

pans (*O. costatum*, *O. rubellum*), it is unlikely that any *Ophioglossum* could tolerate an aquatic environment for that length of time.

Var. *taylorianum* is found growing together with, or in the vicinity of, other *Ophioglossum* species, forming genus communities (Burrows 1992, 1996). In Tanzania, it was recorded growing with *O. rubellum* Welw. ex A. Braun and *O. gomezianum* Welw. ex A. Braun. In Zimbabwe it was found growing near the same two species as well as *O. costatum* R.Br., *O. gracillimum* Welw. ex Hook. & Baker and *O. latifolium* (Prantl) J.E. Burrows. It is of interest to note that var. *africanum* is generally a 'loner taxon', seldom occurring together with other species of *Ophioglossum*.

This variety almost certainly also occurs in Zambia and Malawi.

Specimens examined

TANZANIA.—1035: Songea Dist., \pm 21 km N of Songea, near Lumecha Bridge, (–DD), 945 m, 23 Jan. 1956, Milne-Redhead & Taylor 8406 (K).

ZIMBABWE.—1828: Gokwe Dist., Sengwa Wildlife Research Area, Leguaan Vlei, (–AA), 870 m, 11 Feb. 1991, J.E. & S.M. Burrows 5155 (TI, Herb. JEB). 1930: Gweru Dist., Central Estates, 60.5 km SE of Kwekwe on Mvuma road, 30 Jan. 1994, J.E. & S.M. Burrows 5525 & 5529 (Herb. JEB).

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ERICACEAE

THREE NEW SPECIES OF *ERICA* FROM WESTERN CAPE, SOUTH AFRICA

***Erica cubitans* E.G.H. Oliv., sp. nov., (§*Ephebus*)** in genere aliquantum sejuncta sed corolla ovarioque pilis brevibus glandulosis et pilis longis, poris antherarum parvis, ovulis tribus in quoque loculo, bractea in positione mediana, vena media foliorum crassa et habitu repenti (cubitanti) distinguitur. Figura 14.

TYPE.—Western Cape, 3320 (Montagu): Swellendam [Heidelberg] Dist.; Langeberg, ridge near Lemoenshoek, 4000–4500 ft [1220–1370 m], (–DD), 1-01-1951, *Esterhuysen 18247* (BOL holo.; BM, K, MO, NY, PRE, SAM).

Sparsely branched, decumbent, sprawling shrublet, single-stemmed reseeded. *Branches*: a few lax thin main branches, 400–500 mm long, mostly with continuous vegetative growth, occasionally ending in a florescence, numerous secondary branches, \pm 100–200 mm long, terminating in a florescence, rarely also tertiary branchlets; branchlets not at every node, sometimes only every 2–4th node; internodes on main branches \pm 10 mm long, on lower order branchlets \pm 1 mm long; all branches with long and very short eglandular and/or gland-tipped hairs.

Leaves 3-nate, subspreading to older ones reflexed, \pm 3.0 \times 0.8 mm, narrowly elliptic, acute, open-backed with slightly inrolled margins with distinctly thickened midrib, adaxially glabrous, abaxially densely and very shortly pubescent with occasional stouter longer gland-tipped hairs, margins with numerous simple hairs, 1.0–1.5 mm long, and a few short gland-tipped hairs; petiole 0.6 mm long, glabrous, long ciliate. *Inflorescence*: flowers 3-nate in 1(2) whorls, umbel-like when 2-whorled, terminal on secondary, rarely tertiary branchlets; pedicel 2.5 mm long, with dense short-stalked glands only; bract partially recaulescent in middle position, 2.2 \times 0.5 mm, narrowly elliptic, leaf-like, open-backed; bracteoles in $\frac{3}{4}$ position, slightly shorter than bract, otherwise similar. *Calyx* 4-partite, fused $\pm \frac{1}{10}$ at base; segments 2.0 \times 0.8 mm, narrowly triangular, leaf-like, broadly sulcate for $\pm \frac{2}{3}$ its length, with prominent abaxial midrib vein, indumentum as in bract. *Corolla* 4-lobed, 3.2 \times 3.0 mm, cyathiform, sparsely long puberulous and densely shortly glandular hairy, light purplish pink; lobes very short, erect, 1.8 \times 0.5 mm, subacute, finely erose-crenulate. *Stamens* 8, free, included; filaments linear slightly curved, glabrous, \pm 1 mm long;

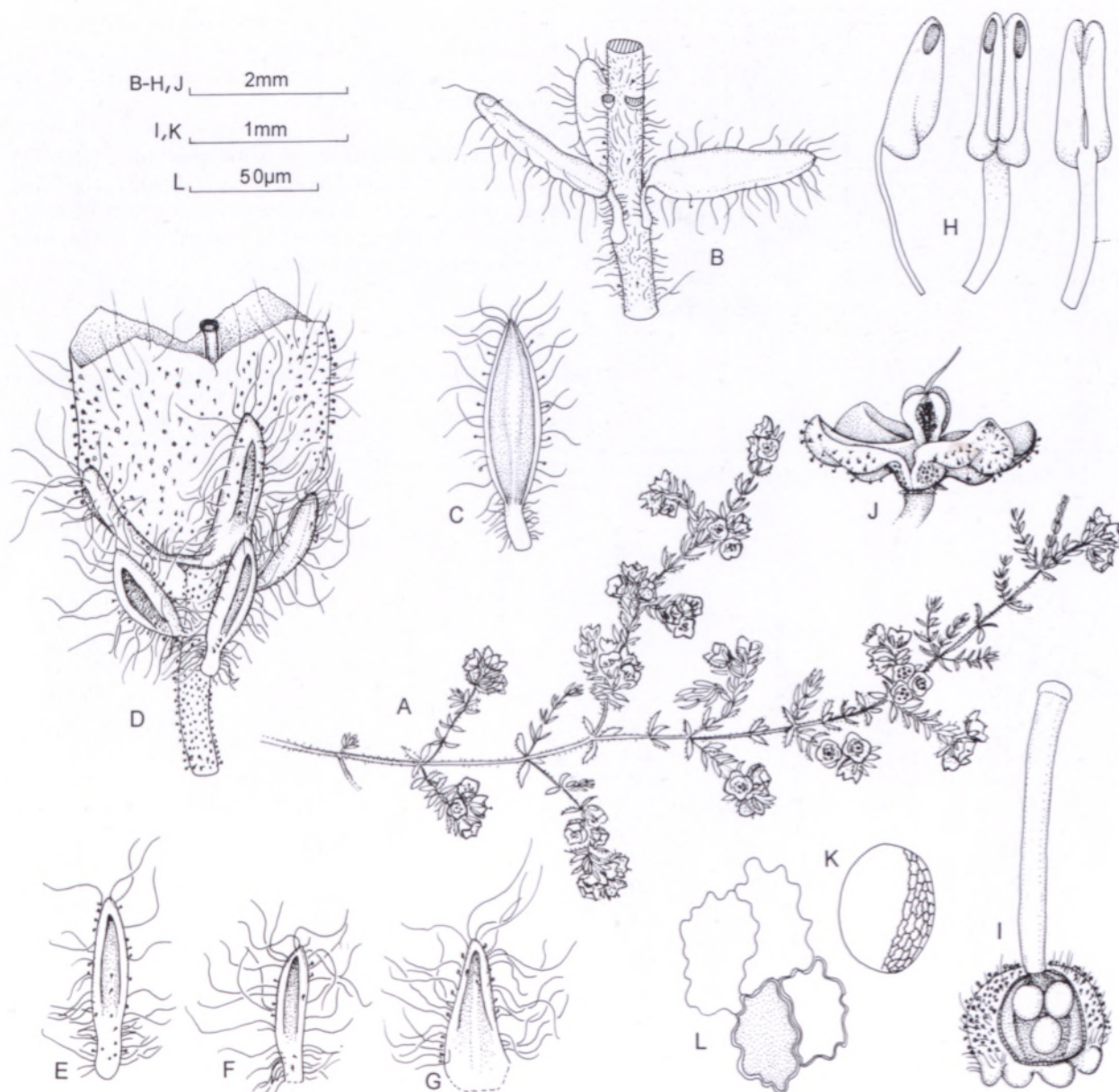


FIGURE 14.—*Erica cubitans*. A, flowering branch; B, portion of branch; C, leaf, abaxial view; D, flower; E, bract; F, bracteole; G, sepal; H, stamens, side, front and back views; I, gynoecium with side of ovary partially removed to show ovules; J, capsule; K, seed; L, testa cells. All drawn from the type, *Esterhuysen 18247*. A, $\times 1$. Scale bars: B–H, J, 2 mm; I, K, 1 mm; L, 50 μ m.

anthers dorsifixed, oblong, bipartite, muticous; thecae erect, appressed, $\pm 1.0 \times 0.3$ mm, narrowly lanceolate, glabrous, occasionally with a small gland or hair on the 'chin' area, pore small $\pm \frac{1}{5}$ length of theca; pollen as tetrads. *Ovary* 4-locular, $\pm 0.6 \times 0.9$ mm, broadly ovoid, slightly emarginate, densely covered with short-stalked glands and a few longer hairs; nectaries around the base; ovules ± 3 per locule, spreading from placenta in upper half; style ± 3.6 mm long, manifest, terete, glabrous; stigma minutely capitate. *Fruit* a dehiscent capsule, valves free spreading to 90° , septa on columella. *Seeds* $\pm 0.7 \times 0.6$ mm, ellipsoid, rounded, testa alveolate, cells slightly longer than broad with irregularly undulate anticlinal walls and numerous fine pits. *Flowering time*: November–January. Figure 14.

This new species is distinguished by the numerous short-stalked glands intermixed with longer fine eglandular hairs on the corolla and ovary, the small anther pores, only three ovules per locule, the capsule with

valves spreading at right angles, the thickened midvein of the leaves, partially recalcrescent bract in the middle position and the decumbent spreading habit.

The relationships of *E. cubitans* are not clear. The presence of glandular hairs on most parts of the flower, especially the ovary, is unusual in the genus. The distinctly broadened midrib vein of the leaves occurs in a group of species from the southwestern parts of the Cape Floral Region from the Riviersonderend Mountains to the Cape Peninsula and northwards to the Cederberg, species such as *E. planifolia* L., *E. leptoclada* Van Heurck & Müll.Arg., *E. longepedunculata* Lodd, *E. cryptanthera* Guthrie & Bolus, *E. thimifolia* J.C.Wendl. and several undescribed species. Some of these have glandular corollas, in particular *E. planifolia*, which also has a glandular ovary and is often diffuse and prostrate in habit, but all are also characterised by the bract being nonrecalcrescent and leaf-like, and the ovaries with many more ovules (15–25) per locule.

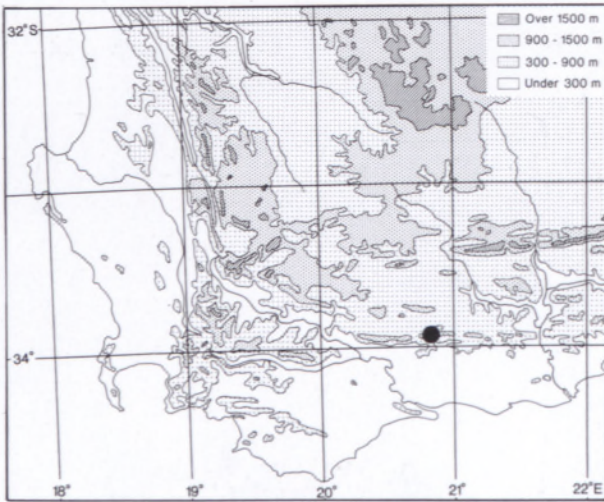


FIGURE 15.—Known distribution of *Erica cubitans*.

E. cubitans is known only from the mountains of the Grootvadersbosch Wilderness area (Figure 15) where it occurs at the higher altitudes on rocky slopes or the plateau from 1 300–1 500 m.

The name is derived from the prostrate, sprawling habit of the species (*cubitans* = lying down, recline; but also, more distantly, to *cubitum* = distance from elbow to tip of middle finger, i.e. ± 450 mm, which is about the length of the old main branches).

Paratype material

WESTERN CAPE.—3320 (Montagu) Langeberg, Lemoenshoek Peak, SE slopes along ridge, 4500 ft [1 370 m], (–DD), 25-12-1964, Esterhuysen 30882 (BOL, NBG); *ibid.*, plateau at summit, 5280 ft [1 609 m], (–DD), 7-12-1981, Stirton 10219a (NBG, PRE); ridge summit just west of Grootberg summit, 5000 ft [1 524 m], (–DD),

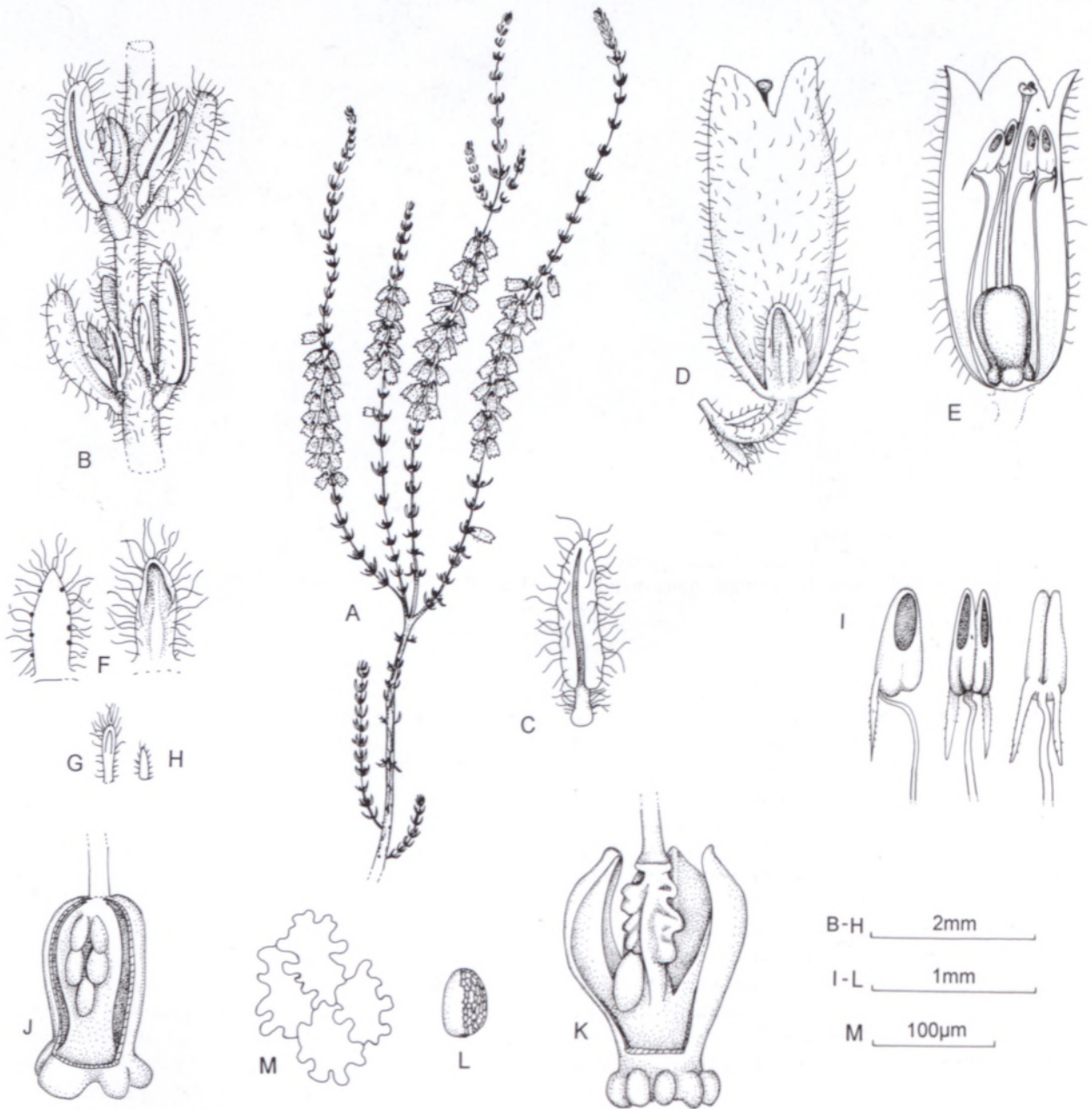


FIGURE 16.—*Erica garciae*. A, flowering branch; B, branch; C, leaf; D, flower; E, flower cut longitudinally showing position of stamens and gynoecium; F, sepals, adaxial & abaxial views; G, bract; H, bracteole; I, anther, side, front and back views; J, ovary with one side removed; K, fruit with one valve removed; L, seed; M, testa cells. All drawn from the type, Oliver 10987. A, $\times 1$. Scale bars: B–H, 2 mm; I–L, 1 mm; M, 100 μ m.

13-01-1997, *Helme 1231* (NBG); Langeberg above Grootvadersbosch, summit of Repeater Kop, 1 515 m, (–DD), 2-12-1987, *McDonald 1549* (K, MO, NBG, P, PRE, S).

***Erica garciae* E.G.H.Oliv., sp. nov., (§*Ephebus*), *E. parviflorae* L. et *E. intervallari* Salisb. affinis, sed ab eis synflorescentibus pseudospicatis, foliis ternatis, ramulis lateralibus brevissimis cum duobus prophyllis differt. Figura 16.**

TYPE.—Western Cape, 3321 (Riversdale): Riversdale Dist.; Langeberg, main ridge just west of summit of Garcia's Pass, 1750 ft [533 m], (–CC), 8-12-1997, *E.G.H. & I.M. Oliver 10987* (NBG, holo.; BM, BOL, K, MO, NY, PRE).

Erect, delicate, sparsely branched shrublet, up to 300 mm high, single-stemmed reseeder. *Branches*: main branches long erect to subspreading and continuing growth, numerous secondary branchlets at about every node usually 1 mm or shorter and with only 2 leaves (the prophylls) remaining vegetative or terminating in a florescence, main internodes 2–5 mm long; stems sparsely puberulous. *Leaves* 3-nate, erect to spreading, $\pm 2.2 \times 0.5$ mm, oblong, shorter than internodes, incurved, subacute, rounded, with sparse hairs all over 0.3–0.5 mm long, sulcus narrow; petiole 0.4 mm long, appressed, long ciliate. *Inflorescence*: flowers 1–3 in a single whorl terminal on very short secondary branchlets, ± 1 –5 mm long, aggregated into spike-like synflorescences 30–50(–100) mm long on main branches; pedicel 1.2 mm long, recurved, with sparse long hairs, red; bract partially recalcrescent in basal position, 0.3 – 0.7×0.1 – 0.2 mm, oblanceolate to lanceolate, the larger ones with sulcate leaf-like upper half, the smaller esulcate and bracteose, all edged with long simple hairs and red or pink; bracteoles 2 in lower half, ± 0.3 mm long, lanceolate, otherwise like the bract. *Calyx* 4-partite/lobed, free or fused for only $\pm 1/10$ its length; segments 1.3×0.5 mm, lanceolate, appressed to corolla, subacute, with sparse long simple hairs mainly at margins and a few minute red subsessile glands on margins and more adaxially, green or red, sulcus broad $1/2$ length of segments; main vein thickened. *Corolla* 4-lobed, 4.0×1.5 mm, tubular to narrowly cyathiform, dull purplish pink, sparsely hairy with shortish simple hairs; lobes erect, 1.0×0.8 mm, triangular, subacute, erose. *Stamens* 8, free, included; filaments dorsifixed, apically geniculate, narrowly linear, glabrous, white; anthers dorsifixed near base, subbipartite, narrowly lanceolate, appendiculate; thecae erect, appressed, $\pm 0.6 \times 0.25$ mm, lanceolate, smooth, golden brown, spurs basal just shorter than theca, very narrowly lanceolate, pendent, white, sparsely and very shortly ciliate; pore $\pm 1/2$ – $2/3$ length of theca; pollen as tetrads. *Ovary* 4-locular, $\pm 1.0 \times 0.6$ mm, obovoid, 4-lobed, obtuse, glabrous, green, with distinct darker nectaries around base; ovules 5 or 6 per locule, pendulous from placenta in upper half; style included to manifest, glabrous, white; stigma capitate. *Fruit* a dehiscent capsule, valves erect separating for $\pm 2/3$ their length, with septa \pm equal on valves and columella. *Seeds* ± 0.4 mm long, ellipsoid, in t/s slightly angled, slightly alveolate, dark brown, testa cells subequal to slightly longer than broad, deeply and irregularly jigsawed anticlinal walls, with no pits. *Flowering time*: November/ December. Figure 16.

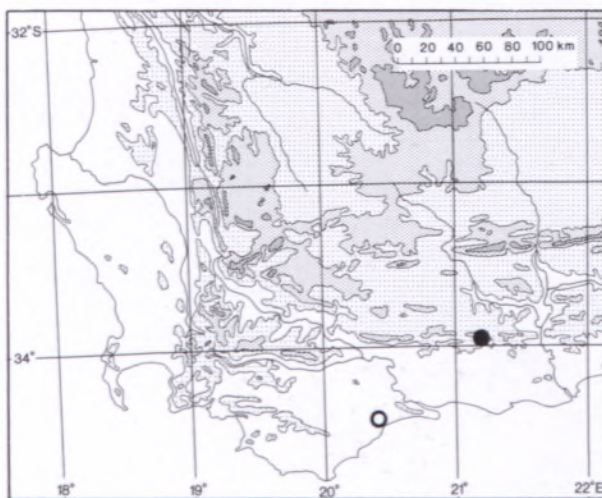


FIGURE 17.—Known distribution of *Erica garciae*, ●; and *Erica sperata*, ○.

This species is allied to the *E. parviflora/intervallaris* complex, but may be distinguished by the distinctive spike-like synflorescences (not a loose open arrangement of florescences), the 3-nate leaves (not 4-nate), the presence of very short lateral branchlets in each leaf axil with the branchlets bearing only the two small prophylls, the testa lacking any pits and the leaves with numerous sclereids (± 45 compared to 3–10).

E. garciae is currently known only from a few collections made on the Langeberg in the vicinity of Garcia's Pass (Figure 17) (hence the name selected), whereas the species in the *E. parviflora/intervallaris* complex are frequent and widespread in the western part of the Cape Floral Region from the Rivieronsderend Mountains and Hermanus to the Cape Peninsula and the Tulbagh/Worcester area. The latter species usually grow in wet seepage areas or on moist south-facing slopes. The plants of the new species in Garcia's Pass, even though occurring on a southeast-facing slope, grow in a rather dry stony/clayey habitat where they are inconspicuous among the taller proteaceous shrubs and restiads with which they are associated. McDonald's collection, mentioned below, was made on the north-facing slopes of the Langeberg with the habitat being 'yellow brown sandy loam stony soil' and recorded as rare.

Paratype material

WESTERN CAPE.—3321 (Riversdale): Riversdale Dist.; Langeberg, N-facing midslopes above Pheasantfontein, 818 m, (–CC), 19-12-1988, *McDonald 1798* (NBG); Garcia's Pass, S slopes near summit, 1700 ft [518 m], (–CC), 15-12-1979, *Oliver 7541* (NBG, PRE).

***Erica sperata* E.G.H.Oliv., sp. nov., (§*Arsace*), *E. arenariae* L. Bolus similis, sed ab ea foliis inflatis parvis, floribus roseis minoribus, ovario glabro sine nectariis differt. Figura 18.**

TYPE.—Western Cape, 3420 (Bredasdorp): Bredasdorp Dist.; De Hoop area, main limestone ridge SW of Wydegeleë, 160 m, (–AD), 30 April 1998, *Manning sub Oliver 11105* (NBG, holo.; BOL, E, K, MO, NY, P, PRE, S).

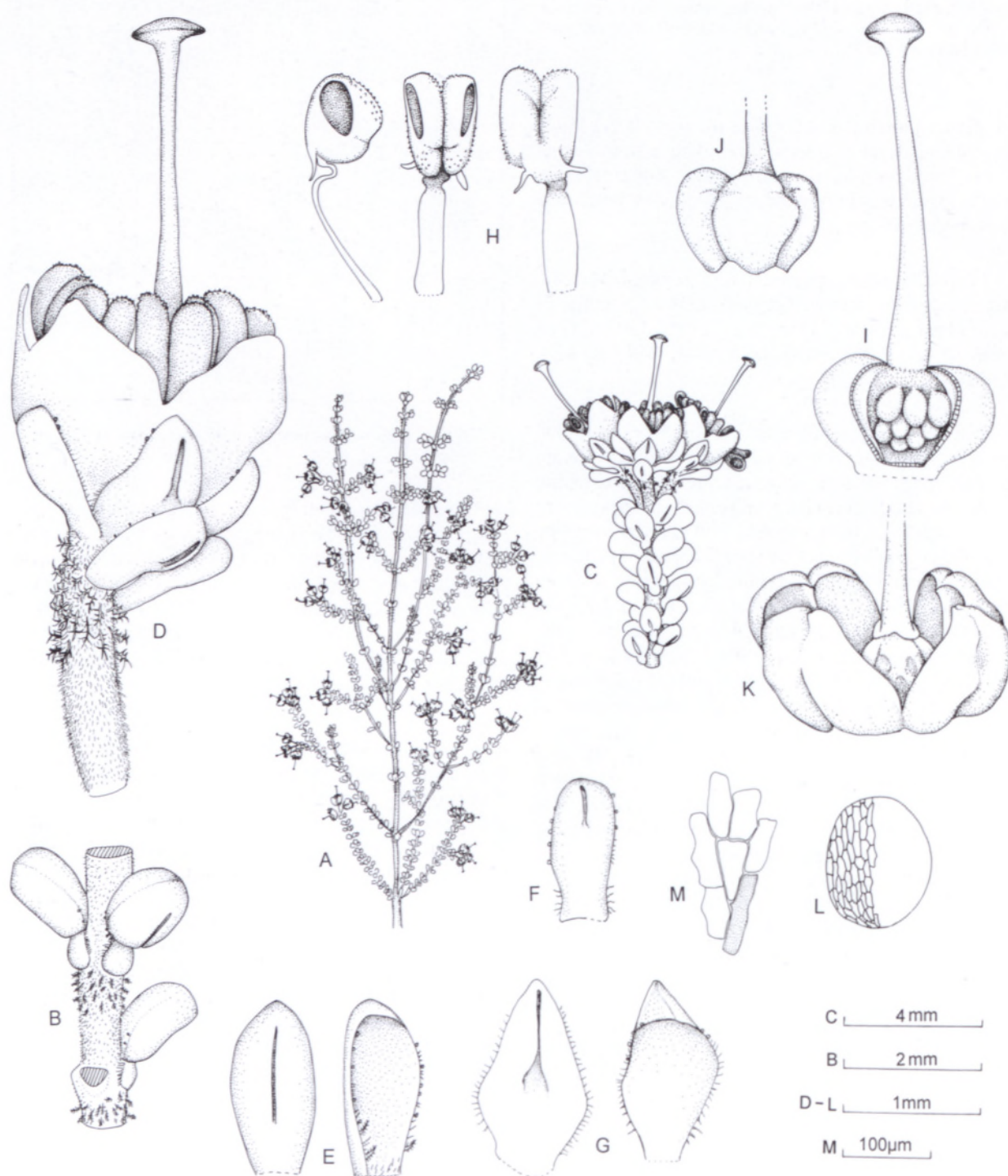


FIGURE 18.—*Erica sperata*. A, flowering branch; B, stem and leaves; C, flowering branchlet; D, flower; E, bract, abaxial and partial adaxial views; F, bracteole; G, sepal, abaxial and adaxial views; H, stamen, side, front and back views; I, gynoecium with ovary partially opened to show ovules; J, ovary; K, capsule; L, seed; M, testa cells. All drawn from the type *Manning sub Oliver 11105*. A, $\times 1$. Scale bars: B, 2 mm; C, 4 mm; D–L, 1 mm; M, 100 μ m.

Dense erect shrub 1–2 m high, single-stemmed reseeders. *Branches*: erect main branches 20–70 mm long, continuing growth, with numerous secondary branchlets 50–10 mm long with terminal florescences, internodes ± 8 mm long on main branches and 1–2 mm on secondary branchlets, no infrafoliar ridges, indumentum of plumose hairs on apical half of internodes and short simple reflexed hairs basally. *Leaves* 3-nate, $\pm 1.4 \times 1.0$ mm, subspreading, ellipsoid, glabrous with 3 or 4 glands or sometimes plumose hairs laterally near base, grey-green, sulcus narrow; petiole ± 0.2 mm long, glabrous, shortly

ciliate. *Inflorescence*: flowers 3(6)-nate in 1(2) whorls at ends of secondary branchlets, when 2-whorled then umbel-like, erect to pendulous; pedicel 1.8 mm long, with short dense reflexed simple hairs with longer plumose hairs in upper half; bract partially recalcrescent and mostly approximate, occasionally in middle position, $\pm 1.1 \times 0.6$ mm, narrowly obovate to narrowly ovate, narrowly sulcate in upper half, glabrous, edged basally with a few minute glands or either plumose or simple hairs, green often tinged pink; bracteoles 2, approximate to calyx, $\pm 1.0 \times 0.5$ mm, otherwise like

bract. *Calyx* 4-partite; segments $\pm 1.2 \times 0.8$ mm, obovate to oblong to ovate, subacute, glabrous, edges ciliate with a few apical glands and occasionally plumose hairs, green tinged pink. *Corolla* 4-lobed, $\pm 1.4 \times 1.9$ mm, cyathiform, glabrous, pinkish to white; lobes $\pm 0.5 \times 1.0$ mm, subacute, margins entire to erose. *Stamens* 8, manifest, free; filaments ± 2.5 mm long, oblong, with subapical sigmoid bend; anthers obovate, bilobed with appressed thecae, spurred or muticous; thecae $\pm 0.6 \times 0.5$ mm, subrhombic-circular; spurs $\pm 0.2 \times 0.1$ mm, linear, arising from upper end of filament, pendulous to spreading; pore $\pm \frac{2}{3}$ size of theca; pollen in tetrads. *Ovary* 4-locular, $\pm 0.7 \times 1.2$ mm, broadly obovoid, obtuse, 4-lobed, glabrous, green; nectaries absent; ovules 8 per locule, subspreading from placenta in upper $\frac{2}{3}$ of columella; style far exserted more than twice length of corolla, ± 2.1 mm long, broader at base; stigma capitate-peltate, 0.4 mm across, often with 4 stigmatic lobes. *Fruit* a dehiscent capsule, $\pm 1.0 \times 1.6$ mm, the valves splitting for $\pm \frac{2}{3}$ their length and to 45° and completely free from columella; columella with small septa. *Seeds* $\pm 0.4 \times 0.3$ mm, ellipsoid, yellow, slightly reticulate, cells elongate $\pm 75 \times 25$ μm , anticlinal walls \pm straight with one or two small undulations, walls pitted, thin not strongly sclerified. *Flowering time*: March–June depending on the rainfall in a given year. Figure 18.

This new species is most closely allied to *Erica arenaria* L.Bolus (§Arsace), but differs by the small inflated grey-green leaves, the smaller pink flowers, the less plumose-hairy bract, bracteoles and sepals, the glabrous ovary without any nectaries and the habitat being more inland on dry hillslopes. *E. arenaria* has leaves two to three times longer, white flowers up to twice as large, distinct nectaries, ovary hairy all over and grows very near the coast in the region to the east.

There are also probable alliances with several other species possessing plumose hairs on the stems and pedicel

in nearby coastal areas—*Erica magnisylvae* E.G.H.Oliv., *E. maritima* Guthrie & Bolus and *E. uysii* H.A.Baker:

1. *E. magnisylvae* produces large shrubs up to 3 m tall, and has a much larger cyathiform stigma ($2 \times$ broader), a very short included style only 0.6 mm long and much longer almost flattened leaves (2.0–2.7 mm long). It is confined to a small area near Gansbaai to the west.

2. *E. maritima* produces smaller delicate shrublets and is easily distinguished by the bract and bracteoles being basal on the pedicel, by the anthers being always muticous and the dark red flowers. It occurs in the coastal areas near Cape Agulhas and surprisingly also on the dry hills near Genadendal and Riviersonderend much further inland than any of the other species.

3. *E. uysii* is also confined to the hills above De Hoop very close to the localities of the new species. It may be distinguished by its flowers being twice as large and an even and brighter pink, the stigma simple/capitellate, the hairy ovary, and the much larger broad anther appendages.

E. sperata is confined to the northern edge of the extensive calcareous ridge due north of De Hoop hence the name (*Hoop* = hope, *speratus* = hoped for) (Figure 17). The habitat is very dry and rocky with protead and tall restiad vegetation.

Paratype material

WESTERN CAPE.—3420: Bredasdorp Dist.: De Hoop area, limestone hills, 200 m, 13-06-1979, *Burgers 1851* (NBG); *ibid.*, S of Wydgeleë, 500 ft, 7-04-1984, *Oliver 8447* (NBG); *ibid.*, Windhoek, 11-04-1971, *C.vd Merwe 2090* (NBG).

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