the taxon had been determined as *C. fischeri* (i.e. *C. petitiana*) but this has shorter glumes with more evident midribs. Species B is probably no more than an inflorescence variant of *C. cyrtosaccus* being similar in the curved utricles and striped leaf sheaths. All the material is from the Poroto Mts.

24. *Carex mildbraediana* *Kük.* in E.P. IV: 20 Cyp.-Car.: 767 (1909); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 11, fig. 34 (1963) (pro parte); Maquet in Fl. Rwanda 4: 430 (1988). Type: Rwanda, [Rukarara] (Lukarara), Rugege Forest, *Mildbraed* 966 (B†, holo.; K!, fragment)

Tufted perennial 0.3–1.7 m tall with woody rhizome. Leaves up to as long as the stems, 4–9(–16) mm wide; lower sheaths purplish. Inflorescences panicles up to 30 cm long with 15–25 dark brown spikes, the lower single or paired; upper all or half male with female flowers at base, 4–7 cm long, 7–9 mm wide; lower peduncles 5–7 cm long, upper short; glumes dark brown with narrow pale midrib, lanceolate, 4–5.5 mm long, glabrous, shortly aristate. Utricles speckled, (3–)3.5–5 mm long including (0.3–)0.5–1 mm long beak which is obliquely truncate with small erect teeth, not conspicuously two-toothed.

UGANDA. Toro District: Ruwenzori, Apr. 1932, *Oliver* 6!

DISTR. U 2; Congo-Kinshasa, Rwanda

HAB. No data; 3000 m

SYN. *C. ramosipes* Chermезon in Bull. Soc. Bot. Fr. 82: 343 (1935); Robyns & Tournay, F.P.N.A. 3: 290 (1955). Type: Congo-Kinshasa, Nyiragongo, *Humbert* 7939 (BR, holo.; K! fragment)
C. bequaertii sensu Hedberg, A.V.P.: 59 (1957) pro parte, *non* De Wild.

25. *Carex mannii* *E.A. Bruce* in K.B. 1933: 150 (1933); Robyns & Tournay, F.P.N.A. 3: 293 (1955); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 18 (1963) & in F.W.T.A. ed.2, 3: 349 (1972); Haines & Lye, Rushes & Sedges of E. Afr.: 380, fig. 783 (1983); Maquet in Fl. Rwanda 4: 730 (1988). Type: Bioko [Fernando Po], Clarence Peak, *Mann* 1478 (K!, holo.; K!, iso.)

Tufted rhizomatous perennial 0.8–1.7 m tall. Leaves ± equalling the stems, 4–6 mm wide, the basal sheaths purplish. Inflorescences narrowly paniculate, ± 20 cm long; spikes dark brown, ± 9, elongate cylindrical, ± 5 cm long, the lower paired, densely flowered; upper spikes entirely male or female at the base, the remainder mostly female or male at extreme apex; peduncles unequal, scabrid; rhachis scabrid; bracts leafy; glumes dark brown with distinct pale keel, lanceolate, shorter than utricule, acuminate-apiculate. Utricles 5–5.5 mm long including 1.5–1.8 mm beak, distinctly toothed, with several longitudinal ribs; nut brown, micropunctate.

UGANDA. Toro District: Ruwenzori, Yeria R., May 1894, *Scott Elliot* 7873!; Kigezi District: col between Mgahinga and Muhavura, Jan. 1933, *Eggeling* 1070! & same locality, 24 Apr. 1970, *Lye & Katende* 5300!

DISTR. U 2; Bioko, Cameroon, E Congo-Kinshasa, Rwanda

HAB. Swamps in upland forest; 2450–3100 m

- SYN. *C. boryana* Schkuhr var. *minor* Boott, *Illustr. Carex* 3: 111 (1862) pro parte quoad t. 348 (which is based on *Mann* 1478, a syntype of var. *simplicissima*)
C. boryana sensu Engl., *Hochgebirgsfl. Trop. Afr.*: 153 (1892); C.B. Clarke in *F.T.A.* 8: 523 (1902) pro parte, *non* Schkuhr
C. boryana Schkuhr var. *simplicissima* Kük. in *E.P. IV.* 20 *Cyp.-Car.*: 651 (1909). Types: Bioko [Fernando Po], Clarence Peak, *Mann* 661, 1478 (K, syn. ubi?); Uganda, Ruwenzori, *Scott Elliot* 7873 (K, syn.), Réunion, *Boivin* 997 (P, syn.)
C. simensis A. Rich. var. *lanuriensis* De Wild., *Pl. Bequaert.* 4: 247 (1927) pro parte quoad *Bequaert* 4680
C. simensis sensu Staner, *Rev. Zool. Bot. Afr.* 23: 212 (1933) & Chermeson in *Bull. Soc. Bot. Fr.* 82: 344 (1935), *non* A. Rich.

NOTE. In 1906 C.B. Clarke redetermined the Scott Elliot specimen as *Carex vallis-rosseto* K. Schum. Bruce cited it as *C. mannii* in her original description.

26. *Carex* sp. B

Short tufted perennial 0.3–1(–2) m tall; leaf sheaths red or purplish. Leaves 40–80 cm long, 7–10 mm wide, plicate, scabrid at the margins, particularly at the apex. Inflorescence with 6–8 or more spikes mostly borne singly but often with additional short spikes at the base of main spike; terminal spike male, 2.5–3 cm long, rest female, 2.5–6(–7) cm long, 8–10 mm wide, uppermost mostly subsessile, lower pedunculate, peduncles 1–3 cm long; glumes coppery to dark brown with pale or green midrib, oblong, 4–9 mm long, mucronate, spreading, equalling or (sometimes much) longer than the utricule. Utricule 3.5–5.5 mm long including 0.5–1.5 mm long beak mostly with short straight teeth.

TANZANIA. Morogoro District: Uluguru Mts, Lukwangule, 4 Jan. 1934, *Michelmores* 916! & 2 Jan. 1934, *Michelmores* 882!; Uluguru S catchment Forest Reserve, W side of Lukwangule Plateau, above Tchenzema Village, 6 Feb. 2001, *Jannerup & Mhoro* 417! & Lukwangule Plateau, above Chenzema, 2 Jan. 1975, *Polhill & Wingfield* 4661!

DISTR. T 6

HAB. Boggy areas by streams and in peat bogs with *Sphagnum* and bracken; 2350–2550 m

NOTE. The nine collections of this species had been given variously six different names, but I have not been able to confirm they belong to any of these. Nelmes studied the two *Michelmores* specimens and noted the utricule beak had short straight teeth in a pencilled note on the cover. He stated the utricule was of the Uganda and West Tropical Africa '*simensis*' type but differed from *Mann* 2099 (Cameroon Mt, named *C. preussii* K. Schum. by Napper in *F.W.T.A.* 3: 347 (1972) and *C. simensis* by C.B. Clarke) in being narrower, more faintly veined and not at all stipitate. *Mann* 2099 is the type of *C. preussii* K. Schum. var. *camerunensis* Nelmes which I have put into the synonymy of *C. petitiiana* (p. 439). It has the beak teeth sharply divaricate.

27. *Carex cognata* *Kunth*, *Enum. Pl.* 2: 502 (1837); Napier in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 12, fig. 20, 21 (1963); Haines & Lye, *Sedges & Rushes E. Afr.*: 383 (1983); Maquet in *Fl. Rwanda* 4: 429 (1988); Gordon-Gray in *Strelitzia* 2: 39 fig. 13 G–I, 14 (quite unlike any E. African material) (1995); Lye in *Fl. Eth.* 6: 510 (1997). Type: South Africa, Zwellendam et George, *Mundt* s.n. (B†, holo.)

Tufted perennial from creeping rhizome with short scaly stolons; stems 0.3–1 m tall, glabrous. Leaf-blades 10–80(–120) cm long, 3–7(–10) wide, plicate, scabrid on the margins at least at the tips; some transverse ribs occur between the longitudinal veins but are obscure. Main inflorescence bracts leafy, 3–6 times as long as spikes, bracts successively smaller upwards. Inflorescence of 4–6 pale, erect, crowded, sessile or subsessile spikes (or in S Tanzania and South Africa the peduncles sometimes well-developed); spikes 2–3, 1–4 cm long, 2–4 mm wide, the terminal spike male and lateral spikes female with conspicuous crown of empty scales at the tip; glumes pale

golden brown, dark brown or red-brown, 3–5 mm long, acuminate, densely scabrid on margin and veins. Utricles pale greenish, golden brown or red-brown, ovoid, 3–4.5 mm long (including beak 1–1.5 mm long), many-veined; beak glabrous, strongly two-toothed. Nutlet yellowish white or dark with pale edges with a long persistent curving style.

var. **cognata**; Haines & Lye, *Sedges & Rushes E. Afr.*: 384 (1983); Lye in *Fl. Eth.*: 511 (1997)

Spikes pale, sessile; glumes yellow or green. Utricle golden brown, 3.5–4 mm long, with teeth of beak less marked \pm as long as the base of beak.

UGANDA. Kigezi District: Kanaba Pass, 13 Feb. 1945, *Greenway & Eggeing* 7123! & same area 1.6 km on Kabale side of PWD camp, 10 Sept. 1952, *Norman* 185! & near Kabale, Kashambya Valley, 21 June 1967, *Haines* 4524!

TANZANIA. Ufipa District: Nsangu area, Molo, 1 Jan. 1962, *Robinson* 4855!; Iringa District: Mafinga [Sao Hill], 30 Oct. 1947, *Greenway & Brenan* 8281!; Rungwe District; between Poroto and Rungwe Mts, Upper Kiwara R. fishing camp, 29 Nov. 1958, *Napper* 1134!

DISTR. U 2; T 4, 7; Congo-Kinshasa, Rwanda, South Africa

HAB. Swampy areas in bamboo forest, perennially wet bogs, sometimes in standing water, *Syzygium* forest, plateau grassland; 1500–2500 m

SYN. *C. retrorsa* Nees in *Linnaea* 10: 204 (1835), *non* Schwernitz (1824)

C. congolensis Turrill in K.B. 1912: 240 (1912). Type: Congo-Kinshasa, Shaba, Lubumbashi, *Rogers* 10082 (K!, holo.)

C. pseudosphaerogyne Nelmes in K.B. 1937: 473 (1937); Napper in *Journ. E. Afr. Nat. Hist. Soc.* 24 (106): 12, f. 22 (1963). Type: Uganda, Kigezi District, Virunga Mts, NW end of Lake Bunyonyi, *G. Taylor* 2146 (BM!, holo.)

C. cognata Kunth. var. *congolensis* (Turrill) Lye in *Nordic Journ. Bot.* 3: 244 (1983); Haines & Lye in *Sedges & Rushes E. Afr.*: 384, fig. 91 (1983)

NOTE. Haines & Lye distinguish var. *cognata* from var. *congolensis* by having leaves up to 9 mm wide rather than up to 6 mm, glumes yellow to green with wide whitish margins, 3.5–4 mm long including 1–1.5 mm long beak rather than 4.5 mm; var. *congolensis* is said to occur in Uganda (Kigezi) but not known from Kenya or Tanzania; var. *cognata* is recorded in East Africa only from the southern highlands in Tanzania. It has always been usual to refer S Tanzanian material to *C. congolensis* (Napper 1963); Nelmes determined *Stolz* 1108 from Tanzania, Rungwe, 3 Feb. 1912 as *C. congolensis* but it had previously been determined as *C. cognata* by ? Kükenthal. Lye (*Fl. Eth.*: 511) records *C. cognata* var. *cognata* from Southern Tanzania. It seems clear that the separation of a var. *cognata* and a var. *congolensis* is not tenable and I have followed Maquet (*Fl. Rwanda* 3: 429 (1988)) in not separating them. Var. *abyssinica* (Chiov.) Lye, known only from the type from N Ethiopia, is distinguished by its red-brown glumes and utricles.

var. **drakensbergensis** (*C.B. Clarke*) *Kük.* in *E.P. IV*, 20, *Cyp.-Car.*: 699 (1909). Types: South Africa, Drakensburg, near Harrismith, *Buchanan* 112 (K!, syn.) & Mooi R. near Potchefstroom, *Nelson* 72 (K!, syn.) & Natal, *Buchanan* 137 (K!, syn.) & ?Orange Free State, *Buchanan* 132 (K!, syn.)

Spikes pale to dark (dark brown in E. African material), the peduncles 1–3(–5) cm long; rostrum of utricule very distinctly divaricately toothed, the teeth needle-like up to about twice as long as base of beak.

TANZANIA. Njombe District: Poroto Mts, Kitulo Plateau, Ndumbi Valley, 24 Mar. 1991, *Bidgood et al.* 2121! & same locality, 24 Mar. 1991, *Bidgood et al.* 2110!

DISTR. T 7; South Africa, Botswana and Swaziland

HAB. Montane grassland along small stream; 2500 m

SYN. *C. drakensbergensis* C.B. Clarke in *Fl. Cap.* 7: 309 (1898)

NOTE. Gordon-Gray does not keep up the variety nor do Germishuizen & Meyer in their Checklist (*Strelitzia* 14) but it is recognised by some South African workers in annotations on Kew material. The East African material is so very distinct from var. *cognata* that I have not hesitated to recognise it. Gordon-Gray states of the syntypes *Buchanan* 132 and 137 Natal, Harrismith ‘not located’ but there is no exact location given on the Kew sheets.

28. *Carex phragmitoides* Kük. in F.R. 21: 329 (1925); F.D.-O.A. 1: 540 (1938); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 12 (1963); Haines & Lye, Sedges & Rushes E. Afr.: 384, fig. 792 (1983). Type: Tanzania, Masai District, Ossirwa Crater, Jaeger 446 (B†, holo.; K!, fragment)

Tufted leafy perennial 40–90 cm tall, with creeping woody rhizome. Leaves overtopping the stems, 6–12 mm wide, flat; sheaths brown. Inflorescence of 4–5 clustered dense spikes, 4 cm long, 4 mm wide; terminal male and laterals female; bracts leafy, exceeding the inflorescence; glumes brown or dark brown, oblong, 5.5–7 mm long including the 2–4.5 mm green or reddish brown excurrent scabrid-hairy arista; margins and surface of glumes scabrid. Utricles greenish or dark reddish brown, much shorter than the glumes, ellipsoid, 3–4 mm long, stipitate (fide Kükenthal), distinctly ribbed, sparsely hispid; beak distinctly bifid.

KENYA. Ravine District: Lake Narasha, 13 Apr. 1966, Haines 120!; Naivasha District: Aberdare Mts, Kinangop, 27 Oct. 1934, G. Taylor 1354!; NE Mt Kenya, Rotundu, 25 Sept., 1997, Luke & Luke 4777!

TANZANIA. Masai District: Ossirwa Crater, 13 Feb. 1907, Jaeger 446!

DISTR. K 3, 4; T 2; not known elsewhere

HAB. Upland bogs and marshes in ericaceous zone, streamsides, crater lake edges; 2500–3100 m

SYN. *C. taylora* Nelmes in K.B. 1937: 472 (1925); Napper in Journ. E. Afr. Nat. Hist. Soc. 24 (106): 12 (1963). Kenya, Naivasha District, Aberdare Mts, Kinangop, Taylor 1354a (BM! holo.; K! fragment)

29. *C. sp. C*

Slender tufted perennial ± 70 cm tall; stolons or rhizome not collected; leaf sheaths partly narrowly longitudinally striped black and yellow, later dull brownish. Leaves 90 cm long, 7.5 mm wide, plicate, scabrid. Inflorescence slender, 9 cm long with ± 9 short sessile spikes, the upper densely congested and not easy to sort out without damaging the unique material, the 4 lower ones separated by 1–2 cm; spikes green, up to 1.5 cm long, 6 mm wide; apical spike probably male and rest female; glumes green with scattered linear brown speckles, 3.5 mm long, acute with some marginal scabridity near apex. Utricles green, narrowly ovoid, ± 3.5 mm long (including 0.5–0.8 mm long beak), strongly ribbed; beak with short erect teeth and some minute intermediary ones. Nut black, densely reticulate-punctate.

KENYA. Elgeyo-Marakwet District: Cherangani Hills, Kiptaber Forest, between Makutano and Kapcherop, 16 Aug. 1978, Lye 9128!

DISTR. K 3

HAB. Forest edge; 2750 m

NOTE. No other material has been seen of this very distinct plant. The collector made no suggestion as to identity on the collection label. D. Simpson has annotated it *Carex* sp. but until more material is available nothing can be done. It may be an undescribed species. I showed it to Lye when he visited Kew and he annotated it “*Carex* sp. insect attacked” which perhaps explains its appearance, nevertheless there are many well-formed utricles with matured nutlets mostly pale yellow but some black.

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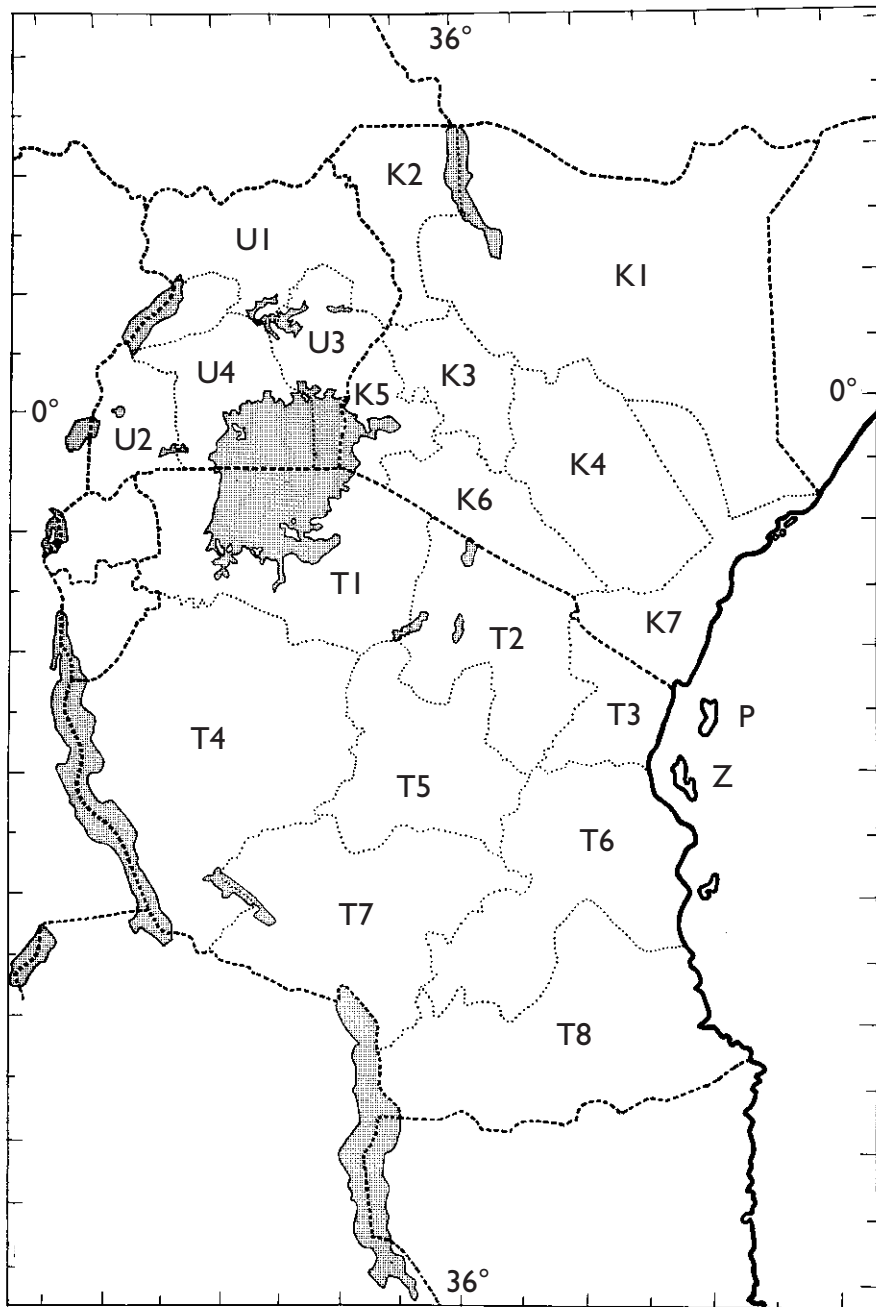
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NEW NAMES VALIDATED IN THIS PART

- Bulbostylis angustespicata** (Lye) Verdc. **comb. nov.**
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Bulbostylis lolokweensis Verdc. **sp. nov.**
Bulbostylis lyei Verdc., **nom. nov.**
Bulbostylis meruensis Verdc. **sp. nov.**
Bulbostylis mlangoyajehenum Verdc. **sp. nov.**
Bulbostylis squarrosa (Lye) Verdc. **comb. nov.**
Carex lycurus K. Schum. subsp. **scabrida** (Kük.) Verdc. **comb. nov.**
Cyperus perrieri (Cherm.) Hoenselaar **comb. nov.**
Fimbristylis quinquangularis (Vahl) Kunth subsp. **macroglumis** (Lye) Verdc. **comb. nov.**
Fimbristylis quinquangularis (Vahl) Kunth subsp. **pallescens** (Lye) Verdc. **comb. nov.**
Fuirena mutali Muasya & I. Nordal **sp. nov.**
Kyllinga brevifolia Rottb. var. **lurida** (Kük.) Beentje, **comb. nov.**
Kyllinga tenuifolia Steud. var. **ciliata** (Boeck.) Beentje **comb. nov.**
Pycreus laxespicatus (Kük.) Hoenselaar **comb. nov.**
Pycreus mundtii Nees var. **densispiculosus** (Kük.) Hoenselaar **comb. nov.**
Pycreus sumbawangensis Hoenselaar **sp. nov.**
Schoenoplectiella erecta (Poir.) Lye subsp. **raynalii** (Schuyler) Beentje, **comb. nov.**
Schoenoplectiella lateriflora (Gmel.) Lye subsp. **laevinux** (Lye) Beentje, **comb. nov.**

FINAL NOTE. As this part went to press, **Fuirena bidgoodae** Hoenselaar & Muasya was published in K.B. 64, 4: 685 (2010). It is close to **F. claviseta** (p. 16) but has a pubescent glume; it is only known from the Dodoma area of central Tanzania.

GEOGRAPHICAL DIVISIONS OF THE FLORA



LIST OF ABBREVIATIONS

A.V.P. = O. Hedberg, Afroalpine Vascular Plants; **B.J.B.B.** = Bulletin du Jardin Botanique de l'Etat, Bruxelles; Bulletin du Jardin Botanique Nationale de Belgique; **B.S.B.B.** = Bulletin de la Société Royale de Botanique de Belgique; **C.F.A.** = Conspectus Florae Angolensis; **E.J.** = A. Engler, Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie; **E.M.** = A. Engler, Monographien Afrikanischer Pflanzen-Familien und Gattungen; **E.P.** = A. Engler, Das Pflanzenreich; **E.P.A.** = G. Cufodontis, Enumeratio Plantarum Aethiopiae Spermatophyta; in B.J.B.B. 23, Suppl. (1953) et seq.; **E. & P. Pf.** = A. Engler & K. Prantl, Die Natürlichen Pflanzenfamilien; **F.A.C.** = Flore d'Afrique Centrale (*formerly* F.C.B.); **F.C.B.** = Flore du Congo Belge et du Ruanda-Urundi; Flore du Congo, du Rwanda et du Burundi; **F.E.E.** = Flora of Ethiopia & Eritrea; **F.D.-O.A.** = A. Peter, Flora von Deutsch-Ostafrika; **F.F.N.R.** = F. White, Forest Flora of Northern Rhodesia; **F.P.N.A.** = W. Robyns, Flore des Spermatophytes du Parc National Albert; **F.P.S.** = F.W. Andrews, Flowering Plants of the Anglo-Egyptian Sudan or Flowering Plants of the Sudan; **F.P.U.** = E. Lind & A. Tallantire, Some Common Flowering Plants of Uganda; **F.R.** = F. Fedde, Repertorium Speciorum Novarum Regni Vegetabilis; **F.S.A.** = Flora of Southern Africa; **F.T.A.** = Flora of Tropical Africa; **F.W.T.A.** = Flora of West Tropical Africa; **F.Z.** = Flora Zambesiaca; **G.F.P.** = J. Hutchinson, The Genera of Flowering Plants; **G.P.** = G. Bentham & J.D. Hooker, Genera Plantarum; **G.T.** = D.M. Napper, Grasses of Tanganyika; **I.G.U.** = K.W. Harker & D.M. Napper, An Illustrated Guide to the Grasses of Uganda; **I.T.U.** = W.J. Eggleing, Indigenous Trees of the Uganda Protectorate; **J.B.** = Journal of Botany; **J.L.S.** = Journal of the Linnean Society of London, Botany; **K.B.** = Kew Bulletin, or Bulletin of Miscellaneous Information, Kew; **K.T.S.** = I. Dale & P.J. Greenway, Kenya Trees and Shrubs; **K.T.S.L.** = H.J. Beentje, Kenya Trees, Shrubs and Lianas; **L.T.A.** = E.G. Baker, Leguminosae of Tropical Africa; **N.B.G.B.** = Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem; **P.O.A.** = A. Engler, Die Pflanzenwelt Ost-Afrikas und der Nachbargebiete; **R.K.G.** = A.V. Bogdan, A Revised List of Kenya Grasses; **T.S.K.** = E. Battiscombe, Trees and Shrubs of Kenya Colony; **T.T.C.L.** = J.P.M. Brenan, Check-lists of the Forest Trees and Shrubs of the British Empire no. 5, part II, Tanganyika Territory; **U.K.W.F.** = A.D.Q. Agnew (or for ed. 2, A.D.Q. Agnew & S. Agnew), Upland Kenya Wild Flowers; **U.O.P.Z.** = R.O. Williams, Useful and Ornamental Plants in Zanzibar and Pemba; **V.E.** = A. Engler & O. Drude, Die Vegetation der Erde, IX, Pflanzenwelt Afrikas; **W.F.K.** = A.J. Jex-Blake, Some Wild Flowers of Kenya; **Z.A.E.** = Wissenschaftliche Ergebnisse der Deutschen Zentral-Afrika-Expedition 1907-1908, 2 (Botanik).

FAMILIES OF VASCULAR PLANTS REPRESENTED IN THE FLORA OF TROPICAL EAST AFRICA

The family system used in the Flora has diverged in some respects from that now in use at Kew and the herbaria in East Africa. The accepted family name of a synonym or alternative is indicated by the word "see". Included family names are referred to the one used in the Flora by "in" if in accordance with the current system, and "as" if not. Where two families are included in one fascicle the subsidiary family is referred to the main family by "with".

PUBLISHED PARTS

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