RHEEDEA
Journal of the Indian Association for Angiosperm Taxonomy

RESEARCH ARTICLE

Vol. 31(4): 235–247 (2021)
ISSN: 0971-2313 (Print edition)
ISSN: 2582-2438 (Online edition)
https://dx.doi.org/10.22244/rheedea.2021.31.04.01

Conspectus of the genus *Pseudanthistiria* (Poaceae: Andropogoneae)

Drisya V. & A.K. Pradeep*

Department of Botany, University of Calicut, Malappuram District, Kerala – 673 635, India
*Email: akpradeep1@rediffmail.com

Abstract: A taxonomic account on the small grass genus *Pseudanthistiria* (Hack.) Hook.f. with two species: *P. umbellata* (Hack.) Hook.f. and *P. heteroclita* (Roxb.) Hook.f. is provided. *Pseudanthistiria burmanica* Hook.f. is reduced to the synonymy of *P. umbellata*. Detailed descriptions, illustrations, conservation status, and a taxonomic key for the identification of the species are provided. Lectotypes for three names, *Anthistiria heteroclita* Roxb., *Pseudanthistiria burmanica* Hook.f. and *P. hispida* Hook.f. are designated.

Keywords: *Andropogon*, *Anthistiria*, Lectotypification, Synonymy, Taxonomy, Western Ghats.

Introduction

Hooker (1897) established the genus *Pseudanthistiria* Hook.f. from *Andropogon* L. sect. *Pseudanthistiria* Hack., with four species. The genus occurs in Bangladesh, China, India to Thailand and Sri Lanka (Clayton & Renvoize, 1986; Watson & Dallwitz, 1994; Chen & Phillips, 2006a). *Pseudanthistiria* can easily be distinguished from all other Andropogoneae by its raceme comprising five spikelets arranged on a jointed rachis, with a basal pair of one sessile and one pedicelled, and a terminal triad of one sessile and two pedicelled spikelets.

Grass classification schemes of Kellogg (2015) and Soreng *et al*. (2017) merged the subtribe Anthistiriinae to Andropogoninae, but they did not include *Pseudanthistiria* in their molecular phylogenies and assumed it to be part of subtribe Andropogoninae. Kellogg (2015) placed it in a DIHETEROPOGON + PARAHYPARRHENIA + PSEUDANTHISTIRIA group of subtribe Andropogoninae. Soreng *et al.* (2017) accepted *Pseudanthistiria* as a distinct genus and placed it under subtribe Andropogoninae. The subtribe Anthistiriinae is accepted in the new subtribal classification of Andropogoneae by Welker *et al.* (2020), but they failed to include *Pseudanthistiria* in their study. Recently, Arthan *et al*. (2021) recognized both the taxa, *Pseudanthistiria* as well as the subtribe Anthistiriinae as distinct and proposed a new subtribal placement of *Pseudanthistiria* in Anthistiriinae as opposed to Andropogoninae based on whole plastome and nuclear data.

The history of the genus dates back to Roxburgh (1820), with the publication of *Anthistiria heteroclita* Roxb. in his '*Flora Indica or Descriptions of Indian Plants*'. However, Nees von Esenbeck (1841) transferred this species to the genus *Andropogon* under the new combination, *Andropogon heteroclitus* (Roxb.) Nees. Subsequently, Hackel (1889) produced a comprehensive taxonomic treatment of Andropogoneae and broadly classified the genera under two series with several subgenera and sections. He placed *Andropogon heteroclitus* under *Andropogon* subg. *Hypogynium* sect. *Pseudanthistiria* Hack., along with another species, *A. umbellatus* Hack. Hackel's (1889) *Andropogon umbellatus* was originally described based on type material of Thwaites's (1864) *Anthistiria heteroclita nom. nud.* and not on Roxburgh's (1820) *A. heteroclita*. Hooker (1897) raised sect. *Pseudanthistiria* to generic rank and, along with *P. heteroclita* (Roxb.) Hook.f. and *P. umbellata* (Hack.) Hook.f., described two more species, *P. burmanica* Hook.f. and *P. hispida* Hook.f.

Received: 28.05.2021; *Revised & Accepted*: 11.09.2021
Published Online: 31.12.2021

Pseudanthistiria hispida was placed in synonymy of *P. heteroclita* (Clayton *et al*., 2006; Clayton *et al*., 2021). All three species, *viz*. *Pseudanthistiria burmanica*, *P. heteroclita* and *P. umbellata*, occur in India (Bor, 1960; Sreekumar & Nair, 1991; Kabeer & Nair, 2009; Potdar *et al*., 2012; Nayar *et al*., 2014), mostly concentrated in Peninsular India especially along the Western Ghats of South India. However, while studying the genus in Peninsular India, *P. burmanica* was found to be conspecific with *P. umbellata* and herein is reduced into synonymy of *P. umbellata*. Another name, *Pseudanthistiria emeinica* S.L.Chen & T.D.Zhuang described from Sichuan (Emei Shan), China has since been reduced into synonymy of *Themeda villosa* (Poir.) A.Camus, as the name was based "on a few anomalous specimens" (Chen & Phillips, 2006b). Thus, only two species are herein accepted in the genus *Pseudanthistiria* in India and worldwide.

Materials and Methods

The present study is based on findings from continuous botanical exploration in Peninsular India during 2015–2021. The taxonomic identity of the taxa was confirmed by critical examination of live specimens in the field as well as herbarium specimens at BARO, BM, BR, CAL, CALI, FRC, K, MEL, MH, P, RHT, SUK, TBGT and W. Micro-morphological characters, taxonomic descriptions and illustrations were prepared using Motic SMZ-168 stereomicroscope (Hong Kong, China) and Leica M80 stereomicroscope fitted with a Leica digital camera and camera lucida (Mannheim, Germany). The terminology used in the morphological descriptions are as per Simpson (2006) and Beentje (2016). Herbarium acronyms follow Thiers (continuously updated). For the assessment of a provisional conservation status of the taxa, the extent of occurrence (EOO) and area of occupancy (AOO) were estimated using GeoCAT (Geospatial Conservation Assessment Tool) by Kew (http://geocat.kew.org/; Bachman *et al*., 2011).

Taxonomic Treatment

Pseudanthistiria (Hack.) Hook.f., Fl. Brit. Ind. 7: 219. 1897. *Andropogon* subg. *Hypogynium* sect. *Pseudanthistiria* Hack. in A.DC. & C.DC., Monogr. Phan. 6: 400. 1889. *Hypogynium* sect. *Pseudanthistiria* Roberty, Boissiera 9: 189. 1960. *Lectotype* (designated by Uniyal, 1984): *Pseudanthistiria heteroclita* (Roxb.) Hook.f.

Annual herbs, creeping or erect. Leaf blade narrowly ovate or narrowly elliptic to linear or lanceolate. Ligule membranous. Inflorescence terminal, false panicle interrupted by spathes and spatheoles, single raceme comprises 2 sessile and 3 pedicelled spikelets (arranged on a jointed rachis, with a basal pair of one sessile and one pedicelled spikelet and a terminal triad of one sessile and two pedicelled spikelets), which is enclosed by a spatheole. Spatheole often leafy, sometimes with developed sheath and lamina. Rachis jointed with two internodes. Sessile spikelet bisexual, elliptic to narrowly elliptic, awned, brownish; callus obtuse to slightly oblique; upper lemma reduced to the hyaline base of the awn; upper palea present, membranous; lodicules 2, cuneate; stamens 3, yellowish; ovary narrowly elliptic to oblong, styles 2, fused at the apex of ovary. Pedicelled spikelets male, elliptic to narrowly elliptic or lanceolate, greenish; upper lemma membranous, variable in shape; upper palea absent or reduced. Lower floret usually absent both in the sessile and pedicelled spikelet. Caryopsis narrowly elliptic to oblong with persistent styles.

Distribution: Bangladesh, China, India to Thailand and Sri Lanka. Species of open habitats, hill sides and disturbed ground (Clayton & Renvoize, 1986; Watson & Dallwitz, 1994; Chen & Phillips, 2006a).

Key to the species of *Pseudanthistiria*

1. Culms erect, robust; leaf blade adaxially scabridulous and sparsely tubercle-based hairy, abaxially tubercle-based hairy and sparsely scabridulous; sessile spikelet lower glume apex muticous and truncate ..... *P. heteroclita*

1. Culms decumbent, creeping below and rooting at the nodes, slender; leaf blade adaxially scabridulous with a few tubercle-based hairs at base, abaxially glabrous to tubercle-based hairy with scabridulous midvein; sessile spikelet lower glume apex muticous, truncate or notched ... *P. umbellata*

Pseudanthistiria heteroclita (Roxb.) Hook.f., Fl. Brit. India 7: 219. 1897; C.E.C.Fisch. in Gamble, Fl. Madras 3: 1749. 1934; Bor, Grass. Burma Ceylon India Pakistan 203. 1960; N.P. Singh, U.R. Deshpande & R.S. Raghavan, Bull. Bot. Surv. India 18(1-4): 124. 1976; Karthik., S.K. Jain, M.P. Nair & Sanjappa, Fl. Ind. Enum. Monocot. 252. 1989; Sreek. & V.J.Nair, Fl. Kerala Grass. 179. 1991; S.Moulik, Grass. Bam. India 1: 223. 1997; Kabeer & V.J.Nair, Fl. Tamil Nadu Grass. 458. 2009; Potdar, Salunkhe & S.R.Yadav, Grass. Maharashtra 232. 2012; T.S.Nayar, M.Sibi & A. Rasiya Beegam, Fl. Pl. Western Ghats, India 2: 1196. 2014. *Anthistiria heteroclita* Roxb., Fl. Ind. 1: 253. 1820. *Andropogon heteroclitus* (Roxb.) Nees, Fl. Afr. Austral. Ill. 1: 115. 1841; Hack. in A.DC. & C.DC., Monogr. Phan. 6: 400. 1889, *p.p. Sorghum heteroclitum* (Roxb.) Kuntze, Revis. Gen. Pl. 2. 791. 1891, *p.p. Hypogynium heteroclitum* (Roxb.) Roberty f. *heteroclitum*, Boissiera 9: 190. 1960, *pp.*

Lectotype (designated here): *Roxb.* no. 1774 (Icones Roxburghianae).

Pseudanthistiria hispida Hook.f., Fl. Brit. India 7: 219. 1897. *Lectotype* (designated here): INDIA, **Madhya Pradesh**, the stream near Khari, Khandwa district, 13.12.88, *J.F. Duthie* 8478 (K [K000245934 digital image!]; isolecto BM [BM000959812 digital image!, CAL [Accession number 532507!]). Other original material: K [K000245935 digital image!], CAL [Accession number 532506!], K [K000975016 digital image!].

Pseudanthistiria intermedia S.P.Birari & R.D'cruz, J. Bombay. Nat. Hist. Soc. 73(1): 192. 1976. *Type*: INDIA, **Maharashtra**, Khandesh, Satpura (Toranmal) Range, 17. 11. 1968, *Rui D'Cruz* I-681 BC (holo Herbarium of College of Agriculture, Pune [*n.v.*]; iso BSI [*n.v.*]). **Figs. 1–3**

Annual, erect, stout, branched herbs, 7–120 cm tall, rooting from lower nodes. Culms erect, geniculate at base; internodes 1–16 cm long, glabrous, pale yellowish with pink dots and streaks; nodes glabrous, dark pinkish–brownish. Leaf sheath 1.5–5 cm long, folded, rounded towards base, keeled towards apex, margin entire, chartaceous, adaxial surface glabrous, smooth, abaxial surface scabrous or tubercle-based hairy at upper half or upper 1/3rd, hairs 0.8–3 mm long, hyaline, greenish. Leaf blade narrowly ovate–lanceolate, 20–150 × 2–5 mm, margin scabridulous, thicker than lamina, apex acute, chartaceous, adaxial surface scabridulous and sparsely tubercle-based hairy, abaxial surface tubercle-based hairy and sparsely scabridulous, hairs up to 2 mm long, greenish, 7-veined, midrib prominent, lateral veins distinct. Ligule *c.* 1 mm long, apex ciliolate, truncate–obtuse, membranous, hyaline. Inflorescence terminal, false panicle interrupted by spathes and spatheoles; raceme comprises 2 sessile and 3 pedicelled spikelets, which is subtended by a spatheole; flowering axis linear, 0.5–6 cm long, primary branch erect, further branches more or less flexuous, ventrally compressed, smooth to sparsely scabridulous, yellowish green, sometimes with purple tinge. Spathe encloses 6–9 racemes, narrowly elliptic, cymbiform, 1.5–2.5 × 0.2–0.3 cm, often leafy, keeled, margin entire, apex acuminate, chartaceous, membranous towards margin, dorsal surface smooth to very sparsely scabridulous and tubercle-based hairy towards margin, hairs 2–3 mm long, hyaline, ventral surface glabrous, smooth, greenish, hyaline towards margin. Spatheole elliptic to narrowly elliptic, folded or cymbiform, 7–12 × 1–2 mm, dorsally keeled, margin entire, apex acuminate, chartaceous, membranous towards margin, dorsal surface glabrous except scabridulous keel and tubercle-based hairs towards margins, tubercle-based hairs 2–3 mm long, hyaline, ventral surface glabrous, smooth, greenish, hyaline towards margin. Peduncle linear, 2.5–4 mm long, broad at apex, ventrally compressed, flexuous, glabrous, smooth. Rachis jointed, lower internode linear,1–1.5 mm long, scabrous to sparsely pilose at upper

Fig. 1. Line drawings of *Pseudanthistiria heteroclita* (Roxb.) Hook.f.: **a.** Habit; **b.** Junction of leaf sheath and blade; **c.** Single raceme; **d–g** For pedicelled spikelet: **d.** Pedicelled spikelet; **e.** Lower glume-ventral view; **f.** Upper glume-ventral view; **g.** Lemma; **h–l** For sessile spikelet: **h.** Sessile spikelet; **i.** Lower glume-ventral view; **j.** Upper glume-ventral view; **k.** Lemma; **l.** Palea; **m.** Lodicules; **n.** Stamens; **o.** Gynoecium; **p.** Caryopsis-ventral view (from *V. Drisya* 157870, drawn by V. Drisya).

Fig. 2. Drawing of lectotype of *Anthistiria heteroclita* Roxb. in Icones Roxburghianae no. 1774 (K). © The Board of Trustees for The Royal Botanic Gardens, Kew. Reproduced with permission.

Fig. 3. Lectotype of *Pseudanthistiria hispida* Hook.f. (*J.F. Duthie* 8478, K000245934 http://specimens.kew.org/herbarium/K000245934). © The Board of Trustees for The Royal Botanic Gardens, Kew. Reproduced with permission.

3/4th, hairs 0.1–0.4 mm long, hyaline, lower 1/4 glabrous, pale greenish; upper internode similar to pedicel, linear, 0.8 mm long, ventrally compressed, dorsal surface densely pilose, hairs 0.4–0.8 mm long, hyaline to pale brownish, ventral surface glabrous, yellowish green. Pedicel linear, 1 mm long, slender, ventrally compressed, dorsal side pilose, hairs 0.5–1 mm long, hyaline to pale brownish, ventral side glabrous, pale greenish–hyaline. Sessile spikelet bisexual, elliptic to narrowly elliptic, 3–4.5 × 0.8–1 mm, pale greenish–brownish, sometimes with purple tinge; callus obtuse, densely pilose, hairs 0.5–1 mm long, hyaline–golden yellowish. Lower glume narrowly ovate–oblong, 2.8–4 × 0.8–1 mm, base truncate, margins incurved, entire, shallowly keeled towards apex, apex muticous and truncate, chartaceous–coriaceous, dorsal surface shallowly depressed, densely scabrous–scabridulous, hairs up to 0.3 mm long, hyaline, ventral surface glabrous, pale greenish–brownish, 9-veined, veins greenish–hyaline, usually prominent on upper half. Upper glume narrowly ovate, cymbiform, 2–3.5 × 0.5 mm, base obtuse, margins entire, membranous, lower half inflexed, upper half infolded, apex obtuse–truncate, sometimes notched, chartaceous–coriaceous, dorsally keeled and humped, 2-grooved in between the veins, dorsal surface glabrous except keel, keel scabrous–scabridulous, ventral surface glabrous, hyaline, 3-veined. Upper lemma reduced to the hyaline base of the awn, linear, 4–5 mm long, glabrous, smooth distally and margin scabridulous towards apex, pale brownish. Awn geniculate, 1.3–3 cm long, scabridulous; column slightly twisted, 7–12 mm long, dark brownish; bristle 8–11 mm long, pale or golden brownish. Upper palea narrowly ovate or narrowly elliptic, 0.9–1 × 0.4–0.5 mm, base truncate, apex acute, membranous, glabrous, hyaline. Lodicules 2, cuneate, *c.* 1 × 0.3–

0.4 mm, hyaline. Stamens 3; filament glabrous, hyaline; anthers 1–2 mm long, yellowish. Ovary narrowly elliptic–oblong, 0.8–0.9 × 0.2–0.3 mm, glabrous, pale yellowish–hyaline; Style 2, 1.2 mm long, glabrous, hyaline, fused at the apex of ovary; Stigma 2, plumose, 2 mm long, purplish. Pedicelled spikelet male, elliptic to narrowly elliptic, 4–5.5 × 0.4–0.8 mm, green, often with purple tinge; callus linear, 0.3–0.5 mm long, broader than pedicel, glabrous, very sparsely pilose at base, hairs minute. Lower glume narrowly ovate, *c.* 5 × 0.6 mm, base truncate, margins infolded at lower half, keeled and ciliate at upper half, hyaline, membranous, keel scabrous–scabridulous, apex acuminate, chartaceous to subcoriaceous, dorsal surface scabridulous, few tubercle-based hairs towards lateral keels, ventral surface glabrous, greenish, nearly 11-veined, veins faint. Upper glume narrowly ovate to narrowly elliptic, cymbiform, *c.* 4.5 × 0.4 mm, base truncate, margins inflexed at lower half, infolded at upper half, ciliate towards apex, apex acute–acuminate, chartaceous to subcoriaceous, dorsal surface glabrous except sparsely scabridulous hairs on veins, ventral surface glabrous, hyaline, 3-veined. Upper lemma narrowly ovate to narrowly elliptic, 0.5–1.5 × 0.4–0.5 mm, base truncate, apex acute, membranous, glabrous, hyaline. Upper palea absent. Lodicules 2, cuneate, *c.* 0.5 × 0.4 mm, apex broad, truncate, hyaline. Stamens 3; filaments hyaline; anthers 2–3 mm long, yellowish. Caryopsis oblong, 1.5–2 × 0.4–0.6 mm, ventrally 2-channelled, styles persistent.

Flowering & fruiting: Flowering and fruiting from September to January.

Habitat: Open grasslands.

Distribution: Peninsular India, West Bengal, Bangladesh and China.

Specimens examined: INDIA, **Daman**, Peq.–Dumforta, 25.09.1963, *M.Y. Ansari* 93606 (CAL). **Gujarat**, Valsad district, Kaparada, 10.10.2010, *Rinku J. Desai* 172; Dangs, 28.11.2010, *Rinku J. Desai* 537 (BARO). **Karnataka**, Belgaum district, near Gunji, 28.10.1978, *Cecil J. Saldanha & P. Prakash* 3705 (CAL). **Kerala**, Kannur district, Madayippara, near fort, 04.10.2011, *C. Pramod* 126821 (CALI); *Ibid*., 18.11.2015, *Rinku J. Desai* 1738 (BARO); *Ibid*., 14.11.2018, *V. Drisya* 157870 (CALI). **Maharashtra**, Kolhapur district, Gaganbawda, 03.10.1989, *S.R. Yadav* 7820; Panhala, 27.09.1992, *C.B. Salunkhe* 7967 (SUK); Panhala fort, 13.01.2017, *V. Drisya* 171415 (CALI); Ramghat, 22.10.1990, *S.R. Yadav* 7473; *Ibid*., *C.B. Salunkhe* 8166; Shivaji University Campus, 08.10.1993, *S.R. Yadav* 8601 (SUK); *Ibid*., 14.01.2017, *V. Drisya* 171419 (CALI); Tillari, 08.01.2017, *V. Drisya* 171401 (CALI); Ratnagiri district, Mandangad, 17.10.1993, *C.B. Salunkhe* 7558; Ori, 13.10.1994, *C.B. Salunkhe* 8266; Pawas, 06.10.1991, *C.B. Salunkhe* 7435 (SUK); Satara district, Kas, 09.10.1994, *C.B. Salunkhe* 8156; *Ibid*., 23.10.2010, *M.M. Lekhak* 398; Koynanagar, 08.10.1989, *C.B. Salunkhe* 7758 (SUK); Mahabaleshwar, 03.12.1987, *K.P. Saira* 11918 (CALI); Mahabaleshwar, Kates point, 07.10.1990, *S.R. Yadav* 8035; *Ibid*., *C.B. Salunkhe* 7651 (SUK); Sindhudurg district, Ambolighat, 21.10.1990, *S.R. Yadav* 8057 (SUK).

Conservation status: The species occurs in Peninsular India, West Bengal, Bangladesh and China. The estimated extent of occurrence is *c.* 2,947,266 km^2, which is beyond the limit of threat categories. Hence, the authors place the species under the category Least Concern (LC) according to IUCN (2019) criteria.

Notes: This species can be easily distinguished from *Pseudanthistiria umbellata* by the presence of prominent tubercle-based hairs on leaf sheaths and blades, and a muticous to truncate apex of the lower glume of the sessile spikelet, in combination with its robust erect habit.

Typification: *Anthistiria heteroclita* was originally described by Roxburgh (1820) in his *Flora Indica* although he did not cite any specimen, but mentioned it as "a native of newly made pasture land in the vicinity of Calcutta". Hooker (1897), when recircumscribing *A. heteroclita* as *Pseudanthistiria heteroclita*, added the statement 'I have seen no Bengal specimens, but the excellent

figure in Roxburgh's "Icones Pictae" leaves no doubt in my mind as to it being of the same species as the Western plant, only more copiously ciliate'. In this, he also provided reference to the type collection as 'Bengal; pastures near Calcutta, Roxburgh & The Concan and Canara, Law, Thomson, &c'. While searching for Roxburgh's drawing, the authors could trace it (with no. 1774) from the Library, Art and Archives at the Royal Botanic Gardens, Kew, where most of the illustrations made by Roxburgh for "Flora Indica" were deposited. Though Nees von Esenbeck (1841) already provided a reference to the illustration, by citing the basionym as "*Anthistiria heteroclita* Roxb. Fl. Ind. Or. I.p. 249. ed. Car. et. Wall. p. 253. n. 4. Tab. Pict. n. 1774", it cannot be considered as a typification because he simultaneously cited several other elements. However the citation of Hance 9667 in Tropicos as "Type-Protolog" is apparently an error, and probably based on Chen and Phillips (2006a). Hence we here designate the illustration (No. 1774) by Roxburgh as the lectotype for the name *Anthistiria heteroclita*.

Hooker (1897) while describing the species *Pseudanthistiria hispida,* provided reference to the collection "The Concan, Stocks, Law, Dalzell & c. Central Provinces; Khandwa, Duthie (No. 8478)". After a thorough search for the original material, the authors could trace six herbarium sheets that were originally mentioned by Hooker (1897) in the protologue. Three sheets of Duthie with collection number 8478 were found, one each at BM (BM000959812 digital image!), CAL (accession number 532507!) and K (K000245934 digital image!). Two more sheets of original material were found at K, one belonging to Dalzell's collection (K000975016 digital image!) while the other sheet (K000245935 digital image!) bears the label of "Herb. Ind. Or. Hook. Fil & Thomson", with Concan as the collection locality and Stocks & Law as collectors. Aside from this label, the second sheet also bears a stamp "Herbarium Hookerianum 1867", clearly indicating it as part of the original material used by Hooker. Apart from this, a duplicate sheet of Stocks and Law was also found at CAL (Accession number 532506). All these available sheets constitute the syntypes. According to article 9.12 of the Shenzhen Code (Turland *et al*., 2018), there need to be a selection of a single specimen as lectotype. Hence, *Duthie* 8478 (K000245934 digital image!) being a well preserved specimen agreeing with the protologue is selected here as the lectotype, and BM000959812 and CAL (Accession number 532507) as isolectotypes.

Pseudanthistiria umbellata (Hack.) Hook.f., Fl. Brit. India 7: 220. 1897; C.E.C.Fisch. in Gamble, Fl. Madras 3: 1749. 1934; Bor, Grass. Burma Ceylon India Pakistan 204. 1960; N.P.Singh, U.R.Deshpande & R.S.Raghavan, Bull. Bot. Surv. India 18(1-4): 124. 1976; Karthik., S.K.Jain, M.P.Nair & Sanjappa, Fl. Ind. Enum. Monocot. 252. 1989; Sreek. & V.J.Nair, Fl. Kerala Grass. 181. 1991; S.Moulik, Grass. Bam. India 1: 225. 1997; Pull., Fl. Andhra Pradesh 3: 1243. 1997; Kabeer & V.J.Nair, Fl. Tamil Nadu Grass. 459. 2009; Potdar, Salunkhe & S.R.Yadav, Grass. Maharashtra 232. 2012; T.S.Nayar, M.Sibi & A.Rasiya Beegam, Fl. Pl. Western Ghats, India 2: 1196. 2014. *Andropogon umbellatus* Hack. in A.DC. & C.DC., Monogr. Phan. 6: 401. 1889. *Sorghum umbellatum* (Hack.) Kuntze, Revis. Gen. Pl. 2. 792. 1891. *Hypogynium heteroclitum* (Hack.) Roberty f. *umbellatum* Roberty, Boissiera 9: 190. 1960. *Anthistiria heteroclita sensu* Thwaites, Enum. Pl. Zeyl. 366. 1864. non Roxburgh, 1820, *nom. nud*. *Type*: SRI LANKA [CEYLON], *s.d., Thwaites* 963 (holo P [P00740707 digital image!]; iso BM [BM000959813, BM000959814 digital images!], BR [BR0000006885847 digital image!], K [K000245936/K000975015 digital image!], MEL [MEL19172 digital image!], W [W18890064970, W18890098348, W19160027408 digital images!]).

Pseudanthistiria burmanica Hook.f., Fl. Brit. India 7: 220. 1897, *syn. nov*. *Lectotype* (first-step designated by Bor, 1960: 203; second-step designated here): MYANMAR [BURMA], **Pegu**, *s.d., S. Kurz* 2755 (K [K000245937 digital image!]; isolecto K [K000246129 digital image!], CAL [CAL0000002053!]). **Figs. 4 & 5**

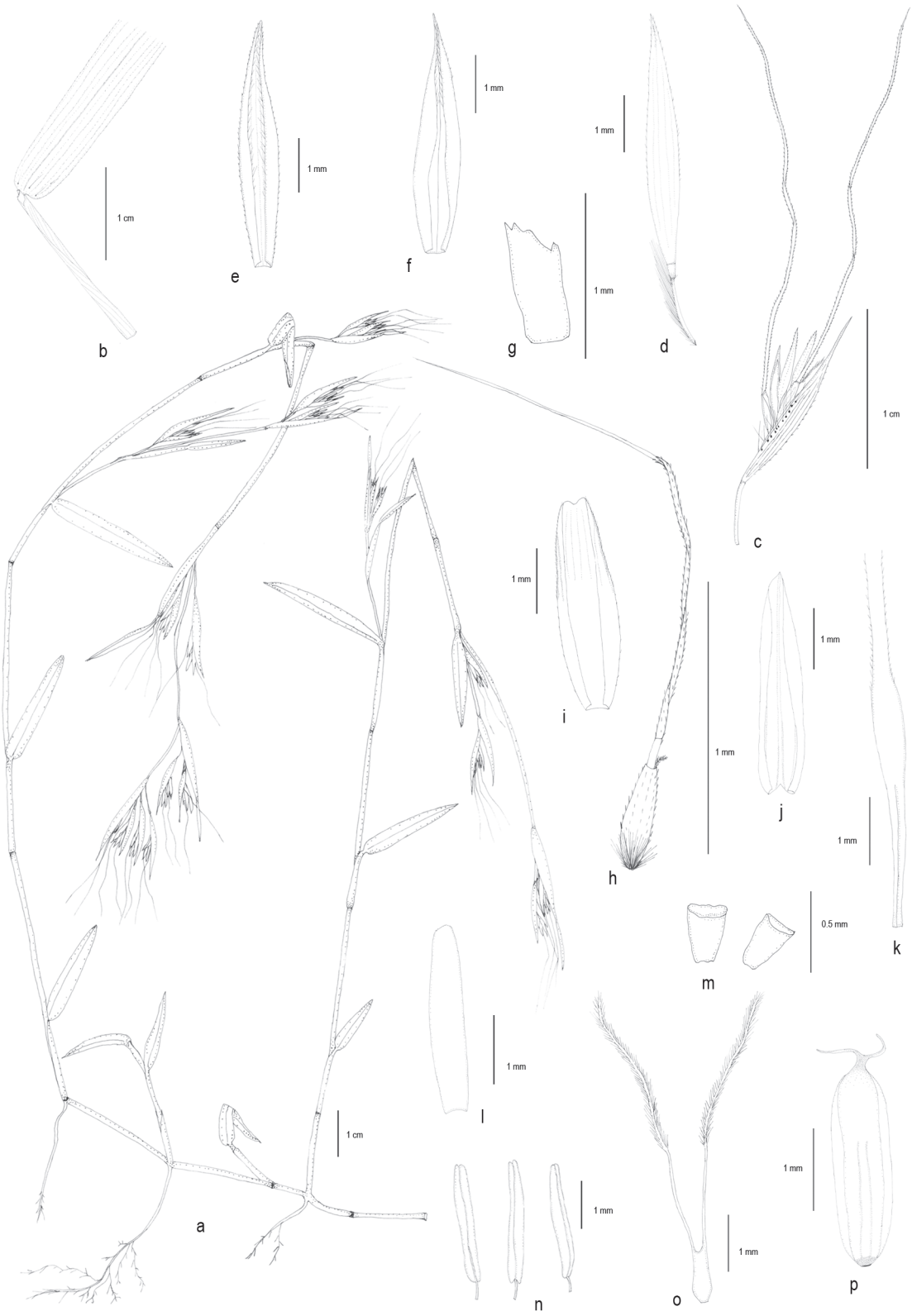

Fig. 4. Line drawings of *Pseudanthistiria umbellata* (Hack.) Hook.f.: **a.** Habit; **b.** Junction of the leaf sheath and blade; **c.** Single raceme; **d–g** For pedicelled spikelet: **d.** Pedicelled spikelet; **e.** Lower glume-ventral view; **f.** Upper glume-ventral view; **g.** Lemma; **h–l** For sessile spikelet: **h.** Sessile spikelet; **i.** Lower glume-ventral view; **j.** Upper glume-ventral view; **k.** Lemma; **l.** Palea; **m.** Lodicules; **n.** Stamens; **o.** Gynoecium; **p.** Caryopsis-ventral view (from *V. Drisya* 169527, drawn by V. Drisya).

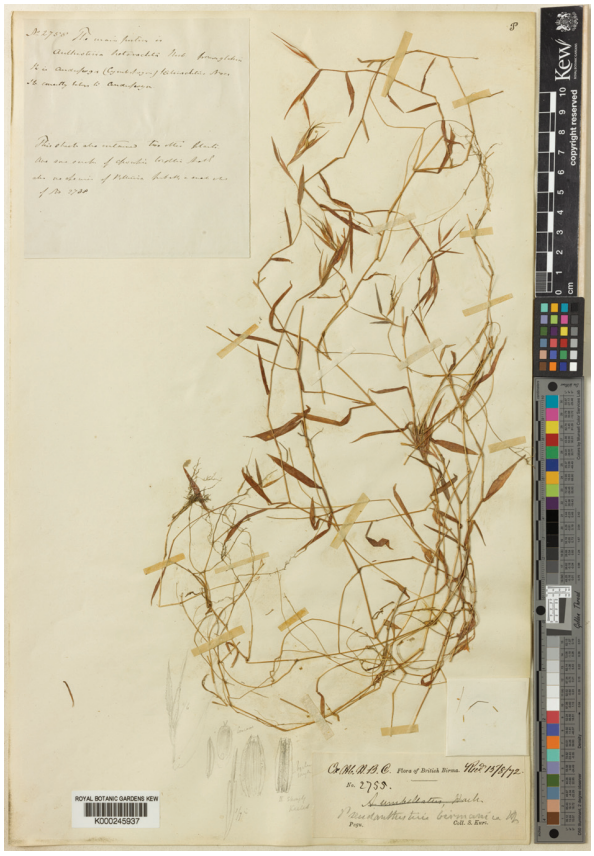

Fig. 5. Lectotype of *Pseudanthistiria burmanica* (Hack.) Hook.f. (*S. Kurz* 2755, K000245937 http://specimens.kew.org/herbarium/K000245937). © The Board of Trustees for The Royal Botanic Gardens, Kew. Reproduced with permission.

Annual, creeping, decumbent, slender herbs, 45–65 cm tall, rooting from lower nodes. Culms geniculate or straight; internodes 1–13 cm long, glabrous, purplish; node glabrous, dark purplish. Leaf sheath rounded to shallowly keeled, 1.5–2.5 cm long, margin entire, chartaceous, adaxial surface glabrous, smooth, abaxial surface glabrous or tubercle-based hairy towards apex, hairs hyaline, 0.5–2 mm long, greenish. Leaf blade narrowly ovate–lanceolate, 1.5–5 × 0.3–1.2 cm, base obtuse–rounded, margin scabridulous, apex acute–acuminate, chartaceous, adaxial surface scabridulous, very few (1 or 2) tubercle-based hairs towards base, abaxial surface glabrous to tubercle-based hairy with scabridulous midvein, greenish, 5–9-veined. Ligule *c.* 0.5 mm long, apex truncate, fimbriate, membranous, hyaline. Inflorescence terminal, false panicle interrupted by spathes and spatheoles; raceme more or less flexuous, comprises 2 sessile and 3 pedicelled spikelets, which is subtended by a spatheole; flowering axis linear, 1–5 cm long, subterete, ventrally compressed, smooth–scabridulous at upper 1/4th, greenish–purplish. Spathe encloses 3–10 racemes, narrowly elliptic, cymbiform, 15–30 × 3–3.5 mm (1.5–2 mm wide when folded), often leafy, dorsally keeled, margins entire, apex acuminate, chartaceous, dorsal surface scabridulous towards apex, tubercle-based hairy at middle portion towards margin, hairs 1–2 mm long, hyaline, ventral surface glabrous, smooth, greenish with purplish tinge, hyaline towards margin. Spatheole narrowly elliptic, cymbiform, 10–12 × 2.5–3 mm (1.5 mm wide when folded), folded, dorsally keeled, base cuneate, margin membranous, hyaline, entire, apex acuminate–aristate, chartaceous, dorsal surface glabrous, tubercle-based hairy at middle portion towards margin, hairs 2.5–3 mm long, hyaline, keel scabridulous, ventral surface glabrous, smooth, greenish. Peduncle linear, 2.5–4.5 mm long, ventrally compressed, dorsal surface and margins scabridulous. Rachis jointed, rachis internode 2; lower internode linear, 2 mm long, scabridulous at upper 2/3rd, sparsely pilose at apex, hairs hyaline, up to 0.5 mm long, greenish; upper internode linear, *c.* 1.5 mm long, ventrally compressed, densely pilose on dorsal surface, hairs 0.5–1 mm long, hyaline to pale brownish, more towards apex, pale greenish. Pedicel linear, 1–1.5 mm long, slender, dorsiventrally compressed, dorsal side pilose, hairs 0.5–1 mm long, hyaline to pale brownish, ventral side glabrous, pale greenish to pale yellowish. Sessile spikelet 2, bisexual, narrowly ovate–elliptic, 3.5–4 × 0.5–0.8 mm, pale greenish–brownish; callus obtuse, slightly oblique, densely pilose, hairs 0.1–1 mm long, hyaline to pale brownish. Lower glume narrowlly ovate–oblong, 3.4–3.5 × *c.* 1 mm, base truncate, margins entire, inflexed at lower half, infolded and keeled at upper half, keel scabridulous, apex muticous, truncate–notched; chartaceous–coriaceous, dorsal surface scabridulous on veins, ventral surface glabrous, pale greenish–brownish, 9–10-nerved, veins usually prominent at upper 1/3rd. Upper glume narrowly ovate, cymbiform,

c. 3.5 × 0.8 mm, base obtuse, margins entire, membranous, lower half inflexed, upper half infolded or inflexed; apex mucronate, chartaceous–coriaceous, dorsally keeled and two channelled, dorsal surface glabrous except scabridulous keel (upper half) and sub apical region, ventral surface glabrous, hyaline with green tinge, 3-veined. Upper lemma reduced to the hyaline base of the awn, 4–4.5 mm long, glabrous. Awn 2.4 cm long, geniculate, brownish, scabridulous; column 10 mm long, slightly twisted, dark brownish; bristle 9–11 mm long, pale brownish. Upper palea variable in shape, 1 × 0.5 mm, base truncate, apex obtuse–rounded, membranous, glabrous, hyaline. Lodicules 2, cuneate, 0.4–0.6 × 0.2–0.3 mm, hyaline. Stamens 3; filament, glabrous, hyaline; anthers 3, 1.8–2 mm long, yellowish. Ovary narrowly elliptic–oblong, 0.5–1.5 × 0.3–0.5 mm, glabrous, hyaline to pale yellowish; Style 2, 1.3–1.5 mm long, fused at the apex of ovary, glabrous, hyaline; Stigma 2, plumose, 1.5–3 mm long, purplish. Pedicelled spikelet 3, male, narrowly elliptic, 5–5.5 × 0.5–0.8 mm, greenish; callus obtuse–linear, *c.* 0.5 × 0.2–0.3 mm long, broader than pedicel, dorsiventrally flattened, glabrous, few very minute hairs towards the pedicel. Lower glume narrowly ovate, 4.8–5.5 × 0.8–1 mm, base truncate, margins at lower 1/3rd inflexed, upper 2/3rd infolded, keeled and ciliate, infolded margins and keel scabridulous, apex acuminate, chartaceous to subcoriaceous, dorsal surface sparsely scabridulous, hairs seen at upper 2/3rd on veins and sub apical region, lower 1/3rd glabrous, ventral surface glabrous, greenish, 7–10-veined. Upper glume narrowly ovate to narrowly elliptic, cymbiform, 3.8–4.1 × *c.* 1 mm, base truncate, margins inflexed at lower half, infolded at upper half, infolded margins ciliate, apex acute, chartaceous to subcoriaceous, dorsal surface scabridulous on veins at upper half, ventral surface glabrous, hyaline, 3-veined, veins greenish. Upper lemma variable in shape, 0.8–2 × 0.3–0.5 mm, base truncate, apex acute, membranous, glabrous, hyaline. Upper palea absent. Lodicules 2, cuneate or triangular, *c.* 0.5 × 0.4 mm, apex broad, truncate, hyaline. Stamens 3; filament glabrous, hyaline; anthers 2–2.8 mm long, yellowish. Caryopsis elliptic–oblong, *c.* 2.5 × 0.8 mm, ventrally 2-channelled, styles persistent.

Flowering & fruiting: Flowering and fruiting from September to January.

Habitat: Open areas, hills sides and roadsides.

Distribution: Peninsular India, Sri Lanka, Myanmar and Thailand.

Specimens examined: INDIA, **Karnataka**, Kodagu district, Medikery, 07.10.2010, *J. Remya* 69559 (TBGT); Shimoga district, Nagare, 13.01.1979, *B.R. Ramesh, K.R. Keshava Murthy & P. Prakash* 5668 (CAL). **Kerala**, Alappuzha district, Thiruvizha, *s.d.*, *C.N. Sunil* 1673 (CALI); Idukki district, Eravikulam, Rajmala, 08.04.1998, *S.D. Biju* 36731; Periyar Wildlife Sanctuary, Vallakkadavu, 30.12.1993. *Jomy Augustine* 12725 (TBGT); Vagamon, 15.10.2015, *V. Drisya & A.K. Pradeep* 144242; Vagamon-Kurisumala, 26.10.2017, *V. Drisya* 157141; *Ibid.*, *V. Drisya* 157150; *Ibid.*, 01.12.2019, *V. Drisya* 170189; *Ibid.*, *V. Drisya* 170193 (CALI); Kannur district, Chengalayi, 22.12.1980, *R. Ansari* 69979 (CAL); Ezhimala, Kurisumala, 12.11.2017, *V. Drisya* 157716; Kunnaru, 12.11.2017, *V. Drisya* 157718; Peringome, 14.11.2018, *V. Drisya* 157859; Madayippara, on the way to Pazhayangadi, 14.11.2018, *V. Drisya* 157871; Madayippara, slopes towards Vengara, 28.11.2012, *C. Pramod* 290360; Kasaragode district Cherkala, 02.11.2017, *V. Drisya* 157198; Periya, 02.11.2017, *V. Drisya* 157194 (CALI); Kollam district, *s.loc.* 24.11.1893, *M.A. Lawson* 137 (CAL); Chandanakkunnu, Thenmala, 21.12.2019, *V. Drisya* 170199 (CALI); Kulathupuzha, Elderslie estate, Road, Thenmala range, 20.12.1975, *K.N. Subramanian* 5781 (FRC); Kumaramperur R.F., 13.11.1976, *M. Chandrabose* 49031 (CAL); Kottayam district, Pulluparai–Peermade, 24.11.1967, *K. Vivekananthan* 29335 (CAL); Kozhikode district, Kakkayam, near Dam, on the way to Oorakuzhi waterfall, 28.12.2017, *V. Drisya* 157804; Kakkayam, Ghat road side, 28.12.2017, *V. Drisya* 157806; Kakkayam, Ambalappara grasslands, 30.11.2018, *V. Drisya*

157884; Malappuram district, Calicut University Campus, 08.03.1978, *M.I. Razia* 29877; *Ibid*., *B.I .Kochumary* 23407; *Ibid*.,12.01.1983, *Shanthi K. Nair* 2029; *Ibid*., 09.11.1981, *K. Kutty Sankar* 182; *Ibid*., 03.09.1981, *T. Beena Joseph* 145; *Ibid*., 20.11.1981, *Egy T. Paul* 141; *Ibid*., 02.12.1981, *P. Manimohan* 105; *Ibid*., 06.02.1982, *K. Susha* 147, *Ibid*., 02.02.1983, *V.T. Nandakumar* 1099; *Ibid*., 03.03.1983, *E.K. Sumathi* 2316; *Ibid*., 01.10.1986, *T.G. Jaisonlal* 4357; *Ibid.,* 30.11.1986, *Sreenivasan Ettammal* 2732; *Ibid*., 07.12.1986, *V. Usha* 3115; C.U. Botanic Garden, 07.11.2000, *S. Jayasree* 74347; *Ibid*., 22.10.2009, *P.I. Jattisha* 127345; *Ibid*., 12.11.2020, *V. Drisya* 169527 (CALI); Kadalundi, 02.05.1978, *Mercy Jacob* 24164 (CALI); Palakkad district, Kottopadam, Thiruvizhamkunnu, Mannarghat, 20.12.1972, *K.N. Subramanian* 4618 (FRC); Silent valley, W. boundary near Walaghat, 23.11.1982, *Sathish Kumar* 10773 (CALI); Sirendhri camp shed, 06.11.2012, *J. Remya* 74588 (TBGT); Pathanamthitta district, Udumpara, near Ezhukuman, Pamba range, 18.11.2017, *V. Drisya* 157742; Thrissur district, Peechi, Karadippara, 22.09.1987, *N. Sasidharan* 4646; Peringalkuttu–Sholayar forest, 25.11.1982, *K. Ramamurthy* 75536 (CALI); Thiruvananthapuram district, Bonaccord, 22.12.1988, *N. Mohanan* 7911; Chemungi, 18.05.1993, *N. Mohanan* 10895 (TBGT); Kottur R.F., 21.02.1979, *M. Mohanan* 59338 (CAL); Nedumangaud, Peringamala, 29.11.1996, *P.S. Jothish* 27848; TBGRI Garden site, 23.11.1984, *K.C. Koshy* 400 (TBGT); Wayanad district, Manikunnumala, 10.11.2000, *M.K. Ratheesh Narayanan* 2158; Wayanad, *s.loc*., *s.d*., *s.coll*. 1597 (CALI); Wayanad, *s.loc*., 22.11.2015, *Rinku J. Desai* 1781 (BARO). **Maharashtra**, Kolhapur district, Ramghat, 22.10.1990, *S.R. Yadav* 7908; Ratnagiri district, Ori, 13.10.1994, *C.B. Salunkhe* 7266; Sangmeshwar, 01.10.1989, *C.B. Salunkhe* 8398; Satara district, Kelghar ghat, 07.10.1990, *C.B. Salunkhe* 8129; Koynanagar, 08.10.1889, *C.B. Salunkhe* 7831 (SUK). **Odisha**, Bolangir district, Patna, 08.11.1959, *G. Panigrahi* 20997 (CAL). **Tamil Nadu**, Nilgiri district, Devala, Nov. 1884, *J.S. Gamble* 15578 (CAL); Nadugani, 07.11.2012, *J. Remya* 75418 (TBGT); Tinnevelly district, Naterikal, 13.02.1913, *D. Hooper & M.S. Ramaswami* 38577 (CAL). MYANMAR. **Tanintharyi Region (Tenasserim)**, Kawamonng, 1912, *A. Meebold* 17243 (CAL). SRI LANKA. **Southern Province**, Galle district, *ca*. 1 mile SE of Yakkalamulla at mile post 14 along road to Imaduwa, 21.10.1974, *G. Davidse* 7828 (CAL).

Conservation status: *Pseudanthistiria umbellata* occurs widely in Peninsular India, Sri Lanka, Myanmar and Thailand. The extent of occurrence (EOO) is estimated to be *c*. 2,875,824 km^2, which does not fall into any of the IUCN (2019) threat categories. Hence, we consider it as of Least Concern (LC) according to IUCN (2019) criteria.

Notes: *Pseudanthistiria burmanica,* as circumscribed by Hooker (1897), is described based on specimens collected at high elevations. It shows continuous variation with regard to leaf shape and pubescence and nature of racemes, making it not easily separable from *P. umbellata*. Hence, *P. burmanica* is treated here as a synonym of *P. umbellata.*

Typification: When Hooker (1897: 220) described *Pseudanthistiria burmanica,* he only cited "Pegu" and "Kurz" in the protologue, referring to the locality and the collector's name, respectively. Bor (1960: 203) mentioned the type is at Kew with the collection number 2755. While searching for the type specimen of *P. burmanica*, the authors found two sheets at K (K000246129 digital image!, K000245937 digital image!) and one sheet at CAL (CAL0000002053!) collected from Pegu by Kurz with the same collection number 2755, as mentioned by Bor (1960: 203). The CAL sheet is also accompanied by a note stating it to be an isotype. As Hooker (1897) did not mention any holotype or isotypes but only type locality and collector's name, these three sheets, K000246129, K000245937 and CAL0000002053, constitute the syntypes. Among these, K000245937 is selected here as the lectotype, since the other two sheets are mixed collections and bear parts of some other plant affixed to the same sheet.

Acknowledgements

The Authors gratefully acknowledge the authorities of K for providing the images of selected lectotypes; BARO, BM, BR, CAL, CALI, FRC, LWG, MEL, MH, P, RHT, SUK, TBGT and W for allowing us to consult the herbarium specimens and herbarium images; Head, Department of Botany University of Calicut for providing all facilities. Authors are grateful to Kerala Forest Department for granting permission (Order No. WL 10-39998/2015 dated 14.01.2016 & Order No.WL10-39998/2015 dated 14.08.2017) and providing all necessary support to explore the forests of Kerala. The first author is thankful to Kerala State Council for Science, Technology & Environment for the support rendered in the form of research fellowship (KSCSTE order No. 001/FSHP-MAIN/2015/KSCSTE dated 22.12.2015). Special thanks are due to Dr. Kanchi N. Gandhi (Senior Nomenclatural Registrar, Harvard University) for the support and discussions and to the anonymous reviewers for critical comments on an earlier version of the manuscript.

Literature Cited

ARTHAN W., DUNNING L.T., BESNARD G., MANZI S., KELLOGG E.A., HACKEL J., LEHMANN C.E.R., MITCHLEY J. & M.S. VORONTSOVA. 2021. Complex evolutionary history of two ecologically significant grass genera, *Themeda* and *Heteropogon* (Poaceae: Panicoideae: Andropogoneae). *Botanical Journal of the Linnean Society* 20: 1–19. https://doi.org/10.1093/botlinnean/boab008

BACHMAN S., MOAT J., HILL A.W., DE LA TORRE J. & B. SCOTT. 2011. Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *In*: SMITH V. & L. PENEV (eds.), *e-Infrastructures for data publishing biodiversity science. ZooKeys* 150: 117–126. https://doi.org/10.3897/zookeys.150.2109

BEENTJE H. 2016. *The Kew plant Glossary*. Second edition. Kew Publishing, Royal Botanic Gardens, Kew.

BOR N.L. 1960. *The grasses of Burma, Ceylon, India and Pakistan (excluding Bambuseae)*. Pergamon Press, Oxford.

CHEN S. & S.M. PHILLIPS 2006a. *Pseudanthistiria*. *In*: WU Z.Y. & P.H. RAVEN (eds.), *Flora of China*. Volume 22. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis. pp. 638–639.

CHEN S. & S.M. PHILLIPS 2006b. *Themeda*. *In*: WU Z.Y. & P.H. RAVEN (eds.), *Flora of China*. Volume 22. Science Press, Beijing and Missouri Botanical Garden Press, St. Louis. pp. 633–637.

CLAYTON W.D. & S.A. RENVOIZE 1986. *Genera graminum – grasses of the world*. The Board of Trustees of the Royal Botanic Gardens, Kew.

CLAYTON W.D., VORONTSOVA M.S., HARMAN K.T. & H. WILLIAMSON 2006 onwards. *GrassBase – the online world grass flora.* Available at: http://www.kew.org/data/grasses-db.html (Accessed on 24.03.2021).

CLAYTON W.D., GOVAERTS R., HARMAN K.T., WILLIAMSON H. & M. VORONTSOVA 2021. *World checklist of Poaceae*. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet: http://wcsp.science.kew.org/Retrieved (Accessed on 24.03.2021).

HACKEL, E. 1889. Andropogoneae. *In*: CANDOLLE A. DE & C. DE CANDOLLE, *Monographiae Phanerogamarum.* Volume 6. G. Masson, Paris. pp. 400–401.

HOOKER J.D. 1897. *Flora of British India* 7. L. Reeve & Co., London.

IUCN 2019. Guidelines for Using the IUCN Red List Categories and Criteria. Version 14. Prepared by the Standards and Petitions Committee. Available at: http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

KABEER K.A.A. & V.J. NAIR 2009. *Flora of Tamil Nadu – grasses*. Botanical Survey of India, Kolkata.

KELLOGG E.A. 2015. Flowering plants, Monocots, Poaceae. *In*: KUBITSKI K. (ed.), *The families and genera of vascular plants*. Springer International, London. pp. 1–416.

NAYAR T.S., SIBI M. & A. RASIYA BEEGAM 2014. *Flowering plants of the Western Ghats, India* 2. Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Thiruvananthapuram.

NEES VON ESENBECK C.G. 1841. *Florae Africae Australioris Illustrationes Monographicae.I. Gramineae*. Prausnitzianis, Glogaviae.

POTDAR G.G., SALUNKHE C.B. & S.R. YADAV 2012. *Grasses of Maharashtra.* Shivaji University, Kolhapur.

ROXBURGH W. 1820. *Flora Indica or descriptions of Indian plant*. Volume 1. The Mission Press, Serampore.

SIMPSON M.G. 2006. *Plant Systematics*, First edition. Elsevier Academic Press, Burlington.

SORENG R.J., PETERSON P.M., ROMASCHENKO K., DAVIDSE G., TEISHER J.K., CLARK L.G., BARBERA P., GILLESPIE L.J. & F.O. ZULOAGA. 2017. A worldwide phylogenetic classification of the Poaceae (Gramineae) II: an update and a comparison of two 2015 classifications. *Journal of Systematics and Evolution* 55: 259–290. https://doi.org/10.1111/jse.12262

SREEKUMAR P.V. & V.J. NAIR 1991. *Flora of Kerala – Grasses*. Botanical Survey of India, Kolkata.

THIERS B. (continuously updated). *Index Herbariorum: a global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available at: http://sweetgum.nybg.org/ih (Accessed on 29.04.2021).

THWAITES G.H.K. 1864. *Enumeratio Plantarum Zeylaniae: an enumeration of Ceylon plants*. Dulau & Co., 37, Soho Square, London.

TURLAND N.J., WIERSEMA J.H., BARRIE F.R., GREUTER W., HAWKSWORTH D.L., HERENDEEN P.S.,KNAPP S., KUSBER W.H., LI D.Z., MARHOLD K., MAY T.W., MCNEILL J., MONRO A.M., PRADO J., PRICE M.J. & G.F. SMITH (eds.) 2018. *International Code of Nomenclature for Algae, Fungi, and Plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017.* Regnum Vegetabile 159, Volume 38. Koeltz Botanical Books, Glashütten. https://doi.org/10.12705/Code.2018

UNIYAL B.P. 1984. Lectotypification of *Pseudanthistiria* (Poaceae). *Taxon* 33(3): 501. https://doi.org/10.2307/1220991

WATSON L. & M.J. DALLWITZ 1994. *The grass genera of the world*. Second edition. CAB International, Cambridge.

WELKER C.A.D., MCKAIN M.R., ESTEP M.C., PASQUET R.S., CHIPABIKA G., PALLANGYO B. & E.A. KELLOGG 2020. Phylogenomics enables biogeographic analysis and a new subtribal classification of Andropogoneae (Poaceae–Panicoideae). *Journal of Systematics and Evolution* 58: 1003–1030. https://doi.org/10.1111/jse.12691