

Five new species of *Erica* (Ericaceae) from the Swartberg Range, Western Cape, South Africa and a note on *E. esterhuyseniae*

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ABSTRACT

Descriptions are provided of five new species of *Erica* L. from the Klein and Groot Swartberg Mountains in Western Cape, South Africa. The two known populations of *E. dolfiana* E.G.H.Oliv. are confined to the stony, southern slopes of two well-separated areas. *E. taylorii* E.G.H.Oliv. is also known from two well-separated populations on the Swartberg but with the others in the Cederberg. The other three new species are allied to *E. esterhuyseniae* Compton: *E. chionodes* E.G.H.Oliv., with brilliant white flowers, occurs only in seepage zones in two well-separated areas, *E. oreotragus* E.G.H.Oliv. (syn. *E. esterhuyseniae* Compton var. *trimeria* Compton) with pale pink to white flowers and *E. blaerioides* E.G.H.Oliv. with white flowers, are widespread in the central and western Swartberg Range.

1. *Erica dolfiana* E.G.H.Oliv., sp. nov., in genere affinitate dubia, sed foliis quadrinatis petiolo longo bractea bracteolisque comparate longis plus minusve sepala aequantibus sed remotis, corolla urceolata glabra alba parva, antheris glabris calcaribus longis tenuibus filamentis tenuibus, stigmatibus subpeltatis ad peltatis seminibus vulgo ericoideis reticulatis dignoscenda. Figura 1.

TYPE.—Western Cape, 3322 (Oudtshoorn): Oudtshoorn, Groot Swartberg, peak just north of Tierberg, 2 010 m, (–AD), 17 October 2000, E.G.H. & I.M. Oliver 11688 (NBG, holo.; BM, BOL, K, MO, NY, P, PRE, S).

Erect, compact shrub up to 300(–500) mm tall, single-stemmed reseeder. *Branches:* main branches up to 50 mm long, erect, with numerous secondary branches 2–5 mm long on every node towards apex and a few sometimes distally, all ending in an inflorescence; all branches with short, spreading to reflexed hairs with or without a few stouter, longer gland-tipped hairs admixed. *Leaves* 4-nate, subspreading, imbricate, ovate to elliptic, 2.0–3.3 × 1.0–1.3 mm, adaxially flattened and abaxially rounded with acute margins, sparsely puberulous with a few long, stouter gland-tipped hairs interspersed abaxially, ciliate with a few long, gland-tipped hairs, sulcus narrow and open at base; petiole ± 1.3 mm long, puberulous. *Inflorescence:* flowers 4-nate in 1 whorl at apex of main and secondary branches, these packed in terminal, capitate or longer spike-like synflorescences; pedicel ± 2.2 mm long, loosely puberulous, white to pale green, sometimes tinged red; bract partially recaulescent from basal to middle position, oblong, ± 1.4 × 0.4 mm, with very short subapical sulcus, white and slightly hyaline, sometimes with pale green tip, sparsely puberulous in upper 1/4–1/2, margins with gland-tipped hairs and one apically, glands white or pink; bracteoles 2, median to just below calyx in position, otherwise like bract. *Calyx* 4-lobed, fused ± 1/8 at base; lobes adpressed to corolla, oblong, ± 2.0 × 0.5 mm, subacute, sulcus in upper half, short and narrow,

white to pale green or reddish, more so at apex, puberulous in upper 1/4–1/2, margins with short gland-tipped hairs, glands red. *Corolla* 4-lobed, campanulate to slightly urceolate, ± 3.4 × 2.2 mm, glabrous, white or tinged pink; lobes ± 0.7 × 1.3 mm, rounded to emarginate, margins entire to slightly erose. *Stamens* 8, included, free; filaments narrowly linear, ± 1.8 mm long, with slight apical S-bend, glabrous, white; anthers bipartite, oblong in adaxial view, dorsally attached near base, appendiculate; thecae erect adpressed, ovate to elliptic in lateral view, ± 0.9 × 0.5 mm, smooth dark brown, spurs narrowly lanceolate, ± 0.6 mm long, with 2 or 3 teeth, white, pore ± 1/3 length of theca; pollen in tetrads. *Ovary* 4-locular, broadly obovoid-ellipsoid, ± 1 × 1 mm, emarginate, puberulous, green, with small dark-green nectaries around base; ovules 9–15 per locule, laterally spreading; style ± 2.7 mm long, exerted, pale greenish red, glabrous; stigma subpeltate to peltate, dark red. *Fruit* a dehiscent capsule, ± 1.1 × 1.5 mm, valves splitting for 3/4 their length and to ± 45° angle, septa equally divided on columella and valves. *Seeds* ellipsoid, ± 0.4 × 0.25 mm, slightly alveolate, orange, testa cells 60–75 × 25–30 µm, anticlinal walls jigsawed, inner periclinal walls pitted. *Flowering time:* October to early December. Figure 1.

Erica dolfiana is characterized by 4-nate leaves with relatively long petioles, relatively large bract and bracteoles about the size of the sepals, but remote from them, sepals white with long-stalked red marginal glands, urceolate glabrous white corolla, which is relatively small for the genus, glabrous anthers with long narrow appendages and thin filaments, enlarged subpeltate to peltate stigma, and the standard reticulate/alveolate ericoid-type seed.

E. dolfiana shows no close affinity to any other species. It may, however, be related to *E. lignosa* H.A.Baker, a widespread Swartberg species, and to *E. jugicola* E.G.H.Oliv. ined., a more restricted new species. Both have similar long-stalked red glands on the bract, bracteoles and sepals, but both have larger, pink flowers (very much larger in the latter) which are mostly finely hairy. They also have larger anther appendages and a small simple stigma. All three species are sympatric on the Blesberg.

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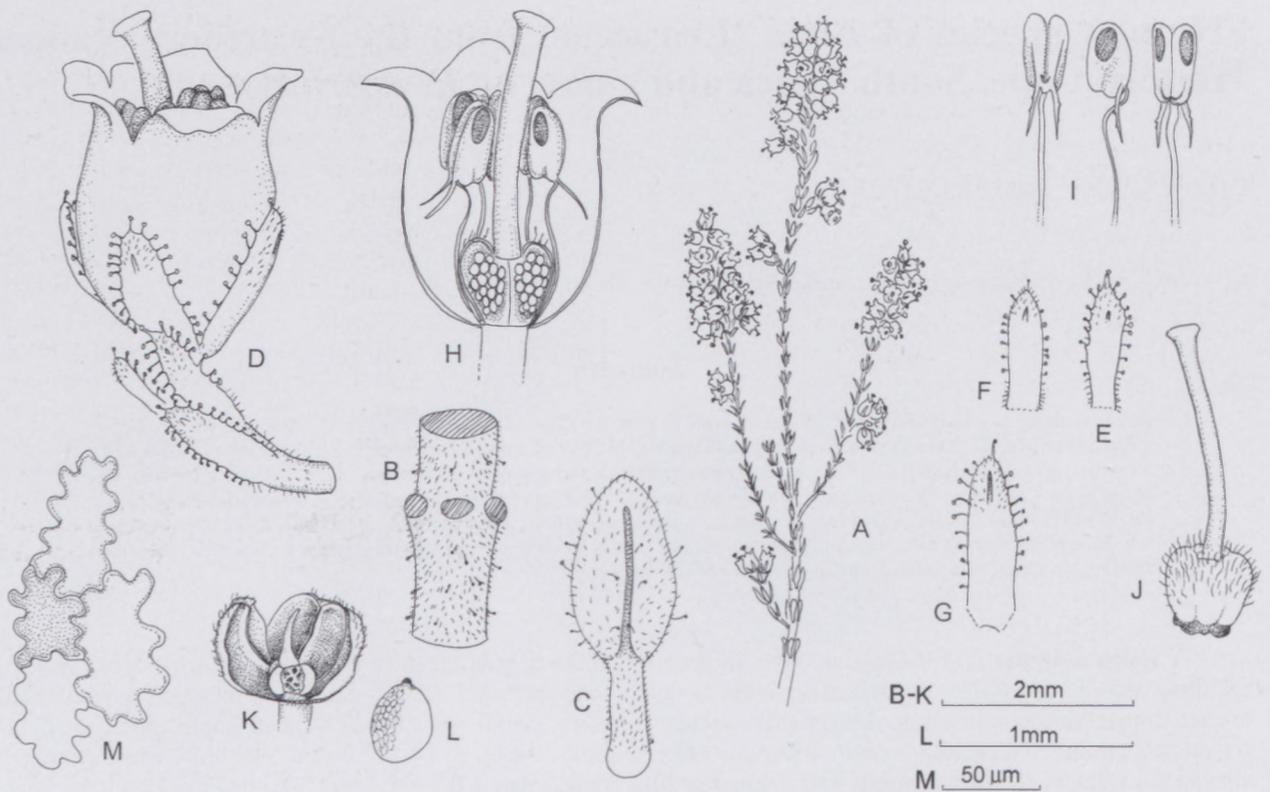


FIGURE 1.—*Erica dolfiana*. A, flowering branch, natural size; B, stem with leaves removed; C, leaf; D, flower; E, bract; F, bracteole; G, sepal; H, flower opened laterally to show androecium and gynoecium with ovary opened laterally; I, stamen, back, side and front views; J, gynoecium; K, capsule; L, seed; M, testa cells. A–J, drawn from the type collection, *Oliver & Oliver 11688*; K–M, from *Oliver 11576*. Scale bars: B–K, 2 mm; L, 1 mm; M, 50 μ m.

This new species is named after Dolf Schumann (1918–) senior author of that very fine illustrated book, *Ericas of South Africa* (Schumann & Kirsten 1992). He made collections of this and the next species on a joint trip with Jan Vlok in 1985. This is the second species of *Erica* that is named after him, the other being *E. schumannii* E.G.H.Oliv. (Oliver & Oliver 1998a).

Erica dolfiana is known thus far from only two localities—the small peak just north of Tierberg and the ridges west and east of Blesberg, some 40 kms to the east (Figure 2). In the latter locality, Pienaar, on the label of

his specimen 67, noted that west of the peak the species was fairly common on the upper northern slopes. Having visited Blesberg peak in July and January, out of the flowering season, we too saw numerous young plants but only in fruit.

The species is confined to southern and northern slopes at high altitudes where it grows in rocky/stony places with very short alpine fynbos. It is very common in the type locality where it is the dominant species of *Erica*. On the open slopes the shrublets, together with the other plants, are small and compact, whereas the few

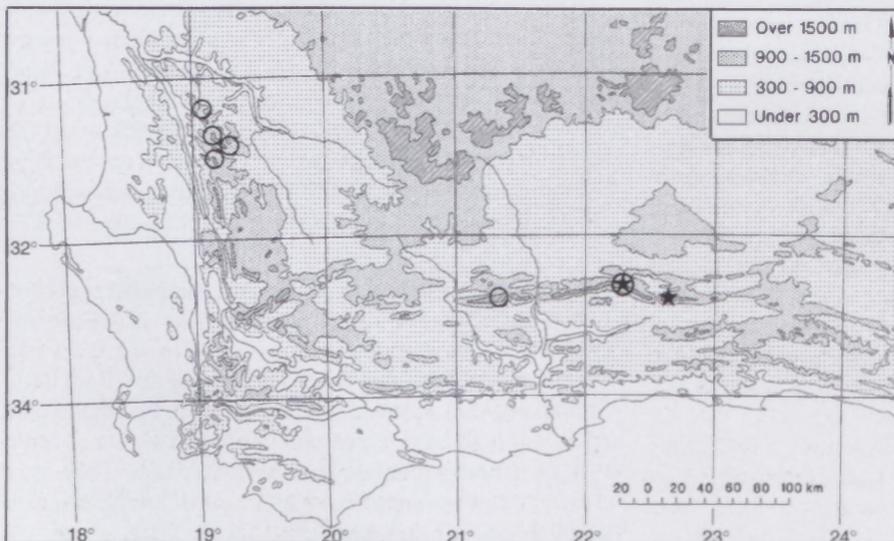


FIGURE 2.—Known distribution of *Erica dolfiana*, \star ; *E. taylorii*, \circ .

shrubs, among larger rocks in rocky areas, are looser and up to 500 mm tall.

Vlok noted that the flowers gave off puffs of pollen when disturbed. This was confirmed by us. The dull white colour of the flowers renders them relatively insignificant and, with the slightly enlarged stigma and somewhat reduced nectaries, suggest both insect- and wind-pollination strategies for the species (Rebello *et al.* 1985). However, the stickiness of the flower heads, caused by the glands on the bracts, bracteoles and calyx segments, may discourage foraging insects from clampering around the inflorescences.

Erica dolfiana would seem to be another of those species in transition from insect- to wind-pollination, with its small white or dull-coloured flowers as found in so many other wind-pollinated *Erica* species. In our experience, size differences between the flowers of species point to different pollination syndromes, but not necessarily to different affinities. The other two undescribed species in this possible alliance have been observed by us to be pollinated by long-tongued flies.

Paratype material

WESTERN CAPE.—3322 (Oudtshoorn): Great Swartberg, peak due south of highest point of jeep track, 2 000 m. (–AD), 5-11-1985, Schumann 390 (NBG); peak behind Tierberg, 5800 ft. (–AD), 5-11-1985, Vlok 1266 (K, NBG, NY, PRE); Blesberg, neck just E, 2 000 m. (–BC), 13-07-2000, fruiting, Oliver 11576 (NBG); *ibid.*, 6-01-2001, fruiting, Oliver 11764 (NBG); *ibid.*, neck just W, 5900 ft. (–BC), 12-11-1976, Pienaar 67 (NBG).

2. *Erica taylorii* E.G.H.Oliv., sp. nov., pilis longis in marginibus foliorum, bracteeae, bracteolarum et sepalorum, bractea bracteolisque magnis subpetaloideis, antheris calcaribus brevibus crassis, ovario ramisque puberulis dignoscenda. Figura 3.

TYPE.—Western Cape, 3322 (Oudtshoorn): Oudtshoorn, Groot Swartberg, peak just north of Tierberg, 2 010 m. (–AD), 17 October 2000, E.G.H. & I.M. Oliver 11691 (NBG, holo.; BM, K, MO, NY, P, PRE).

Erica oresigena Bolus var. *mollipila* Bolus in Guthrie & Bolus: 129 (1905). Types: Worcester Div., on the Matroos Berg, Bolus s.n. (BOL?); Clanwilliam Div.; Sneeuwkop, Cederberg Range near Wuppertal, Bodkin sub Bolus 6492 (BOL!).

Illustration.: Schumann & Kirsten: 112, fig. 49, 50 (1992).

Low, prostrate, spreading shrublet up to 200 mm tall and 0.5(–1.2) m across, single-stemmed reseeder. *Branches*: main branches mostly prostrate, numerous old and woody; numerous secondary branches \pm 100–300 mm long, erect, with occasional \pm 5–10 mm long tertiary branches, all ending in a florescence, internodes very short, all covered with fine dense short retrorse hairs, occasionally interspersed with few plumose hairs on older branches. *Leaves* 3- or 4-nate, imbricate, oblong, 3–5 \times 1 mm, erect, adaxially flattened, abaxially rounded, with acute margins, finely hairy on both sides and with short, stout, plumose hairs on margins, sulcus narrow, closed at base; petiole 0.6–0.8 mm long, puberulous and edged with a few short, stout, plumose hairs. *Inflorescence*: flowers 3 or 4 in 1(–3) whorls, terminal on

secondary and tertiary branches; pedicel 2.0–3.5 mm long, finely hairy with retrorse hairs and occasionally short, stout, plumose hairs interspersed, reddish; bract partially recalcrescent from $\frac{1}{4}$ – $\frac{1}{2}$ way up pedicel, oblong to lanceolate, 3.5–4.5 \times 1.0–1.2 mm, cream to reddish pink, sometimes with green mainly in upper half, glabrous to finely hairy, with long, plumose marginal hairs, sulcus narrow, $\frac{1}{2}$ length of bract; bracteoles 2, placed $\frac{3}{4}$ way up pedicel, 3.0 \times 0.7–1.0 mm, otherwise like bract. *Calyx* 4-partite, segments slightly imbricate, broadly lanceolate to ovate, 3.5–4.5 \times 1.0–1.5 mm, reddish pink, glabrous to finely hairy, margins with long, plumose hairs, sulcus $\frac{1}{2}$ length of segment. *Corolla* 4-lobed, 6–9 \times 3–5 mm, ovoid-urceolate, finely puberulous to glabrous, pink to dark pink, hairs white; lobes spreading-recurved, rounded, 1.5–2.0 \times 1.8–2.5 mm, erose. *Stamens* 8, included, free; filaments linear, \pm 4 mm, slightly widening to base, with slight bend below anther, glabrous, white; anthers bilobed, narrowly ovate to oblong in adaxial view, dorsally attached near base, appendiculate; thecae ovate to elliptic in lateral view, 1.0–1.2 \times 0.5–0.6 mm, erect, brown, very finely aculeate, pore small $\frac{1}{4}$ – $\frac{1}{5}$ length of theca, spurs subspreading, abaxially \pm 0.6 \times 2.5 mm, occasionally toothed, pink; pollen in tetrads. *Ovary* 4-locular, broadly obovoid to globose, 2–3 \times 2–3 mm, emarginate, covered with dense, short hairs, red, with dark nectaries around base; ovules 40–50 per locule, spreading laterally from full-length placenta; style included, \pm 4.5–5.0 mm long, glabrous, dull red; stigma capitate, dark red. *Fruit* a dehiscent capsule, \pm 2.5 \times 3.5 mm, valves splitting $\frac{3}{4}$ their length and to 45° angle, septa only on valves, placenta large, convoluted and warty. *Seeds* ellipsoid, \pm 0.6 \times 0.35 mm, shallowly reticulate-alveolate, brown; testa cells \pm 100 \times 40 μ m, anticlinal walls jigsawed, inner periclinal walls densely pitted. *Flowering time*: October to December. Figure 3.

In *Flora capensis* Bolus (1905) described the variety *mollipila* of his *E. oresigena*, based on collections from Matroosberg and the Cederberg. Hugh Taylor, who studied the vegetation of the Cederberg, expressed surprise, since he knew *E. oresigena* and did not think that Bolus' variety *mollipila* belonged to the same species. It is a mystery to us why Bolus did not describe the variety *mollipila* as a separate species, since our studies have shown that the two taxa differ in many critical characters which indicates that this taxon is more closely related to species other than *E. oresigena*. The only similar characters are those of the anthers. *E. oresigena* is an upright, woody, rounded bush 0.5–1.5 m tall. It is distinguished by its long pedicels, entire corolla lobes, short, woolly hairs on the pedicel and sepals, large dark red glands on the margins of the bract, bracteoles, sepals and young leaves, and by the ovary which is glabrous.

Erica taylorii, here described *de novo* as a distinct species, is related to the group of species which is characterized by plumose hairs and large, coloured, petaloid bract and bracteoles. The group includes the *E. goatcheriana* L.Bolus complex, *E. modesta* Salisb. and the recently described *E. schumannii* E.G.H.Oliv. (Oliver & Oliver 1998a) and *E. kirstenii* E.G.H.Oliv. (Oliver & Oliver 2000). *E. taylorii* differs in having very few, relatively short (not numerous and dense), plumose hairs on

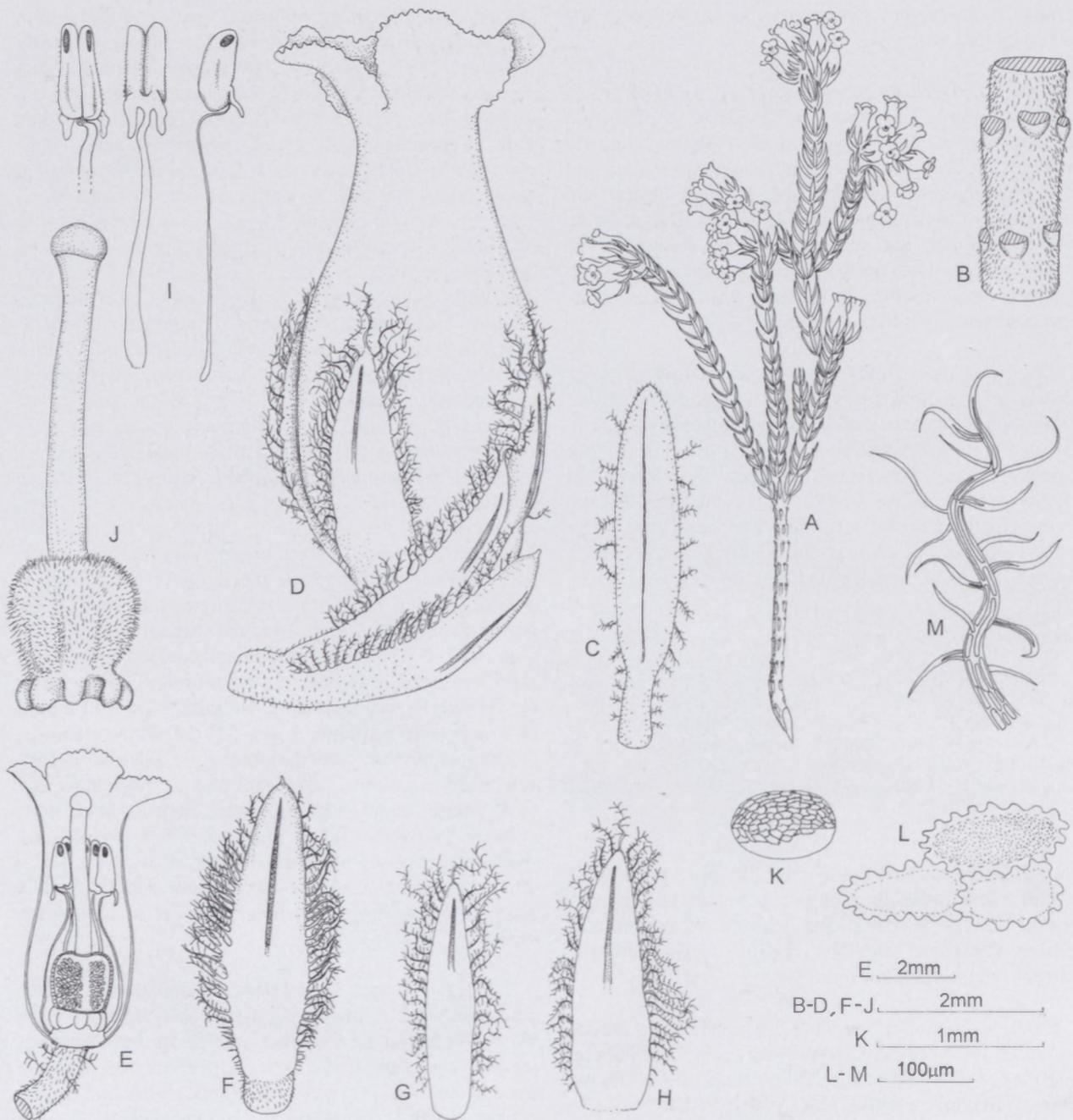


FIGURE 3.—*Erica taylorii*. A, flowering branch, natural size; B, stem with leaves removed; C, leaf; D, flower; E, flower with corolla and ovary cut open laterally; F, bract; G, bracteole; H, sepal; I, stamen, front, back and side views; J, gynoecium; K, seed; L, testa cells; M, typical multiserial plumose hair. A–J, drawn from the type collection, *Oliver & Oliver 11691*; K & L, drawn from *Oliver 10007a*. Scale bars: B–J, 2 mm; K, 1 mm; L, M, 100 μ m.

the pedicel, and flowers in one, sometimes up to three whorls. This latter character relates the species to two species with plumose hairs and umbel-like inflorescences, namely *E. cernua* C.V.Montin and *E. sphaerocephala* J.C.Wendl. ex Benth. The former has a globose corolla and larger anther appendages, whereas the latter has much reduced bracteoles and sepals (not large and petaloid), and long-aristate leaves, bract, bracteoles and sepals.

This new species is named after the vegetation ecologist, the late Hugh Taylor (1925–1999), a colleague and friend of many years who had a profound knowledge of the Cape Flora (McDonald *et al.* 2000). He collected many fine herbarium specimens, including one of this

species, made during his major vegetation survey of the Cederberg Mountains.

Erica taylorii occurs in two widely separated areas, the Swartberg Range above Ladismith and Oudtshoorn, and the Cederberg Mountains east of Clanwilliam (Figure 2). It is variable in the number of leaves per whorl, number of flowers per inflorescence and in the size of the corolla, which can be hairy or glabrous.

The Cederberg populations have 3- or 4-nate leaves, whereas the Swartberg populations have only 4-nate leaves. Most plants have a hairy corolla with the variation in indumentum not linked to any specific area. The totally glabrous form occurs in *Schumann 380* with the

type collection having a few flowers with some hairs on the corolla lobes and slightly more in *Vlok 1263*. The Seweweekspoort populations are all finely puberulous. All the collections from the Cederberg have a hairy corolla, except for a few branches on *Bond 1403*, which have very short hairs only on the corolla lobes.

The eastern populations of the species are confined to the Swartberg Range in two widely separated areas, one above Ladismith along the Klein Swartberg in the region of Seweweekspoort Mtn, and the other some 90 kms to the east in the Tierberg area above Oudtshoorn. It is surprising that no collections have been made on any of the numerous intervening peaks where suitable habitats surely occur, despite visits to these peaks by Stokoe, Esterhuysen, Taylor and ourselves. We have selected our recently collected material near Tierberg as the type of the species, since it provided adequate isotypes and excellent fresh material for us to study.

The type population was very localized on a small, very low rocky ridge on the southern slopes, just below the summit of the minor peak north of Tierberg. A few plants were also found on nearby rocky outcrops. The plants grew in crevices on the rocks and between rocks and spread out over the surface for up to half a metre. They were woody and in some cases had gnarled stems. The open slopes surrounding the low ridge were covered with numerous plants of *E. dolifiana* (see above) in very short, alpine-like vegetation.

On the peaks just west of Seweweekspoort, *E. taylorii* is apparently more common, judging by the collection records of 'frequent'. It was collected there by Andreae, Barnard, Primos and Stokoe on the first expedition to the Klein Swartberg in 1928 (Linder *et al.* 1993). On Hoeko Peak we noted numbers of low, spreading plants growing among short restiads and in rock crevices on northern slopes, but only in fruit. Andreae recorded the plants as 'low spreading shrublets on ground or adpressed to rocks on flat open places'. Vlok noted that plants were 'frequent on southern slope between large rock blocks', which could explain why he recorded the height of the plants as ± 1.2 m, if they grew up among the rocks.

The populations in the Cederberg Mtns occur on the highest peaks from Krakadouw to Sneeuberg, a distance of 30 kms. Pocock, who made numerous collections of plants in the Cederberg in the mid-1920s, noted on her collection 650 'found on all the high peaks but nowhere abundant except on Krakadouw Great Peak'.

While looking for *E. cedromontana* E.G.H.Oliv. (Oliver & Oliver 1998b) on the Langberg, we searched for *E. taylorii* too, but did not locate any plants. Thus details of the habit and habitat are taken from other collectors' notes. Pocock recorded plants as 'low shrubs 3–15 inches tall, growing on small vlaktes and crannies among rocks on Krakadouw' and 'stunted shrub in cracks in rocks' on Sneeu kop summit. Taylor recorded it as growing 'in small *Ischyrolepis curviramis* sand flat on bedrock' and Stehle gave 'on rocks'.

Esterhuysen gave a detailed record of the species on the Sneeu berg when she collected some old fruiting

material in April. She wrote 'plants were common and conspicuous on the south side in rocky places—mostly growing from rock crevices in flat or sloping rock and spreading out over rocks forming low dense masses, protected from fires'. She also made the interesting observation that the plants were rooting along the stems.

The record by Harry Bolus of a *Bolus s.n.* specimen from Matroosberg, a syntype of his *E. oresigena* var. *mollipila*, was regarded by us as doubtful. This collection was not filed under *E. oresigena* in BOL, but was noted on the sheet as having been removed by Elsie Esterhuysen to *E. maderi* where, unfortunately, it cannot now be found. The collection must have consisted of a flowering branch 100 mm long, deduced from the clear imprint on the sheet where it had formerly been mounted and annotated by Bolus, and certainly gives the impression of being *E. maderi*, which is common on the lower slopes of Matroosberg. A collection of that species from Matroosberg by Alfred Bolus is housed in SAM. The other syntype of the variety, which was collected by Bodkin from the Cederberg, consists of three small branchlets in poor condition with just six buds and six mature flowers.

Paratype material

WESTERN CAPE.—3219 (Wuppertal): Krakadouw Peak, summit, 5900–6700 ft, (–AA), *Pocock 650* (NBG); Groot Krakadouw, summit massif, 1 700 m, (–AA), 22 November 1987, *Taylor 11905* (NBG); Sneeu kop, (–AC), *Bodkin sub Bolus 6492* (BOL); *ibid.*, 5500–6300 ft, 6-04-1969, fruiting, *Esterhuysen s.n.* (BOL); *ibid.*, 6300 ft, 13-10-1923, *Pocock 214* (NBG); Langberg, 6000 ft, 15-12-1941, *Bond 1403* (NBG); *ibid.*, 15-12-1941, *Esterhuysen 7306* (BOL, SAM); Sneeu berg Peak, 6200 ft, (–AC), 2-12-1969, *Stehle 310* (NBG); Wolfberg Arch area, (–AD), 28-11-1959, *Jessop sub Oliver 324* (NBG); 3321 (Ladismith); Toverkop, 6000–7000 ft, (–AC), 15-12-1956, *Esterhuysen 26759* (BOL); Seven Weeks Poort Mtn, 2 300 m, (–AD), 26-12-1928, *Andreae 1181* (BOL, NBG); *ibid.*, 5000–7000 ft, 12-1928, *Barnard in SAM46306* (SAM); *ibid.*, 1 800–2 100 m, 26-12-1928, *Primos 16* (BOL, NBG); *ibid.*, 7200 ft, 26-12-1928, *Stokoe 1878* (BOL); *ibid.*, 7500 ft, 5-01-1981, *Vlok 140* (NBG); Hoeko Peak, 1 900 m, (–AD), 4-02-1992, fruiting flowers only, *Oliver 10007a* (NBG); 3322 (Oudtshoorn); Great Swartberg, peak north of Tierberg, 6250 ft, (–AD), 5-11-1985, *Vlok 1263* (NBG); *ibid.*, 1 900 m, 5-11-1985, *Schumann 389* (NBG, PRE).

THE ERICA ESTERHUYSENIAE COMPLEX

The following three new species form a complex with *E. esterhuyseniae* Compton. They are all confined to high altitudes along the Klein and Groot Swartberg ranges and in some places grow sympatrically.

Erica esterhuyseniae was described by Compton in 1941 (Compton 1941). In the protologue he divided the species into two varieties, var. α *tetramera* and var. β *trimera* based on the distinction of 4-nate versus 3-nate leaves. According to the current nomenclatorial rules he should have retained the epithet '*esterhuyseniae*' under the autonym rule for the var. α (Oliver & Oliver 1994).

We support Compton's recognition of two separate taxa, but with all the additional material available to us, feel that there are sufficient grounds for separating them at specific level. The number of leaves per whorl is a clear distinction, but one which Compton felt was of 'less systematic importance' in *E. esterhuyseniae*. There

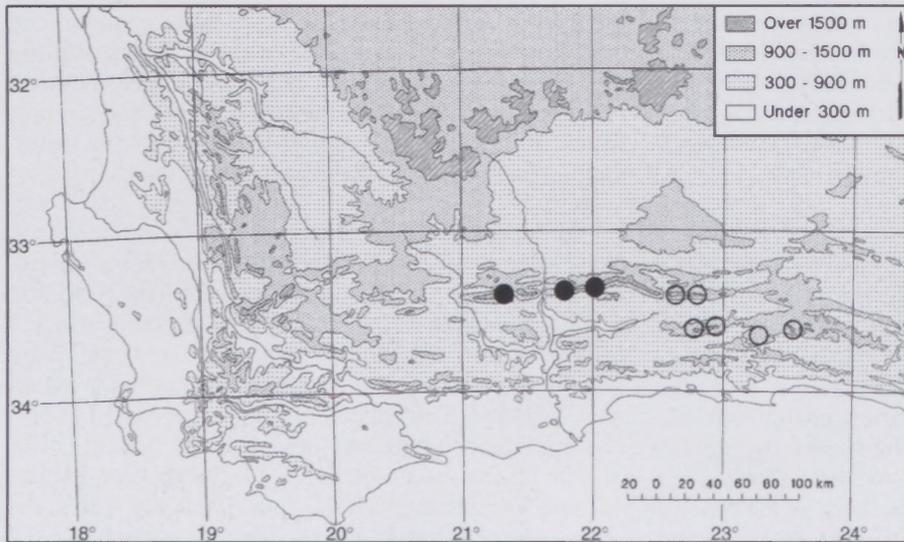


FIGURE 4.— Known distribution of *Erica oreotragus*, ●, and *E. esterhuyseniae*, ○.

are, however, several other characters which he did not notice and which can be used to distinguish the two taxa (see below).

3. *Erica esterhuyseniae* Compton: 193 (1941) pro *E. esterhuyseniae* var. *α tetramera*; Dulfer: 75 (1965); *E. esterhuyseniae* var. *esterhuyseniae*, E.G.H.Oliv. & I.M.Oliv.: 27 (1994). Type: Cape Province. Uniondale Division: Kamanassiberg [Kammanassie] (Mannetjiesberg), 1 700 m, 1-02-1941, *Compton 10557* (NBG!).

Illustration: Compton: 194, fig. 3 (left), 1–12 (1941).

Erica esterhuyseniae is characterized by the 4-nate leaves which are relatively broad, open-backed and curve inwards, and the long, narrow, almost acuminate, corolla lobes $\frac{1}{3}$ – $\frac{1}{2}$ length of corolla. It is allied to *E. oreotragus* and *E. blaerioides* (see below).

The species occurs on the far-eastern portion of the Swartberg Range around Blesberg, on the Karoo inselberg—the Kammanassie Mtns just to the south, and on the western half of the Kouga Mtns (Figure 4). In all localities it grows on the south-facing upper slopes in sandy loamy soil, or in areas where there is more moisture in winter, which is the case with our recent collection, 11799, from the drier foothill ridge just north of the main range of Blesberg.

Specimens examined

WESTERN CAPE.—3322 (Oudtshoorn): Blesberg, (–BC), 17-10-1955, *Esterhuysen 24917* (BOL); *ibid.*, 2 040 m, 13-07-2000 (fruiting), *Oliver 11549* (NBG); *ibid.*, 1 960 m, 7-01-2001, *Oliver 11779* (NBG); *ibid.*, northern foothill ridge, 1 840 m, 7-01-2001, *Oliver 11799* (NBG); Great Swartberg at Kolberg, 1 500 m, (–BD), 20-03-1983, *Schumann 93* (NBG); Kammanassie Mtns, Buffelsberg, 5000 ft, (–DB), 29-01-1929, *Viviers & Vlok 37* (NBG); Kammanassie Mtns, Mannetjiesberg, (–DC), 1-02-1941, *Compton 10557* (NBG); *ibid.*, 5000 ft, 1-02-1941, *Esterhuysen 4762* (BOL, K, PRE); *ibid.*, 1 800 m, 9-01-2001, *Oliver 11831* (NBG). 3323 (Uniondale): Hoopsberg, 5000 ft, (–CB), 12-03-1966, *Rourke 399* (NBG); Kouga Mtns, Saptoukop, 1 530 m, (–DA), 16-12-1991, *Oliver 9938a* (NBG).

4. *Erica oreotragus* E.G.H.Oliv., sp. nov., *Ericae esterhuyseniae* Compton affinis sed ab ea foliis ternatis

angustioribus sulco minus aperto, lobis corollae angustioribus, calcaribus antherarum latioribus differt. Figura 5.

E. esterhuyseniae Compton var. *trimera* Compton: 193 (1941); Dulfer: 75 (1965); E.G.H.Oliv. & I.M.Oliv.: 27 (1994). Type: Cape Province. Oudtshoorn Division: Swartberg Pass, 2 000 m, 28-12-1941, *Bond 866* (NBG, holo.!, BOL!, PRE).

Illustration: Compton: 194, fig. 3 (right), 1–10 (1941).

Erect, sparse to suberect and compact, shrublet, 300–400 mm high, single-stemmed reseeder. *Branches*: numerous main branches 50–100 mm long, terminating in an inflorescence, internodes 2–10 mm long, occasional short, secondary branches 2–5 mm long with or without terminal inflorescence; all branches covered with dense, short, spreading hairs or with short and long hairs intermixed. *Leaves* 3-nate, erect incurved, broadly ovate to elliptic, 2.0–3.2 × 0.8–1.3 mm, subacute, adaxially flat, abaxially rounded, margins acute, densely hairy on both surfaces, sulcus partially open, closed at base; petiole ± 1 mm long, hairs all over or only on margin. *Inflorescence*: flowers 3-nate in 2, rarely 3, whorls in umbel-like group at apices of main and secondary branches; pedicel ± 1.2 mm long, glabrous to finely and shortly hairy; bract partially recalcrescent, in mid position on pedicel, narrowly lanceolate to linear, 0.7–1.6 × 0.1 mm, variable in size in an inflorescence, glabrous but ciliate along margin, esulcate, greenish red to whitish; bracteoles 2, in mid position, minute or reduced to just a tuft of hairs within an inflorescence, esulcate. *Calyx* 4-partite, very slightly fused at base; segments lanceolate to ovate, 1.5–1.8 × 0.5 mm, subacute, puberulous to glabrescent, ciliate with long, spreading hairs and occasionally 1 or 2 minute subsessile to sessile glands, sulcus fairly broad, $\frac{1}{3}$ – $\frac{1}{2}$ length of lobe. *Corolla* 4-lobed, urceolate, ± 3.3 × 2.0 mm, with 4 bulges at base, densely hairy with short and long spreading hairs admixed, pale pinkish to white; lobes spreading, ± 1 mm long, broadly rounded, subacute to obtuse, margins minutely crenulate to entire. *Stamens* 8, included, free; filaments ± 1.5 mm long, widening towards base, with marked apical S-bend; anthers bilobed, elliptic in outline in adaxial view, dorsally attached near base, appendiculate; thecae erect adpressed, narrowly ovate-elliptic in lateral view, ± 0.8 × 0.3 mm, glabrous, smooth,

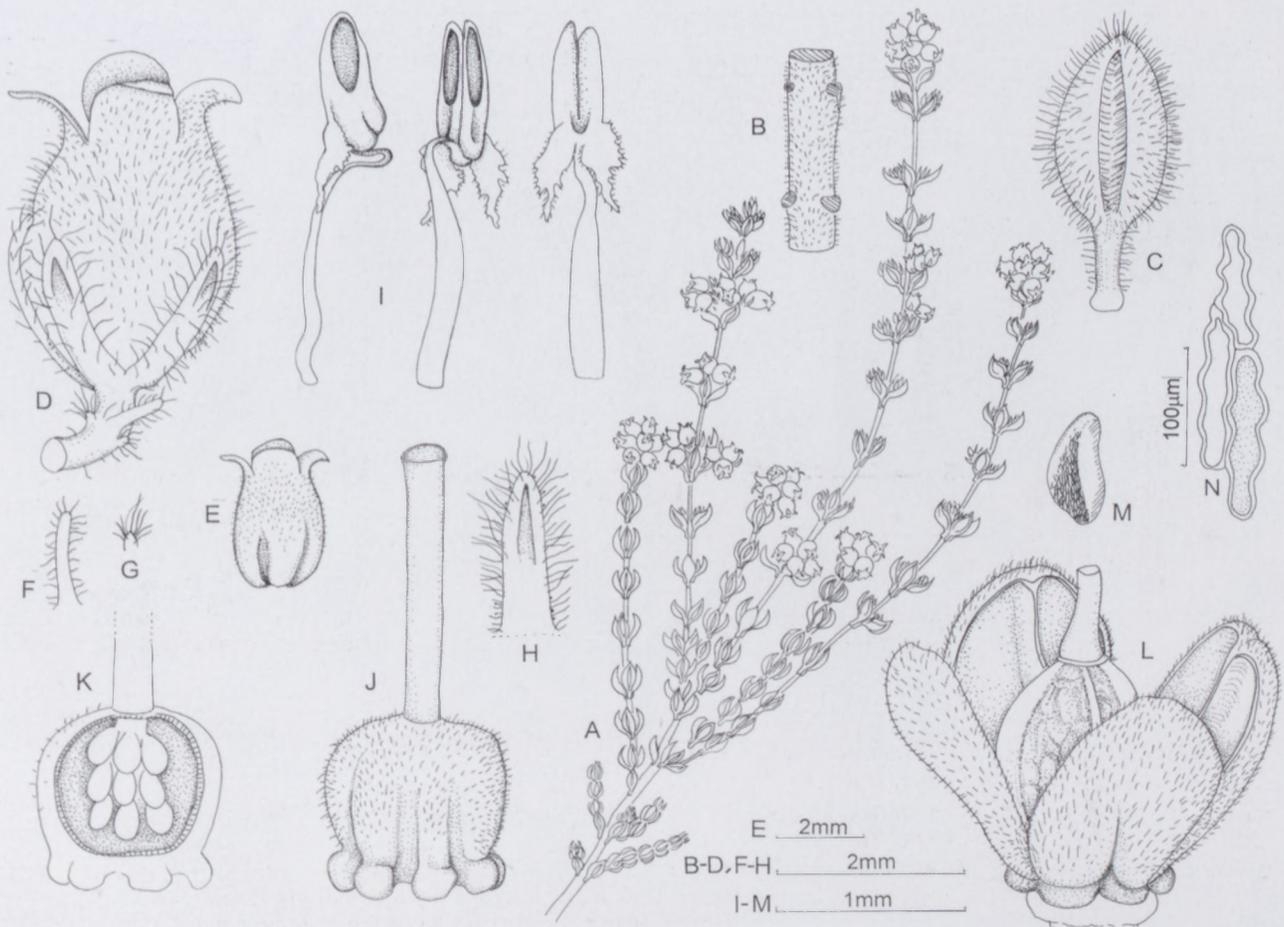


FIGURE 5.—*Erica oreotragus*. A, flowering branch, natural size; B, stem with leaves removed; C, leaf; D, flower; E, corolla; F, bract; G, bracteole; H, sepal; I, stamen, side, front & back views; J, gynoecium; K, ovary opened laterally; L, capsule; M, seed; N, testa cells. All drawn from the type collection. Scale bars: B–H, 2 mm; I–M, 1 mm.

brown, pore $\pm \frac{1}{2}$ length of theca; spurs $\pm 0.6 \times 0.2$ – 0.1 mm, attenuate from broad flat base, unevenly serrate to entire and shortly ciliate, brown; pollen in tetrads. Ovary 4-locular, globose, $\pm 1 \times 1$ mm, obtuse, densely and shortly hairy, with distinct nectaries around base; ovules ± 9 per locule, pendulous from placenta in upper $\frac{2}{3}$; style included, terete, glabrous, white; stigma simple, rounded, reddish. Fruit a dehiscent capsule, $\pm 1.7 \times 2.2$ mm, valves fused up to $\frac{1}{5}$ their length spreading to 45° , equally on valves and columella. Seeds $\pm 0.6 \times 0.3$ mm, 4-ridged, abaxially rounded, laterally and adaxially flattened, reticulate, orange-yellow, testa cells 100 – 125×27 μm , with undulate thick anticlinal walls, periclinal walls with a few very small pits. Flowering time: December to March. Figure 5.

This new species and the other two new species described here, namely *E. blaerioides* and *E. chionodes*, are closely allied to *E. esterhuyseniae*. All three new species, however, have 3-nate leaves, whereas in *E. esterhuyseniae* they are 4-nate.

Erica oreotragus occurs on the Klein Swartberg and on the western and central portions of the Groot Swartberg (Figure 4) with no areas of overlap with *E. esterhuyseniae*, which occurs much further east. It grows sympatrically with *E. blaerioides* in the Botes Nek area (see below).

The epithet for this, the commoner of the two former varieties of *E. esterhuyseniae*, is derived from *Oreotragus oreotragus*, the scientific name of the small klip-springer buck which is often seen in the Cape folded mountains. We who have the privilege of knowing the remarkable Elsie Esterhuysen (1912–) and of having been out in the mountains collecting with her, will always have visions of a metaphorical klipspringer hopping from rock to rock and darting around the slopes, selecting choice plants for the collecting bag and press. Elsie is in her element roaming these Cape mountains. This epithet is chosen in fond remembrance.

Paratype material

WESTERN CAPE.—3321 (Ladismith): Klein Swartberg, N slopes of Hoeko Peak, 2 080 m, (–AD), 3-02-1992, *Oliver 10004* (NBG, PRE); Seven Weeks Poort Mtn, 7000 ft, (–AD), 12-1928, *Primos 24* (BOL, NBG, PRE); Calitzdorp area, Groot Swartberg in Botes Nek area, 6000 ft [1 830 m], (–BD), 31-12-1969, *Oliver 3068* (NBG). 3322 (Oudtshoorn): Swartberg Pass, 1 590 m, 6-02-1986, *Brusse 4866* (NBG, PRE); *ibid.*, 5000 ft, 25-01-1941, *Esterhuysen 4513* (BOL); *ibid.*, 5000 ft, 25-01-1941, *Esterhuysen 4772* (BOL); *ibid.*, 28-01-1961, *Esterhuysen 28806* (BOL, K, PRE); *ibid.*, S side, 1 500 m, (–AC), 01-1979, *Oliver 7407* (NBG); *ibid.*, 03-1942, *Stokoe in SAM55440* (SAM). Swartberg, without precise locality, 01-1935, *Stokoe 6668* (BOL).

5. *Erica chionodes* E.G.H.Oliv., sp. nov., synflor-
escentibus longis densis spicatis, floribus niveis puberu-

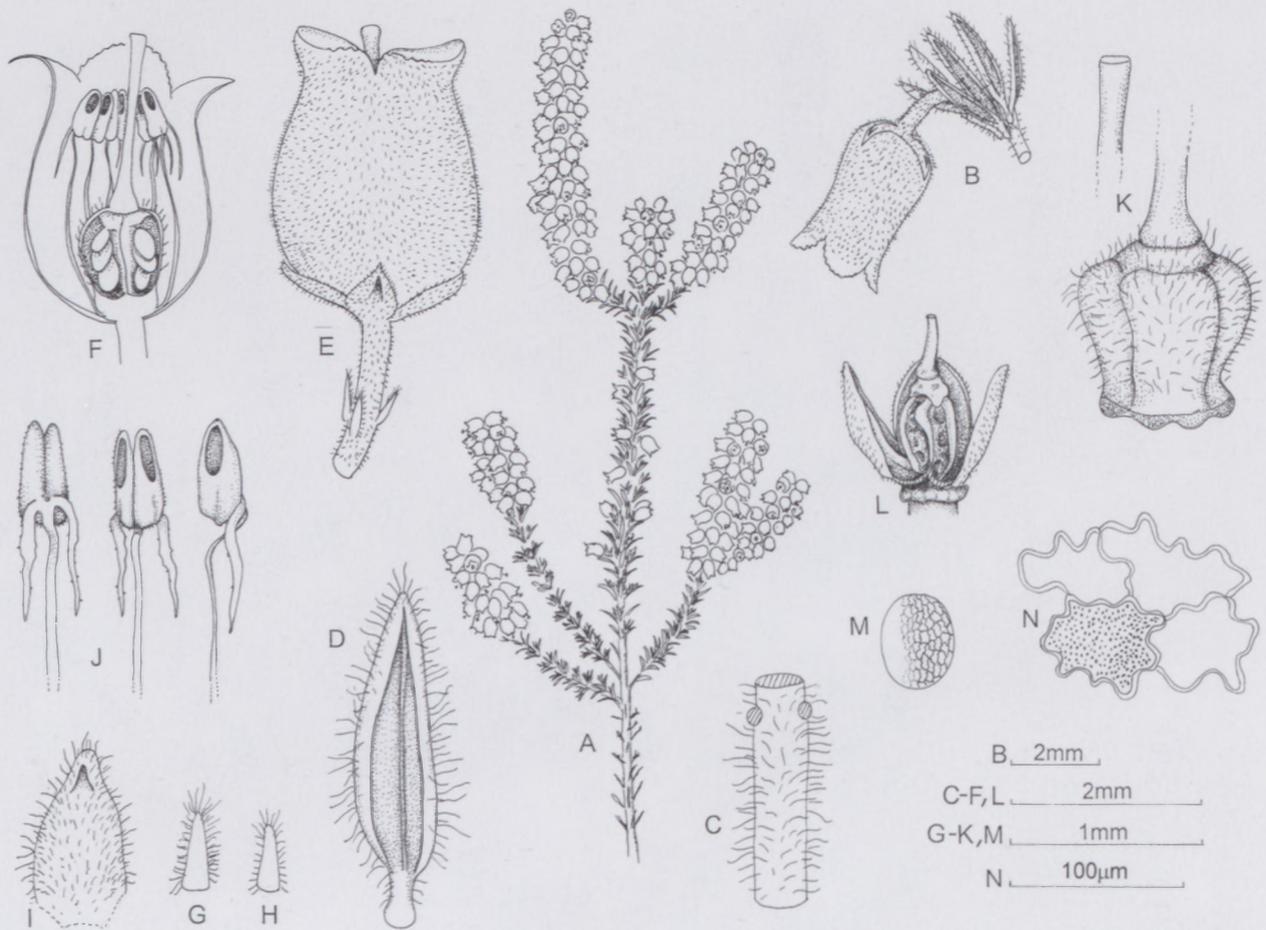


FIGURE 6.—*Erica chionodes*. A, flowering branch, natural size; B, lateral flowering branchlet; C, stem with leaves removed; D, leaf; E, flower; F, flower, half section; G, bract; H, bracteole; I, calyx lobe; J, stamen, back, front and side views; K, ovary and stigma; L, capsule with one valve removed; M, seed; N, testa cells. All drawn from the type collection. Scale bars: B-F, L, 2 mm; G-K, M, 1 mm; N, 100 μ m.

lis, ramis puberulis, foliis abaxialiter semipatentibus, calcaribus antherarum longis angustis, ovario hirsuto dignoscenda. Figura 6.

TYPE.—Western Cape, 3322 (Oudtshoorn): Oudtshoorn, Groot Swartberg, peak just north of Tierberg, small kloof WNW of peak, 1 720 m, (–AD), 17 October 2000, E.G.H. & I.M. Oliver 11699 (NBG, holo.; BM, BOL, K, MO, NY, P, PRE, S).

Illustration: pro *E. esterhuyseniae*, Schumann & Kirsten: 116, fig. 70, 71 (1992).

Erect, sparse to compact shrub up to 600 mm tall, single-stemmed reseeder. **Branches:** main branches erect 30–50(–80) mm long, with determinate, occasionally continuing growth; secondary branchlets very short, \pm 1–2 mm long on every node; tertiary branchlets occasional, \pm 1 mm long on previous year's secondary branchlets; all branches pilose to hirsute with spreading hairs. **Leaves** 3-nate, subspreading, narrowly lanceolate-oblong, 2.5–3.5 \times 0.4–1.2 mm, adaxially flat, abaxially rounded with rounded margins, partially open-backed, sulcus broad, open at base, pilose to hirsute all over except in sulcus; petiole 0.5 mm long, pilose. **Inflorescence:** flowers 1(–3)-nate on ends of secondary, and occasionally tertiary, branchlets, crowded along and towards ends of main branches in dense spike-like synflorescences 100(–200) mm long; pedicel 1.7 mm long,

pilose, pale red; bract partially recaulescent about $\frac{1}{6}$ way up pedicel, narrowly lanceolate, 0.4 \times 0.15 mm, not sulcate, pilose, white; bracteoles 2, like bract but placed slightly higher up pedicel and slightly smaller. **Calyx** 4-lobed, 0.9 \times 0.5 mm, tube about $\frac{1}{6}$ length of calyx; lobes ovate, adpressed to corolla, with very short, subapical, wide sulcus, puberulous, very pale green to white. **Corolla** 4-lobed, urceolate, 2.8–3.8 \times 2.0 mm, puberulous, white; lobes 0.8 \times 1.0 mm, rounded, erose. **Stamens** 8, included; filaments free, linear, \pm 2 mm long, with slight apical S-bend, glabrous, white; anther bilobed, dorsally attached near base, ovate in adaxial view, appendiculate; thecae erect adpressed, ovate-elliptic in lateral outline, \pm 0.5 \times 0.3 mm, aculeate, brown, spurs irregularly linear-lanceolate, \pm 0.7 mm long, slightly longer than thecae, pendulous, with few lateral teeth, yellowish, pore $\frac{1}{3}$ – $\frac{1}{2}$ length of theca; pollen in tetrads. **Ovary** 4-locular, broadly obovoid, \pm 1.0 \times 0.9 mm, rounded, finely hairy all over, green, with reddish green apical portion and dark red nectaries around base; ovules \pm 6 per locule, pendulous from placenta in upper half of locule; style manifest, 2 mm long, dull reddish; stigma truncate to sub-capitulate, dull red. **Fruit** a dehiscent capsule, \pm 1.5 \times 1.8 mm, valves fused \pm $\frac{1}{4}$ at base, opening to \pm 45° angle; septa about equally split on valve and columella. **Seeds** ellipsoid, \pm 0.5 \times 0.4 mm, slightly flattened laterally, testa medium hard in texture, orange, reticulate-alveolate, cells 60–75 \times 35–45 μ m, anticlinal walls undulate to slightly jigsawed, inner periclinal wall pitted

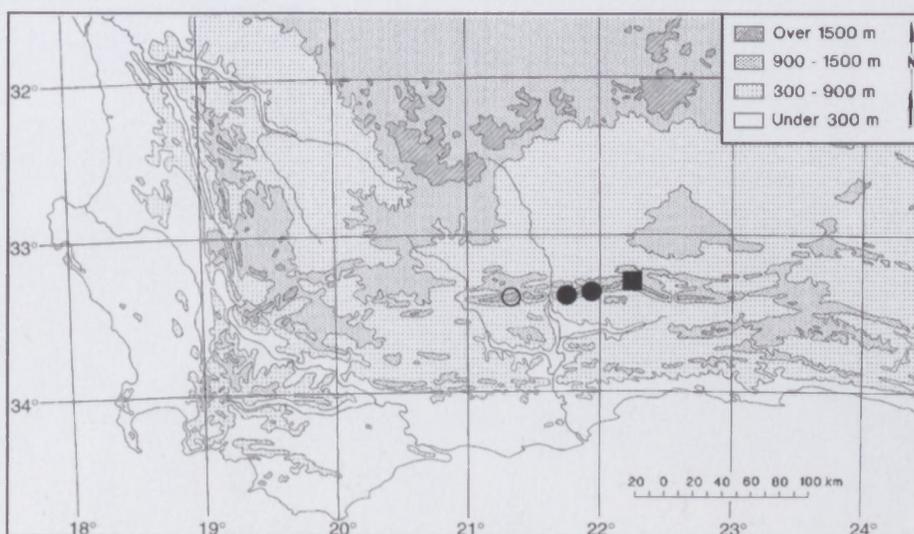


FIGURE 7.—Known distribution of *Erica chionodes*, ■; *E. blaerioides* subsp. *blaerioides*, ●; *E. blaerioides* subsp. *hirsuta*, ○.

with fairly large pits occasionally coalescing. *Flowering time*: September to November. Figure 6.

Erica chionodes is distinguished by the long, dense, spike-like synflorescences with pure white, finely hairy flowers, partially open-backed leaves, long, narrow, pendulous anther appendages and hairy ovary. It is closest to *E. oreotragus* E.G.H.Oliv. (see above) which is common along the full length of the Swartberg Range and has flowers in terminal 6–8-flowered heads on main branches (not in spike-like synflorescences), glabrous, mostly shorter pedicels, longer sepals which are about half the length of the corolla and have fewer longer hairs, relatively long corolla lobes, and anther appendages shorter than the thecae and broader and hairy. It is also allied to the new species, *E. blaerioides* (see below).

The species was studied by us in a large kloof on the northwest side of Tierberg above the Cango Caves, Oudtshoorn (Figure 7), where we saw just two populations. Both are growing in seepage areas with a predominance of low, matted species of Restionaceae. The profusion of brilliant white flowers contrasted dramatically against the dark restiads and was reminiscent of patches of snow, hence the epithet, *chionodes* = like snow (Greek).

The type population was undoubtedly the one seen by the first and only other collectors of the species, Vlok & Schumann in 1985. In the kloof the species was common and grew together with another very striking, but pink-flowered species, *E. nervata* Guthrie & Bolus. The population was studied on a hot sunny afternoon when several flies and beetles were seen to visit the flowers. The flowers gave off no detectable scent. The population lower down and across the valley (11705) was growing in a pure stand of restiads in a seepage area close to the main stream and had older flowers.

There is a record from Toverberg above Ladismith in the Klein Swartberg by Esterhuysen (*Esterhuysen* 26768)—‘S slopes near base of shale band, slightly marshy’. No colour is recorded for the flowers. This specimen fits the species, but is more compact in growth with shorter synflorescences and has 4-nate leaves. The large gap between the two areas is similar to that in the previous species, *E. taylorii*, described here, and is also

surprising, although in this case the wet seepage habitat is very much scarcer than the rocky one of the latter.

Paratype material

WESTERN CAPE.—3322 (Oudtshoorn): Swartberg Mtns, main kloof running north just NW of Tierberg, sides of main stream, 1 400 m, (–AC), 17-10-2000, *Oliver* 11705 (E, NBG, W); next to track near Tierberg, 4600 ft, (–AD), 5-11-1985, *Vlok & Schumann* 1264 (BM, BOL, K, NBG, NY, PRE).

6. *Erica blaerioides* E.G.H.Oliv., sp. nov., *Ericae oreotragus* E.G.H.Oliv. affinis, sed ab ea synflorescentibus breviter spicatis, bractea bracteola subaequantibus difert. Figura 8.

TYPE.—Western Cape, 3321 (Ladismith): Calitzdorp area, Groot Swartberg in Botes Nek area, 6000 ft [1 830 m], (–BD), 31 December 1969, *Oliver* 3049 (NBG, holo.; BM, BOL, K, NY, PRE).

Erect, compact, much branched shrublet to 0.3 m, rarely 1.2 m tall, with thin twiggy branches, single-stemmed reseeder. *Branches*: numerous, thin; main branches 20–50(–100) mm long, with continuous apical growth, secondary branches 1–5 mm long ending in an inflorescence, all branches covered with simple short spreading hairs, internodes 1.0–1.5 mm long. *Leaves* 3-nate, erect, slightly incurved, occasionally spreading when older, lanceolate to elliptic, 1.7–2.2 × 0.6–0.8 mm, adaxially flat, abaxially rounded, with subacute margins, partially open-backed to narrowly sulcate, sulcus open at base, puberulous to sparsely so when young with longer apical tuft, glabrescent with age; petiole ± 0.5–0.9 mm long, glabrous, ciliate. *Inflorescence*: flowers 3 in 1 whorl at apex of secondary branches; pedicel ± 2.0–3.5 mm long, glabrous to puberulous; bract partially recaulescent, $\frac{1}{3}$ – $\frac{2}{3}$ way up pedicel, narrowly oblong to lanceolate, 1.4 × 0.2–0.3 mm, white, glabrous or sparsely puberulous, ciliate, sulcus very small or absent; bracteoles 2, slightly above bract, otherwise same as bract. *Calyx* 4-partite, very slightly fused at base; segments not imbricate, mostly adpressed to corolla, lanceolate to broadly so, ± 1.4–2.2 mm long, acute, white, glabrous or puberulous, ciliate with hairs and a few non-sticky short-stalked glands, sulcus ± $\frac{1}{3}$ length of sepal,

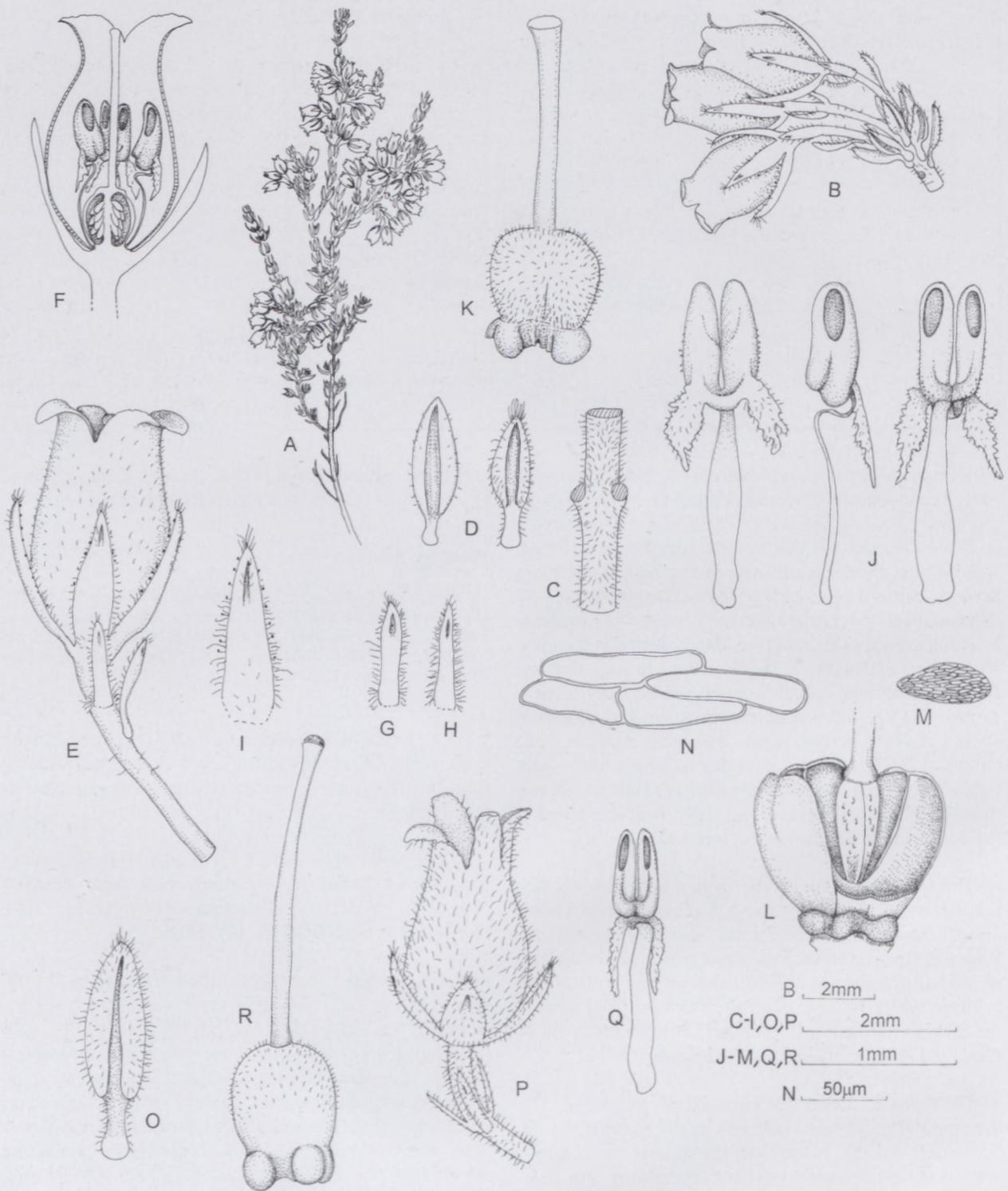


FIGURE 8.—*Erica blaerioides* subsp. *blaerioides*. A, flowering branch, natural size; B, flowering branchlet with single inflorescence; C, stem with leaves removed; D, two leaves; E, flower; F, flower, cut open longitudinally; G, bract; H, bracteole; I, sepal; J, stamen, back, side and front views; K, gynoecium; capsule, with one valve removed; M, seed; N, testa cells. Subsp. *hirsuta*. O, leaf; P, flower; Q, stamen; R, gynoecium. A–N, drawn from the type of the species, *Oliver 3049*; O–R, from the type, *Oliver 5529*. Scale bars: B–I, O, P, 2 mm; J–M, Q, R, 1 mm; N, 50 μ m.

narrow. *Corolla* 4-lobed, narrowly urceolate, 3.2–3.4 \times 1.7–2.0 mm, sparsely puberulous to puberulous, white; lobes suberect to recurved, narrowly deltoid to broadly so, 0.6–0.9 \times 0.5 mm, subacute to rounded, margins erose. *Stamens* 4–8, free, included; filaments oblong, 1.2–1.5 \times 0.2 mm, slightly widened in middle or towards base, with marked apical S-bend, glabrous, white; anthers bipartite, erect, lanceolate to oblong in adaxial view, dorsally attached near base, appendiculate; thecae

erect adpressed, curved oblong in lateral view, 0.6–0.9 \times 0.2–0.3 mm, aculeate, brown, pore \pm $\frac{1}{3}$ length of cell, appendages irregularly shaped, 0.3–0.6 \times 0.1–0.2 mm, irregularly lacerate, puberulous; pollen in tetrads. *Ovary* 4-locular, broadly obovoid to globose, 0.8–1.0 \times 0.7 mm, very slightly emarginate, puberulous to puberulous in upper half only, with well developed nectaries around base; ovules 8–12 per locule, pendulous from placenta almost the length of columella; style included, straight,

1.5–2.0 mm long, glabrous; stigma simple truncate. *Fruit* a dehiscent capsule, valves splitting nearly to base and to $\pm 45^\circ$, delicate, not hard and woody, septa only on the valves. *Seeds* elongate ovoid, $\pm 0.6 \times 0.3$ mm, orange, testa cells $75\text{--}100 \times 25$ μm , anticlinal walls slightly thickened, straight to very slightly and irregularly undulate, no pits in inner periclinal walls. Figure 8.

The species occurs at high altitudes only in the western parts of the Groot Swartberg Range and eastern Klein Swartberg (Figure 7).

Erica blaerioides is closely related to the previous two species. It has spike-like synflorescences similar to those of *E. chionodes*, but differs in these being looser and much shorter, in having longer sepals, a differently shaped corolla which is more sparsely hairy with longer hairs, differently shaped ovary, stamens in a lower position in the corolla and very different seeds. It is also allied in many respects to *E. oreotragus*, but differs in the form of its inflorescence which is spike-like and not umbel-like, and by its subequal bract and bracteoles.

This new species is divided into two subspecies on a number of characters, which show slight disjunctions—stamen number, size of the leaf sulcus, hairiness of the bract, bracteoles and sepals, and size of the sepals and anther appendages. The two taxa are allopatric. The type of the species and typical subspecies has been chosen from among the field collections made by the first author in the eastern populations.

subsp. *blaerioides*

Stamens always 4; bract, bracteoles and sepals glabrous but ciliate; leaves partially open-backed; longer, narrower sepals (1.6–2.0 mm long); broader, larger anther appendages (Figure 9A–N). *Flowering time*: December and January.

The typical subspecies has been recorded from the summit ridge of the Groot Swartberg from Botes Nek to above Kliphuisvlei (Figure 7) where it occurs on cool south-facing slopes. In the type locality the species occurred sympatrically with *E. oreotragus* and was easily recognizable as a distinct species mainly on the differences in the inflorescence types.

subsp. *hirsuta* *E.G.H.Oliv.*, subsp. nov., a subspecies typica foliis minus sulcatis, omnibus partibus floris (staminibus exclusis) puberulis, sepalis brevioribus et latioribus (± 1.4 mm longis), staminibus 4–8 calcaribus angustioribus differt. Figura 9O–R.

TYPE.—Western Cape, 3321 (Ladismith): Klein Swartberg, Seweweekspoort peak, 7500 ft [2 280 m], (–AD), 5-01-1981, *Vlok 139* (NBG).

This subspecies is distinguished from the typical subspecies in having leaves not quite as open-backed, all parts of the flower (excluding stamens) puberulous, shorter and broader sepals (± 1.4 mm long) and 4–8 stamens with narrower appendages (Figure 9O–R).

Flowering time: December and January.

The subspecies has been recorded from the high altitudes of the eastern end of the Klein Swartberg Mountains just west of Seweweekspoort (Figure 7) where it has been recorded growing with *E. oreotragus*. It was first collected by two of the first group of botanical explorers of that rugged high area in December 1928, Andreae and Stokoe (Linder *et al.* 1993) (see also *E. taylorii* above). This area is about 40 kms west of the populations of subsp. *blaerioides*. Other than the peak just east of Seweweekspoort which we have investigated, the intervening mountain range has not to our knowledge ever been botanised. However, this range decreases in altitude down to the large Gamkaskloof and would therefore most probably not provide the type of high altitude, cool slopes required by the species.

Paratype material

subsp. *blaerioides*

WESTERN CAPE.—3321 (Ladismith): Oudtshoorn, Groot Swartberg, summit ridge above Kliphuisvlei, 1 900 m, (–BD), 1-01-1975, *Oliver 5529* (NBG, PRE); *ibid.*, 6500 ft [1 980 m], 17-01-1954, *Taylor 1087* (BOL).

subsp. *hirsuta*

WESTERN CAPE.—3321 (Ladismith): Klein Swartberg, Klein Swartberg Peak [?Seweweekspoortberg], 6700 ft [2 040 m], (–AD), 28-12-1928, *Andreae 1280* (BOL, PRE); *ibid.*, 6800 ft [2 070 m], 28-12-1928, *Stokoe 1768* (NBG, PRE), as *1768a* (BOL, PRE); Seweweekspoort Peak, (–AD), 12-1928, *Stokoe 6669* (BOL, K. PRE).

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