

A taxonomic revision of the genus *Merciera* (Campanulaceae)

C.N. CUPIDO*

Keywords: Campanulaceae, *Merciera* A.DC., South Africa, taxonomy, Western Cape

ABSTRACT

A taxonomic account of Western Cape endemic genus *Merciera* A.DC. is presented. Six species, supported by recent phenetic studies, are recognized. *M. brevifolia* A.DC., *M. eckloniana* H.Buek, *M. leptoloba* A.DC. and *M. tenuifolia* (L.f.) A.DC. are retained as species. *M. azurea* Schltr. is returned to species status and *M. tetraloba* C.N.Cupido was recently described. Each species is described and illustrated. A key to the species, and distribution maps are provided.

INTRODUCTION

Merciera A.DC. is a poorly known genus of small shrubs confined to Western Cape, South Africa. The genus is classified in the Campanulaceae subfamily Campanuloideae. This subfamily, often treated as a separate family, comprises between 35 to 55 genera and 600 species (Cosner *et al.* 2004). In the southern hemisphere only South Africa shows great diversity with 10 genera. Eight genera are endemic to South Africa and of these five are endemic to the Cape Floristic Region (CFR) (Goldblatt 1978). Taxonomically, genera are separated on account of capsule structure, particularly the mode of dehiscence. *Merciera* is unique amongst the South African genera in that its capsule is indehiscent. In addition to the unique capsule, the genus is characterized by salverform, tetramerous or pentamerous, blue-violet or white flowers and four basal ovules.

Species limits of *Merciera* were re-assessed in Cupido (2003), employing phenetic methods. The results of the phenetic studies support the recognition of six species. A taxonomic account of *Merciera* based on the phenetic studies is presented here.

MATERIAL AND METHODS

Sampling methods, preparation and examination of study material used are set out in Cupido (2003). In addition to specimens from SAM, BOL, and NBG cited in Cupido (2003), material from PRE, K and MO (acronyms as in Holmgren *et al.* 1990) were also examined for this revision.

Species concept

Taxonomists are frequently criticized for not being explicit about the criteria used in species delimitation. No universal species concept exists (Davis & Goldman 1993) and it therefore depends on the individual taxonomist to define species level taxa (Cupido 2003). In this study, the criterion of overall similarity that is based on observed patterns of character variation is employed. This criterion has been formulated into the phenetic species concept. The phenetic species concept considers discrete clusters

in character hyperspace as species. Phenetic clusters are recognized by the possession of a particular minimum number of characters in common. Six phenetic clusters were revealed by phenetic analysis (Cupido 2003). Each of these clusters is considered a species.

TAXONOMIC HISTORY

De Candolle (1830) established the genus *Merciera* to accommodate three species of Campanulaceae from the Cape characterized by having four basal ovules in unilocular or incompletely two-locular ovaries, and indehiscent capsules. One of these species, *M. tenuifolia* (L.f.) A.DC. had previously been placed in either *Trachelium* L. or *Roella* L., the other species were newly described. The genus was named in honour of botanist Phillip Mercier who wrote a monograph on the family Polemoniaceae. Initially De Candolle described the genus as '*incertae sedis*' because of the unusual structure of the ovary, but later classified it in the monogeneric tribe Merciereae (De Candolle 1839). Buek (1837) added two more species, but one of these, *M. heteromorpha*, was erroneously placed in the genus, belonging in the Rubiaceae instead (Sonder 1865). Species described by Buek (1837) appear to have been overlooked by De Candolle (1839). Sonder (1865) reduced the genus to two species, *M. brevifolia* A.DC. and *M. tenuifolia*, which were divided into two and four varieties respectively. More than three decades later, Schlechter (1898) described a species, *M. azurea* Schltr. from Sir Lowry's Pass. In the last comprehensive treatment of *Merciera*, Adamson (1954) recognized five species, one of which, *M. tenuifolia*, was divided into two varieties. In a remarkable coincidence, Adamson, like Buek before him, described a species, *M. vaginata* Adamson, which also belongs in the Rubiaceae (Adamson 1955). Since Adamson's treatment, Cupido (2002) added one more species from localities west of the Hottentots Holland Mountains in the Western Cape. In the present paper, six species are recognized in total, comprising De Candolle's (1830) original three, and one each described by Buek (1837), Schlechter (1898) and Cupido (2002). None of the species are divided into varieties.

Nomenclatural notes

Phillips (1951) cited *Merciera leptoloba* A.DC. as the type species of *Merciera*, in effect, an act of lectotypification. However, according to Stafleu & Cowan (1983), Pfeiffer (1874) frequently indicated type species for

* Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, 7735 Claremont, Cape Town.
E-mail: Cupidoen@sanbi.org
MS. received: 2005-06-27.

generic names, which constitute in numerous instances, the first selection of a lectotype. For the genus *Merciera*, Pfeiffer (1874) cited only *Trachelium tenuifolium*, the basionym of *M. tenuifolia* (L.f.) A.DC. Single species are mentioned only when they serve as a type of new genera or sections, as was done with *Merciera*. Article 9.17 of the Code (Greuter *et al.* 2000) is applied here. It states that the author who first designated a lectotype or a neotype must be followed. The species designated by Pfeiffer should therefore be regarded as the lectotype of *Merciera*.

The author citations of *Merciera* species described by Buek in the *Enumeratio* (Ecklon & Zeyher 1837) were given as H.Buek ex Eckl. & Zeyh. by Welman & Cupido (2003), because the specific epithets are interpreted as manuscript names. Nordenstam (2003) came to a different conclusion after studying Buek's taxonomic contributions to South African Campanulaceae, particularly the typification of species described by Buek. He found that the published descriptions attributed to the Buek MS and the wording of the handwritten descriptions found on the specimens in Stockholm (S), agree completely with that of Buek. Buek is therefore 'the author of the Campanulaceae in the *Enumeratio* (Ecklon & Zeyher 1837) and names published therein must be attributed to H.Buek alone (or H.Buek in Eckl. & Zeyh., if a bibliographical citation is involved; cf. Art. 46 Note 1 of the ICBN, Greuter *et al.* 2000)' (Nordenstam 2003). This conclusion is followed here.

MORPHOLOGICAL CHARACTERS

Habit

All species are resprouting, dwarf shrubs with branched stems. Stems are decumbent to suberect, occasionally with groups of branches at the end of a year's growth. The resprouting habit of *Merciera* is an adaptation to survive fires, and the genus is confined to the fire-prone fynbos vegetation of the Cape Region. Vegetatively, *Merciera* species resemble species of *Roella*, particularly of the series *Ciliatae*.

Leaves

The leaves are alternate, linear and sessile, often appearing dead due to the brown colour. The margins are entire, and usually ciliate. The abaxial surface is hairy in all species, except in *Merciera tetraloba* C.N.Cupido.

Leaves are variable in size and insertion along the stem. In *Merciera leptoloba* the leaves become smaller towards the top of the stem. In *M. tenuifolia* and *M. azurea* the leaves are subequal and crowded, but in *M. eckloniana* H.Buek, they are widely spaced.

Clusters of smaller green leaves are always present in the axils of leaves in all species except *Merciera azurea*, in which they are seldom present. These leaf clusters are in fact highly reduced short shoots developed in the axils of long shoot leaves.

Inflorescence

In an account on the inflorescence morphology of the Campanulaceae, Philipson (1953) described the inflores-

cence of *Merciera* as intercalary. The flowers are solitary in the axils of foliage leaves and after producing a zone of flowers, the axis continues to grow vegetatively. This arrangement is particularly marked in *M. leptoloba*.

Careful examination of the inflorescence reveals that there are in fact three flowers per axil. Only the terminal one develops however, and the two lateral flowers remain rudimentary on highly reduced lateral branches with bract-like leaves. The terminal flower lacks a bract-like leaf. The reduction of the lateral branches gives the flowers an axillary appearance. This basic structure is repeated in the entire flowering zone, forming a spike-like synflorescence towards the end of the main branches. The order of flowering is acropetal.

Flowers

Phenotypic plasticity is common in the Campanulaceae (Eddie & Ingrouille 1999) and *Merciera* is no exception to the rule. Numbers of floral parts are sometimes variable in the same species. Additional floral parts tend to develop, and flowers that are normally pentamerous, may become hexamerous. Both flower types are usually present on the same plant.

Calyx

The calyx is 4- or more commonly 5-lobed. Hairs are often present on the hyaline tips, but only on the margins in *Merciera tetraloba*. The lobes are fused at the base to form a short tube.

Corolla

The corolla is actinomorphic with a conspicuous tube and 4 or 5 spreading lobes. The corolla colour is white or blue to violet, and occasionally white-flowered species have purple tips to the corolla lobes. Tube length and flower colour is correlated, dividing the genus into two groups. White-flowered species have tube lengths less than 7 mm, whereas blue to violet-flowered species have tube lengths exceeding 7 mm.

Androecium

Stamens are 4 or 5, free, inserted at the base of the corolla tube and included in the corolla. The filaments are flattened, wider and pilose about the middle becoming narrower towards the apex. Anthers are linear and basifixed.

Gynoecium

The inferior ovary is surrounded by a hispid hypanthium. In accordance with the trichome terminology of Payne (1978), four trichome types are found on the hypanthium: filiform, clavate, uncinata or circinate (Figure 1A-D). The locule number has been described as 1- or incompletely 2-locular (De Candolle 1830). However, careful dissecting of the ovary reveals a complete but delicate septum, dividing the ovary into 2 locules. Each locule contains 2 basal ovules. The style is filiform, exerted, glabrous and inserted in a convex disc. The style is shortly divided, with the number of stigmatic lobes corresponding to the number of locules in the ovary.

Fruits and seeds

Merciera has indehiscent, hispid capsules, crowned with a persistent calyx (Figure 1E). Only 1 ovule develops into a seed, which occupies the entire capsule cavity. Seeds are elliptic to ovate, pale brown with a darker hilum.

TAXONOMIC TREATMENT

***Merciera* A.DC.**, Monographie des Campanulées: 369 (1830); H.Buek: 372 (1837); Sond.: 530 (1865); Adamson: 157 (1954). Type species: *M. tenuifolia* (L.f.) A.DC. [*Trachelium tenuifolium* L.f.: 143 (1782)]. (lecto-type, designated by Pfeiffer 1874).

Subshrubs; branches hispidulous to hispid. *Stems* decumbent or suberect, branched. *Leaves* alternate, sessile, linear, subulate, entire, scattered or crowded, ascending or spreading, glabrous or hairy abaxially, margins \pm ciliate, axillary clusters of smaller, glabrous leaves often present. *Inflorescence* 3-flowered, with 1 terminal, and 2 rudimentary flowers lateral, on highly reduced lateral branches with bract-like leaves, aggregated into spike-like synflorescences towards ends of main branches. *Flowers* sessile, axillary, actinomorphic; bract-like leaves 2, succulent, subtending each rudimentary flower, absent in terminal flower; hypanthium obconical, hispid with clavate, filiform, uncinate or circinate trichomes; calyx 4- or 5-lobed, often fused at base to form short tube, glabrous or hairy on hyaline tips and margins; corolla narrowly tubular or funnel-shaped, white, occasionally with purple tips, or violet-blue, or very rarely pale blue, lobes 4 or 5, ovate or linear-lanceolate, occasionally unequal, glabrous, or hairy on back. *Stamens* 4 or 5, free, inserted at base of corolla tube; filaments flattened, wider and pilose \pm in middle, narrower towards apex; anthers linear, basifixed. *Ovary* inferior, 2-locular, containing 4 erect basal ovules; style filiform, bifid, exserted, glabrous, swollen at base; stigmas glabrescent, bluish purple. *Fruit* a hispid capsule, crowned with persistent calyx, 1-seeded, indehiscent. *Seed* elliptic to ovate.

The six species are endemic to the southwestern parts of the CFR and grow in open, sandy, clayey or rocky soil, often in disturbed habitats. Fire is important in the growth and survival of the genus. After fire, the plants resprout from the base and a period of four to six years of vigorous vegetative growth and flowering follows. After six years, the plants become moribund and start disappearing when the veld remains unburnt for very long periods.

1. ***Merciera tenuifolia* (L.f.) A.DC.**, Monographie des Campanulées: 370 (1830); Sond.: 596 (1865); Adamson: 159 (1954). *Trachelium tenuifolium* L.f.: 143 (1782); Thunb.: 38 (1800). *Roella tenuifolia* (L.f.) Thunb.: 174 (1823). Type: South Africa, without precise locality, *Thunberg* 4774 (UPS-THUNB, lecto., here designated, NBG, microfiche!).

M. tenuifolia (L.f.) A.DC. var. *candolleana* Sond.: 596 (1865). Type: South Africa, Western Cape, Houwhoek Mountains, *Ecklon & Zeyher* 2417 (SAM!).

M. tenuifolia (L.f.) A.DC. var. *thunbergiana* Sond.: 596 (1865). Type: South Africa, without precise locality, *Thunberg* 4773 (UPS-THUNB, holo.).



FIGURE 1.— *Merciera*. A–D, trichome types: A, clavate; B, filiform; C, uncinate; D, circinate. E, capsule. Scale bar: 1 mm. Artist: W.A. Hitchcock.

Key to species

- 1a Flowers pentamerous, blue, violet or purple, rarely white; corolla tube more than 7 mm long:
 - 2a Plants slender (stem equal to or less than 1 mm thick); leaves scattered; corolla lobes glabrous adaxially; distributed from Groenlandberg (Grabouw, 3419AA) northwards to Tulbagh (3319AC)3. *M. eckloniana*
 - 2b Plants stout (stem more than 1 mm thick); leaves crowded; corolla lobes hairy adaxially; distributed south of Groenlandberg (Grabouw, 3419AA):
 - 3a Stems suberect; leaves ascending, abaxial surface hairy, axillary clusters of smaller leaves always present; corolla tube 11–26 mm long, five times as long as lobes1. *M. tenuifolia*
 - 3b Stems decumbent; leaves spreading, abaxial surface glabrescent, axillary clusters of smaller leaves occasionally present on lower parts of stem; corolla tube 7–14 mm long, less than three times as long as lobes2. *M. azurea*
- 1b Flowers tetramerous or pentamerous, white, occasionally with purple tips; corolla tube less than 7 mm long:
 - 4a Flowers tetramerous; margins of calyx lobes ciliate; hypanthium trichomes uncinata to circinate; plants growing in clayey soil; distributed west of Hottentots Holland Mountains6. *M. tetraloba*
 - 4b Flowers pentamerous; margins of calyx lobes glabrous; hypanthium trichomes clavate or filiform; plants growing in sandy or stony soil; distributed southeast of Hottentots Holland Mountains:
 - 5a Plants decumbent, stout; lower leaves more than 8 mm long, crowded; corolla lobes, linear-lanceolate; 2–6 mm long, almost as long as tube; hypanthium trichomes clavate4. *M. leptoloba*
 - 5b Plants suberect, slender; lower leaves less than 8 mm long, scattered; corolla lobes ovate, 2–3 mm long, up to half as long as tube; hypanthium trichomes filiform5. *M. brevifolia*

Stems suberect, sparsely or profusely branched, occasionally with group of branches at end of each season's growth. *Leaves* crowded, ascending, hairy on abaxial surface, axillary cluster of smaller leaves occasionally present; bract-like leaves 4–10 mm long. *Flowers* violet-blue, rarely white; hypanthium 1–3 mm long, hispid with clavate trichomes; calyx lobes 5, 0.8–1 mm long, hairs on hyaline tips; corolla tube narrow, 10.0–25.5 mm long; lobes 5, ovate, 2.5–4.0 mm long, hairy on back. *Stamens* 5; filaments 7–21 mm long. *Style* 13.0–30.5 mm long. *Flowering time*: December to January. Figure 2.

Distribution and habitat: the distribution of *Merciera tenuifolia* (Figure 3) is limited to Bot River, Houwhoek and Kogelberg where it is found on stony soil at altitudes ranging between 110 and 600 m.

The locality of the specimen MacOwan 3103 (SAM) collected at Tulbagh Nuwekloof is suspect. It has the same locality, collecting date and number as a specimen of *M. azurea*. No recent collections of *M. tenuifolia* have been made in the Tulbagh area.

Conservation status: Vulnerable D2 (World Conservation Union [IUCN] 2001).

2. *Merciera azurea* Schltr. in Botanische Jahrbücher 24: 447 (1898). *M. tenuifolia* (L.f.) A.DC. var. *azurea* (Schltr.) Adamson: 160 (1954). Type: South Africa, Western Cape, Sir Lowry's Pass, Schlechter 7263 (B, holo.; MO, SAM, iso.).

Stems decumbent, stout, occasionally with group of branches at end of each season's growth. *Leaves* crowded, spreading, glabrous or hairy on abaxial surface, axillary cluster of smaller leaves occasionally present; bract-like leaves 4.0–9.5 mm long. *Flowers* violet-blue, rarely white; hypanthium 1.5–2.7 mm long, hispid with clavate or filiform trichomes; calyx lobes 5, 1.0–1.9 mm long, hairy on hyaline tips; corolla tube wide, 7–14 mm long; lobes 5, ovate, 3.0–5.5 mm long, glabrous or hairy on back. *Stamens* 5; filaments 7–11 mm long. *Style* 12.0–19.5 mm long. *Flowering time*: November to February. Figure 4.

Distribution and habitat: *Merciera azurea* ranges from Sir Lowry's Pass to Bredasdorp (Figure 5) and occurs on

sandy or stony soil at altitudes ranging between 100 and 650 m.

The locality of the specimen MacOwan 3103b (SAM) collected at Tulbagh Nuwekloof is suspect. It has the same locality, collecting date and number as a specimen of *Merciera tenuifolia*. No recent collections of *M. azurea* have been made in the Tulbagh area.

During 1896 MacOwan made several collecting trips to Tulbagh, Caledon, Houwhoek and the Hottentots Holland Mountains (Gunn & Codd 1981) and it could have happened that specimens from the different localities were unknowingly mixed up resulting in incorrect locality information.

Conservation status: Vulnerable D2 (World Conservation Union [IUCN] 2001).

3. *Merciera eckloniana* H.Buek in Eckl. & Zeyh., Enumeratio plantarum Africae Australis extratropicae: 387 (1837); Adamson: 160 (1954). *M. tenuifolia* (L.f.) A.DC. var. *eckloniana* (H.Buek) Sond.: 596 (1865). Type: South Africa, inter rupes (altit. IV) montium supra 'Waterfall' in valle 'Tulbagh' (Worcester), December, Ecklon & Zeyher 2420 (S, holo.; SAM, iso.).

Stems semi-erect, slender, occasionally with group of branches at end of each season's growth. *Leaves* scattered, spreading, glabrous, or hairy on abaxial surface, axillary cluster of smaller leaves occasionally present; bract-like leaves 2–6 mm long. *Flowers* violet-blue, rarely white; hypanthium 1.0–2.8 mm long; hispid with filiform trichomes; calyx lobes 5, less than 1 mm long, hairs on hyaline tips; corolla tube narrow, 7.5–16.0 mm long, lobes 5, ovate, 1.5–3.5 mm long, glabrous on back. *Stamens* 5; filaments 5.5–10.0 mm long. *Style* 8.5–17.5 mm long. *Flowering time*: October to February. Figure 6.

Distribution and habitat: this species is distributed from the Groenlandberg northwards to Tulbagh (Figure 5). It is found on sandy or stony soil at altitudes ranging from 450 to 1 500 m.

Conservation status: Vulnerable D1 (World Conservation Union [IUCN] 2001).

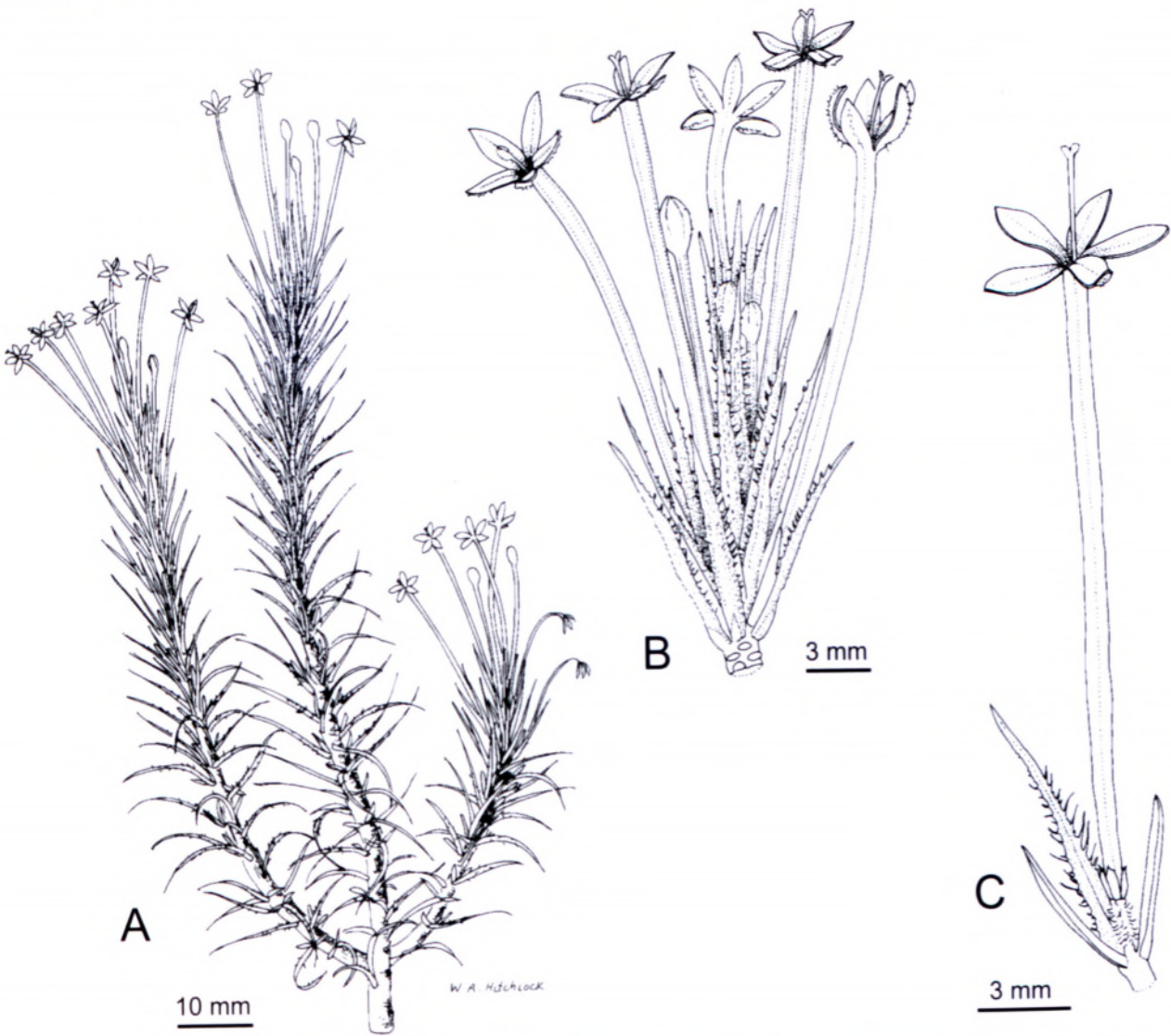


FIGURE 2.—*Merciera tenuifolia*, Cupido 289. A, portion of plant; B, flowering branch; C, flower with prophylls. Scale bars: A, 10 mm; B, C, 3 mm. Artist: W.A. Hitchcock.

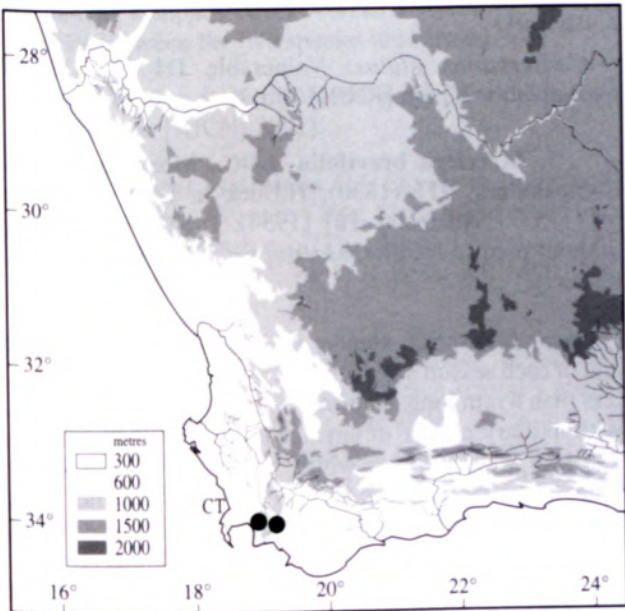


FIGURE 3.—Known distribution of *Merciera tenuifolia*.

4. *Merciera leptoloba* A.DC., Monographie des Campanulées: 371 (1830); H.Buek in Eckl. & Zeyh.: 387 (1837); Adamson: 162 (1954). *M. brevifolia* A.DC. var. *leptoloba* (A.DC.) Sond.: 596 (1865). Type: South Africa, Cape of Good Hope (Caput Bonae Spei), *Hooker s.n.* (K, holo.!).

Stems decumbent with groups of branches at end of each season's growth. *Leaves* scattered to crowded, lower leaves more than 8 mm long, glabrous to hairy on abaxial surface, with axillary cluster of smaller leaves; bract-like leaves 2–8 mm long. *Flowers* white; hypanthium 1–3 mm long; trichomes clavate; calyx lobes 5, 0.7–1.8 mm long, hairy on hyaline tips, rarely on back; corolla tube 3.0–5.5 mm long, occasionally shorter than lobes; lobes 5, linear, 2–6 mm long, glabrous on back. *Stamens* 5; filaments 3–5 mm long. *Style* 4–12 mm long. *Flowering time*: November to March. Figure 7.

Distribution and habitat: *Merciera leptoloba* is a common species of the Cape southeast coast, from Kogelberg to Bredasdorp (Figure 8). This species is found on sandy or stony flats and hills at altitudes ranging between sea level and 400 m.

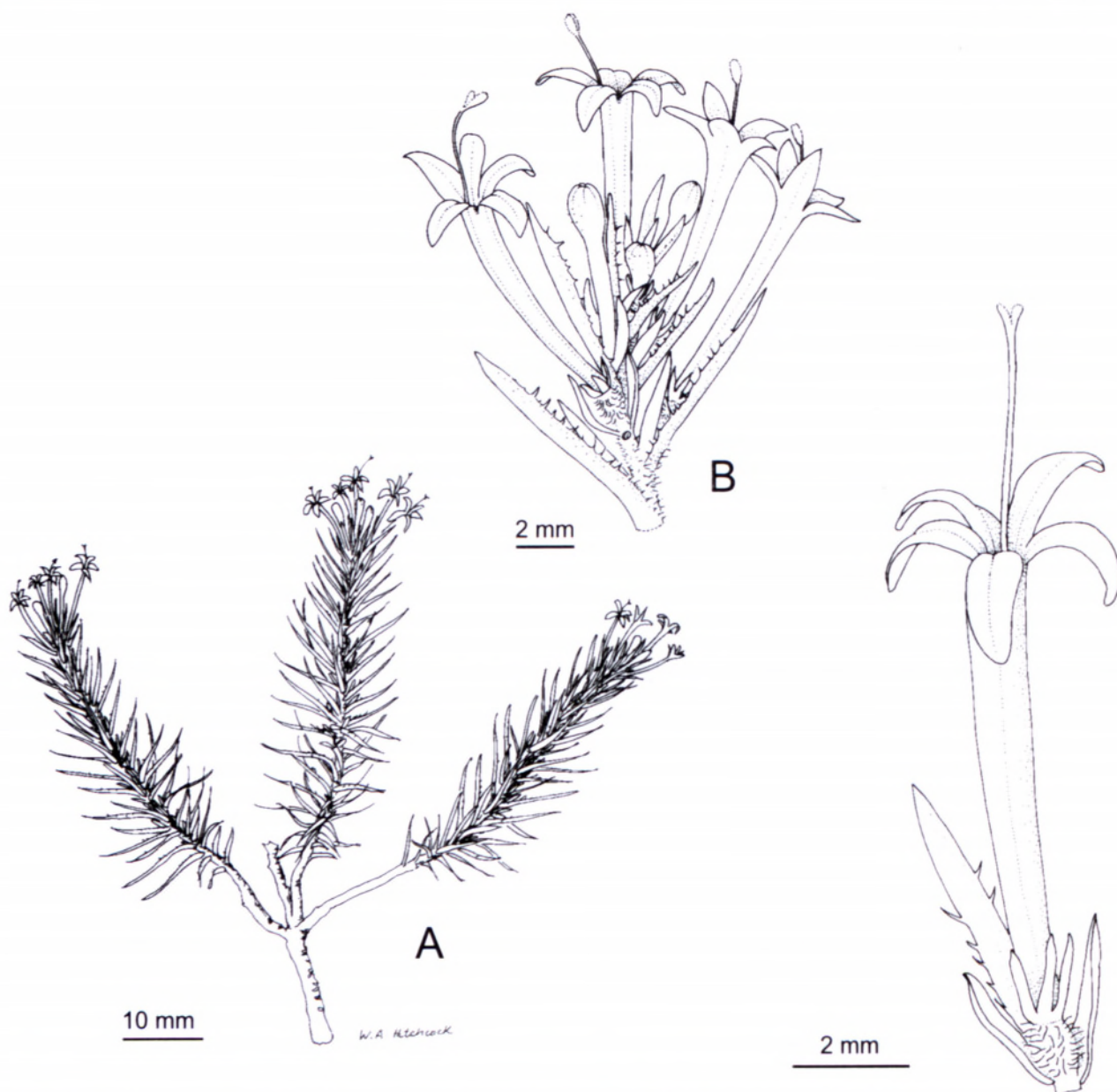


FIGURE 4.—*Merciera azurea*, Cupido 68. A, portion of plant; B, flowering branch; C, flower with prophylls. Scale bars: A, 10 mm; B, C, 2 mm. Artist: W.A. Hitchcock.

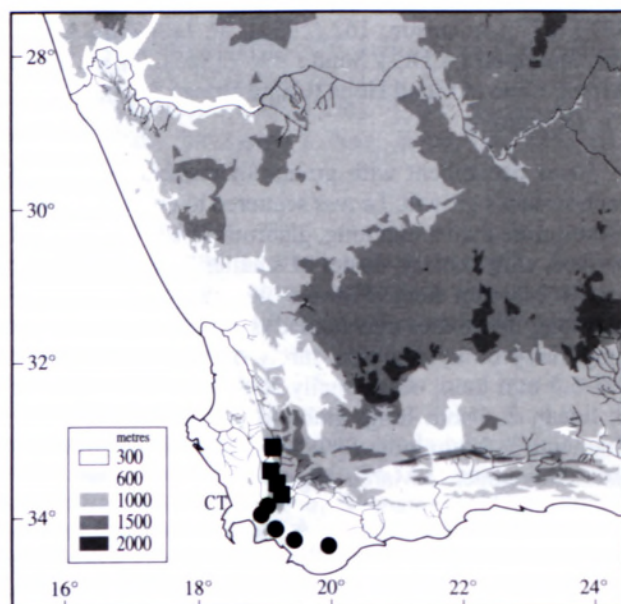


FIGURE 5.—Known distribution of *Merciera azurea*, ●; *M. eckloniana*, ■.

Conservation status: Vulnerable D1 D2 (World Conservation Union [IUCN] 2001).

5. *Merciera brevifolia* A.DC., Monographie des Campanulées: 371 (1830); H.Buek in Eckl. & Zeyh.: 387 (1837); Adamson: 161 (1954). Type: South Africa, without precise locality, *Masson s.n.* (BM, holo. –NBG, photo!).

Stems semi-erect, slender with groups of branches at end of each season's growth. *Leaves* scattered to crowded, less than 8 mm long, glabrous to hairy on abaxial surface, with axillary cluster of smaller leaves; bract-like leaves 2–4 mm long. *Flowers* white; hypanthium 0.8–1.6 mm long; trichomes filiform; calyx lobes 5, 0.5–1.0 mm long, hairy on hyaline tips, rarely on back; corolla tube 3–6 mm long; lobes 5, ovate, 1.5–3.0 mm long, glabrous on back. *Stamens* 5; filaments 2–4 mm long. *Style* 4.0–8.5 mm long. *Flowering time*: November to February. Figure 9.

Distribution: *Merciera brevifolia* is a montane species occurring on the Babylons Tower, and on the Bot

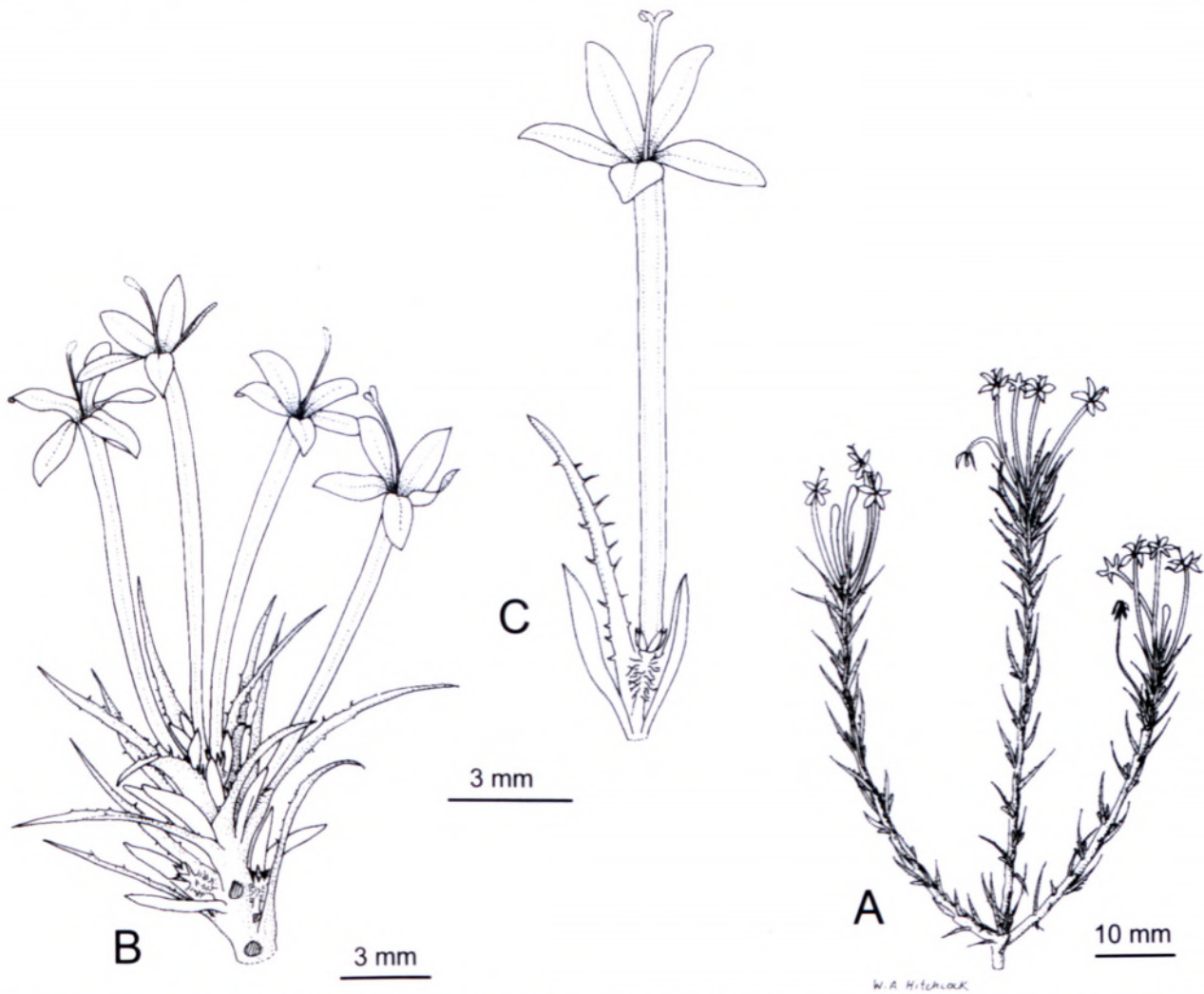


FIGURE 6.—*Merciera eckloniana*, Cupido 71. A, portion of plant; B, flowering branch; C, flower with prophylls. Scale bars: A, 10 mm; B, C, 3 mm. Artist: W.A. Hitchcock.

River, Houwhoek, Shaw’s Mountains and the Caledon Swartberg (Figure 10).

On the Houwhoek Mountains where this species occurs in sympatry with *Merciera leptoloba*, possible hybrids between the two species are formed.

Conservation status: Vulnerable D2 (World Conservation Union [IUCN] 2001).

6. ***Merciera tetraloba*** C.N.Cupido in Bothalia 31: 74 (2002). Type: Western Cape, Strand, Harmony Flats, Tortoise Nature Reserve, off Disa Road, 17 January 2000, C.N. Cupido 77 (NBG, ho !o.; BM!, K!, MO!, NY!, PRE!, iso.).

Stems decumbent or suberect, slender, occasionally with groups of branches at end of each season’s growth. **Leaves** scattered, ascending, the older spreading, glabrous on abaxial surface, margins ciliate; axillary cluster of smaller leaves present; bract-like leaves, 1–4 mm long. **Flowers** tetramerous, white, occasionally with purple tips, or very rarely pale blue; hypanthium 1–2 mm long, hispid with uncinatate or circinate trichomes; calyx lobes 4, 0.6–1.2 mm long, often hairy on hyaline tips and margins; corolla tube 4–6 mm long; lobes 4, ovate, 2–3 mm long, glabrous or hairy on back. **Stamens** 4; filaments 3.0–4.5 mm long. **Style** 6–10 mm long. **Flowering time:**

November to January. Figure 11.

Distribution and habitat: this species is found in Faure, Gordon’s Bay, Sir Lowry’s Pass, Somerset West, Strand, Dal Josaphat, Du Toitskloof, Stellenbosch, Hermon and Malmesbury on flats and lower mountain slopes at altitudes between 30 and 350 m (Figure 10). It grows in open clayey soil, often in disturbed habitats.

When originally described, this species was thought to be restricted to Faure, Gordon’s Bay, Sir Lowry’s Pass, Somerset West, Strand, Dal Josaphat, Du Toitskloof, and Stellenbosch. Subsequently, the author came across a specimen collected by Elsie Esterhuysen (Esterhuysen 34802, BOL) at Michiel Heyns Kraal near Malmesbury in 1977 and misidentified as *Lightfootia*. Attempts to verify this collection in the field have so far been unsuccessful. John Manning recorded another new locality for this species (Manning 2941, NBG) at Hermon on the Farm Bosplaas in 2005.

Conservation status: Endangered B1 a (i, ii) b (iii) 2 (i, ii) b (iii) D (World Conservation Union [IUCN] 2001).

Large areas of the habitat of this species in the Helderberg and Stellenbosch areas have been destroyed because lower mountain slopes and lowland areas are sought after for urban development. On the Harmony

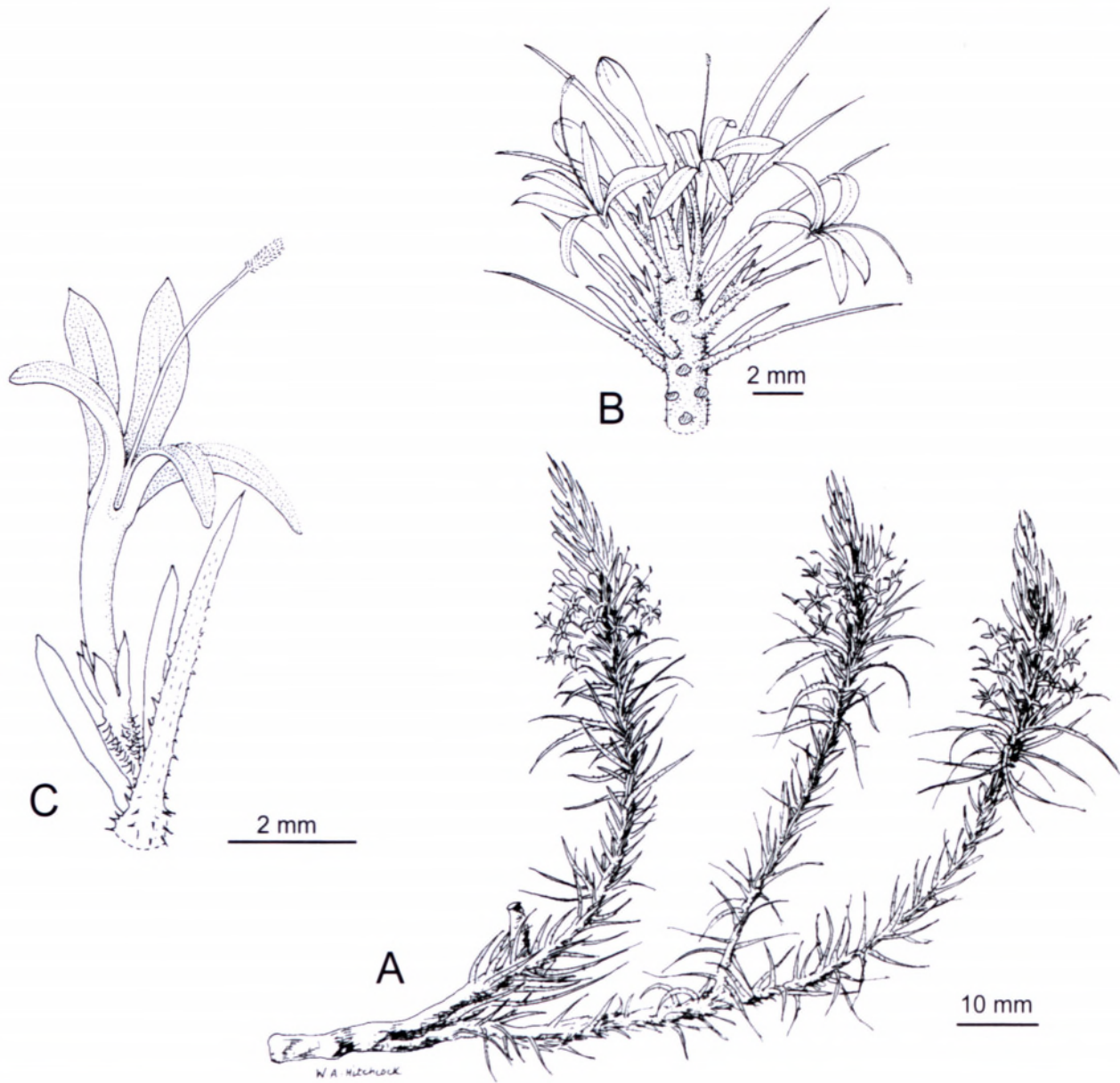


FIGURE 7.—*Merciera leptoloba*, Cupido 66. A, portion of plant; B, flowering branch; C, flower with prophylls. Scale bars: A, 10 mm; B, C, 2 mm. Artist: W.A. Hitchcock.

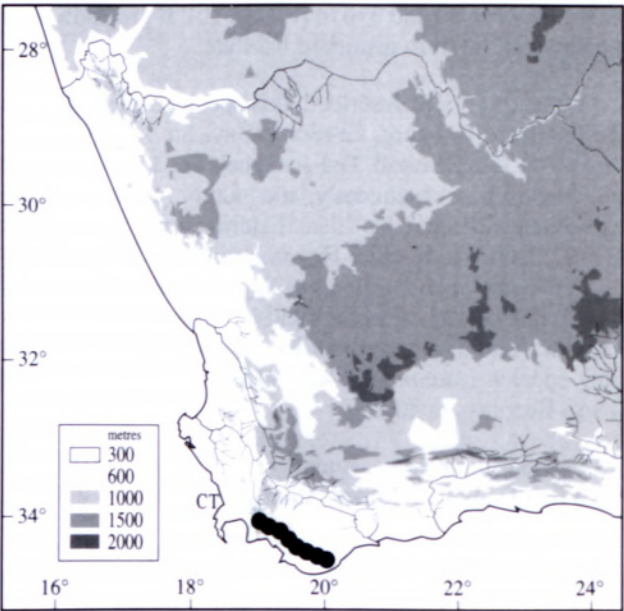


FIGURE 8.—Known distribution of *Merciera leptoloba*.

Flats in Strand, the few existing populations are under serious threat of extinction.

Excluded species

Merciera heteromorpha H.Buek = *Carpacoe heteromorpha* (H.Buek) Bolus

When Buek (1837) described the species, he noted that it most likely constituted a distinct genus. Sonder (1865) considered it a member of Rubiaceae, but did not treat it taxonomically. A few decades after Sonder, Bolus (1896) transferred the species to the genus *Carpacoe* in the Rubiaceae, where it is currently classified.

Merciera vaginata Adamson = *Carpacoe heteromorpha* (H.Buek) Bolus (*Merciera heteromorpha* H.Buek)

Adamson erroneously thought that *Stokoe s.n.* (SAM) from the Somerset Snееuk represented a new species of *Merciera* and consequently described it as such. After it had been brought to his attention that the plant described as *M. vaginata* appeared to be the same as

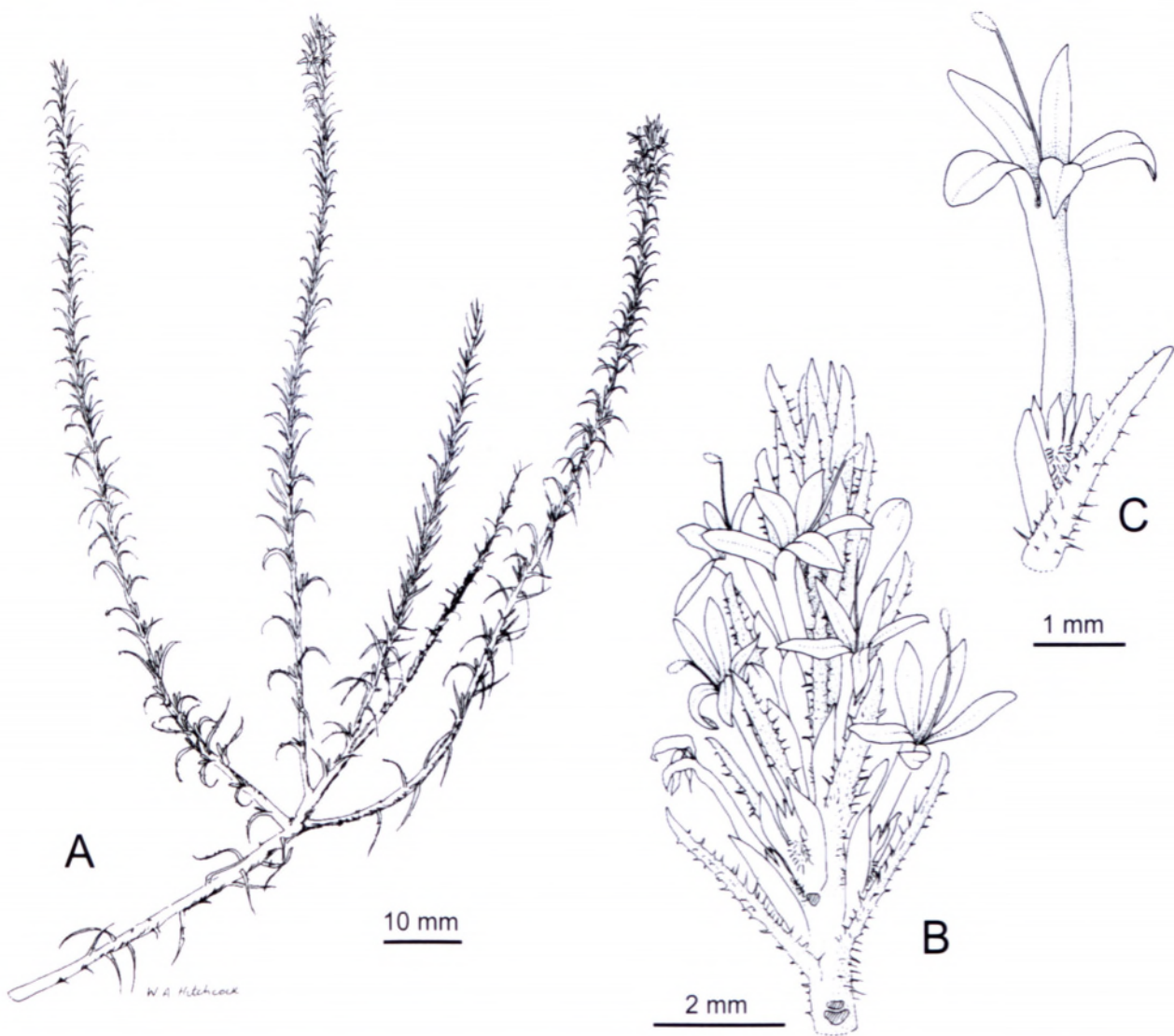


FIGURE 9.—*Merciera brevifolia*, Cupido 235. A, portion of plant; B, flowering branch; C, flower with prophylls. Scale bars: A, 10 mm; B, 2 mm; C, 1 mm. Artist: W.A. Hitchcock.

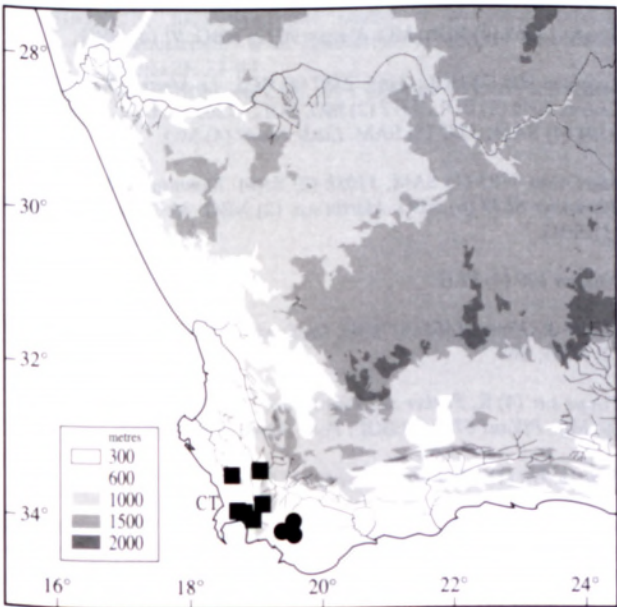


FIGURE 10.—Known distribution of *Merciera brevifolia*, ●; *M. tetraloba*, ■.

certain specimens in the herbarium of the South African Museum, he re-examined the specimen. He conceded that the plant was the same as Zeyher 2421, the type of *M. heteromorpha* (Adamson 1955) and is therefore correctly referred to *Carpacoe heteromorpha*.

Merciera muraltioides Schltr.

Specimens collected by R. Schlechter (*Schlechter* 7372, BOL, MO, SAM) from Houwhoek appear under the manuscript name *Merciera muraltioides* Schltr. sp. nov. This name was never published and is therefore not valid. The inclusion of these specimens in *M. brevifolia* A.DC. by Adamson (1954) is supported by the phenetic studies of Cupido (2003) and accordingly upheld in this paper.

SPECIMENS EXAMINED

Adamson 4095 (4) PRE; 4098 (1) BOL; 4773, 4774, 4898 (4) BOL; 4780 (4) K; 4781 (4) SAM; 4895 (6) BOL; 4904 (2) SAM.

Barker 286 (3) NBG; 7776 (4) NBG; 8802 (5) NBG; 8865 (6) NBG. Barker (Belle) s.n. (2) MO. Barnard 40469 (2) SAM. Bayer SA01108

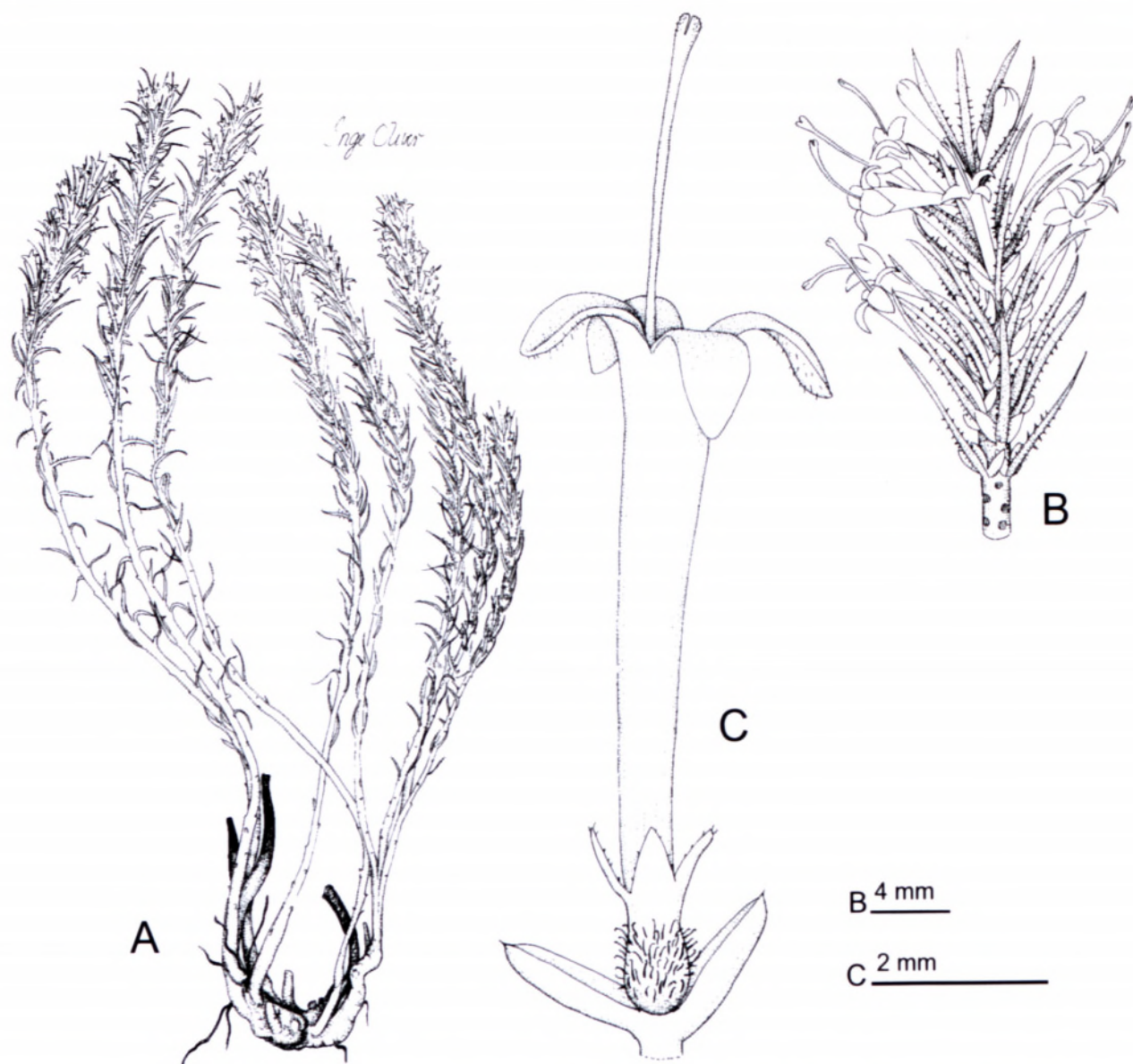


FIGURE 11.—*Merciera tetraloba*, Cupido 77. A, portion of plant, life size; B, flowering branch; C, flower with prophylls. Scale bars: B, 4 mm; C, 2 mm. Artist: Inge Oliver.

(2) MO. Bayliss 4089 (6) NBG, MO. Bolus 634 (2) SAM; 4679, 5105 (5) BOL; 6948 (1) NBG; 7402 (5) BOL; BOL98256 (6) BOL. Bond 1684 (3) NBG. Boucher 167, 1781 (2) NBG; 932, 1769 (4) NBG; 3447 (6) NBG, PRE; 5279 (1) NBG. Brennan 14048 (4) NBG, MO, K. Burger 2859 (4) NBG. Burman 1079 (2) BOL; 1255 (4) BOL.

Compton 6116, 10223, 14225, 18951, 19016, 23238 (4) NBG; 10372 (6) NBG; 10603 (5) NBG; 14234, 16835 (2) NBG; 16832 (1) NBG; 21897 (3) NBG. Cupido 66, 69, 72 (4) NBG; 67, 71 (3) NBG; 68, 70, 73 (2) NBG; 75, 77, 117 (6) NBG.

De Vos 475 (4) NBG; 1161 (2) NBG. Drège SAM17297 (6) SAM.

Ecklon & Zeyher s.n. (5) SAM; 2417 (1) SAM; 3154 (5) NBG. Esterhuysen 4229, 10007 (2) BOL; 4954 (4) NBG; 11424, 14361 (3) BOL; 19594, 33722 (4) BOL.

Forsyth 394 (4) NBG.

Galpin 11316 (4) PRE, K. Goldblatt 5381 (4) PRE, K; 7623, 11262 (3) MO. Gill s.n. (1) BOL. Gillet s.n. (5) NBG; 670 (3) NBG. Guthrie s.n. (4) NBG; 2275 (1) NBG; 2792 (6) NBG.

Hafström & Acocks 2006 (5) PRE. Haynes 1543 (1) NBG.

Jordaan s.n. (6) NBG; 832, 18402 (2) NBG.

Kensit 13469 (4) BOL, MO. Kruger 90 (2) NBG; 91 (4) NBG.

Leighton 906 (2) BOL; 2465, 2587 (4) BOL. Le Maitre 177 (1) NBG. Levyns 4046 (4) BOL; 5372 (2) MO, BOL; 11265 (4) BOL, PRE. Lewis 3194 (4) SAM; 3532 (5) SAM. Liede 16447 (4) MO.

MacOwan 3103 (1) SAM; 3103b (2) SAM. Manning 2941 (6) NBG. Markotter 8639 (6) NBG. Martin s.n. (2) NBG. McDonald 603, 1735 (3) NBG.

Nilsson 120 (4) PRE.

Oliver & Oliver 11866 (6) NBG. Orchard 341 (4) NBG, MO; 358, 524 (2) NBG, MO.

Pappe s.n. (4) K. Parker 3455 (6) K, MO; 3550 (6) NBG, MO, K; s.n. (6) MO. Pillans 6749 (3) BOL. Potts 5054 (4) SAM.

Rourke 998 (1) NBG. Rycroft 3149 (4) NBG.

Salter 5136 (3) BOL, K. Schlechter 7211 (6) PRE, MO, K; 7263 (2) MO, SAM; 7370 (1) MO; 7372 (5) BOL, MO, PRE; SAM, 9228 (3) MO. Steiner 2445 (2) NBG. Stokoe 8653, 9113, 69735, 358443 (1) BOL; 58444 (4) SAM; 58445, 64365, 67099 (3) SAM; 64366, 65581 (2) SAM.

Taylor 3016, 3877 (3) NBG; 3793 (4) NBG; 4401, 10251 (2) NBG;

9557 (4) K, NBG, PRE. *Thompson* 2303 (3) NBG; 3872 (4) NBG. *Tyson* 899 (6) SAM.

Van der Merwe 1787 (2) NBG. *Van der Schijff* 7437 (2) MO; 7457 (4) MO. *Van Jaarsveld & Bean* 6411 (3) NBG. *Viviers* 81 (2) NBG; 775 (3) NBG.

Walters 51, 1048 (4) NBG. *Williams* 65 (4) MO, K; 2937 (2) NBG; 2949 (4) NBG, PRE; 3389 (4) NBG.

Zeyher 3152 (1) NBG; 3154 (5) BOL.

ACKNOWLEDGEMENTS

This study formed part of an M.Sc. (Systematics & Biodiversity Science) thesis obtained at the University of Cape Town. I wish to express my thanks and appreciation to many people and institutions for their assistance and support: Prof. H.P. Linder for supervising the study; dr J.C. Manning for valuable comments on the final draft of this manuscript; the curators of BOL, K, NBG and PRE for permission to examine their collections; P.B. Phillipson for providing information for specimens at MO; my colleagues at the Kirstenbosch Research Centre for their support and encouragement; the South African National Biodiversity Institute for financial support; and the Western Cape Nature Conservation Board for granting permission to collect plants.

REFERENCES

ADAMSON, R.S. 1954. The genus *Merciera*. *Journal of South African Botany* 20:157–163.
ADAMSON, R.S. 1955. *Merciera*: a correction. *Journal of South African Botany* 21: corrigenda.
BOLUS, H. 1896. Contributions to the flora of South Africa. *Journal of Botany* 34: 16–25.
BUEK, H.W. 1837. Campanulaceae. In C.F. Ecklon & K.L. Zeyher, *Enumeratio plantarum Africae australis extratropicae* 3: 372–387. Perthes & Besser, Hamburg.
COSNER, M.E., RAUBESON, L.A. & JANSEN, R.K. 2004. Chloroplast DNA rearrangement in Campanulaceae: phylogenetic utility of highly rearranged genomes. *BMC Evolutionary Biology* 4: 27 (<http://www.biomedcentral.com/1471-2148/4/27>).
CUPIDO, C.N. 2002. A new species of *Merciera* from Western Cape, South Africa. *Bothalia* 32: 74–76.
CUPIDO, C.N. 2003. Systematic studies in the genus *Merciera* (Campanulaceae): a re-assessment of species boundaries. *Adansonia* 25: 33–44.
DAVIS, J.I. & GOLDMAN, D.H. 1993. Isozyme variation and species

delimitation among diploid populations of the *Puccinella nuttaliana* complex (Poaceae): character fixation and the discovery of phylogenetic species. *Taxon* 42: 585–599.
DE CANDOLLE, A.L.P.P. 1830. *Monographie des Campanuleés*. Desray, Paris.
DE CANDOLLE, A.L.P.P. 1839. Campanulaceae. In A.P. de Candolle, *Prodromus systematis naturalis regni vegetabilis* 7: 414–496. Treuttel & Würtz, Paris.
EDDIE, W.M.M. & INGROUILLE, M.J. 1999. Polymorphism in the Aegean ‘five-loculed’ species of the genus *Campanula*, Section *Quinqueloculares* (Campanulaceae). *Nordic Journal of Botany* 19: 153–169.
GOLDBLATT, P. 1978. An analysis of the flora of southern Africa: its characteristics, relationships, and origin. *Annals of the Missouri Botanical Garden* 65: 369–436.
GREUTER, W., MCNEIL, J., BARRIE, F.R., BURDET, H.M., DEMOULIN, V., FILGUIERAS, T.S., NICOLSON, D.H., SILVA, P.C., SKOG, J.E., TREHANE, P. & TURLAND, N.J. 2000. International Code of Botanical Nomenclature (Saint Louis Code). Adopted by the Sixteenth International Botanical Congress St. Louis, Missouri, July–August 1999. *Regnum Vegetabile* 138. Koeltz, Königstein.
GUNN, M. & CODD, L.E. 1981. *Botanical exploration of southern Africa*. Balkema, Cape Town.
HOLMGREN, P.K., HOLMGREN, N.H. & BARNET, L.C. 1990. *Index herbariorum*. New York Botanical Garden, Bronx, New York.
LINNAEUS, C. (fil.) 1782 (‘1781’). *Supplementum plantarum*. Orphanotropei, Brunsvigae.
NORDENSTAM, B. 2003. Types of H. Buek’s South African Campanulaceae in Stockholm (S). *Taxon* 52: 819–830.
PAYNE, W.W. 1978. A glossary of plant hair terminology. *Brittonia* 30: 239–255.
PFEIFFER, L.K.G. 1874. *Nomenclator botanicus*. Kassel.
PHILIPSON, W.R. 1953. The relationships of the Compositae particularly as illustrated by the morphology of the inflorescence in the Rubiales and the Campanulatae. *Phytomorphology* 3: 391–404.
PHILLIPS, E.P. 1951. Genera of South African flowering plants, edn 2. *Memoirs of the Botanical Survey of South Africa* No. 25.
SCHLECHTER, R. 1898. Plantae Schlechterianae novae vel minus cognitae describuntur. I. *Botanische Jahrbücher* 24: 447.
SONDER, W. 1865. Campanulaceae. In W.H. Harvey & O.W. Sonder, *Flora capensis* 3: 530–605. Hodges, Smith, Dublin.
STAFLEU, F.A. & COWAN, R.S. 1983. *Taxonomic literature*, vol. IV: P–Sak. Bohn, Scheltema & Holkema, Utrecht.
THUNBERG, C.P. 1800. *Prodromus plantarum capensium*. Uppsala.
THUNBERG, C.P. 1823. *Flora capensis*, edn Schultes. Cotta, Stuttgart.
WELMAN, W.G. & CUPIDO, C.N. 2003. Campanulaceae. In G. Germishuizen & N.L. Meyer, *Plants of southern Africa: an annotated checklist*. *Strelitzia* 14: 336–346. National Botanical Institute, Pretoria.
WORLD CONSERVATION UNION (IUCN) 2001. *IUCN Red List categories and criteria: version 3.1*. IUCN Species Survival Commission. IUCN, Gland, Switzerland and Cambridge, UK.