

# The genus *Erica* (Ericaceae) in southern Africa: taxonomic notes 2

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## ABSTRACT

This is a continuation in the series of notes from *Bothalia* 32 (2002) reflecting the status of species of *Erica* L. recognized in the Compton Herbarium. These notes cover the 43 species currently included in the section *Evanthe* of *Flora capensis*. Five new species, *E. ceraria*, *E. croceovirens*, *E. gerhardii*, *E. prolata* and *E. viridimontana* and six new subspecies are described.

## INTRODUCTION

The first paper in this series (Oliver & Oliver 2002a) dealt with the large-flowered species with tubular corollas that are borne near the ends of extremely reduced (almost invisible), non-leafy lateral branchlets which are then aggregated into dense, spike-like synflorescences. The term ‘axillary’ was applied by previous workers to these inflorescences. The next set of species with long tubular corollas has the flowers also borne near the ends

of lateral branchlets but these are leafy and usually clearly visible. These were termed ‘terminal’ inflorescences. They may be aggregated into dense, spike-like synflorescences or are rather loose on main branches, or scattered over the whole plant. These species were included in §*Evanthe* according to *Flora capensis* (Guthrie & Bolus 1905).

We have found this grouping very unsatisfactory due to the relationship, in our opinion sometimes very close, between these long-tubed species and much smaller-flowered species included in §*Ephebus*, e.g. *E. stagnalis* Salisb. and *E. chrysocodon* Guthrie & Bolus.

## ERICA PATERSONII-NANA COMPLEX

This complex is characterized by 4-nate leaves, flowers 4-nate on short, lateral, leafy branchlets, a relatively short pedicel (very long in *E. vallis-araneorum*), a corolla some shade of yellow but occasionally reddish, and usually rather hard and wax-like in texture with erect-spreading lobes (Figure 1), anthers with long, thin appendages, an ovary markedly emarginate and with a bulbous placenta at the apex of the columella, and a capsule of the same type with a distinctive shape and construction (see Figure 2K).

The group comprises eight species (numbers 36–39)—*E. patersonii* (36), *E. sacciflora* (37), *E. gerhardii* (37.1), *E. foliacea* (38), *E. vallis-araneorum* (38.1), *E. galpinii* (38.2), *E. ceraria* (38.3) and *E. nana* (39). These are illustrated in Figure 1.

## Key to species in the *Erica patersonii-nana* complex

- 1a Pedicel long ( $\pm 8$  mm), red ..... *E. vallis-araneorum* (38.1)
- 1b Pedicel short ( $< 2$  mm), greenish/yellowish:
  - 2a Sepals ovate with very long-attenuated apex ..... *E. patersonii* (36)
  - 2b Sepals without long-attenuated apex:
    - 3a Sepals broad,  $\pm$  as broad as long:
      - 4a Sepals  $\pm$  as long as bract and bracteoles and imbricating them ..... *E. galpinii* (38.2)
      - 4b Sepals much longer than bract and bracteoles not imbricating ..... *E. sacciflora* (37)
    - 3b Sepals long and narrow, equal to more than twice their width:
      - 5a Bract and bracteoles ovate, much shorter than sepals ( $\pm 1.5$  mm long) ..... *E. gerhardii* (37.1)
      - 5b Bract and bracteoles lanceolate, as long as sepals:
        - 6a Corolla mouth open, lobes  $\pm$  rounded ..... *E. nana* (39)
        - 6b Corolla mouth constricted, lobes rounded but with acute tip:
          - 7a Corolla very hard, greenish yellow; stem glabrous ..... *E. ceraria* (38.3)

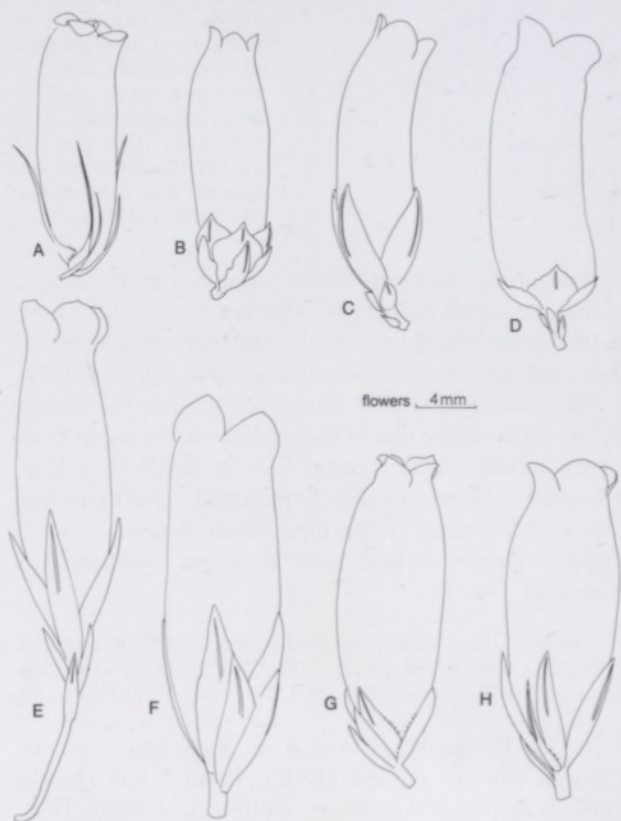


FIGURE 1.—Flowers of species in the *Erica patersonii-nana* complex. A, *E. patersonii*, Albertyn STE32110; B, *E. galpinii*, Williams 1650; C, *E. gerhardii*, type; D, *E. sacciflora*, Stehle 286; E, *E. vallis-araneorum*, Boucher 1249; F, *E. nana*, Oliver STE30128; G, *E. foliacea* subsp. *foliacea*, Middelmann NBG80661; H, *E. ceraria*, type. Scale bar: 4 mm. Artist: I.M. Oliver.

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FIGURE 2.—*Erica gerhardii*. A, flowering branch,  $\times 1$ ; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, anther, side, back and front views; I, gynoecium; J, ovary, l/s to show placentation; K, capsule with one valve removed; L, seed; M, testa cells. Scale bars: B, C, E–K, 2 mm; D, 4 mm; L, 1 mm; M, 100  $\mu$ m. A–J, drawn from the type; K–M, Kirsten 644. Artist: I.M. Oliver.

7b Corolla not very hard, yellow to yellowish orange; stem hairy:

8a Flowers 2–4-nate at ends of scattered side branches ..... *E. foliacea* subsp. *foliacea* (38a)

8b Flowers 4-nate in dense spike-like synflorescences ..... *E. foliacea* subsp. *fulgens* (38b)

36. *E. patersonii* Andrews, Coloured engravings of heaths: t. 43 (1795) [as *pattersonia*], non L.Bolus (1928); Salter: 635 (1950); Dulfer: 41 (1965). Iconotype: l.c. t. 43.

Note 1: Andrews used the spelling 'pattersonia' on the plate and text in 1795 but altered it to 'patersonia' in the Index he published in 1802 and all his subsequent publications. He did not give the etymology in the protologue but the species is undoubtedly named after William Paterson, horticulturist, later soldier and administrator, who mentioned seeing the species at Cape Hangklip in October 1777 (Paterson 1789: 9)—'Here I found a species of *Erica*, which was quite new, with a spike of long tubular [sic] flowers, the most beautiful I had ever seen'.

Note 2: Andrews' specific epithets commemorating persons with the -ia ending have been amended to the genitive -ii/-iae format. They were originally thought to be the use of generic names in apposition but investigations have shown that some do not reflect any known generic name, and some were described before the corresponding genus (Nelson & Oliver 2004).

*E. patersonia* Andrews var. *major* Andrews: t. 195 (1809). Iconotype: l.c. t. 195.

*E. abietina* sensu Benth.: 630 (1839) quoad specmn, non *E. abietina* L.; Guthrie & Bolus: 67 (1905).

Illustrations: Andrews: t. 43 (1795); Baker & Oliver: t. 21 (1967); Schumann & Kirsten: 53, t. 1, 2 (1992); I.M. Oliver & Oliver: t. 6 (2000).

**Diagnostic features:** aense compact and elongate spike-like synflorescences; flowers 4-nate on short, leafy, lateral branchlets; sepals long, narrow from broad base; corolla clear yellow; capsule dehiscence sideways.

This well-known and distinctive species, the Mealie heath, is becoming rare in the wild due to the destruction of its habitat on the coastal flats in the Betty's Bay-Kleinmond-Hermanus area. Some small populations survive in the Cape of Good Hope Nature Reserve. A well-known, chance hybrid with *E. nana* is known as 'Gengold' (see 39).

Vouchers: *Albertyn* STE32110 (NBG!); *Kirsten* 1368 (NBG!); *Parker* 4498 (BOL!, NBG!); *Schlechter* 9551 (BM!, BOL!, NBG!, P!, PRE!, W); *Thode* 9359 (NBG!); *Zeyher* 3179 (BOL!, K!, NBG!, P!, PRE!, W).

37. *E. sacciflora* Salisb. in Transactions of the Linnean Society 6: 355 (1802); Benth.: 630 (1839); Guthrie & Bolus: 67 (1905); Dulfer: 42 (1965). Type: Hottentots Holland, *Masson s.n.* (BM!).

Illustrations: Schumann & Kirsten: 53, t. 3, 4 (1992).

**Diagnostic features:** loose to compact spike-like synflorescences; flowers single on ends of short, leafy, lateral branchlets; bract and bracteoles small; sepals broadly ovate; corolla yellow to yellow-orange with green tips; anther appendages with a few short upward-pointing hairs.

This species is confined to the mountains around



Franschhoek. It is most closely related to the new species, *E. gerhardii* under which the differences are discussed.

A small flowered collection, *Esterhuysen 9614*, from Winterberg in the Wemmershoek/Du Toitskloof area is placed here with some uncertainty. It needs further investigation before any definite taxonomic position can be assigned to it.

Vouchers: *Kriel sub Bolus 6333* (BM!, BOL!, K!, NBG!, PRE!); *Haynes 653* (NBG!, PRE!); *Lewis 5280* (MO!, NBG!, NY!); *MacOwan Herb. Norm. 958* (BM!, K!, PRE!, SAM!); *Stehle 286* (NBG!, PRE); *Winter 31* (NBG!, PRE).

37.1. *E. gerhardii* E.G.H.Oliv. & I.M.Oliv., sp. nov., affinitate *E. sacciflorae* sed synflorescentibus nonnullis vel sparsissimis floribus 1- vel 2-natis erectis ad suberectis, bractea bracteolisque parva ovata, sepalis lanceolatis, corolla viridiflava parum quadrangulata, antherae calcaribus pilis reflexis dignoscenda. Figura 2.

TYPE.—Western Cape, 3419 (Caledon): Klein River Mtns WNW of Stanford, ridge just W of Boskop on Morning Star 630, 620 m, (–AD), 14 August 1999, E.G.H. & I.M.Oliver 11277 (NBG, holo.; K, PRE).

Shrubs sparsely branched, erect, 1.0–1.5 m tall, single-stemmed reseeder. *Branches*: few main branches normally with continuous apical growth, rarely ending in a florescence, secondary branches occasional (not every node),  $\pm 3$ –30 mm long, internodes  $\pm 1.5$  mm long with infrafoliar ridges; stems glabrous with very occasionally, a few short gland-tipped hairs in grooves. *Leaves* 4-nate, suberect incurved, imbricate, very narrowly lanceolate, 8–10  $\times$  0.8 mm, triangular in section, margins acute, flat adaxially, with distinct small acute tip, glabrous, sulcus narrow, closed at base; petiole  $\pm 1$  mm long, glabrous, with occasional marginal hairs. *Inflorescence*: flowers 1(2)-nate at ends of side branches, rarely main branches, mostly suberect, occasionally spreading to slightly pendulous, not in spike-like synflorescence; pedicel  $\pm 3$  mm long, glabrous; bract partially recalcrescent near base of pedicel, ovate-triangular, 1.5–2.0  $\times$  0.7 mm, glabrous, acute, pale yellow-green, margin with or without short, gland-tipped hairs, sulcus present or absent; bracteoles 2,  $\pm$  in middle of pedicel, ovate to obovate, acute, 2–3  $\times$  1.2 mm, glabrous, pale yellow-green, glabrous margin entire, sulcus in upper  $\frac{1}{2}$  narrow. *Calyx* 4-partite, ovate-lanceolate,  $\pm 7 \times 2$  mm, slightly imbricate laterally, margins entire, sulcus narrow  $\pm \frac{2}{3}$  length of segment, slightly keeled, pale green, darker around sulcus. *Corolla* 4-lobed, broadly tubular, 16–17  $\times$  5 mm, slightly 4-angled in t/s, slightly curved, slightly contracted below mouth, greenish yellow, hard when fresh, glabrous; lobes  $\pm 2 \times 2.5$  mm, rounded, entire, erect to slightly spreading. *Stamens* 8, free, included; filaments  $\pm 12$  mm long with apical sigmoid curve, glabrous, white; anthers bilobed, appendiculate, dorsally attached  $\pm \frac{1}{3}$  way up, narrowly ovate in adaxial view, thecae erect, adpressed, slightly curved-oblong,  $\pm 1.2 \times 0.6$  in lateral view, strigose apically, dark brown, appendages narrowly lanceolate,  $\pm 1.4 \times 0.15$  mm, subpendulous, covered with short upwardly pointing strigae; pore  $\pm \frac{1}{2}$  length of theca; pollen shed in tetrads. *Ovary* 4-locular, oblate,  $\pm 2.5 \times 3.0$  mm, deeply emarginate, glabrous, nectaries apparently absent, ovules  $\pm 12$  per locule spreading from small bulbous placenta in upper half of columella; style included,  $\pm 12$  mm long, slightly curved, glabrous; stigma capitate. *Fruit* a dehiscent capsule, broadly obovoid,  $\pm 4 \times 5$  mm, hard and

woody, valves laterally splitting to base, septa remaining attached to columella. *Seeds* ellipsoid,  $\pm 1 \times 0.7$  mm, shallowly alveolate, brown; testa cells rectangular to somewhat square,  $\pm 100 \times 100 \mu\text{m}$ , anticlinal walls jigsawed, inner periclinal wall with numerous small pits. Figure 2.

*Diagnostic features*: no noticeably spike-like synflorescence, inflorescences more scattered; flowers 1- or 2-nate at ends of short to long, leafy lateral branches, mostly erect to suberect; bract and bracteoles small ovate; sepals relatively long lanceolate; corolla greenish yellow, slightly 4-angled; anther appendages long with numerous upward-pointing short hairs.

This new species falls within the *E. patersonii-sacciflora-nana* alliance with its 4-nate leaves, hard yellow-green corolla, long anther appendages and similar ovary and fruit (Figure 1). It appears to be most similar to *E. sacciflora* due to the few-flowered inflorescences, and the small and more remote bract and bracteoles. The latter differs in having spike-like synflorescences with flowers spreading to pendulous, shorter, broader sepals,  $\pm 3.5 \times 3.5$  mm (not  $5 \times 2$  mm), and shorter leaves, 4–5 mm long (not 8–10 mm) and hairy stems. *E. sacciflora* occurs some 60 km to the northwest in the Franschhoek Mountains.

*Erica gerhardii* is very localized on the mountains above Stanford: we saw only 24 plants in one population (Figure 3). These grew on a steep southeast-facing slope in very old, moist fynbos vegetation. The mountain was subsequently burnt in the summer of 2001. The most noticeable feature of the plants in the wild was the growth form—tall, erect, very sparsely branched, with the leaves confined to the uppermost parts and the erect to suberect, greenish yellow flowers.

The species was first collected by Niven two hundred years ago and then turned up again by Gerhard Kirsten (1931–2000), the co-author of the finely illustrated book, *Ericas of South Africa* (Schumann & Kirsten 1992), who was unable to be with us when the type material was collected due to illness, but gave us directions to find the population. We name this species in honour of his dedication to the collection and study of *Erica* over a period of 25 years. He is also commemorated in *E. kirstenii* E.G.H.Oliv. (Oliver & Oliver 2000a).

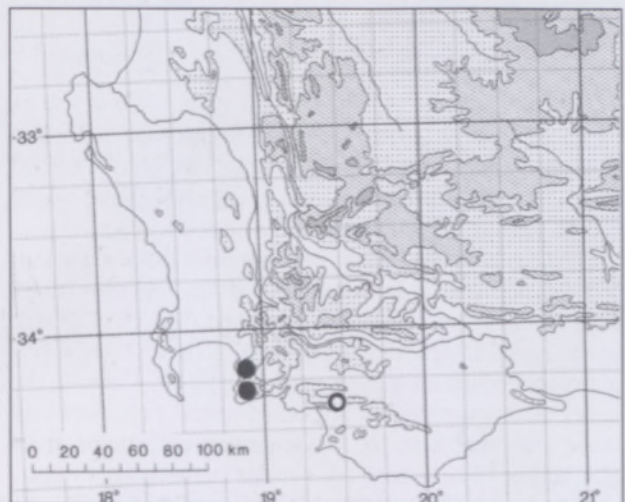


FIGURE 3.—Known distribution of *Erica gerhardii*, O; and *E. ceraria*, ●.



*Paratype material*: WESTERN CAPE.—3419 (Caledon): Klein River Mtns, Glenhart, (–AD), 3-12-1977 (fruiting), *Kirsten* 644 (NBG); *ibid.*, 26-08-1978, *Kirsten* 675 (BM, NBG); *ibid.*, 11-08-1995, *Kirsten* 1379 (NBG); *ibid.*, overlooking Stanford–Hermanus, 500 m, 28-07-1989, *Schumann* 692 (NBG); Kleinrivierberg, Morning Star, 1600 ft [490 m], (–AD), 4-09-1978, *Vogelpeel* NBG116862 (NBG); Klein River (without precise locality), alpine places, *Niven* 263 (BM).

38. ***E. foliacea* Andrews**, Coloured engravings of heaths: t. 235 (post 1822–pre 1825); Andrews: t. 263 ( $\pm$  1828). Iconotype: l.c.: t. 235.

Note: the larger plate in Andrews' Coloured engravings of heaths, t. 235, must have been published later than 1822 since in the text accompanying the plate he cites plants he had seen in 1822, but the volume is dated 1805—the publication cannot be dated accurately (Cleavelly & Oliver 2002). See discussion under *E. colorans* (63) regarding dating these works.

*Diagnostic features*: synflorescence loose to dense, flowers 2–4-nate on short, leafy side branches; bract and bracteoles long; sepals relatively short, lanceolate; corolla yellow and orange-red, appendages long. The internodes are longer than in the related species,  $\pm$  1.5–4.0 mm long and are finely hairy.

The plate of Andrews clearly does not depict the plant that was until now known as *E. foliacea*—it is now being described as *E. ceraria*. His protologue notes—'flowers nearly an inch long ( $\pm$  25 mm), yellow, and transparent'. The many collections currently recognized under this name have flowers which are  $\pm$  18 mm long, yellowish green and very hard, smooth and wax-like in texture, not the pure yellow with longitudinal stripes/ridges and do not have the ovary with bulbous upper lobes, as illustrated by Andrews. Guthrie & Bolus (1905) had only one of these collections, *Bolus* 6870, to which Andrews' name was applied thus setting the identification of all subsequent collections. All this material is here described as *E. ceraria* (38.3).

Andrews' iconotype matches reasonably well the few collections that, until now, have been identified as *E. foliacea* var. *fulgens*. This latter name in fact refers to a distinct variant based solely on the density of the synflorescences, the flowers being identical in all the collections of the species. These variants are recognized here at sub-specific level.

### 38a. subsp. ***foliacea***

Benth.: 630 (1839); Guthrie & Bolus: 68 (1905) p.p.; Dulfer: 42 (1965) p.p.

Illustrations: Andrews: t. 235 (post 1822–pre 1825); Schumann & Kirsten: 54, t. 5 (1992).

*Diagnostic features*: loose synflorescence with 2–4 flowers on occasional leafy side branches; corolla entirely yellow or yellow below and orange-red above where facing the sun (in wild-collected material).

The typical subspecies is known only from a few collections on the Paardeberg west of Houwhoek/Bot River. This material has flowers shorter than Andrews' 25 mm in the range 15–20 mm, all of them do not have the single colour of the iconotype. Andrews ( $\pm$  1824) shows the ovary with exaggerated thickened apical processes and these are present in the Middelman collections from Honingklip. These are very similar to the bulges occurring in *E. curviflora* (45).

Vouchers: *Bolus* s.n. (BOL!, PRE!); *Middelmann* NBG69881, NBG80661 (NBG!).

38b. subsp. ***fulgens* (Klotzsch) E.G.H.Oliv. & I.M.Oliv.**, stat. et comb. nov.

*E. foliacea* var. *fulgens* Klotzsch, *Linnaea* 12: 507 (1838b); Guthrie & Bolus: 68 (1905); Dulfer: 42 (1965). Type: Prom. b. sp. in montibus altit. IV–V ad flumen 'Palmietrivier' prope villam 'Grietjiesgat' inter flumina 'Palmiet- et Steenbrassensrivier' (Prov. Stellenbosch), Jun., [Mtns at Palmiet River near house/farm Grietjiesgat between Palmiet and Steenbrass Rivers, June], *Ecklon & Zeyher* s.n. (B†, holo.; NBG!, SAM!; TCD!); as 46 (MEL!). Lectotype selected here: locality as cited above (56.6), *Ecklon & Zeyher* s.n. (SAM!).

Note 1: Klotzsch quoted '*E. fulgens* Klotzsch' in synonymy as a manuscript name that he must have written on his type specimen in B prior to deciding to describe it as the variety of *E. foliacea*.

Note 2: there is among the other collections of this species, a considerable mix-up as to who the collectors were. Guthrie gives his No. 3551 to a collection in NBG 'made for C. Grisbrook', i.e. Charles Southey Grisbrook, his brother-in-law, on 9/1895. He gave a sheet to SAM, but said he had not yet assigned a collecting number to 'a few good specimens'. Bolus sent a collection of the same date to Medley Wood in NH (now in NBG) attributing the collection to 'C.H.G.' who would be the father of the above, Charles Hewson Grisbrook, but who died in 1876! A specimen at Kew and another BOL specimen are labelled as '*Grisbrook* sub *Guthrie* 3766' and the BM material as '*Guthrie* sub *Bolus* s.n.'—all collected 9/1895.

*Diagnostic features*: long, dense, spike-like synflorescences on long main stems; flowers 4-nate on short lateral branchlets borne at every node; corolla red-orange and yellow. The main branches appear to be fewer and much longer with longer internodes (2–4 mm).

This subspecies is apparently extinct, having been last collected by Guthrie/Grisbrook/Bolus and Schlechter in the 1890s and never again despite searches in the area by ourselves. It must have been a very striking plant with its 'very pronounced red-orange and yellow flowers' (noted by Guthrie). Klotzsch gave the diagnostic character as '*corollis lateritis*' (with corollas brick red like roof tiles) that he must have seen on the recently collected Ecklon material since Ecklon never recorded colour on his collections.

The locality must have been on the moist southern side of Sir Lowry's Pass (Gantouws Pass) where Grietjiesgat was a known stop-off point for hungry, thirsty travellers after the arduous ascent up the pass. This whole area has been under alien pine plantations for many years. Guthrie must have travelled that route many times to and from his family home at Caledon to which he had retired from Cape Town and Bolus went many times to the Houw Hoek estate which was owned by Guthrie's brother-in-law, C.S. Grisbrook, where they met and discussed plants, especially *Erica* (L. Bolus pers. comm. 1963).

The collection by Schlechter as 'Koue Bokkeveld' and the excellent one by MacOwan as 'Zwartebergen, Caledon' are certainly incorrect localities. MacOwan collected several species from that locality which we have found to be incorrect (see *E. macowanii* No. 57).

Vouchers: *Guthrie* 3551 (BOL!, NBG!, PRE, SAM!); *MacOwan* sub *Herb. Norm.* 1720 (BM!, K!, SAM!); *Schlechter* 8925 (BM!, BOL!, K!, P!, PRE!, SAM!).

38.1. ***E. vallis-araneorum* E.G.H.Oliv.** in *The Flowering Plants of Africa* 42: t. 1680 (1973). Type: 3418 (Simonstown): head of Spinnekopsneskloof, Kogelberg area, south-facing slopes, 1 066 m, (–BB), 21 April 1970, *Oliver* 3112 (STE [NBG], holo.; BOL, K, MO, NY, PRE, S, W).

Illustrations: *Oliver* l.c.: t. 1680 (1973); Schumann & Kirsten: 54, t. 8, 9 (1992).



**Diagnostic features:** sparse or very reduced synflorescence; flowers pendulous 1 or 2 on very short lateral branchlets; pedicel 10–13 mm long, red; sepals relatively long, narrow, lanceolate; corolla quadrangular, yellow; anthers distinctly prognathous at base.

This very distinct species is allied to *E. ceraria* and to *E. nana*—all three occurring in the Kogelberg area but with this one being highly restricted and very rare.

Vouchers: *Boucher 1249* (NBG!, PRE); *Oliver 3112* (BOL!, K!, MO!, NBG!, NY!, PRE!, S!, W!).

**38.2. *E. galpinii* T.M.Salter** in *Journal of South African Botany* 1: 35 (1935). *E. foliacea* Andrews var. *galpinii* (T.M.Salter) Dulfer: 42 (1965). Type: Caledon Dist.; Maanschyn Kop, Hermanus, on moist slope near summit, alt. 2900 ft [884 m], April 1934, *Galpin 12661* (BOL!, holo.; BM!, K!, PRE).

Illustrations: Schumann & Kirsten: 55, t. 10, 11 (1992).

**Diagnostic features:** short to long, dense, spike-like synflorescence; flowers 3- or 4-nate on short, leafy, lateral branchlets; bract and bracteoles large and broad like sepals; sepals short and broadly ovate; corolla bright yellow.

This species has sepals similar to those of *E. saciflora* but has a very dense, longer synflorescence and the plants are taller and sparsely branched and the bract and bracteoles lanceolate. It is confined to the mountains above Hermanus. The pale sepals are very noticeable on the dried material.

Vouchers: *Rourke 1345* (BOL!, NBG!); *Vogelpoel sub Baker 3045* (BOL!, NBG!); *Williams 1650* (NBG!).

**38.3. *E. ceraria* E.G.H.Oliv. & I.M.Oliv.**, sp. nov., sine synflorescentibus distinctis, floribus (3)4(5)-natis in extremis ramulis lateralibus foliferibus, bractea bracteolis sepalisque longa, corolla dura ceraria flavovirenti, antheris base parum prognathis, ramis glabris dignoscenda. Figura 4.

TYPE.—Western Cape, 3418 (Simonstown), Kogelberg, ridge east of peak, 1 100 m, (–BB), 25 May 1989, *Oliver 9138* (NBG, holo.).

*E. foliacea* Andrews, sec. Guthrie & Bolus: 68 (1905), p.p., quoad Bolus 6870.

Illustrations: Baker & Oliver: t. 23 (1967); Schumann & Kirsten: 54, t. 6, 7 (1992) [all as *E. foliacea*].

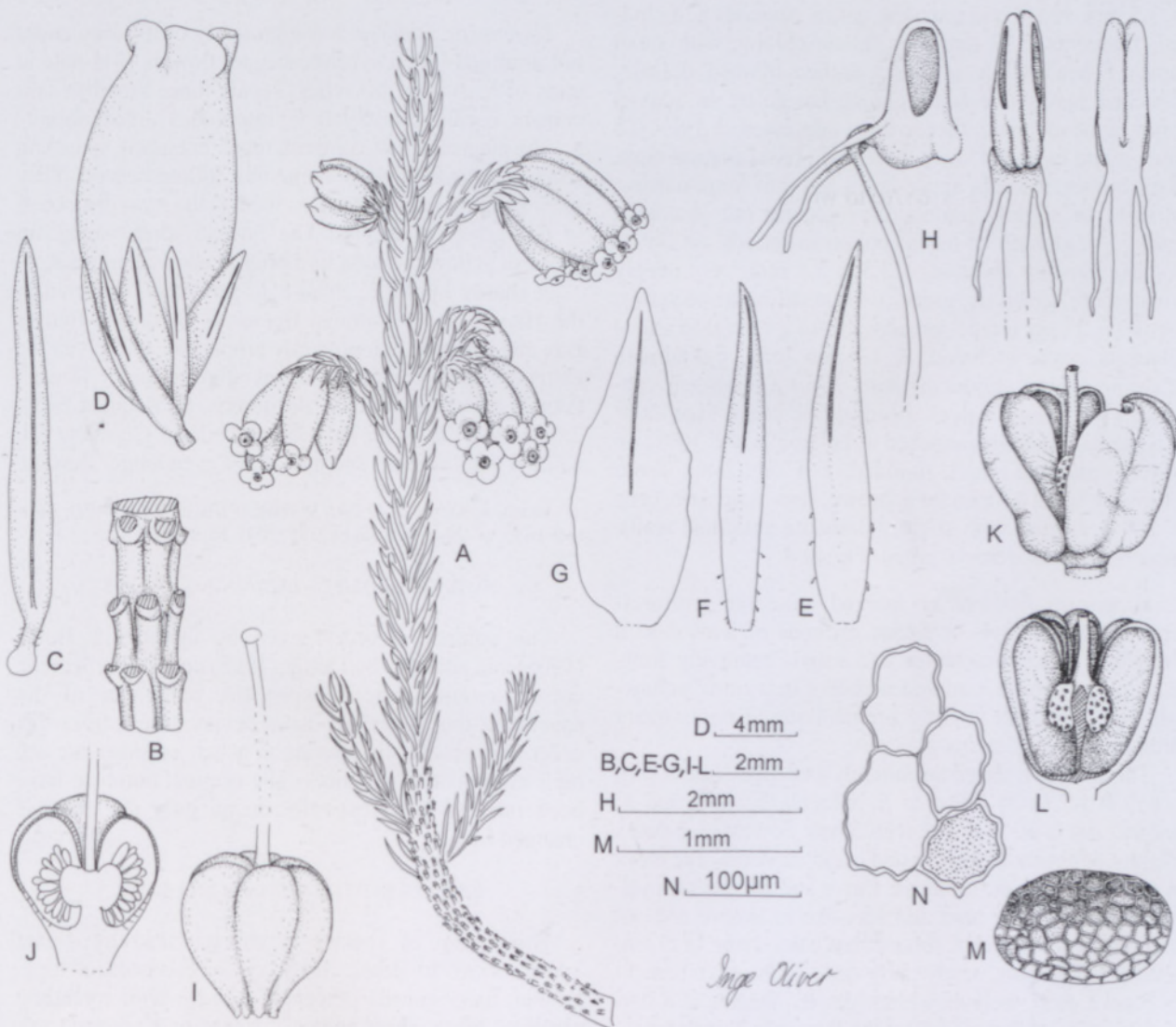


FIGURE 4.—*Erica ceraria*. A, flowering branch,  $\times 1$ ; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, anther, side, front and back views. I, J, ovary: J, l/s to show placentation. K, L, capsule: L, one valve removed to show placentation. M, seed; N, testa cells. Scale bars: B, C, E–L, 2 mm; D, 4 mm; M, 1 mm; N, 100  $\mu\text{m}$ . A–J, drawn from the type; K–N, *Maguire 2657*. Artist: I.M. Oliver.



Woody, somewhat sparse, erect shrub, 0.25–1.0 m tall, single-stemmed. *Branches*: main branches 100–300 mm long with continuous apical growth with  $\pm 2$ –6 secondary branches,  $\pm 10$ –30 mm long, recurving, ending in a florescence; stems with infrafoliar ridges, internodes  $\pm 1.5$  mm long, glabrous; bark on old stems noticeably scarred with tightly packed, old leaf scars. *Leaves* 4- or 5-nate, imbricate,  $\pm 10 \times 1$  mm, linear-oblong, acute, incurved, erect, flattened on both sides with entire acute hyaline margins, glabrous, sulcus narrow, open at base; petiole  $\pm 1$  mm long, ciliate. *Inflorescence*: flowers (3)4- or 5-nate in 1 whorl at ends of secondary branches, pendulous; pedicel 1.5–2.0 mm long, glabrous; bract partially recalcrescent in middle of pedicel, narrowly lanceolate,  $\pm 9 \times 1.3$  mm, glabrous green, margins entire with a few, short, pendulous, gland-tipped hairs, sulcus  $\pm \frac{1}{2}$  length of bract; bracteoles 2, placed just below sepals,  $\pm 8 \times 1$  mm, otherwise like bract. *Calyx* 4-partite, segments not imbricate, narrowly ovate,  $\pm 8.0 \times 2.5$  mm, acute, glabrous, yellow along edges, green towards sulcus, margins straight or slightly serrated with or without a few small hairs and glands, sulcus  $\pm \frac{2}{3}$  length of segment, closed. *Corolla* 4-lobed,  $\pm 18 \times 8$  mm, broadly tubular, sometimes slightly arcuate, mouth slightly contracted, glabrous, greenish yellow, thick and wax-like; lobes  $\pm 2 \times 3.5$  mm, broad and rounded, entire. *Stamens* 8, included; filaments  $\pm 12$  mm long, linear-oblong, with small apical S-bend, white, glabrous; anthers bilobed, dorsally attached just above base, oblong-lanceolate in adaxial view, appendiculate; thecae erect adpressed,  $\pm 1.6 \times 0.8$  mm, ovate in lateral view, with slight basal adaxial nose, dark brown, smooth, appendages  $\pm 2$  mm long, narrow, straight or slightly undulate, projecting out abaxially, pore  $\frac{1}{2}$ – $\frac{2}{3}$  length of theca; pollen in tetrads. *Ovary* 4-locular, broadly obovoid,  $\pm 3.5 \times 3.5$  mm, very deeply emarginate, glabrous, green, with small basal nectaries; ovules  $\pm 25$  per locule spreading from a central to apical placenta; style included,  $\pm 13$  mm long, cylindrical, glabrous white; stigma capitate. *Fruit* a dehiscent capsule,  $\pm 4 \times 5$  mm, valves splitting free to the base laterally, septa remaining attached to columella and 100% on valves; placenta small, rounded,  $\pm 1$  mm long. *Seeds* ellipsoid,  $\pm 1 \times 0.6$  mm long, brown, testa reticulate, cells  $\pm 100 \times 76 \mu\text{m}$ , with slightly undulate anticlinal walls, periclinal walls densely pitted. Figure 4.

*Diagnostic features*: no marked spike-like synflorescence, flowers (3)4- or 5-nate on ends of leafy lateral branches; bract, bracteoles and sepals relatively long, lanceolate; corolla hard and wax-like in texture, yellowish green; anthers slightly prognathous at base; ovary broadly obovoid; stems glabrous.

This species is the taxon currently well known as '*E. foliacea*'. It is closely allied to *E. foliacea*, *E. nana* and *E. galpinii* but is the only one with 5-nate flowers (3–5-nate), slightly prognathous anthers and glabrous stems. The calyx is also hidden by the imbricate leaves and the greenish yellow corolla is very hard and wax-like in texture and not transparent nor ridged. *E. foliacea* has hairy stems. In *E. foliacea* subsp. *fulgens*, nearly every node on the main branches bears a short, secondary branchlet, terminating in a florescence and is therefore very spike-like, as in *E. galpinii*.

Guthrie & Bolus (1905) had a single unlocalized specimen of this species which they placed under *E. foliacea* (Bolus 6870). This was the first collection of *E. ceraria*.

The name is derived from *cerarius*, of wax, waxy (Latin), in allusion to the hard, wax-like texture of the flowers.

This species is confined to the rocky peaks and ridges around Kogelberg Peak down the west side of the Biosphere Reserve to above Betty's Bay (Figure 3).

*Paratype material* (selection from numerous specimens): WESTERN CAPE.—3418 (Simonstown): summit of Steenbrakop NW of 5 Beacon Ridge, 1 060 m, (–BB), 13-04-1983, *Le Maitre* 371 (NBG!, PRE); slopes of Kogelberg, 09-1953, (–BB), 09-1953, *Stokoe* SAM57872 (NBG! SAM!); Voorberg, 1500 ft [457 m], (–BD), 19-09-1959, *Baker* 1429 (BM!, NBG!); Porter Reserve, 06-1960, (–BD), *Baker* in PRE30134 (PRE) [voucher for Baker & Oliver: t. 23]; Hangklip, 1000 ft [304 m], (–BD), 5-09-1942, *Compton* 13528 (BOL!, NBG!); Pringle East Peak, 2000 ft [609 m], (–BD), 16-09-1951, *Esterhuysen* 18849 (BOL!, NBG!, PRE); Platberg, top of ridge, 2800 ft [853 m], (–BD), 16-09-1967, *Taylor* 7147 (NBG!, PRE). Without precise locality: Hottentots Holland, *Stokoe* 6397 (BOL!, K!, SAM!). Without locality: *Bolus* 6870 (BOL!, K!, PRE); *Pillans* 8283 (BOL!).

39. *E. nana* Salisb. in Transactions of the Linnean Society 6: 355 (1802); Benth.: 631 (1839); Guthrie & Bolus: 68 (1905); Dulfer: 42 (1965). Type: Hottentots Holland, *Masson* s.n. (BM!).

Illustrations: Baker & Oliver: t. 24 (1967); Schumann & Kirsten: 55, t. 12, 13 (1992).

*Diagnostic features*: loose grouping of inflorescences not arranged into a synflorescence; flowers (3)4-nate at ends of leafy side branches; sepals long, broadish lanceolate; corolla bright yellow; internodes almost absent.

The plants are low, compact, much-branched, spreading shrublets, covered with numerous inflorescences. They grow hanging over rocks. This habit is the most distinctive in this group of species. The flowers when young are greenish yellow but soon turn bright yellow at anthesis.

A chance hybrid *E. nana*  $\times$  *E. patersonii* occurred in the Harold Porter National Botanical Garden at Betty's Bay and has been subsequently propagated and given the cultivar name 'Gengold'. It has slightly larger flowers than *E. nana* and is more floriferous. Subsequent backcrosses onto *E. nana* have been made in Germany (H. Kramer pers. comm.) and these have even longer flowers.

Vouchers: Oliver in STE30128 (BOL!, NBG!, NY!, PRE!); same collection, as Oliver sub *Baker* 2595 (BM!, K!, NBG!).

#### NOTE ON ORDER OF REMAINING SPECIES

The numbering order given by Guthrie & Bolus (1905) and added to by Dulfer (1965) does not reflect the correct relationships between the remainder of the species in this paper. We have deviated here from this order and placed the species in what we postulate are their more natural alliances. The original numbers have been retained for cross-referencing, only the order is changed here.

#### ERICA CURVIFLORA-PERSPICUA GROUP

This group of species is characterized by 4-nate leaves, loose to dense, leafy synflorescences, a long, tubular, hairy corolla (except *E. ignita*) with spreading recurved lobes, short pedicel (except in *E. conspicua*), anthers lacking appendages or sometimes possessing the remnants of appendages, ovary 4–8-locular, mostly obovoid and a capsule opening widely (Figure 5).



The group contains the following species: *E. xanthina* (40), *E. ignita* (40.1), *E. bibax* (44), *E. kogelbergensis* (44.1), *E. curviflora* (45), *E. stagnalis* (45.1), *E. conspicua* (48), *E. densifolia* (49), *E. wendlandiana* (50), *E. macowanii* (57), *E. leucotrachela* (57.1), *E. cremea* (57.2), *E. viridimontana* (57.3), *E. latituba* (57.4), *E. perspicua* (62) and *E. dulcis* (62.1) (Figure 6). These species are, in our opinion, not the only ones in this alliance, since there are numerous small-flowered species in the section *Ephebus* which are clearly closely related to several of the above species.

*Erica curviflora* is by far the most widespread species occurring from the Gifberg in the north to the Cape Peninsula and eastwards as far as Grahamstown. All the other species have much more limited ranges and in some cases are very localized in the region between the Hottentots Holland Mtns and Klein River Mtns.

Several species were described by Andrews in his *Coloured engravings of heaths* (1794–1830) using cultivated material that bore flowers on short, lateral, leafy branches arranged in loose to dense, spike-like synflorescences and had tubular, hairy corollas that were pink and white. These look similar to the form and arrangement in currently recognized species such as *E. perspicua*, *E. macowanii*, *E. leucotrachela* and *E. latituba* known from the wild. With the specific differences based among others on microcharacters of ovary complement and seed structure that are not shown in Andrews' drawings, it is not possible to identify them with any certainty. Also, with numerous cultivated variants and hybrids being raised in England at the time (Nelson & Oliver 2004), we are very hesitant to ascribe these names to currently known wild populations. We have therefore decided to regard them as cultivars or artificially raised hybrids. Among these are Andrews' *E. linnaea*, l.c.: t. 106 (1801), *E. linnaea superba*, l.c.: t. 243 (post 1828) and *E. linnaeoides*, l.c.: t. 107 (1803).

**40. *E. xanthina* Guthrie & Bolus** in *Flora capensis* 4: 69 (1905); Dulfer: 43 (1965). Type: Caledon Div.; Genadendal, *Alexander* 5 (K, holo.; BOL, fragm.; sub s.n. PRE!).

*E. parvulisepala* H.A.Baker: 31 (1969). Type: Caledon and Robertson Districts, Riviersonderende Mtns above Greyton between Kanonberg and Galgeberg, marshy places at 4000 ft [1 220 m] and above, *Baker* 2801 (NBG, holo.; BOL!).

Illustrations: Baker l.c.: t. 3 (1969); Schumann & Kirsten: 67, t. 63 (1992).

**Diagnostic features:** dense, short to long synflorescence; flowers 1- or 2-nate on ends of short, leafy side branchlets; bract and bracteoles minute; sepals small, ovate; corolla very finely hairy, cream to salmon/peach pink; ovary 4-locular (Figure 6C).

The species is confined to small seepage areas at the heads of kloofs along the western end of the Riviersonderend Mountains. Baker overlooked *E. xanthina* when describing his species.

Vouchers: *Baker* 2801 (BOL!, NBG!); *Oliver* 10745 (NBG!); *A.S.Schelp* 739 (BOL!, NBG!).

**40.1 *E. ignita* E.G.H.Oliv.** in *Yearbook of the Heather Society* 2000: 67 (2000). Type: 3419BB, Riviersonderend Mtns, Pilaarkop, moist S-slopes below ridge WNW of peak, ± 4800 ft [1 460 m], 28 October

1997, *Oliver* 10944 (NBG, holo.; BM, BOL, K, MO, NY, P, PRE, S).

Illustrations: *Oliver* l.c.: t. 1, 2, 3.

**Diagnostic features:** a very dense, long, spike-like synflorescence; flowers mostly 4-nate on ends of short, leafy side branchlets; sepals short, ovate with elongate, acute apex; corolla glabrous, dull brick-red flushed with orange; ovary (5)6(7)-locular (Figures 5B; 6A).

This striking species is highly restricted in its distribution, being confined to a few steep slopes near the summit of the Riviersonderend Mountains above the town.

Vouchers: *Oliver* 10944 (BM!, BOL!, K!, MO!, NBG!, NY!, P!, PRE!, S!).

**42. *E. x pallens* Andrews**, *Coloured engravings of heaths*: t. 194 (1806); Benth.: 635 (1839); Guthrie & Bolus: 70 (1905); Dulfer: 43 (1965). Type: l.c.: t. 194.

This taxon is regarded as a hybrid of garden origin in England. No material matching Andrews' plate has been located in the wild in South Africa.

**43. *E. x dubia* Rach** in *Linnaea* 26: 776 (1853); Guthrie & Bolus: 70 (1905); Dulfer: 43 (1965). *E. cylindrica* J.C.Wendl.: f. 11, t. 7 (1802) non Thunb. 24 (1785). Type: l.c.: t. 7.

This taxon is regarded as a hybrid of garden origin in Germany. No material matching Wendland's plate has been located in the wild in South Africa.

**44. *E. bibax* Salisb.** in *Transactions of the Linnean Society* 6: 358 (1802); Benth.: 633 (1839); Guthrie & Bolus: 70 (1905); Dulfer: 43 (1965). Type: growing naturally beside Palmiet Rivier, *Masson* s.n. (holo.). Neotype: Sir Lowry's Pass, 1300 ft, 5.v.1896, *Schlechter* 7813 (NBG; isotypes, BM!, BOL, K!, PRE, W, Z!).

Note: there are no collections annotated by Salisbury in either BM or K.

*E. curviflora* sensu Thunb.: sp. 30 (1785) non L. Type: *Thunberg* s.n. (UPS, holo.; microfiche!).

Illustrations: Schumann & Kirsten: 56, t. 16, 17 (1992).

**Diagnostic features:** loose to dense, long, spike-like synflorescences; flowers 1-nate on very short, non-leafy side branchlets; bract smaller than bracteoles; sepals elongate, lanceolate; corolla very finely hairy, pale yellow with white tips; anther base running into filament even though subbasally attached, no appendages; ovary 4-locular, slightly stipitate (Figures 5A; 6H).

*Erica bibax* occurs in the area between Kogelberg and Sir Lowry's Pass on streambanks and in seeps.

Vouchers: *Kirsten* 943 (NBG!, NY!); *MacOwan* Herb. Norm. 712 (BM!, K!, NBG!, W); *Schlechter* 7813 (BM!, K!, NBG!, PRE, W).

**44.1. *E. kogelbergensis* E.G.H.Oliv.** in *Yearbook of the Heather Society* 1996: 3 (1996). *E. serratifolia* Andrews var. *subnuda* Bolus: 158 (1910); Dulfer: 47 (1965). Syntypes: Caledon Div., mountains between Caledon and Hermanus, fl. May, Sept., *N.S.Pillans* 228 & 1334 (BOL!). Lectotype selected here: Cape Colony, Caledon Division, mountains between Caledon and Hermanus, May, [near Hermanuspetersfontein, bought fresh in Cape Town, 2 May 1908], *Pillans* 1334 (BOL, lecto.; NBG!, PRE!, SAM!).



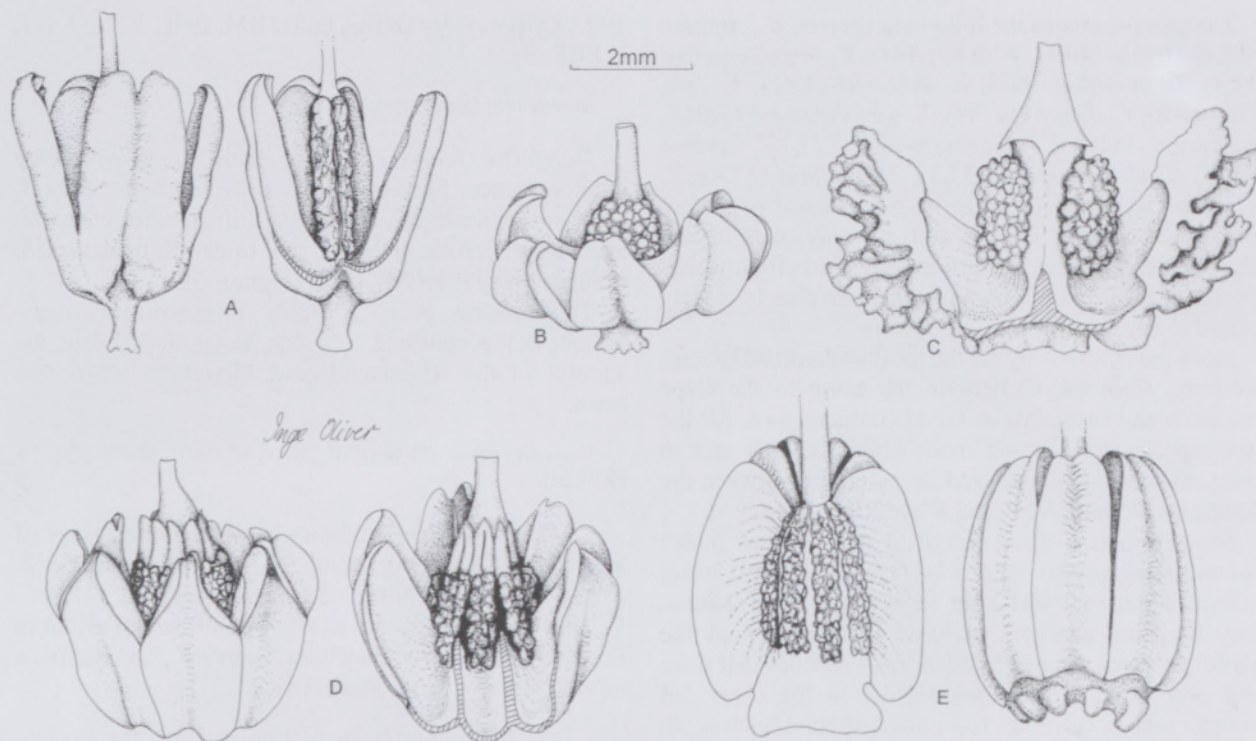


FIGURE 5.—Capsules of some species in the *Erica curviflora-perspicua* group. A, *E. bibax*, whole and with one valve removed, drawn from Kogelberg, *Grisbrook* 3552; B, *E. ignita*, drawn from Pilaarkop, the type; C, *E. curviflora*, with front and back valves removed, drawn from Ruitersberg, *Vlok* 1731; D, *E. perspicua* whole and with one valve removed, drawn from Hermanus, *Walters* 1148; E, *E. stagnalis* with one valve and whole, drawn from *F. Kruger* 36. Scale bar: A–E, 2 mm. Artist: I.M. Oliver.

Illustrations: Schumann & Kirsten: 61, t. 38, 39, 40 (1992), as *E. xseriatifolia*; Oliver l.c.: t. 1, 2, 4 (1996).

**Diagnostic features:** flowers 1–4-nate at ends of short, lateral branchlets arranged in a dense, spike-like inflorescence, 40–100 mm long; corolla very finely hairy, plain yellow or bicoloured (red with yellow apex); sepals elongate, lanceolate; anthers dorsally attached near base, with small decurrent appendages on apex of filament; ovary 4(–6)-locular; leaves hard in texture (Figure 6G).

The localities given for the syntypes are clearly erroneous information derived from the flower sellers. It is postulated that this was done purposely to protect their sources.

Vouchers: lectotype and *Oliver* 9137 (BM!, K!, MO!, NBG!, PRE!).

45. *E. curviflora* L., *Species plantarum*, edn 1, 1: 354 (1753); Benth.: 633 (1839); Guthrie & Bolus: 71 (1905); Dulfer: 43 (1965). Syntypes: L., Hort. Cliff.: 148 (1737); Seba, *thesaurus*: t. 19, f. 5 (1735); Plukenet, *mantissa*: t. 346, f. 9 (1700). Lectotype selected here by Oliver & Cafferty: Herb. Clifford: 148, *Erica* sheet no. 10 (BM!).

*E. sulcata* Benth.: 632 (1839); Guthrie & Bolus: 72 (1905). *E. curviflora* var. *sulcata* (Benth.) Dulfer: 45 (1965). Type: in colonia Capensi, *Niven s.n.* (K!). Note: specimen in K is labelled—Devil's Head, George, *Niven* 190.

*E. burchellii* Benth.: 632 (1839). *E. curviflora* var. *burchellii* (Benth.) Bolus: 71 (1905); Dulfer: 44 (1965). Type: in Prov. George et Albany?, *Burchell* 6023 as *α glabriflora* (K!).

*E. curviflora* var. *versatilis* Bolus: 71 (1905); Dulfer: 44 (1965). Syntypes: Worcester Div., Goudini, *Schlechter* 9948 (BOL!); Caledon Div., mtns near the Zondereinde River, 4500 ft [1 400 m], *Bolus* in Herb. *Guthrie* 4595 (BOL!).

*E. curviflora* var. *diffusa* Bolus: 72 (1905); Dulfer: 44 (1965). Syntypes: Paarl Div., mtns around French Hoek, *MacOwan* Herb. Norm. 957 (BOL!); *ibid.*, *Schlechter* 9264 (BOL!); Caledon Div., Klein Houw Hoek, *Niven* 10 (?K!).

Illustrations: Baker & Oliver: t. 28 (1967); Schumann & Kirsten: 56, t. 18, 19 (1992).

**Diagnostic features:** flowers 1-nate on leafy lateral branches in a loose arrangement up main branches; corolla mostly hairy with long, distinct hairs or glabrous, pink to orange to red, spreading to slightly recurved; sepals varying from 0.4–1.2 mm long; anthers manifest to just exerted, dorsally attached, with appendages distinct and short or just visible as remnants on apex of filament; ovary 4–[8]-locular, emarginate, with apical part having distinctive enlarged callous-like bosses (Figures 5C; 6N).

This is the most widespread and variable of the species in this group, occurring from the Gifberg near Vanrhynsdorp, throughout the Cape Floral Region as far east as Grahamstown. There is much variation in the size, colour and indumentum of the flowers and in the size of the leaves. In corolla indumentum there are some distinct variants confined to certain localities but also variable within a locality. We have found no reliable characters that can be used to subdivide the species. The most distinctive variant is one with very long leaves (up to 18 mm) which are covered with very long simple hairs. It occurs in the Kogelberg area and surprisingly also in the mountains above George.

Vouchers: *Bolus* 8668 (BOL!, NBG!, PRE); *Brusse* 4890 (NBG!, PRE); *Gillett* 3357 (NBG!, NY!); *Goldblatt* 1785 (MO, NBG!, PRE); *Hanekom* 2984 (NBG!); *Kerr* STE30086 (NBG!, NY!, PRE) [voucher for Baker & Oliver, l.c.]; *Oliver* 567 (BM!, NBG!), 346, 3058 (NBG!, PRE!), 5863, 7397 (NBG!), 8462 (NBG!, PRE!), 11846 (NBG!); *Oliver & Palser* 14 (K!, NBG!); *Parker* 3853 (NBG!); *Rourke* 299 (NBG!, NY!); *Schlechter* 4810 (NBG!, PRE), 10223 (NBG!), 10379 (BM!, K!, NBG!, P!, PRE, W); *Sieber* 76 (NBG!, PRE, W).

45.1. *E. stagnalis* *Salisb.* in *Transactions of the Linnaean Society* 6: 359 (1802). Type: without locality, (?)*Roxburgh s.n.* (K!).



*E. sulphurea* Andrews, Coloured engravings of heaths: t. 278 (post 1816–pre 1825); Benth.: 634 (1839) as '*sulfurea*'. *E. curviflora* L. var. *sulphurea* (Andrews) Bolus: 71 (1905); Dulfer: 44 (1965). Type: l.c.: t. 278. Note: the larger, fuller (quarto) painting by Andrews in *Coloured engravings of heaths* appeared only in vol. IV with an unknown date which makes precise dating impossible (Cleevely & Oliver 2002). However, investigations of the octavo edition, *The Heathery*, indicate that the volumes were likely published complete and that vol. V, containing t. 241, was published as a unit not before 1816 and probably around 1828 (Cleevely *et al.* 2003). See under *E. colorans* (63).

**Diagnostic features:** similar to *E. curviflora* but corolla bright yellow and more sparsely hairy with shaggy hairs; ovary 8-locular, broadly obovoid with no apical bosses.

#### 45.1a. subsp. *stagnalis*

Illustration: Andrews l.c.: t. 278.

**Diagnostic features:** corolla tubular, 20–24 mm long (Figure 6L).

The typical subspecies occurs in the mountains from the Houw Hoek Mtns, the Hottentots Holland to the Franschoek Pass area.

Vouchers: Compton 22928 (BOL!, NBG!); Esterhuysen 9724, 33982 (BOL!); Kruger 298 (NBG!); Oliver 10274, 10765 (NBG!); Salter 2835 (BOL!); Schlechter 9264 (NBG!, PRE, W).

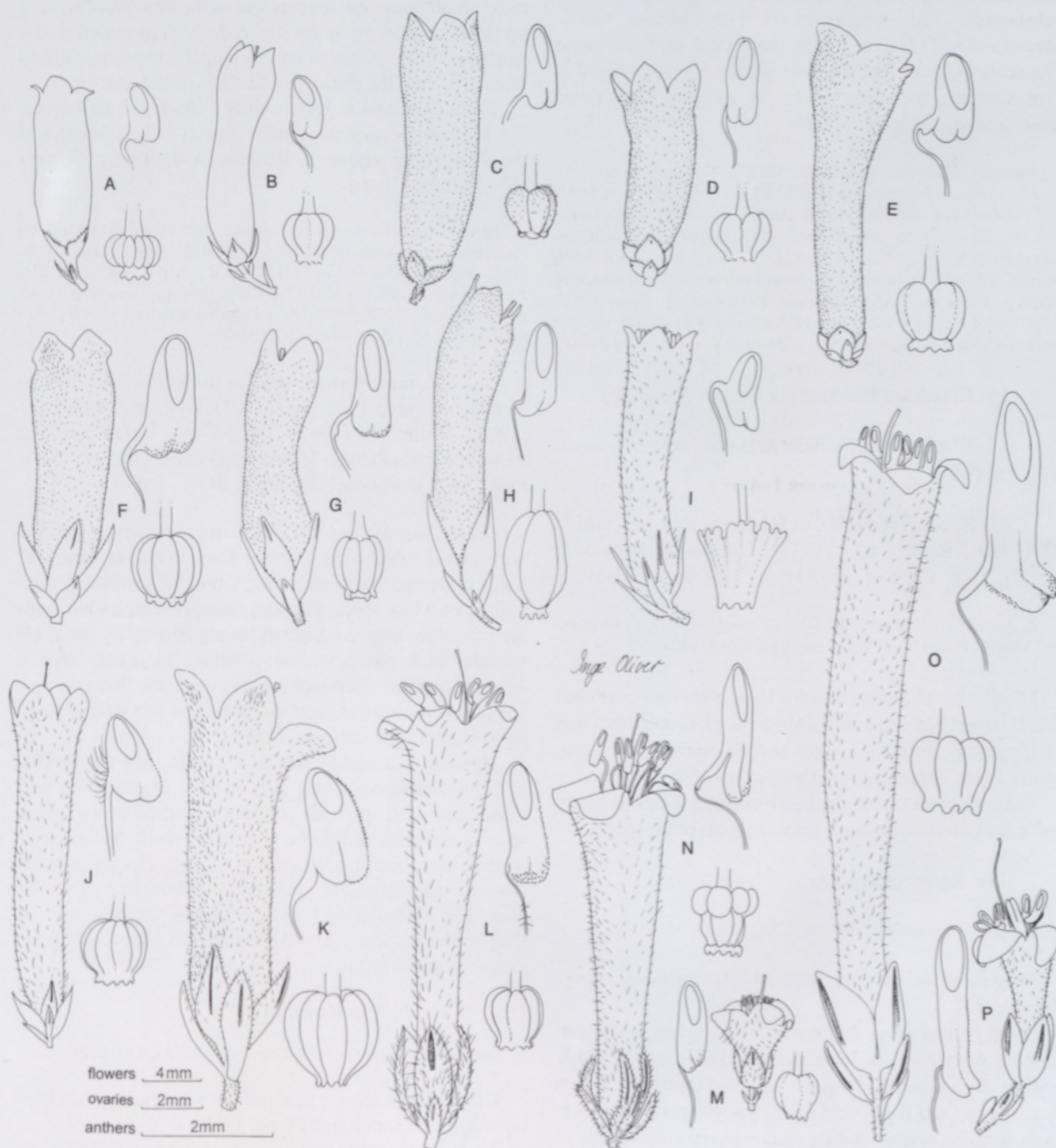


FIGURE 6.—*Erica curviflora*/perspicua group showing a flower, anther and ovary. A, *E. ignita*, 5–8 locules, Oliver 10944; B, *E. colorans*, 4–6 locules, Oliver 5880; C, *E. xanthina*, 4 locules, Schelpe 739; D, *E. cremea*, 4 locules, Esterhuysen 30774; E, *E. viridimontana*, 4 locules, type; F, *E. leucotrachela* subsp. *leucotrachela*, 4–7 locules, Taylor 7062; G, *E. kogelbergensis*, 4–6 locules, Oliver 9137; H, *E. bibax*, 4 locules, Schlechter 7813; I, *E. verticillata*, (4), 7, 8 locules, Bolus 2965; J, *E. perspicua* subsp. *perspicua*, 8 locules, Oliver 95; K, *E. macowanii* subsp. *macowanii*, 8 locules, Oliver 8604; L, *E. stagnalis* subsp. *stagnalis*, 8 locules, Oliver 10274; M, *E. chrysocodon*, 4 locules, Pool 76; N, *E. curviflora*, 4(8) locules, Brusse 4890; O, *E. conspicua* subsp. *conspicua*, 4 locules, Hanekom 2988; P, *E. conspicua* subsp. *roseoflora*, 4 locules, Esterhuysen 34307. Scale bars: flowers, 4 mm; ovaries and anthers, 2 mm. Artist: I.M. Oliver.



45.1b. subsp. **minor** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., corolla 12 ad 15 mm longa dignoscenda.

TYPE.—Western Cape: 3419 (Caledon), Lebanon Forest Reserve near Elgin, steep south-facing slopes in moist patches, 3500 ft [1 065 m], (–AA), 31 October 1969, *Oliver 3010* (NBG, holo.; PRE).

*Diagnostic features*: corolla tubular-infundibuliform, 12–15 mm long.

This new subspecies is restricted to the Groenlandberge which are just east of Viljoen's Pass and the populations of the typical subspecies. A single collection, *Stehle 272*, from just east of Sir Lowry's Pass is west of the ranges of both subspecies. The subspecies is very similar to *E. chrysocodon* (141), a highly restricted endemic near Franschhoek Pass, but that has 4-celled ovaries. Further investigations, including molecular analyses need to be done to assess their relationship.

*Paratype material*: WESTERN CAPE.—3418 (Simonstown): Rooskraal Nature Reserve, 2600 ft [790 m], (–BB), 11-09-1969, *Stehle 272* (NBG). 3419 (Caledon): Houw Hoek Mtn towards Mt Lebanon, (–AA), 28-09-1975, *Esterhuysen 33982* (BOL!); Lebanon, Jakkalsrivier Catchment 1b, 3700 ft [1 127 m], (–AA), 19-09-1969, *Haynes 212* (NBG); Grabouw area, Groenlandberge, S side of neck E of Graskop, 1 030 m, (–AA), November 1994, fruiting, *Oliver 10597* (NBG); Mt Lebanon, (–AA), 2-11-1975, *Wisura 3563* (NBG). Without locality: Caledon Wildflower Show, 9-09-1939, *Compton 7716* (NBG).

46. *E. sulcata* Benth.—see *E. curviflora* (45).

47. *E. macropus* Guthrie & Bolus—see *E. haematosiphon* (68).

48. *E. conspicua* Sol. in *Hortus kewensis* 2, edn 1: 22 (1789); Benth.: 633 (1839); Guthrie & Bolus: 73 (1905). Type: Cape of Good Hope, *Masson s.n.* (BM!).

*E. splendens* J.C.Wendl.: 5 (1800). *E. curviflora* L. var. *splendens* (J.C.Wendl.) Dulfer: 44 (1965). Iconotype: l.c.: 5 (1800).

*Diagnostic features*: flowers 1(–4)-nate on occasional short, lateral branches; sepals always glabrous, hard and cartilaginous, broadly ovate; corolla with loose, long, sparse hairs; anthers prognathous at base (chin and nose).

Two subspecies are recognized based on the corolla length and colour. Both share the distinctive sepals of the species.

48a. subsp. **conspicua**

Illustrations: Schumann & Kirsten: 58, t. 20, 21 (1992).

*Diagnostic features*: corolla 24–36 mm long, orange (Figure 6O).

Subsp. *conspicua* has the longest flowers among the tubular-flowered species—up to 36 mm long, and is second only to *E. junonia* var. *junonia* in the genus with its flowers 40–50 mm long. In the Cold Bokkeveld where this subspecies grows in seeps with the similar looking *E. curviflora*, a few plants of obvious hybrid origin have been recorded, *Oliver 11518* (NBG).

The subspecies occurs in the Franschhoek Mtns, near Wolesley and in the Cold Bokkeveld.

Vouchers: *Barker 8874* (NBG, NY); *Bolus 5169* (BM); *Compton 8177* (NBG); *Hanekom 2988, 2989* (NBG); *Hardy 1640* (NBG, PRE); *Oliver 629* (NBG), *639* (BM, NBG); *Schlechter 9320* (BM, K, NBG).

48b. subsp. **roseoflora** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., a subspecies typical corolla 8–15 mm longa pallide rosea differt. Figura 6P.

TYPE.—Western Cape, 3319 (Worcester); Keerom, at NE base of the Keeromsberg, in marshes and on stream-bank along stream flowing from E end of Keeromsberg, 3500–4000 ft [1 060–1 220 m], (–DA), 30 May 1976, *Esterhuysen 34307* (BOL, holo.; BM, K, MO, NBG, NY, PRE).

*Diagnostic features*: corolla 8–15 mm long, pale pink (Figure 6P).

At first investigation, the material cited below seemed to be an obvious new species, but in the process of writing up the taxa for these notes it was decided to regard it as a subspecies of *E. conspicua*, the sepals and prognathous anthers having the distinctive features of the species.

The subspecies is known only from two small areas, the Keeromsberg, with shorter flowers (8–10 mm) and the Langeberg above Robertson, with longer flowers (13–15 mm).

*Paratype material*: subsp. *roseoflora*. WESTERN CAPE.—3319 (Worcester): Keeromsberg, E slopes, 4000 ft [1 220 m], (–DA), 5-09-1965, fruiting, *Esterhuysen 31131* (BOL, NBG); *ibid.*, ex hort Kirstenbosch, *Hitchcock 603/87* (NBG); western Langeberg above Koo, headwaters of Dieprivier above Farm Versameling, 4900 ft [1 490 m], (–DB), 1-03-1997, *Helme 1248* (NBG).

57. *E. macowanii* Cufino in *Bullettino della Societa Botanica Italiano* 1903: 290 (1903); Guthrie & Bolus: 77 (1905); Dulfer: 48 (1965). Type: Caput Bonae Spei: In montibus Zwarsbergen [Swartberg] pone Caledon; floret maio. *s.n.* [*MacOwan*] (FI, holo.; BOL!, fragm.).

*Diagnostic features*: flowers erect-spreading; corolla with broad tube,  $\pm$  22–25 mm long, with no subapical bulge and large, more spreading lobes, yellow or red, with yellow or white apical portion; bract, bracteoles and sepals relatively large and broad; ovary 8-locular, seeds alveolate, finely pitted, without small scales; leaves large,  $\pm$  1 mm broad, no scale-like leaves below the flowers.

*E. macowanii* var. *latifolia* Benth. is transferred to *E. perspicua* subsp. *latifolia* (62b).

This forms a complex with the following six species and their subspecies and only careful examination and dissection will provide correct identifications. This species complex should be re-evaluated when molecular studies have been undertaken of all the relevant populations in order to ascertain the true relationships of all the taxa. The delimitation provided here is the best we can find in the currently available material based solely on morphological grounds.

57a. subsp. **macowanii**

Illustrations: Schumann & Kirsten: 62, t. 41, 42, 43 (1992).

*Diagnostic features*: hairs on corolla fine; sepals elliptic-ovate,  $\pm$  9 mm long (Figure 6K).

The typical subspecies occurs at higher altitudes on most of the mountains in the Kogelberg Biosphere Reserve.

Vouchers: *Baker 1407* (BM!, NBG!); *Esterhuysen 18848* (BOL!, PRE); *Herb Bolus 6899* (BOL!, K!, NBG!, PRE); *Oliver 23, 8604* (NBG!); *Rycroft 1447* (BOL!, NBG!, PRE); *Schumann 165* (NBG!); *Taylor 7234* (NBG!).



57b. subsp. **lanceolata** (Bolus) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

*E. perspicua* J.C.Wendl. var. *lanceolata* Bolus, Flora capensis 4: 80 (1905). Type: Caledon Div., Zwartberg, Miss Borchers in Herb Bolus 6286 (BOL!, K!, SAM!).

**Diagnostic features:** hairs on corolla longer and shaggy; sepals narrow-lanceolate,  $\pm 5$  mm long.

This taxon is confined to the upper reaches of the Klein River Mtns above Hermanus where two closely related taxa also occur, *E. latituba* at higher altitudes and *E. perspicua* subsp. *latifolia* on the flats.

Vouchers: Oliver 11290 (NBG!); Stokoe SAM55341 (SAM!); Williams 2724, 2920, 3860 (NBG!).

The types of both subspecies are reported to have come from the Swartberg at Caledon where the species has never been recorded. These localities are therefore suspect.

57.1. **E. leucotrachela** H.A.Baker in Journal of South African Botany 26: 75 (1960); Dulfer: 48 (1965). Type: Caledon Div., in large colonies usually above 2000 ft. on steep, marshy slopes on the seaward side of all major peaks from Rooiels to Palmiet River. Not found below the mist of cloud belt characteristic of this district, Baker 1415 (BOL, holo.; BM!, NBG!, PRE!, W).

Note: no precise locality was cited for the holotype, only general distributional details for the holotype and the five paratypes given above.

**Diagnostic features:** flowers 16–18 mm long with bulbous subapical zone; bract-like leaves usually on the flowering branchlet just below the flower; seeds with scale-like flaps and with the normal small pits coalescing into long, snake-like pits; corolla dark purplish/cerise pink with white apical portion, hairy (Figure 6F).

#### 57.1a. subsp. **leucotrachela**

Illustrations: Baker l.c.: t. 1 (1960); Schumann & Kirsten: 62, t. 44, 45, 46 (1992).

The typical subspecies occurs at higher altitudes on the mountains west of the Palmiet River in the Kogelberg Biosphere Reserve.

Vouchers: Andreae 861 (NBG!, PRE); Boucher 132 (NBG); Compton 7702 (NBG!); Esterhuysen 18857 (BOL!, NBG!, W); Rycroft 2111 (NBG!, K!); Wood sub Baker 1342 (BM!, BOL!).

57.1b. subsp. **monicae** E.G.H.Oliv. & I.M.Oliv., subsp. nov., a subspecies typica foliis minoribus  $\pm 4$ –5  $\times$  1 mm corolla pilis longioribus hirsutis differt.

TYPE.—Western Cape, 3419 (Caledon): Kleinmond, Honey Rock Kloof, 4 June 1951, Monica Cloete SAM60960 (NBG, holo.).

**Diagnostic features:** leaves mostly shorter,  $\pm 5 \times 1$  mm; corolla with longer, more shaggy hairs.

This subspecies is confined to the upper reaches of the Paardeberg Mtn northeast of Kleinmond where it grows alongside streams or in seeps.

Paratype material: WESTERN CAPE.—3419 (Caledon): Bot River Mtns, (–AA/AC), 04-1909, Marloth 4725 (NBG) [as Palmiet River Mouth in PRE]; Perdeberg on Isaacs Rivier 548, 500 m, (–AC), Feb. 2004, Oliver 12229 (NBG); Highlands Forest Reserve, E of hiking trail above Kleinmond, 500 m, (–AC), 1 July 1984, Schumann 228 (NBG); Paardeberg Mtns, (–AC), 03-1950, Stokoe SAM65398 (SAM). Without precise locality ex Caledon: 05-1900, Tyson 3359 (SAM).

57.2. **E. cremea** Dulfer in Annalen des Naturhistorischen Museums, Wien 66: 21 (1963). Type: Paarl-Worcester Div., Upper Wellington Sneekop above Tijgerkloof, 5500 ft. [1 676 m], 11-11-1956, Esterhuysen 26486 (W, holo.; BOL!, K!, NBG!, PRE!).

Illustration: Schumann & Kirsten: 63, t. 47 (1992).

**Diagnostic features:** flowers on very short, lateral branchlets arranged in loose, long, spike-like synflorescences; corolla short,  $\pm 12$  mm long, pale cream, with very fine short hairs; bract, bracteoles and sepals small, broad-ovate; ovary 4-locular (Figure 6D).

This species is known only from the Bain's Kloof Mtns where it is rather far removed from the other closely related species in the group.

Vouchers: type collection & Schumann 579 (NBG!) [voucher for illustration, l.c. (1992)].

57.3. **E. viridimontana** E.G.H.Oliv. & I.M.Oliv., sp. nov., floribus 1-natis dispersis, foliis parvis bracteosis sub inflorescentibus, bractea bracteoleis sepalisque ovatis vel ellipticis, corolla pilis brevissimis, ovario 4-loculato, seminibus squamis lacunis elongatis dignoscenda. Figura 7.

TYPE.—Western Cape, 3419 (Caledon): Grabouw area, Groenlandberg, collected for Caledon Wildflower Show, (–AA), 3 September 1998, Pitte sub Oliver 11114 (NBG, holo.; BM, BOL, K, MO, NY, PRE, S).

Shrubs erect to semi-decumbent, bushy,  $\pm 750 \times 750$  mm, single-stemmed reseeder. Branches: numerous main branches (50–)100–200 mm long with vegetative apices and a few scattered secondary branchlets, 3–10 mm long, terminating in a florescence, occasional to rare tertiary branchlets, 2–5 mm long, with terminal florescence; stems downy, sometimes with long, spreading, simple hairs, becoming glabrous; internodes on main branches  $\pm 100$  long, on secondary branchlets, 2–8 mm long. Leaves 4-nate, linear, 5.0–0.9  $\times$  0.9 mm, spreading to subspreading, flattened, adaxially glabrous to a few hairs, abaxially sparsely hirsute, sulcus narrow, closed basally; petiole adpressed,  $\pm 0.9$  mm long, ciliate. Inflorescence: flowers 1-nate at ends of secondary and tertiary branchlets with 1 or 2 whorls of minute, bract-like leaflets on stem below the flower; pedicel  $\pm 0.5$  mm long, pubescent; bract partially recalcrescent, median in position but appearing approximate to calyx, ovate to broadly elliptic,  $\pm 1 \times 0.8$  mm, glabrous, ciliate, orange; bracteoles 2, same as bract. Calyx 4-partite, lobes imbricate, broadly elliptic,  $\pm 2.8 \times 2.5$  mm, acute, glabrous, ciliate, orange. Corolla 4-lobed, curved tubular-infundibuliform, 18–30 mm long, 4 mm wide in middle up to 6 mm wide below apex, with slight bulbous apex, finely puberulous, yellow-orange to red-orange or bright crimson especially at apex; lobes spreading to slightly recurved, broadly triangular, entire. Stamens 8, free, included; filaments narrowly linear,  $\pm 16$  mm long, with slight apical bend otherwise straight, white to orange, glabrous; anthers bilobed, dorsifixed near base, slightly inclined adaxially, oblong in adaxial view, appendiculate; thecae narrowly ovate-oblong and  $\pm 1.5 \times 0.6$  mm in lateral view, glabrous, dark brown, pore  $\pm \frac{1}{3}$  length of theca, appendages minute decurrent along upper portion of filament; pollen shed as tetrads. Ovary 4-locular, 8-lobed/ridged, broadly and shortly cylindrical,  $\pm 2 \times 2.8$





FIGURE 7.—*Erica viridimontana* subsp. *viridimontana*. A, flowering branch,  $\times 1$ ; B, stem; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, stamen, side, front and back views; I, gynoecium; J, ovary opened laterally to show placenta and ovules; K, upper part of style and stigma; L, capsule; M, seed; N, testa cells. Scale bars: B, C, E–H, K–M, 1 mm; D, I, J, 2 mm; N, 100  $\mu\text{m}$ . All drawn from the type by I.M. Oliver.

mm, emarginate, with basal nectaries, glabrous, orange; ovules  $\pm 50$  per locule, lateral from a complete placenta; style included, becoming exserted, straight glabrous except for small stiff hairs below apex, orange; stigma simple truncate, sometimes appearing subcapitellate. *Fruit* a dehiscent capsule, valves splitting open halfway and remaining  $\pm$  vertical, septa on valves only, placenta broadly ellipsoid. *Seeds* angled-ellipsoid,  $\pm 0.6 \times 0.4$

mm, grey-white or pink-brown, deeply alveolate, cells elongate hexagonal,  $\pm 70\text{--}100 \times 50 \mu\text{m}$ , anticlinal walls slightly undulate, inner periclinal walls with large slit-like or round pits. Figures 6E; 7.

*Diagnostic features*: flowers 1-nate on short, leafy, lateral branchlets sometimes one per node, arranged in very loose, spike-like system; bract-like leaves on stem below



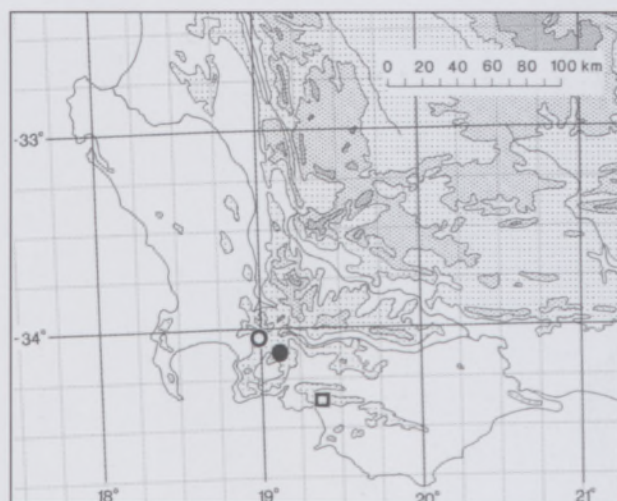


FIGURE 8.—Known distribution of *Erica viridimontana*: subsp. *viridimontana*, ●; subsp. *nivicola*, ○; and *E. latituba*, □.

florescence; bract, bracteoles and sepals short and broadly ovate; corolla very finely and shortly hairy, yellow-orange; ovary 4-locular; seeds with large scales and slit-like pits.

*E. viridimontana* belongs in the *E. curviflora-perspicua* complex on the grounds of the 4-nate leaves, hairy tubular corolla, similar anthers and ovary (but 4-celled). The peculiar seeds clearly ally it to *E. leucotrachela* and *E. latituba*. Superficially the flowers look similar to those of *E. cremea* and *E. xanthina* due to the similar, short, broad, adpressed sepals and very finely hairy corollas, but these species have dense, spike-like synflorescences.

The species is divided into two subspecies based on differences in the corolla and seed.

#### 57.3a. subsp. *viridimontana*

**Diagnostic features:** corolla yellow-orange, 18–24 × 4 mm; seeds with large slit-like pits and large scales, grey-white.

The typical subspecies was first recorded at the Caledon Wildflower Show in 1991 with no reliable locality details. Then it appeared at the Flora 93 Wildflower Show in Cape Town with details provided to us by the supplier, Mr B. Morkel of Vyeboom and again at the Caledon Show due to the collecting of Mr Pitte who informed us of the exact locality.

It is confined to the summit regions of the Groenlandberg east of Grabouw (Figure 8), hence the specific epithet—*viridis*, green, *montanus*, of mountains (Latin); *Groenlandberg* (Afrikaans), green-land-mountain. Unfortunately all the range was burnt off in December 1999 and we will have to wait a few more years for the plants to grow to full maturity.

**Paratype material:** WESTERN CAPE.—3419 (Caledon): Groenlandberg, ex Flora 93 Wildflower Show, Villiersdorp exhibit, (–AA), 7-09-1993, B. Morkel STE32111 (NBG); without locality, said to be Riviersonderend Mtns, ex Caledon Wildflower Show, 12-09-1991, Oliver 9890 (NBG).

57.3b. subsp. *nivicola* E.G.H.Oliv. & I.M.Oliv., subsp. nov., a subspecies typica corolla vivido-carminea 22–30 × 5 mm, seminibus lacunis grandis rotundatis sine squamis, roseobrunneis differt.

**TYPE.**—Western Cape, 3418 (Simonstown): Somerset Sneekop, 5000 ft [1 524 m], (–BB), November 1934, Stokoe 4023 (BOL, holo.; NBG).

**Diagnostic features:** corolla bright crimson, 22–30 × 5 mm; seeds with large, round pits and no scales, shiny, pink-brown.

This taxon was last collected in 1948 by Thomas Stokoe. Several attempts to re-collect it have not been successful despite the reasonably small but rugged area of Somerset Sneekop. Unfortunately several fires in rather close succession have ravaged the Hottentots Holland Mtns during the last 10 years.

In the Cape herbaria the material cited below was identified as *E. bibax*, *E. macowanii* and *E. leucotrachela*. It has the flower colour of *E. leucotrachela* and general facies of that species but does not have the very characteristic seeds with their scales and slit-like pits which are also found in subsp. *viridimontana*. We have thus placed this material as a subspecies of *E. viridimontana* rather than in *E. leucotrachela*.

It is confined to the highest reaches of the Hottentots Holland Mtns, mainly on Somerset Sneekop (Figure 8), hence the epithet, *nix/nivis*, snow, *-cola*, dweller (Latin).

**Paratype material:** WESTERN CAPE.—3418 (Simonstown): Hottentots Holland Mtns, Somerset Sneekop, 5000 ft [1 524 m], (–BB), 11-1938, Stokoe 6683 (BOL, NBG); *ibid.*, 5000 ft [1 524 m], 11-1039, Stokoe SAM55189A (SAM); between Somerset Sneekop & Landrostkop, (–BB), 1-6-11-1938, Stokoe SAM53958 (SAM); Landrostkop, (–BB), Stokoe 6303 (BOL, NBG). Without precise locality: Hottentots Holland Mtns, 12-1948, Stokoe SAM55189B (SAM).

57.4. *E. latituba* L.Bolus in *Annals of the Bolus Herbarium* 4: 16 (1925). *E. viridescens* var. *latituba* (L.Bolus) Dulfer: 47 (1965). Type: Cape Province: South-Western Region; Caledon Div.?; obtained at the Caledon Wildflower Show, Sept. 1908, N.S.Pillans 1451 (BOL!).

**Diagnostic features:** flowers (1)2–4-nate at ends of short, leafy, lateral branches, spreading to subpendulous, ± 16 mm long, without small, bract-like leaves below the inflorescence; sepals long and narrow, leaf-like, from a dilated, pinkish, semitransparent, small basal portion hardly visible; corolla with stiffish scattered hairs, lobes erect, mouth not widened; ovary 5–8-locular; seeds with slight scales, pits small not coalescing; no bract-like leaves below the flowers (Figure 9).

This species belongs in the *E. curviflora/perspicua* complex due to the 4-nate leaves, hairy corolla, anther shape and ovary details of shape and variable number of locules. Unlike most of the group with 1-nate flowers, this has (1)2–4-nate flowers. The shape of the sepals is similar to *E. curviflora* which, however, always has callosities on the ovary, and to *E. perspicua* subsp. *latifolia* which has a corolla with an open mouth. Both of these species have the 1-nate flowers. The seeds with small scales are similar to those of *E. leucotrachela* but the pits do not coalesce as in the species. *E. leucotrachela* also differs in having small, bract-like leaves on the stems just below the inflorescence.

The species was known only from the unlocalized type collection until our studies and was misunderstood by both L. Bolus and Dulfer—the former likened it to *E. colorans* and *E. glandulosa*. We therefore include here detailed drawings of the species (Figure 9). The material collected in the latter half of the last century clearly constituted a distinct species that we were planning to describe, until examination of the type and only collec-



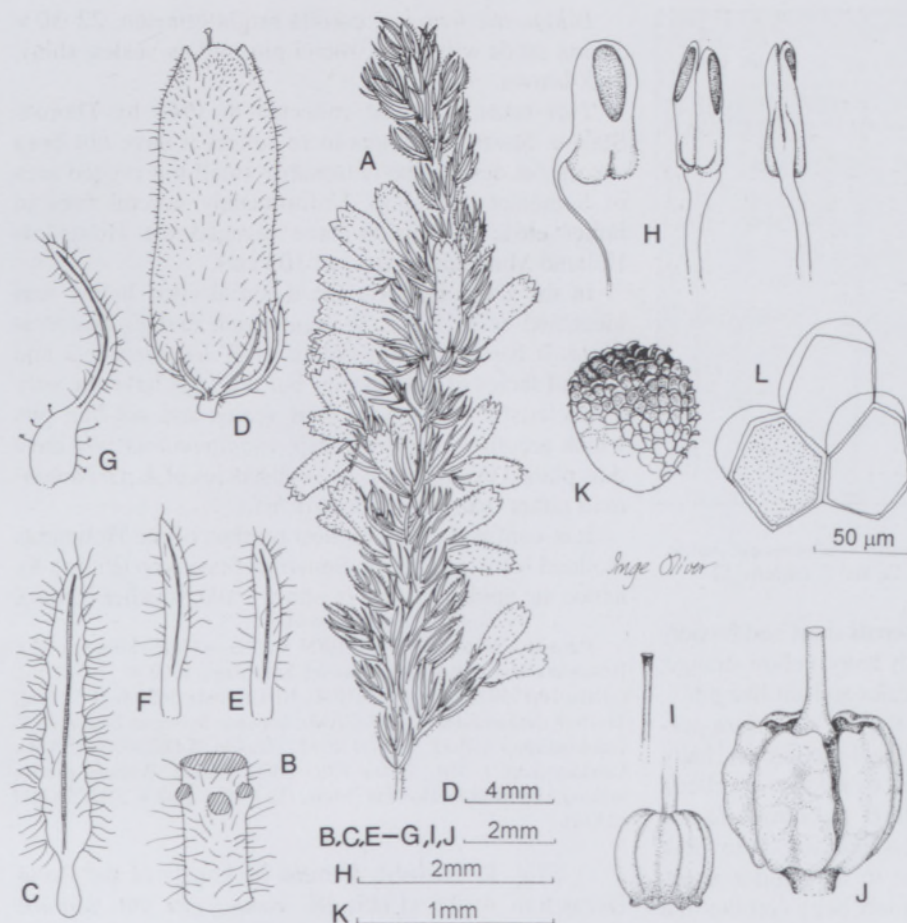


FIGURE 9.—*Erica latituba*, Kirsten 1398b. A, flowering branch,  $\times 1$ ; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, stamen, side, front and back views; I, gynoecium; J, capsule; K, seed; L, testa cells. Scale bars: B, C, E–J, 2 mm; D, 4 mm; K, 1 mm. Artist: I.M. Oliver.

tion of *E. latituba* revealed its true identity. Fortunately, a seed found in the flower dissected, showed the characteristic testa cells. A figure is published here to highlight the existence of this taxon that was otherwise very poorly understood.

The material figured by Andrews and named by him as *E. linnaeoides* (*Coloured engravings of heaths*: t. 107, 1805) looks very much like this species in general facies. However, the sepals are shown as lanceolate, not the distinctive linear from a small dilated base, and the distinctive seeds are not illustrated. Benth (1839) suggested this was a hybrid of garden origin.

**Material examined:** WESTERN CAPE.—3419 (Caledon): Hermanus, in mtn stream, 500 ft [150 m], (–AD), 26-04-1955, *Baker 686* (NBG); top of hill above Stanford, (–AD), 12-1976, *Baker 1801* (NBG); Hermanus area, Glenhart, S slopes towards Maanskynekop, 3000 ft [914 m], (–AD), 25-08-1996, *Kirsten 1398b* (NBG); Klein River Mtns WNW of Stanford, ridge just W of Boskop on Morning Star 630, 620 m, (–AD), 14-08-1999, *Oliver 11298* (NBG); Klein River Mtns near Stanford, 3000 ft [914 m], (–AD), 14-4-1952, *Stokoe SAM66699* (NBG, SAM); Hermanus, Vogelgat near Peter's Pass, Beacon Head, 500 m, (–AD), 4 August 1993, *Williams 3869* (NBG).

**62. *E. perspicua* J.C.Wendl.**, *Ericarum icones*: f. 1, 7 (1798). Benth.: 634 (1839); Guthrie & Bolus: 79:f.1, (1905); Dulfer: 50 (1965). Iconotype: L.c.: 7.

**Diagnostic features:** corolla finely but perceptibly hairy with narrow tube,  $\pm 22$  mm long, having no distinct sub-apical bulge, white to pink with white tips; flowers erect-spreading; leaves small,  $\pm 4.5 \times 0.5$  mm (Figure 5D).

The species forms a variable complex with *E. macowanii* (57) and *E. leucotrachela* (57.1). All three occur in the Betty's Bay/Kleinmond area with the latter two on

the mountains. Only careful examination of the flowers can provide the distinguishing characters with corolla colour being a problem—easily noticed in fresh material, but not always recorded in dried herbarium material.

The species is commonly known as the Prince of Wales heath.

#### 62a. subsp. *perspicua*

Illustrations: Wendland l.c.: t. 7 (1798); Schumann & Kirsten: 66, t. 57, 58 (1992).

**Diagnostic features:** flowers mostly 1-nate, occasionally 2-nate, on short, lateral branches; anthers with hairs (Figure 6J).

The typical subspecies occurs abundantly in marshy places on the coastal flats from Rooiels to Kleinmond. However, one collection in BOL, *Burman 978*, is recorded from Onrust Mtn.

**Vouchers:** Goldblatt 1594 (MO, NBG!, PRE); Oliver 31 (NBG!, PRE), 7421 (NBG!); Oliver & Palser 58 (NBG!, PRE); Parker 4521 (K!, NBG!); Schlechter 9426 (BM!, BOL!, K!, NBG!, P!, PRE, W).

#### 62b. subsp. *latifolia* (Benth.) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

*E. perspicua* J.C.Wendl. var. *latifolia* Benth. in DC., *Prodromus* 7: 634 (1839); Guthrie & Bolus: 80 (1905). Type: Swellendam, Masson [Niven] s.n. (K!). Note: Benth incorrectly labelled and quoted several numbered specimens as Masson collections when they were actually made by Niven with the labels in his own hand. The type is 'marsh plains near mouth of Klein River, Niven 50'.

**Diagnostic features:** flowers 1(–3)-nate on short lateral branches; anthers glabrous.

This subspecies is confined to the lowland flats between Hermanus and Stanford.



Vouchers: *Maguire 1258* (NBG!, NY!, PRE); *Martin 320* (BM!, NBG!); *Oliver 3793* (NBG!); *Williams 3545* (K!, NBG!, PRE).

62.1. ***E. dulcis*** *L.Bolus* in *Annals of Bolus Herbarium* 2: 154, t. 10D (1918); *Dulfer*: 50 (1965). Type: South-Western Region, bought fresh in Cape Town, Oct., *H.Bolus 13407* (BOL!).

Illustrations: *Bolus l.c.*: t. 10D (1918); *Schumann & Kirsten*: 66, t. 60 (1992).

**Diagnostic features:** corolla funnel-shaped, 8–13 mm long, pink with white mouth; filaments  $\frac{2}{3}$  length of corolla; ovary 8-locular.

This species has sometimes been regarded as a short-tubed variant of *E. perspicua*. It also has, in our opinion, close relationships with *E. octonaria* (62.2), *E. trichophora* Benth. (142) and *E. propendens* Andrews (139)—all have 8-locular ovaries. We are unable at this stage to take any decisions on their relative statuses. Further research including DNA analyses may help unravel this complex.

Most herbarium collections of this species have been derived from flower shows or flower sellers with no locality details being provided which complicates the assessment of diversity of regional populations in this species complex.

Voucher: *Rourke 1627* (NBG!).

62.2. ***E. octonaria*** *L.Bolus* in *Journal of Botany* 72: 45 (1934); *Dulfer*: 50 (1965). Type: Caledon Div., exact locality uncertain, [Hermanus area], Sept. 1933, *W. Paterson* in *BOL20850* (BOL!).

**Diagnostic features:** corolla broadly funnel-shaped to obconical,  $\pm$  6 mm long, dark to pale pink; filaments  $\frac{2}{3}$  length of corolla; ovary 8-locular; stems pilose; leaves rather flat.

This species is clearly very closely allied to *E. propendens* (139) and *E. trichophora* (142). See discussion above under 62.1. It is known only from the Klein River Mtns.

Vouchers: type; *Kirsten 674* (NBG!); *Oliver 11281* (NBG!).

63. ***E. colorans*** *Andrews*, *Coloured engravings of heaths* 4: t. 223 (post 1814–pre 1825); *The Heathery* 5: t. 209 ( $\pm$  1816); Benth.: 634 (1839); *Guthrie & Bolus*: 80 (1905); *Dulfer*: 51 (1965). Iconotype: *l.c.*: t. 209.

Note: the larger format plate was published by Andrews in vol. IV of *Coloured engravings of heaths* which is impossible to date accurately: it is unfortunately one of those undated plates in the last two volumes. The date of *The Heathery* plate is also uncertain. Following the researches of *Cleevely et al.* (2003)—‘As a consequence, it can be concluded that most, if not all, of H.C. Andrews’ new names for *Erica* species were first published in *Coloured engravings of heaths*’, we typify the name with t. 223.

Illustrations: *Andrews l.c.*: t. 223; *Schumann & Kirsten*: 67, t. 61, 62 (1992).

**Diagnostic features:** flowers 1-nate on short, leafy, side branches arranged in long, sometimes dense synfloriscences on main branches; corolla long, delicate, transparent with expanded, bulbous apex below spreading lobes; glabrous or hairy, white turning pink or totally deep pink; sepals broadly lanceolate; anther with

appendages minute decurrent or mucous; ovary (4–)6-locular, with slight stipe; bract and bracteoles not approximate, narrow and leaf-like (Figure 6B).

The species occurs in the area from Stanford to Elim and is not sympatric with *E. perspicua*.

*E. colorans* var. *breviflora* H.A.Baker is transferred to *E. plena* *L.Bolus* (265.3). We regard this as a species distinct from, but close to, *E. colorans* and not just as a short-tubed variant, since the flowers have a different shape and the anthers a different position.

Vouchers: *Baker 1155* (BM!, NBG!); *Bolus 6760* (BOL!, NBG!, PRE); *Oliver 4239* (BM!, K!, NBG!, PRE!); *Oliver & Palser 82* (K!, NBG!, PRE!); *Schlechter 7693* (BM!, BOL!, K!, NBG!, P!, PRE, W).

64. ***E. verticillata*** *P.J.Bergius*, *Descriptiones plantarum ex Capite bonae spei*: 99 (1767); *Guthrie & Bolus*: 81 (1905); *Dulfer*: 51 (1965). Neotype: *Caput bonae spei, Grubb s.n.* (SBT!).

Note: in the protologue Bergius cites only ‘HERM. Afr. 8’, presumably a collection by Hermann which we have not been able to locate. There is, however, a good specimen in his own herbarium communicated to him by Michael Grubb, a director in the Swedish East India Company. This is determined by himself and undoubtedly provided all the details for his full description in the protologue. It is selected here as the neotype.

*E. concinna* Sol.: 23 (1789); Benth.: 636 (1839). Type: *Masson s.n.* (BM!).

Illustrations: *Schumann & Kirsten*: 68, t. 64, 65 (1992); *I.M. Oliver & Oliver*: 7 (2000).

**Diagnostic features:** flowers 2–4-nate on leafy side branches arranged in bunches along main stems often with long, almost naked areas in between and long continuous growth; corolla finely hairy, rosy purple; anthers dorsally attached in midregion, filaments with distinct cobra-like stance; ovary (4–)7 or 8-celled, obconical, with erect apical calluses (not bulging laterally as in *E. curviflora*) (Figure 6I).

This species is extinct in the wild having formerly been collected only on the sandy Cape Flats (*I.M. Oliver & Oliver* 2000). It is still cultivated in several botanical gardens, in South Africa and Europe, and from nurseries in Australia and western USA. It can be grown very easily (*Hitchcock* 2003).

Vouchers: *Bolus 2965* (BM!, BOL!, K!, NBG!, PRE); *Bolus Herb. Norm. 14* (BM!, BOL!, K!, NBG!, P!); *Dümmer 210* (NBG!); *Thode 7973* (NBG!).

66.1. ***E. pillansii*** *Bolus* in *Transactions of the Royal Society of South Africa* 1: 158 (1909); *Dulfer*: 52 (1965). Type: Cape Colony, Caledon Div., fl. May–Jan., *Pillans 585* (BOL!).

**Diagnostic features:** flowers 1–3(4)-nate on short, lateral, leafy branches, densely aggregated along main branches; corolla finely hairy, bright scarlet, narrow tube 6–16 mm long; anthers with small basal appendages; ovary 4-locular, with erect hairs on upper half.

There is considerable variation in the length of the corolla with most of the long-tubed variants flowering in late summer/autumn and the short-tubed variants flowering in spring/early summer.

66.1a. subsp. ***pillansii***

Illustrations: *Baker & Oliver*: t. 27 (1967); *Schumann & Kirsten*: 68, t. 68, t. 69; 69, t. 70 (1992).



**Diagnostic features:** flowers in a spike-like synflorescence, 120–260 mm long; corolla 12–16 mm long, tube not narrowed below the mouth.

Pillans said (pers. comm.) that he had never seen this species in the wild, only in flower sellers' buckets in Cape Town and was told that the material came from the Caledon District.

The typical subspecies occurs in the Kogelberg Biosphere Reserve from low to middle altitudes from the Platberg area to near Kleinmond and flowers mainly in autumn.

Vouchers: Baker 1297 (BM!, NBG!); Boucher 310 (NGB!, PRE); Compton 13506 (NGB!); Kirsten 1193 (NGB!); Oliver 10604 (NGB!), STE30043 (NGB!, PRE!) [voucher for Baker & Oliver l.c.].

66.1b. subsp. **fervida** (L.Bolus) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

*E. fervida* L.Bolus in Annals of the Bolus Herbarium 3: 173, t. 9A (1923); Dulfer: 52 (1965). Type: ?Caledon Div., sold in Cape Town, fl. Oct., Bolus 13408 (BOL!, K!).

*E. pyrantha* Bolus: 157 (1909); Dulfer 49 (1965). Type: Cape Colony, South-western Region, reported to come from the Caledon Div., and sold fresh in the streets of Cape Town, fl. Aug. (1908), Miss A.M. Krige sub BOL13023 (BOL!).

Illustrations: L.Bolus: t. 9A (1923); Oliver: t. 1C (1986); Schumann & Kirsten: 69: t. 71, 72 (1992).

**Diagnostic features:** flowers in a spike-like synflorescence, 60–120 mm long; corolla 6–8(–10) mm long, constricted below the mouth.

The protologue of *E. pyrantha* gives the corolla length in the Latin diagnosis as 5 mm [0.5 cm] long but in the description, as 10 mm [1 cm] long. Bolus referred to this species as 'unlike any known to me' and surprisingly did not refer to *E. pillansii* which he described in the same paper. It is known only from the type collection. There is a possibility that *E. pyrantha* may be a chance hybrid between subsp. *pillansii* or subsp. *fervida* and the yellow-flowered *E. campanularis*, since the corolla is described as 'orange with a red base' and the anthers are much lower down in the corolla tube as in that species, with several other floral characters being similar in both species. It is tentatively placed in synonymy under this subspecies. The types of all three taxa were 'collected' in flower-sellers' buckets in Cape Town.

This subspecies also occurs in the Kogelberg Biosphere Reserve but mainly at middle altitudes from Kogelberg to above Betty's Bay. It flowers mainly in spring. In two well-separated populations, hybrids have been recorded between this subspecies and *E. fastigiata* and were described under the name, *E. xvinacea* L.Bolus (L.Bolus 1928; Oliver 1986).

Vouchers: Haynes 695 (NGB!, PRE); Kirsten 894 (NGB!); Oliver 8610 (BM!, NBG!), 8798 (NGB!, PRE!); Schumann 168 (NGB!) [voucher for Schumann & Kirsten l.c.].

66.2. *E. fervida* L.Bolus—see *E. pillansii* (66.1).

66.3. *E. humidicola* E.G.H.Oliv. in Bothalia 30: 149 (2000c). Type: Western Cape, 3418 (Simonstown): Kogelberg Reserve, Spinnekopsneskloof, west-facing lower slopes below Dwarsrivierberg, 180 m, (–BD), 22 September 1999, Oliver 11353 (NGB, holo.; BM, K, MO, NY, PRE, S).

Illustration: l.c.: t. 150.

**Diagnostic features:** corolla  $\pm 4.5 \times 3$  mm, broadly campanulate, finely and shortly hairy, dark pink; flowers

1–3-nate on short, leafy, side branches crowded along main branches into loose spike-like synflorescences; anthers with distinct large basal appendages.

This species occurs in the central part of the Kogelberg Biosphere Reserve, in Spinnekopsneskloof. In one population of mixed plants of *E. humidicola* and *E. campanularis*, a single undoubted hybrid plant was recorded.

Voucher: type collection.

49. *E. densifolia* Willd., Caroli a Linné species plantarum 2: 359 (1799); Guthrie & Bolus: 73 (1905); Dulfer: 45 (1965). Type: Herb. Willdenow (B!).

*E. uhria* Andrews: t. 141 (1802); Benth.: 628 (1839). Iconotype: l.c.: t. 141.

Illustrations: Andrews l.c.: t. 141 (1802); Baker & Oliver: t. 19 (1967); Schumann & Kirsten: 58, t. 22, 23 (1992).

**Diagnostic features:** flowers mostly single on ends of short, lateral, leafy branchlets, aggregated into short, spike-like synflorescences below ends of main branches; sepals with sessile glands on adaxial surface; corolla shortly hairy, pink to red with green tips; anthers with long appendages; ovary 4-locular, long, narrow and not emarginate; the style slightly swollen at base.

There is considerable variation in a number of characters—length of the pedicel (0.8–10 mm), position of the bract and bracteoles, sepal shape, texture and indumentum (narrow to broadly lanceolate, glabrous to lanate, simple to gland-tipped hairs, leaf-like to very hard and rigid). Some nine variants (Figure 10A–I) have been noted, but not named, since additional research, including DNA analyses, needs to be done on the species.

The species ranges from the Grootvadersbosch area on the Langeberg, eastwards to Humansdorp and inland on the Kammanassie and eastern Groot Swartberg ranges.

Vouchers: Acocks 21749 (K!, NBG!, PRE); Bolus 8669 (BOL!, K!, NBG!, PRE); Compton 23339 (MO!, NBG!), 23498 (BM!, NBG!, NY!); Fourcade 3843 (NGB!, PRE); Kerr STE30041 (K!, NBG!, PRE); McDonald 1257 (NGB!, PRE); Oliver 11809, 11887 (NGB!); Rourke 1337 (NGB!, NY!, PRE); Schlechter 5837 (BM!, BOL!, K!, NBG!, PRE, W); Thode A2412 (NGB!, PRE).

50. *E. xerophila* Bolus—see *E. wendlandiana* (below).

50. *E. wendlandiana* Klotzsch in Linnaea 9: 652 (1835); Benth.: 629 (1839); Guthrie & Bolus: 82 (1905); Dulfer: 52 (1965). Type: Prom. b. sp., Mundt & Maire s.n. (B†, holo.; K!). Lectotype selected here: Mundt & Maire s.n. [ex B, det. Klotzsch] (K!).

*E. xerophila* Bolus: 74 (1905); Dulfer: 45 (1965). Type: Ladismith Div.; slopes of the Klein Zwartberg Range, near Ladismith, about 2000 ft [610 m], Marloth 2935 (BOL!).

Illustrations: Schumann & Kirsten: 58, t. 24, 25 [as *E. xerophila*] (1992).

**Diagnostic features:** flowers 1 or 2(3)-nate on ends of leafy, lateral branchlets, scattered over plant or sometimes aggregated into loose, spike-like synflorescences; corolla sparsely and finely hairy, pale orange; ovary 4-locular, long and narrow, not emarginate, with very distinctive large bulge at base of style, sometimes wider than ovary.

The identity of *E. wendlandiana* was formerly uncertain and it was regarded as a possible variant of *E. curviflora* until we examined the lectotype at Kew. The dis-



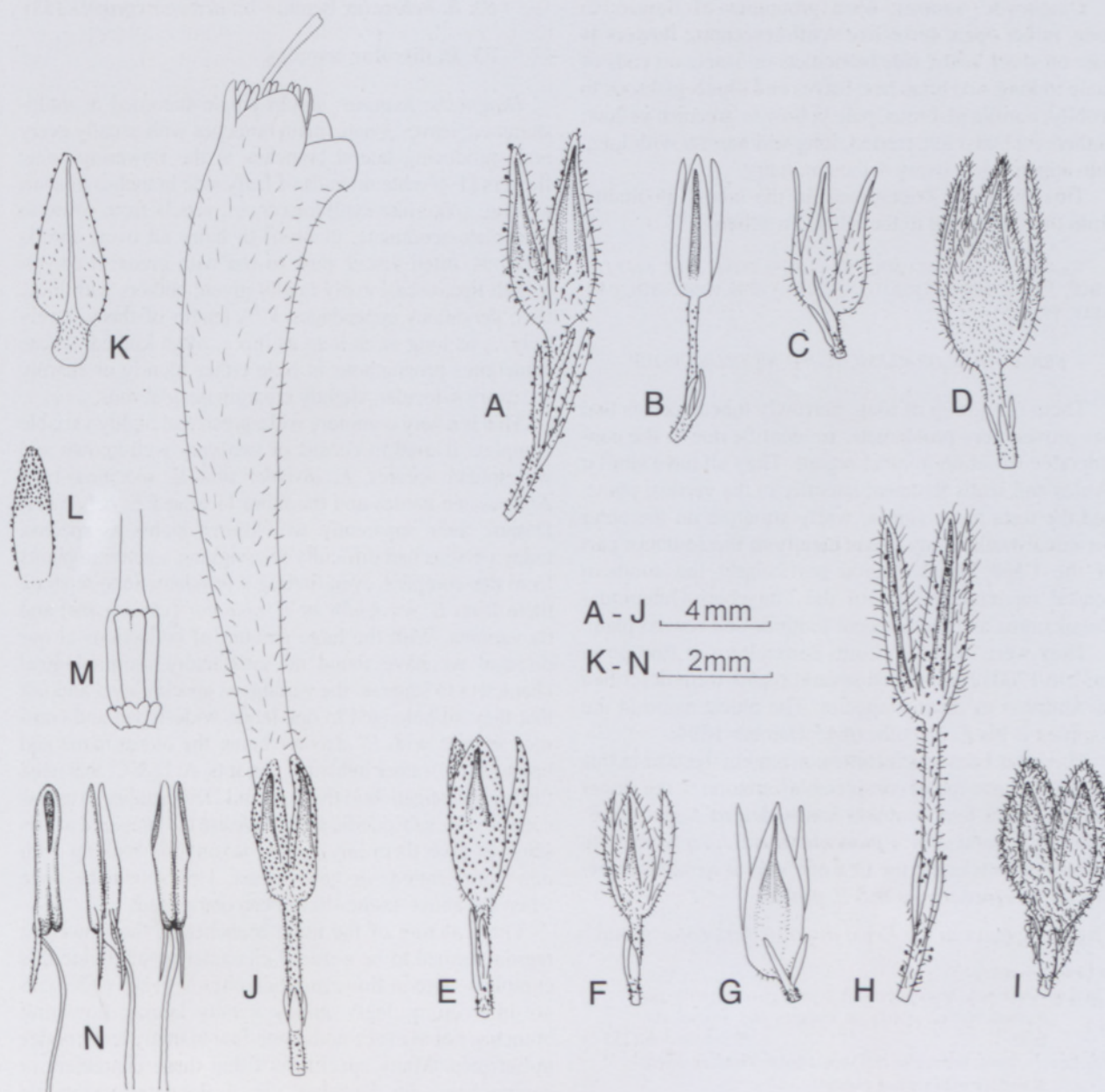


FIGURE 10.—*Erica densifolia* variants. A–I, variations in pedicel, bract, bracteoles and calyx; A, Grootvadersbos, McDonald 1642; B, Grootvadersbos, Van der Merwe 91; C, Garcia's Pass, Bohnen 8426; D, Robinson Pass, Paterson-Jones 797; E, Outeniqua Pass, Compton 23498; F, Coldstream, Humansdorp, Compton 23339; G, Prince Alfred's Pass, Middlemost 2007; H, Kammanassie, Viviers & Vlok 20; I, Eastern Swartberg, Hagas, Vlok 2535. J, flower; K, leaf; L, sepal, adaxial view showing patch of sessile glands; M, ovary; N, anther, side, back and front views. J–N, drawn from Doornrivier, Outeniqua Mtns, Oliver 11887. Scale bars: A–J, 4 mm; K–N, 2 mm. Artist: I.M. Oliver.

tinctive base of the style pointed straight to the known *E. xerophila*.

The species occurs in dry areas, often rocky habitats, on the mountains of the western Little Karoo from near Laingsburg and Touwsrivier to the eastern Swartberg and Baviaanskloof Mtns.

Vouchers: Esterhuysen 29539 (BOL!, K!, NBG!, PRE, W); Marloth 11334 (NBG!, PRE); Oliver 9729, 10079, 10342 (NBG!); Schumann 547 (NBG!) (voucher for Schumann & Kirsten l.c.); Steyn 274 (BM!, BOL!, NBG!, NY!); Wurts 1257 (BOL!, K!, NBG!).

50.1. *E. annalis* E.G.H.Oliv. & I.M.Oliv. in Bothalia 32: 178 (2002b). Type: Western Cape. 3322 (Oudtshoorn): Kammanassie Mountains, Perdekloof, northern foothills of Mannetjiesberg above Buffelsklip, 820 m, 3 September 2001, E.G.H. & I.M. Oliver 11929 (NBG, holo.; BOL, K, NY, PRE).

Illustration: l.c.: t. 12 (2002b).

**Diagnostic features:** leaves 4-nate; corolla hairy with distinct swelling at base; bract and bracteoles small and remote; anthers well exerted, muticous, long and narrow; sparse hairs on filaments and style; pedicel relatively long (10–15 mm) with small, sticky red glands; ovary densely hairy, cylindrical.

Vouchers: type and De Jaar 508 (NBG!).

41. *E. maximilianii* Guthrie & Bolus in Botanische Jahrbücher 27: 173 (1900); Guthrie & Bolus: 69 (1905); Dulfer: 43 (1965). Type: Koudeberg, near Wupperthal, Clanwilliam, 3700 ft [1 127 m], fl. Aug., Schlechter 8739 (B†, BM!, BOL!, K!, NBG!, P!, W). Lectotype selected here: Schlechter 8739 (BOL).

Illustrations: Schumann & Kirsten: 56, t. 14, 15 (1992).



**Diagnostic features:** open groupings of flowers to long, rather open, spike-like synflorescences; flowers 1-nate on short, leafy, side branchlets or 3-nate on ends of main to long side branches; leaves and sepals glabrous to woolly; corolla glabrous, pale yellow to greenish yellow; anthers included to exerted, long and narrow with long, thin appendages; ovary 4-locular, hairy.

This species is widespread on the inland mountains from the Cederberg to the Klein Swartberg.

Vouchers: *Bolus 8683* (BOL!, K!, NBG!); *Oliver 5344, 5443* (K!, NBG!, PRE!), *10380a* (NGB!); *Schlechter 8739* (BM!, BOL!, K!, NBG!, P!, W).

#### ERICA DISCOLOR-VERSICOLOR-UNICOLOR GROUP

There is a group of long, narrowly tubed species that has proven very problematic to identify, due to the considerable variation in most organs. They all have similar ovules and seeds flattened laterally in the vertical plane, and the testa has a similar warty structure on the outer periclinal walls. They occur mainly in the southern part of the Cape Floral Region particularly the southern coastal mountain ranges of the Langeberg-Outeniqua-Tsitsikamma and the adjacent foothills and coastal plain.

They were introduced into horticulture in Europe in the late 1700s from which several plants were described by Andrews as distinct species. The oldest name in the complex is his *E. discolor* of 15 October 1794.

There has been much confusion among the taxa in this group. We have found considerable variation to the extent that we retain four common and widespread species, *E. discolor*, *E. versicolor*, *E. unicolor* and *E. diaphana*, note several variants under the first one, and describe two new species, *E. croceovirens* and *E. prolata*.

#### Key to species in the *Erica discolor-versicolor* group

##### 1a Leaves 4-nate:

2a Leaves, bract, bracteoles and sepals covered with numerous stalked glands on margins and abaxial surface ..... *E. croceovirens* (55.1)

2b Leaves, bract, bracteoles and sepals not covered on adaxial surface with stalked glands:

3a Filaments distinctly widened and usually spoon-shaped at base ..... *E. versicolor* (58)

3b Filaments not distinctly widened at base:

4a Corolla green; sepals long ( $\pm 11$  mm),  $\pm \frac{1}{3}$  length of corolla, narrow; anther appendages long ..... *E. unicolor* subsp. *unicolor* (55a)

4b Corolla bicoloured; sepals 5–11 mm long:

5a Leaves 5–6 mm long; sepals 5–7 mm long; anther appendages absent ..... *E. unicolor* subsp. *mutica* (55b)

5b Leaves 7–11 mm long; sepals  $\pm 11$  mm long; anthers with or without appendages ... *E. unicolor* subsp. *georgensis* (55c)

##### 1b Leaves 3-nate:

6a Anther appendages long, narrow,  $\pm \frac{2}{3}$  as long as theca, rarely only  $\frac{1}{2}$  or as long as theca ..... *E. discolor* complex [*discolor/speciosa/hebecalyx*] (53)

6b Anther appendages absent or very short:

7a Ovary finely and densely hairy ..... *E. prolata* (59.1)

7b Ovary glabrous:

8a Sessile glands scattered over adaxial surface of sepals; filaments spoon-shaped at base ..... *E. versicolor* (58)

8b Sessile glands packed densely together on adaxial surface of sepals; filaments not expanded at base:

9a Leaves broad and short ( $\pm 3$  mm long); sepal sulcus short,  $\pm \frac{1}{3}$  length of sepal ..... *E. berzeloides* (59)

9b Leaves elongated ( $\pm 7$  mm long); sepal sulcus long,  $\pm \frac{2}{3}$  length of sepal ..... *E. diaphana* (60)

51. *E. speciosa* Andrews—see *E. discolor* complex (53).

52. *E. hebecalyx* Benth.—*E. discolor* complex (53)

#### 53. *E. discolor* complex

**Diagnostic features:** shrubs single-stemmed or multi-stemmed; leaves 3-nate; main branches with usually every node producing lateral branches in the flowering zone; flowers (1–)3-nate on ends of leafy side branches in short to long, spike-like synflorescences; sepals from ovate to lanceolate-acuminate, glabrous to hairy all over; corolla glabrous, often viscid, pink to red with greenish or yellowish tips, occasionally totally green; anthers with long, thin, pendulous appendages  $\pm \frac{2}{3}$  length of theca, rarely only  $\frac{1}{2}$  as long or as long as theca, often kinked, thecae sometimes prognathous at base either bluntly or sharply so; ovary 4-locular, slightly emarginate, glabrous.

This is a very common, widespread and highly variable complex. It used to consist of two very well-known and widespread species, *E. discolor* and *E. speciosa*, both Andrewsian names and the more localized *E. hebecalyx*. Despite their apparently well-known status as species, many persons had difficulty in assigning a name to plants from this complex, even finding it problematic to separate them from *E. versicolor* or *E. unicolor* (*viridescens*) and its variants. With the large amount of collections at our disposal we have found no satisfactory morphological characters to separate the variants at species level and felt that they all belonged to one large, widespread and common species with *E. discolor* being the oldest name and having three, rather indistinct variants, A, B & C, that need further investigation in the field and DNA studies to assess correctly for subspecific status. We are not prepared at this stage to give them any formal taxonomic ranking with new combinations or new names. This should be done when the above studies have been completed.

The structure of the main branches in the flowering region seemed to be a useful character to subdivide this complex—lateral flowering branches at every node with no intervening leafy nodes versus lateral flowering branches not at every node with few to many leafy nodes in-between. Many specimens fitted these characters in conjunction with the other one of elongated vegetative growth or not, but there were exceptions—the iconotype of *E. discolor* being one of these.

We hope that collectors will take note of all these problems when accurately noting population and plant details in the field.

**VARIANT A: *E. discolor* Andrews**, Coloured engravings of heaths 1: 20 (1794); Benth.: 629 (1839); Guthrie & Bolus: 75 (1905); Dulfer: 46 (1965). Iconotype: l.c.: t. 20 (15 Oct. 1794).

*E. cupressiformis* Salisb.: 354 (1802), *nom. illeg.* Type: as above.

Illustrations: Schumann & Kirsten: 59, t. 30, 31 (1992) as *E. discolor*.

Plants that were associated with this name have mainly a bushy growth coming from a multi-stemmed base and the main branches not usually continuing with long vegetative growth beyond the flowering zone. This is seen in wild populations in the region from Betty's Bay to Agulhas. We surmise that the occasional elongated vegetative growth with a more floriferous flowering zone would attract a collector more readily than the more sparsely flowering, short branches, hence the presence of this feature in a number of herbarium collections.



The iconotype of this name has the main branches continuing with vegetative growth beyond the inflorescence zone, several whorls of leaves between the lateral flowering branches (i.e. flowering branches not at every node), both of which can be found in some collections. We feel that this condition may have arisen due to very favourable growing conditions of unburnt young plants in England. The other variants, B & C, listed below, all have this clear growth. The ovate, glabrous sepals with a short sulcus,  $\pm \frac{1}{3}$  the length of the sepal and paler coloured flowers of the iconotype, match those of material from the western part of the distribution from Betty's Bay to Agulhas.

The leaves also tend to be shorter in this variant, 2–4 mm long.

This variant is widespread, occurring from Betty's Bay along the southern coastal lowlands to Humansdorp. It is more common in the west.

Vouchers: *Baker 211* (NBG!, NY!); *Baker 8896* (K!, NBG!); *Bolus 6761* (BOL!, NBG!, PRE!); *Ecklon & Zeyher locality 56.6* (NBG!, Pl, W); *Esterhuysen 28769* (BOL!, NBG!); *Goldblatt 3786* (MO, NBG!); *Lewis SAM65395* (BM!, SAM!); *Oliver 3353, 4191, 8474* (NBG!, PRE!); *Oliver & Palser 80* (NBG!, PRE!); *Zeyher 3159* (NBG!, Pl, PRE, W).

#### VARIANT B: '*speciosa*'

*E. speciosa* Andrews, Coloured engravings of heaths: t. 133 (1804) non Scheenv.: 1, t. 3 (1792); Benth.: 630 (1839); Guthrie & Bolus: 75 (1905); Dulfer: 45 (1965). Iconotype: l.c.: t. 133. Note: the plate is dated 'Dec. 1st 1804'.

*E. hirta* Andrews: t. 101 (1804) non Thunb. (1785). *E. speciosa* var. *hirta* (Andrews) Dulfer: 46 (1965). Iconotype: Andrews l.c.: t. 101. Note: the plate is dated 'Feb. 1st 1804'.

Illustrations: Andrews l.c.: t. 133; Schumann & Kirsten: 59, t. 26, 27 (1992).

This variant is usually a single-stemmed reseeder and has the main branches continuing with elongated vegetative growth beyond the flowering zone on every plant. The leaves are 6–10 mm long and the sepals narrower, 4–8 × 1–2 mm, with an attenuate apex. The corolla is always bicoloured, from dark pink to orange-red with green or yellowish tips. We have seen only single-stemmed plants, but have had reports of multistemmed resprouters in some inland populations.

A minor variation of this variant has slightly longer leaves and sepals which are either hairy or glabrous. Superficially it looks rather like *E. unicolor* subsp. *georgensis* (55c), which, however, has 4-nate leaves. It occurs along the coastal plains east of George from Knysna to Humansdorp.

Variant B is also common and widespread, mainly along the coastal mountain ranges from George to Humansdorp, but extends onto the much drier inland mountains of the Little Karoo from Laingsburg to Willowmore.

Vouchers: *Acocks 20392* (NBG!, PRE!); *Baker 325, 2449* (BM!, NBG!); *Oliver 3065, 3134, 10033* (NBG!, PRE!); *Rycroft 2977* (NBG!, NY!).

VARIANT C: *E. hebecalyx* Benth. in DC., Prodrum 7: 630 (1839); Guthrie & Bolus: 75 (1905); Dulfer: 46 (1965). *E. speciosa* Andrews var. *tomentosa* Klotzsch: 656 (1835). Type: Prom. b. sp. [Cape of Good Hope], *Mund & Maire s.n.* (B†, holo.; K!, W).

Illustrations: Schumann & Kirsten: 59, t. 28, 29 (1992).

The tomentose sepals were regarded by Guthrie & Bolus (1905) as giving this variant 'a distinct appearance' and referred to those plants occurring in the mountains above George. Subsequent collections have shown populations with tomentose sepals in the Kammanassie Mtns and as far afield as the northern side of Seweweekspoort. It forms single-stemmed plants with the main branches producing elongated vegetative growth in the George area where the flowers are a pale yellow-green, occasionally reddish pink with green tips. We have not studied the other populations in the field.

Vouchers: *Barker 8192* (NBG!, NY!); *Marsh 1414* (K!, NBG!); *Middlemost 2117* (NBG!, PRE!); *Oliver 9247, 11834* (NBG!); *Schlechter 2268* (BM!, BOL!, K!, NBG!, Pl, W).

54. *E. dichrus* Spreng.—see *E. unicolor* subsp. *mutica* (55b).

55. *E. unicolor* J.C.Wendl., *Ericarum icones et descriptiones*: f. 25, 7, t. 3 (1819); Guthrie & Bolus: 76 (1905). Iconotype: l.c.: t. 233 (1818).

*E. viridescens* Lodd.: 3, t. 233 (1818); Dulfer: 47 (1965), nom. nudum. Iconotype: l.c.: t. 233. Note: in most cases Loddiges's plates were not accompanied by either a diagnosis nor a description and are therefore invalid according to Art. 32.1 of the International Code of Botanical Nomenclature (2000) (Nelson & Oliver in prep.).

*E. hirta* Andrews var. *viridiflora* Andrews: t. 173 (post 1805–pre 1809); Andrews: t. 166 ( $\pm$  1807). Iconotype: l.c.: t. 173. See under typification of *E. colorans* (63) for a discussion on dates.

**Diagnostic features:** leaves 4-nate; no glandular hairs on the vegetative parts; flowering lateral branches not at every node, sometimes arranged in clusters on main branches; filaments not widened and spoon-like at base.

#### 55a. subsp. *unicolor*

Illustrations: Schumann & Kirsten: 60, t. 36, 37 (1992).

**Diagnostic features:** leaves 6–10 mm long, villous; sepals  $\pm$  11 mm long,  $\pm \frac{1}{3}$  length of corolla; corolla unicoloured, yellow-green; anther appendages 1.3–1.7 mm long, usually slightly kinked.

This subspecies occurs on the southern slopes of the Outeniqua Mtns between Robinson Pass and George.

Vouchers: *Acocks 20580* (K!, NBG!, PRE!); *Compton 19602* (NBG!); *Esterhuysen 22804* (BOL!, PRE!); *Goldblatt 1782* (MO, NBG!, PRE!); *Oliver 10427* (NBG!); *Schumann 344* (NBG! voucher for Schumann & Kirsten l.c.); *Taylor 9395* (NBG!, NY!).

55b. subsp. *mutica* E.G.H.Oliv. & I.M.Oliv., stat. et nom. nov.

*E. bicolor* Andrews, Coloured engravings of heaths: t. 79 (1804) non Thunb. (1785). *E. dichrus* Spreng.: 179 (1825); Benth.: 631 (1839); Guthrie & Bolus: 76 (1905). Iconotype: l.c.: t. 79.

Illustrations: Schumann & Kirsten: 60, t. 32, 33 (1992).

**Diagnostic features:** leaves 5–6 mm long, glabrous to sparsely hirsute; sepals 5–7 mm long,  $\pm \frac{1}{4}$  length of corolla; corolla bicoloured, red with green tips; anthers muticous or occasionally with very short appendages.

Subsp. *mutica* occurs on the lowlands south of the Outeniqua Mtns in the Herbertsdale/Mossel Bay area and lower southern and northern slopes of the mountains from Herbertsdale to George.

Vouchers: *Barker 7942* (NBG!); *Compton 23507* (NBG!, NY!); *Galpin 3579* (NBG!); *Killick 3467* (NBG!, PRE!); *Middlemost 2020* (K!,



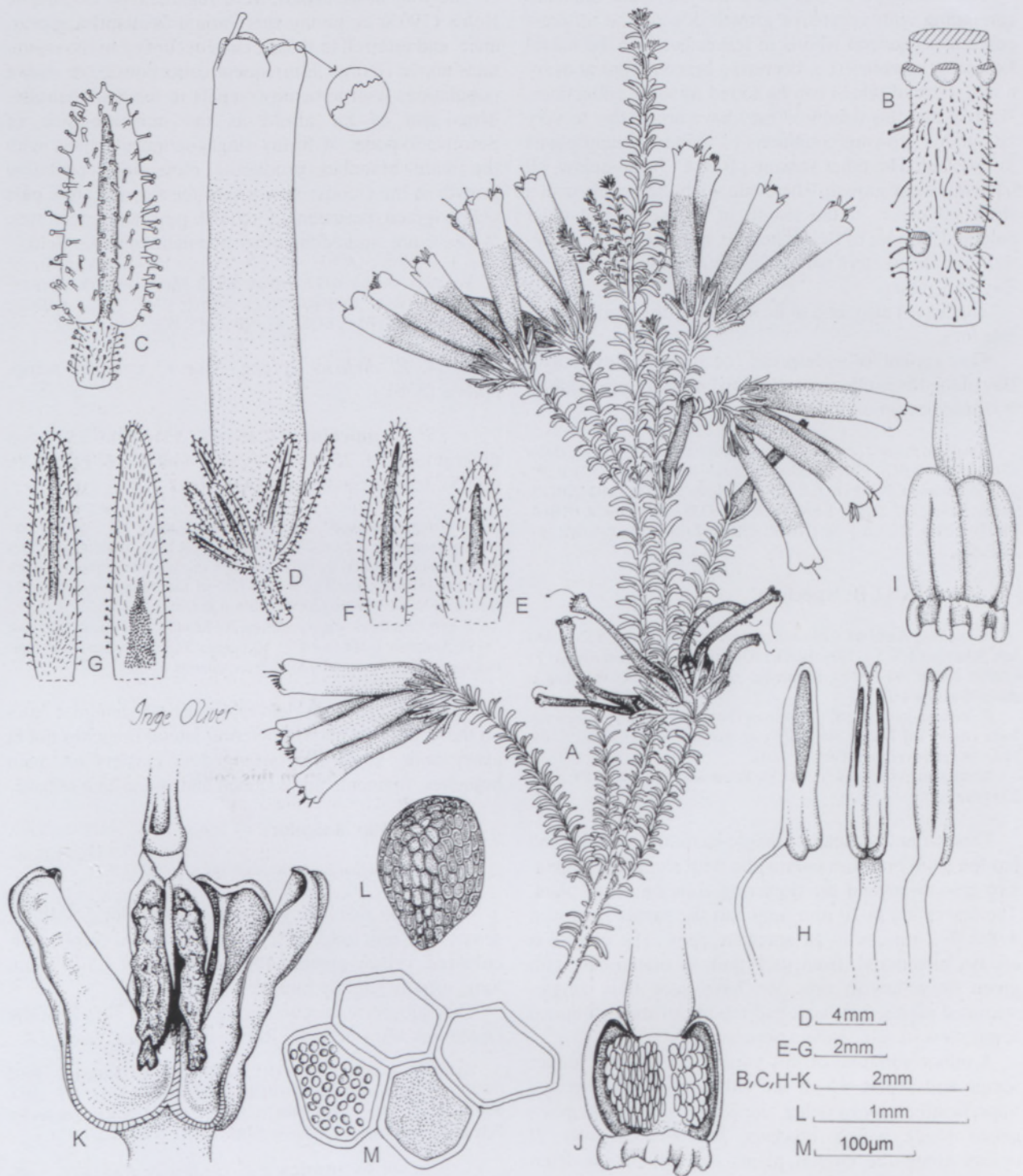


FIGURE 11.—*Erica croceovirens*. A, flowering branch,  $\times 1$ ; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal, abaxial view on left and adaxial view on right showing small patch of sessile glands; H, anther, side, front and back views. I, J, ovary; J, opened laterally to show ovules and placenta. K, capsule with one valve removed; L, seed; M, testa cells. Scale bars: B, C, E–K, 2 mm; D, 4 mm; L, 1 mm; M, 100  $\mu\text{m}$ . All drawn from the type collection by I.M. Oliver.

NBG!; Murray sub Baker 1220 (BM!, NBG!); Oliver 9111, 10835 (NBG!); Van Wijk 863 (NBG!); Wells 2822 (NBG!, PRE).

55c. subsp. **georgensis** E.G.H.Oliv. & I.M.Oliv., subsp. nov., foliis longis 7 ad 11 mm, sepalis plusminusve 11 mm longis antheris calcaribus ad 2 mm longis vel sine calcaribus dignoscenda.

TYPE.—Western Cape: 3322 (Oudtshoorn), George District, Outeniqua Pass, S side near summit, 790 m, (–CD), January 1979, Oliver 7402 (NBG).

**Diagnostic features:** leaves 7–11 mm long, glabrous and sparsely ciliate; sepals  $\pm$  11 mm long; corolla bicoloured, shades of pink-red with green/yellow tips; anthers muticous or with thin straight appendages up to 2 mm long.

This subspecies is confined to the mountains above George where it can be sympatric with *E. discolor* variant C (*E. hebecalyx*). Hybrids have been noted by us on the northern side of the Montagu Pass. Some collections exhibit ciliate corolla lobes.



*Paratype material* (selection from numerous specimens): WESTERN CAPE.—3322 (Oudtshoorn); George District, Montagu Pass, (–CD), 14-01-1897, *Bolus* 4353 (NBG!); *ibid.*, 29-09-1939, *Compton* 7536 (NBG!); *ibid.*, 06-1927, *Fourcade* 3251 (NBG!); *ibid.*, 09-1932, *Fourcade* 4747 (NBG!); *ibid.*, 24-06-1943, *Fourcade* 6016 (NBG!); Outeniqua Pass, (–CD), 14-07-1964, *Baker* 2322 (NBG!); *ibid.*, 15-04-1952, *Barker* 7935 (NBG!); *ibid.*, 15-04-1952, *Lewis* SAM66702 (NBG!, SAM!); Klein Swart River, (–CD), 8-10-1928, *Gillett* 1220 (NBG!); George, near the town, (–CD), 13-01-1897, *Guthrie* 4352 (NBG!); Blanco, (–CD), 04-1930, *Meyer* STE10963 (NBG!); Gwyon [Gwaing] River, (–CD), 1880, *Young* BOL5519 (NBG!).

55.1. ***E. croceovirens* E.G.H.Oliv. & I.M.Oliv., sp. nov.**, *Ericae unicolori* affinis sed indumento pilorum crassorum glandulorum cum pilis simplicibus brevioribus in ramis, foliis, pedicellis, bracteis, bracteolis sepalibusque differt. Figura 11.

TYPE.—Western Cape, 3322 (Oudtshoorn): Outeniqua Mtns, north side; Groot Doringrivierkloof Wilderness area, Modderas Kloof 133, 600 m, (–CD), 8 March 2000, *E.G.H. & I.M. Oliver* 11889 (NBG, holo.; BM, BOL, K, MO, NBG, NY, PRE).

Shrubs scraggy, sparse, up to 1.5 m tall with a few long, upright, main branches and bushy, twiggy, lower growth, multistemmed resprouters or sometimes single-stemmed reseeders. *Branches*: few main erect branches varying considerably in length, 200–500 mm, with or without continuing vegetative terminal growth, secondary branches 20–30 mm long in groups of 4–8 at every 5–10 nodes; internodes on main branches 2–6 mm long, on secondary branches  $\pm 2$  mm long; stems with short, dense, spreading, simple hairs and scattered, long, mainly reflexed, gland-tipped hairs. *Leaves* 4-nate, spreading-recurved, broadly oblong, 4–10 mm long, rounded on both sides with rounded margins but acute towards base, abaxially covered with very short simple hairs and scattered, longer, gland-tipped hairs, adaxially with eglandular hairs, margin with long, relatively stout, gland-tipped hairs, sulcus slightly open, open at base; petiole  $\pm 0.7$  mm long, short, simple, longer, stouter, gland-tipped hairs. *Inflorescence*: flowers 4-nate in a single whorl at ends of secondary branches; pedicel 2.8–3.2 mm long, covered with short, simple, longer, stouter, gland-tipped hairs; bract partially recaulescent approximate to calyx, broadly lanceolate,  $\pm 4.5 \times 1.7$  mm, green and leaf-like; bracteoles 2, approximate to calyx, lanceolate,  $\pm 5.7 \times 1.2$  mm, otherwise like bract. *Calyx* 4-partite, segments lanceolate,  $\pm 7 \times 1.3$  mm, with adaxially at base a triangular patch of sessile viscid glands,  $\pm \frac{1}{3}$  length of segment, otherwise like bract. *Corolla* 4-lobed, tubular, 23–28  $\times$  5 mm, straight to very slightly curved when young, more so when older, glabrous, viscid, bright orange in lower  $\frac{2}{3}$  apically yellow-green, slightly narrowed towards mouth; lobes erect to slightly spreading,  $\pm 2.5 \times 3$  mm, broadly rounded, erose. *Stamens* 8, free, included to subexserted; filaments linear,  $\pm 21$  mm, with slight sigmoid bend near apex, glabrous, white; anthers bilobed, erect, oblong in adaxial view, muticous, orange, smooth; thecae oblong,  $\pm 2.6 \times 0.5$  mm in lateral view, adpressed with apices slightly spreading; pore elongate,  $\pm 1.5$  mm long,  $\frac{2}{3}$  length of theca; pollen shed in tetrads. *Ovary* 4-locular, broadly cylindrical to ellipsoid, 2  $\times$  1.5–2.0 mm, apically rounded and emarginate, glabrous, green, with distinct large nectaries around base; ovules 35–60 per locule from a placenta the complete length of columella, laterally flattened; style exserted, from 1–3 mm long, white; stigma simple, truncate to

minutely widened, dark green. *Fruit* a dehiscent capsule,  $\pm 4.3 \times 4.3$  mm, hard and woody, valves splitting  $\pm \frac{3}{5}$  their length to 30°, septa variable with basal portion mostly on valve to upper portion equally on valve and columella, placenta convoluted and warty, elongate, lobed towards base. *Seeds*  $\pm$  obovoid but subangular and laterally flattened, alveolate, brown, testa cells  $\pm$  hexagonal, anticlinal walls thick, straight, outer periclinal walls with numerous bumps, inner periclinal walls with numerous small pits. Figure 11.

*Diagnostic features*: leaves 4-nate; stout, gland-tipped hairs on stems, leaves, pedicel, bract, bracteoles and sepals together with much shorter, finer indumentum of simple hairs; corolla bicoloured, orange with upper third yellow-green; anthers muticous.

This new species is related to the group of tubular-flowered species (*E. unicolor*, *E. discolor* complex, *E. versicolor*, *E. diaphana*, *E. berzeloides*) which all have the same seed structure and arrangement of bract, bracteoles and sepals and viscid corollas caused by sessile glands on the inner, adaxial surface of the sepals. It is most closely related to *E. unicolor* in the 4-nate leaves, narrow sepals and muticous to appendiculate anthers. The flowers are yellow-green to green in subsp. *unicolor* to bicoloured, orange-red and green/yellow in subsp. *mutica* and subsp. *georgensis*. The latter differs in having only simple hairs when these are present. The other species listed above all have 3-nate leaves.

*E. croceovirens* has distinctively orange flowers with the upper third of the tube being yellow-green, hence the epithet: *croceus*, saffron orange; *virens*, green (Latin). There is little variation in this colour combination other than in the intensity of the orange.

The species is confined to the Doringrivier Wilderness Area on the northern slopes of the Outeniqua Mountains (Figure 12) where it grows on sandy, dry flats or rocky, north-facing slopes with short fynbos vegetation. In the area, scattered plants of the glandular *E. glandulosa* occur, as well as plants of *E. discolor* with its flowers being more pink. The species could well be overlooked as being another form of *E. glandulosa* but it is easily distinguished on closer examination and assessment of the characters mentioned above. This probably explains its somewhat recent discovery by Jan Vlok.

*Paratype material*: WESTERN CAPE—3322 (Oudtshoorn): Doringrivier Wilderness Area, N slopes of Outeniqua Mtns, 1500 ft [460 m], (–CC), 28-08-1989, *Kirsten* 1207 (NBG); *ibid.*, 2000 ft [610 m], 9-02-1989, *Vlok* 2129 (NBG); Groot Doringrivierkloof Wilderness area, Modderas Kloof 132, SE of Brookesbosberg, 660 m, (–CC), 8-03-2000, *E.G.H. & I.M. Oliver* 11893 (NBG); Groot Doringrivier Valley, N slopes of Outeniqua Mtns, 1950 ft [595 m], (–CD), 27-08-1989, *Oliver* 9249 (K, NBG, PRE); Doringrivier West, (–CD), 23-07-1994, *Van Wijk* 827 (NBG).

56. ***E. x serratifolia* Andrews**, Coloured engravings of heaths: t. 58 (1798); Benth.: 631 (1839); Guthrie & Bolus: 77 (1905); Dulfer: 47 (1965). Iconotype: l.c.: t. 58.

Andrews described the plants as having 4-nate leaves with flowers 2- or 3-nate but shows in the drawing, five as 2-nate, 13 as 3-nate and two as 4-nate. He says the flowers are 'orange yellow' but shows in his painting the open flowers with a distinct, red base ( $\frac{1}{4}$ – $\frac{1}{3}$ ) and clear yellow upper portion, therefore bicoloured, and the buds all dis-



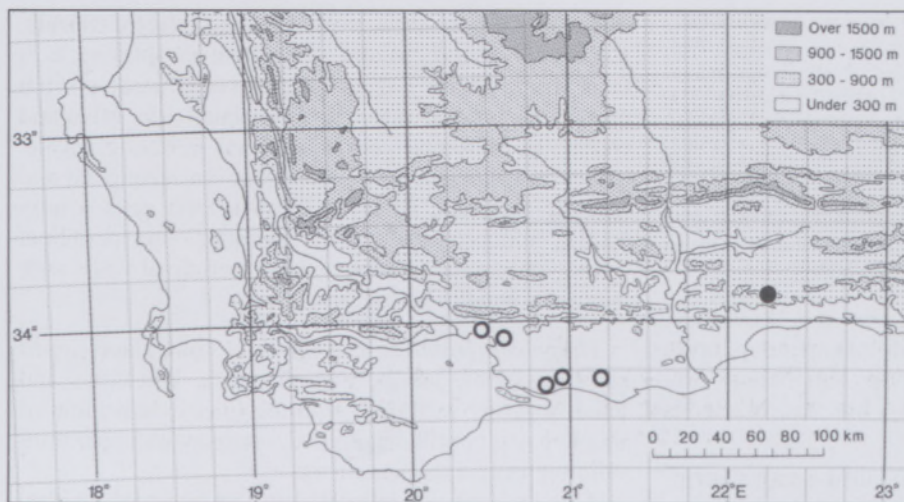


FIGURE 12.—Known distribution of *Erica croceovirens*, ●; and *E. prolata*, ○.

tinctly green-tipped ( $1/4$ ), tricoloured. This material we regard as a hybrid of garden origin in England with *E. unicolor* subsp. *mutica* (55b) possibly as one of the parents.

*E. serratifolia* var. *subnuda* Bolus has been described as *E. kogelbergensis* (44.1). The figures and text in Schumann & Kirsten (1992: 66) refer to this species.

58. *E. versicolor* Andrews, Coloured engravings of heaths, t. 67 (1796). Benth.: 631 (1839); Guthrie & Bolus: 78 (1905); Dulfer: 48 (1965). Iconotype: l.c. t. 67.

Note: the plate is dated 'June 1st 1796'.

*E. versicolor* var. *ciliata* J.C.Wendl.; 115, t. 43 (1809); Dulfer: 49 (1965). Iconotype: l.c.: t. 43.

*E. versicolor* var. *longiflora* Andrews: t. 249 ( $\pm$  1816); Dulfer: 48 (1965). Iconotype: l.c.: t. 249.

*E. versicolor* var. *monticola* Bolus: 78 (1905); Dulfer: 49 (1965). Syntypes: Worcester Div.; Matroosberg, 3500 ft, Bolus in Herb. Guthrie 3951 (BOL!); Swellendam Div.; Shand in Herb. Bolus (BOL!).

Illustrations: Schumann & Kirsten: 63, t. 48, 49 (1992).

**Diagnostic features:** lateral branchlets not at every node; leaves 3- occasionally 4-nate; sepals with narrowed leafy apex, often slightly spreading; filaments spoon-shaped at base; anthers often with sharp projecting point at base, muticous.

This is a variable species especially in the habit and habitat, the indumentum, the leaf arrangement, colour of the corolla and in the base of the anthers. Bolus' var. *monticola*, although growing in inland, rocky, dry areas from Matroosberg to near Citrusdal, has no morphological features to distinguish it from typical *E. versicolor* from the moist Langeberg range. The Shand collection, syntype of var. *monticola*, is clearly the Langeberg variant and not the gnarled inland variant. Detailed work is required to ascertain whether these variants should receive taxonomic status.

The species occurs from Citrusdal to the Anysberg (Laingsburg) and along the Langeberg and western Outeniqua Mtns and the coastal plains from Swellendam to Gouritz River.

Vouchers: Bohnen 8063 (K!, NBG!, PRE!); Galpin 3574 (NBG!, PRE!), 3581 (BOL!, K!, NBG!, PRE!); Oliver 4149, 7602, 7606, 8648, 10545 (NBG!); Schlechter 1981 (BM!, BOL!, K!, NBG!, PRE!); Taylor 5924 (NBG!); Van Zyl 3393 (NBG!).

59. *E. berzeloides* Guthrie & Bolus in Flora capensis 4: 78 (1905); Dulfer: 49 (1965). Type: Bredasdorp Div.; Mierkraal, 200 ft, Schlechter 10530 (BOL!).

Illustration: Schumann & Kirsten: 63, t. 50 (1992).

**Diagnostic features:** lateral branchlets not at every node; leaves 3-nate, elliptic/ellipsoid, short,  $\pm$  3 mm long; flowers 1-3-nate, scattered; corolla red-pink in lower half with white upper half; sepals with sessile glands on adaxial surface densely packed; anther appendages small; ovary 4 locular, emarginate, glabrous.

This species is restricted to flats and calcareous ridges south of Bredasdorp. Indications are that it could be a resprouter.

Vouchers: Kirsten 852 (NBG!); Oliver 8823 (NBG!); Schumann 225 (NBG!).

59.1. *E. prolata* E.G.H.Oliv. & I.M.Oliv., sp. nov., habitu ramorum principalium perlongorum prolatorumque flores ferentibus ex parte basali fruticosaque, ovario pubescenti dignoscenda. Figura 13.

**TYPE.**—Western Cape, 3420 (Bredasdorp): Heidelberg Dist., Rondekop above Melkhoutkraal, NW of Duivenhoks River mouth, 200 m, (–BD), 4 September 2001, E.G.H. & I.M. Oliver 11935 (NBG, holo.; BM, BOL, K, MO, NY, P, PRE, S).

Very sparse, slender, erect shrub up to 3(–4) m tall with 3–5 erect main branches arising from bushy,  $\pm$  0.5 m tall base, single-stemmed. **Branches:** main branches leafy for upper 100–500 mm, with continuous apical growth, secondary branches few, 10–200 mm long, either vegetative or ending in a florescence; tertiary branchlets occasional, very short, 10–20 mm long, ending in a florescence; stems covered with very short, dense, retrorse hairs and a few very short-stalked glands; internodes 1–5 mm long. **Leaves** 3-nate, oblong to occasionally narrowly ovate,  $\pm$  4.2  $\times$  1.2 mm, erect to suberect, abaxially rounded, adaxially flattened with margins acute, glabrous, margins of young leaves with sessile glands, sulcus narrow, open at base; petiole  $\pm$  1 mm long, glabrous margins with short hairs and glands. **Inflorescence:** 3 flowers in 1 whorl at ends of secondary branches and occasionally tertiary branchlets, suberect to pendulous; pedicel 4–6 mm long with same indumentum as stem; bract partially recaulescent, approximate to calyx, ovate,  $\pm$  2.5  $\times$  2 mm, glabrous, green, margin with sessile glands, sulcus narrow,  $\pm$   $1/2$  length of bract; bracteoles 2, approximate to calyx,  $\pm$  2.8  $\times$  1.2–1.8 mm, otherwise like bract. **Calyx** 4-partite, segments ovate,  $\pm$  3.5  $\times$  2.2 mm, apex suddenly tapering into subacute point, green glabrous, margins with sessile glands, adax-



ially most of basal area covered with very sticky, sessile glands, sulcus narrow,  $\pm \frac{1}{3}$  length of segment. *Corolla* 4-lobed, tubular with slight bulge near mouth, very slightly contracted below lobes, 25–35 mm long, glabrous, very viscid and shiny, purplish pink, lobes  $\pm 1.5 \times 2$  mm, rounded, erose, erect to suberect. *Stamens* 8, included near the mouth, free; filaments  $\pm 24$  mm long, narrow with slight sigmoid bend below anthers, glabrous white; anthers bilobed, dorsally attached, muticous; thecae adpressed, narrowly oblong in adaxial view,  $\pm 2.2 \times 0.6$  mm, oblong in lateral view with slight basal adaxial nose, smooth, brown, pore  $\pm \frac{3}{4}$  length of theca, narrow; pollen in tetrads. *Ovary* 4-locular, broadly oblong,  $\pm 2.5 \times 3$  mm, emarginate, 8-lobed, covered with dense, short hairs, with small nectaries around base, ovules  $\pm 100$  per locule, spreading to pendulous, arranged in perpendicular rows, flattened laterally, placenta large, covering upper half of columella; style  $\pm 28$  mm long, narrow, just exserted, white glabrous; stigma simple truncate. *Fruit* a dehiscent capsule,  $\pm 5 \times 6$  mm, hard and woody, valves

opening to  $30^\circ$  for  $\frac{3}{4}$  their length; septa totally on valves, placenta  $\frac{2}{3}$  length of columella. *Seeds* ellipsoid,  $\pm 1.1 \times 0.7$  mm, slightly flattened, cells slightly sunken, anticlinal walls straight, thick, periclinal walls with dense pits and bladder-like protuberances. Figure 13.

*Diagnostic features:* habit of a few, very long, erect, subnaked stems, bearing the flowers and arising from a bushy, leafy base; main stems with occasional side branches (not every node); leaves 3-nate; anthers muticous; ovary densely and finely hairy.

The species is most similar to *E. diaphana* and *E. berzeloides* but differs mainly in the marked dimorphism of the branching system—the other species having rounded, open to closed, bushy habits. It is the only species in this complex with a hairy ovary.

*E. prolata* has an unusual and distinctive growth form which is similar to that found in *E. barrydalensis* (285.1) from the northern slopes of the Langeberg near Barrydale. The single-stemmed shrub forms a rounded,

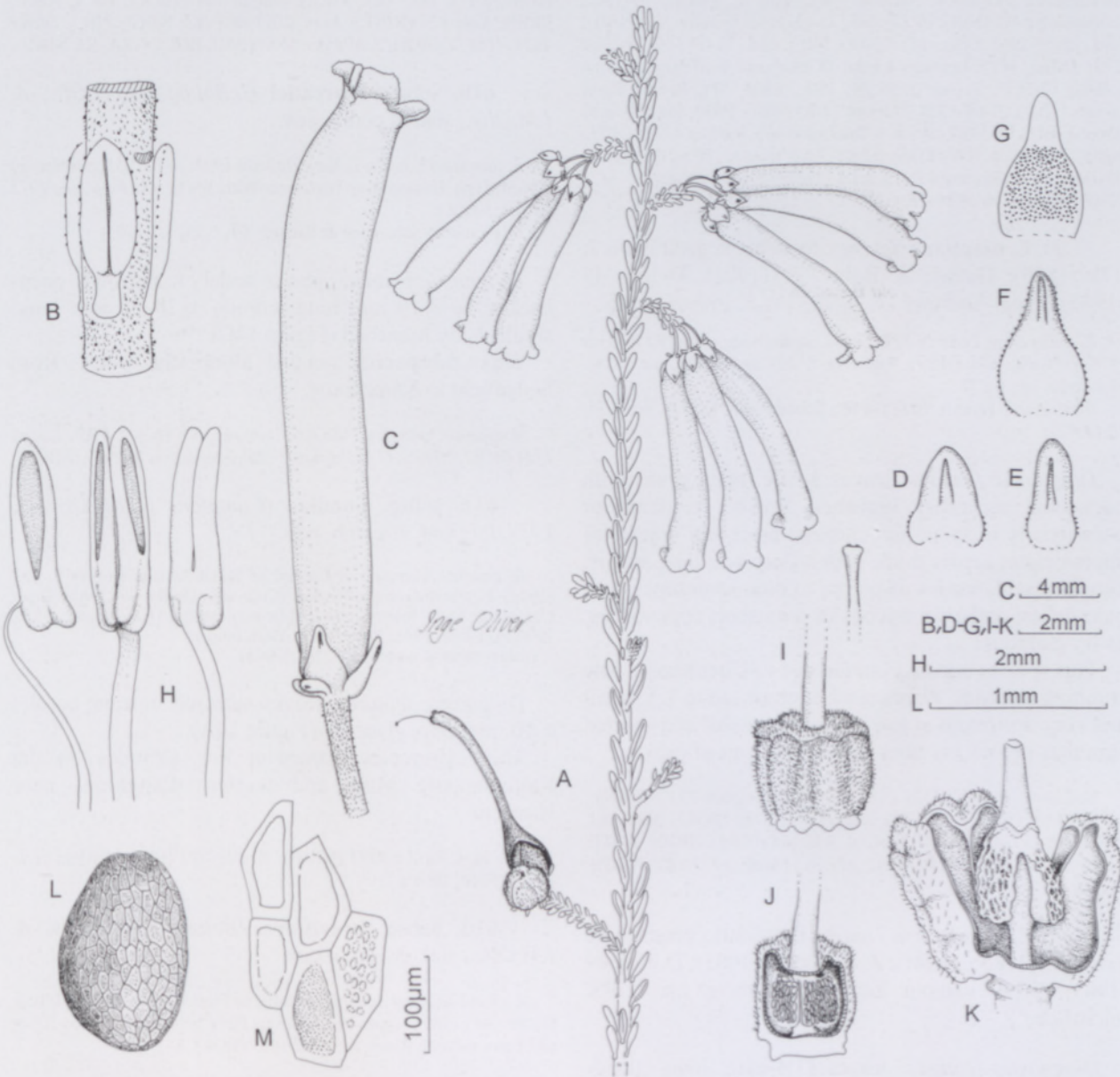


FIGURE 13.—*Erica prolata*. A, flowering branch,  $\times 1$ ; B, stem with leaves; C, flower; D, bract; E, bracteole. F, G, sepal: F, abaxial view; G, adaxial view showing sessile glands. H, anther, side, front and back views; I, gynoecium; J, ovary opened laterally to show ovules and placenta; K, capsule with one valve removed; L, seed; M, testa cells. Scale bars: B, D–K, 2 mm; C, 4 mm; L, 1 mm. All drawn from the type collection by I.M. Oliver.



much-branched, leafy, bushy base up to about 0.5 m high. From this 'bush' there arise 3–5 vigorous, erect main branches growing up to 4 m tall in old plants. These branches are almost devoid of leaves in their lower regions and bear the short, lateral, leafy, flowering side branches. No flowers occur on the bushy basal part of the plant. The name, derived from *prolatus*, extended, elongated (Latin), refers to the remarkable, very long, main flowering branches.

Material of this species has been variously identified as *E. versicolor* or *E. diaphana*.

The species is known from the coastal lowlands from near Swellendam to the mouths of the Breede and Duivenhoks Rivers and eastwards to the region south of Riversdale (Figure 12). In this range it occurs on various soil types from sandy gravel inland near Swellendam to sand associated with calcareous deposits near the coast. Plants in the type locality were visited by sunbirds; the stout main branches providing an ideal perch for the foraging birds.

*Paratype material:* WESTERN CAPE.—3420 (Bredasdorp): Swellendam, Bontebok National Park, 100 m, (–AB), 09-1962, Liebenberg 6476 (NBG, PRE); *ibid.*, 16-11-1966, Grobler 583 (NBG); *ibid.*, 25-09-1961, Oliver 1514 (NBG, PRE); *ibid.*, 26-09-1961, Rycroft 2303 (NBG, NY); between Kenko [Kinko] and Buffeljagts Rivier, (–BA), 10-183?, Zeyher 3156 (K, PRE, SAM, W); Breede River mouth, (–BD), 21-05-1928, Marloth 13185 (NBG, PRE); lower Breede River, (–BD), 05-1928, Mrs A.A. Tomlinson sub Marloth 13185 (BOL, NBG); Rondekop, NW of Duivenhoks River mouth, 180 m, (–BD), 20-03-1985, 3421 (Riversdale): 12 miles [19 km] S of Riversdale, (–AC), 22-09-1959, Lewis 5626 (NBG).

**60. *E. diaphana* Spreng.**, *Systema vegetabilium* 2: 178 (1825); Guthrie & Bolus: 79 (1905); Dulfer: 49 (1965). Type: Andrews l.c.: t. 283 [as *E. transparens*].

*E. transparens* Lodd.: t. 177 (1818), nomen nudum, non P.J.Bergius (1767); Benth.: 631 (1839); Andrews: t. 283 (post 1820, pre 1828). Iconotype: l.c.: t. 177.

Illustrations: Dyer: t. 1042 (1948); Schumann & Kirsten: 64, t. 51, 52 (1992).

*Diagnostic features:* leaves 3-nate; main stems with occasional secondary branches; flowers scattered or occasionally in spike-like clusters; bract and bracteoles approximate; sepals thick with a deep-set, long sulcus; corolla viscid, shades of purple to pink sometimes with paler lobes; anthers muticous or with short appendages; ovary glabrous.

This species occurs from George to Uitenhage at low and high altitudes. Plants can be robust, up to 1.5 m tall and very floriferous at low altitudes to small and gnarled shrublets in rock crevices near the summit of peaks.

Vouchers: Acocks 13724 (NBG!, PRE); Compton 23340 (NBG!, NY!), 23899 (BM!, NBG!, S!); Esterhuysen 6739 (BOL!, BOL!, K!, PRE); Oliver 3436, 9958 (NBG!); Schlechter 5993 (BOL!, NBG!, PRE); Taylor 9839 (BM!, NBG!, PRE); Thode A925 (K!, NBG!); Wisura 963 (NBG!, P!).

**61. *E. glandulosa* Thunb.**, *Dissertatio botanica de Erica*: 25 (1785); Guthrie & Bolus: 79 (1905); Dulfer: 49 (1965). Type: without locality, *Thunberg s.n.* (UPS, microfiche!).

*Diagnostic features:* leaves (3)4-nate; long, gland-tipped hairs on all parts except corolla and internal floral organs; flowers 4-nate on short to longish, leafy, side branches, bunched into loose spike-like groups on main branches; bract and bracteoles approximate; sepals nar-

row linear; corolla  $\pm$  20–30 mm long, semi-transparent, mostly glabrous, rarely hairy, with marked red veins and often longitudinal ridges.

This widespread species displays much variation in the length of side branches, leaf shape and corolla size (Figure 14). This variation range warrants the reduction of several formerly described species to synonymy and the recognition of subspecific categories.

#### 61a. subsp. *glandulosa*

Illustrations: Baker & Oliver: t. 20 (1967); Schumann & Kirsten: 64, t. 53, 54 (1992).

*Diagnostic features:* leaves narrowly sulcate,  $\pm$  5–7 mm long; corolla  $\pm$  20–30 mm long; shrubs single- or multi-stemmed, erect, bushy, up to 1.5 m tall (Figure 14D).

This is the most widespread subspecies occurring from the eastern Langeberg as far east as Port Elizabeth and inland to the eastern Great Swartberg.

Vouchers: Acocks 19910 (GRA, NBG!, PRE); Fourcade 2726 (K!, NBG!, NY!), 3882 (K!, NBG!); Galpin 3591 (BOL!, GRA, NBG!, PRE!); Keet 876 (NBG!); Kerr STE30085 (K!, NBG!, PRE); Oliver 4626, 10811 (NBG!); Schlechter 5858 (BM!, BOL!, GRA, K!, NBG!).

**61b. subsp. *fourcadei* (L.Bolus) E.G.H.Oliv. & I.M.Oliv.**, stat. et comb. nov.

*E. fourcadei* L.Bolus in Kew Bulletin 1933: 185 (1933); Dulfer: 50 (1965). Type: Humansdorp Dist., near Witte Els Bosch, Fourcade 2975 (BOL!, NBG!).

Illustrations: Schumann & Kirsten: 64, t. 55, 56 (1992).

*Diagnostic features:* leaves widely to narrowly open-backed,  $\pm$  7–10 mm long; corolla  $\pm$  20–30 mm long; shrubs laxly branched (Figure 14C).

This subspecies occurs along the coast from Sedgefield to Kareedouw.

Vouchers: Chater s.n. (NBG!); Fourcade 3005 (NBG!, PRE); Gillett 1324 (BOL!, NBG!); O'Callaghan, Fellingham & Van Wyk 119 (NBG!).

**61c. subsp. *bondiae* (Compton) E.G.H.Oliv. & I.M.Oliv.**, stat. et comb. nov.

*E. bondiae* Compton in Journal of South African Botany 9: 153 (1943). *E. glandulosa* var. *bondiae* (Compton) Dulfer: 49 (1965). Type: Uniondale Div.: Mannetjiesberg [Mannetjiesberg] (Kamassie Mts), 1000 m, 1 Feb. 1941, Bond 925 (NBG!, holo.).

Illustration: Compton l.c.: t. 6 (1943).

*Diagnostic features:* leaves narrowly sulcate; corolla  $\pm$  10 mm long, glabrous (Figure 14A).

This subspecies occurs at low altitudes on the Kammanassie Mtns and western Langkloof near Haarlem.

Vouchers: Oliver 9395 (NBG!); Rourke 371 (BM!, NBG!); Wells 2829 (NBG!, PRE!).

**61d. subsp. *breviflora* (Bolus) E.G.H.Oliv. & I.M.Oliv.**, stat. et comb. nov.

*E. glandulosa* var. *breviflora* Bolus in Flora capensis 4: 79 (1905); Dulfer: 49 (1965). Type: Humansdorp Div.; between Gamtoos River and Leuvenbosch River, Burchell 4803 (BOL!, K!).

*Diagnostic features:* leaves narrowly sulcate; corolla  $\pm$  10 mm long, glandular hairy (Figure 14B).

This subspecies occurs NW of Humansdorp and we feel must be regarded as distinct from the glabrous-flow-



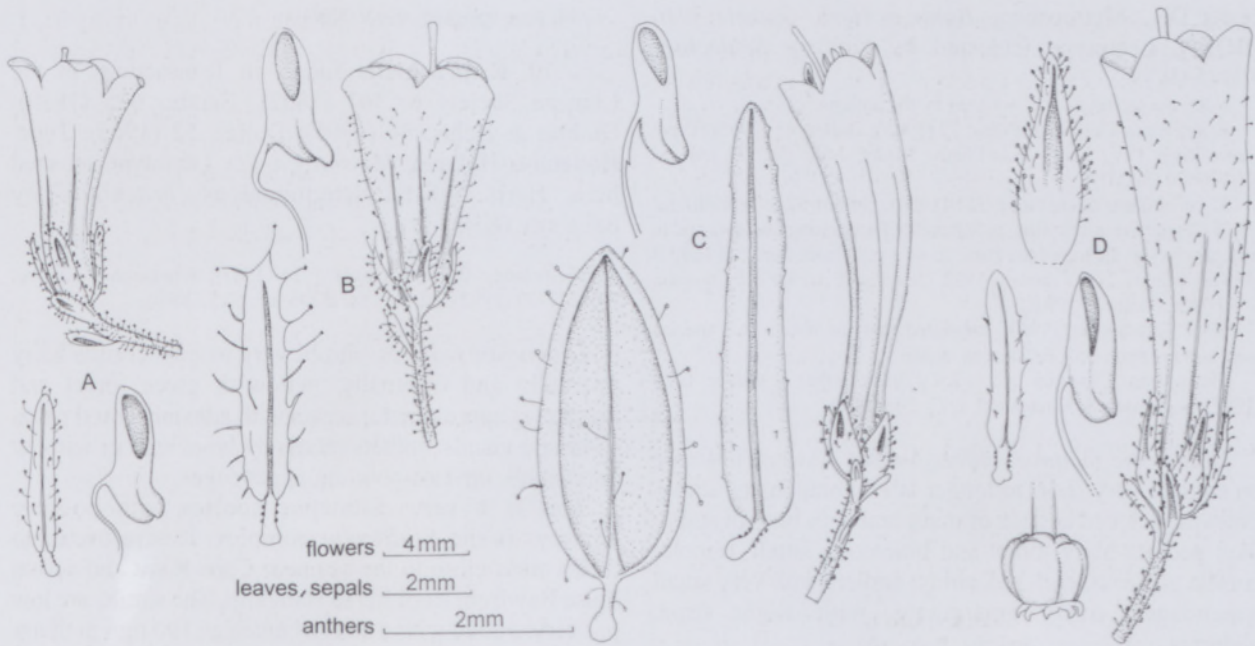


FIGURE 14.—*Erica glandulosa*. A, subsp. *bondiae*, Rourke 371, flower, leaf and anther; B, subsp. *breviflora*, Oliver 9376, flower, leaf and anther. C, subsp. *fourcadei*: O'Callaghan 564, flower, sulcate leaf and anther; Geldenhuis 1066, open-backed leaf. D, subsp. *glandulosa*, Oliver 7953, leaf, flower, sepal, anther and ovary. Scale bars: flowers, 4 mm; leaves, sepals and anthers, 2 mm. Artist: I.M. Oliver.

ered subsp. *bondiae*. We postulate that it evolved as a short-tubed variant from a local glandular-flowered subsp. *glandulosa* independently from subsp. *bondiae*.

Vouchers: type and Oliver 9376 (NBG!; PRE!).

61.1. *E. pyrantha* Bolus—see *E. pillansii* (66.1).

61.2. *E. etheliae* L.Bolus in Annals of the Bolus Herbarium 2: 154, t. 10C (1918); Dulfer: 49 (1965). Type: South-Eastern Region, near Port Elizabeth, *Ethel West* 295 (BOL!).

Illustration: l.c.: t. 10C.

**Diagnostic features:** like *E. glandulosa* but anthers differently shaped and subbasally attached, with longer decurrent appendages; flowers borne more terminally on main branches.

This is known only from the type collection, the locality of which is rather vague. No additional collections have been made. With the areas of unspoiled indigenous vegetation now virtually absent on the sandy flats west of Port Elizabeth due to the spread of housing, farming and alien plants (Australian *Acacia* spp.) the likelihood of finding material to match the type is very small.

We postulate that this material could have been of hybrid origin with the parent species being *E. glandulosa* and *E. chloroloma* both of which have been recorded in the Port Elizabeth area.

61.3. *E. fourcadei* L.Bolus—see *E. glandulosa* subsp. *fourcadei* (61b).

65. *E. ×mertensiana* J.C.Wendl. ex Klotzsch in Linnaea 9: 659 (1835); Benth.: 635 (1839); Guthrie & Bolus: 81 (1905); Dulfer: 51 (1965). Type: ex hort. anglicanis, *Herb Wendland* s.n. (?). This taxon is regarded as a hybrid of garden origin in England.

66. *E. cruenta* Sol. in Aiton, Hortus kewensis, edn 1, 2: 16 (1789); Benth.: 629 (1839); Guthrie & Bolus: 82 (1905); Dulfer: 51 (1965). Type: Cape of Good Hope, *Masson* s.n. (BM!).

*E. cruenta* var. *mutica* Bolus: 82 (1905); Dulfer: 51 (1965). Type: Caledon Div., Houw Hoek, 1000 ft. [300 m], *Guthrie* 4590 (BOL!).

*E. cruenta* var. *buccinula* Bolus: 82 (1905); Dulfer: 51 (1965). Syntypes: Caledon Div., Palmiet River, 800 ft [244 m], *Guthrie* 2297 (?), 3553 (BOL!), & 4163 (BOL!).

Illustrations: Schumann & Kirsten: 68, t. 66, 67 (1992).

**Diagnostic features:** leaves 3-nate; flowers 1–3-nate on short, leafy branchlets at each node, often aggregated into loose to dense, spike-like synflorescences; corolla glabrous, dark red; anthers with high dorsal attachment, mucicous with long appendages; ovary 4-locular, with slight stipe, not emarginate.

This species is variable in corolla length, 10–24 mm, with collections at the lower end having been described as var. *buccinula*. There is no clear-cut distinction in this range to warrant taxonomic recognition.

*E. cruenta* occurs on heavy shale soils at low altitudes where it is often found in renosterveld or such-like arid vegetation and as such is the only species of *Erica* with this habitat preference. It grows from Grabouw to Riversdale.

*E. cruenta* var. *campanulata* Bolus is transferred to *E. elimensis* L.Bolus (261.2).

Vouchers: Oliver 3259 (K!, NBG!, PRE!); Schlechter 7783 (BM!, BOL!, K!, NBG!, P!, PRE!); Zeyher 3155 (K!, NBG!, P!, PRE!).

67. *E. wendlandiana* Klotzsch—this species has been moved to No. 50, p. 136.

68. *E. haematosiphon* Guthrie & Bolus in Flora capensis 4: 83 (1905); Dulfer: 52 (1965). Syntypes: coast region, from 1700–5500 ft [520–1 680 m]: Clanwilliam Div.; without precise locality, *Leipoldt* 622 (BOL!); Ceres Div., near Ceres, *Guthrie* 3182 (BOL!); Gydouw Mountain, *Schlechter* 10045 (BM!, BOL!, W); Wor-



cester Div., Matroosberg, *Bolus in Herb. Guthrie 3946* (BOL!). Lectotype (selected by Dulfer): *Schlechter 10045* (W).

Note: the lectotype was not seen by the authors.

*E. macropus* Guthrie & Bolus: 72 (1905); Dulfer: 45 (1965). Type: Clanwilliam Div.; near Clanwilliam, *Mader 2180* (BOL!) [*Mader SAM40600* (SAM!)].

*E. coralliflora* Compton: t. 551 (1934); Dulfer: 52 as 'corallifera' (1965). Type: Ceres Division, in Mitchell's Pass among boulders and in rock crevices at the top of the Pass, about a mile from Ceres, at 1600 ft [488 m] altitude, 24th February, 1932, *Compton & Archer sub Compton 3950* (BOL, holo.; K!, PRE).

Note: Esterhuysen (1963) suggested that the above two species were synonymous with *E. haematosiphon*.

Illustrations: Compton l.c.: t. 551 (1934); Baker & Oliver: t. 26 (1967); Schumann & Kirsten: 69, t. 73, 74 (1992).

**Diagnostic features:** leaves 4-nate; flowers 1–4-nate on ends of very short to longer lateral branchlets, sometimes aggregated at ends of main branches but not spike-like; pedicel hairy; bract and bracteoles small, remote; corolla glabrous, dark red, shiny; anthers with very small appendages; ovary emarginate, with slight stipe, glabrous.

This species occurs in rocky areas or on rocks in the Cold Bokkeveld and Cederberg.

Vouchers: *Beyers 124* (NBG!); *Esterhuysen 2457* (BOL!, K!, NBG!, PRE); *Oliver 671* (BM!, NBG!), *10618* (NBG!); *Schlechter 10045* (BM!, BOL!, K!, NBG!, PRE); *Vogelpoel sub Baker 2439* (BM!, NBG!); *Williams 1985* (NBG!, PRE).

68.1. *E. coralliflora* Compton—see *E. haematosiphon* (68).

69. *E. chloroloma* Lindl. in Botanical Register 1838: t. 17 (1838); Benth.: 629 (1839); Guthrie & Bolus: 83 (1905); Dulfer: 52 (1965). Iconotype: l.c.: t. 17.

Illustrations: Lindley: t. 17 (1838); Baker & Oliver: t. 22 (1967); Schumann & Kirsten: 70, t. 75, 76 (1992).

**Diagnostic features:** leaves 4-nate; flowers 1–4 on ends of scattered, leafy side branches; pedicel hairy; bract and bracteoles small, median to approximate; corolla glabrous, red with green-tipped lobes; anther appendages long; ovary 4-locular, not emarginate, glabrous, with naked area on placenta.

This is an eastern species occurring on coastal dunes and limestone from Wilderness to the Fish River mouth.

Vouchers: *Acocks 18326* (NBG!, K!, PRE); *Booyesen STE30042* (voucher for Baker & Oliver l.c.) (BOL!, K!, MO!, NBG!, NY!, PRE); *Fourcade 2161* (BOL!, K!, NBG!, NY!); *Williams 1780* (BM!, NBG!, PRE).

69.1. *E. abelii* E.G.H.Oliv. in South African Journal of Botany 3: 268 (1984). Type: Cape Province: Uitenhage District, Perdekloof in the Elandsrivier Forest Reserve, 1600 ft [487 m], *Oliver 8407* [NBG(STE), holo.; BOL, GRA, K, NY, PRE].

Illustrations: Oliver l.c.: t. 1 (1984); Schumann & Kirsten: 60, t. 34, 35 (1992).

**Diagnostic features:** corolla lime-green, very finely hairy; ovary narrow, cylindrical, seated on large nectariferous basal disc, style with slightly swollen base.

The species is a very localized endemic to the mountains just NW of Uitenhage.

Vouchers: type and *Abel 9* (NBG!).

70. *E. brachialis* Salisb. in Transactions of the Linnean Society 6: 367 (1802); Benth.: 635 (1839); Guthrie & Bolus: 84 (1905); Dulfer: 52 (1965). Type: Hottentots Holland, *Masson s.n.* (?). Lectotype selected here: Herb. Salisb., determined as '*brachialis*' by Salisbury (K!).

Illustrations: Baker & Oliver: t. 25 (1967); Schumann & Kirsten: 70, t. 77–79 (1992); Oliver l.m. & Oliver: t. 15 (2000).

**Diagnostic features:** shrubs very woody; corolla hairy internally and externally, yellowish green; bract and bracteoles approximate; sepals with adaxial central patch of sessile glands; anthers relatively large with or without very small, upward-pointing appendages.

This is a very distinctive species with possible alliances in the *E. discolor* complex. It is restricted to rocky areas close to the sea near Cape Point and across False Bay from Rooi Els to Hangklip. The shrubs are low but very woody with trunks as much as 100 mm in diam. and in some cases growing just above the spray zone of the waves.

Vouchers: *Bolus Herb. Norm. 347* (BM!, BOL!, K!, NBG!, P!, SAM!); *Oliver STE30026* (BOL!, NBG!, K!, PRE!); *Parker 4455* (BOL!, K!, NBG!).

70.1. *E. inordinata* H.A.Baker in Journal of South African Botany 35: 25 (1969). Type: Cape Province. Uniondale Dist., Mannetjesberg, southern slopes to West of main peak  $\pm$  4500 ft [1 370 m], 18 Sept. 1967, *J.P.Rourke 859* (NBG!, holo.; BOL!, PRE!).

Illustrations: Baker l.c.: pl. 1, t. 1 (1969); Schumann & Kirsten: 70, t. 80, 81 (1992).

**Diagnostic features:** sepals broad, thick and hard in texture with adaxial sessile glands; corolla subterminally and basally inflated and slightly flattened laterally, extremely viscid, bright orange-red.

This is a very distinctive species with unclear relationships. It was placed next to *E. brachialis* by Dulfer, but is in our opinion totally unrelated to that species and very far removed geographically—occurring at high altitudes from the Kammanassie Mtns to the central Kouga Mtns. We suggest a possible relationship with *E. nubigena* Bolus (No. 277) which has small, purple-pink, viscid flowers.

Vouchers: *Esterhuysen 6476* (BOL!, K!, PRE); *Oliver 9934, 11825* (NBG!); *Williams 1075* (NBG!, PRE).

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