

A revision of the genus *Corymbium* (Asteraceae)

F.M Weitz

Herbarium, University of the Western Cape, Private Bag X17, Bellville, 7535 Republic of South Africa

Accepted 24 July 1989

A revision of the genus *Corymbium* L. (Asteraceae; Vernoniaeae) is presented in which nine species, four subspecies and five varieties are recognized. *C. elsiae* Weitz and *C. laxum* subsp. *bolusii* Weitz are described as new taxa and several new combinations are made. Full descriptions, synonymy, distribution data, maps, illustrations, and a key to the species are provided. Remarks on diagnostic features, ecology and a brief historical review are given.

'n Hersiening van die genus *Corymbium* L. (Asteraceae; Vernoniaeae) word aangebied waarin nege spesies, vier subspesies en vyf variëteite onderskei word. *C. elsiae* Weitz en *C. laxum* subsp. *bolusii* Weitz word as nuwe taksa beskryf en 'n aantal nuwe kombinasies word gemaak. Volledige beskrywings, sinonimie, verspreidingsgegewens, kaarte, afbeeldings en 'n sleutel tot die spesies word voorsien. Opmerkings oor die diagnostiese kenmerke, ekologie en 'n kort geskiedkundige oorsig word gegee.

Keywords: Asteraceae, *Corymbium*, revision

Introduction

Corymbium is a small, well-defined southern African genus of the Asteraceae, comprising nine species which are endemic to the south-western and southern Cape.

The first published report on *Corymbium* was that of Breynius (1680). He described it as '*Bupleuro affinis planta umbellifera foliis liratis, longissimis*'. This species is presently known as *C. glabrum*. Two species, *C. glabrum* and *C. africanum*, are illustrated as figures 4 and 5 on plate 272 in Plukenet's *Almagestum* (1696). He described figure 4, *C. glabrum* as '*Bupleuri similis planta umbellata, Aethiopica, ad caulium nodos tomentosa*' which appears to be similar to Breynius' description. Figure 5, *C. africanum*, Plukenet named '*Bupleurifolia semini papposo, Valerianoides, Umbellata, cauliculo scabro*'.

The name *Corymbium* was first proposed by Gronovius in 1737 (Linnaeus 1737a). In *Hortus Cliffortianus* (1737b), Linnaeus distinguished typical *Corymbium* and a variety alpha. The former was based on two elements: 1. *Bupleurifolia* etc. Pluk. t. 272, f5 and, 2. a specimen in the Clifford herbarium from which he prepared the description given at the end of his account.

Variety alpha was based on Pluk. t. 272, f.4. Burman (1738) described the presently known *C. africanum* as *Corymbium folius ad radicem longissimis, liratis* with a beautiful illustration by Hendrik Claudius.

In *Species Plantarum* (1753), Linnaeus recognized only one species of *Corymbium*, viz. *C. africanum* on which he based his account in *Hortus Cliffortianus* as well as that of Burman (1738). Up to 1764 Linnaeus seems to have made no modification in his concept of *C. africanum* (1753). However, in October 1767 Linnaeus segregated *C. africanum* into two species, viz. *C. glabrum* and *C. scabrum*, and abandoned the name *C. africanum*. He completely ignored the description given in *Hortus Cliffortianus* which formed part of the original description of *C. africanum* (1753).

In September 1767, Bergius described *C. scabridum* which he based on Linnaeus' description in *Species Plantarum* excluding Pluk t. 272. f.4. Therefore *C. scabridum* antedates *C. scabrum*.

However, Sprague (1940), in discussing the type of *C. africanum*, concluded that the *C. africanum* L. (1753) is conspecific with and antedates *C. scabridum* Berg. (1767).

Burman filius (1768) cited two species, *C. gramineum* and *C. africanum*. *C. gramineum* is presently incorrectly known as *C. glabrum*.

Two species, *C. villosum* and *C. filiforme*, were contributed by Linnaeus filius (1781).

Thunberg (1794) described two new species, viz. *C. hirtum* and *C. nervosum*, and also recognized *C. glabrum* L. *C. hirtum* is conspecific with *C. villosum* while *C. nervosum* is conspecific with *C. glabrum*.

De Candolle (1836) described two new species *C. congestum* and *C. cymosum*, bringing the total to eight species. Species that appeared in de Candolle's *Prodromus V* include: 1. *C. congestum*; 2. *C. cymosum*; 3. *C. filiforme*; 4. *C. glabrum*; 5. *C. luteum*; 6. *C. nervosum*; 7. *C. scabrum*; 8. *C. villosum*.

Harvey (1865) recognized seven species with three infraspecific taxa, viz. 1. *C. latifolium*; 2. *C. nervosum* var. *subulifolium*; 3. *C. glabrum*; 4. *C. cymosum*; 5. *C. scabrum* var. *filiforme*, var. *luteum*; 6. *C. villosum*; 7. *C. congestum*. He described one new species, *C. latifolium*, which he based on a specimen collected by Zeyher in the Van Stadensberg mountains.

In the last comprehensive treatment of the genus, Markötter (1939) recognized 12 species with two infraspecific taxa: 1. *C. congestum*; 2. *C. villosum*; 3. *C. scabridum* var. *filiforme*; 4. *C. cymosum*; 5. *C. africanum*; 6. *C. fourcadei*; 7. *C. enerve*; 8. *C. theileri*; 9. *C. salteri*; 10. *C. rogersii*; 11. *C. harveyanum*; 12. *C. latifolium*.

Of the twelve species listed above, she described five new species, viz. *C. enerve*, *C. salteri*, *C. rogersii*, *C.*

theileri and *C. harveyanum*.

Other authors who described species of *Corymbium* include Hutchinson (1932) and Compton (1936) who described *C. fourcadei* and *C. laxum* respectively.

As a result of this study, I recognize nine species and eight infraspecific taxa, viz. 1. *C. africanum* L. subsp. *africanum*; subsp. *scabridum* (Berg.) Weitz var. *scabridum* comb. et stat. nov.; subsp. *scabridum* (Berg.) Weitz var. *gramineum* (Burm. fil.) Weitz comb. et stat. nov.; subsp. *scabridum* (Berg.) Weitz var. *fourcadei* (Hutch.) Weitz comb. et stat. nov.; 2. *C. enerve* Markötter; 3. *C. villosum* L. fil.; 4. *C. cymosum* E. Mey. ex DC.; 5. *C. glabrum* L. var. *glabrum*, var. *rogersii* (Markötter) Weitz comb. et stat. nov.; 6. *C. congestum* E. Mey. ex DC.; 7. *C. theileri* Markötter; 8. *C. laxum* Compton subsp. *laxum*, subsp. *bolusii* Weitz subsp. nov.; 9. *C. elsiae* Weitz sp. nov.

Materials and Methods

The present revision is based mainly on field studies, and collections as well as on extensive herbarium material. All species were seen in flower with the exception of *C. laxum* subsp. *laxum*. The collections studied include most of the relevant material in the South African herbaria and in the European herbaria of greatest importance with respect to South African representation. Most of the types located in overseas herbaria were photographed by Prof. R.O Moffett who also supplied me with descriptions based on collectors' notes and his own observations. The herbaria listed under Specimens examined are abbreviated according to Holmgren *et al.* (1981).

The specimens studied are enumerated and plotted according to the Quarter Degree Reference system of Leistner & Morris (1976). Some localities, especially those of Ecklon & Zeyher have been obtained from Gunn & Codd (1981).

The descriptive terminology is according to Lawrence (1951) and Stearn (1966), while Payne (1978) was used for hair terminology.

Principles

As knowledge of the genus increased through the study of herbarium specimens, living plants *in situ*, as well as the anatomy of the leaf (Weitz 1987), it became apparent that certain characters were more stable than others. These characters are considered to be taxonomically important and include:

1. Leaf shape: basic outline
2. Leaf texture: cartilaginous, coriaceous or herbaceous
3. Indumentum: types of trichomes
4. Conflorescence: arrangement of capitula
5. Involucral bracts: apices
6. Corolla: colour and length
7. Pedicel: present or absent
8. Cypsela: vesture
9. Stomata : orientation of the guard cells
10. Epidermal cells: cellulose or lignin
11. Veins: prominent or sunken

12. Bundle sheath extensions: present or absent

13. Leaf margin: thickened or not thickened.

The approach to the species concept of the present work was based on the work of Briggs & Walters (1984) and Grant (1981). In this study, the taxonomic species concept was used which is based on morphological likeness and differences of individuals.

Delimitations of species were performed by the choice of combinations of critical characters on comparative morphological bases with additional ecological features. The morphological characters are considered to be probably genetically distinct, and discontinuous variation between at least any three of them was the criterion required for the recognition of a species.

Species delimitations in approximately half the number of species are clear-cut and the species are easily defined by several discontinuous characters. Others are taxonomically more intricate, highly variable or forming groups of closely allied and not so easily defined taxa.

The subspecies rank was chosen to designate mainly taxa, which are closely allied but morphologically distinguishable e.g. *C. africanum* subsp. *africanum*. This rank was used in those cases in this study where the morphological discontinuities are regarded as insufficient for the distinction of species. Geographically isolated taxa, separated by small quantitative differences have also been given the subspecies rank (e.g. *C. africanum* subsp. *africanum*).

A third category, viz. *varietas*, has been used in the above-mentioned taxa as well as in *C. glabrum* to give taxonomic recognition to an unusual condition where a single discontinuous character resulted in a striking difference between two allied taxa.

Taxonomic treatment

Corymbium

Corymbium L., Corollarium Generum Plantarum: 14 (1737); L.: 928 (1753); L.: 400 (1754); L.: 582 (1770); Lam.: 129 (1786); Juss.: 176 (1789); Gaertn.: 42 (1790); Murray: 841 (1798); Willd.: 1106 (1798); Thunb.: 729 (1823); Less.: 330 (1829); DC.: 88 (1836); Harv.: 157 (1838); Harv.: 55 (1865); Benth.: 234 (1873); Hoffm.: 128 (1897); Marloth: 247 (1932); Markötter: 356 (1939); Levyns: 764 (1950); Phillips: 777 (1951); Dyer: 663 (1975); Bond & Goldblatt: 161 (1984). Type species. *C. africanum* L.

Contarena Adans.: 120 (1763).

Acaulescent perennial, herbaceous, tufted, rosette plants; monoecious; fibrous rhizome covered with persistent leaf bases and long, soft silky hairs. *Indumentum* villous, hirsute or glabrous. *Leaves* basal, petiole absent, both surfaces smooth, if covered with glandular hairs then viscid; blades terete, involute or flat, linear to broadly elliptic-lanceolate, apex acute to acuminate, base much narrowed, petiole-like, margins entire, venation parallel with or without prominent veins, texture cartilaginous, coriaceous or herbaceous; *upper or cauline leaves* several, often subtending flowering branches, intermediate between leaves and bracts.

Corymbophore glabrous or scabrid, terete or angular with hypsophylls. *Corymbs* compact or loosely composed. *Heads* one-flowered arranged in racemes, panicles or corymbs. *Involucral bracts* in 2 rows, 2–3 short basal bracts and 2 upper bracts sheathing the flower; upper bracts, subequal, outer bract clasping around inner bract, keeled, apex 2–3-fid, 3-nerved, hyaline or herbaceous, glabrous or scabrid, usually green with purple tips or tinged purple when fresh. *Flowers* regular, bisexual, epigynous, mauve, pink or white, pedicel present or absent in one species. *Corolla* salverform with short tube, 5-lobed, lobes longer than tube, linear to oblong. *Stamens* 5; anthers linear, connate, shortly sagittate without distinct apical appendages. *Ovary* cylindrical, hirsute or villous; style exerted, terete, bifid; style branches linear, obtuse or acute, hispid on outer surface. *Stylophore* short, flattened. *Cypsela* linear to elliptic somewhat dorso-ventrally compressed, hirsute or villous. *Pappus* short, crown-like, divided irregularly into a number of fine lobes, or free, fine bristles. *Seed* linear to oblong to elliptic, flattened in cross-section.

Diagnostic features

Acaulescent, herbaceous, tufted plants, monocotyledonous in appearance in the vegetative state. *Leaves* basal, linear to broadly elliptic-lanceolate, parallel venation with or without prominent veins, glabrous, villous or hirsute. *Heads* one-flowered arranged in racemes, panicles or corymbs. *Involucral bracts* in two rows with two upper bracts sheathing the flower, glabrous or scabrid. *Flowers* regular, bisexual; *stamens* 5; anthers linear, shortly sagittate; style exerted, terete, bifid; style branches hispid on outer surface. *Fruit* cypsela, linear to elliptic, hirsute or villous. *Pappus* crown-like or free bristles.

Distribution

Corymbium is endemic to the south-western Cape and the nine species are confined to the Cape Folded Belt and the southern coastal foreland. They range from the Cedarberg in the north to the Cape Peninsula in the south, and in an easterly direction as far as Grahamstown, excluding the Knysna forest.

Habitat

Usually found in poor, shallow, sandy soils of the quartzitic fold ranges and the heavy-textured soils derived from slates, phyllites and granite of the Bokkeveld and Malmesbury Groups. Although one species occurs in the shallow calcareous soil overlying the limestone hills of the Bredasdorp–De Hoop area, no *Corymbium* species is found in the deep calcareous soil of the Cape Peninsula. This genus occurs over a wide range of altitude varying from sea level to approximately 1 850 m above sea level.

Ecology

Corymbium species always occur in open communities with low canopy cover. Under high canopy cover they

are present on the edges.

They usually flower during summer, 6 or 7 months after a fire and will flower again for two or three seasons after which the plants enter a predominantly vegetative phase. Occasionally they also flower after the veld has been cleared. It seems, therefore, that the plants are to a certain extent dependent on fire to induce flowering or some other 'mechanism' when the above-ground parts are removed.

Virtually nothing is known of the pollination biology of *Corymbium*. The flowers produce copious nectar and it is therefore known as 'heuningbossie' (honey bush). Bees, beetles, wasps and ants, which have been seen visiting the flowers, are undoubtedly the main pollinators.

Key to the species

[Conflorescence: Heads or capitula assembled into loose clusters imitating inflorescences such as racemes, panicles and corymbs (Leppik 1977)].

- 1a Conflorescence typically corymboid:
 - 2a Pedicel absent; cypsella villous **4. *C. cymosum***
 - 2b Pedicel present, cypsella hirsute:
 - 3a Long bracts of the involucre muricate (rough) and glandular (sticky):
 - 4a Leaves villous; flowers white; pedicel more than 1 mm **3. *C. villosum***
 - 4b Leaves glabrous; flower pink or white, if white then style purplish; pedicel less than 1 mm **1. *C. africanum***
 - 3b Long bracts of the involucre glabrous:
 - 5a Corymbophore smooth, leaves with conspicuous parallel veins; flowers mauve **5. *C. glabrum***
 - 5b Corymbophore muricate (rough); parallel veins not so conspicuous; flowers white or pink **2. *C. enerve***
- 1b Conflorescence in a lax panicle or capitula arranged in secondary corymbs:
 - 6a Corymbophore and long bracts of the involucre muricate and glandular:
 - 7a Leaf blades scabrid, narrow to broadly lanceolate; bracts 12–14 mm long **6. *C. congestum***
 - 7b Leaf blades glabrous, linear or falcate; bracts 7.5–12 mm long:
 - 8a Leaf veins prominent, margins thickened **7. *C. theileri***
 - 8b Leaf veins not prominent, margins not thickened:
 - 9a Capitula sessile; bract apices not sharply toothed, 7.5–8 mm long **1. *C. africanum***
 - 9b Capitula both pedunculate and sessile; bract apices sharply toothed, 9–12 mm long **9. *C. elsiae***
 - 6b Corymbophore and long bracts of the involucre glabrous:
 - 10a Capitula all pedunculate; petals 6–8 mm long **8. *C. laxum***
 - 10b Capitula both pedunculate and sessile; petals 3.5–6 mm long **5. *C. glabrum***



Figure 1 *Corymbium africanum* (lectotype: specimen in the Clifford herbarium).

Description of species

1. *C. africanum* L., Sp. Pl.: 928 (1753). Type: Specimen in Clifford Herbarium at BM labelled *C. africanum* taken as type. [BM, lecto., designated by Sprague (1940), photo!].

C. africanum auct. non L.: Markötter: 368 (1939).

Roots fibrous or wiry. *Basal leaves* glabrous; blades linear to falcate (50–)100(–200) mm long, (1–)4(–10.5) mm broad, flat, slightly involute or filiform, sometimes channelled, apex acute, silky hairs prominent at the base, base dilated, clasping or half-clasping, sometimes with submembranous margins, margins sometimes thickened, veins not prominent; texture coriaceous to cartilaginous; *cauline leaves* scabrid, sometimes lower ones smooth 5–50 mm long, 1–4 mm broad, base clasping or half clasping, lower ones decurrent becoming less decurrent and smaller upwards, passing into bracts. *Corymbophore* terete, scabrid, (40–)175(–350) mm long, 1–2 mm in diameter. *Heads* in corymbose clusters arranged in a corymb or panicle. *Involucral bracts* scabrid, viscid when fresh; upper involucral bracts subtended by 2 or 3 smaller bracts, upper involucral bracts (6.5–)8.8(–11) mm, apex fimbriate, usually green with purple tips or tinged purple when fresh. *Flowers* mauve, pink or white; pedicel present 0.5–1 mm long. *Petals* linear to oblong-elliptic 4–7 mm long, 1–1.5 mm broad; corolla tube 1.5–4 mm long, cylindrical. *Anthers* 1.5–3 mm long including base. *Ovary* hirsute; style branches ca. 1.5 mm long, obtuse. *Cypselas* ca. 4 mm long, ca. 1 mm broad, linear to ovoid. *Pappus* coroniform at base, fimbriate, bristles many up to 2 mm long (Figures 1, 2, 3 & 4).

Diagnostic features

Basal leaves glabrous; blades linear to falcate, flat, slightly involute or filiform, sometimes channelled. *Corymbophore* scabrid. *Heads* in corymbose clusters arranged in a corymb or panicle. *Involucral bracts* scabrid. *Flowers* mauve, pink or white. *Ovary* hirsute.

Distribution and habitat

One of the most widely dispersed species in the genus, *C. africanum*, occurs throughout the south-western Cape from the Cedarberg in the north, southwards to the mountains of the Cape Peninsula and eastwards as far as Grahamstown (Figure 2). The habitats may vary from sandy flats near the coast to steep rocky mountain slopes at an altitude of 1 800 m. It occurs in a variety of substrates including sandy to clayey, acid soil derived from the Table Mountain Super Group and the Malmesbury Group. Associated vegetation varies from Mountain Fynbos to Coastal Fynbos to Rhenosterveld.

C. africanum together with *C. glabrum* is the most widely ranging and variable species of the genus.

A close study of the populations in the field and of the herbarium material revealed that the most significant variable characters in the complex are leaf shape and size, and the arrangement of the heads.

Populations occurring in the mountains around Ceres have flat to involute leaves with heads arranged in a panicle.

These populations differ from the rest of the distribution area, where the populations have either involute or terete leaves with heads arranged in a corymb.

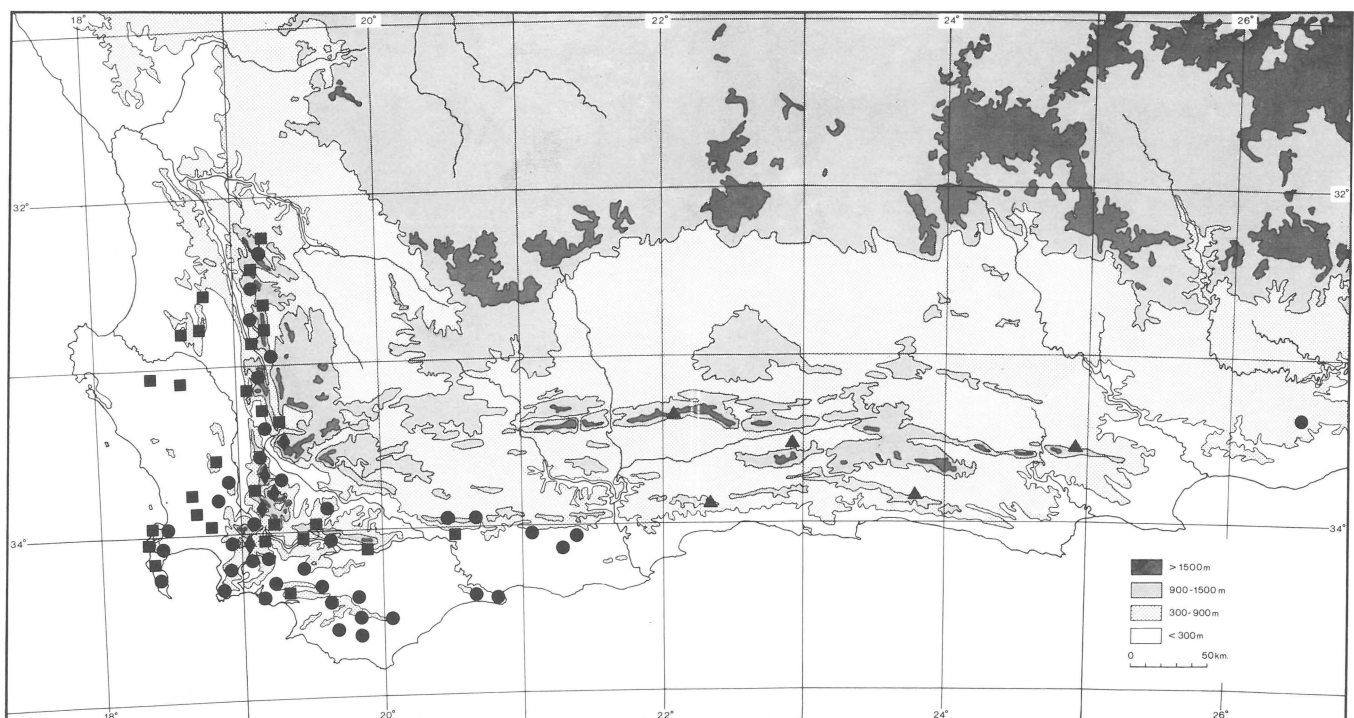


Figure 2 Geographic distribution of *Corymbium africanum*: subsp. *africanum* ◆; subsp. *scabridum* var. *scabridum* ■; var. *gramineum* ●; var. *fourcadei* ▲.

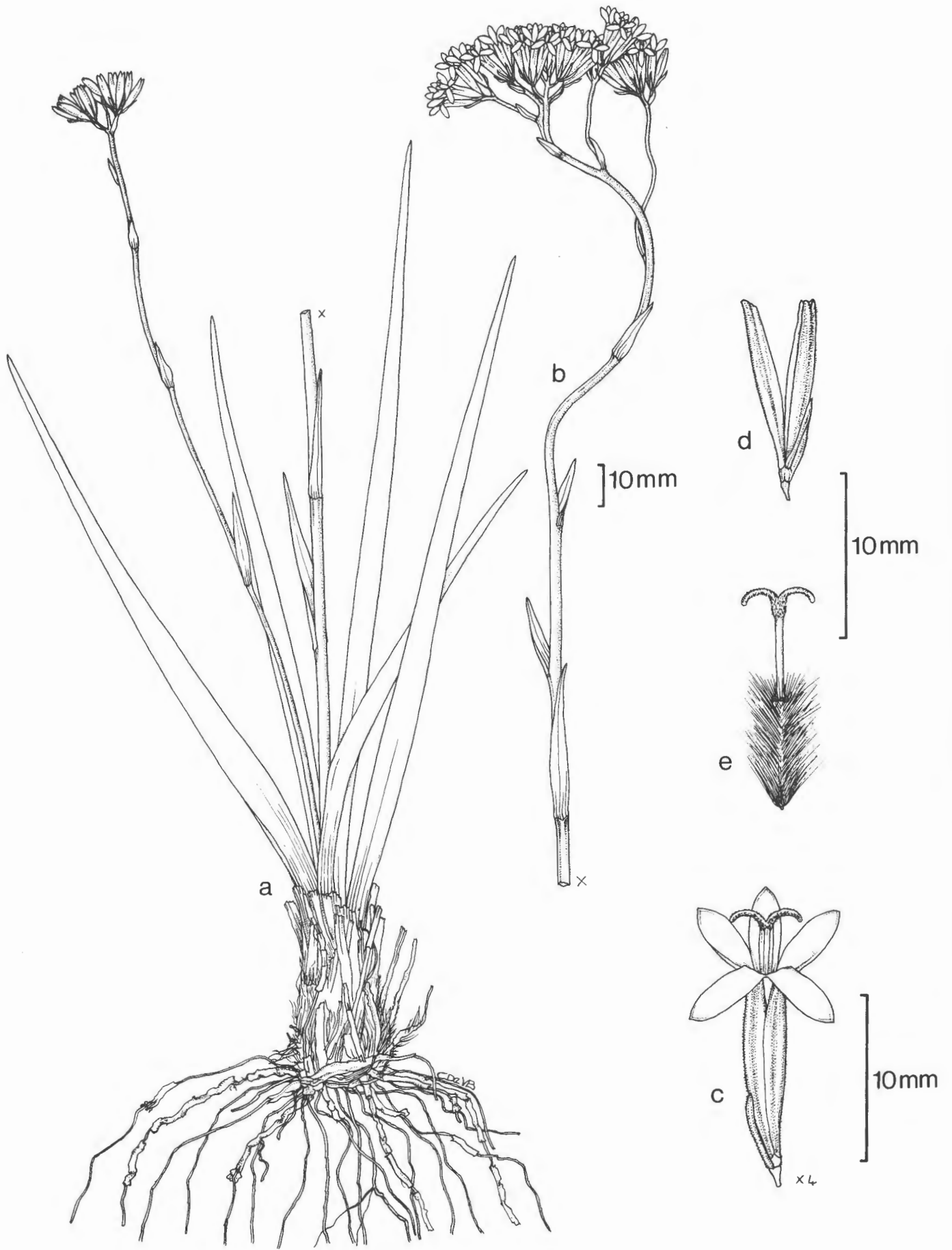


Figure 3 *Corymbium africanum* subsp. *scabridum* var. *scabridum*. a, plant; b, confluence; c, capitulum with flower; d, involucral bracts; e, gynoecium. (Weitz 254).

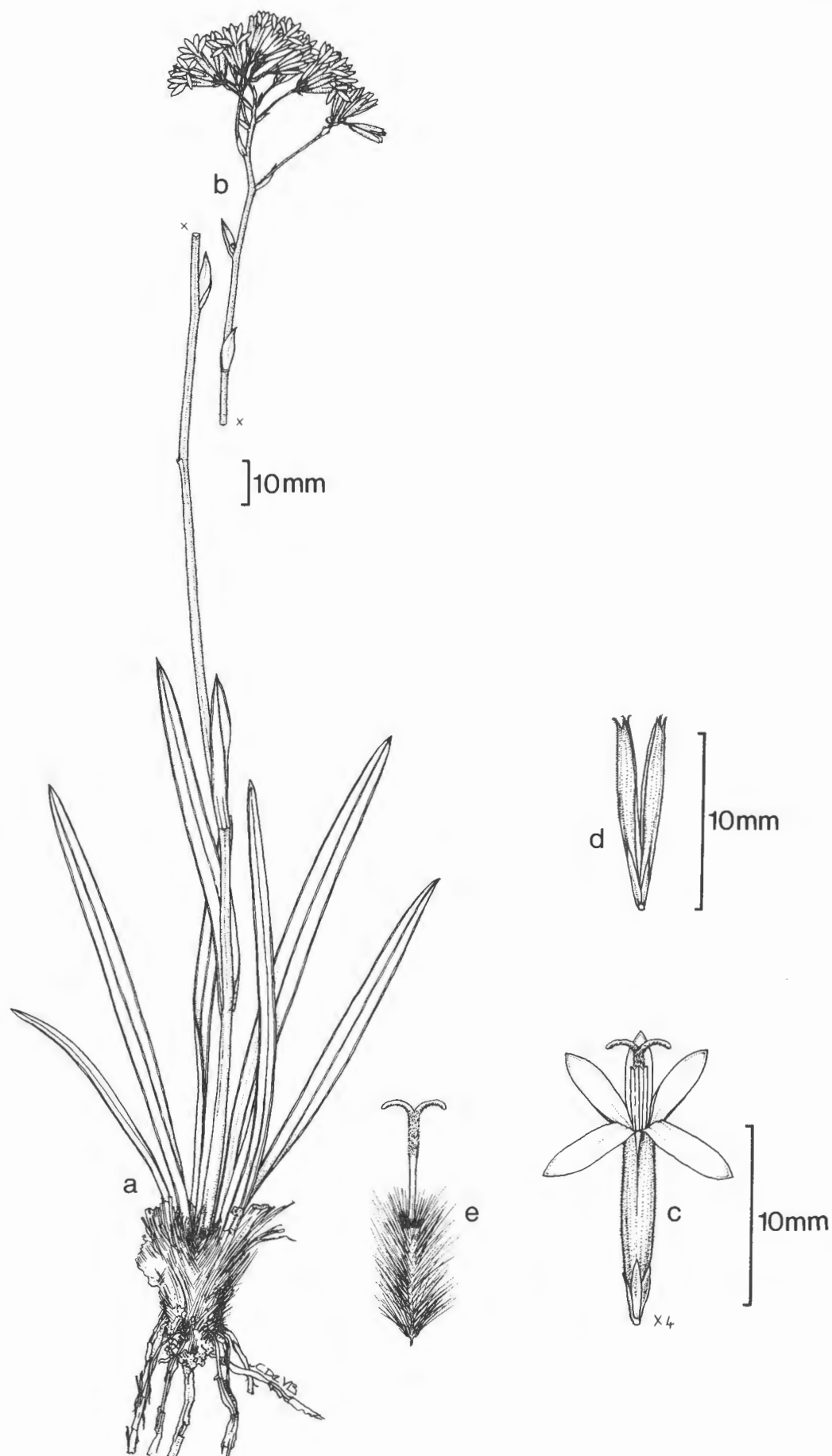


Figure 4 *Corymbium africanum* L. subsp. *scabridum* var. *fourcadei*. a, plant without conflorescence; b, conflorescence; c, capitulum with flower; d, involucral bracts; e, gynoecium. (Fourcade 2849 BOL).

Key to the subspecies

- 1a Heads arranged in a panicle; leaves involute or flat, less than 5 mm broad, flowers mauve **a. subsp. africanum**
 1b Heads arranged in a corymb; leaves terete, involute or flat, if flat then more than 5 mm broad; flowers mauve, pink or white **b. subsp. scabridum**

a. subsp. africanum

C. africanum L., Sp. Pl.: 928 (1753).

Plants (70–)180(–310) mm tall. *Basal leaves* glabrous blades linear to falcate, flat or involute, less than 5 mm broad. *Corymbose clusters* arranged in a panicle. *Corolla tube* less than 3 mm. *Anthers* less than 3 mm long (Figure 1).

Distribution and habitat

This subspecies is exclusively montane. It is known from the mountains near Ceres, southwards as far as Dwarsberg in the Villiersdorp vicinity (Figure 2). This subspecies is found in moist, steep habitats, on mountain slopes at an altitude of ca. 1 000 m and higher.

Specimens examined

- 3319** (Worcester): Waaihoek mountains (–AD), *Esterhuysen 8313* (BOL); Suurvlakte, above head of Du Toit's Kloof Pass, 1 000 m (–CA), *Esterhuysen 35135* (BOL); Mountains S. of Wemmershoek, 1 200 m – 1 500 m (–CC), *Andreae 811* (PRE); Slopes along W. ridge of Du Toit's Peak, 2 000 m (–CC), *Esterhuysen 28453* (BOL).
 —**3419** (Caledon): Dwarsberg (–AA), *H.C. Taylor 10178* (STE).

Linnaeus cited three different polynomials when he described *C. africanum*, including a reference to a specimen in Clifford's herbarium. Sprague (1940), in discussing the type of *C. africanum*, concluded that the type of *C. africanum* is the specimen in the Clifford herbarium. This specimen matches Linnaeus' description in *Hortus Cliffortianus*.

This subspecies is closely allied to *C. elsiae*, but differs in the clustered heads, shorter corolla tube and anthers.

b. subsp. scabridum (Berg.) Weitz comb. et stat. nov.

C. scabridum Berg., Descr. Pl. Cap. 341 (1767); Markötter: 359 (1939). Type: Iconotype: Burm.: t. 70,1 (1738).

C. scabrum L.: 120 (1767b); L.: 582 (1770); L. fil.: 392 (1781); Lam.: 130 (1786); Gmelin: 373 (1791); Thunb.: 170 (1794); Murray: 841 (1798); Willd.: 1106 (1798); Thunb.: 729 (1823); Less.: 331 (1829); E. Mey. & Drège: 301 (1837); DC.: 89 (1836); Steud.: 425 (1840); Drège: 175 (1843); Harv.: 56 (1865). Type: Iconotype: Pluk. 73: t. 272 (1696).

Plants (40–)195(–350) mm tall. *Basal leaves* glabrous, blades linear to falcate, involute, terete or flat, if flat then more than 5 mm broad. *Corymbose clusters* arranged in a corymb (Figures 3 & 4).

Distribution and habitat

C. africanum subsp. *scabridum* is known from the northern Cedarberg, southwards to the mountains of the Cape Peninsula and from here eastwards to Grahamstown (Figure 2). It occurs in different kinds of habitats, varying from shallow to deep acid sandy and clayey soil derived from the Table Mountain Super Group and the Malmesbury group.

Two distinct leaf shapes can be distinguished, viz. filiform leaves up to 1.5 mm broad and linear to falcate leaves more than 1.5 mm broad. Populations with the above-mentioned leaf shapes occur sympatrically.

Isolated populations studied from the Swartberg and Lang Kloof areas revealed that the linear leaves are rigid with cartilaginous, thickened margins. Anatomical studies of the leaf indicated that these populations have lignified epidermal cell walls (Weitz 1987).

From the above it is clear that the leaves may either be terete, involute or flat and that the flat leaves may possess thickened margins and lignified epidermal cell walls.

Key to varieties

- 1a Leaves flat or involute, more than 1.5 mm broad:
 2a Margins not thickened, leaves flat or involute **var. a. scabridum**
 2b Margins thickened, leaves flat **var. c. fourcadei**
 1b Leaves terete, less than 1.5 mm in diameter **var. b. gramineum**

a. var. scabridum

C. scabridum Berg.: 341 (1767); Markötter: 359 (1939).

Leaves flat or involute, more than 1.5 mm broad, margins not thickened. (Figure 3).

Specimens examined

- 3218** (Clanwilliam): Het Kruis (–DA), *Barker 2576* (NBG); Hills NW of Mouton's Vlei (–DC), *Pillans 7529* (BOL, NBG); 3 km NE of Bugler's Post (–DD), *Weitz 429* (UWC).
 —**3219** (Wuppertal): Pakhuis Peak, 800 m (–AA), *Weitz 354* (UWC); Middelberg Plateau (–AC), *Compton 12703* (NBG), *Esterhuysen 7189* (BOL); 15 km S. of Rietvlei, 1 000 m (–AD), *Weitz 408* (UWC); Buffelshoek farm (–CA), *Weitz 171* (UWC); 2 km S. of Appelfontein (–CC), *Weitz 404* (UWC).
 —**3318** (Cape Town): Hopefield (–AB), *Bachmann 937* (Z); Swartberg, Moorreesburg (–BA), *Jordaan 548(b)* (STE); Pipe Track, Table Mountain (–CD), *Schmidt 627* (M); Turn off to Atlantis from the Cape Town–Malmesbury road (–DA), *Esterhuysen 34738* (BOL); Modderkloof, Paardeberg (–DB), *Weitz 454* (UWC); Langverwacht, above Kuils River (–DC), *E.G.H. Oliver 4784* (STE, PRE); 'Dwars in die weg' Farm, E. of Devon Valley road (–DD), *Boucher 4019* (STE); Jonkershoek State Forest, upper valley, 400 m (–DD), *Kruger 67* (PRE, STE).
 —**3319** (Worcester): Saron, 330 m (–AA), *Schlechter 10651* (BM, BOL, BR, G, G-BOIS, G-DC, HBG, L, M, P, PRE, S, Z); 2 km N. of Slagboom (–AA), *Weitz 310* (UWC); Winterhoek Mountains, Tulbagh (–AA), *Zeyher* in SAM

16134 (SAM); Tulbagh (-AC), *Ecklon & Zeyher s.n.* (P); Worcester (-AC), *Ecklon & Zeyher s.n.* (S); Mitchell's Pass, Ceres (-AD), *Rehmann 2348* (Z); Foot of French Hoek Pass, Villiersdorp side (-CC), *Compton 6005* (NBG); Drakenstein Mountains, 100 m (-CC), *Drège s.n.* (HBG); Jonas Kop, roadside (-DC), *Hugo 955* (STE).

—3418 (Simonstown): Above Bakoven (-AB), *Barker 3235* (NBG); Bergvliet Farm, Constantia (-AB), *Purchell* in *SAM 290529* (SAM); Mountains W. of Ocean View (-AB), *Weitz 193* (UWC); Simonstown (-AB), *Wright 322* (TCD); Harmony flats, alongside Lwandle township (-BB), *Boucher 4186* (STE).

—3419 (Caledon): Jakkalsrivier Catchment, Lebanon Forest Reserve (-AA), *Haynes 500* (PRE, STE); Draaiberg, 320 m (-AA), *Weitz 153* (UWC); Donkershoek, 5 km W. of Genadendal (-AB), Caledon (-AB), *Burchell 7914* (K); Fern Kloof Nature Reserve, 75 m (-AD), *Orchard 327* (BR, PRE, STE); Riviersonderend (-BB), *Zeyher* in *SAM 16131* (SAM).

—3420 (Bredasdorp): Bontebok Park, 166 m (-AB), *Acocks 22898* (PRE).

The leaves vary greatly in this taxon. In most instances they are involute, but leaves with flat margins do also occur.

b. var. *gramineum* (*Burm. fil.*) *Weitz* comb. nov. et stat. nov.

C. gramineum *Burm. fil.*, *Fl. Cap. Prod.* 29 (1768). Type: Iconotype: *Pluk.*: t. 272 fig. 5 (1696).

C. filiforme *L. fil.*: 392 (1781); *Gmelin*: 374 (1791); *Murray*: 841 (1798); *Willd.*: 1107 (1798); *Less.*: 331 (1829); *DC.*: 89 (1836); *Steud.*: 425 (1840); *Drège*: 175 (1843); *Krauss*: 72 (1846). Type: *Thunberg* in *LINN-SMITH 1360.4* (LINN, lecto., here designated, photo!)

C. luteum *E. Mey ex DC.*, *DC.*: 89 (1836); *E. Mey. & Drège*: 301 (1837); *Steud.*: 425 (1840); *Drège*: 175 (1843). Type: *Paarlberg*, *Drège 1527* (G-DC, holo., photo!).

Leaves terete, less than 1.5 mm in diameter.

Specimens examined

—3219 (Wuppertal): Kliphuis Ridge, 700 m (-AA), *Weitz 348* (UWC); Near Ezelbank, 1 160 m (-AC), *Drège s.n.* (CGE); Buffelshoek Farm, 1 000 m (-CA), *Weitz 170* (UWC); De Trap Farm, above Bo-Rosendal (-CD), *Moffett 3623* (UWC).

—3318 (Cape Town): Table Mountain (-CD), *Dümmer 142* (NBG); Kenilworth Race Course (-CD), *Weitz 266* (UWC); Paarlberg (-DB), *Drège s.n.* (G, HBG, K, KIEL, L, S, TUB); Eensaamheid Nature Reserve (-DD), *Weitz 222* (UWC).

—3319 (Worcester): Between Rosendalfontein and Visgat (-AA), *Pillans 9765* (BOL); Worcester, Waterfall, 300–600 m (-AC), *Ecklon & Zeyher s.n.* (C, G, G-BOIS, HBG, KIEL, L, M, P, S), *Ecklon & Zeyher* in *STE 26157* (STE); Du Toit's Kloof 800–1 300 m (-CA), *Drège s.n.* (G, K, P, TCD); Bohneur Farm, Rawsonville (-CB), *Stayner* in *NBG 90161* (NBG); Wemmershoek Dam (-CC), *Bruwer* in *NBG 65514* (NBG); Louw's Hoek Farm, Du Toits Mountains (-CD), *Weitz 131* (UWC); Bossiesveld Mountains (-DC), *Stokoe* in *SAM 56629* (SAM).

—3320 (Ladismith): Ridge above Boskloof Hut, Swellendam

Hiking Trail (-CD), *Esterhuysen 35618* (BOL); Langeberg Mtns., near Zuurbraak, 1 100 m (-DC), *Schlechter 2158* (Z).

—3326 (Grahamstown): Howison Poort, 700 m (-AD), *MacOwan 6533* (SAM).

—3418 (Simonstown): Mountains between Silvermine and Muizenberg, 100 m (-AB), *Andraea 124* (PRE); Mountains W. of Oceanview (-AB), *Weitz 194* (UWC); Bright Water (-AD), *Barker 7179* (NBG, UWC); E. of Rondebosch (-AD), *Burchell 171* (M); Olifantsbos, Cape of Good Hope Nature Reserve, (-AD), *Compton 23714* (NBG); Mountains above Gordon's Bay, 100 m (-BB), *Bayliss 4069* (NBG, Z); Helderberg, upper S. slope (-BB), *Esterhuysen 7664* (PRE, UWC); Top of Platbos Pass, Kogelberg Forest Reserve (-BD), *Boucher 810* (STE).

—3419 (Caledon): Highlands, Elgin (-AA), *Compton 14087* (NBG); NE of new bridge over Theewaterskloof Dam (-AA), *Weitz 108* (UWC); Caledon (-AB), *Compton 6007* (BOL); Onrust, Caledon (-AC), *Compton 3362* (BOL, NBG); Vogelgat (-AD), *Moffett 3680* (UWC); Fern Kloof Nature Reserve (-AD), *Orchard 389* (BR, STE); Riviersonderend Mountains near Greyton, 1 000 m (-BA), *Esterhuysen 20778* (BOL, PRE); Appelskraal (-AB), *Ecklon & Zeyher 2739* (S, SAM); Paardeberg, 133 m (-BC) *H. Taylor 4073* (PRE, STE); Aries Kraal (-BD), *Compton 16468* (NBG); Between Elim and De Dam (-DA), *Weitz 151* (UWC); Mierkraal (-DB), *C.A. Smith 4942* (PRE).

—3420 (Bredasdorp): Potberg Flats (-BC), *Barker 8469* (NBG, STE), *Weitz 433* (UWC); Slopes at foot of Bredasdorp Mountain (-CA), *Galpin 10474* (LD, PRE).

—3421 (Riversdale): Corente River Farm, Riversdale District (-AA), *Muir 210* (PRE); NE of Soetmelks River Station (-AB), *Burchell 6663* (K, L), *Burchell 6726* (L, M).

Of significance are the high-altitude populations that occur from the Hottentots Holland Mountains to the Langeberg, near Swellendam. Plants are sometimes 40 mm tall with heads tightly grouped together in corymbose clusters.

c. var. *fourcadei* (*Hutch.*) *Weitz*, comb. nov. et stat. nov.

C. fourcadei *Hutch.* in *Kew Bull.*: 510 (1932); *Markötter*: 363 (1939). Type: Uniondale, Blaauw Bosch Pass, N. side, 730 m, *Fourcade 2849* (BOL, holo.!: K, PRE!, iso.).

Height (110–)167(–240) mm. *Basal leaves* glabrous; blades linear, margins thickened. *Flowers* mauve. (Figure 4).

Distribution and habitat

C. africanum subsp. *scabridum* var. *fourcadei* is confined to the Outeniqua and Swartberg Mountain ranges in the vicinity of Oudtshoorn and George, reaching in an easterly direction as far as the Great Winterhoek Mountains. (Figure 2). The substrate varies from shallow to deep sandy soil derived from Table Mountain sandstone at an altitude of 700 m to 1 860 m above sea level.

Flowering time is from November to February with a peak in December and January.

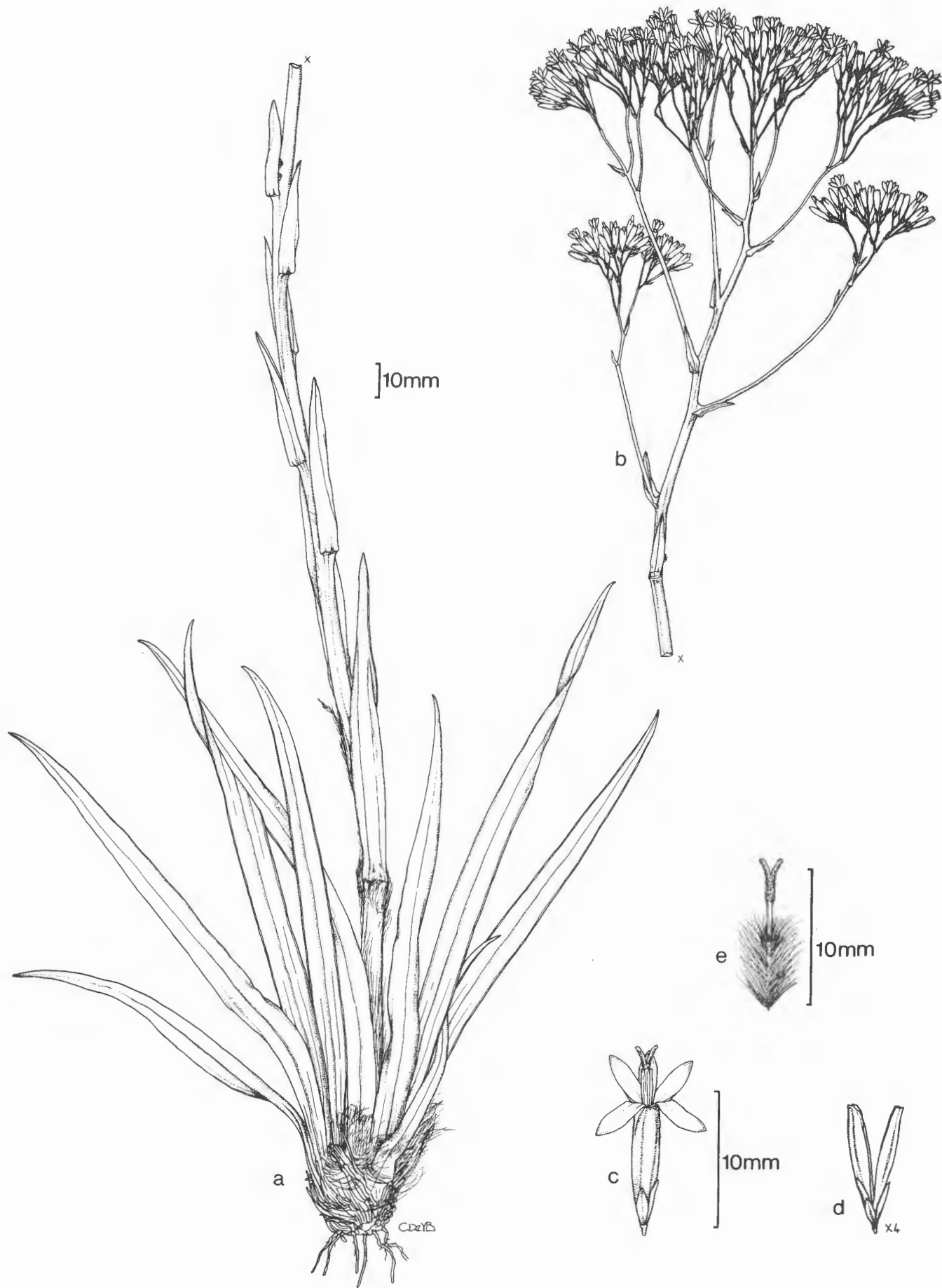


Figure 5 *Corymbium enerve* Markötter. a, plant without conflorescence; b, conflorescence; c, capitulum with flower; d, involucre bracts; e, gynoecium. (Esterhuysen 22390 BOL).

Specimens examined

—3322 (Oudtshoorn): Swartberg, S. of Blouberg (–AC), E.G.H. Oliver 5598 (STE); Outeniqua Pass, 1 000 m (–CD), Weitz 389 (UWC); Buffelsdrif (–DB), W. Bond 1645 (SAAS, STE).

—3323 (Willowmore): Blaauwbosch Pass (–DD), Fourcade 2849 (BOL, PRE); Blaauw Bosch Berg (–DD), Fourcade 3153 (BOL).

—3324 (Steytlerville): Cockscomb, N. slopes, Great Winterhoek Mountains (–DB), Archibald 3500 (BOL).

C. africanum subspecies *scabridum* var. *fourcadei* was first collected by H. Fourcade in November 1923 and described by Hutchinson in 1932. Few subsequent collections have been made, probably on account of the high altitude of this variety.

This variety differs from *C. enerve*, in habit and especially in having scabrid involucre bracts and prominent venation.

2. *C. enerve* E. Markötter, Engl. Bot. Jb. 70: 366 (1939); Levyns: 765 (1950). Type: West of Paulsberg, Cape of Good Hope Nature Reserve, Salter 2938 (BOL, holo.!:; BM, iso.!).

Roots wiry. *Basal leaves* glabrous; blades linear to falcate (110–)180(–300) mm long, (3.5–)10(–18.5) mm broad, apex acute, leaf base dilated, clasping or half-clasping with submembranous margins, silky hairs prominent, margins thickened, slightly muricate, finely impressed veins; texture coriaceous, somewhat thickish; *cauline leaves* glabrous, diminishing in size upwards, 4–130 mm long, 1.5–10 mm broad, base expanded, clasping, shortly decurrent, sometimes pilose in the axil.

Corymbophore elliptic to angular in cross section, scabrid, sometimes lower half pilose, (130–)340(–520) mm long. *Heads* in compact, corymbose clusters arranged in a corymb. *Involucre bracts* glabrous, upper involucre bracts subtended by 2–3 smaller bracts, upper sheathing bracts (6.4–)7.5(–9) mm long, green with purple tips when fresh. *Flowers* white or pink, *pedicel* present. *Petals* linear, acute 4.5–6 mm long, ca. 1.5 mm broad; corolla tube 1.2–2 mm long. *Anthers* 2–3 mm including the base. *Ovary* hirsute, style branches ca. 2 mm long, obtuse. *Cypselas* ca. 5 mm long, ca. 1 mm broad, linear to obovoid. *Pappus* coroniform at base, fimbriate, bristles many, ca. 1 mm long. (Figures 5 & 6).

Diagnostic features

Basal leaves glabrous; blades linear to falcate, coriaceous, margins thickened, slightly muricate. *Corymbophore* scabrid. *Heads* in corymbose clusters arranged in a corymb. *Involucre bracts* glabrous. *Flowers* white or pink, *pedicel* present. *Ovary* hirsute.

Distribution and habitat

C. enerve is confined to the Cape Peninsula from Table Mountain in the north, southwards to Cape Point and in the Cape Hangklip area (Figure 6). This species is found on mountain slopes and on flats of the Cape of Good Hope Nature Reserve, from close to sea level to about 800 m above sea level. It prefers moist habitats and is sometimes present in semi-marsh habitats. The substrate is normally a shallow to deep sandy soil. Populations of this species are always found in Restionaceous fynbos.

Flowering time is from November to February with a peak during November and December.

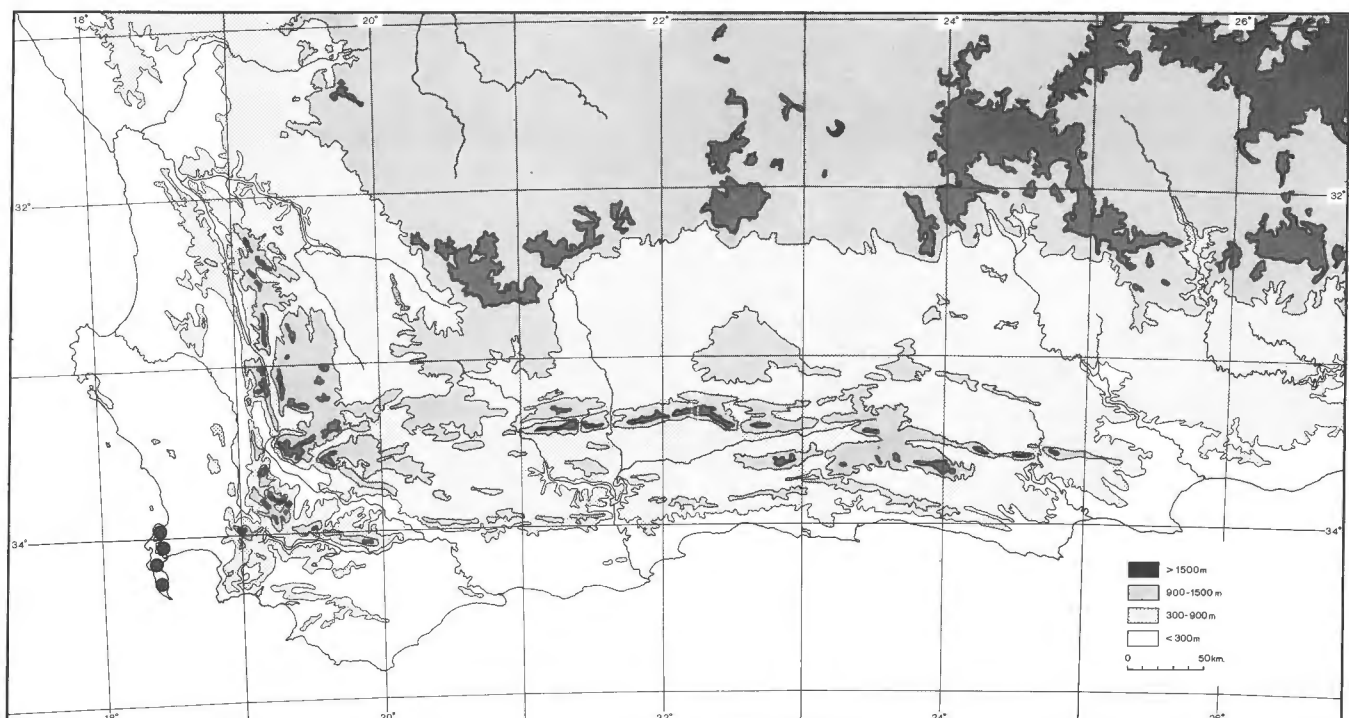


Figure 6 Geographic distribution of *Corymbium enerve*.

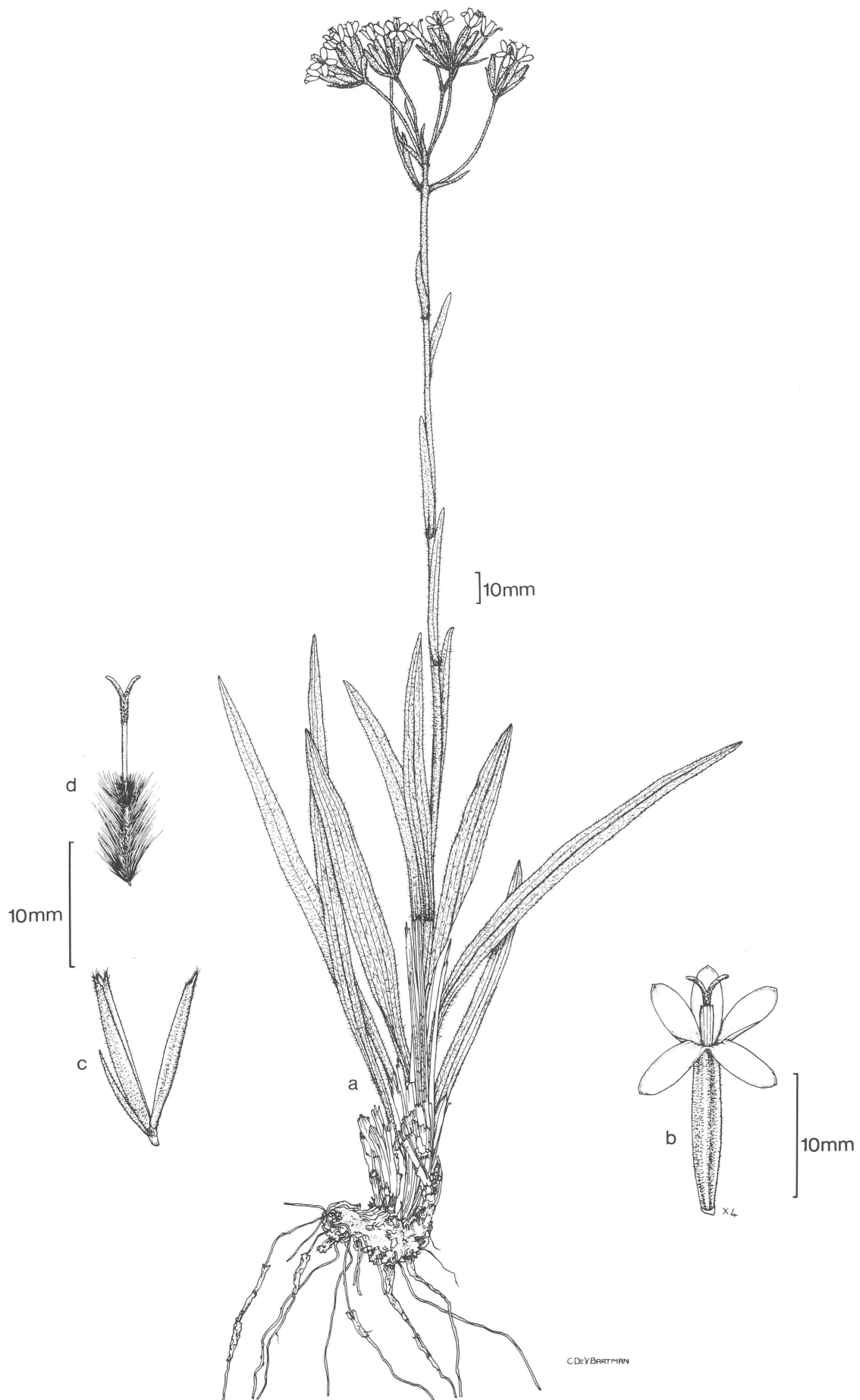


Figure 7 *Corymbium villosum* L. fil. a, plant; b, capitulum with flower; c, involucre bracts; d, gynoecium. (Weitz 267).

Specimens examined

—3318 (Cape Town): Kirstenbosch, Skeleton butress (–CD), *Compton 1611* (UWC); Slopes above Window gorge, 830 m (–CD), *Esterhuysen 11034* (BOL); Table Mountain (–CD), *Rehmann 752* (Z); Vlaggenberg, N. slope near summit (–CD), *Salter 2905* (BM, BOL).

—3418 (Simonstown): Silvermine, near stream, 330 m (–AB), *Compton 14286* (NBG); Steenberg, 330 m (–AB), *Compton 17873* (NBG); W. of Paul's Berg, Cape of Good Hope Nature Reserve (–AD), *Salter 2938* (BM, BOL); Palmiet River mouth (–BD), *Compton 12826* (NBG).

T.M. Salter made the first recorded collection of this species on the 22nd of January 1928 on Muizenberg Mountain, and Markötter in 1939 described *C. enerve* from a specimen collected by Salter on Paulsberg in the Cape of Good Hope Nature Reserve.

The specific epithet, *enerve*, refers to the sunken veins which are scarcely visible in fresh material.

C. enerve is closely related to *C. africanum* subsp. *scabridum*, but differs from the latter in habit, and especially in the glabrous involucre bracts, the average size of the corymbophore and the leaves which are coriaceous with thickened, muricated margins.

3. *C. villosum* L. fil., Suppl. Pl.: 392 (1781); Lam.: 130 (1786); Gmelin: 374 (1791); Thunb.: 170 (1794); Murray: 841 (1798); Willd.: 1107 (1798); Thunb.: 730 (1823); Less.: 691 (1831); DC.: 89 (1836); Steud.: 425 (1840); Drège: 175 (1843); Harv.: 56 (1865); Markötter: 358 (1939). Type: Cape Province Cap. b. Spei, Cape of Good Hope, *Thunberg* in *LINN-SMITH 1360.5* (LINN, lecto., here designated, photo!).

C. hirsutum Eckl. ex DC.: 89 (1836) nom. nud.

C. hirtum Thunb.: 170 (1794). Type: Cap. b. Spei, *Thunberg* in herb. THUNB. (Juel 20993) (UPS-THUNB, holo., photo!).

Roots fibrous to wiry. *Basal leaves* villous, glandular hairs on both surfaces, viscid; blades linear to sub-falcate (115–)240(–450) mm long, (2.5–)4.5(–9.2) mm broad, apex acute, texture herbaceous; *cauline leaves* 15–160 mm long, 1.5–8 mm broad, base expanded, half-clasping, decurrent. *Corymbophore* terete, villous and glandularly muricated, (190–)360(–610) mm long. *Heads* in corymbose clusters arranged in a corymb. *Involucre bracts* scabrid, viscid; upper sheathing bracts (9–)11(–14) mm, irregularly trifid. *Flowers* white; pedicel present 1–2 mm long. *Petals* linear, acute 4–6 mm long, 1–1.5 mm broad; corolla tube 3–4.5 mm long, cylindrical. *Anthers* 2.5–3 mm long including base. *Ovary* hirsute; style branches obtuse. *Cypselas* ca. 4 mm long, 1 mm broad, elliptic. *Pappus* coroniform, bristles 1–2 mm (Figures 7 & 8).

Diagnostic features

Basal leaves villous, glandular hairs on both surfaces, viscid; blades linear to sub-falcate. *Corymbophore* hispid. *Heads* in corymbose clusters arranged in a corymb. *Involucre bracts* scabrid, viscid. *Flowers* white. *Ovary* hirsute.

Distribution and habitat

This species is known from the Northern Cedarberg southwards to the Hottentots Holland Mountains and from here eastward to the Bredasdorp Mountains. Populations are also found in the Langeberg, near Robertson (Figure 8).

C. villosum occurs on Table Mountain Sandstone and

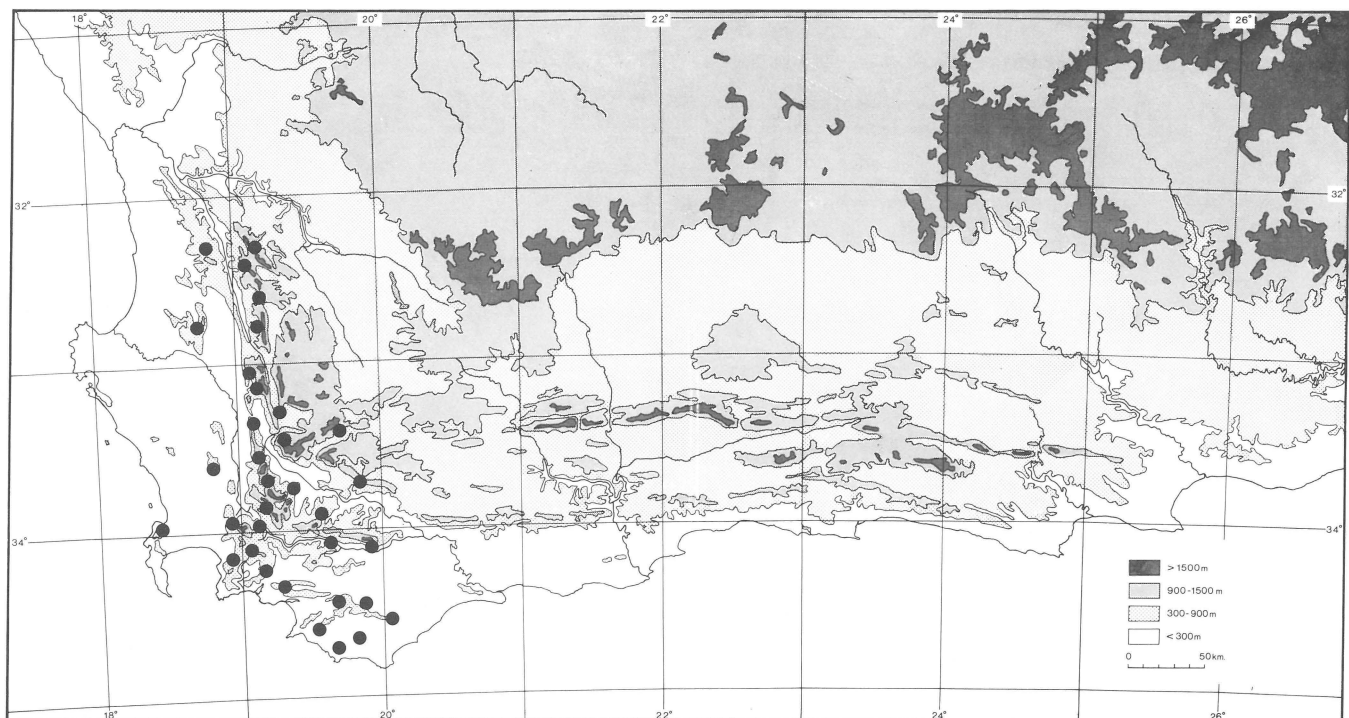


Figure 8 Geographic distribution of *Corymbium villosum*.

is also present on Bakkeveld shale and granite soil of the Malmesbury Group.

This species prefers moist habitats either along mountain slopes, river valleys or poorly drained flats. It occurs over a wide range of altitude varying from 20 m above sea level at Gonna Kraal on the Elim flats to 1 600 m above sea level in the Cedarberg.

This species usually grows in association with low-growing shrubs in Mountain Fynbos and Rhenosterveld.

Flowering time is from October to January with a definite peak during November.

Specimens examined

—**3218** (Clanwilliam): Hills between Witelskloof and Lambertshoekberg (–BD), *Pillans 9082* (BOL, NBG, PRE); Piketberg mountain, 500–1 000 m (–DA), *Drège s.n.* (CGE, S, TUB); SW slopes of Zebra Kop (–DB), *Pillans 7306* (BOL); Hills NW of Mouton's Vlei (–DC), *Pillans 7237* (BOL); 3 km NE of Bugler's Post, Piketberg, 146 m (–DD), *Weitz 428* (UWC).

—**3219** (Wuppertal): Middelberg above Algeria, 900 m (–AC), *Weitz 356* (UWC); Buffelshoek farm (–CA), *Weitz 173* (UWC); Cardouw Pass, 1 000 m (–CC), *Barker 7592* (NBG; UWC).

—**3318** (Cape Town): Riebeeck Kasteel (–BD), *Pillans 6101* (BOL); Koeberg (–CB), *Zeyher in SAM 16141* (SAM); Lion's Head (–CD), *Thunberg s.n.* (S); Pearl mountain (–DB), *Weitz 267* (UWC); Jonkershoek (–DD), *Compton 15300* (NBG); Stellenbosch (–DD), *Ecklon s.n.* (BR), *Harvey s.n.* (TCD).

—**3319** (Worcester): Winterhoek, 300–1 600 m (–AA), *Ecklon & Zeyher in SAM 16142* (SAM), *Ecklon & Zeyher s.n.* (L); between Rosendalfontein and Visgat (–AA), *Pillans 9645* (BOL); Gydo Pass (–AB), *Weitz 402* (UWC); Plains near Tulbagh (AC), *Marloth 9569* (PRE); Mitchell's Pass (–AD), *Compton 11942* (NBG, STE), *Esterhuysen 6151* (BOL); Hex River (–BC), *Bolus in PRE 11896* (PRE); Du Toit's Kloof (–CA), *Barker 5986* (NBG), *Drège s.n.* (CGE, G, K, KIEL, L); Bain's Kloof (–CA), *Button s.n.* (TCD); Slopes behind Brandvlei (–CB), *Levyns 10771* (BOL); French Hoek Kloof, 500–650 m (–CC), *Drège s.n.* (BOL, G, G-BOIS, L, SAM, TCD); West of Louwshoek Peak, 1 000–1 300 m (–CD), *Esterhuysen 11201* (BOL); Scherpenheuvel (–DA), *Barker 7518* (NBG); Poesjenels River, Dry slopes, 900 m (–DC), *Levyns 5455* (BOL); Robertson, lower slopes of Langeberg (–DD), *Levyns 4323* (BOL).

—**3418** (Simonstown): Sir Lowry's Pass (–BB), *Compton 16529* (NBG); Helderberg, 300 m (–BB), *Parker 3739* (BOL, NBG).

—**3419** (Caledon): Elgin (–AA), *Compton 16519* (NBG), *Leighton 818* (BOL), *Lewis in SAM 56611* (PRE), *Lewis in SAM 56612* (SAM); Draaiberg, 320 m, NE of new bridge over Theewaterskloof Dam (–AA), *Moffett 2664* (UWC), *Weitz 109* (UWC); Caledon, 160 m (–AB), *Acocks 22951* (PRE); Hermanus (–AC), *Rogers 26465* (PRE); Fernkloof Nature Reserve, Hermanus (–AD), *P. Bond 1698* (NBG), 150 m, *Orchard 367* (BR, PRE, STE); Genadendal, 500 m (–BA), *Galpin 4112* (PRE); Ganzekraal, stony hill near station (–BB), *Burchell 7560* (K, L, M, P); Paardeberg Farm, 13 km E. of Stanford, 145 m (–BC), *H.C. Taylor 4072* (STE);

Strandkloof (–CB), *Compton 22136* (NBG); Waterford, Haelkraal River (–DA), *E.G.H. Oliver 6122* (PRE, STE); Koude River, 266 m (–DA), *Schlechter 9608* (BOL, Z); Gonnakraal (–DA), *Weitz 148* (UWC); Elim (–DB), *Bolus 6909* (BOL, NBG), *Frowein 15638* (PRE); Bredasdorp Mountains, Napier (–DB), *Jordaan 240*, (STE).

—**3420** (Bredasdorp): Bredasdorp Mountain, northern aspect, 300 m (–CA), *Weitz 141* (UWC).

Without precise locality: Cape of Good Hope, *Thunberg in LINN-SMITH 1360.5* (LINN).

Linnaeus filius described *C. villosum* from Thunberg's collection. There is one specimen in the Smith herbarium in LINN as well as one at UPS. Both specimens bear Thunberg's script and are all identical, so I lectotypify the specimen in Smith's herbarium while the one at UPS is considered as an isolectotype.

The specific epithet *villosum* refers to the villous leaves described by Linnaeus filius as '*villosolanicum*'.

C. villosum is closely related to *C. africanum* subsp. *scabridum*, but differs from the latter in habit, especially the leaves which are villous and viscid, the longer corolla tube and the longer pedicel. It differs from *C. enerve* by its villous leaves, longer corolla tube and bracts which are scabrid.

Populations from the Elim, Bredasdorp localities have a coarser leaf surface, a more ramified conflorescence, but still typically corymbose.

Common name: 'Heuningbossie', honey bush. (Smith 1966).

4. *C. cymosum* *E. Mey. ex DC.*, Prodr. 5: 89 (1836); *E. Mey. & Drège*: 301 (1837); *Steud.*: 425 (1840); *Drège*: 175 (1843); *Harv.*: 56 (1865); *Markötter*: 364 (1939). Type: Cape Province, Paarl Mountain, *Drège 1525* (G-DC, holo., photo!).

Roots wiry. *Basal leaves* glabrous; blades linear to falcate (18–)33(–50) mm long, (2.5–)5(–8) mm broad, flat or slightly involute, apex acute, base dilated, half-clasping or nearly so, sparsely woolly in the axil of the young leaves, margins thickened, finely impressed veins, texture cartilaginous; silky hairs not so prominent at leaf bases, *cauline leaves* glabrous, 5–150 mm long, 1.5–8 mm broad; uppermost leaves small and reduced to lanceolate or subulate scales. *Corymbophore* elliptic in cross section, glabrous or slightly muricated, sometimes upper portion slightly pubescent (130–)380(–630) mm long. *Heads* in compact corymbose clusters arranged in a corymb. *Involucral bracts* glabrous; upper involucral bracts subtended by 2 or 3 smaller bracts, upper sheathing bracts (6.8–)8.5(–10.5) mm long, green with purple tips when fresh. *Flowers* ivory white; pedicel absent. *Petals* linear, acute 4–5 mm long, *ca.* 1.5 mm broad; corolla tube 2–3 mm long. *Anthems* 1.5–2.5 mm long including base. *Ovary* villous; style branches, obtuse. *Cypselas ca.* 5 mm long elliptic ovoid. *Pappus* coroniform, bristles *ca.* 2 mm long (Figures 9 & 10).

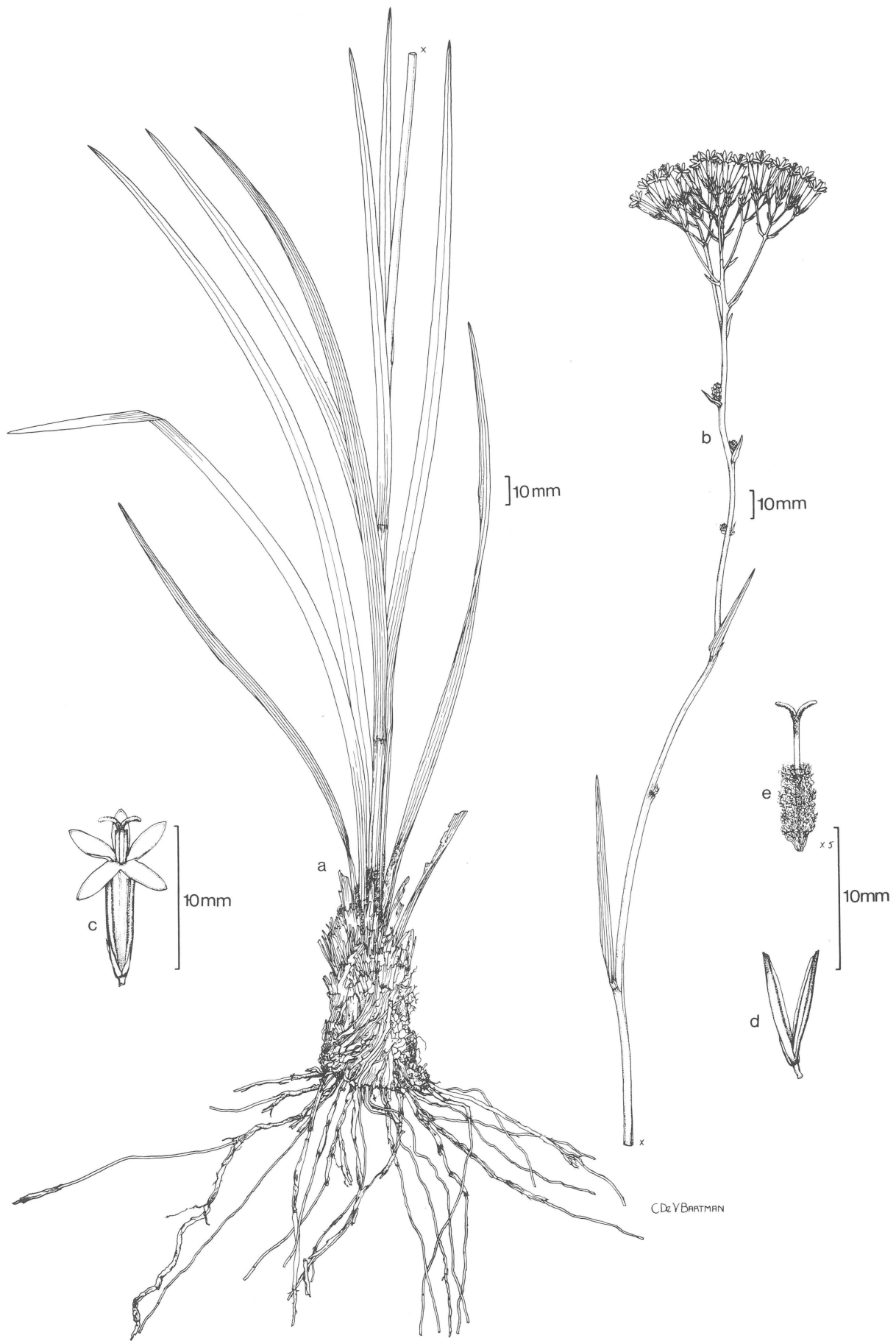


Figure 9 *Corymbium cymosum* E.Mey. ex DC. a, plant without conflorescence; b, conflorescence; c, capitulum with flower; d, involucre bracts; e, gynoecium. (Weitz 213).

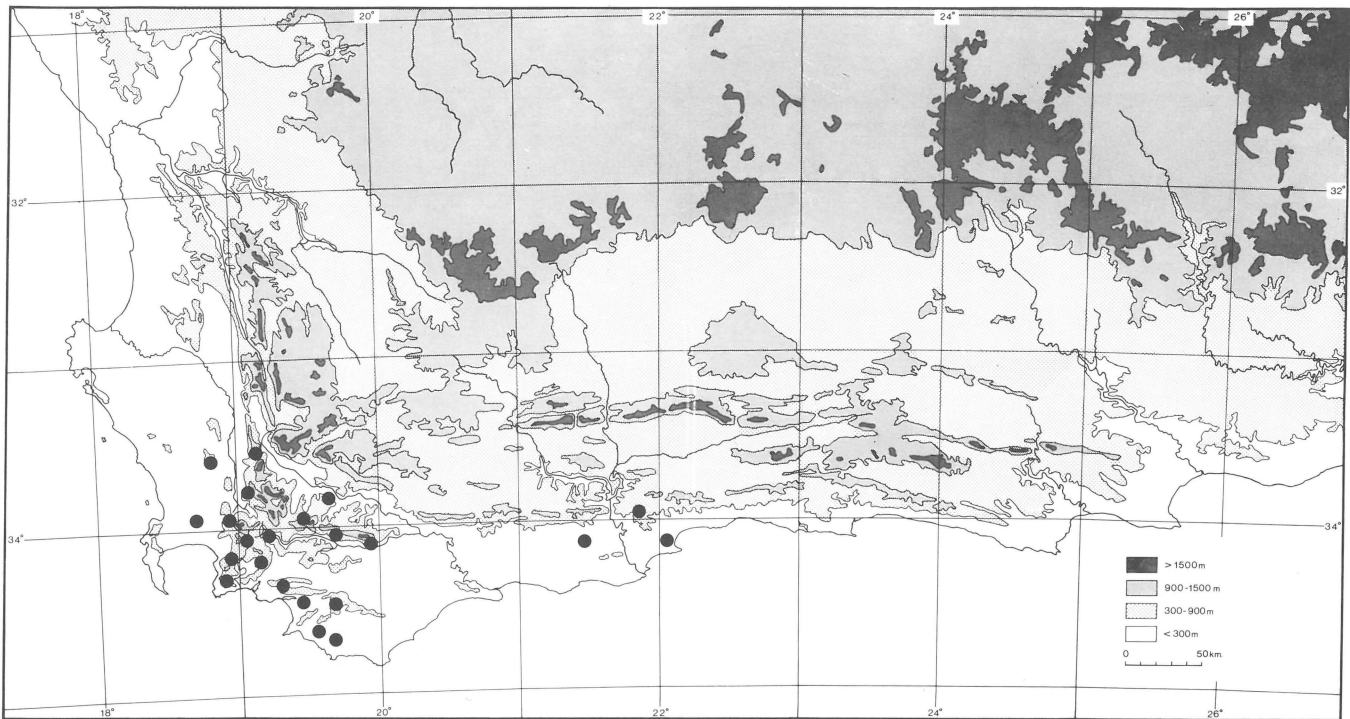


Figure 10 Geographic distribution of *Corymbium cymosum*.

Diagnostic features

Basal leaves glabrous; blades linear to falcate, flat or slightly involute. *Corymbophore* glabrous or sometimes slightly muricated. *Heads* in corymbose clusters arranged in a corymb. *Involucral bracts* glabrous. *Flowers* white, pedicel absent. *Ovary* villous.

Distribution and habitat

This species occurs from Paardeberg near Malmesbury and the Tygerberg and Bottelary hills north-east of Cape Town eastwards to the Langeberg Mountains as far as Mossel Bay (Figure 10). Although it is often found in a mountainous habitat, it also occurs on the southern coastal foreland from 20 m above sea level to about 1 000 m above sea level. The substrate varies from sandy to clayey acid soil derived from the Table Mountain Supergroup and the Malmesbury Group.

C. cymosum usually grows in association with low growing shrubs in Mountain Fynbos, Coastal Fynbos on acidic sand and Rhenosterveld.

Flowering time is from October to December with a peak in October and November.

Specimens examined

—**3318** (Cape Town): Paarl Mountain (–DB), *Drège 1525* (G-DC); Modderkloof farm, Paardeberg, 400 m (–DB), *Weitz 260* (UWC); Tygerberg Nature Reserve (–DC), *Loubser 4117* (UWC); Langverwacht farm, above Kuils River (–DC), *E.G.H. Oliver 4785* (STE); Jonkershoek, Jakkalsvlei, northern side of valley, 430–760 m (–DD) *H.C. Taylor 4379* (PRE).
—**3319** (Worcester): Villiersdorp (–CD), *Esterhuysen* in *NBG 23780* (NBG), *Esterhuysen* in *PRE 41559* (PRE); Scherpenheuvel hillside (–DA), *Barker 7520* (SAM); Du Toit's Kloof

Peak, western side of mountains, 900 m (–CC), *Acocks 20642* (PRE).

—**3321** (Ladismith): Cloete's Pass, Herbertsdale, low hill behind northern range (–DD), *Moffett 2370* (UWC).

—**3418** (Simonstown): Kogelberg, Palmiet Valley near Highlands crossing (–AD), *Boucher 2026* (PRE, STE); Sir Lowry's Pass (–BB), *Compton 16535* (NBG, UWC); Buffel's River Valley, Hangklip (–BD), *Compton 17582* (NBG).

—**3419** (Caledon): 35 km NW of Eerstehoop (–AA), *Acocks 24267* (PRE); Houw Hoek Pass, upper slopes, SE aspect (–AA), *Barker 8798* (NBG); Draaiberg, 320 m, NE of new bridge over Theewaterskloof Dam (–AA), *Weitz 111* (UWC); Caledon, kloof above Nature Reserve (–AB), *Jordaan 840* (STE); Fernkloof Nature Reserve, Hermanus (–AD), *Orchard 388* (BR, PRE, STE); Genadendal, mountain sides, 400 m (–BA), *Galpin 4111* (PRE); Drayton Siding (–BA), *Granby 84* (C); Appelskraal, Riviersonderend (–BB), *Zeyher* in *SAM 37670* (SAM); Paardeberg farm, 10 km E. of Stanford (–BC), *Taylor 4075* (PRE); Anyskop, S. of Rietpoel (–BD), *Jordaan 953* (STE); Hills NE of Pearly Beach, 170 m (–DA), *Acocks 22980* (PRE); Gonnakraal, between Elim and De Dam (–DA), *Weitz 146* (UWC).

—**3421** (Riversdale): Soetmelks River, NE of station (–AB), *Burchell 6661* (K).

—**3422** (Mossel Bay): Near Mossel Bay, on rocky hillside (–AA), *Rodin 1349* (BOL, PRE).

Although this species was collected by Masson in 1772 and Thunberg in 1773, it was only described by De Candolle in 1836 from a specimen collected by J.F. Drège at Paarl Mountain in 1827. Linnaeus filius saw Thunberg's specimen and wrongly labelled it *C. glabrum* L. The description given by DC matches Drège's specimen except for the corymbophore which is slightly

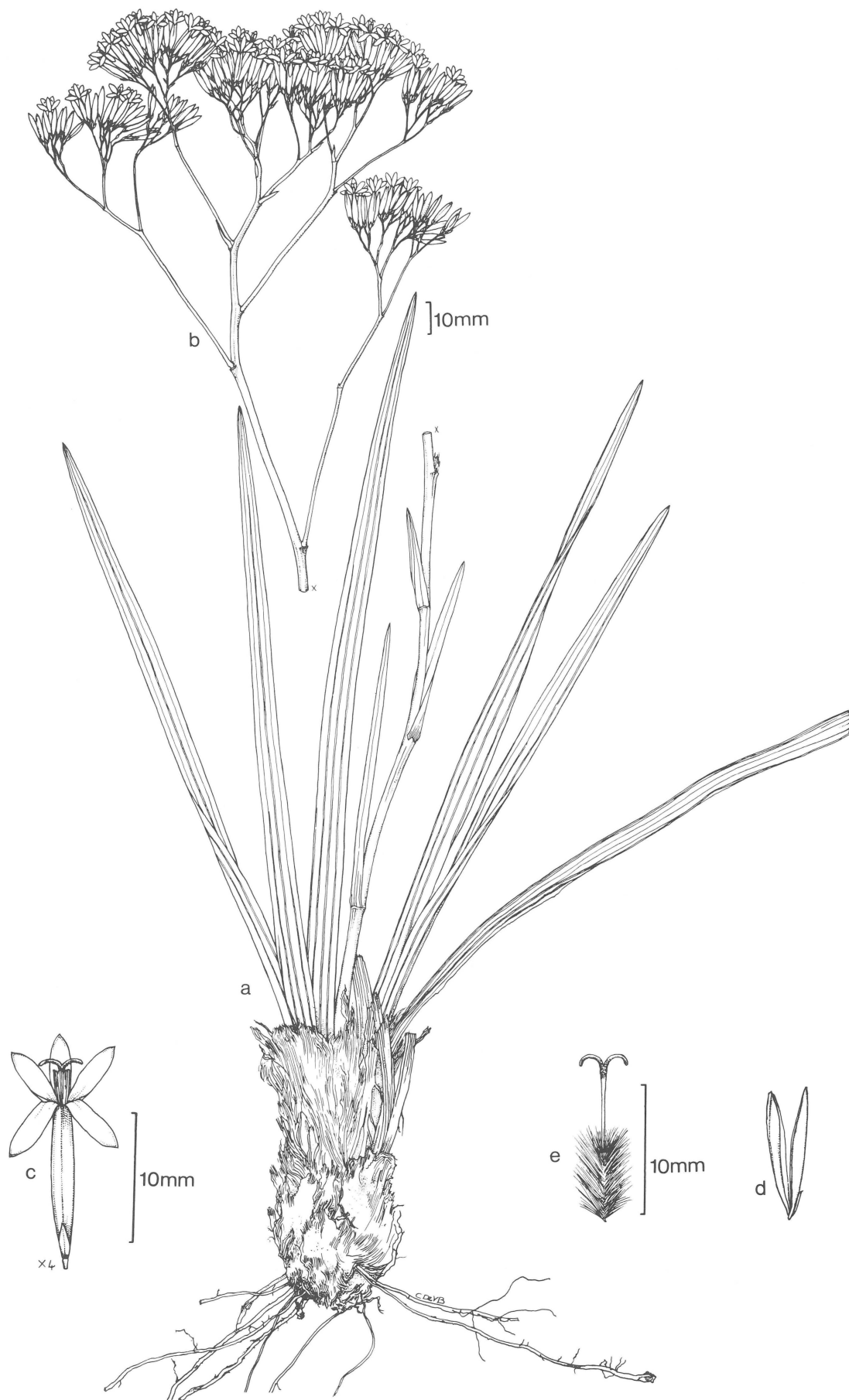


Figure 11 *Corymbium glabrum* L. var. *glabrum*. a, plant without confluence; b, confluence; c, capitulum with flower; d, involucral bracts; e, gynoecium. (Weitz 284).

pubescent which has been described by DC as '*totum glaberrimum*' (totally glabrous).

The specific epithet, *cymosum*, refers to the cymose arrangement of the heads.

C. cymosum is a well-defined species and easily recognized in the veld. The typical form is found in the Grabouw-Villiersdorp area. Further eastwards towards the Langeberg the conflorescence tends to become more ramified but with the corymbose clusters still in a corymb.

5. *C. glabrum* L., Syst. Nat. 12,2: 582 (1767). Type: Iconotype: Pluk.: t. 272, fig. 4 (1696). Illustration: Lam. t.1 (1797).

Roots wiry. *Basal leaves* glabrous; blades narrowly to broadly linear, sometimes falcate, rigid, (80–)190 (–330) mm long, (0.5–)6.8(–20.9) mm broad, apex acute, base dilated, half-clasping with submembranous margins, silky hairs prominent, margins smooth, scabrid or slightly muricated, venation prominent; texture cartilaginous to coriaceous; *cauline leaves* glabrous; sometimes sparsely lanate in the axils, much shorter than basal leaves 5–80 mm long, 1–6 mm broad, base clasping or half-clasping, lower ones decurrent. *Corymbophore* terete to angular, glabrous (95–)286(–600) mm long, 1–3.5 mm in diameter. *Heads* in corymbose clusters arranged in a corymb or lax panicle. *Involucral bracts* glabrous, upper bracts subtended by 2 to 3 smaller bracts, upper bracts (6–)8.5(–12) mm long, apex fimbriate, hyaline, usually green with purple tips or tinged purplish when fresh. *Flowers* mauve; pedicel present 0.5–1 mm long. *Petals* linear (3.5–)4.8(–6.4) mm long, cylindrical. *Anthers* 2–3.6 mm long including

base. *Ovary* hirsute; style branches ca. 2 mm long, obtuse. *Cypselas* 4–7 mm long, 1–1.5 mm broad, linear. *Pappus* coroniform at base, fimbriate, bristles many ca. 1.5 mm long (Figures 11 & 13).

Diagnostic features

Basal leaves glabrous; blades narrowly to broadly linear, sometimes falcate, rigid, venation prominent. *Corymbophore* glabrous. *Heads* in corymbose clusters arranged in a corymb or lax panicle. *Involucral bracts* glabrous. *Flowers* mauve. *Ovary* hirsute.

Distribution and habitat

C. glabrum is the most widely dispersed species occurring from the Cedarberg in the north, southwards to the mountains of the Cape Peninsula and eastwards as far as Grahamstown, excluding the Knysna Forests (Figure 12). The habitat appears to vary somewhat as might be expected in such a widespread species: the plants grow in clayey or sandy, acid soil derived from the Table Mountain Super Group and the Malmesbury group.

Flowering time is from December to February with a peak during December and January.

C. glabrum is a remarkably variable species. Previous systematic treatments of this species reflect the great variability in habit. In botanical literature published since Harvey (1865), it has often been regarded as 5 or 6 different species. However, some consistency was attained after the treatment of *Corymbium* in Flora of the Cape Peninsula by Levyns (1950), but only in local regional herbaria.

The differences between population groups are mainly due to the great diversity in shape and size of the radical

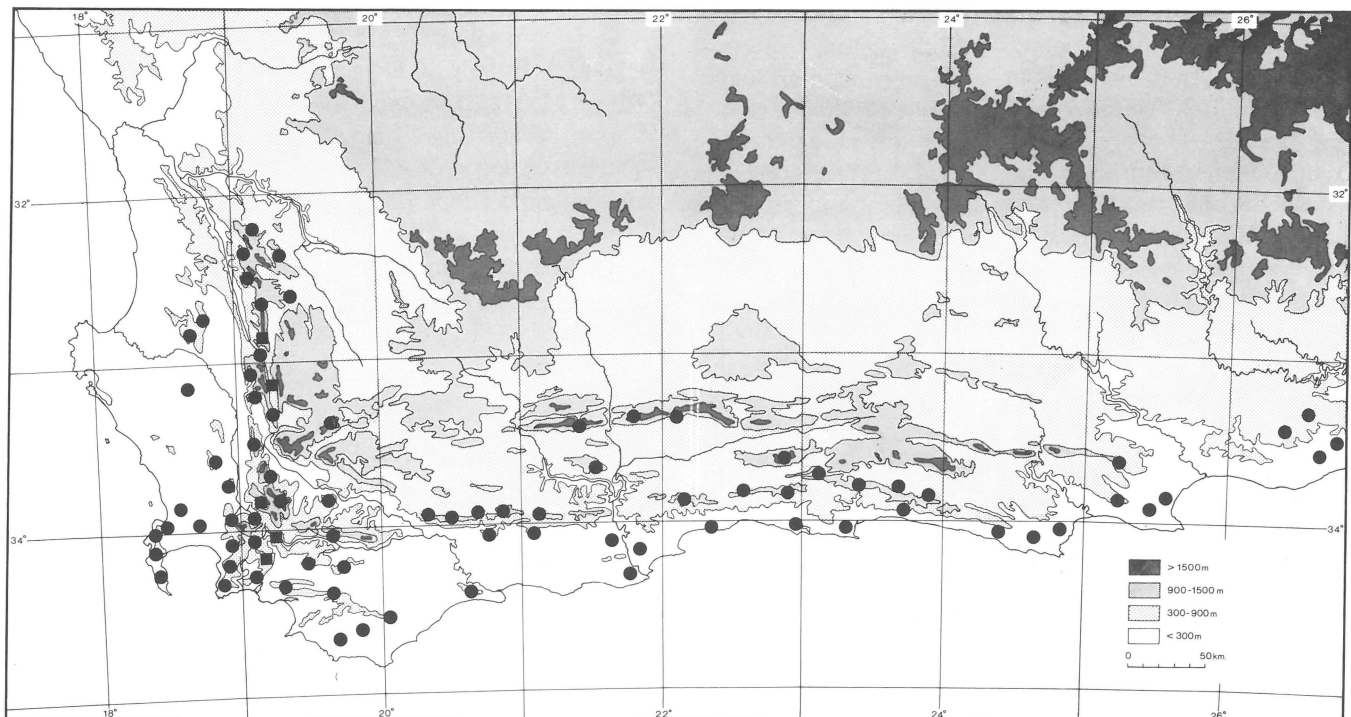


Figure 12 Geographic distribution of *Corymbium glabrum* var. *glabrum* ● and var. *rogersii* ■.

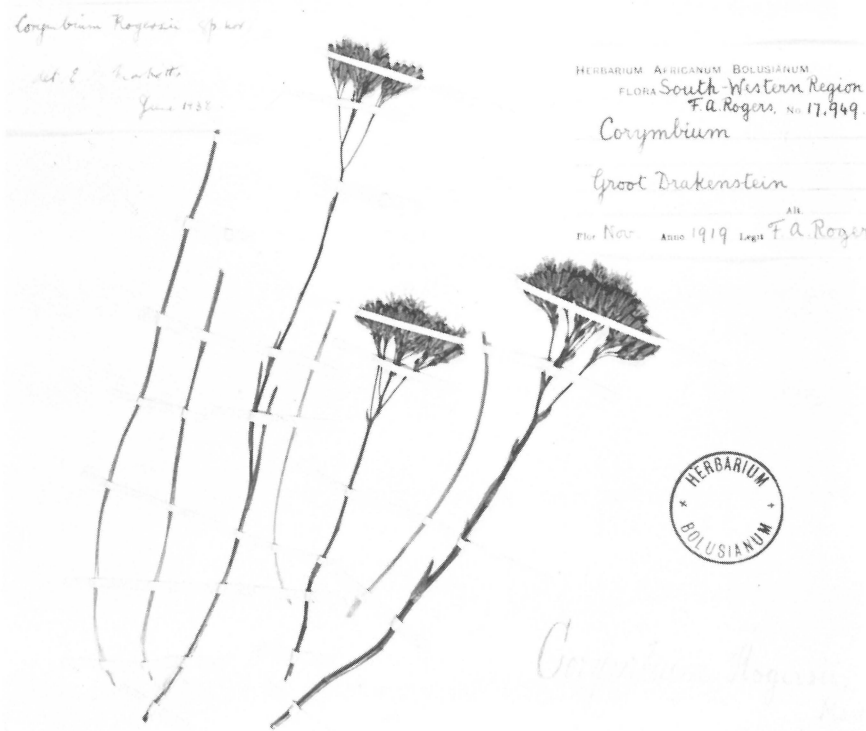


Figure 13 *Corymbium glabrum* var. *rogersii*, Groot Drakenstein Mountains (holotype: Rogers 17949 BOL).

leaves and the conflorescences. Intermediates between forms with differently shaped leaves and conflorescence structure are not uncommon and there seems to be no sharp genetic barriers between some of them. However, there are certain populations with distinct leaf shapes which differ quite radically from others.

Populations occurring from the Olifants River Mountains southwards as far as the Houwhoek Mountains have filiform leaves with corymbose clusters arranged in a corymb. Within the same distribution range are also found populations with linear, rigid, cartilaginous leaves with prominent veins growing in close proximity.

Populations occurring from Hottentots Holland to the Van Stadens Mountains have broad, coriaceous leaves which become rugulose when dry. They appear in the same distribution range with populations having linear, rigid, cartilaginous leaves with prominent venation. A form with broad, coriaceous leaves is found in the vicinity of Swellendam where the leaves have a slightly wavy, muricated margin, sometimes with marginal cilia.

Much variation in the size and shape of the leaves can be observed under varying ecological conditions. From the above it is proposed that two varieties be recognized in *C. glabrum*.

Key to the varieties

- 1a Leaf blades narrowly to broadly linear, sometimes falcate, more than 2 mm broad; corymbose clusters arranged in a corymb or panicle **a. var. glabrum**
- 1b Leaf blades narrowly linear (filiform), less than 2 mm broad; corymbose clusters arranged in a corymb **b. var. rogersii**

a. var. glabrum

C. glabrum L.: 582 (1767a); L. fil.: 92 (1781); Lam.: 130 (1786); Gmelin: 374 (1791); Thunb.: 170 (1794); Murray: 841 (1798); Willd.: 1107 (1798); Thunb.: 729 (1823); Less.: 691 (1831); DC.: 89 (1836); E. Mey. & Drège: 301 (1837); Steud.: 425 (1840); Drège: 175 (1843); Krauss: 72 (1846); Harv.: 55 (1865); Levyns: 764 (1950).

C. nervosum Thunb.: 170 (1794); Thunb.: 729 (1823); DC.: 89 (1836); E. Mey. & Drège: 301 (1837); Steud.: 425 (1840); Drège: 175 (1843); Krauss: 72 (1846); Harv.: 55 (1865). Type: Cap. b. Spei, Thunberg in herb. Thunberg (Juel 20994) (UPS-THUNB, holo., photo!).

Illustration: Marloth: t.55 (1932).

— **var. subulifolium** Harv.: 55 (1865). Type: Uitenhage, Zeyher 2736 (SAM!, lecto., here designated, K!, P!, S!, STE!, Z!).

C. latifolium Harv.: 55 (1865); Markötter: 358 (1939). Type: Van Stadensberg, Uitenhage, Zeyher 2737 (SAM, lecto!).

C. harveyanum Markötter: 366 (1939). Type: Wynberg, Wallich 417 (BM, holo!).

C. salteri Markötter: 367 (1939). Type: S. slopes of Helderberg, Somerset West, Salter 4236 (BOL, holo!).

Plants (100–)350(–600) mm high. Leaf blades linear to falcate, cartilaginous with strongly prominent veins; margins smooth or with muricated margins. Heads in corymbose clusters arranged in a corymb or lax panicle (Figure 11).

Distribution and habitat

C. glabrum var. *glabrum* is the most widespread variety occurring from the Cedarberg to Grahamstown, from close to sea level to about 1 900 m above sea level (Figure 12). Although it occurs in a variety of habitats it prefers dry mountain slopes while the substrate varies from shallow to deep sandy or clayey acid soil. This variety is also found on the limestone hills in the Bredasdorp – De Hoop area. Here it is confined to the shallow sandy pits that form in crevices.

Specimens examined

- 3218** (Clanwilliam): Versveld Pass, Piketberg (–DC), *Weitz 421* (UWC); Bugler's Post, Piketberg (–DD), *Weitz 424* (UWC).
- 3219** (Wuppertal): Pakhuis Pass (–AA), *Barker 857* (NBG); Langberg 1 660 m (–AC), *Andrag 200* (STE); Nieuwoudt Pass, 15 km S. of Rietvlei Farm, eastern Wolfberg, 1 200 m (–AD), *Weitz 409* (UWC); Elandskloof (–CA), *Esterhuysen 3991* (BOL); Kromrivier Kloof (–CB), *Esterhuysen 17977* (BOL); Skoongesig, Cold Bokkeveld (–CC), *Hanekom 1525* (PRE, STE); De Trap Farm, above Bo-Rozendal (–CD), *Moffett 3622* (UWC).
- 3318** (Cape Town): Swartberg, Moorreesburg (–BA), *Jordaan 548(a)* (STE); Table Mountain (–CD), *Ecklon 219* (HBG, KIEL, M, S, TUB); Modderkloof, Paardeberg (–DB), *Weitz 262* (UWC); Tygerberg (–DC), *Ecklon s.n.* (S); Jonkershoek (–DD), *Compton 15277* (NBG, PRE).
- 3319** (Worcester): Winterhoek Mountains, 500–600 m (–AA), *Drège s.n.* (KIEL); Kleinfontein, Tierberg (–AB), *Weitz 159* (UWC); Tulbagh (–AC), *Ecklon & Zeyher s.n.* (BOL); Near Ceres (–AD), *Adamson D46* (PRE); Roodeberg, 1 666 m (–BC), *Compton 8393* (NBG); Bain's Kloof (–CA), *Compton 16923* (BOL, STE); Brandvlei (–CB), *Rehmann 2396* (BM, Z); French Hoek Pass, E. side (–CC), *Compton 8154* (NBG); Mountain side, Elandskloof (–CD), *Galpin 12321, 12322* (PRE); Poesjenels River, lower slopes, 330 m (–DC), *Levyns 5456* (BOL).
- 3320** (Montagu): Swellendam mountains, 1 830 m (–CD), *Compton 10580* (NBG); Tradouw Pass, 900 m (–DC), *Weitz 368* (UWC); Naauwpoort Peak, Heidelberg, 330–500 m (–DD), *Thorne in SAM 44518* (SAM).
- 3321** (Ladismith): E. of Waterkloof, Ladismith (–AD), *Moffett 2647* (UWC); Garcia's Pass (–CC), *Burchell 6947* (K); Groenkloof, Rooiberg (–DA), *H.C. Taylor 9792* (STE); Cloete's Pass, Herbertsdale (–DD), *Moffett 2368A* (UWC).
- 3322** (Oudtshoorn): SW foot of Swartberg Pass, 630 m (–AC), *W. Bond 1555* (SAAS); Robinson Pass (–CC), *Barker 7149* (NBG); Outeniqua Pass, 1 000 m (–CD), *Weitz 391* (UWC); Kamanassie, 1 800 m (–DB), *W. Bond 1645* (SAAS); Berg Plaats, 333 m (–DC), *Fourcade 3467* (BOL); Karatara (–DD), *Keet 1140* (GRA, PRE, STE).
- 3323** (Willowmore): Sand dunes, Groot River (–BA), *Fourcade 1095* (BOL); Potjiesberg Pass, Uniondale (–CA), *Weitz 385* (UWC); Ongelegen area, W. of Misgund, Langkloof (–CB), *Moffett 2406* (UWC); Prince Alfred Pass, 400 m (–CC), *Acocks 21729* (M, PRE); Misgund hills (–CD), *Esterhuysen 6947* (BOL); Skrik River, Baviaan's Kloof (–DB), *Manson 238* (SAAS, STE); Tsitsikamma Park, 16 m (–DC), *Bokelmann P160* (PRE); Blaauw Bosch Pass, 730 m (–DD),

Fourcade 2850 (BOL, K, PRE, STE).

- 3325** (Port Elizabeth): Groendal Wilderness Area, 580 m (–CA), *Scharf 1077* (PRE); Vermaakskop Farm, Groendal Wilderness Area, 1 000 m (–CB), *Scharf 1769* (PRE); Uitenhage (–CC), *Zeyher 302* (BM, BOL, K, STE); Van Stadens Mountain (–CC), *Zeyher 2736* (K, P, S, SAM, STE, Z), *Zeyher 2737* (SAM); Parson's Vlei (–CD), *F. Long 873* (GRA, PRE); Port Elizabeth (–DC), *Trash 002* (GRA).
- 3326** (Grahamstown): Faraway, Coldsprings, 700 m (–AD), *Jacot Guillarmod 9301* (GRA); Grahamstown mountain, S. slope (–BC), *Britten in PRE 41604* (PRE); Hopewell, Bathurst dist. (–BD), *Acocks 11059* (PRE); Southwell, 330 m (–DA), *Bayliss 3128* (NBG); Barville Park, near Port Alfred (–DB), *Leach & Bayliss 12652* (PRE).
- 3418** (Simonstown): Chapman's Peak, 200 m (–AB), *Compton 15436* (NBG); Bright Water (–AD), *Barker 7181* (NBG, UWC); Hottentots Holland Mountain (–BB), *Ecklon s.n.* (S); Near Oudebos Farm house, 66 m, Kogelberg Nature Reserve (–BD), *Boucher 1012* (PRE, STE).
- 3419** (Caledon): Houw Hoek Mountains (–AA), *Weitz 232* (UWC); Caledon, 66 m (–AB), *Grobler 29294* (PRE); Onrust River Mountain, 666 m (–AC), *Esterhuysen 4235* (BOL); Fern Kloof Nature Reserve, 125 m (–AD), *Orchard 344* (BR, STE), Baviaanskloof, Genadendal, 333–666 m (–BA), *Krauss 582* (G-BOIS, TUB); Perdeberg, E. of Stanford (–BC), *Jordaan 337* (STE); Anys Kop, Caledon (–BD), *Jordaan 954* (STE); Danger Point Mountain (–CB), *Leighton 1561* (BOL); Gonna Kraal, between Elim and De Dam (–DA), *Weitz 142* (UWC); Poort, near Bredasdorp (–DB), *Compton 23199* (NBG).
- 3420** (Bredasdorp): Grootvadersbosch, lower mountain slopes (–BB), *Lewis 5338* (NBG, STE); S. slopes of Potberg (–BC), *Weitz 439* (UWC); Bredasdorp Mountains (–CA), *Galpin 10452* (PRE, STE).
- 3421** (Riversdale): Between Mount station and Lombards (–AA), *Burchell 7140* (K); 9 km W. of Albertinia (–AB), *Almborn 1042* (LD); Ystervarkfontein, 600 m (–BC), *Bayliss 4077* (NBG, Z).
- 3422** (Mossel Bay): Flats on road to Herolds Bay (–AB), *Fourcade 6505* (STE); Sandy hillside, Belvidere (–BB), *Duthie 1020* (STE).
- 3423** (Knysna): Between Noetzie and The Heads, 133 m (–AA), *H.C. Taylor 2932* (PRE, STE); Cairn Brogie, W. of Plettenberg Bay, 200 m (–AB), *Hugo 2085* (STE).
- 3424** (Humansdorp): At foot of Kareedouw Mountains, near Humansdorp (–AB), *Dawson 48* (BM); Slang River, Humansdorp (–BA), *Phillips 3438* (PRE); Near Humansdorp (–BB), *Britten 1057* (PRE).

This is the most complex variety found in *C. glabrum* and sometimes local forms can be recognized, but these on the other hand merge with other forms at other places.

The following noteworthy trends are evident within *C. glabrum* var. *glabrum*. The most typical form of this variety is found on the mountains of the Cape Peninsula. It has linear leaves with prominent veins and the corymbose clusters are arranged in corymbs (Figure 11).

The forms present in the Bain's Kloof–Ceres area also have the typical corymbose arrangement, but with the confluence more ramified (open). In the Cold

Bokkeveld and Cedarberg areas, the conflorescence is extremely ramified while the leaves have prominent veins.

From the Hottentots Holland Mountains eastwards as far as Van Stadens Mountains populations with broad leaves, up to 20 mm occur. Considerable thought has been given to the possibility of making this another variety of *C. glabrum*, but because of the many local races that are recognizable another variety is unwarranted.

Population studies done in the Tradouw's Pass revealed that there are specimens with narrow leaves ca. 5 mm broad and those with broad leaves up to 15 mm broad, which occur less than 2 m apart. The conflorescence varies from a typical corymbose to a lax panicle, but with individual heads grouped in corymbose clusters.

A noteworthy population occurs in the southern Cape Peninsula near Silvermine. The plants are up to 250 mm tall, with leaves 100–225 mm long and 2–6.2 mm broad. In close proximity (2–3 m) are populations with plants up to 500 mm high with leaves up to 300 mm long, and up to 115 mm broad. Intermediates between these populations are also present.

The iconotype of this variety is an illustration in Plukenet's Phytographia while the typtype is a specimen in the Sloane herbarium, Vol. 99, folio 155 on the right hand side.

Common name: 'Heuningbossie'; 'Plampers'. (Smith 1966).

b. var. rogersii (Markötter) Weitz comb. nov. et stat. nov.

C. rogersii Markötter in Eng. Bot. Jb. 70: 371. Type: Groot Drakenstein, *Rogers 17949* (BOL, holo.!; GRA, iso.!).

Plants (120–)190(–300) mm high. *Leaf blades* linear, filiform, (80–)140(–210) mm long, (0.5–)1(–1.2) mm broad. *Heads* in corymbose clusters arranged in a corymb (Figure 13).

Distribution and habitat

C. glabrum var. *rogersii* is known from the Olifants River Mountains southwards as far as the Houw Hoek Mountains. This variety is exclusively montane up to an altitude of 1 500 m (Figure 12).

Like *C. glabrum* var. *glabrum* this variety also occurs in a wide range of habitats, but on wetter southern and eastern slopes.

Specimens examined

—**3219** (Wuppertal): Olifants River Valley, Grootfontein, SE of Grasruggens, 460 m (–CC), *E.G.H. Oliver 4074* (STE), *E.G.H. Oliver 4084* (PRE).

—**3319** (Worcester): E. slopes of Olifants River Mountains (–AA), *Esterhuysen 13428* (BOL); Elands Kloof, 1 200 m (–AC), *Compton 16779* (NBG); Plateau between Tulbagh Waterfall and Kluitjieskraal Forest Station (–AC), *Hugo 770* (STE); Groot Drakenstein (–CC), *Rogers 17949* (BOL, GRA).

—**3419** (Caledon): NE of new bridge over Theewaterskloof

Dam (–AA), *Weitz 204* (UWC), *Weitz 205* (PRE), *Weitz 208* (K); Houwhoek Pass, E. slopes of Houwhoek Mountains (–AA), *Weitz 244* (UWC).

F.A. Rogers made the first recorded collection of this variety which Markötter (1939) described as a new species, viz. *C. rogersii*.

Harvey (1865) described a variety *subulifolium* under *C. nervosum* from Van Stadens Mountains. However, the leaves of this taxon have prominent veins and it is therefore a narrow leaf form of *C. glabrum* var. *glabrum*.

6. C. congestum E. Mey ex DC., Prodr. 5: 89 (1836); E. Mey & Drège: 301 (1837); Steud.: 425 (1840); Drège: 175 (1843); Harv.: 43 (1860); Harv.: 56 (1865); Markötter: 357 (1939). Type: Cape Province, Drakenstein Mountains, *Drège 1529* (G-DC, holo., photo!). Illustration: Harv.: t. 69 (1860).

Roots wiry. *Basal leaves* hirsute, glandularly-hispid on both surfaces, viscid; blades broadly elliptic-lanceolate (100–)190(–320) mm long, (8–)24(–44) mm broad, apex acuminate, texture herbaceous; silky hairs prominent at leaf bases; *cauline leaves* shorter, narrower and more acuminate than basal leaves, the uppermost small and reduced to lanceolate and subulate scales. *Corymbophore* somewhat angular, hispid and glandularly muricate, (200–)470(–700) mm long. *Heads* in corymbose clusters arranged in a panicle. *Involucral bracts* scabrid, viscid; upper sheathing bracts (12–)13.5(–14) mm, trifid. *Flowers* mauve; pedicel present 1.5–2 mm long. *Petals* linear, acute, 5–6.5 mm long, 1–1.5 mm broad; corolla tube 4–5.5 mm long, cylindrical. *Anthers* 3.5–4 mm long including base. *Ovary* hirsute; style branches obtuse. *Cypselas* 3–5 mm long, elliptic ovoid. *Pappus* coroniform, bristles 1–2 mm. *Chromosome number* $2n=16!$ (Figures 14 & 15).

Diagnostic features

Basal leaves scabrid, glandularly hispid on both surfaces, viscid; blades broadly elliptic-lanceolate. *Corymbophore* hispid. *Heads* in corymbose clusters arranged in a panicle. *Involucral bracts* scabrid, viscid, trifid. *Flowers* mauve. *Ovary* hirsute.

Distribution and habitat

C. congestum is exclusively montane. It is known from the northern Cedarberg southwards to the Hottentots Holland Mountain, and from here eastwards to the Houwhoek Mountains (Figure 15). The species is found in cool, rather moist, steep mountain slopes and in river valleys from 700–1 600 m.

It occurs on Table Mountain Sandstone in open to closed Mesic Fynbos associated with acidic sandy, shallow soil.

Flowering time is from November to March with a definite peak during December and January.

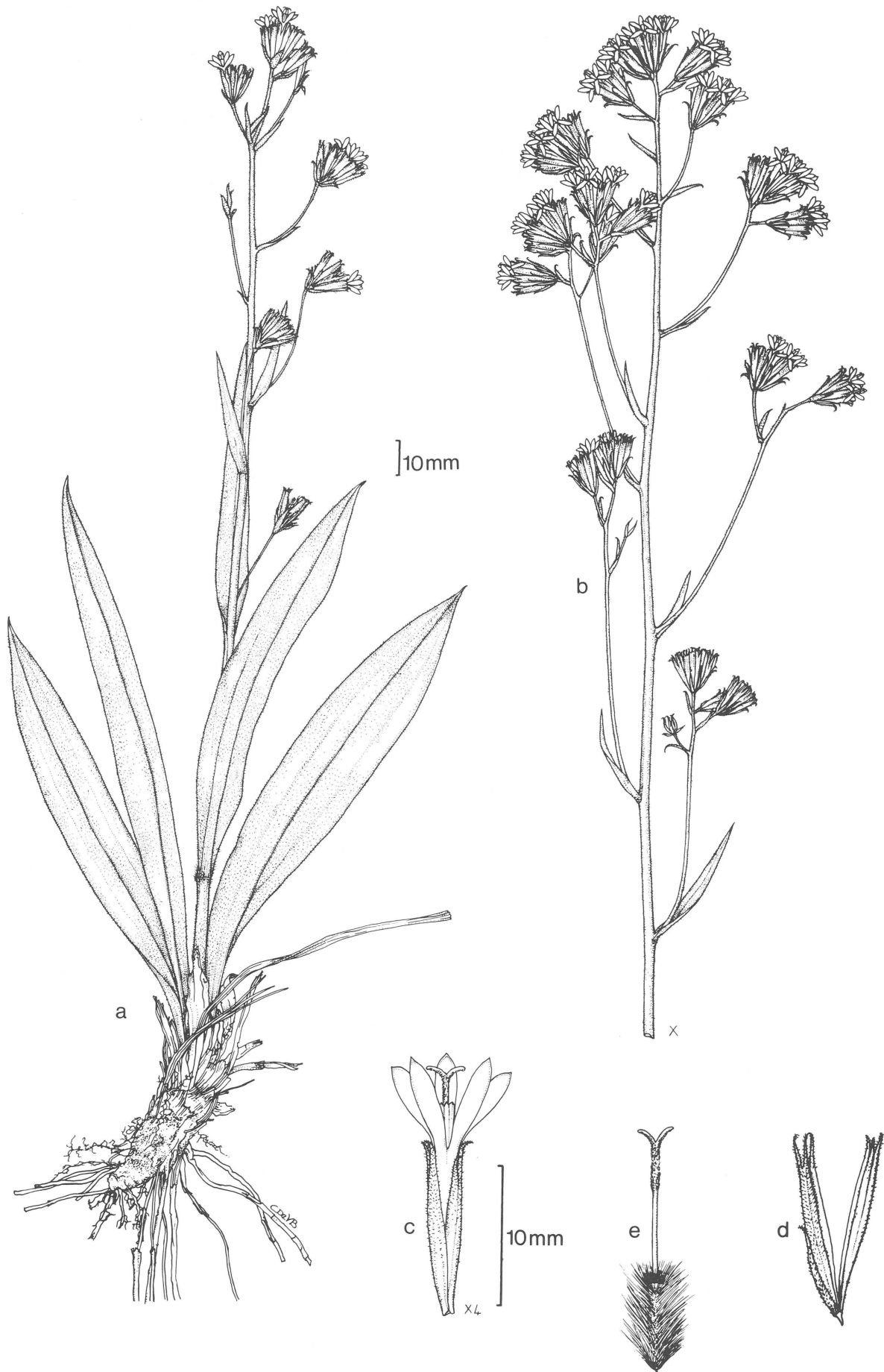


Figure 14 *Corymbium congestum* E. Mey. ex DC. a, plant; b, conflorescence; c, capitulum with flower; d, involucre bracts; e, gynoecium. (Weitz 354).

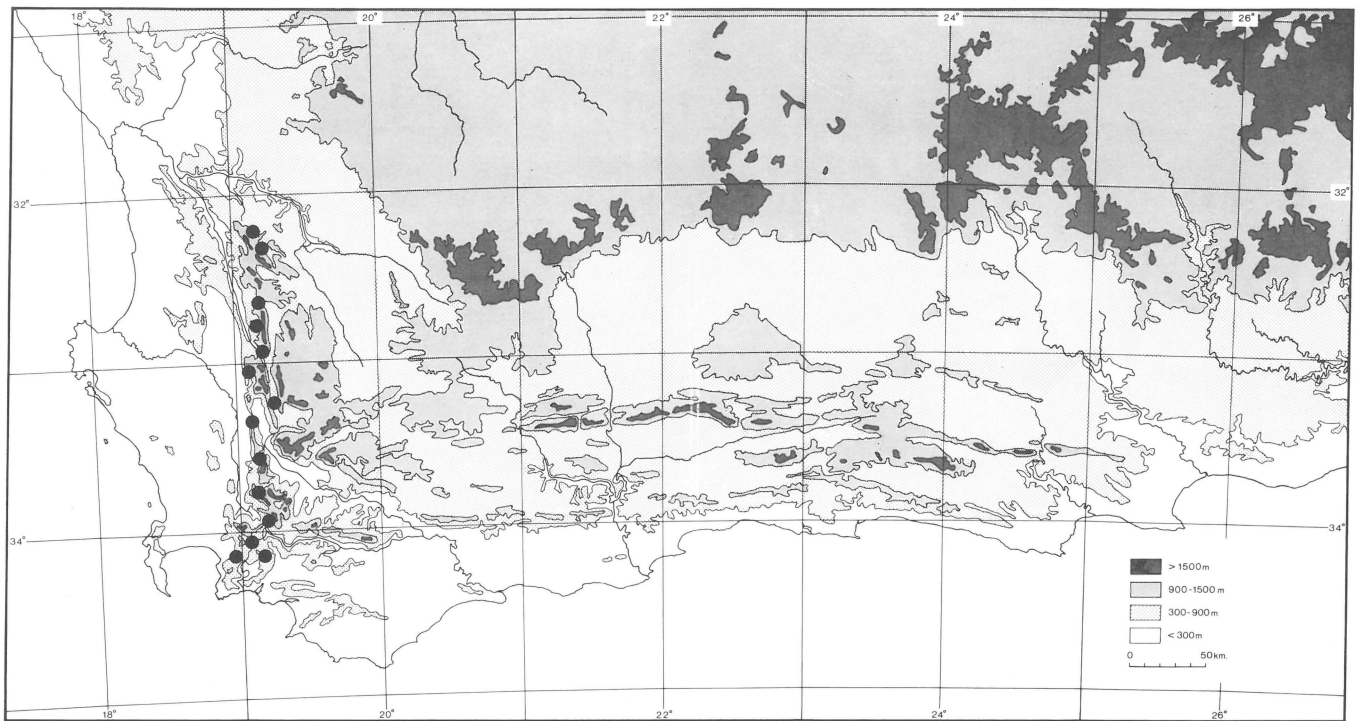


Figure 15 Geographic distribution of *Corymbium congestum*.

Specimens examined

—**3219** (Wuppertal): Uitkyk Pass, N. of Wuppertal (–AA), *P. Bond 1416* (NBG); Groot Koupoort (–AA), *Haynes 1275* (STE); Pakhuis mountain, 1 120 m (–AA), *Leipoldt 3664* (BOL); Pakhuis Pass, 700 m (–AA), *Weitz 353* (UWC); Near Eselbank, 1 170 m (–AC), *Drège s.n.* (K, P, TCD); Middelberg above Algeria, 900 m, *Weitz 364* (UWC); Elands-kloof (–CA), *Compton 22682* (NBG); Mountain above Elands Kloof (–CA) *Esterhuysen 18451* (BOL, PRE); Buffelshoek farm (–CA), *Weitz 176* (UWC), *Weitz 178* (UWC); Skoongesig, Cold Bokkeveld (–CC), *Hanekom 1524* (PRE, STE).

—**3319** (Worcester): Little Winterhoek, 1 000 m (–AA), *Marloth in PRE 41597* (PRE); Little Winterhoek (–AA), *Stokoe in PRE 41596* (PRE); Gydo (–AB), *H. Bolus 8441* (BOL); Skurweberg, SE of Slagboom, 1 000 m (–AB), *Weitz 319* (UWC); Nuwekloof Pass (–AC), *Ecklon & Zeyher s.n.* (C, S); Du Toit's Kloof, 830 m (–CA), *H. Bolus 5196* (BM, BOL, Z); Du Toit's Kloof, 830–1 330 m (–CA), *Drège s.n.* (G, K, L); Haelhoeksneekop (–CC), *Stokoe s.n.* (PRE), *Stokoe in SAM 56615* (SAM); Wemmershoek Mountain, Spitskop, 1 560 m (–CC), *H.C. Taylor 7642* (STE); Du Toit's Peak, 1 330 m (–CC), *Esterhuysen 8604* (BOL); Mountains S. of Wemmershoek, 483 m (–CC), *Andrae 812* (PRE); Berg River Hoek, 1 100 m (–CC), *Compton 13824* (NBG).

—**3418** (Simonstown): Helderberg, upper southern slopes (–BB), *Esterhuysen 7662* (BOL); Sir Lowry's Pass, 1 400 m (–BB), *Schlechter 7229* (BM, BOL, G, G-BOIS, G-DC, G-DEL, HBG, L, P, PRE, S, STE, Z); Sir Lowry's Pass (–BB), *Weitz 120* (UWC).

—**3419** (Caledon): Hottentots Holland Mountain, Victoria Peak 1 160–1 500 m (–AA), *Esterhuysen 9758* (BOL); Lebanon Catchment, 1 160 m (–AA), *Kruger 642* (PRE, STE); Jakkalsrivier Catchment, 860 m (–AA), *Kruger 1120*

(STE, PRE); E. slopes of Landros Kop, 1 330 m (–AA), *Thorne in SAM 49941* (SAM); Lebanon, 1 066 m (–AA), *Verdoucq 85* (PRE, STE); Mount Lebanon, 1 000 m (–AA), *Weitz 288* (UWC).

J.F. Drège made the first recorded collection of *C. congestum* in 1827. This was followed by Ecklon and Zeyher in the Worcester district in 1830. De Candolle (1836) described this species as *C. congestum* by which name it is known today.

The specific epithet *congestum* is probably derived from the closely arranged capitula which resulted in a 'congested corymb', described by De Candolle (1836) as '*corymbo congesto*'.

C. congestum is not very variable. It is easily recognized in the veld. However, the leaves of specimens from the Cold Bokkeveld area tend to be narrower than those from the Du Toits Kloof – Hottentots Holland area — possibly moisture related.

Common name: Known as 'Vingerhoed' in the Cold Bokkeveld north of Ceres probably because of the bracts that look like a thimble (information from herbarium specimen).

7. *Corymbium theileri* E. Markötter, Engl. Bot. Jb. 70: 363 (1939). Type: Piketberg, *Theiler 3* (PRE, holo!, STE, iso!).

Roots wiry. **Basal leaves** glabrous; blades linear to falcate (130–)170(–200) mm long, (3.5–)6.4(–8) mm broad, apex acute, leaf base broad, clasping with submembranous margins, silky hairs prominent, margins smooth, thickened, venation prominent; texture cartil-

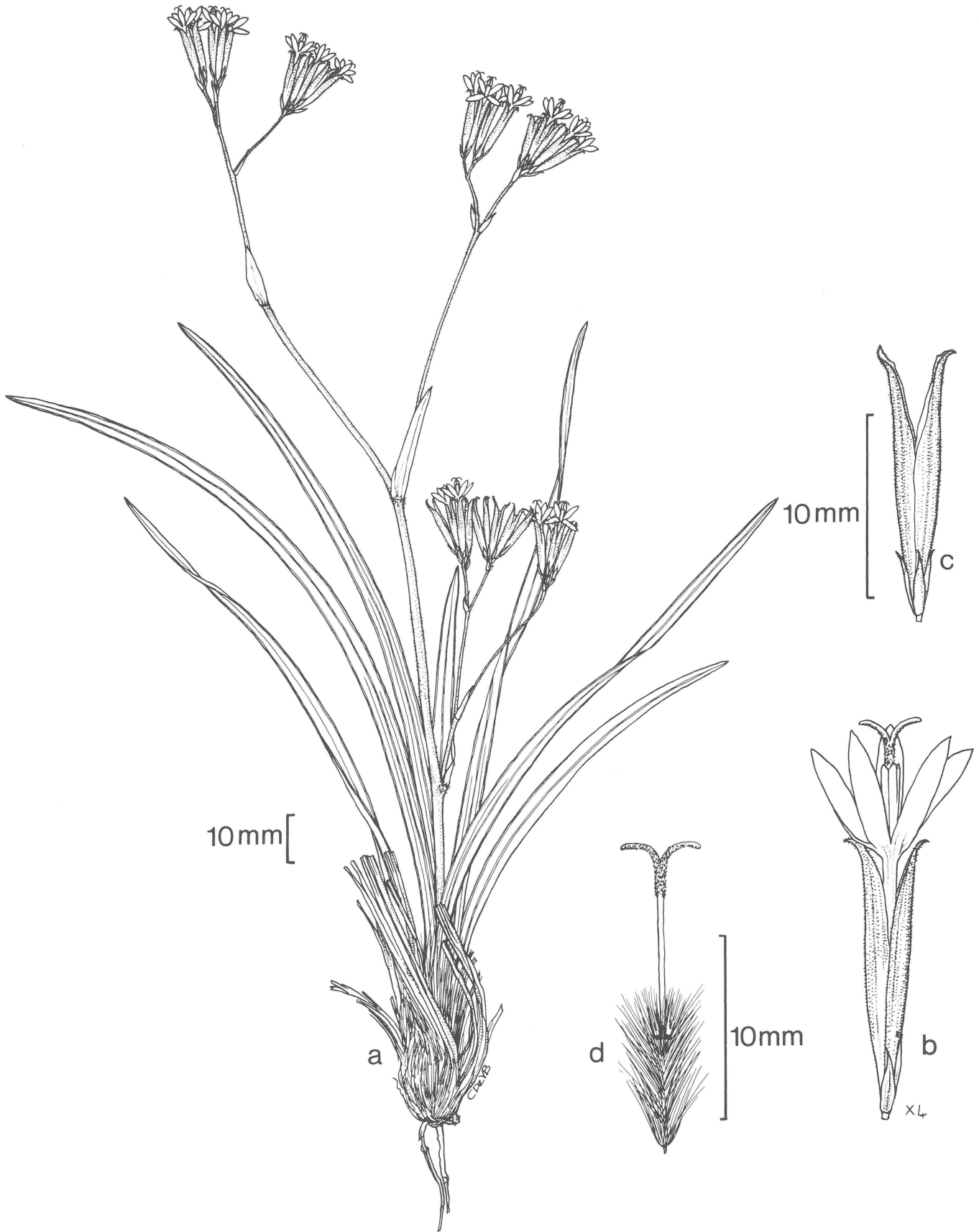


Figure 16 *Corymbium theileri* Markötter. a, plant; b, capitulum with flower; c, involucre bracts; d, gynoecium. (Weitz 427).

aginous; *cauline leaves* glabrous, margins slightly scabrid, sometimes lower parts scabrid; 5–80 mm long, 1–7 mm broad, base clasping or half-clasping, lower ones sometimes decurrent becoming less decurrent and smaller passing into bracts. *Corymbophore* terete to elliptic, scabrid, base villous, (140–)230(–300) mm long, 1.5–3 mm in diameter. *Heads* in corymbose clusters arranged in a lax panicle. *Involucral bracts* scabrid, viscid when fresh; uppermost involucral bracts subtended by 2 or 3 smaller bracts, upper involucral bracts (10.5–)12.0(–13.5) mm, apex trifid, green, tinged with purple. *Flowers* mauve; pedicel present ca. 1 mm long. *Petals* linear to elliptic ca. 6 mm long, ca. 1.5 mm broad; corolla tube ca. 5 mm long, cylindrical. *Anthers* ca. 3 mm long including base. *Ovary* hirsute; style branches ca. 2.5 mm long, obtuse. *Cypselas* ca. 5 mm long, ca. 1 mm broad, linear. *Pappus* coroniform, bristles fused more than half the length ca. 1.5 mm long (Figures 16 & 17).

Diagnostic features

Basal leaves glabrous; blades linear to falcate, margins smooth, thickened, venation prominent. *Corymbophore* scabrid, villous at base. *Heads* in corymbose clusters arranged in a panicle. *Involucral bracts* scabrid, trifid. *Flowers* mauve. *Ovary* hirsute.

Distribution and habitat

C. theileri is endemic to the Piketberg mountain occurring on rocky outcrops at an altitude of about 700 m above sea level (Figure 17). The substrate consists of shallow sandy acidic soil derived from Table Mountain Sandstone. Associated Fynbos elements include low-growing

Restionaceae and Ericaceae.

Specimens examined

—3218 (Clanwilliam): Piketberg (–DD), *Theiler* 3 (PRE, STE); Piketberg, 3 km NE of Bugler's Post (–DD), *Weitz* 426 (UWC), *Weitz* 427 (PRE), *Weitz* 430 (K).

A. Theiler made the first collection of this species and it was described by Markötter in 1939.

C. theileri is closely allied to *C. glabrum* var. *glabrum* but differs from the latter in the scabrid corymbophore, with a villous base, the scabrid involucral bracts which are sometimes trifid and the coroniform pappus with bristles almost completely fused. It differs from *C. africanum* subsp. *scabridum* in leaf texture, lax conflouescence, villous base of corymbophore, slightly longer corolla tube and longer style branches.

8. *C. laxum* Compton, Jl S. Afr. Bot. 2: 165 (1936).

Type: Cedarberg, Sneeuwkop, 1 830 m, *Compton* 6190 (NBG, holo!, BOL, iso.!).

Illustration: Compton: t.10 (1936).

Roots wiry. *Leaves* glabrous; blades narrowly linear to sub-falcate, sometimes canaliculate, (100–)190(–280) mm long, (1.5–)2.5(–3.5) mm broad, apex acute, base dilated, clasping with submembranous margins, silky hairs prominent, margins involute, sometimes scariosae; veins not prominent; texture coriaceous; *cauline leaves* glabrous, much shorter 5–54 mm long, 1–2 mm broad, base clasping, lower ones decurrent, becoming less decurrent and smaller upwards, passing into bracts. *Corymbophore* elliptic in cross section, glabrous, (200–)280(–350) mm long, 1–1.5 mm in diameter,

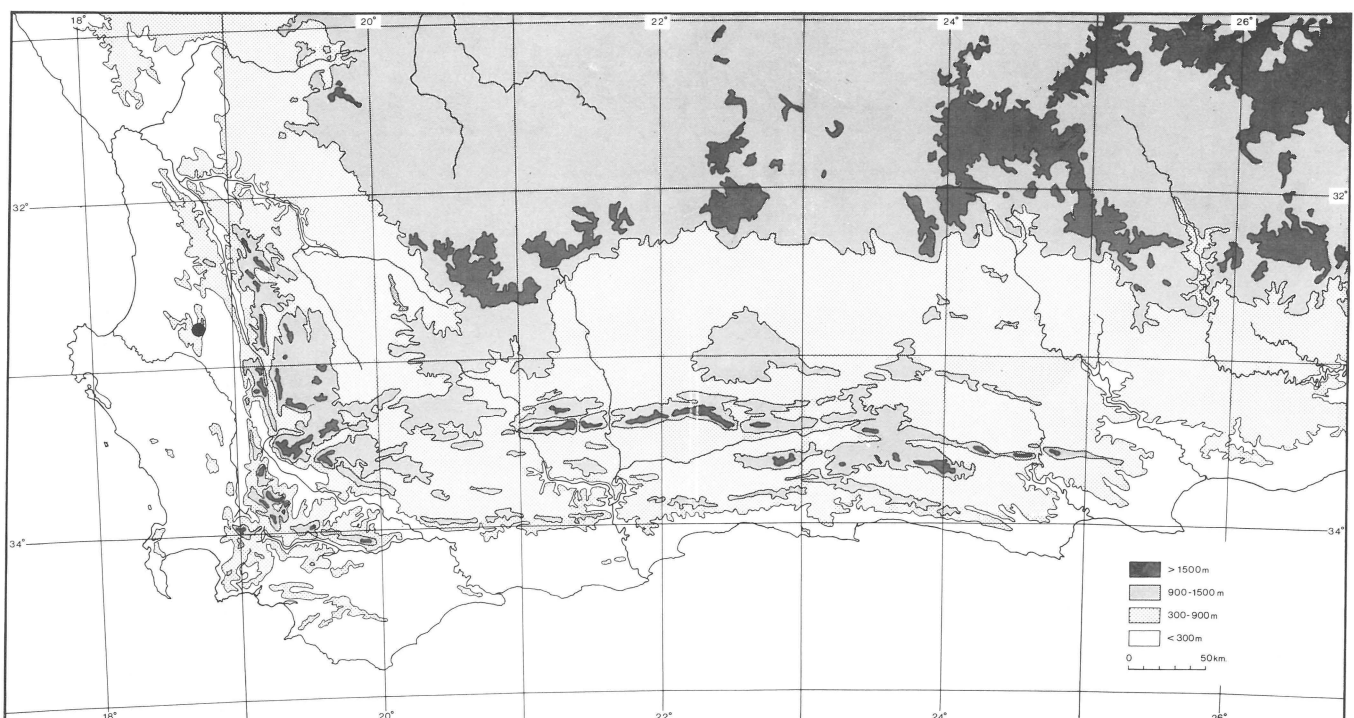


Figure 17 Geographic distribution of *Corymbium theileri*.

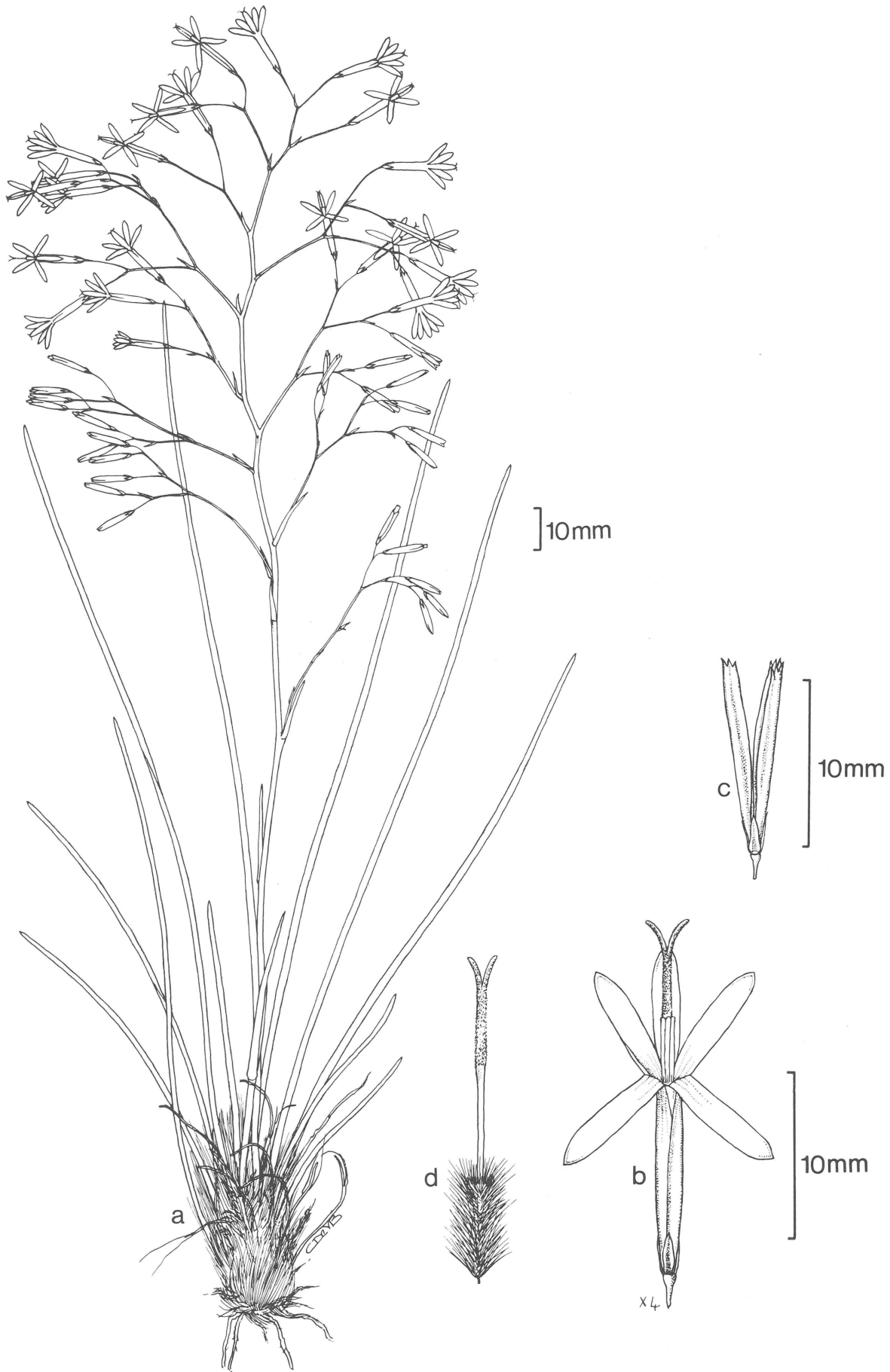


Figure 18 *Corymbium laxum* Compton subsp. *laxum*. a, plant; b, capitulum with flower; c, involucre bracts; d, gynoecium. (Compton 6190 NBG).

branching of corymbophore strictly dichotomous. *Heads* solitary, distinctly pedunculate, arranged in a lax panicle. *Involucral bracts* glabrous, upper involucral bracts subtended by 3 smaller bracts, upper involucral bracts (9–)10(–11.5) mm long, apex fimbriate, hyaline, greenish purple. *Flowers* mauve, pedicel present. *Petals* oblong-elliptic 6.0–8 mm long, ca. 2 mm broad; corolla tube 4–6 mm long. *Anthers* 3.5–5 mm long including the base. *Ovary* hirsute, style branches ca. 2 mm long, obtuse. *Cypselas* ca. 5 mm long, ca. 1.5 mm broad, linear to ovoid. *Pappus* coroniform at base, fimbriate, bristles many, 1 mm long. (Figures 18, 19 & 20).

Diagnostic features

Leaves glabrous; blades narrowly linear to sub-falcate, sometimes canaliculate, margins involute. *Corymbophore* glabrous, dichotomously branched. *Heads* solitary, distinctly pedunculate. *Involucral bracts* glabrous. *Flowers* mauve, pedicel present. *Ovary* hirsute.

Careful studies of herbarium specimens and populations in the field revealed that *C. laxum* could on morphological grounds be divided into two morphs with distinct geographical distribution.

Populations from the Cedarberg are characterized by a more lax confluence while the lateral branching of the corymbophore occurs more than half way down the length of the corymbophore.

In populations from the Villiersdorp area the confluence is more congested with the arrangement of the heads approaching a condition towards a corymbose arrangement with lateral branching not more than half way down the length of the corymbophore.

As the difference in morphology of the confluence is associated with populations from different geographically circumscribed areas, it is proposed that two subspecies be recognized in *C. laxum*.

Key to the subspecies

- 1a Branching of the corymbophore more than half way down; confluence lax (Cedarberg) **a. subsp. laxum**
 1b Branching of corymbophore not more than halfway down; confluence more congested (Villiersdorp, French Hoek) **b. subsp. bolusii**

a. subsp. laxum

Leaves glabrous; blades narrowly linear to sub-falcate (100–)190(–280) mm long, (1.5)2.5(–3.5) mm broad. *Corymbophore* glabrous, branching of corymbophore more than half way down, confluence lax (Figure 18).

Distribution and habitat

C. laxum subsp. *laxum* is endemic to the Cedarberg from Wuppertal to Citrusdal (Figure 19). It is a subspecies which occurs in sandy shallow soil, along mountain slopes, at an altitude of ca. 1 600 m above sea level.

Flowering time is from December to February with a peak in January.

Specimens examined

—3219 (Wuppertal): Sneekop, 1 830 m (–AC), Compton 6190 (BOL, NBG); Middelberg (–AC), Esterhuysen 7212 (NBG), Esterhuysen 7277 (BOL); Between Sneeberg and Hoogvertoon (–AC), Haynes 1364 (STE); Clanwilliam, Cedarberg (–AC), Stokoe 6615 (BOL); Gabriel's Pass, Sederberg Forestry Station (–AC), Viviers 1207 (UWC);

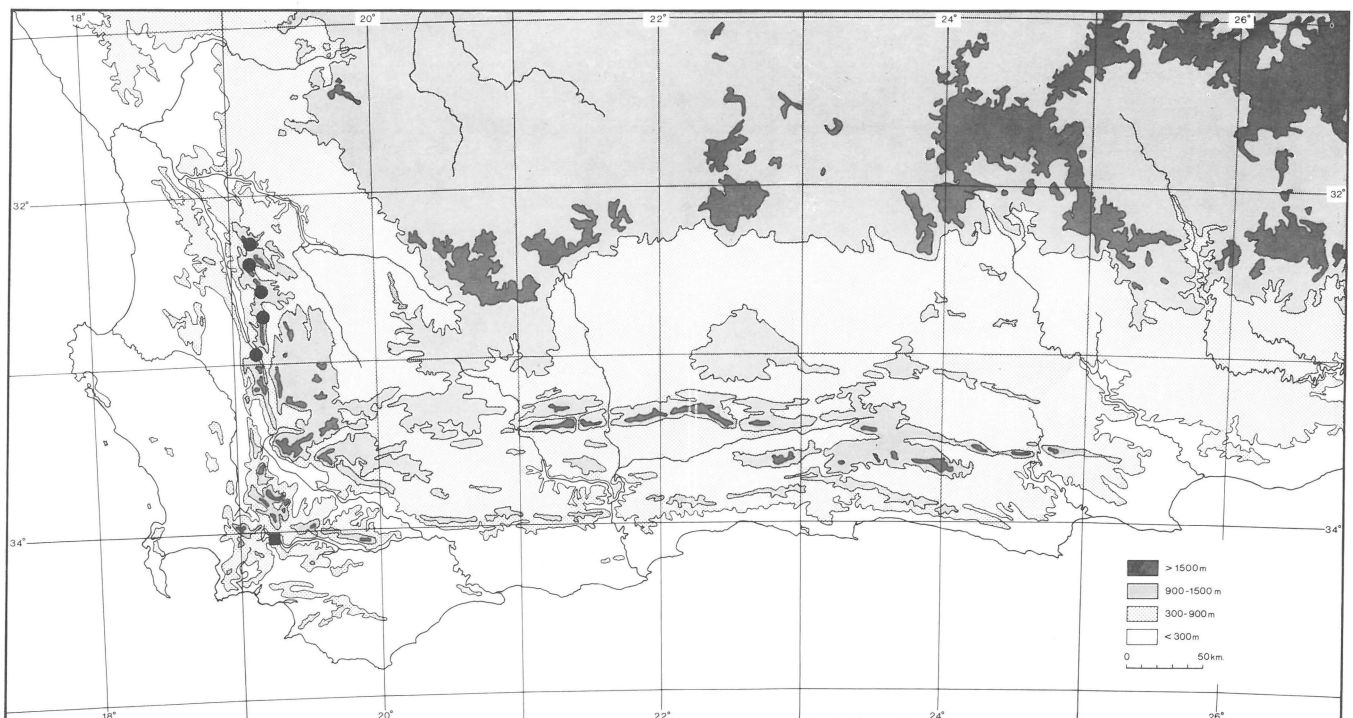


Figure 19 Geographic distribution of *Corymbium laxum* subsp. *laxum* ● and subsp. *bolusii* ■.

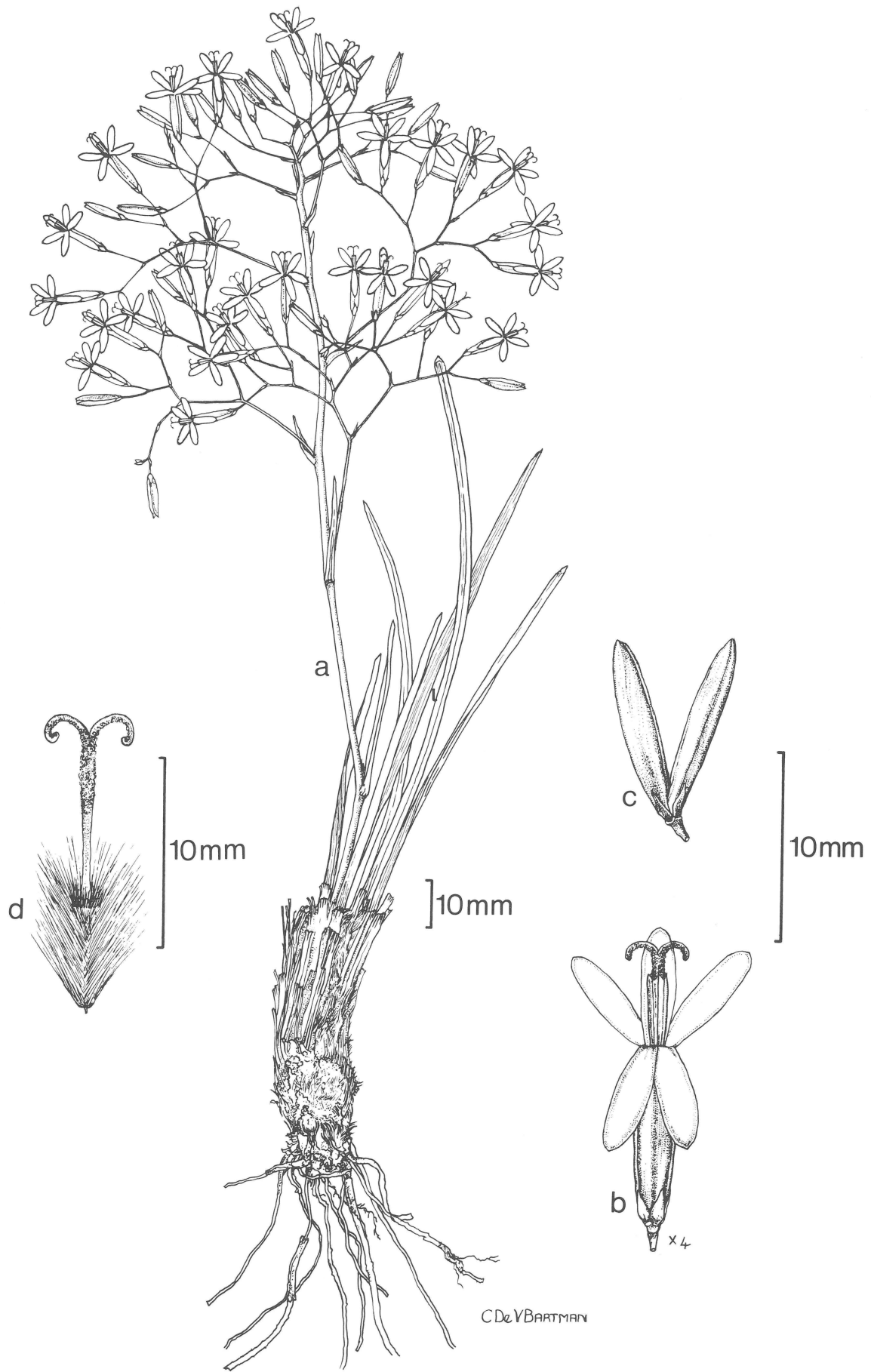


Figure 20 *Corymbium laxum* Compton subsp. *bolusii* Weitz. a, plant; b, capitulum with flower; c, involucre bracts; d, gynoecium. (Weitz 112).

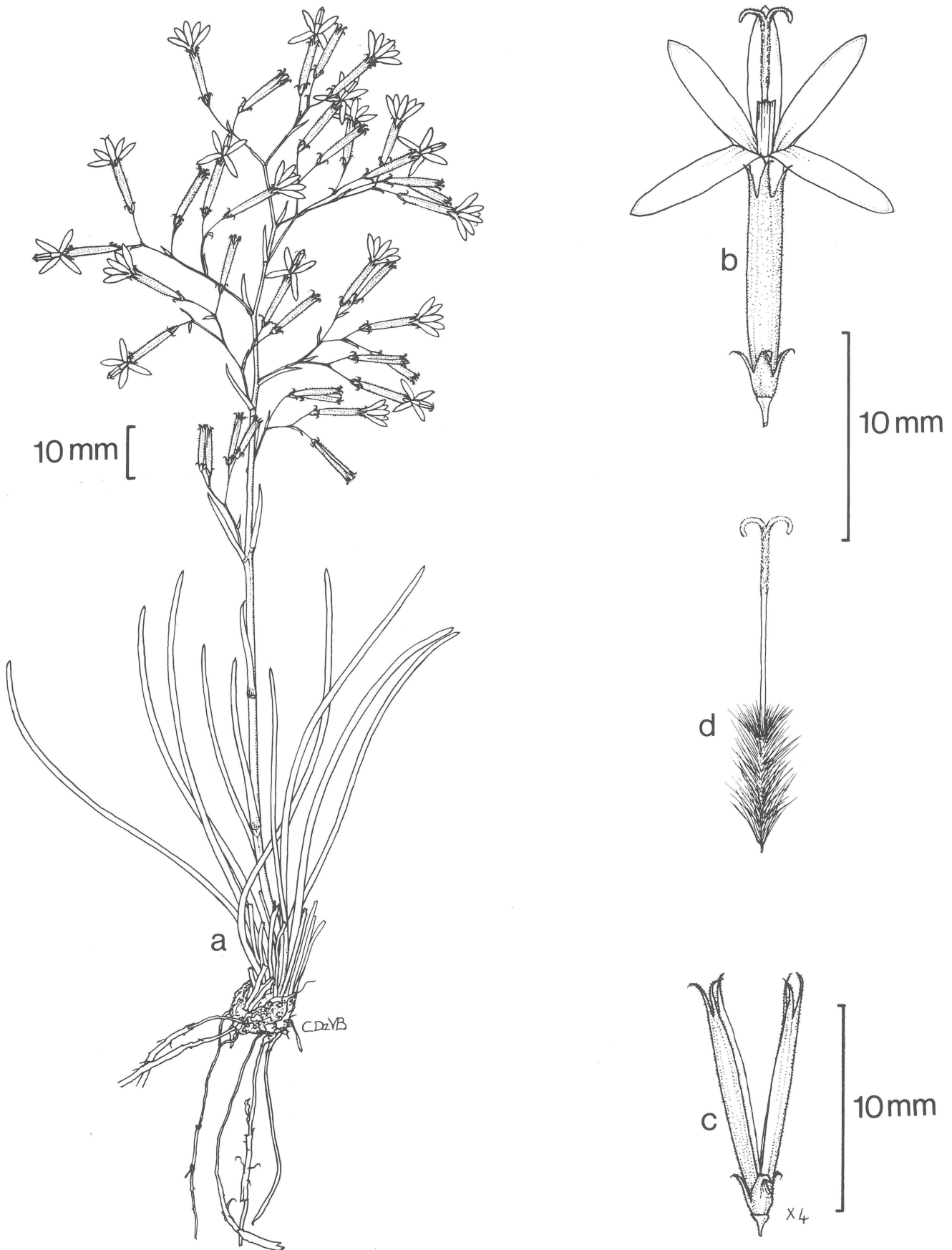


Figure 21 *Corymbium elsiae* Weitz. a, plant; b, capitulum with flower; c, involucral bracts; d, gynoecium (Weitz 332).

Middelberg, above Algeria, 1 200 m (-AC), *Weitz 360* (UWC); Sneeuwberg (-CA), *Esterhuysen 13840* (BOL); Skurweberg (-CC), *Primas in PRE 41609* (PRE), *Primas in SAM 45694* (SAM).

Prof. Compton made the first recorded collection of this species on Sneeuwkop in the Cedarberg and described it in 1936. *C. laxum* subsp. *laxum* is a well-defined taxon and is easily recognized in the veld. However, in the vegetative state it is difficult to distinguish this taxon from *C. africanum* because of the leaves which are similar in appearance.

b. subsp. bolusii *Weitz*, subsp. nov.

Corymbyo laxo subsp. *laxo* similis, sed conflorescentia plus congesta et corymbophorum usque ad dimidium longitudinem ramificans.

TYPUS.— Cape Province: 2 km N. of Draaiberg, between Villiersdorp and French Hoek, alt. 1 000 m, *Weitz 112* (UWC, holotypus; PRE, isotypus).

Similar to *C. laxum* subsp. *laxum*, but differing in branching of corymbophore which is not more than half way down and conflorescence more congested.

Leaves glabrous; blades narrowly linear to sub-falcate (70–)85(–100) mm long *ca.* 1.6 mm broad. *Corymbophore* glabrous, branching of corymbophore not more than half way down, conflorescence more congested (Figure 20).

Distribution and habitat

C. laxum subsp. *bolusii* is a subspecies that is localized on the south side of the French Hoek Mountains

between Villiersdorp and French Hoek at an altitude of 1 000 m (Figure 19). The associated vegetation is low-growing Restionaceae and Ericaceae.

Flowering time is in January – February.

Specimens examined

—**3419** (Caledon): 2 km N. of Draaiberg, between Villiersdorp and French Hoek, 1 000 m (-AA), *Weitz 112* (PRE, UWC). Without precise locality: Mountains between Villiersdorp and French Hoek, *H. Bolus 5063* (BOL).

A single collection of this subspecies was made as early as 1897 by H. Bolus between Villiersdorp and French Hoek. No subsequent collections except by the author, have been made, probably because of the rather isolated locality in which this species grows.

9. *Corymbium elsiae* *Weitz* sp. nov.

Corymbyo laxo subsp. *laxo* similis, sed corymbophoro folio caulino scabrido et bracteis scabridis, differt.

TYPUS.— Cape Province: Ceres District, Kokedouw Kloof, near reservoir, *Esterhuysen 22545* (BOL, holotypus!).

Similar to *C. laxum* subsp. *laxum*, but differing by the scabridity of the corymbophore, cauline leaves and bracts.

Roots wiry. *Leaves* glabrous; blades narrowly linear to falcate, sometimes canaliculate, (80–)120(–170) mm long, 1.5–2 mm broad, apex acute, base dilated, clasping with submembranous margins, silky hairs prominent, margins involute, veins not prominent; texture coriaceous becoming rugulose; *cauline leaves* scabrid, 5–65 mm long, 1–2 mm broad, clasping or half-

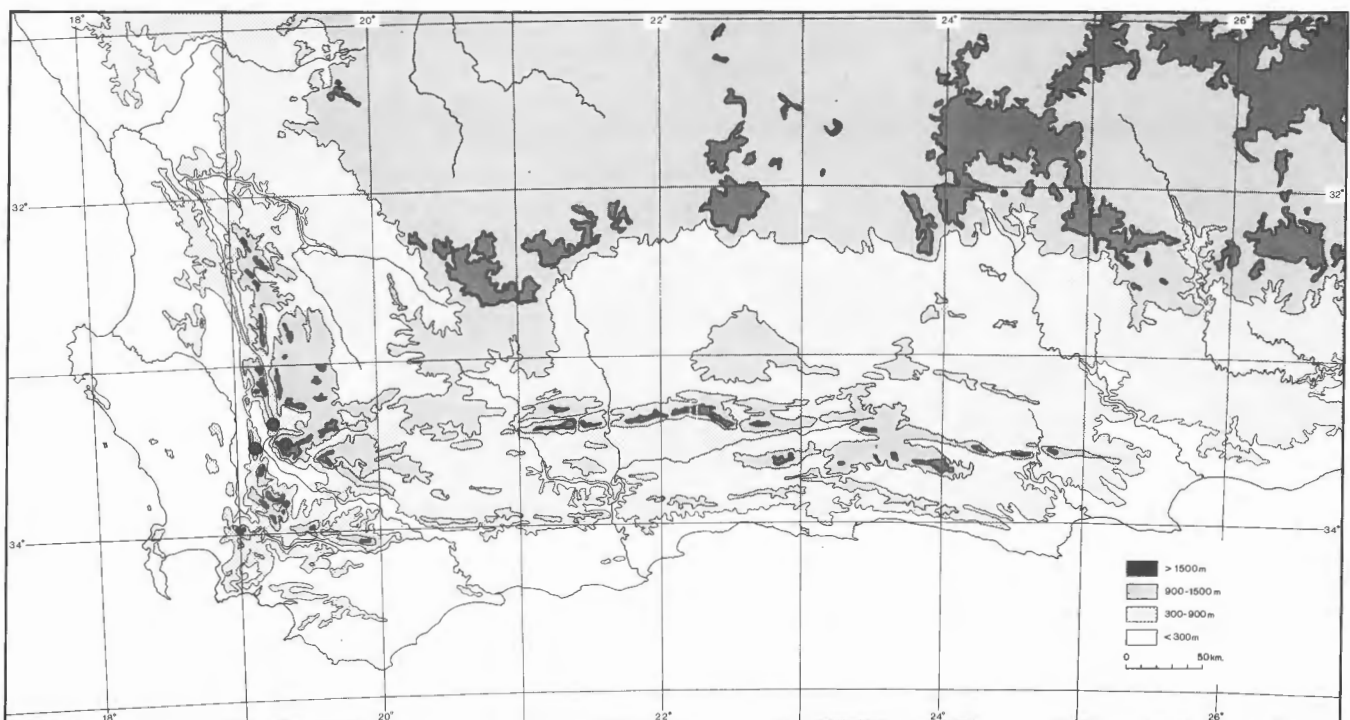


Figure 22 Geographic distribution of *Corymbium elsiae*.

clasping, diminishing in size upwards. *Corymbophore* round to angular in cross section, scabrid, glandularly muricated, (150–)190(–255) mm long, 1.5–2 mm in diameter, branching from corymbophore dichotomously. *Heads* distinctly pedunculate or with a very short peduncle ca. 1 mm or sessile, arranged in a panicle. *Involucral bracts* scabrid, glandularly muricate, 2–3 smaller bracts subtending 2 upper bracts; upper bracts (6.5–)9.5(–12) mm, apex trifid or fimbriate, purple or greenish purple. *Flowers* mauve, pedicel present. *Petals* oblong elliptic (4.8–)6.8(8.3) mm long, ca. 2 mm broad; corolla tube 3–5 mm long. *Anthers* ca. 4.2 mm including base. *Ovary* hirsute, style branches long obtuse. *Cypselae* ca. 5 mm long 1.5 mm broad, linear to elliptic. *Pappus* coroniform at base, fibrillate, bristles many 1 mm long (Figures 21 & 22).

Diagnostic features

Radical leaves glabrous; blades narrowly linear to falcate, sometimes channelled, margins involute. *Corymbophore* scabrid. *Heads* distinctly pedunculate or with a short peduncle or sessile, arranged in a panicle. *Involucral bracts* scabrid, trifid. *Flowers* mauve. *Ovary* hirsute.

Distribution and habitat

C. elsiae is a high-altitude species with a narrow distribution, from Ceres Peak to Bain's Kloof (Figure 22). Populations occur on steep rocky slopes especially in crevices, in shallow soil derived from Table Mountain Sandstone. This species usually grows in association with low-growing Restionaceous Fynbos.

Specimens examined

—3319 (Worcester): Koekoedouw Kloof, near reservoir (–AD), *Esterhuysen* 22545 (BOL); Between Castle Rocks and Schurftberg, S. slopes (–AD), *Esterhuysen* 28422 (BOL); E. of Castle Rocks, near Mitchell's Pass (–AD), *Esterhuysen* 28445 (BOL); Upper valley, above Ceres (–AD), *Guthrie* in NBG 23855 (NBG); Ceres Peak, 1 000 m, E. aspect (–AD), *Weitz* 332 (UWC), *Weitz* 333 (PRE); Bain's Kloof (–CA), *Mortensen* 243 (C).

C. elsiae is closely allied to *C. laxum* differing in scabridity of the corymbophore, cauline leaves and bracts, and with cellulosic leaf epidermal cell walls (Weitz 1987).

There is a considerable variation in the arrangement of heads in the conflorescence of *C. elsiae*. It is either distinctly pedunculate or with a very short peduncle or sessile. The conflorescence of certain populations may vary from a simple to a much-branched panicle with pedunculated or sessile heads. Therefore, pedunculated heads is not a constant character for this species as in *C. laxum*. The specimen collected on Ceres peak (Weitz 332, Figure 21) has heads with distinct peduncles.

Although local races may appear distinct, continuous variation of the corymbophore morphology within a race does not warrant the subdivision of this species into infraspecific taxa.

Acknowledgements

This paper is based on a thesis submitted by the author to the University of the Western Cape (Bellville) for the Master of Science Degree.

I would like to express my thanks to my promoter, Prof. R.O. Moffett, for his guidance and encouragement in undertaking this revision, my joint promoter, Prof. C.T. Johnson, Head of the Department of Botany, for his eagerness and willingness to assist me in the technical aspects of my work and for checking the final manuscript and Dr J.P. Rourke for drawing my attention to the genus *Corymbium* and for doing the Latin translations.

The directors of the institutes mentioned in the text are thanked for the loan of their material and especially the Curator of the Compton herbarium for allowing me to section material of some specimens in the historically valuable SAM collection. Mrs C. Bartman is thanked for her indispensable contribution in drawing all the species.

References

- ADANSON, M. 1763. *Contarena. Familles des Plantes* 2. Paris.
- BENTHAM, G. 1873. *Compositae*. In: *Genera plantarum*, eds Bentham G. & Hooker, J.D., Vol. 2(1), London.
- BERGIUS, P.J. 1767. *Descriptiones plantarum ex Capite Bonae Spei*. Stockholm.
- BOND, P. & GOLDBLATT, P. 1984. *Plants of the Cape Flora: A descriptive catalogue. Jl S. Afr. Bot. suppl. vol. 13*.
- BREYNIUS, E.J. 1680. *Prodromus fasciculi rariorum plantarum*. Danzig.
- BRIGGS, D. & WALTERS, S.M. 1984. *Plant variation and evolution*, 2nd edn, Cambridge University Press, Cambridge.
- BURMAN, J. 1738. *Rariorum africanarum plantarum*. Amsterdam.
- BURMAN, N.L. 1768. *Prodromus florae capensis* (appendix to 'Flora indica'). Leyden.
- COMPTON, R.H. 1936. *Corymbium laxum*. *Jl S. Afr. Bot.* 2: 165.
- DE CANDOLLE, A.P. 1836. *Prodromus systematis naturalis regni vegetabilis* etc., pars 5, Treutel et Wurz, Paris.
- DRÈGE, J.F. 1843. *Zwei pflanzengeographische documente nebst einer Einleitung von E. Meyer*. *Flora* 2, Suppl. p. 230.
- DYER, R.A. 1975. *The genera of southern African flowering plants*. Vol. 1, Government Printer, Pretoria.
- GAERTNER, J. 1790. *De fructibus et seminibus plantarum* 2. Leipzig.
- GMELIN, J.F. 1791. *Caroli a Linne, ... Systema naturae*, 2(1). Leipzig.
- GRANT, V. 1981. *Plant speciation*. Columbia University Press, New York & London.
- GUNN, M. & CODD, L.E. 1981. *Botanical exploration of southern Africa*. A.A. Balkema, Cape Town.
- HARVEY, W.H. 1838. *The genera of South African plants*, 1st edn, Cape Town.
- HARVEY, W.H. 1860. *Thesaurus capensis*. Dublin.
- HARVEY, W.H. 1865. *Compositae*. In: *Flora Capensis*, eds Harvey, W.H. & Sonder, O.W., Vol. 3, p. 44, L. Reeve, Ashford.
- HOFFMANN, O. 1897. *Compositae*. In: *Nat. Pfl. Fam.*, eds Engler, A. & Prantl, K., Vol. 4(5), Leipzig.

- HOLMGREN, P.K., KEUKEN, W. & SCHOFIELD E.K. 1981. Index herbariorum. Part 1, Herbaria of the world. In: *Regnum Vegetabile*, ed. Stafleu, R.A., 7th edn, Vol. 106, pp. 1–452, Bohn, Scheltema & Holkema, Utrecht, W. Junk, The Hague.
- HUTCHINSON, J. 1932. *Corymbium africanum*. *Kew Bull.* 9: 510.
- JUSSIEU, A.L. 1789. *Genera plantarum*. Paris.
- KRAUSE, C.F.F. 1846. *Beitrage zur flora des Cap und Natallandes*. Regensburg.
- LAMARCK, J.B.A.P.M. de, 1786. *Encyclopedie methodique. Botanique*, 2, 1. Paris.
- LAMARCK, J.B.A.P.M. de, 1797. *Tableau encyclopedique methodique*, pl. 723. Paris.
- LAWRENCE, G.H.M. 1951. *Taxonomy of vascular plants*. Macmillan, New York.
- LEISTNER, O.A. & MORRIS, J.W. 1976. Southern African place names. *Ann. Cape Province Mus.* 12.
- LEPPIK, E.E. 1977. The evolution of capitulum types of the Compositae in the light of insect-flowering interactions. In: *The biology and chemistry of the Compositae*, eds Heywood, V.H., Harborne, J.B. & Turner, B.L., Academic Press, London.
- LESSING, C.F. 1829. *Corymbium*. *Linnaea* 4: 330–331.
- LESSING, C.F. 1831. *Corymbium*. *Linnaea* 6: 691.
- LEVYNS, M.R. 1950. Compositae. In: *Flora of the Cape Peninsula*, eds Adamson, R.S. & Salter, T.M., Cape Town.
- LINNAEUS, C. 1737a. *Corollarium generum plantarum*. Leyden.
- LINNAEUS, C. 1737b. *Hortus Cliffortianus*. Amsterdam.
- LINNAEUS, C. 1753. *Species plantarum*. Facsimile ed. 1959, Vol. 2, Ray Society, London.
- LINNAEUS, C. 1754. *Genera plantarum*, 5th edn, Stockholm.
- LINNAEUS, C. 1764. *Species plantarum*, 3rd edn, Stockholm.
- LINNAEUS, C. 1767a. *Systema naturae*, 12th edn, Vol. 2, Stockholm.
- LINNAEUS, C. 1767b. *Mantissa plantarum*. Stockholm.
- LINNAEUS, C. 1770. *Systema naturae*, 13th edn, Vol. 2, Stockholm.
- LINNÉ, C. von (fil.), 1781. *Supplementum plantarum*. Braunschweig.
- MARKÖTTER, E.J. 1939. Eine revision der gattung *Corymbium* L. *Bot. Jb.* 70: 354–372.
- MARLOTH, R. 1932. *The flora of South Africa*. Vol. 3, 2, Cape Town.
- MEYER, E.H.F. & Drège, J.F. 1837. *Commentariorum de plantis Africae australis*. Leipzig.
- MURRAY, J.A. 1798. *Systema Vegetabilium*, 15th edn, Paris.
- PAYNE, W.W. 1978. A glossary of plant hair terminology. *Brittonia* 2: 239–255.
- PHILLIPS, E.P. 1951. The genera of South African flowering plants. *Mem. bot. Surv. S. Afr.* 15. Pretoria.
- PLUKENET, L. 1696. *Almagestum botanicum*. London.
- SMITH, C.A. 1966. Common names of South African plants. *Mem. Bot. Surv. S. Afr.* 35. Pretoria.
- SPRAGUE, T.A. 1940. The type of *Corymbium*, *Kew Bull.* 17: 163–166.
- STEARN, W.T. 1966. *Botanical Latin*. Nelson, London.
- STEUDEL, E.G. 1840. *Nomenclator botanicus*, 2nd edn, Stuttgart.
- THUNBERG, C.P. 1794. *Prodromus Plantarum Capensium*. Uppsala.
- THUNBERG, C.P. 1823. *Flora Capensis*. Stuttgart.
- WEITZ, F.M. 1987. A monographic study of *Corymbium* L. (Asteraceae), M.Sc. thesis, Univ. of the Western Cape.
- WILLDENOW, C.L. 1798. *Caroli a Linne Species plantarum*, 1, 2. Berlin.