

The genus *Erica* (Ericaceae) in southern Africa: taxonomic notes 1

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ABSTRACT

This is the first in a series of notes on the southern African species of *Erica* L. which are currently recognized. Brief synonymy citing only the important revisions and synonyms is given, as well as comments on the status and diagnostic characters of each species. One new species, *E. petrusiana* E.G.H.Oliv. & I.M.Oliv. and 14 new subspecies are described, and 11 species are reduced to subspecific status. Where necessary drawings of important features and variations are given. Part 1 covers the first 35 species (Sections 1–3).

INTRODUCTION

The last revision of the genus *Erica* L. covering the species in southern Africa was undertaken by Dulfer (1965) and published as a brief conspectus—excluding descriptions and with very little or no discussion about problems of delimitation and the decisions he took. All of this was based almost exclusively on the very small collection of *Erica* housed in the Natural History Museum in Vienna (W), in many cases with species represented by only one or two specimens. He had only a few small loans from the Bolus Herbarium (BOL) and the Royal Botanic Gardens, Kew (K), having been refused large loans. His work was based on that of Guthrie & Bolus in *Flora capensis* (1905) and included the 220 species described since that publication. We estimate that he had far less material on which to base his decisions than did Guthrie & Bolus, who also consulted the large collections at Kew and the Natural History Museum, London (BM) and also at Trinity College, Dublin (TCD). Bolus also consulted the important Ericaceae collections in Berlin, which, except for the Willdenow herbarium, were totally destroyed during World War II. Fortunately he was allowed to remove a few flowers from several of the types and these are in BOL.

Dulfer's work is valuable in that he spent much time checking the synonymy and old references that Guthrie & Bolus had put together. This remains a much used source of reference in our work on *Erica*. Since Dulfer's revision, another 63 species have been added, and all the species formerly included under the 23 minor genera have also been added, with the relegation of these genera to synonymy under *Erica* (Oliver 1988, 1993a, 1993b, 2000). The number of species in the genus currently stands at 765 in the area covered by the *Flora of southern Africa*. The number of specimens located in the two Cape herbaria, Bolus Herbarium (BOL) and the Compton Herbarium (NBG), which now includes the old South African Museum Herbarium (SAM) and Government Herbarium, Stellenbosch (STE), greatly increases the amount of material that exhibits variation, compared to that which was available for Guthrie &

Bolus and considerably more so in the case of Dulfer.

Having studied the genus in the herbarium and in the field for 42 years (EGHO) and 15 years (IMO) respectively, we are in a position to update the species concepts currently recognized in the literature (Dulfer 1965; Oliver & Van Wyk 1993), and to publish our concepts which are incorporated as curatorial practice in the Compton Herbarium (NBG).

It has been decided to produce a series of taxonomic notes on the species following the short format used by Dulfer, but with short to detailed explanations of variations, of problems with delimitation and of new delimitation of some taxa. Where necessary illustrations of the variable taxa have been included. We have followed the numbered order started by Guthrie & Bolus (1905) and adapted by Dulfer (1965) and then by ourselves in the Compton Herbarium. This system follows the sectional arrangement used by Guthrie & Bolus in which the genus is divided into 43 sections based on the earlier work of Bentham (1839). These sections were an attempt to group the species into supposedly related assemblages. In some cases this is clearly the case, but in others there are no close relationships and species are, in our opinion, sometimes widely separated from their nearest relatives. An example is a species which was described twice by Guthrie & Bolus (1905), firstly as *E. auriculata*, which is no. 135, and secondly as *E. greyii*, which is no. 338.

This sectional/species arrangement is used here for want of a better, natural system which is as yet not forthcoming. The available morphological characters are not sufficiently adequate for this purpose due to the high degree of homoplasy present within the genus. To attempt to resolve this impasse, a study is to be undertaken into the molecular relationships of some 300 species in collaboration with overseas researchers to try to ascertain the basic clades within the genus and to couple this with an analysis of morphological characters. These results should give a good indication as to which the important morphological characters are in a reassessment of the genus at the level of subgenus and section.

In a few cases the species have not been fully resolved and we are forced to list these in complexes under the oldest name with pointers towards the problems that need to be resolved through more detailed fieldwork and molecular studies.

The genus *Erica* is by far the largest represented in the Cape Flora and it is, in our opinion, clearly still evolving

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actively. There are many species which are isolated in their relationships, and these one may regard as palaeoendemics, whereas there are many that form extremely complicated complexes that currently, and perhaps always will, defy satisfactory resolution.

To date, the only subspecific category that has been used in the main revisions is that of variety (*varietas*). With the current trend to drop that category, we have resorted to recognizing worthy subspecific groupings as subspecies, especially when there is, in addition to some morphological disjunction, also a disjunction in distribution, ecology or postulated pollination biology. In other cases we have refrained from a proliferation of subspecies and have resorted to listing unnamed variants which reflect what we believe are low level groupings that have been noted by us.

The concentration of so many species in the Cape Floral Region is shown in counts we have done. Often we have found four species growing in one square metre with the highest count thus far obtained being seven, or, in one case, four species in a quarter square metre—all not closely related species. In a number of cases the disjunctions between taxa can occur over very short distances with variants being confined to relatively small areas.

With such a large genus—currently 760 species in southern Africa, we are forced to publish this review in a series of parts covering a varying number of species per part depending on the complexity of the species and the species complexes in order to provide data on species delimitation soon, rather than wait many years for a complete coverage of all 680 capsular species in one publication. The 84 indehiscent fruited species have recently been dealt with in detail (Oliver 2000).

NOTE 1: in the numbering system the whole numbers for the species are those that were originally allocated by Guthrie & Bolus (1905). The species described since then until 1965 were placed by Dulfer nearest their supposedly nearest ally as a & b numbers. These we have altered to decimal notation since we use the a/b notation for subspecies. Species described since Dulfer's 1965 revision have been placed by us in their postulated alliances. Species we recognize are printed in bold Roman type. Those that are reduced to synonymy, or that we regard as cultivated forms, or dubious, are printed in bold italics.

NOTE 2: the inclusion under the synonymy of citations of publications additional to the original one, is restricted to the most important revisions of the genus. For all other citations and more detailed synonymy, reference should be made to Guthrie & Bolus (1905) and to Dulfer (1965).

NOTE 3: in the case of citations involving the two works of Andrews, *Coloured engravings of heaths* (1794–?1830) and *The Heathery* (1804–1812), the relevant work has to be cited in full in each instance, due to the considerable overlapping of publication dates (see Cleveley & Oliver 2002), and cannot be cross-referenced in the references.

ERICA COCCINEA COMPLEX

This complex, consisting of *E. coccinea*, *E. melastoma*, *E. intermedia* and *E. monadelphica*, is characterized by an enlarged petaloid bract and bracteoles

addressed to the calyx, long, attenuated, well-exserted anthers with rounded apices and basal attachment, the often flap-like placenta with a naked abaxial zone, shiny smooth seeds (not alveolate or reticulate) and leaves with a large sclerenchyma bundle on either side of the sulcus—these visible as white stripes in fresh or pressed material.

The inflorescence consists of 3-nate flowers, except in *E. melastoma* where they are borne singly.

The '*coccinea*' complex's nearest relatives are the species belonging to the small-flowered *E. imbricata* complex (no. 369) and not to any of the other large-flowered species, e.g. *E. plukenetii*, where similarities are the result of convergent evolution in pollination syndromes. It is at times difficult to differentiate between the various species, especially in the '*imbricata-placentiflora*' complex which has evolved numerous variants and in some cases these are sympatric, thus adding to the confusion. There could very well be a case for considering hybridization between some of these variants.

These two complexes cover a wide range of flower sizes from a large tubular corolla \pm 20 mm long, to a small globose one \pm 2 mm long. The pollination syndromes vary from bird pollination in the large-flowered species to insect and wind pollination in the small-flowered species.

Erica banksii is very similar to members of this complex, but lacks the distinctive sclerenchyma bundles in the leaves, and the anthers have the filaments attached more or less dorsally.

1. ***E. coccinea* L.**, *Species plantarum* edn 1, 1: 355 (1753); Salter: 633 (1951) p.p.; Dulfer: 28 (1965) p.p. Lectotype: Seba: t. 21, fig. 4 (1735), selected here by Oliver, Jarvis & Cafferty.

Note: a paper covering the typification of all Linnaean names of Cape *Erica* spp. is in preparation by Oliver, Jarvis & Cafferty.

Diagnostic features: corolla tubular, \pm 16–22 mm long; bract, bracteoles and sepals with long narrow sulcus; anthers far exserted; leaves recurved.

1a. subsp. ***coccinea***

E. petiveri L.: 10, t. 50 (1770); Benth.: 621 (1839); Guthrie & Bolus: 47 (1905). Lectotype: L., t. 50, selected here by Oliver, Jarvis & Cafferty, in prep.

E. sebana Donn: 45 (1796) nom. nud., et auct. mult.

E. petiveri var. *pubescens* Bolus: 47 (1905); *E. coccinea* var. *pubescens* (Bolus) Dulfer: 29 (1965). Type: Stellenbosch Div., Lowry's Pass, Burchell 8246 (K!); Hottentots Holland *Niven* 129 (K!); Caledon Div., Houw Hoek, Burchell 8130 (K!); Div.?, Bolus 8036 (BOL!).

Illustrations: Baker & Oliver: t. 1, 1–7 (1967); Schumann & Kirsten: 35, t. 2 & 37, t. 2 (1992); Oliver & Oliver: t. 2 (2000).

Diagnostic features: leaves small, closely packed and recurved; flowers 3-nate on ends of short, leafy, side branches, red, orange, yellow or green and usually unicoloured (Figure 1A₁, A₂).

A yellow-flowered variant with long narrow sepals which has a dark corolla mouth, occurs in the Bredasdorp to Gansbaai area.

The typical subspecies is the common and widespread taxon in this species occurring from the Cederberg to the Cape Peninsula and eastwards as far as the Kammanassie Mountains.

Vouchers: *Balfour* s.n. (MO!, NBG!); *Bolus* 6758 (BOL!, NBG!); *Compton* 23683 (NBG!, S!); *Johnson* 304 (K!, NBG!); *Lewis* 5300

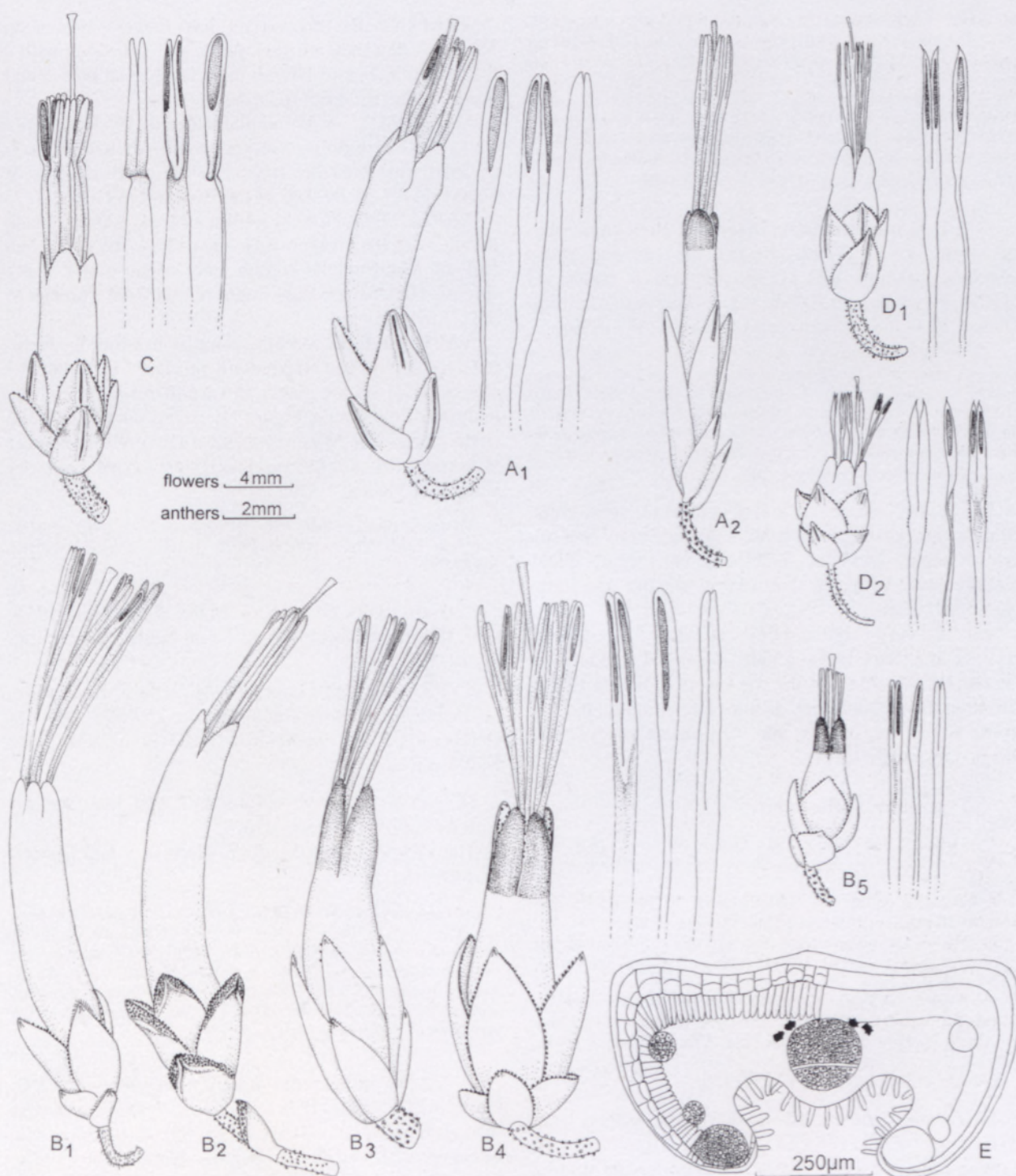


FIGURE 1.—*Erica coccinea* complex: flowers and anthers. A₁, A₂, *E. coccinea* subsp. *coccinea*: A₁, Baker 42, Constantiaberg; A₂, Baker 2014, Elim. B₁–B₄, *E. melastoma* subsp. *melastoma*: B₁, variant D, Oliver 10676; B₂, variant E, Kirsten 811, De Tronk; B₃, variant A, Oliver 8013, Caledon Swartberg; B₄, variant B, Oliver 11287, Klein River Mtns. B₅, *E. melastoma* subsp. *minor*, Baker 1250, Baardskeedersbos. C, *E. monadelphia*, De Vos 648, Kleinmond. D₁, D₂, *E. intermedia*: D₁, subsp. *intermedia*, from type, Niven 127; D₂, subsp. *albiflora*, Oliver 9105, Ruitersberg. E, c/s leaf. Scale bars: flowers, 4 mm; anthers, 2 mm; E, 250 μm.

(BM!, NBG!, PRE); MacOwan sub Herb. Norm. 5 (BM!, K!, SAM!); Middlemost 1556 (NBG!, NY!); Oliver STE30141 (BM!, BOL!, NBG!, PRE), STE30142 (NBG!, P!, PRE); Zeyher 3185 (BOL!, K!, P!, PRE, SAM!, W).

1b. subsp. **uniflora** E.G.H.Oliv. & I.M.Oliv., subsp. nov., flore uno foliis suberectis ad recurvatis distinguatur.

TYPE.—Western Cape, 3419 (Caledon): Springfield, (–DB), 12 January 1958, Rycroft 2104 (NBG, holo.; K, PRE).

Diagnostic features: flowers borne singly at ends of short, leafy lateral branches, usually yellow, sometimes orange-red; leaves semi-erect to reflexed.

This is a lowland taxon occurring on hills and flats not far from the coast from the Cape Peninsula eastwards to near Mossel Bay.

Paratype material (selection from numerous collections): WESTERN CAPE.—3418 (Simonstown): Karbonkelberg, 1500 ft [450 m], (–AB), 21-07-1974, Esterhuysen 33586 (BOL!, NBG!); Sir Lowry's Pass, 1000 ft [300 m], (–BB), 11-07-1890, Guthrie 2001 (NBG!). 3419

(Caledon): Baviaansfontein, Gansbaai, 800 ft [250 m], (–CB), 14-03-1977, *Hugo 806* (NBG!, PRE); Kleinbos, Die Kelders, 50 ft [15 m], (–DA), 4-11-1969, *Taylor HC 7420* (NBG!, PRE); Bredasdorp Forest Reserve, 60 ft [18 m], (–DC), 12-03-1979, *Thompson MF 3974* (NBG!, PRE). 3420 (Bredasdorp): Potberg, 500–600 ft [150–180 m], (–BC), 19-06-1984, *Oliver 8512* (NBG!). 3421 (Riversdale): Canca, (–BC), 20-03-1975, *Oliver 5739* (NBG!); Ystervarkpunt, 80 m, (–BD), 15-05-1987, *Willemse 185* (NBG!). 3422 (Mossel Bay): Mossel Bay, dunes, (–AA), 08-1962, *Liebenberg 6376* (BM!, NBG!, PRE).

1.1. **E. melastoma** Andrews, Coloured engravings of heaths: t. 37 (1799). *E. petiveri* var. *melastoma* (Andrews) Benth.: 622 (1839); Guthrie & Bolus: 47 (1905). *E. follicularis* Salisb. var. *melastoma* (Andrews) Dulfer: 29 (1965). Iconotype: Andrews: t. 37 (1799).

Note: Dulfer overlooked the problem of the dates of publication of Andrews' plates and selected Salisbury's name of 1802 for the species, thereby relegating Andrews' *E. melastoma* to varietal status. Dulfer (1965) cited 1802 as the date of publication for *E. melastoma* which is the date of the bound volume and not the date which is printed on the plate. A paper detailing the publication dates of all Andrews' species is in preparation (Cleevly & Oliver 2002).

Diagnostic features: leaves erect to semi-erect, straight; flowers single on short, leafy side branches; sulcus on sepals, bract and bracteoles very short, apical, broadly open, V-shaped (not narrow, slit-like and forming a keel) or absent.

This is a very variable species in the size of the flowers, size and shape of the sepals, shape and stickiness of the corolla and colour of the corolla apex. Within all this variation there is only one distinct discontinuity, namely in the size of the corolla, and we propose to recognize this at subspecific level.

1.1a. subsp. **melastoma**

E. vestiflua Salisb.: 346 (1802); Guthrie & Bolus: 48 (1905); Dulfer: 30 (1965). Type: sine loc., *Roxburgh s.n.* [*Roxburgh 71* det. Salisbury] (K!).

E. follicularis Salisb.: 348 (1802); Dulfer: 29 (1965). Iconotype: Andrews, Coloured engravings of heaths: t. 44 (1797).

E. petiveri var. *willdenovii* Bolus: 48 (1905). *E. coccinea* var. *willdenovii* (Bolus) H.A.Baker: 184 (1967). Type: *Thunberg s.n.* (UPS).

E. coccinea var. *inflata* H.A.Baker 75 (1958). *E. follicularis* var. *inflata* (H.A.Baker) Dulfer: 30 (1965). Type: Caledon Div., Koude Mountains, between Gaansbaai and Elim, *Baker 1154* (BOL, holo.; NBG!).

Illustration: Baker & Oliver: t. 1, 8 (1967).

Diagnostic features: corolla \pm 18 mm long (Figure 1B₄).

Within the subspecies there is a considerable amount of variation in several characters, mainly the corolla shape, colour and stickiness. Despite there being some collections which appear to be very distinct, we are unable to recognize any formal categories and thus list them here as unnamed variants to show possible groups that need to be worked on in detail in the field and through DNA analyses.

VARIANT A: the corolla is yellow with a dark, almost black, distal end. It may, however, be greenish yellow with the distal end fading to brown soon after anthesis. The typical variant, shown in Andrews' painting, has large sepals, i.e. broad and more than half the length of the corolla tube, the corolla slightly to much inflated towards the base and mostly not sticky although small sessile glands may occur on the margins of the sepals (Figure 1B₃). The leaves can be short to very long. The distribution is from Stellenbosch to Bredasdorp.

VARIANT B: this variant has flowers similar to Variant A, but they are very sticky and yellowish with a black mouth (Figure 1B₄). It includes the var. *inflata* and occurs in the Bredasdorp District.

VARIANT C: with similar flowers to A, but not sticky, usually light orange-yellow, mostly with no tufted small side branches typical of the other variants. It occurs on limestone flats of the Bredasdorp District.

VARIANT D: flowers yellow-orange with no black mouth, with long narrow tube and a short calyx less than half the length of the corolla tube, which is not sticky (Figure 1B₁). This occurs in the region from Tulbagh to the Cederberg.

VARIANT E: flowers the same as those in D above, but very sticky. The stickiness is produced by a remarkable array of sessile glands in several zones around the margins of the sepals (Figure 1B₂). This variant is found in the Porterville Mountains, but a few collections near Wemmershoek and Baviaansberg, Ceres, have a reduced amount of glands.

Vouchers: *Andreae 686* (NBG!); *Guthrie 2005, 2498* (NBG!); *Hanekom 2941* (NBG!); *Oliver 10676* (NBG!); *STE30143* (BOL!, NBG!, PRE).

1.1b. subsp. **minor** *E.G.H.Oliv. & I.M.Oliv.* subsp. nov., floribus minoribus, 6 ad 7 mm longis, distinguitur. Figura 1B₅.

TYPE.—Western Cape, 3419 (Caledon): Koueberge, SE-facing slope above Remhoogte, \pm 250 m, (–DA), 27 October 2001, *R.C. Turner 401* (NBG, holo.; BM, BOL, K, NY, PRE).

Diagnostic features: corolla 6–7 mm long, yellow with dark mouth (Figure 1B₅).

The subspecies occurs in the Hermanus and Bredasdorp Districts.

Paratype material: WESTERN CAPE.—3419 (Caledon): Hermanus Mtns, (–AD), 10-1924, *Marloth 6225* (NBG!, PRE); Baard-skeedersbos, (–DA), 8-9-1957, *Baker 1250* (NBG!); Remhoogte, (–DA), 25 October 1967, *Thomas in NBG86471* (NBG). 3420 (Swellendam): Bredasdorp Mtn, (–CA), 15-10-1951, *Esterhuysen 19169* (BOL!, NBG!, PRE). Without locality: Caledon Wildflower Show, 09-1965, *Oliver STE32109* (NBG!).

1.2. **E. intermedia** Klotzsch ex Benth. in DC. Prodrum 7: 621 (1839). *E. petiveri* var. *intermedia* (Klotzsch ex Benth.) Bolus: 47 (1905). *E. coccinea* var. *intermedia* (Klotzsch ex Benth.) Dulfer: 29 (1965). Syntypes: Swellendam, *Masson s.n.* (K), *Niven s.n.* (BOL!, K), *Ecklon s.n.* (B[†]). Lectotype to be selected from the material used by Bentham in K.

Diagnostic features: anther apices acuminate; corolla distinctly longer than calyx, \pm 6–11 mm long.

1.2a. subsp. **intermedia**

Diagnostic features: flowers green to yellow-green, 8–11 mm long; corolla tubular-ovoid; bract, bracteoles and sepals with small sessile glands and short hairs on margins (Figure 1D₁).

This occurs along the Langeberg and Outeniqua Ranges from Swellendam to George.

Vouchers: *Fourcade 5693* (NBG!, PRE), 4706 (BOL!, PRE); *McDonald 1274* (NBG!); *Rourke 294* (NBG!); *Taylor LE 3014* (NBG!).

1.2b. subsp. **albiflora** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., floribus albis minoribus corolla 5.5–6.0 mm longa late ovoidea, glandibus in marginibus bractearum, bracteoleae sepalorumque distinguitur. Figura 1D₂.

TYPE.—Western Cape. 3322 (Oudtshoorn); Ruitersberg, N slopes at W end, 3000 ft [910 m], (–CC), 11 March 1988, *Oliver 9105* (NBG).

Illustration: Schumann & Kirsten: 35, t. 1 (1992).

Diagnostic features: flowers white; corolla broadly ovoid, 5.5–6.0 mm long; bract, bracteoles and sepals with only small sessile glands on margins and no hairs admixed (Figure 1D₂).

The subspecies occurs in the Robinson Pass/Ruitersberg to Jonkersberg area of the Outeniqua Mountains.

Paratype material: WESTERN CAPE.—3322 (Oudtshoorn); Outeniqua Mtns, Ruytersbosch, (–CC), 19-09-1951, *G. van Niekerk 79* (BOL!, NBG!); Robinson Pass, 1850 ft [560 m], (–CC), 2-04-1979, *Campbell 13342* (NBG!); *ibid.*, 30-06-1947, *Compton 19595* (NBG!); *ibid.*, 2-05-1974, *Goldblatt 1781* (MO, NBG!); Ruitersberg, 3000 ft [914 m], (–CC), 11-03-1988, *Oliver 9105* (NBG!); *ibid.*, 765 m, 5-04-1994, *Oliver 10429* (NBG!); Jonkersberg, (–CC), 29-08-1978, *W. Bond 1462* (NBG!); *ibid.*, 790 m, 4-02-1986, *Brusse 4794* (NBG!, PRE); *ibid.*, 09-1912, *Rogers 4273* (NBG!); *ibid.*, 2-06-1951, *L.E. Taylor 3006* (NBG!, PRE); *ibid.*, *Van Breda & Admiraal 2105* (NBG!, PRE); *ibid.*, 2600 ft [790 m], 6-02-1978, *Williams 2433* (NBG!); Engelsberg, 1800 ft [549 m], (–CC), 23-10-1984, *Vlok 858* (NBG!, PRE).

2. *E. vestiflora* Salisb.—see *E. melastoma* subsp. *melastoma* (1.1a).

6. *E. monadelphica* Andrews, Coloured engravings of heaths: t. 38 (1797); Benth.: 622 (1839); Guthrie & Bolus: 50 (1905); Dulfer: 32 (1965) cum auct. Willd. Iconotype: Andrews: t. 38 (1797).

Note: Andrews published the name as 'monodelphia' in the protologue (text and plate), but later changed it to 'monadelphica' in the index which was published some five years later in 1802 when the completed volume was bound. He also used the spelling 'Monadelphica'. This latter spelling was taken up by all subsequent authors who did not query the '-ia' ending. There is no indication why Andrews used this substantival epithet in apposition. This could be assumed to be Linnaeus' major Class name, Monadelphia (stamens united by their filaments into one body) (Stearn 1957: 31). The grammatically correct adjectival epithet would be 'monodelpha'.

Illustrations: Baker & Oliver: t. 6 (1967); Schumann & Kirsten: 37, t. 1 (1992); Oliver & Oliver: t. 3 (2000).

Diagnostic features: anthers with a distinct boundary between thecae and filament, and a slight basal adaxial 'nose'; corolla tube straight, \pm 11 mm long, bright red (Figure 1C).

This is a distinct species within the 'coccinea' complex and not with *E. banksii* as its number would suggest. There are two branching forms within the species—one with numerous very short side branches as in *E. coccinea*, the other without these. The species is a resprouter after fires.

Vouchers: *Baker 1886* (NBG!); *Oliver 3360* (NBG!, PRE); *Oliver & Palser 78* (K!, NBG!, PRE); *Salter 4278* (BM!, BOL!, K!, PRE); *Schlechter 9750* (BM!, BOL!, K!, PRE).

ERICA PLUKENETII COMPLEX

Three separate species used to be recognized in this

complex—*E. plukenetii*, *E. lineata* and *E. breviflora*.

3. *E. lineata* Benth.—see *E. plukenetii* subsp. *lineata* (5d).

4. *E. breviflora* Dulfer—see *E. plukenetii* subsp. *breviflora* (5e).

5. *E. plukenetii* L., Species plantarum, edn 1, 1: 356 (1753); Benth.: 622 (1839); Guthrie & Bolus: 50 (1905); Dulfer: 31 (1965). Lectotype: Plukenet, *Almagesti Mantissa botanici* 45: t. 344, fig. 3 (1700) selected here by Oliver, Jarvis & Cafferty, in prep.

Note: the iconotype accurately reflects Plukenet's specimen, Herb. Sloane 89: 11 (BM! photo.—NBG).

Diagnostic features: bract and bracteoles very reduced, remote from calyx; anthers exerted, long attenuated with rounded apices; placenta covered entirely by ovules abaxially; seeds reticulate.

The main variation in this species is in the length and shape of the corolla and sepals, size and texture of the leaves, and in its habit. The flowers are 7–16(–28) mm long with a tubular or inflated tubular corolla with far-exserted stamens (Figure 2). Flowers change shape as they mature, often being rather slender in bud and quite inflated at maturity. The sepals range from 2–12 mm long, lanceolate to ovate in shape with the sulcus as long as the sepal. The plants are mostly reseederers, but can be resprouters in some areas, and can vary from woody, rounded shrubs 0.75 m tall near the coast, to tall delicate erect shrubs in the Bredasdorp District. In the Kamiesberg the multi-stemmed resprouters can be up to 3 m tall.

This species is often confused with species in the *E. coccinea* complex. The position and size of the bract and bracteoles is the most visible character to distinguish it from that group.

5a. subsp. *plukenetii*

E. plukenetii var. *densa* Bartl.: 630 (1832); Dulfer: 31 (1965). Type: Caledon und Hottentotsholland, *Ecklon s.n.* (?).

E. plukenetii var. *brachysepala* Bartl.: 631 (1832); Dulfer: 31 (1965). Type: Zwischen Sträuchen am Fusse des Teufelsbergs [Table Mtn] in zweiter Höhe, *Ecklon s.n.* (P!).

E. plukenetii var. *brevifolia* Bolus: 50 (1905); Dulfer: 31 (1965). Type: Piquetberg Div.; Piquetberg Range, *Schlechter 5208* (BOL!).

Illustrations: Baker & Oliver: t. 2 (1967); Schumann & Kirsten: 36, t. 7, 8, 9 (1992); Oliver & Oliver: t. 1 (2000).

Diagnostic features: sepals 2–8 mm long, short and ovate to longer and lanceolate (Figure 2A, B).

There is considerable overlapping variation in the length of the leaves and in the width and length of the sepals. This subspecies also exhibits considerable range in the size of its flowers.

Vouchers: *Barker 10423* (MO!, NBG!); *Maguire 1129* (NBG!, NY!); *Oliver 3764* (K!, NBG!, PRE), *4918* (NBG!, PRE); *Oliver & Palser 22* (K!, NBG!, PRE); *Phillips 7587* (K!, NBG!, NY!, PRE); *Rycroft 1949* (NBG!, P!); *Schlechter 5208* (BM!, BOL!, K!, NBG!).

5b. subsp. **bredensis** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., sepalis latibus \pm 5–6 \times 3 mm foliis 7–10(–12) mm longis dignoscenda. Figura 2E.

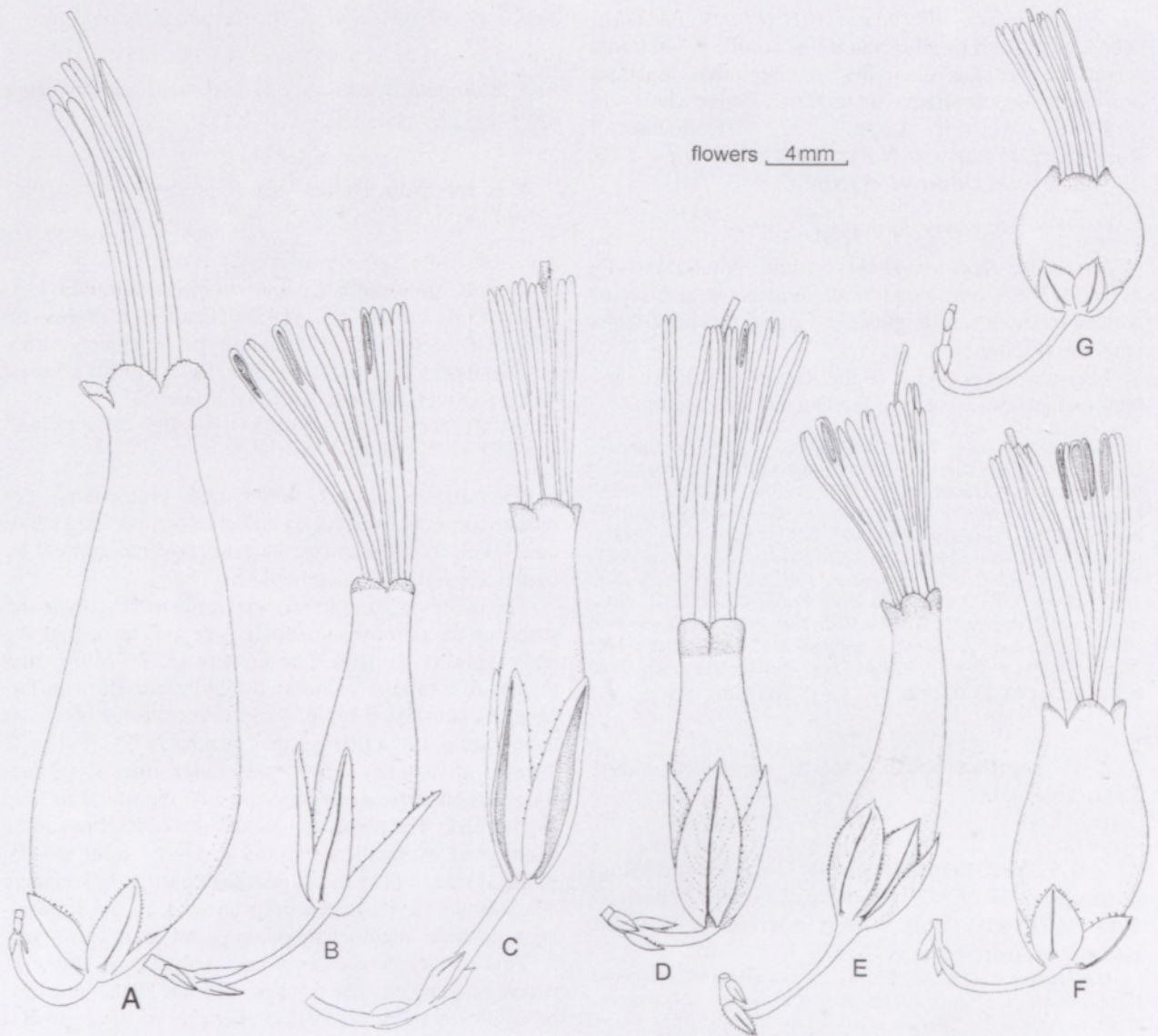


FIGURE 2.—*Erica plukenetii* complex. A, B, subsp. *plukenetii*: A, *Oliver 5953*, Kamiesberg; B, *Rycroft 1949*, Bainskloof. C, subsp. *penicellata*, *Oliver 4226*, Stanford; D, subsp. *lineata*, *Oliver 8749*, Pearly Beach, Carruther's Hill; E, subsp. *bredensis*, *Marsh 1468*, Cape Infanta. F, G, subsp. *breviflora*: F, *Taylor 11670*, Cederberg; G, *Rourke 653*, Boboskloof. Scale bar: A–G, 4 mm.

TYPE.—Western Cape, 3420 (Bredasdorp): De Hoop Nature Reserve, 100 ft [30 m], (–AD), 28 July 1970, *Marsh 1468* (NBG).

Diagnostic features: sepals broad (elliptic to ovate), $\pm 5\text{--}6 \times 3$ mm, leathery; leaves 7–10(–12) mm long; corolla ± 15 mm long, white with a pink mouth, red or occasionally yellowish (Figure 2E). Flowers look very much like those of subsp. *lineata*, but leaves are broader and shorter.

The taxon occurs on limestone hills and lateritic flats from Heuningrug south of Bredasdorp, eastwards as far as Cape Infanta and also on the sandstone of Potberg. There are numerous collections from this area.

Paratype material (selection from many specimens): WESTERN CAPE.—3419 (Caledon): Bredasdorp Dist., Heuningrug, 70 m. (–DB), 1-04-1995, *Paterson-Jones 218* (NBG!); De Hoop area, (–AD), 8-04-1957, *Barker 8681* (NBG!); *ibid.*, 200 m, 14-06-1979, *Burgers 1865* (NBG!); *ibid.*, Hardevlakte, 10-03-1985, *Fellingham 947* (NBG!); Albertsdal, (–BC), 31-05-47, *Barker 4553* (NBG!); Potberg, Elandspad, 600 ft [182 m], (–BC), 1-05-1985, *Leith 51* (NBG!, PRE); Cape Infanta, 150 ft [45 m], (–BD), 7-04-1984, *Oliver 8428* (NBG!);

Die Poort, (–CA), 10-08-1949, *Steyn 341* (NBG!); Moerasfontein, 50 ft [15 m], (–CB), 15-03-1977, *Thompson 3430* (NBG!, PRE).

5c. subsp. ***penicellata*** (*Andrews*) *E.G.H.Oliv. & I.M.Oliv.* stat. et comb. nov.

E. penicellata Andrews, Coloured engravings of heaths 2: t. 116 (1802). Iconotype: Andrews: t. 116 (1802).

E. revolvens Bartl.: 631 (1832). *E. plukenetii* var. *bicarinata* Bolus: 51 (1905); Dulfer: 31 (1965). Type: berge bei Gnadenhal, *Ecklon s.n.* (?holo.; ?P). Note: the collection in P is this species, but not yet verified as this subspecies.

Diagnostic features: sepals up to 12 mm long, thick and fleshy, with distinctive non-revolute thick margins forming two longitudinal keels like a catamaran (Figure 2C), bases of these keels produced into small lobes beyond point of attachment to pedicel. These features are well displayed in Andrews' drawing. Bartling's description fits this taxon—'sepals base productis solutis, margine revolutis'.

Vouchers: *Oliver 4226* (NBG!); *Schlechter 7743* (BM!, BOL!, K!, PRE).

5d. subsp. **lineata** (Benth.) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. lineata Benth. in DC., Prodrum 7: 622 (1839); Guthrie & Bolus: 48 (1905); Dulfer: 30 (1965). Type: in colonia Capensi [Cape Colony], *Mund* s.n. (K!).

Illustrations: Baker & Oliver: t. 3 (1967); Schumann & Kirsten: 35, t. 3, 4 (1992).

Diagnostic features: leaves very long, narrow; sepals (Figure 2D) broad and flat sepals like those in subsp. *brevidensis*.

The subspecies occurs on sandy soils associated with coastal limestone deposits from Gansbaai to Zoetanyberg.

Vouchers: Kerr STE30029 (BM!, K!, NBG!, PRE); Oliver 3365 (NBG!, PRE); Schlechter 9711 (BM!, BOL!, K!, P!, PRE, SAM!, W).

5e. subsp. **brevipflora** (Dulfer) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. brevipflora Dulfer in Annalen des Naturhistorischen Museums, Wien 68: 30 (1965). Type: *Thunberg* s.n. (UPS).

E. scariosa Thunb.: 350 (1823); Guthrie & Bolus: 49 (1905); non P.J.Bergius (1767). Type: as for *E. brevipflora* above.

E. penicillata Benth.: 622 (1839), non Andrews, Coloured engravings of heaths 2: t. 116 (1802) (see subsp. 5c).

Illustrations: Schumann & Kirsten: 36, t. 5, 6 (1992).

Diagnostic features: corolla short, ovoid to almost globose, mostly ± 7 mm but less than 12 mm, white, occasionally pink; synflorescence typically very long spike-like up to 250 mm long (Figure 2F, G).

There is an increase in flower size in some collections from the Cederberg together with a reduction in the length of the synflorescences. These can merge with some short variants of subsp. *plukenetii* in the Franschoek Mountains. We have noted that populations in the Porterville Mountains have flowers that are sweetly scented. This coupled with the smaller flowers would indicate that the subspecies is pollinated by insects as opposed to the postulated bird-pollinated, longer flowers of all the other subspecies. The plants are single-stemmed reseeder.

Guthrie & Bolus (1905) noted under *E. scariosa* 'we admit this species with doubt' and kept it as distinct 'with some reluctance'.

The subspecies occurs in the Cederberg to Porterville and the southern Cold Bokkeveld area.

Vouchers: Bolus 5114 (BM!, BOL!, K!, PRE, SAM!); Drege 7694 (BM!, K!, NBG!, PRE, W); Oliver 4075 (NBG!, PRE); Rourke 653 (K!, NBG!); Schlechter 9084 (BM!, K!, NBG!, PRE).

6. *E. monadelphia* Andrews—this has been placed in the *E. coccinea* group after *E. intermedia* (1,2).

7. *E. banksii* Andrews, Coloured engravings of heaths 1: t. 5 (1797) as *E. banksia*; Willd.: 395 (1799); Bauer: t. 29 (1803); Benth.: 624 (1839); Dulfer: 32 (1965); as *banksia* Guthrie & Bolus: 51 (1905). Iconotype: Andrews: t. 5 (1797).

Note: as with several other epithets coined by Andrews, the '-ia' ending was thought to reflect the use of a generic name used in apposition, in this case *Banksia* (Australian Proteaceae), and should not be corrected. However, there are some cases where a generic name did not exist or was coined later than the publication of the species name. These -ia endings are being replaced by the relevant genitive ending (-i, -ii, -ae or -iae) for all Andrews' names commemorating persons. The date of the Bauer plate is actually 1 Jan. 1801 and not the date of the

first published fascicle in the bound publication, i.e. 1796, as used by Dulfer to antedate Bauer's name over that of Andrews. However, fascicle 3 containing this plate only appeared in 1803 (Britten 1899).

Diagnostic features: anthers well exerted with filaments held in a tight bundle, bilobed with basal attachment and distinct basal 'chin'; corolla lobes spreading to reflexed; tube straight, white or greenish with lobes green or purple; leaves slightly serrated with sharp, short to long mucro and longish petiole; bract and bracteoles large and approximate to calyx; sepals with terminal sharp mucro. Inflorescences numerous, pendulous, consisting of 3-nate flowers at ends of main branches.

7a. subsp. **banksii**

Diagnostic features: leaves short, ± 5 –6 mm long; corolla yellowish green; ovary hairy (Figure 3A).

The typical subspecies forms a small, compact, woody shrublet growing on rock ledges and occurs in the mountains around the Elgin Basin.

Vouchers: Esterhuysen 2695 (BOL!, NBG!, PRE); Schlechter 7572 (BOL!, K!, PRE).

7b. subsp. **purpurea** (Andrews) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. banksia var. *purpurea* Andrews, The Heathery 3: t. 106 (1806); Guthrie & Bolus: 51 (1905). *E. banksia* var. *purpurea* (Andrews) Dulfer: 32 (1905). Iconotype: Andrews: t. 106 (1806). Note: Andrews' painting in Coloured engravings of heaths: t. 151 is not dated, so the volume date has to be used in this case, namely 1809.

Illustrations: Baker & Oliver: t. 5 (1967); Schumann & Kirsten: 38, t. 3, 4 (1992).

Diagnostic features: corolla white with purple lobes; leaves short, ± 5 –9 mm long; ovary glabrous.

This subspecies grows on the mountains from Babylon's Tower southeast to Quoin Point.

Vouchers: Oliver STE30033 (BOL!, K!, NBG!, PRE); Zeyher 3189 (BOL!, P!, W).

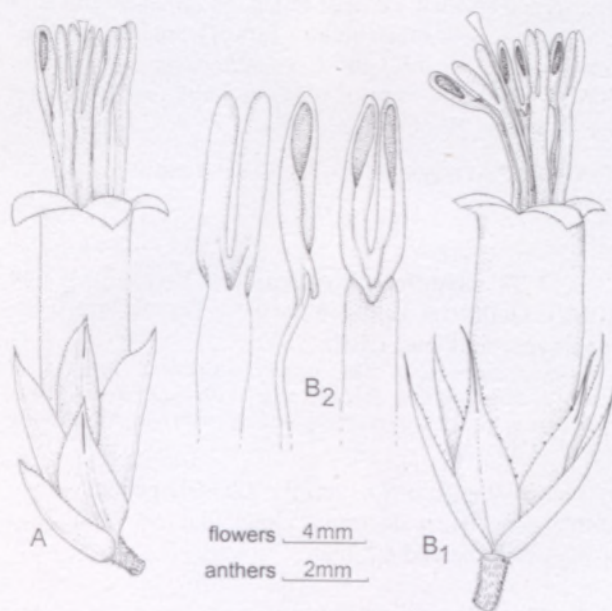


FIGURE 3.—*Erica banksii*. A, subsp. *banksii*, Esterhuysen 2695, Rooskraalberg; B₁, B₂, subsp. *comptonii*, holotype, Compton 6066, Hangklip. Scale bars: A, B₁, 4 mm; B₂, 2 mm.

7c. subsp. **comptonii** (Salter) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. comptonii Salter in Journal of South African Botany 2: 60 (1936); Dulfer: 32 (1965). Type: Caledon Div., among rocks, northeast slope of Hangklip, 1400 ft [426 m], Jan, *Compton 6066* (BOL!, K!, NBG!).

Illustrations: Baker & Oliver: t. 4 (1967); Schumann & Kirsten: 38, t. 5, 6 (1992).

Diagnostic features: corolla greenish white; leaves long, 12–20(–26) mm long; ovary glabrous (Figure 3B).

This subspecies is confined to the higher mountain peaks from Kogelberg to Hangklip. In the Kogelberg complex the subsp. *banksii* occurs at lower altitudes at the northeastern end.

Subsp. *comptonii* differs from the other two subspecies in the larger, more open habit (up to 500 mm tall) in open ground between rocks and in the longer leaves (up to 26 mm) with longer mucros on the leaves and sepals (Figure 3B₁). The sepals can vary from about half to the full length of the corolla tube.

The variation in this species occurs in the flower colours, the habit, habitat, length of leaves and length of the mucro on the leaves and sepals. Disjunctions occur regionally, but warrant recognition only at subspecific level.

Vouchers: *Boucher 1332* (NBG!, PRE); *Compton 6066* (BOL!, K!, NBG!); *Pillans 8183* (BOL!, K!).

8. *E. primulina* Bolus—see *E. viridiflora* subsp. *primulina* (9b).

8.1. *E. leucosiphon* L.Bolus in Kew Bulletin 1933: 186 (1934); Dulfer: 32 (1965). Type: Cape Town Wild Flower Show, *BOL19253* (BOL!).

Illustrations: Schumann & Kirsten: 39, t. 9, 10 (1992).

Diagnostic features: pedicel long, with dense plumose hairs; calyx white; anther appendages broad; corolla white.

This distinct species has no alliances with any other long-tubed species, but has, rather, an alliance with several species with much shorter flowers, such as *E. monsoniana* L.f. (no. 402) and *E. goatcheriana* L.Bolus (no. 405.1). The possession of plumose hairs on the pedicel are shared by all of them.

Vouchers: *Kellerman 157* (PRE); *Kirsten 434* (NBG!); *Oliver 4101* (NBG!).

9. *E. viridiflora* Andrews, The Heathy: t. 299 (1812); Guthrie & Bolus: 52 (1905); Dulfer 32 (1965). Iconotype: Andrews: t. 299 (1812).

Note: Andrews' much fuller painting in Coloured engravings of heaths: t. 287, must have appeared after 1820, which date Andrews mentioned in the text accompanying the plate, even though the volume is dated '1809'.

Diagnostic features: corolla lobes large and erect; anther appendages decurrent along filament, pendulous to very reduced and ear-like.

9a. subsp. **viridiflora**

Illustrations: Baker & Oliver: t. 7 (1967); Schumann & Kirsten: 39, t. 11, 12 (1992).

Diagnostic features: corolla lime-green, sticky, with a patch of sessile, sticky glands in centre of upper half of adaxial surface of sepals. Inflorescence consists of three flowers; it is terminal on main and occasionally secondary branches; bract and bracteoles approximate to calyx; anthers bilobed with thecae often divergent; ovary ovoid and glabrous (Figure 4A).

The typical subspecies forms an erect shrub, 0.5–1.0 m tall, growing in open ground or between rocks. It occurs on the coastal mountains from George through to Humansdorp.

Erica clavata Andrews (Coloured engravings of heaths: t. 159, 1809) was included by Guthrie & Bolus (1905) and Dulfer (1965) in synonymy. Careful examination of his painting leads to the conclusion that *E. clavata* could be a hybrid with *E. viridiflora* as a possible parent. Characters which do not fit the current taxon are the erect imbricate leaves, the broadly ovate sepals with long attenuate apices, and the mucous anthers.

Vouchers: *Oliver STE30030* (BM!, BOL!, K!, NBG!, PRE!); *Schlechter 5801* (BM!, BOL!, K, PRE, W).

9b. subsp. **primulina** (Bolus) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. primulina Bolus in Flora capensis 4: 51 (1905); Dulfer: 32 (1965). Type: Ladismith Div., on rocky mountain slopes of the Klein Zwartbergen, near Seven Weeks Poort, 3250 ft [990 m], *Marloth 2937* (BOL!).

Illustrations: Schumann & Kirsten: 39, t. 7, 8 (1992).

Diagnostic features: corolla cream to greenish, non-sticky; shrubs small, woody shrublets, erect to 300 mm

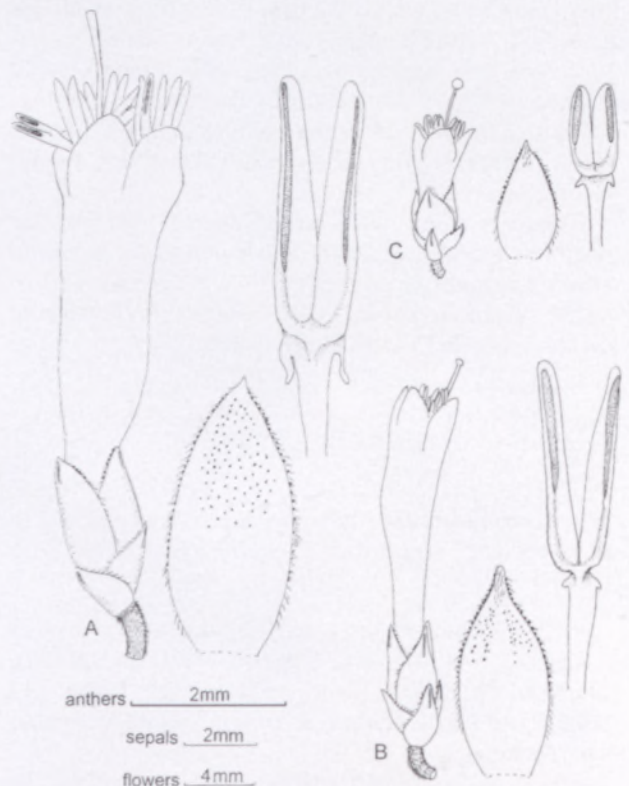


FIGURE 4.—*Erica viridiflora*, with flower, sepal in adaxial view showing zone of sessile glands, and anther. A, subsp. *viridiflora*, Visser 29, Ruitersberg; B, subsp. *primulina*, Oliver 10819, Meiringspoort; C, subsp. *redacta*, Vlok s.n., Meiringspoort. Scale bars: anthers, sepals, 2 mm; flowers, 4 mm.

high but sometimes prostrate (Figure 4B).

Subsp. *primulina* occurs only in the Swartberg Range from the Klein Swartberg to near Willowmore. A collection from Gamkaberg, which is further to the south and west than the rest of the collections, is an intermediate variant having the flowers of this subspecies, but the growth of subsp. *viridiflora*—it is recorded as a woody erect shrub 500 mm tall.

In the protologue, Bolus mentioned the affinity with *E. viridiflora*, but surprisingly stressed a closer likeness to *E. banksii* and gave the differences from that species.

Vouchers: Esterhuysen 6286 (BOL!, K!, NBG!, PRE); Oliver 3436 (NBG!).

9c. subsp. **redacta** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., a subspecies typica floribus multo minoribus differt. Figura 4C.

TYPE.—Western Cape, 3322 (Oudtshoorn): Meiring's Poort, (–BC), 14-10-2001, *Vlok & Schutte 458* (NBG, holo.; BM, K, NY, MO, PRE).

Diagnostic features: differs from subsp. *primulina* only in size of flowers and their parts, corolla 4.5–5.0 mm long (Figure 4C).

This small-flowered form is restricted to a single population of some 100 plants occurring in crevices on a large steep slab of quartzite rock. The plants were about 200 mm tall and bore creamy white to sometimes green-tinted flowers. Subsp. *primulina* grows in similar habitats in the vicinity.

This is clearly a case of a short-tubed variant adapted to a different pollination syndrome (insect versus bird).

Paratype material: WESTERN CAPE.—3322 (Oudtshoorn): Meiring's Poort, (–BC), 01-2001, fruiting, *Vlok s.n.* (NBG).

10. *E. sphenanthera* Tausch, *Flora*: 17: 626 (1834); Guthrie & Bolus: 52 (1905); Dulfer: 33 (1965). Type: without locality or collector (PRG!, holo.; photo. –NBG!).

This taxon is regarded as a hybrid of garden origin in Europe. No material matching the description and the type has been found in the Cape. Parentage could include *E. abietina* because of the similar bracteoles, anthers and ovary.

11. *E. cerviciflora* Salisb. in *Transactions of the Linnean Society* 6: 362 (1802); Guthrie & Bolus: 53 (1905); Dulfer: 33 (1965). Type: Hottentots Holland, *I. Mulder s.n.* (K!).

No material matching the description and type has been found in the Cape. We postulate that this collection is of hybrid origin in the wild. Parentage could include *E. abietina* because of the similar anthers and ovary. Jacob Mulder is known only through the citation by Salisbury of 37 species of *Erica* from the Cape (Gunn & Codd 1981). Only one specimen is labelled as a Mulder collection by Salisbury.

11.1. *E. beatricis* Compton in *Journal of South African Botany* 9: 128 (1943); Dulfer: 33 (1965). Type: Uniondale Dist., Helpmekaar (or Thumb) Peak, *Bond 892* (NBG!).

Illustration: Compton, l.c., t. 8 (1943).

Diagnostic features: anthers exerted, with short stubby appendages below thecae; ovary puberulous; corolla glabrous; stems, leaves, pedicel, bract, bracteoles and sepals all puberulous.

This species has been collected only once. There are no indications of its alliances. There is a possibility that it is a naturally occurring hybrid, as found in several other supposedly rare species that have been investigated in the wild, e.g. *E. × flavisepala* (Oliver 1977) and *E. × vinacea* (Oliver 1986).

Vouchers: *Bond 892* (NBG!); *Esterhuysen 5021* (BOL!).

The remaining 24 species with whole numbers dealt with in this paper were placed by Guthrie & Bolus (1905) in §*Evanthe* which was based on 'Inflorescence mostly axillary, more rarely also terminal on the same plant. Corolla tubular, mostly over 6 lin. [12 mm] long, rarely shorter.' The inflorescence is 1-flowered on a very short lateral branchlet often less than 1 mm long and sometimes bearing very reduced scarious leaflets. These occur in the axils of leaves on the main branch (hence axillary) and are arranged in dense spike-like synflorescences towards the ends of the main branches which continue their vegetative growth. This contrasts with the often 3-nate inflorescences on leafy lateral branchlets found in §*Pleurocallis* which will be dealt with in Part 2.

The inclusion of species in this section, §*Evanthe*, has been rather arbitrary, being based mainly on the size of the corolla. Species with smaller flowers, but with the same inflorescence structure, have been included in §*Hermes*, and one of these is certainly very closely related to some species in this section, e.g. *E. axilliflora* L.Bolus.

12. *E. mammosa* L. *Mantissa plantarum altera*: 234 (1771); Benth.: 624 (1839); Guthrie & Bolus: 53 (1905); Dulfer: 33 (1965). Lectotype: *Herb. Linn. 498.33* (LINN), selected here by Oliver, Jarvis & Cafferty in prep.

E. gilva J.C.Wendl.: 48 et fig. (1798); Benth.: 624 (1839); Guthrie & Bolus: 54 (1905). Type: *sine. coll. et loc. (?)*; iconotype: J.C.Wendl. fig. (1978).

Illustrations: Baker & Oliver: t. 9 (1967); Schumann & Kirsten: 40, t. 1–3; 42, t. 5, 6 (1992); Oliver & Oliver: t. 4 (2000).

Diagnostic features: corolla narrowed at base with 4 indentations or folds, glabrous; bract and bracteoles small and remote from calyx; anthers with long thin appendages and a basal, projecting 'nose'; leaves erect and green; ovary short, rounded and glabrous.

We agree with Salter's reduction of *E. gilva* to synonymy under *E. mammosa*, both having four broad to narrow indentations at the base of the corolla. The former occurs only on Table Mountain on the Cape Peninsula and was separated by Guthrie & Bolus (1905) on the longer bract, bracteoles and sepals—it has white flowers sometimes with a green tip. There is a lot of variation in the colour of the flowers on the Peninsula, particularly in the southern parts and some plants in the Cape of Good Hope Nature Reserve have very long spike-like synflorescences.

Erica mammosa is widespread from the Cape Peninsula to the Cold Bokkeveld and eastwards to Bredasdorp with flowers orange or deep purple-red, greenish yellow to white. Variations occur in the length of the spike-like synflorescence from short and dense to

very long (up to 250 mm) and rather open. The pedicel can be glabrous or hairy and the sepals 3–6 mm long. On the mainland the plants are resprouters, whereas on the Peninsula they may be resprouters or single-stemmed reseeders. The most variation occurs on the mountains above Simonstown.

Vouchers: *Bolus 3354* (BM!, BOL!, K!, P!, PRE, SAM!); *Schlechter 10115* (BM!, K!, P!, PRE, W).

13. *E. broadleyana* Andrews, Coloured engravings of heaths: t. 154 (1809). Type: Andrews: t. 154 (1809).

This is regarded as a hybrid of garden origin in England. The plant looks like *E. plukenetii*, but has included anthers. Andrews' drawing shows the upper part of the filaments zig-zagged, which condition would indicate that the anthers could become exerted from the very narrow mouth.

14. *E. baueri* Andrews, The Heathery: t. 252 (1812) as *bauera*; Dulfer: 33 (1965). Iconotype: Andrews: t. 252 (1812).

Note: Andrews' epithet is corrected to the genitive case instead of the generic name, *Bauera*, used in apposition (see note under *E. banksii* no. 7).

E. bowieana Lodd.: t. 842 (1824); Benth.: 624 (1839); Guthrie & Bolus: 54 (1905). Iconotype: Lodd.: t. 842.

Illustrations: Baker & Oliver: t. 10 (1967); Schumann & Kirsten: 40, t. 4 (1992).

Diagnostic features: corolla base inflated and rounded with no indentations, white or shell pink; anthers with basal nose and long thin appendages; leaves usually greyish and recurved; long curved pedicel, small bract and bracteoles remote from calyx; ovary short, rounded, glabrous.

14a. subsp. *baueri*

Diagnostic features: leaves short, spreading to recurved; flowers usually 10–20 in few short dense sub-terminal spike-like synflorescences, white to pale pink.

This commonly cultivated and well-known subspecies is now becoming rare in its habitat due to the spread of agriculture and alien vegetation (mainly *Acacia cyclops*) in the sandy flats which are derived from quartzitic sandstone and lie west of Albertinia.

Vouchers: *Kerr STE30084* (BOL!, K!, NBG!, PRE); *Oliver 174 sub Baker 1589* (BM!, NBG!).

14b. subsp. *gouriquae* E.G.H.Oliv. & I.M.Oliv., subsp. nov., a subspecies typica foliis erectis floribus plus numerosis plus sparsis differt. Figura 5.

TYPE.—Western Cape, 3421 (Riversdale): Albertinia, Rein's Coastal Nature Reserve, main valley just N of Trig. Beacon 64, 150 m. (–BC), E.G.H. & I.M.Oliv. 11933 (NGB, holo.; BM, BOL, E, K, MO, NY, P, PRE, S).

Diagnostic features: leaves erect; flowers 5–10 in loose, spike-like synflorescences, more numerous and scattered over shrub, pale to deep pink (Figure 5).

This subspecies forms a taller, denser shrub up to 2.5 m. It grows very localized in sandy areas associated with limestone between the hills to the south of Albertinia near the coast, an area called Gouriqua.

Paratype material: WESTERN CAPE.—3421 (Riversdale):

Buffelshoek, N of Ystervarkpunt, 140 m. (–BC), 13-09-1983, *Burgers 3152* (NGB!); Ystervarkpunt/Gouriqua, 130 m. (–BC), 9-07-1987, *Willemse 624* (NGB!); *ibid.*, 200 m, 27-10-1986, *T.J. van der Merwe 146* (NGB!).

15. *E. gilva* J.C.Wendl., see under *E. mammosa* (12).

16. *E. sessiliflora* L.f., Supplementum plantarum: 222 (1782); Benth.: 625 (1839); Guthrie & Bolus: 55 (1905). Type: Cap. bonae spei, *sine coll.* (UPS).

E. clavaeflora Salisb.: 365 (1802). *E. sessiliflora* var. *clavaeflora* (Salisb.) Bolus: 55 (1905); Dulfer: 34 (1965). Type: *comm. Hibbert s.n.* (K!).

E. sceptriformis Salisb.: 365 (1802). *E. sessiliflora* var. *sceptriformis* (Salisb.) Bolus: 55 (1905); Dulfer: 34 (1965). Type: *sine loc. Roxburgh s.n.* (K!).

E. sessiliflora var. *oblanceolata* Bolus: 55 (1905); Dulfer: 34 (1965). Type: *sine loc.*, *Guthrie 3795* (BOL).

Illustrations: Baker & Oliver: t. 8 (1967); Schumann & Kirsten: 42, t. 7–9 (1992); Oliver & Oliver: t. 5 (2000).

Diagnostic features: pedicel very short; bract, bracteoles and sepals equally long and becoming enlarged, fleshy and persistent in fruiting stage; corolla pale green to yellowish green; sepals spatulate with entire to serrated margins; anther appendages narrow; ovary short, rounded and glabrous.

This is a very distinctive species being the only one in the genus exhibiting serotiny—the fruiting synflorescences remain on the plants for several seasons as cone-like structures with the fruits protected by the thickened calyces. The species is very variable in the size of the corolla and in the shape of the sepals from narrowly oblanceolate to very broadly spatulate—characters used to separate several varieties by previous authors. There is, however, no clear-cut disjunction between these shapes that warrant recognition. A very showy variant occurs on the Riviersonderend Mountains with green corolla and bright red sepals compared to the normal green sepals.

Vouchers: *Burchell 5354* (NGB!, NY!, W); *Compton 14230* (NGB); *Oliver 8995, 11236* (NGB); *Parker 3798* (BOL!, NBG!); *Schlechter 7583* (BM!, K!, NBG!, PRE, W).

17. *E. filipendula* Benth. in DC., Prodrumus 7: 663 (1839); Guthrie & Bolus: 56 (1905); Dulfer: 34 (1965). Type: Cape Colony, *Bowie s.n.* (K!).

Diagnostic features: corolla cyathiform or slightly closed at mouth, 5–10 mm long; sepals narrow lanceolate, about $\frac{1}{3}$ – $\frac{1}{2}$ length of corolla; anther appendages narrow with very few lateral teeth, anther nose long, erect to absent.

17a. subsp. *filipendula*

Illustrations: Baker & Oliver: t. 13 (1967); Schumann & Kirsten: 43, t. 12, 13 (1992).

Diagnostic features: corolla cyathiform, 8–10 mm long, yellow or dark pink; anthers situated in middle of corolla. Figure 6B.

The typical subspecies occurs on sandy hills between Viljoenshof and Pearly Beach in the Bredasdorp District. Both colour forms have been noted growing sympatrically.

Vouchers: *Baker 1775* (BM!, NBG!); *Bolus 8450* (BM!, BOL!, PRE); *Guthrie 3786* (BOL!, NBG!); *Oliver 3414* (NGB!, PRE), 8748 (NGB!).

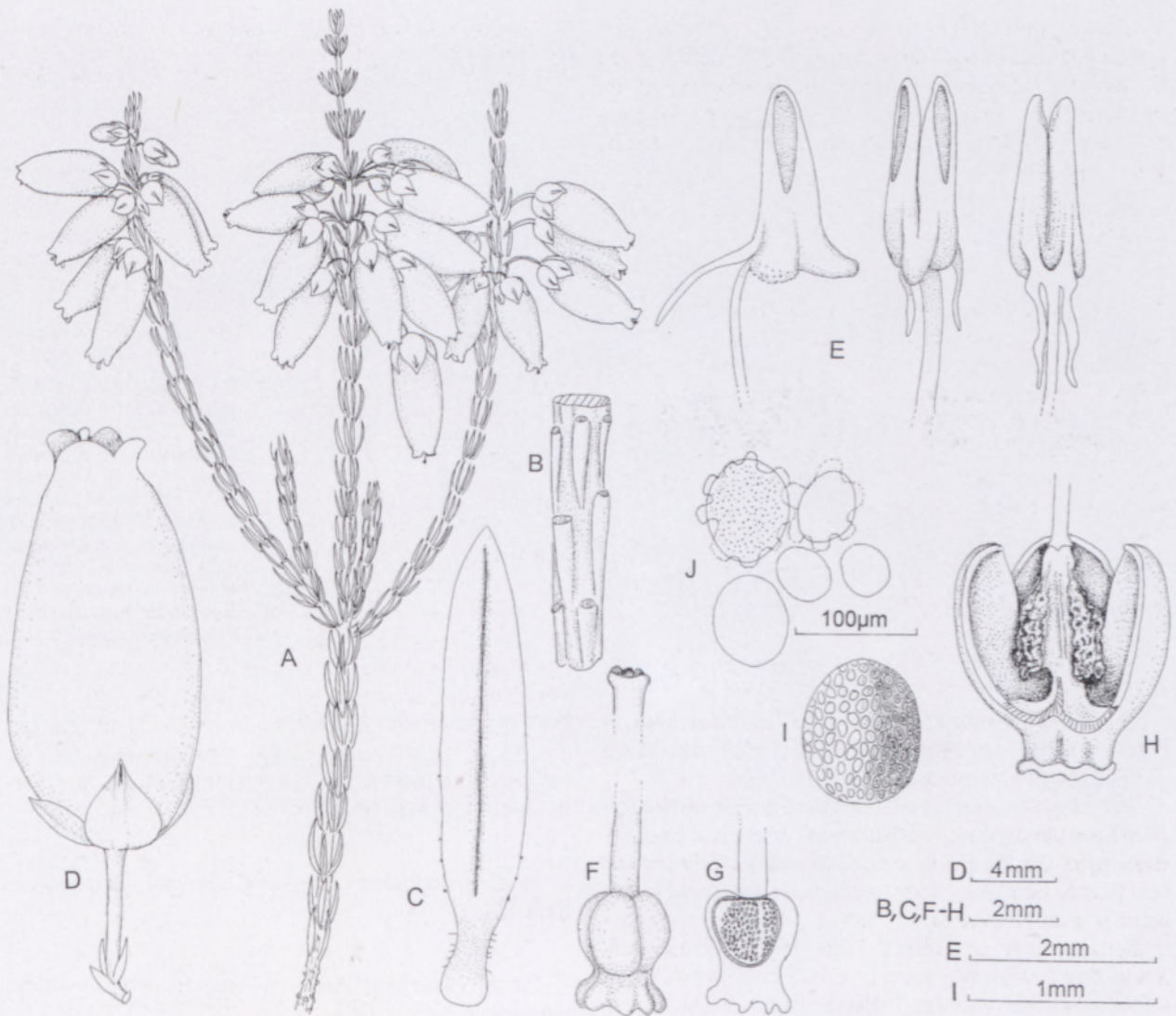


FIGURE 5.—*Erica baueri* subsp. *gouriquae*, Willemse 624. A, flowering branch, $\times 1$; B, stem with leaves removed; C, leaf; D, flower; E, anther, side, front and back views; F, gynoecium; G, ovary, opened laterally; H, capsule; I, seed; J, testa cells. Scale bars: B, C, E, F–H, 2 mm; I, 1 mm; D, 4 mm.

17b. subsp. **parva** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., subspeciei typicae similis sed floribus albis ad pallide roseis corolla 5–7 mm longa antheris in corolla altioribus differt. Figurae 6C; 7.

TYPE.—Western Cape. 3419DB (Caledon): Bredasdorp Dist., Soetanyberg area, west end just east of Melkpan, 40 m, 12 May 1999, *E.G.H. & I.M. Oliver 11254* (NBG, holo.; BM, K, MO, NY, PRE).

E. filipendula var. *minor* Bolus: 56 (1905) p.p. Syntypes: Bredasdorp Div., between Elim and Ratel River, 200–300 ft [60–90 m], *Guthrie 3784* (BM!, BOL!, SAM!); *ibid.*, *Bolus 8451* (BM!, BOL!); sine loc., *Zeyher 1090* (K!, BOL! fragm.).

Diagnostic features: corolla white to pale pink, urceolate-cyathiform, 5–7 mm long; anthers positioned higher up in corolla than in typical subspecies. Figures 6C; 7.

The type population had flowers varying from white to pink on the same plant and grew with low plants of the green-flowered form of *E. penduliflora* (17.2). The subspecies occurs on sandy flats and hills between Elim and Zoetanyberg. There are numerous collections from this region.

Paratype material: WESTERN CAPE.—3419 (Bredasdorp): Ratel River, 150 ft [45 m], (–DA), 16-07-1895, *Guthrie 3784* (BM!, BOL!

fragm., SAM!); Uintjieskuil, near Ratel River, (–DA), *Van Breda 2149* (NBG!); Soetanyberg, W end above Suur-en-Soet, 350 ft [106 m], (–DB), 29-03-1971, *Oliver 3357* (NBG!, PRE); Rietfontein, near homestead, 45 m, (–DB), *Paterson-Jones 234* (NBG!); Rietfontein, (–DB), 14-05-1993, *Schumann 843* (NBG!); 1 mile [1.6 km] N of Soetanyberg, 300 ft [90 m], (–DB), 2-06-1967, *Williams 1005* (NBG!, PRE). Without precise locality: near Elim and Ratel River, 300 ft [90 m], (–DA), 07-1895, *Bolus 8451* (BM!, BOL!).

This species forms a complex with the next two species, which were all treated as one species by Guthrie & Bolus (1905). It varies in a number of characters—size and colour of flowers, form of anther appendages, anther shape and position in the flower (Figure 5). Bolus' var. *major* was removed as a distinct species, *E. penduliflora* (17.2) and Dulfer (1965) described var. *minor* Bolus as *E. globulifera*. The remaining medium to small-flowered forms constitute this species.

17.1. *E. globulifera* *Dulfer* in *Annalen des Naturhistorischen Museums, Wien* 68: 35 (1965). *E. filipendula* Benth. var. *minor* Bolus: 56 (1905) p.p. Type: Bredasdorp Div., between Elim and Ratel River, 200–300 ft [90 m], *Schlechter 10472* (BM!, BOL!, P!, PRE, SAM!, W).

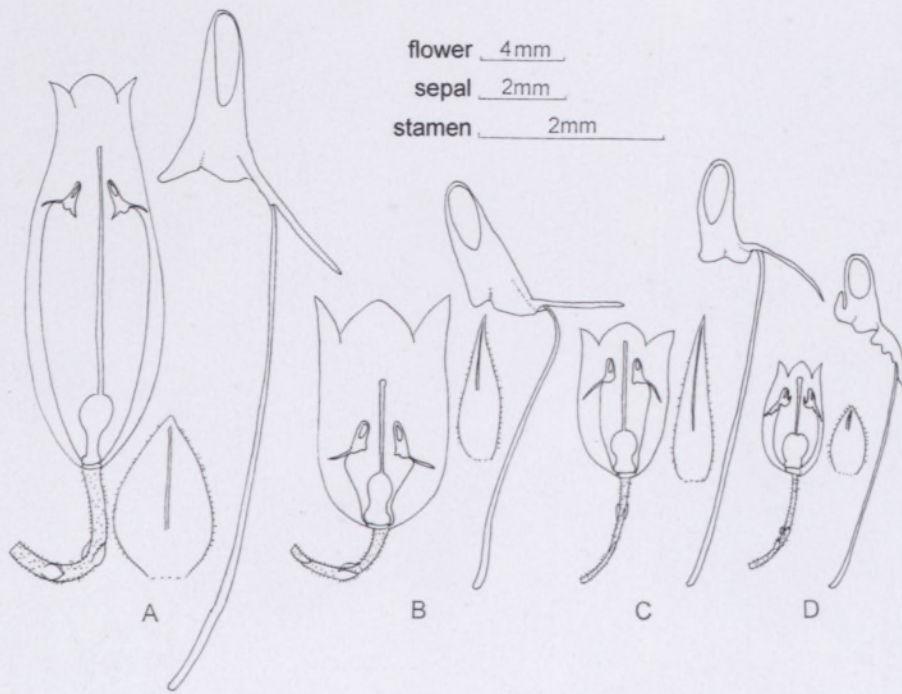


FIGURE 6.—Relationship of floral parts in A, *Erica penduliflora*; B, *E. filipendula* subsp. *filipendula*; C, *E. filipendula* subsp. *parva*; D, *E. globulifera*. Left, flower cut open longitudinally to show position of anthers; centre, sepal; right, stamen in side view showing variations in basal nose. Scale bars: flower, 4 mm; sepal, stamen, 2 mm.

Diagnostic features: sepals ovate, $\frac{1}{5}$ – $\frac{1}{4}$ as long as corolla; anther appendages broadly based and much toothed; corolla purplish pink, 3–5 mm long.

The larger-flowered collections southwest of Bredasdorp have very reduced anther noses, whereas the collections from the De Hoop area have smaller flowers and remarkable turned-up noses, a character not found in any other species (Figure 6D).

Dulfer only examined the single collection, *Schlechter 10472* (W), when he raised *E. filipendula* var. *minor* to specific status and selected that as the lectotype, unaware that the other three syntypes constituted another distinct taxon (see 17b).

Vouchers: *Schlechter 10472* (BM!, BOL!, P!, SAM!, W).

17.2. *E. penduliflora* E.G.H.Oliv. in E.G.H.Oliv. & I.M.Oliv. in Yearbook of the Heather Society 2001: 31 (2001). Type: Western Cape, 3419DA, Bredasdorp Dist., hills NW of Viljoenshof, 120 m, 12 May 1999, white-flowered, E.G.H. & I.M.Oliver 11245 (NBG, holo.; BM, BOL, K, MO, NY, P. PRE, S).

E. filipendula var. *major* Bolus: 56 (1905). Types: Syntypes: Bredasdorp Div., fairly abundant on downs between Elim and Ratel River, 300–600 ft [90–180 m], Guthrie 3786 (BOL!, NBG!); *ibid.*, Bolus 8452 (BM!, BOL, NBG!, PRE); *ibid.*, *Schlechter 7618* (BM!, BOL!, NBG!, P!, PRE, W), *Schlechter 7726* (BM!, BOL!, P!, W); *ibid.*, MacOwan [Schlechter] in *Herb. Aust. Afr.* 1920 (BM!, BOL!, P!, SAM!).

Illustrations: Baker & Oliver: t. 13 (1967); Schumann & Kirsten: 43, t. 11 (1992).

Diagnostic features: corolla 12–18 mm long; sepals broadly ovate; anthers with projecting nose and long thin appendages; ovary glabrous with long stipe. Figure 6A.

This was regarded as a large-flowered variety of *E. filipendula* by Bolus (1905), but was deemed sufficiently distinct to be recognized as a distinct species based on the above characters. The species has two distinct colour variants, white or yellowish green, which are allopatric. In the Pearly Beach area a white variant has recently

been recorded with green tips.

Vouchers: *Oliver 11245* (BM!, BOL!, K!, MO!, NBG!, NY!, P!, PRE!, S!), *11246* (BM!, K!, NBG!, NY!, PRE!); *Schlechter 7618* (BM!, BOL!, NBG!, P!, PRE, W).

18. *E. grandiflora* L.f.—see *E. abietina* subsp. *aurantiaca* (23e).

19. *E. exurgens* Andrews—see *E. abietina* subsp. *aurantiaca*. (23e).

20. *E. longisepala* Guthrie & Bolus: 57 (1905); Dulfer: 35 (1965). This is just a large-flowered form of *E. parilis* Salisb. (Guthrie & Bolus 1905: sp. no. 301).

21. *E. hibertii* Andrews, Coloured engravings of heaths: t. 172 (1805) as *hibbertia*; Guthrie & Bolus: 58 (1905); Dulfer: 36 (1965). Type: Andrews: t. 172 (1805).

Note: see note under *E. banksii* (7) for the need to change Andrews' personal epithets.

Illustrations: Baker & Oliver: t. 18 (1967); Schumann & Kirsten: 44, t. 16, 17 (1992).

Diagnostic features: corolla smooth (lacking any longitudinal ridges), sticky; bract and bracteoles nearly as long as sepals and approximate to them; inflorescences umbel-like.

The inflorescence is umbel-like on the main stems and can have, in addition, below the umbel, short leafy branchlets ending with a 3- or 4-nate inflorescence. This latter situation is shown in Andrews' painting.

The main axis can sometimes continue growth.

Vouchers: *Bolus 5168* (BOL!, PRE); *Oliver STE30035* (BM!, K!, NBG!, PRE!); *11952* (K, NBG, NY, PRE); *Salter 4952* (BOL!, K!, SAM!).

21.1. *E. tenax* L.Bolus—see *E. thomae* (21.2).

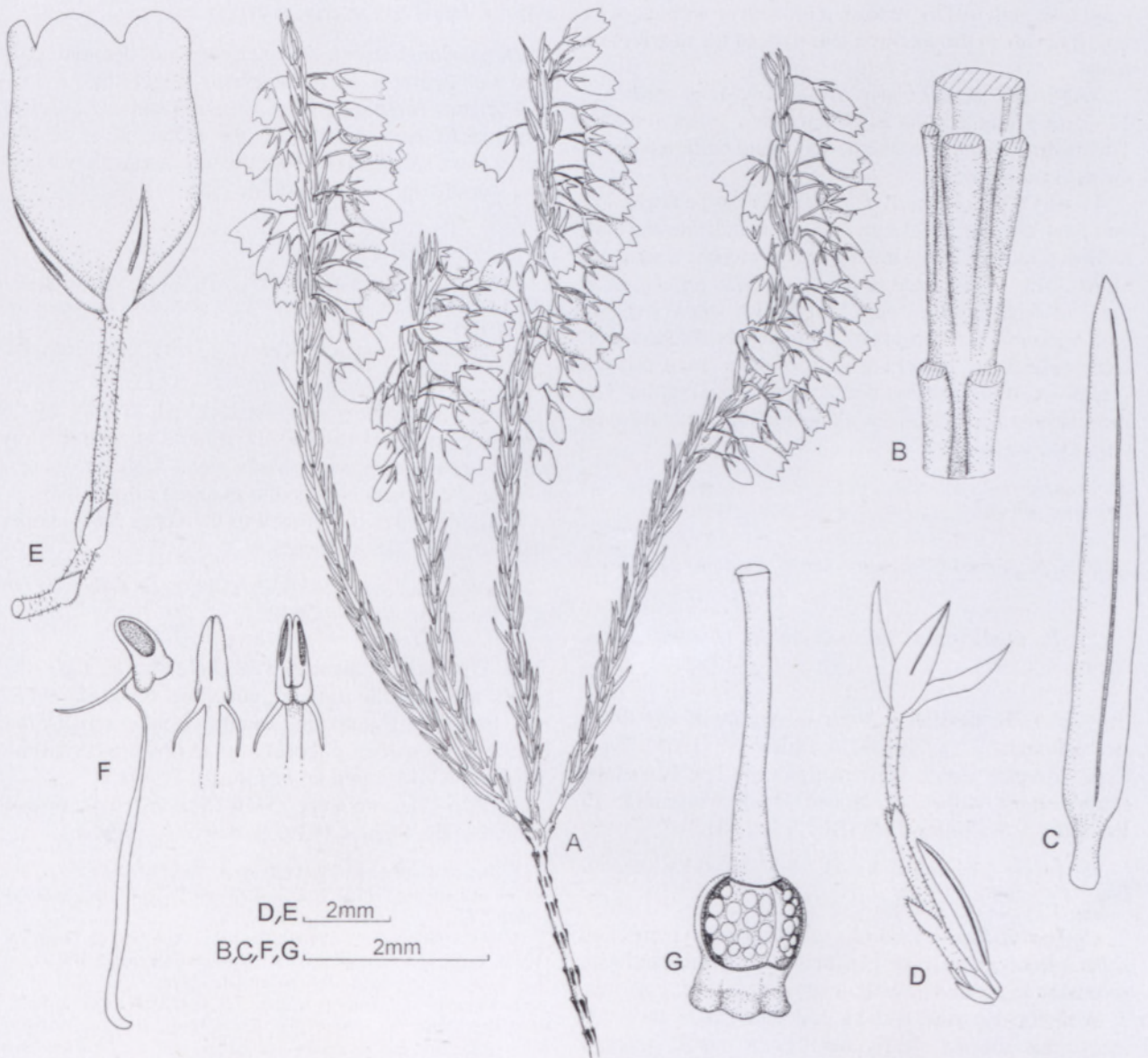


FIGURE 7.—*Erica filipendula* subsp. *parva*, type, *Oliver 11254*. A, flowering branch, $\times 1$; B, stem with leaves removed; C, leaf; D, vestigial lateral branch in axil of vegetative leaf, showing vestigial leaves at base and flower with corolla removed; E, flower; F, anther, side, back and front views. Scale bars: B–G, 2 mm.

21.2. *E. thomae* L.Bolus in *Annals of the Bolus Herbarium* 4: 17, t. 1A (1925); Dulfer: 36 (1965). Syntypes: Cape Province, South-Western Region; Caledon Div., fl. Jan., Rooi Els near Hangklip, *T.P. Stokoe in BOL17571* (BOL! K!); Palmiet River Valley, *Stokoe in BOL17572* (BOL!). Lectotype selected here: *Stokoe in BOL17571* (BOL).

E. thomae L.Bolus var. *brevisepala* L.Bolus: 18 (1925). Type: Cape Town Wildflower Show, *sine coll.* *BOL16233* (BOL!).

E. tenax L.Bolus: 17, t. 1B (1925); Dulfer: 36 (1965). Type: Caledon Div., Palmiet River Valley, fl. Jan., *T.P. Stokoe in BOL17623* (BOL! K!).

E. porteri Compton: 125, t.7 (1953); Dulfer: 36 (1965). Syntypes: Caledon Dist., Buffels Kloof, near Pringle Bay, 500 ft. alt., 25 March 1953, [specimen figured], *Porter s.n.* (NBG!); *ibid.*, 25 March 1953, *Porter s.n.* (NBG!); *ibid.*, 17 August 1953, *Porter s.n.* (NBG!).

Illustrations: L.Bolus: t. 1A (1925); Schumann & Kirsten: 44, t. 18; 45, t. 19–21 (1992).

Diagnostic features: corolla sticky, with longitudinal ridges, densely to sparsely covered with hair-like spicules or pustules; flowers in a dense spike-like syn-

florescence, with 1-flowered florescences on vestigial lateral branchlets bearing small scarious leaves; bract and bracteoles small, tough and situated in middle of pedicel; anthers included with ear-like appendages below thecae; filaments with spicule-like hairs; ovary rounded and glabrous.

We retain the epithet *thomae* in recognition of Thomas Stokoe's considerable collections of fynbos plants made from the 1920s to the early 1950s—both L. Bolus' species were described on the same page.

The species shows much variation in the size, thickness and degree of spreading of the leaves, the length of pedicels (from 4–16 mm long), and the colour and size of the flowers. There are no clear-cut discontinuities to warrant formal taxonomic rank and the three species have been grouped here as variants of a single species. All occur in the mountains from Kogelberg to Hangklip to Kleinmond. Some detailed molecular studies may help to elucidate the relationships between the variants.

VARIANT A (formerly *E. thomae sensu stricto*): medium-long pedicels, 6–10 mm long; corolla 22–30 mm

long, rose pink to dark reddish pink with or without paler tips. It occurs in the southwestern parts of the distribution range.

VARIANT B (formerly *E. tenax*): long pedicels, 13–16 mm long; corolla 22–30 mm long, green to white. This is the variant from the northern and eastern parts of the distribution range.

VARIANT C (formerly *E. porteri*): short pedicels, 4–7 mm long; corolla 20–25 mm long, more delicate and dark reddish pink with white mouth; leaves more spreading up to 90°. This is restricted to a single small population in the Buffelsrivier Valley near Pringle Bay where it grows with Variant A and appears to produce hybrids. However, some collections of Variant A from other areas possess similar small flowers, but not the bicoloured corolla. The Buffelsrivier population has plants more delicate than the other two variants.

Vouchers: *Oliver 92* (NBG!, PRE!); *Porter s.n.* (K!, NBG!), *sub PRE28592* (K!, PRE); *Stokoe 8347* (BOL!, NBG!, PRE).

21.3. *E. porteri* Compton—see *E. thomae* (21.2).

22. *E. phyllicifolia* Salisb.—see *E. abietina* subsp. *atrorosea* (23b).

22.1. *E. nevillei* L.Bolus in *Annals of the Bolus Herbarium* 3: 172, t. 7B (1923); *Dulfer*: 37 (1965). Type: Cape Province: South-Western Region: Cape Peninsula, southwestern slopes of Noord Hoek Mountain, fl. Jan–Feb., *N.S. Pillans 4124* (BOL!, K!, NBG!).

Illustrations: *Schumann & Kirsten*: 46., t. 24 (1992); *Oliver & Oliver*: t. 12 (2000).

Diagnostic features: corolla tube with basal restriction zone; inflorescence spike-like and/or umbel-like and with no continuing apical growth; ovary emarginate, glabrous.

With the bipartite anthers and emarginate turbinate ovary, this species clearly belongs in the *E. abietina* group. It is a restricted endemic on the Cape Peninsula.

Vouchers: *Baker 612* (BM!, NBG!, PRE!); *Galpin 12531* (K!, P!, PRE); *Pillans 4124* (BOL!, K!, NBG!).

22.2. *E. quadrisulcata* L.Bolus in *Annals of the Bolus Herbarium* 3: 172, t. 7D (1923); *Dulfer*: 37 (1965). Type: Cape Province: South-Western Region: Cape Peninsula, neck between Signal Mountain and Zwartkop, Klaver Valley, near Simonstown, fl. Jan., *Pillans 3944* (BOL!, NBG!).

Illustrations: L.Bolus: t. 7D (1923); *Schumann & Kirsten*: 46, t. 25 (1992); *Oliver & Oliver*: t. 14 (2000).

Diagnostic features: ovary acute, glabrous; inflorescence umbel-like, not continuing with vegetative elongation.

The species is a very restricted endemic on the Cape Peninsula.

Vouchers: *Baker 852* (BM!, NBG!); *Galpin 12798* (K!, PRE); *Pillans 3944* (BOL!, NBG!).

23. *E. abietina* L., *Species plantarum* edn 1, 1: 355 (1753); *Salter*: 634 (1951); *Dulfer*: 37 (1965). Type: this will be dealt with in a paper on Linnaean typification

(*Oliver, Jarvis & Cafferty, in prep.*).

Diagnostic features: ovary emarginate, obovoid, covered with dense, short, retrorse hairs (Figure 8).

The considerable range of variation and lack of clear disjunctions have resulted in the reduction of several well-known species to subspecific rank and with two new taxa warranting only subspecific rank.

23a. subsp. *abietina*

E. coccinea sensu P.J.Bergius: 92 (1767), non L. (1753); Benth.: 627 (1839); *Guthrie & Bolus*: 59 (1905). Type: without locality or collector (SBT).

Illustrations: *Schumann & Kirsten*: 46, t. 26 (1992); *Oliver & Oliver*: t. 9 (2000).

Diagnostic features: corolla dark red, tubular, 18–26 mm long, spiculed to sparsely puberulous and slightly viscid; sepals subovate, sparsely pilose with adaxial sessile glands; anthers included to exerted (Figure 8B).

The subspecies is confined to the upper rocky slopes and plateau of Table Mountain.

Vouchers: *Bolus 3366* (BM!, BOL!, K!, PRE), *sub Herb. Norm. 189* (BM!, BOL!, P!); *Oliver 110* (NBG!).

23b. subsp. *atrorosea* E.G.H.Oliv. & I.M.Oliv., subsp. nov., corolla rosea ad atrorosea, tubulosa, 18–22 mm longa, ± glabra aliquantum viscida, sepalis lanceolatis, sparse puberulis glandibus adaxialibus, antheris inclusis interdum manifestis. Figura 8C.

TYPE.—Western Cape, 3418 (Simonstown): Froggy Pond, (–AB), 14 June 1949, *Barker 5355* (NBG).

E. purpurea Andrews, Coloured engravings of heaths: t. 50 (1795); Benth.: 627 (1839); *Guthrie & Bolus*: 58 (1905). Iconotype: Andrews: t. 50 (1795).

E. phyllicifolia Salisb.: 364 (1802); *Salter*: 636 (1951); *Dulfer*: 36 (1965). Type: Sponte nascentem in Hottentots Holland, *I. Mulder s.n.* (K!). Note: the type has a finely puberulous calyx.

E. hesseana J.C.Wendl. ex Klotzsch: 634 (1835); *Guthrie & Bolus*: 61 (1905); *Dulfer*: 38 (1965). Type: Prom. b. sp., *Hesse s.n.* (MEL!). Note: there are two specimens in MEL—one the original from Wendland's herbarium determined by Klotzsch, the other a branch broken off by Klotzsch and retained in B and seen by Benth. Both were borrowed by Sonder who was working on the genus for his *Flora capensis* when he died, and were never returned to the original herbaria. His herbarium was sold in two parts with the Ericaceae going to Baron Ferdinand von Mueller in MEL.

Illustration: *Schumann & Kirsten*: 45, t. 23 (1992).

Diagnostic features: corolla rose to deep rose, tubular, 18–22 mm long, ± glabrous and somewhat sticky; sepals broadly lanceolate, sparsely puberulous with adaxial sessile glands; anthers included, occasionally manifest (Figure 8C).

The taxon is confined to the Cape Peninsula and occurs from the lower slopes of Table Mountain at Kirstenbosch along the mountains southwards to Cape Point. It is not sympatric with subsp. *abietina*.

Paratype material (selection from numerous collections): WESTERN CAPE—3318 (Cape Town): Kirstenbosch, 150 ft [45 m], (–CD), 27-08-1997, *McGrath s.n.* (NBG!); 3418 (Simonstown): Muizenberg, 1400 ft [426 m], (–AD), 02-1878, *Bolus 4475* (BM!, BOL!, K!, PRE!); Muizenberg/Kalk Bay Mtns, 300 ft [90 m], (–AD), 03-1880, *Bolus 4516* (BM!, BOL!, K!, NBG!); St James, 900 ft [274 m], (–AD), 12-02-1959, *Oliver 50* (NBG!); Kalk Bay Mtn, 800 ft [243 m], (–AD), 12-02-1959, *Oliver 54* (NBG!); Swartkop, Klaver Valley, 1100 ft [335 m], (–AD), 14-02-1985, *Oliver 8675* (NBG!); Vasco da Gama Peak, (–CB), 12-12-1959, *Oliver 353* (NBG!); Cape Point, (–CB), 10-02-1929, *J.B. Gillett 3465* (NBG!); *ibid.*, 06-1967, *Williams 1008* (NBG!).

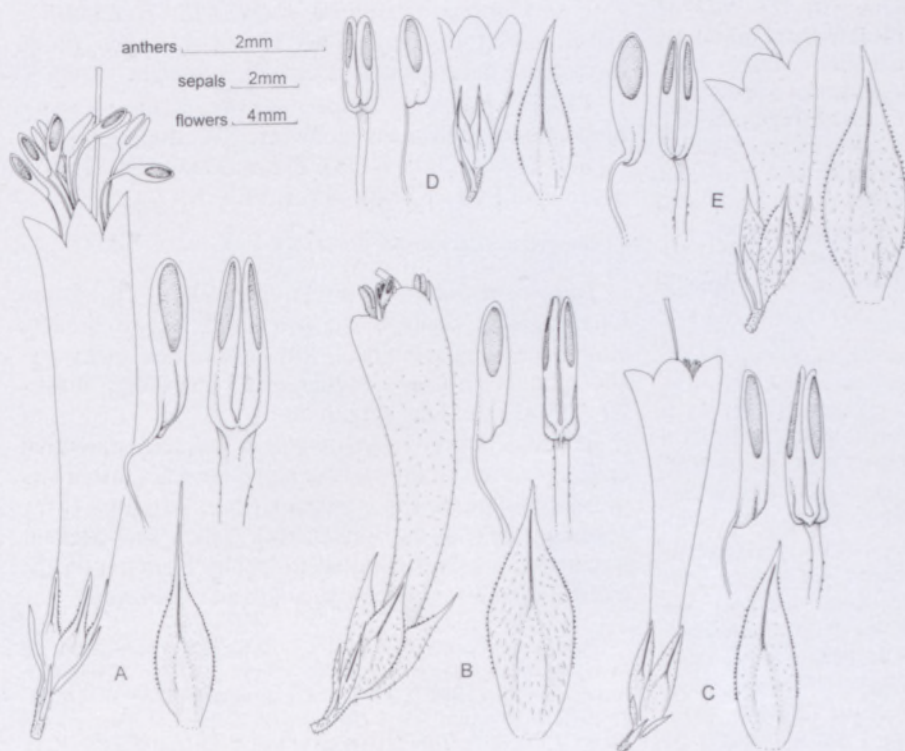


FIGURE 8.—*Erica abietina* complex. A, subsp. *aurantiaca*, Van Wyk 481, Rocklands, Cold Bokkeveld; B, subsp. *abietina*, Taylor 5777, Table Mtn, Platteklip; C, subsp. *atrorosea*, Oliver 8675, Simonstown; D, subsp. *constantiana*, Oliver 11335, Constantiaberg; E, subsp. *diabolis*, Kirsten 422, Devil's Peak Saddle. Scale bars: anthers, sepals, 2 mm; flowers, 4 mm.

23c. subsp. **diabolis** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., corolla breviter obconica, rosea, 11–14 mm longa, subglabra, sepalis ovatis pilosis glandibus sessilibus adaxialibus dignoscenda. Figura 8E.

TYPE.—Western Cape, 3318 (Cape Town): saddle between Devil's Peak and Table Mountain, 2100 ft [640 m], (–CD), 25 August 1973, *Kirsten 422* (NBG).

E. coccinea L. var. *echiiflora* sensu Bolus: 60 (1905) non *E. echiiflora* Andrews. *E. abietina* var. *echiiflora* (Bolus) Salter: 643 (1951); Dulfer: 37 (1965).

Illustration: Schumann & Kirsten: 46, t. 27 (1992).

Diagnostic features: corolla shortly obconical, rose-pink, 11–14 mm long, subglabrous, subviscid; sepals ovate, pilose with adaxial sessile glands (Figure 8E).

The subspecies is a very restricted endemic occurring only on the saddle between Devil's Peak and Table Mountain.

Andrews' *E. echiiflora* is placed under *E. viscaria* subsp. *gallorum* (34d). His paintings show a ridged corolla with nipped-in mouth and spreading corolla lobes and an ovary with longish erect hairs—all typical of that species.

Vouchers: *Bolus 3772* (BM!, BOL!, K!); *Kirsten 422* (NBG!).

23d. subsp. **constantiana** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., floribus obconicis, roseis, sepalis sparse puberulis vel glabris, antheris inclusis dignoscenda. Figura 8D.

TYPE.—Western Cape, 3418 (Simonstown): Constantiaberg, middle N slopes, 620 m, (–AB), 21-09-1999, *E.G.H. & I.M.Oliver 11335* (NBG).

E. conica Lodd.: t. 1179 (1824); Benth.: 664 (1839); Guthrie & Bolus: 60 (1905); Salter: 649 (1951); Dulfer: 37 (1965). Iconotype: Lodd.: t. 1179 (1824).

Illustrations: Schumann & Kirsten: 47, t. 28, 29 (1992); Oliver & Oliver: t. 10 (2000).

Diagnostic features: corolla pale to deeper rose-pink,

obconic, 8–11 mm long, glabrous, subviscid; sepals lanceolate-ovate, with adaxial sessile glands; anthers always included, situated about $\frac{2}{3}$ way up tube (Figure 8D).

This subspecies is confined to the Cape Peninsula occurring on the mountains from Constantia Neck to Chapman's Peak.

Guthrie & Bolus (1905) noted that there is little to separate *E. conica* from subsp. *diabolis* (quoted by them as *E. abietina* var. *echiiflora*). We retain it as a subspecies in this complex.

Paratype material (selection from numerous collections): 3318 (Cape Town): Kasteelspoort, 1200 ft [365 m], 08-1877, *Bolus 3715* (BOL!, K!); no precise locality, mtns near Cape Town, 1894, *Bolus 7949* (BOL!, NBG!, PRE). 3418 (Simonstown): Constantiaberg, 2000 ft [609 m], (–AB), 22-05-1941, *Compton 10842* (NBG!); *ibid.*, 2900 ft [883 m], 5-06-1985, *Oliver 8742* (NBG!); *ibid.*, 29-08-1963, *Stauffer 5063* (K!, NBG!, PRE); Orangetloof, (–AB), 28-08-1954, *Esterhuysen 23085* (BOL!); Chapman's Peak/Noordhoek, 900–1000 ft [274–304 m], (–AB), 1-08-1972, *Kirsten 304* (NBG!); Karbonkelberg, (–AB), 16-08-1972, *Oliver s.n.* (NBG!); Vlakkenberg, (–AB), 13-09-1936, *Salter 6283* (BOL!, K!); Noordhoek Peak, (–AB), 1400 ft [426 m], 20-07-1967, *Taylor 6395* (NBG!, PRE).

23e. subsp. **aurantiaca** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., corolla (10–)25–30[–34] mm longa, glabra, viscida vel non viscida, sepalis longe acuminata ex base ovata, antheris inclusis ad perexertis. Figura 8A.

TYPE.—Western Cape, 3319 (Worcester): Fransch Hoek Pass, mtn slopes NE of top of pass, 2500 ft [760 m], (–CC), February 1966, *Chater in STE30037* (NBG, holo.; BM, BOL, K, PRE).

E. grandiflora L.f.: 223 (1782); Benth.: 628 (1839); Guthrie & Bolus: 57 (1905). Type: Caput bonae spei, *Thunberg s.n.* (UPS).

E. exurgens Andrews, Coloured engravings of heaths: t. 22 (1796); Benth.: 627 (1839); Guthrie & Bolus: 57 (1905); Dulfer: 35 (1965); *E. grandiflora* var. *exurgens* *E.G.H.Oliv.*: 204 (1967). Iconotype: Andrews: t. 22 (1796). Note: Andrews' paintings bearing the above names all seem to be of the Franschoek/Wemmershoek form with longer leaves and pale to dark orange flowers, but not pure yellow.

Illustrations: Baker & Oliver: t. 14 (1967); Schumann & Kirsten: 44, t. 14 (1992).

Diagnostic features: corolla tubular, (10–)25–30[–34] mm long, glabrous, sometimes with few hairs on lobes, orange to orange-red, sticky to non-sticky; sepals long acuminate from ovate base, with large area of adaxial sessile glands; anthers included to far exerted (Figure 8A).

This is the most widespread, common and variable of the subspecies, occurring from the hills just northeast and east of Cape Town to as far inland as the Witteberg at Matjiesfontein and southeast to near Ashton, but absent from the Cape Peninsula. The flowers can be pale to dark orange with zones of yellow below, to completely deep orange-red.

Paratype material (selection from numerous specimens): WESTERN CAPE.—3318 (Cape Town): Klein Dassenberg, Kanonkop, (–DA), 3-05-1986, *Fellingham 1077* (NBG!); Kuils River hills, 600 ft [182 m], (–DC), 19-06-1972, *Oliver 3767a* (K!, NBG!, PRE). 3319 (Worcester): Agter Witsenberg, (–AB), 10-03-1959, *Barker 8875* (MO!, NBG!); Michell's Pass, 1 400 m, (–AD), 01-1892, *Guthrie 2285* (NBG!); *ibid.*, 1200 ft [365 m], 15-01-1896, *Schlechter 9958* (BOL!, K!, NBG!, PRE!, W); Ceres, Waboomsberg, 1 320 m, (–AD), 12-11-1989, *Oliver 9272* (NBG!); Bokkerivier, (–BD), 9-11-1963, *Middlemost 2241* (NBG!, NY!); Du Toit's Kloof, foot Paarl side, (–CA), 15-10-1949, *Barker 6076* (NBG!, P!); Paarl, Donkerkloof, (–CC), 12-09-1948, *Esterhuysen 14560* (BOL!, NBG!); French Hoek, (–CC), 1894, *Fair sub Bolus 6321* (BOL!, NBG!, PRE); Fransch Hoek Pass, 920 m, (–CC), 8-01-1970, *Oliver & Palsler 12* (NBG!, PRE). 3320 (Montagu): Touwsrivier, Pienaarspoort, 1 000 m, (–AA), 5-05-1994, *Oliver 10464* (NBG!); Remhoogte SE of Ashton, 425 m, (–CC), 21-03-1986, *Oliver 8814* (NBG!).

23f. subsp. **perfoliosa** *E.G.H.Oliv. & I.M.Oliv.*, subsp. nov., foliis longioribus 20–30(–42) mm, corolla flava dense puberula non viscida dignoscenda. Figura 9.

TYPE.—Western Cape. 3318 (Cape Town): Stellenbosch, Jonkershoek Twins, SW slopes, 600 m, (–DD), 24 May 2001, *E.G.H. & I.M.Oliver 11912* (NBG, holo.; BM, BOL, K, MO, NY, P, PRE, S).

Illustration: Schumann & Kirsten: 44, t. 15 (1992).

Diagnostic features: corolla pure yellow, 20–25 mm long, densely, finely hairy, non-sticky; sepals broadly elliptic and long acuminate, with adaxial non-sticky sessile glands; anthers included to manifest; leaves 20–30(–42) mm long (Figure 9).

The material of this taxon was at one stage classified as *E. exurgens* Andrews. The taxon does not match any of Andrews' plates and is a distinct, very localized entity occurring only in the Jonkershoek Valley near Stellenbosch where it is occasional to locally common on the moister granitic slopes facing south and southwest.

Paratype material: WESTERN CAPE—3318 (Cape Town): all from Stellenbosch, Jonkershoek Valley, (–DD), 29-03-1943, *Esterhuysen 8789* (BOL!); 3-04-1949, *Esterhuysen 15230* (BOL!); 25-01-1975, *Esterhuysen 33758* (BOL!, K!); 19-05-1950, *Parker 4477* (BOL!, K!, NBG!); 2300 ft [700 m], 14-06-1962, *Taylor 3399* (BM!, NBG!, PRE); 3000 ft [914 m], 30-01-1963, *Taylor 4628* (NBG!, PRE); 13-04-1961, *Van Rensburg 465* (NBG!, PRE).

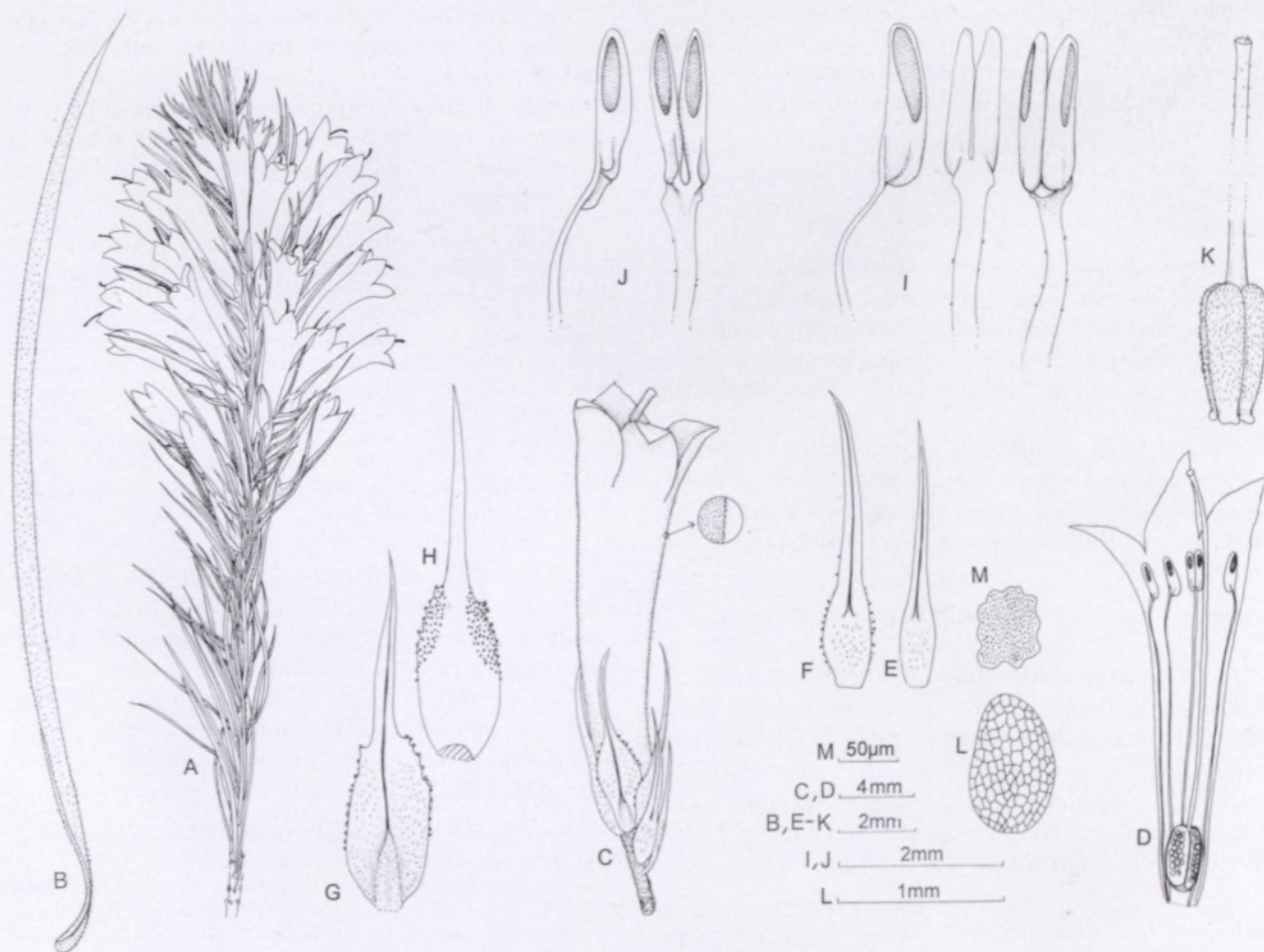


FIGURE 9.—*Erica abietina* subsp. *perfoliosa*, type *Oliver 11912*. A, flowering branch, $\times 1$; B, leaf; C, flower; D, flower cut in half with sepals removed; E, bract; F, bracteole; G, sepal; H, sepal, adaxial surface showing sessile glands; I, anther, side, back and front views; J, anther variant, side and front views; K, gynoecium seed; M, testa cell. Scale bars: B, E–K, 2 mm; C, D, 4 mm; L, 1 mm; M, 50 μ m.

23g. subsp. **petraea** E.G.H.Oliv. & I.M.Oliv., subsp. nov., corolla flava dense puberula non viscida, sepalis sine glandibus adaxialibus, habitu petrensis dignoscenda. Figura 10.

TYPE.—Western Cape. 3319 (Worcester): Porterville area, Groot Winterhoek Mtns, Kliphuisvlakte, road to Groot Kliphuis, rock crevices in rocky outcrop, 1 140 m, (–AA), 23 November 1999, E.G.H. & I.M. Oliver 11440 (NBG, holo.; K, PRE).

Diagnostic features: corolla pure yellow, \pm 20 mm long, densely, finely hairy, non-sticky; sepals narrow-lanceolate with no adaxial sessile glands; anthers manifest to exserted (Figure 10).

The subspecies is restricted to rocky outcrops on the mountains above Porterville where the common and widespread subsp. *aurantiaca* is not known to occur.

Paratype material: WESTERN CAPE.—3219 (Wupperthal): Groot Winterhoek Wilderness area, mtns above and ENE of Porterville, 3200 ft [975 m], (–CC), 23-11-1999, E.G.H. & I.M. Oliver 11449 (BM!, NBG!).

Erica abietina is highly variable in flower size and colour, indumentum of calyx and corolla, stickiness of the corolla, degree of inclusion/exsertion of the stamens, anther shape, and leaf length and habitat preferences. It used to consist of four separate species that were long established in the literature—*E. abietina*, *E. phyllicifolia*, *E. grandiflora* and *E. conica*. There are no clear disjunctions in the ranges of characters that were formerly used to separate them, but there are some slight discontinuities which warrant only subspecific recognition.

The whole complex is held together by flowers borne 1-nate or occasionally 2-nate on vestigial lateral branch-

lets arranged in compact, spike-like synflorescences towards the ends of main branches. The leaves are all apiculate and vary from 10–30(–42) mm long, the sepals vary from very narrow, long-lanceolate to lanceolate, to broadly lanceolate, to almost ovate and long-acuminate and have a flattened, raised area below the sulcus. They may be villous to pilose or glabrous and often bear numerous sessile glands over their inner surface, thus rendering the corolla viscid. The sepals all have sessile glands on the margins and, except for subsp. *petraea*, numerous sessile glands adaxially in the middle zone next to the margins (Figure 9H)—these may be sticky or non-sticky.

The corolla is mostly long-tubular varying from 18 to 30(–34) mm in length, but in two subspecies, obconical and only 8–14 mm long. It varies from glabrous to subglabrous to densely and finely hairy and may be red, orange-red, orange, deep pink, pink or yellow. In the fresh state these colours are very distinctive, and would clearly lead one to use them as specific characters, but in dried material without colour notes, identification is nigh impossible and one has to resort to a few morphological characters. The anthers can be distinctly bipartite, even splitting in the apex of the filament, to having the thecae closely adpressed—sometimes varying in a single collection. They are mostly attached basally to slightly sub-basally. The filaments are often sparsely strigulose with the style sparsely hairy.

The Peninsula taxa tend to form a group having the apex of the corolla lobes a little more rounded, whereas the taxa from the mainland have more acute apices to the corolla lobes.

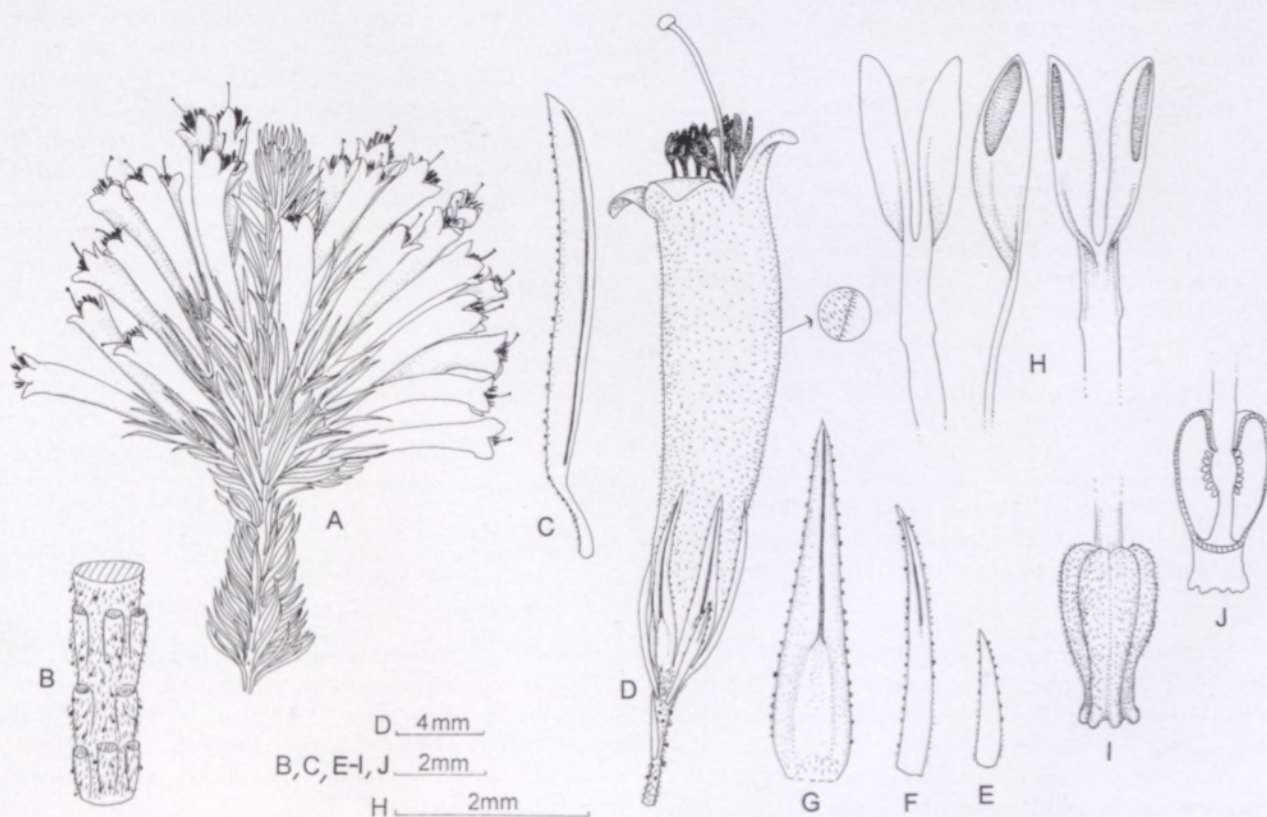


FIGURE 10.—*Erica abietina* subsp. *petraea*, type Oliver 11440. A, flowering branch, \times 1; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, anther, back, side and front views; I, ovary; J, l/s ovary. Scale bars: B, C, E–J, 2 mm; D, 4 mm.

24. *E. conica* Lodd.—see *E. abietina* subsp. *constantina* (23d).

25. *E. pinea* Thunb., *Dissertatio botanica de Erica*: 23 (1785); Guthrie & Bolus: 60 (1905); Dulfer: 38 (1965). Type: sine loc., *Thunberg s.n.* (UPS; BM!, K!).

E. aurea Andrews, *Coloured engravings of heaths*: t. 76 (1803); Benth.: 628 (1839). Iconotype: Andrews: t. 76 (1803).

E. argentiflora Andrews, *The Heathery*: t. 202 (1809). *E. pinea* var. *argentiflora* (Andrews) Bolus: 61 (1905); Dulfer: 38 (1965). Iconotype: Andrews: t. 202 (1809).

E. aurea Andrews var. *viscosissima* Benth.: 628 (1839). *E. pinea* var. *viscosissima* (Benth.) Bolus: 61 (1905); Dulfer: 38 (1965). Type: Fransche Hoek Kloof, *Masson s.n.* (K!).

Illustrations: Schumann & Kirsten: 47, t. 30, 31 (1992).

Diagnostic features: corolla glabrous, smooth, dry; sepals with no glands on adaxial surface; ovary globose, subsituate, glabrous, 6–8-locular.

This species is characterized by the 6–8-locular ovary which is stipitate and glabrous, the glabrous dry smooth corolla and no glands on the adaxial surface of sepals. The flowers may be yellow with a white tip or pure white. It can easily be mistaken for white-flowered forms of *E. viscaria* subsp. *longifolia*.

Vouchers: *Esterhuysen 1769, 19987* (BOL!, NBG!, PRE); *Oliver 1136* (NBG!); *Schlechter 10254* (BM!, K!, NBG!, PRE); *Thompson 3834* (K!, NBG!, PRE).

26. *E. hesseana* J.C.Wendl. ex Klotzsch—see *E. abietina* subsp. *atrorosea* (23b).

27. *E. annectens* Guthrie & Bolus in *Flora capensis* 4: 61 (1905); Salter: 637 (1951); Dulfer: 38 (1965). Type: Cape Div., mountains near Kalk Bay, *Guthrie 1002* (BOL!, PRE).

Illustrations: Baker & Oliver: t. 16 (1967); Schumann & Kirsten: 48, t. 32, 33 (1992).

Diagnostic features: flowers 4-nate, terminal on branches; corolla glabrous, smooth, non sticky; anthers dorsally attached; ovary globose, glabrous, 8-locular.

This is a rare, highly restricted endemic on the Cape Peninsula. It is related to *E. pinea* and *E. verticillata* (64), which also have 8-locular ovaries.

Vouchers: *Oliver STE30036* (BM!, BOL!, K!, NBG!, PRE!).

28. *E. regia* Bartl. in *Linnaea* 7: 630 (1832); Benth.: 626 (1839); Guthrie & Bolus: 62 (1905); Dulfer: 38 (1965). Type: Zoutendaelsvalley im Distr. Caledon [Zoetendalsvlei near Agulhas], *Miss Joubert s.n.* (GOET?).

Diagnostic features: corolla glabrous and smooth, texture stiff and cartilaginous; anthers with vestigial appendages on apex of filaments; ovary hairy at top with erect hairs.

With only a slight disjunction in one morphological character coupled with a clear difference in habitat preferences, we are reducing this complex of three species and three varieties to one species with two subspecies.

28a. subsp. *regia*

E. regia var. *variegata* Bolus in *Flora capensis* 4: 62 (1905); Dulfer: 38 (1965). Syntypes: Bredasdorp Div., hills near Elim, 300–400 ft [90–120 m], *Pappe 60* (?); *ibid.*, *Bolus 6754* (BM!, BOL!, K!, PRE); *ibid.*, *Guthrie 2362* (BOL!); *ibid.*, *Will sub MacOwan in Herb. Austr.-Afr. 1718* (BM!, BOL!, K!, P!).

E. regia var. *williana* Bolus: 62 (1905); Dulfer: 38 (1965). Syntypes: Bredasdorp Div., hills near Elim, 300–400 ft [90–120 m], *Guthrie 3788* (NBG!); *ibid.*, *Bolus 8448* (BM!, BOL!); *ibid.*, *Schlechter 7680* (BM!, BOL!, PRE); *ibid.*, *Will sub MacOwan Herb. Austr. Afr. 1719* (BM!, BOL!, K!, P!, SAM!). Lectotype selected here: *Will sub MacOwan Herb. Norm. Austr. Afr. 1719* (BOL!).

E. casta Guthrie & Bolus: 62 (1905); Dulfer: 38 (1965). Syntypes: Bredasdorp Div., maritime downs and hills near Elim, about 300 ft [90 m], *Guthrie 3719* (?); *ibid.*, *Bolus 6752* (BM!, BOL!), *6762* (BOL!, K!) & *8446* (BM!, BOL!, K!). Note: *Bolus 6762* = *E. vestita* (31).

E. casta var. *breviflora* Guthrie & Bolus: 63 (1905); Dulfer: 38 (1965). Syntypes: Bredasdorp Div., hills near Elim, 300 ft [90 m], *Guthrie 3790* (BOL, SAM!); *ibid.*, *Bolus 8449* (BOL!, K!), *8460* (BOL! K!). Note: *Guthrie's 3790* in SAM = *E. axilliflora* also *Bolus 8449* in BM. Bolus determined his *8449* in BOL as *E. axilliflora* and cites it as such in *Flora capensis*. He noted on the label of *8460* that it grew with his *8446* and *8449*. *Guthrie 3789* is *E. axilliflora* and cited as such in *Flora capensis*.

Illustrations: Baker & Oliver: t. 11 (1967); Schumann & Kirsten: 48, t. 34–37 (1992).

Diagnostic features: corolla nipped in at apex just below spreading lobes.

Guthrie & Bolus (1905) noted under *E. casta*—‘closely allied to *E. regia*....we propose the species with some doubt’. We concur with them.

The variant with variegated flowers (basal white zone, middle mauve/purple zone and bright red upper zone) is very striking and well known as the Elim Heath, but has no morphological differences from the unicoloured forms, some of which can have a slightly paler whitish basal portion.

The var. *williana* described by Bolus is a problem in that it was considered by us as a short-tubed form (flowers 6–12 mm long versus 14–20 mm in the typical subspecies) with a postulated different pollination syndrome and worthy of subspecific status. However, we have recorded it as a few plants growing together with the orange-red long-tubed typical subspecies and the dark pink *E. axilliflora* Bartl. just northwest of Zoetanyberg (see Note above under synonymy). The flowers varied from pale to darker purple. At the time we concluded that the plants were possible hybrids between the two species. Further ‘populations’ of this form need to be located and investigated thoroughly before any definite conclusions can be made as to its identity.

Vouchers: *Bolus 8448* (BM!, BOL!, K!, PRE); *Oliver 3371* (K!, NBG!, PRE), *3415* (K!, NBG!, PRE!), *STE30138* (K!, NBG! NY!, PRE!).

28b. subsp. *mariae* (Guthrie & Bolus) *E.G.H.Oliv.* & *I.M.Oliv.*, stat. et comb. nov.

E. mariae Guthrie & Bolus in *Flora capensis* 4: 63 (1905); Dulfer: 39 (1965). Type: Riversdale Div., at Milkwood Fontein, 600 ft [180 m], *Galpin 3565* (BOL!, K!, PRE).

Illustrations: Schumann & Kirsten: 50, t. 38–40 (1992).

Diagnostic features: corolla not nipped in at apex.

This subspecies occurs only on limestone ridges from southwest of Bredasdorp to Stilbaai. In the Mierkraal area this taxon grows on the limestone ridge, whereas the variegated variant of subsp. *regia* grows on the nearby lateritic/sandy flats.

Guthrie & Bolus separated the species in this variable complex on the colour and shape of the corolla and the

degree of protrusion of the nose at the base of the anthers.

The protologue for the species described the type with 'flores purpurei'. We have not seen a purple-flowered long-tubed plant in the wild, but have seen fresh material of the purple-flowered short-tubed form (var. *williana*). The Elim hills and Zoetanyenberg possess a form with bright orange-red flowers and further south towards the sea the white-flowered (sometimes tinged pinkish) form, formerly *E. casta*, occurs, both on sandy substrates. On the lateritic flats southeast and east of Elim the form with variegated flowers occurs. On the limestone ridges from Mierkraal right through to Stilbaai, there occur plants with dark red flowers. The colours are very distinctive and recognizable, but have no major taxonomic significance to warrant subspecific ranking. Herbarium material in which colour has not been recorded cannot be identified with any certainty.

The corolla shape in *E. regia* and *E. casta* is almost identical, both having a restriction below the spreading corolla lobes and sometimes a tapering towards the base. The flowers of *E. mariae* do not have the distinct restriction. There is no clear-cut boundary between the more extreme anther noses in some material of *E. regia* to the almost lack of a nose in *E. casta* and *E. mariae*.

Vouchers: *Compton* 23202 (NBG!, W); *Oliver* 5788 (NBG!, PRE); *Taylor* 8951 (K!, NBG!, PRE).

29. *E. casta* Guthrie & Bolus—see *E. regia* subsp. *regia* (28a).

30. *E. mariae* Guthrie & Bolus—see *E. regia* subsp. *mariae* (28b).

31. *E. vestita* Thunb., *Dissertatio botanica de Erica*: 22 (1785); Benth.: 626 (1839); Guthrie & Bolus: 63 (1905); Dulfer: 39 (1965). Type: sine loc., *Thunberg s.n.* (UPS, K!, fragm.).

E. vestita var. *coccinea* Curtis: t. 402 (1798). *E. longifolia* Bauer var. *amplicata* Bolus: 66 (1905); Dulfer: 40 (1965). Type: Curtis: t. 402 (1798).

E. vestita var. *fulgida* Andrews: t. 137 (1804); Bolus: 64 (1905); Dulfer: 39 (1965). Iconotype: Andrews: t. 137 (1804).

E. longifolia Bauer var. *maritima* Bolus: 66 (1905); Dulfer: 40 (1965). Type: Bredasdorp Div., hills near Cape Agulhas, *Schlechter* 10556 (BM!, BOL!, PRE!, W).

Illustrations: Baker & Oliver: t. 12 (1967); Schumann & Kirsten: 50, t. 41, 42 (1992).

Diagnostic features: long leaves with long petiole (i.e. versatile leaves); corolla trumpet-shaped, 16–24 mm long, finely hairy, not ridged; ovary hairy on top, hairs erect.

The variation in this species occurs in the shape of the sepals from narrow-lanceolate to those with a broader base, the corolla indumentum from very finely downy to pilose and flower colour—white, pink, purple to red. The northern groups of populations have distinctly geographical colours—white at Ezeljacht hills, red on the Rivieronderend Mountains and purplish pink on the Langeberg near Swellendam. They all have finely downy corollas, whereas the southern populations from the Klein River Mountains to Cape Agulhas have more pilose corollas. The population north of Stanford has

white flowers, whereas there is a mixture of purple-pink to reddish in the colour of the flowers from the hills east of Stanford to Agulhas. The type is described as white-flowered and would probably match the Ezeljacht material.

Under *E. longifolia* Bolus commented on the close similarity between his var. *maritima* and *E. vestita*. We find it inseparable from the various forms of *E. vestita* found in the Bredasdorp District and transfer it as a synonym under this species—the smooth corolla (without ridges) being sparsely pilose and the long petioles making the leaves versatile, are the defining characters.

Vouchers: *Burchell* 7949 (K!, P!, PRE); *Oliver* 7536, 8982, 10970 (NBG!); *Schlechter* 7634 (BM!, K!, P!, PRE, W).

32. *E. nematophylla* Guthrie & Bolus in *Flora capensis* 4: 64 (1905); Dulfer: 39 (1965). Syntypes: Riversdale Div., 1000 ft [300 m]; slopes of the Langeberg Range near Riversdale, *Schlechter* 1728 (BM!, BOL!, K!, P!, Z); roadside, Garcia's Pass, *Galpin* 3643 (BOL!, K!, PRE). Lectotype selected here: *Galpin* 3643 (BOL).

E. filamentosa Andrews var. *longiflora* Bolus: 65 (1905); Dulfer: 40 (1965). Syntypes: Swellendam Div., mountain ridges along lower part of River Zondereinde, *Zeyher* 3171 (BOL!, K!, P!, PRE, W); Caledon Div., without collector's name or number, Cape Govt. Herb. (?).

Illustrations: Schumann & Kirsten: 51, t. 43, 44 (1992).

Diagnostic features: corolla tubular, 10–12 mm long, narrowed slightly towards apex, finely hairy to subglabrous, white or pink.

The long-flowered variety of *E. filamentosa* has the closed corolla mouth of this species, and even though the corolla is pink, it is transferred to this species. There is a clear disjunction in the distribution range with the pink variant on the eastern Rivieronderend Range and the white variant on the Langeberg at Grootvadersbos and Garcia's Pass.

Vouchers: *Kirsten* 677 (BOL!, K!, NBG!); *Oliver* 8633 (NBG!); *Schlechter* 1728 (BM!, BOL!, K!, P!, Z); *Zeyher* 3171 (BOL!, K!, P!, PRE, W).

33. *E. filamentosa* Andrews, Coloured engravings of heaths: t. 91 (1804); Benth.: 664 (1839); Guthrie & Bolus: 65 (1905); Dulfer: 39 (1965). Iconotype: l.c., t. 91 (1804).

Note: Dulfer incorrectly dated Andrews' plates of this species—Coloured engravings of heaths: t. 91 is dated Feb. 1804 on the full painting, with the reduced version. The Heathery: t. 22, dated Feb. 1805 on the plate.

Illustration: Schumann & Kirsten: 51, t. 45 (1992).

Diagnostic features: corolla broadly obconic, 8–9 mm long, sparsely and very finely hairy, pink.

The species is confined to the gravelly flats southeast of Swellendam in the Bontebok National Park. It clearly has a different pollinator from the pink-flowered form of *E. nematophylla* as the anthers are situated lower down in the very open-mouthed corolla.

E. filamentosa var. *longiflora* Bolus is transferred to *E. nematophylla* (32).

Vouchers: *Kirsten* 744 (BM!, NBG!); *MacOwan* 1494 (K!, NBG!, PRE, W).

34. *E. viscaria* L., *Dissertatio botanica de Erica*: 10 (1770); Andrews: t. 71 (1800); Benth.: 664 (1839); Guthrie & Bolus: 210 (1905); Salter: 649 (1950); Dulfer: 102 (1965). Lectotype: *Herb. Linn. no. 498.74*, lectotype selected here by Oliver, Jarvis & Cafferty, in prep.

Diagnostic features: corolla longitudinally ridged with very short bristle-like hairs or pustules; tube slightly constricted below spreading lobes, not or rarely obconical to broadly so; ovary obconical, not stipitate, covered with erect dense fairly long, white hairs (Figure 11).

This is a very variable species which occurs from the Cape Peninsula to Franschhoek and to the Bredasdorp coastal flats. It is probably the most variable species of *Erica* with respect to flower colour—white, green, yellowish, pink, purple, red, or combinations of pink with a white mouth or red with a yellow mouth. Some of these colour variants are very striking and showy. The corolla varies in shape and size over a wide range. The indumentum may be almost absent, finely puberulous, strigose, spiculate, strigose from pustules, or markedly pustulate. The flowers may be very viscid, partially so or non-viscid and the plants may be reseeders or resprouters with long to short leaves.

Colour is an unsuitable character since this is not retained by older herbarium material and can therefore not be used as a sole distinguishing feature.

Corolla length we regard as important in distinguishing subspecies, since the open corolla shape of these taxa coupled with a lower position of the stamens in their flowers would suggest a different pollination syndrome from the bird-pollinated long-flowered variants.

34a. subsp. *viscaria*

E. decora Andrews, Coloured engravings of heaths: t. 162 (1807); Benth.: 664 (1839); Salter: 649 (1950); Baker & Oliver: 119 (1967). *E. viscaria* L. var. *decora* (Andrews) Bolus: 211 (1905); Dulfer: 103 (1965). Iconotype: Andrews: t. 162 (1807).

Illustrations: Baker & Oliver: t. 114 (1967); Schumann & Kirsten: 169, t. 19 (1992).

Diagnostic features: inflorescence mostly lax; corolla short (5–9 mm long), urceolate to campanulate-obconic, soft and more transparent with slightly softer and shorter hairs; anthers often adhering laterally; thecae with more prominent basal bulges towards filament (Figure 11G).

Bolus (1905) noted the slight difference between subsp. *viscaria* and subsp. *gallorum* by describing *E. viscaria* var. *hispida* from the Sir Lowry's Pass area (see below under 34d). The inflorescence is mostly laxer and longer and the corolla soft and more transparent in the typical subspecies.

This subspecies occurs on the Cape Peninsula mountains and also the surrounding flats from where it is now mostly extinct except in the northern parts. Two variants occur—the commoner one with narrower, hairy sepals on the mountains and the rarer with broader, subglabrous sepals, as represented by the lectotype selected above, mostly on the flats.

Vouchers: Baker 1228 (BM!, NBG!), 1773 (NGB!, PRE); Bolus 4610 (BOL!, K!, NBG!, PRE); Oliver 8683 (NGB!); Steyn 88 (BOL!, NBG!); Taylor 6404 (NGB!).

34b. subsp. *longifolia* (Bauer) E.G.H.Oliv. & I.M.Oliv., comb. et stat. nov.

E. longifolia Bauer, *Delineations of exotick plants cultivated in the royal garden at Kew*: t. 4 (1796); Benth.: 625 (1839); Guthrie & Bolus:

65 (1905); Dulfer: 40 (1965). Iconotype: Bauer: t. 4 (1796). Note: the plate was dated 1 Jan 1793 by the artist/engraver, but published in the fascicle, part 1, dated April 1796 (see Britten 1899).

E. pinea J.C.Wendl.: 1, t. 11 (1798), non Thunb. (1785). *E. longifolia* var. *contracta* Bolus: 66 (1905); Dulfer: 40 (1965). Type: J.C.Wendl.: t. 11 (1798).

E. longifolia var. *squarrosa* Bolus: 66 (1905); Dulfer: 41 (1965). Syntypes: sine loc., Bolus 8039 (BOL!) & Schlechter 4789 (BM!, BOL!, NBG!, W).

E. longifolia var. *stricta* Dulfer: 41 (1965). Type: Caledon Distr.; Palmiet Rivier, Schlechter 7326 (BM!, BOL!, W).

Illustrations: Baker & Oliver: t. 15 (1967); Schumann & Kirsten: 52, t. 47 (1992).

Diagnostic features: corolla ± 12–20 mm long, tubular, non-viscid, hairy or pustulate, red, pink, purple, white, yellowish or green or, in some cases, bicoloured—pink with a white mouth or red with a yellow mouth; sepals, bract and bracteoles long, linear-lanceolate (Figure 11A, B).

This is the most variable subspecies, which it may, on more detailed population studies coupled with molecular analyses, be possible to divide into more subspecific taxa. All plants appear to be single-stemmed reseeders.

There are problems in distinguishing material of the pink/purple-flowered form in the Bredasdorp District from similarly coloured forms of *E. vestita*. It is very possible that the two species hybridize where they are sympatric. The flowers of *E. viscaria* subsp. *longifolia* have a longitudinally ridged corolla and do not possess the longer, soft hairs of *E. vestita*.

E. longifolia var. *maritima* Bolus has been transferred to *E. vestita* (31).

Vouchers: Burchell 8039 (K!, NBG!, P!, W); Oliver 4175 (BM!, K!, NBG!, PRE!), STE30038 (BOL!, K!, NBG!, PRE!); Schlechter 4789 (BM!, BOL!, NBG!, W); Zeyher 3172 (BOL!, NBG!, P!, PRE, W).

34c. subsp. *macrosepala* E.G.H.Oliv. & I.M.Oliv., stat. et nom. nov.

E. glutinosa Andrews, Coloured engravings of heaths: t. 25 (1798), non P.J.Bergius (1767). Iconotype: Andrews: t. 25 (1798).

E. onosmiflora Salisb.: 363 (1802); Benth.: 626 (1839); Guthrie & Bolus: 66 (1905); Dulfer: 41 (1965). Type: as for *E. glutinosa* Andrews.

E. viridis Andrews: t. 140 (1805). *E. longifolia* var. *viridis* (Andrews) Bolus: 66 (1905); Dulfer: 41 (1965). Type: Andrews: t. 140 (1805).

Diagnostic features: sepals lanceolate to ovate-lanceolate, often with a broader base and attenuated apex, corolla ± 15–20 mm long, tubular (Figure 11D).

The corolla is yellowish to green, occasionally white and the plants are mostly resprouters. Some variants may have very viscid flowers. The subspecies occurs in the region from Betty's Bay to Elim.

Vouchers: Compton 6135, 6149 (NGB!); Esterhuysen 4949 (BOL!, NBG!); Hugo 1541 (NGB!, PRE); I. Kruger 1026 (NGB!); Oliver 3351, 4202, 7423, 8700 (NGB!).

34d. subsp. *gallorum* (L.Bolus) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. gallorum L.Bolus in *Annals of Bolus Herbarium* 1: 155, t. 11A (1918); Dulfer: 41 (1965). Type: Cape Province: South-Western Region, French Hoek, fl. Oct., *Anon. in BOLI4029* (BOL!, K!, PRE).

E. echiiflora Andrews: t. 164 (1805). Iconotype: Andrews: t. 164 (1805).

E. echiiflora Andrews var. *purpurea* Andrews: t. 260 (?1812). Iconotype: Andrews: t. 260 (1812).

E. viscaria L. var. *hispida* Bolus: 211 (1906). Syntypes: Stellenbosch Dist., mountains near Sir Lowry's Pass, 900 ft [274 m], Bolus 5548 (BOL!, K!, NBG!, SAM!); *ibid.*, Guthrie 3524 (BOL!).

Illustrations: L.Bolus, t. 11A (1918); Schumann & Kirsten: 52, t. 49 (1992).

Diagnostic features: corolla short 5–10(–12) mm long, elongate-campanulate to obconic with pink lower half and white mouth or sometimes pinkish throughout; hairs short and stout (Figure 11F).

The subspecies is confined to the Nuweberg Reserve, Elgin, on the eastern and southeastern side of the

Hottentots-Holland Mountains where the red-flowered form of subsp. *longifolia* occurs at higher altitudes.

Andrews' *E. echiiflora* is included as a synonym based on the ridged corolla with spreading to reflexed lobes and the ovary with erect, fine hairs, which are all characteristic of *E. viscaria* and not of *E. abietina*.

Vouchers: *Anon. in BOL14029* (BOL!, K!, PRE); *Kirsten 546* (NBG!); *Stokoe 7851* (BOL!, NBG!, PRE).

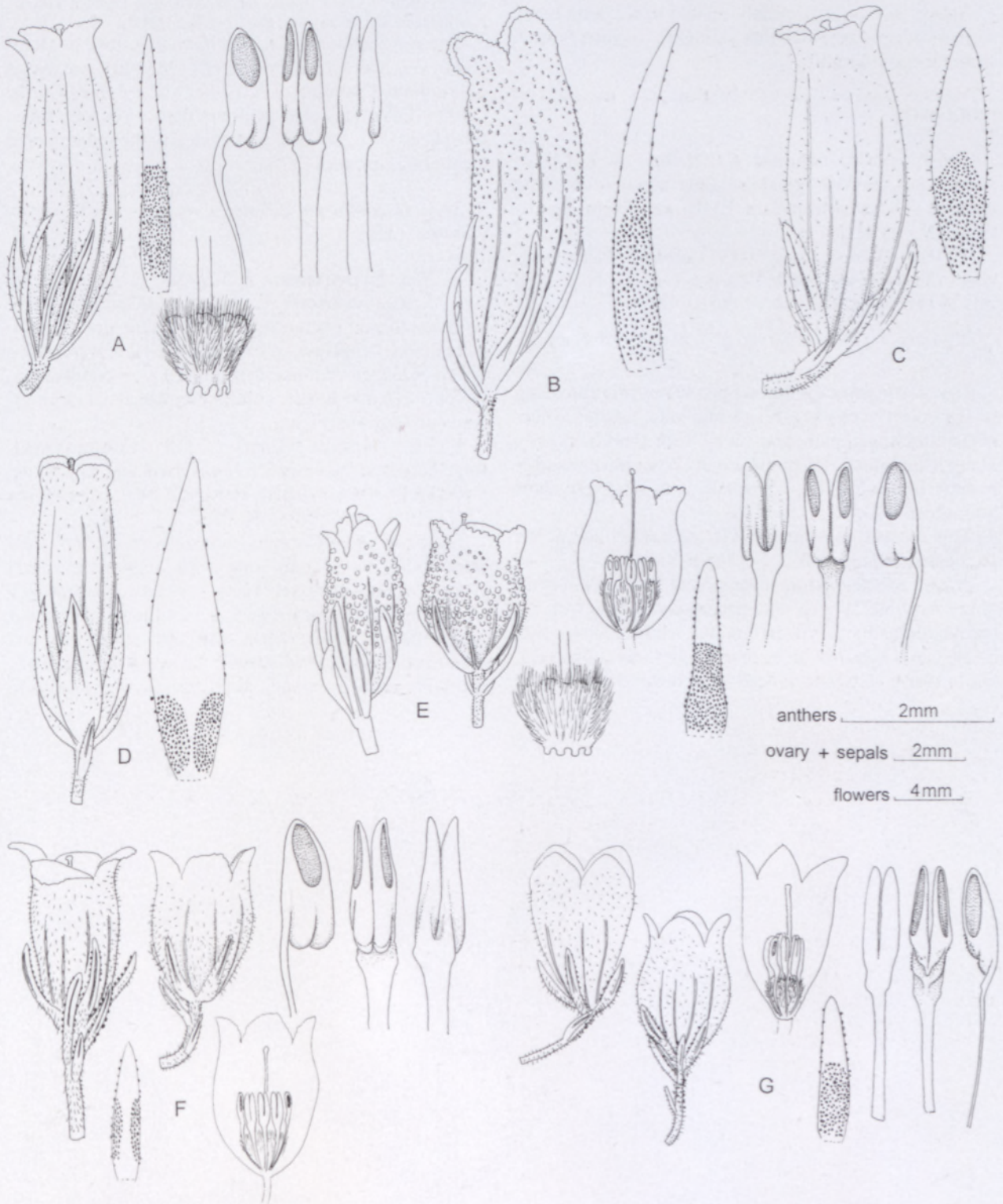


FIGURE 11.—*Erica viscaria* complex with flowers, sepal in adaxial view showing zones of sessile glands, anther and ovary. A, B, subsp. *longifolia*: A, Oliver 11473, Steenbras; B, Gillett 999, Hermanus. C, subsp. *pendula*, Oliver 7610, Highlands; D, subsp. *macrosepala*, Porter s.n., Hangklip; E, subsp. *pustulata*, Williams 1552, Hermanus; F, subsp. *gallorum*, Kirsten 546, Nuweberg; G, subsp. *viscaria*, Oliver 8683, Simonstown. Scale bars: anthers, ovaries, sepals, 2 mm; flowers, 4 mm.

34e. subsp. **pustulata** (H.A.Baker) E.G.H.Oliv. & I.M.Oliv., stat. et comb. nov.

E. pustulata H.A.Baker in Journal of South African Botany 39: 207 (1973). Type: Cape, 3419 (Caledon): above the dams on Mossel River at Hermanus, (-AC), at about 609 m, 11-10-1971, Williams 1552 (BOL!, holo.; NBG!).

E. patersonii L.Bolus: 134 (1928), non *E. patersonia* Andrews. *E. longifolia* var. *breviflora* Dulfer: 40 (1965). Type: Caledon Div., Hermanus, fl. Sept. 1926, Paterson in BOL18548 (BOL!).

Diagnostic features: corolla markedly pustulate, yellow, ± 7 mm long, ovoid-urceolate (Figure 11E).

Subsp. *pustulata* is closely related to the long-tubed form of subsp. *longifolia* with yellowish to green flowers from the same locality.

Vouchers: Paterson in BOL18548 (BOL!, K!); Williams 1552 (BOL!, NBG!).

34f. subsp. **pendula** E.G.H.Oliv. & I.M.Oliv., subsp. nov., floribus pendulis albis non viscidis tubo corollae sub ore constricto ± 12 –18 mm longo dignoscenda. Figura 11C.

TYPE.—Western Cape: 3419 (Caledon): Paardeberg, south of Highlands Forest Reserve, (-BC), 550 ft [150 m], 26 February 1980, Oliver 7610 (NBG).

Illustration: Schumann & Kirsten: 52, t. 50 (1992) sub *E. onosmiflora*.

Diagnostic features: flowers pendulous (not spreading to semi-erect); corolla ± 12 –18 mm long, tubular, white, sometimes tinged pink, non-sticky, with short hairs only along longitudinal ridges and around base; plants sparsely branched and up to 1.5 m tall, with relatively short grey-green leaves (Figure 11C).

This subspecies is confined to the eastern end of the Paardeberg Range west of Bot River Village.

A few collections from the region of Shaw's Mountain (e.g. Oliver 8022) have semi-pendulous flowers with the corolla red and a yellow mouth, but sticky and strigose. These could possibly be included under this subspecies. These could possibly be included under this subspecies, but further investigations need to be done to assess their

identity within this highly variable species.

Paratype material: WESTERN CAPE.—3419 (Caledon): Arieskraal, (-AA), 17-11-1944, Compton 9021 (NBG!); *ibid.*, 255 ft [78m], 13-02-1993, Rhode & Boucher 22 (NBG!); Paardeberg/Highlands, 800 ft [240 m], (-AC), 25-02-1970, Boucher 1151 (K!, NBG!); *ibid.*, 1000 ft, 22-03-1971, F.J. Kruger 1176 (NBG!); *ibid.*, 550 ft [167 m], 12-01-1970, Oliver & Palser 67, 69 (NBG!); *ibid.*, 150 m, 3-1985, Schumann 307 (NBG!); *ibid.*, 3-1949, Stokoe s.n. (SAM!); Houtech, SW of Houhoek, 1700 ft [578 m], (-AC), 17-09-1987, Oliver 9021 (NBG!); Shaw's Mtn, above Langhuis, 300 m, (-AD), 2-08-1983, Oliver 8022 (NBG!). Without precise locality (3418BB/3419AA): Palmiet/Grabouw, 800 ft [240 m], 20-07-1895, Guthrie 4971 (NBG!); *ibid.*, foothills, 10-1948, Stokoe s.n. (SAM!); road from Sir Lowry's Pass to Houwhoek, 6-04-1892, Guthrie 2294 (NBG!).

The var. *amplicata* of *E. longifolia* described by Bolus (1905: 66) and upheld by Dulfer (1965: 40), was based on a coloured painting of *E. vestita* var. *coccinea* Curtis: t. 402 (1798). This plate does not depict any long-tubed subspecies of *E. viscaria* and is clearly the red-coloured form of *E. vestita* (31).

34.1. *E. gallorum* L.Bolus—see *E. viscaria* subsp. *gallorum* (34d).

34.2. *E. petrusiana* E.G.H.Oliv. & I.M.Oliv., sp. nov., *Ericae viscaria* L. affinis sed corolla breve infundibuliformi-obconica, $\pm 8.5 \times 5.0$ mm, porcis longitudinalibus, subglabra, subviscida, obscure flava, lobis erectis et *Ericae latiflorae* L.Bolus sed lobis corollae brevioribus 1.2 mm longis, coloris corollae flava non purpurea distinguitur. Figura 12.

TYPE.—Western Cape, 3418 (Simonstown): Kogelberg area, between Steenbras River and Kogelberg, ± 1000 ft [± 300 m], (-BB), 16 March 1969, Esterhuysen 32128 (BOL, holo.; NBG, K, PRE).

Erect low woody shrubs. **Branches:** numerous main branches ± 30 –50 mm long with continuous apical growth, secondary branches few, very reduced, bearing a subterminal flower; internodes ± 1 mm long; stems covered with very short, dense, stiff, spreading hairs and occasional short-stalked glands. **Leaves** 4–6-nate, 8–12 mm long, erect, incurved, shortly acute, finely hairy to

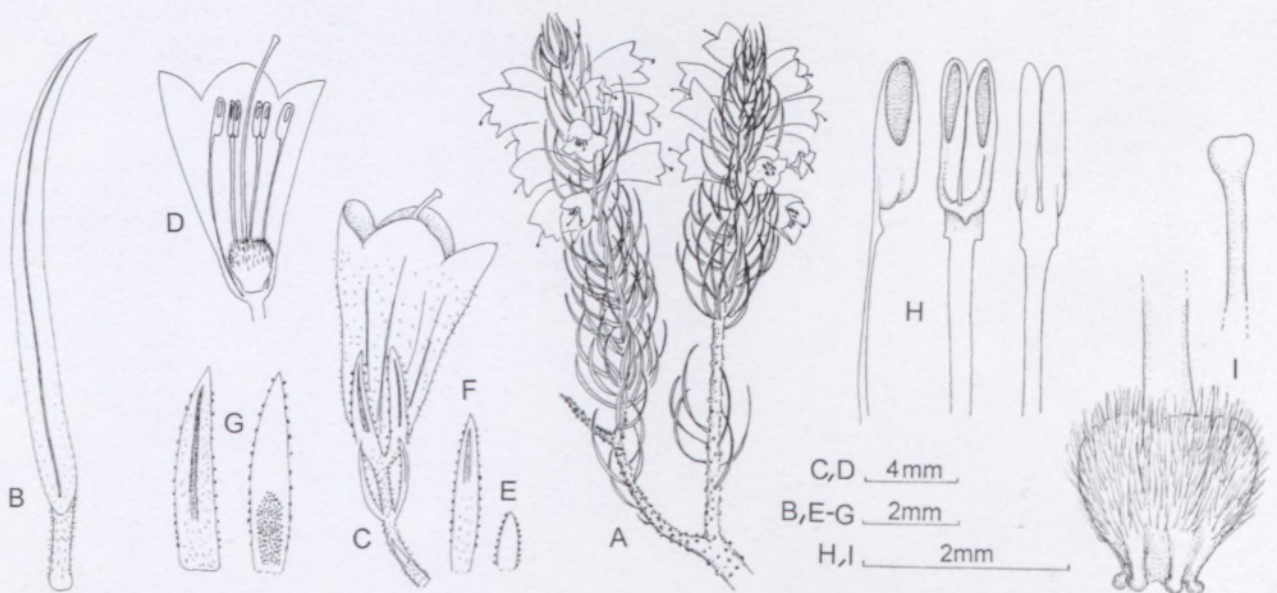


FIGURE 12.—*Erica petrusiana*, type Esterhuysen 32128. A, flowering branch, $\times 1$; B, leaf; C, flower; D, flower opened laterally; E, bract; F, bracteole; G, sepal, abaxial view (left), adaxial view (right); H, stamen, side, front and back views; I, gynoecium. Scale bars: B, E–I, 2 mm; C, D, 4 mm.

glabrous on both sides, sulcus narrow, closed at base; petiole \pm 18 mm long, puberulous. *Inflorescence*: 1 flower subterminal on very short, secondary branches at each node, all aggregated into a spike-like synflorescence, \pm 15–20 mm long, towards ends of main branches, flowers suberect to spreading; pedicel \pm 6 mm long, indumentum like stem; bract partially recaulescent \pm $\frac{1}{4}$ way up pedicel, lanceolate, \pm 1 mm long, glabrous, ciliate with sessile glands, esulcate; bracteoles about $\frac{1}{2}$ way up pedicel, linear-lanceolate, \pm 3 mm long, finely hairy and ciliate with sessile glands, green, sulcate for $\frac{1}{3}$ their length. *Calyx* 4-partite; segments adpressed to corolla, lanceolate, \pm 4.0 \times 0.8 mm, abaxially finely hairy, adaxially with a basal, central zone of sessile sticky glands, sulcate for $\frac{3}{4}$ their length. *Corolla* 4-lobed, funnel-shaped-obconic, widest at mouth, longitudinally ridged, sparsely strigulose, dull yellow; lobes \pm 1.2 \times 3.5 mm, erect, margins entire. *Stamens* 8, free, included just below mouth; filaments straight, glabrous, with vestigial appendages just below thecae; anthers bilobed, oblong in adaxial view, thecae oblong in lateral view, \pm 1.5 \times 0.5 mm, smooth, pore $\frac{1}{2}$ length of theca; pollen in tetrads. *Ovary* 4-locular, broadly obovoid, \pm 1.8 \times 1.8 mm, emarginate, densely hairy with thick erect hairs, with basal nectaries; style exerted, glabrous; stigma capitate. Figure 12.

Diagnostic features: corolla shortly funnel-shaped/obconic with an open mouth, \pm 8.5–5.0 mm long, longitudinally ridged, dull yellow, almost glabrous (only a few minute stiff hairs) with no pustules, slightly sticky, not nipped in below mouth, lobes erect, not spreading (Figure 12).

Erica petrusiana is closely related to the short-tubed subspecies of *E. viscaria*, but differs in the shape of the corolla with its open mouth. It shares this character with *E. latiflora* L. Bolus (303.1) which has an even more open corolla with longer lobes. This latter relationship points to the problem in the genus of the long-tubed and short-tubed species being closely related, but placed very far apart in the current sectional system.

The name is derived from the generic name of the fish, *Petrus rupestris*, the 'red steenbras' (red rock-bream), after the locality, the Steenbras area which is the type and only known locality. Esterhuysen records the plants as very local, but common, in stony shaly soil and also on sandstone ridge. She also records 'corolla was yellow, not very bright, but certainly yellow, slightly sticky'.

35. *E. onosmiflora* Salisb.—see *E. viscaria* subsp. *macrosepala* (34c).

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