

## THYMELAEACEAE

### A NEW SPECIES OF *LACHNAEA* ENDEMIC TO THE SOUTHEASTERN MOUNTAINS OF THE WESTERN CAPE

***Lachnaea sociorum*** Beyers, sp. nov., structura inflorescentiae florisque *L. ericoidis* similis, sed sepalis tomentosis, stigmatibus penicellatis, foliis lanceolatis ad anguste ellipticis, abaxiale leviter 3-costatis, apice acuto, glabris.

TYPE.—Western Cape, 3321 (Ladismith): Langeberg, Bergfontein, S-facing midslopes of Koksposberg, 379 m, (–DC), 18-01-1991, McDonald 2059 (NBG, holo.; BOL, K, NY, PRE, iso.).

Erect, compact, moderately branched shrub up to 0.6 m tall, multistemmed at base, resprouting after fire. Branches erect, slender, ridged below leaf bases, covered with long, straight, adpressed hairs admixed with crooked ones, densely leafy, becoming naked with prominent leaf scars. Leaves alternate, ascending or occasionally inclined to patent, with apex curled inward, imbricate, sessile, lanceolate to narrowly elliptic or occasionally elliptic to obovate, 3.6–6.0 × 0.9–2.4 mm, coriaceous, green, those below inflorescence sometimes tinged maroon, glabrous, adaxially concave, smooth, dull, ± white-punctate, abaxially convex, faintly 3-ribbed or subkeeled towards apex, glossy, subpapillate, apex acute, base cuneate. Inflorescence a terminal, sessile, ebracteate, 6–14-flowered umbel with up to 9 open flowers at a time, on main flowering branches. Flowers subactinomorphic, white, skunk-scented. Pedicel 0.3–0.7 mm long, sericeous. Hypanthium 2.5–3.7 mm long, circumscissile, three-fifths to three-quarters from base, upper portion funnel-shaped, tomentose outside, adpressed hirsute within, basal portion oblong, glabrous, rarely tomentose outside, glabrous within. Sepals 4, patent, subequal, widely ovate or subrotund, 1.7–3.0 × 1.7–3.2 mm, apex rounded or obtuse, adaxially and abaxially tomentose. Petals absent. Stamens 4 + 4, exerted, outer, antisepalous whorl inserted at base of sepals, 0.7–1.5 mm long, inner, antipetalous whorl inserted at rim of hypanthium, 0.5–1.2 mm long (inner stamens the shortest or equal to the shortest of outer stamens); anthers widely ellipsoid, 0.4–0.6 mm long, abaxially without broad connective tissue. Scales 8, exerted, inserted at mouth of hypanthium immediately below antipetalous stamens, obovoid or subglobose, 0.3–0.5 mm long, glabrous, translucent-white when fresh. Ovary ellipsoid or obovoid, 0.9–1.4 mm long, glabrous. Style linear-obconical, 2.0–2.9 mm long, with straight, adpressed or incurled hairs in upper half to two-thirds. Stigma penicillate. Chromosome number: 2n = 18 (Beyers 176). Figure 8.

#### Leaf anatomy

Blade dorsiventral, epistomatic, glabrous, in transverse section slightly concave to more or less plane adaxially, convex abaxially (Figure 9). Cuticle well developed, thicker abaxially, surfaces papillate, with flaky wax deposits, particularly adaxially (Figure 10). Epidermis uniseriate, adaxial epidermal cells much smaller than abaxial ones, usually periclinally elongated; abaxial epidermal cells square to radially elongated, with outer tangential walls thicker than inner tangential walls (before gelatinisation), inner tangential cell walls of some cells gelatinised; adaxial epidermal cells incompletely and weakly gelatinised; stomata sunk below adjacent epidermal cells. Mesophyll differentiated into palisade and spongy parenchyma; palisade abaxial, 1- or 2-seriate; spongy parenchyma adaxial, cells palisade-like, loosely arranged with fairly large intercellular spaces. Vascular bundles comprising a large mid-bundle, flanked by 2 smaller lateral bundles on either side, with small intermediate bundles in between these two types; each bundle capped abaxially by large extraxylary fibres which are particularly well developed in the mid- and lateral bundles; bundle sheath present, uniseriate, parenchymatous, incomplete, interrupted by extraxylary fibre cap. Crystals of diosmin (potassium hydroxide test: Jackson & Snowdon 1990) present in adaxial epidermis and mesophyll, occurring as shaero-crystalline to somewhat dendritic masses, pale yellow; crystals and tanniferous deposits mutually exclusive. Tanniferous deposits present in all abaxial, and in some adaxial epidermal cells.

Vouchers: Beyers 176; McDonald 2059.

#### Pollen morphology

Pollen grains shed as monads, spheroidal, pantoporate, 39–41 µm diam. Tectum reticulate with triangular suprategal subunits, (crotonoid pattern *sensu* Erdtman 1966); suprategal subunits triangular in surface view, with either a single central spinule or with usually four spinules, lateral sides of subunits straight or emarginate, surface around spinules striate to granular-striate, with muri (ridges) cross-linked in subunits with lateral sides emarginate. Figure 11.

Vouchers: Beyers 176; Oliver 10524.

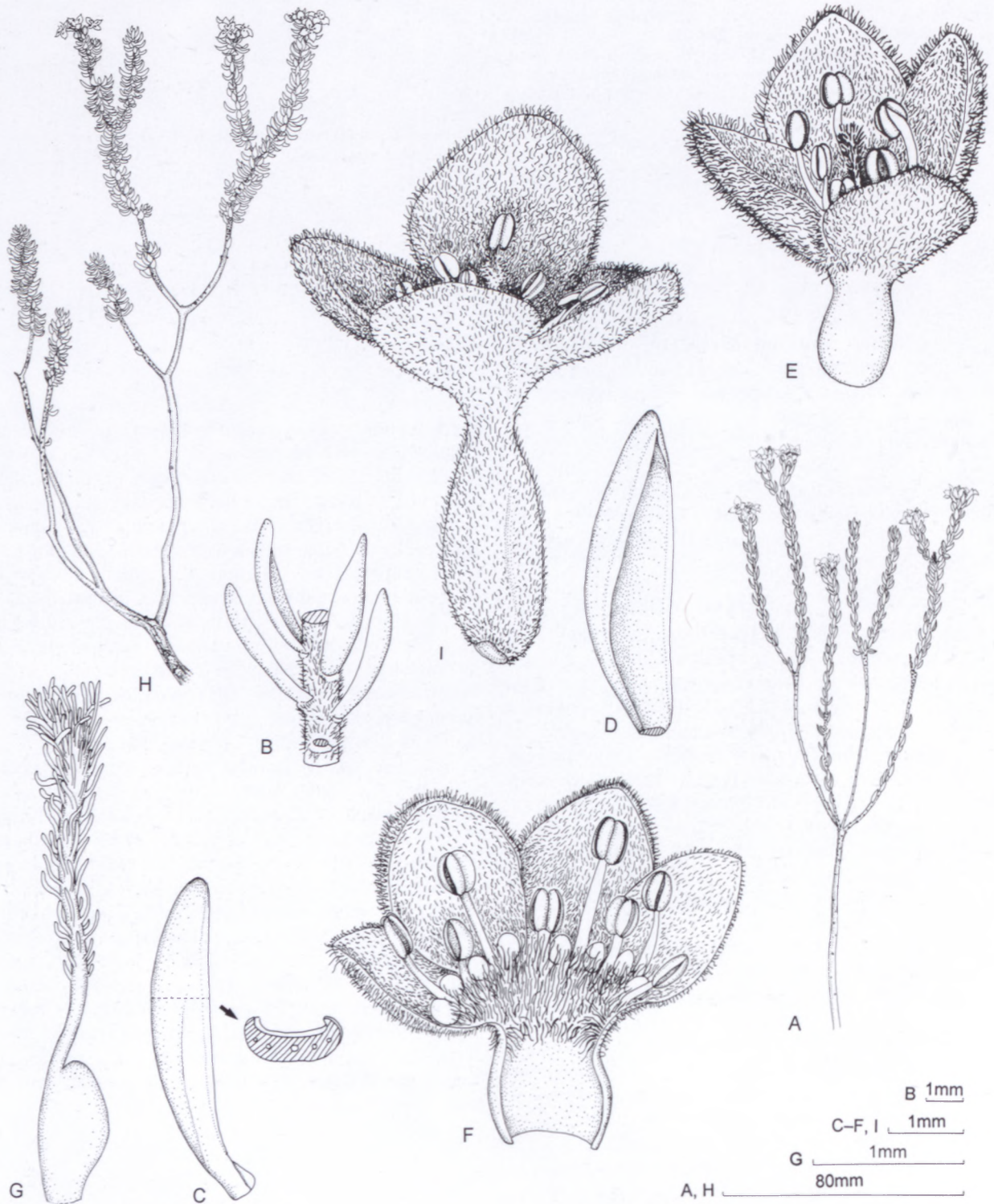


FIGURE 8.—*Lachnaea sociorum*. A, portion of plant; B, branchlet (enlarged); C, leaf (abaxial view and cross section); D, leaf (lateral view); E, flower; F, flower split longitudinally with gynoecium removed; G, gynoecium; H, portion of plant; I, flower; atypical pubescent form. A–G, McDonald 2059; H, I, Beyers 176.

#### *Distribution, ecology and variation*

Recorded from the eastern end of the Langeberg Mountains, from Perdeberg in the west eastwards to Gavelbos and the southern slopes of the Attakwa Mountains below Perdekop. Plants occur in stony soil on the southern and northern slopes, at altitudes between

300 and 1 100 m (Figure 12). Flowering recorded from August to January.

The population on the northern side of the Langeberg at Tygerberg, west of Huisrivier, is very localised and reasonably old. These plants are single-stemmed at the base, branching close to the ground and are open at the crown

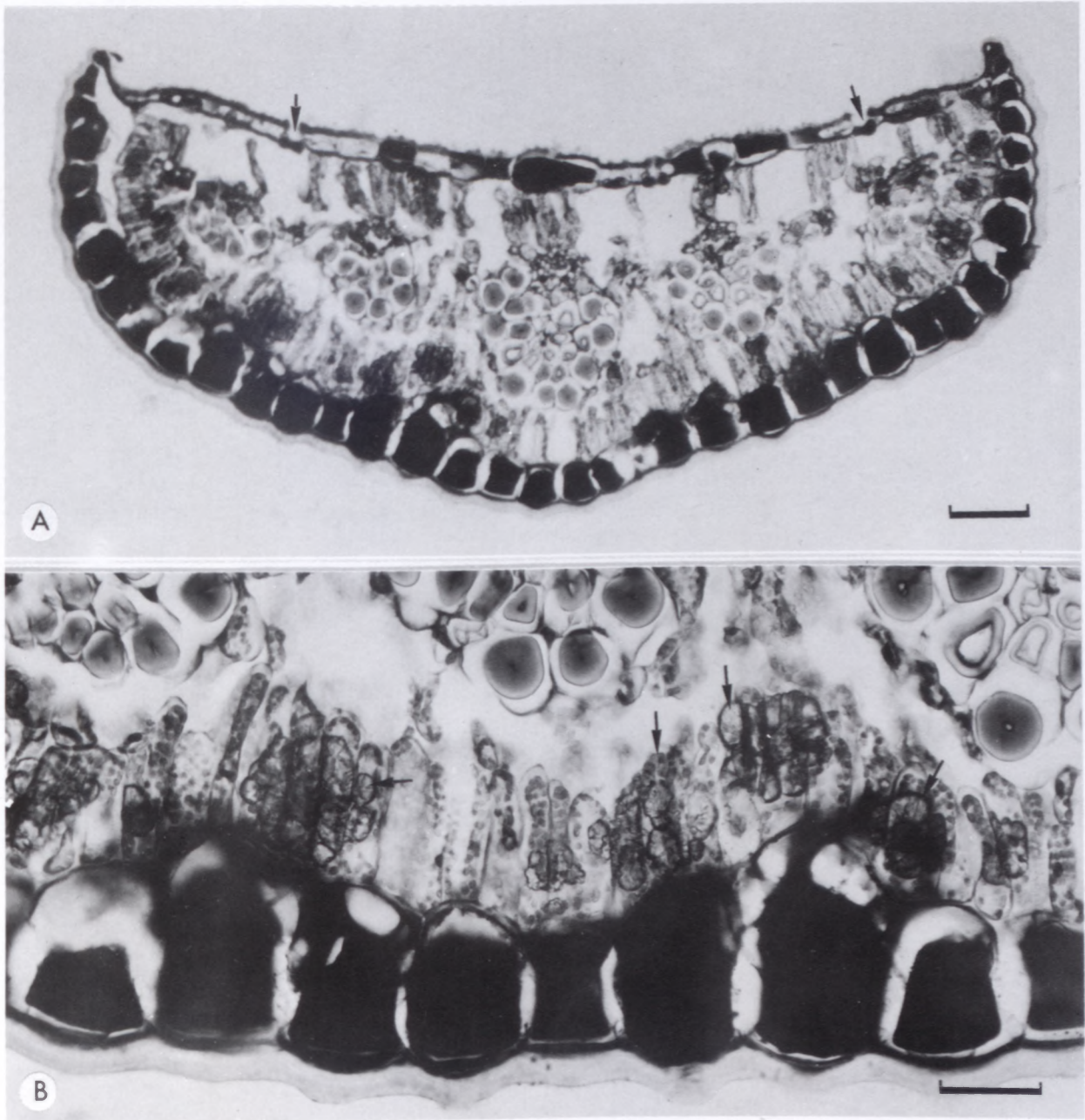


FIGURE 9.—*Lachnaea sociorum*, McDonald 2059, leaf anatomy, transverse sections. A, leaf lamina, note outline of shape, tanniferous epidermal cells (particularly abaxially), sunken stomata (arrowed) and vascular bundles with prominent caps of extraxylary fibres; B, portion of lamina showing tanniferous abaxial epidermal cells, adjacent palisade layer and extraxylary fibres, note masses of diosmin crystals (arrowed) in palisade cells. Scale bars: A, 100  $\mu$ m; B, 50  $\mu$ m.

with decumbent branches. Whether they would resprout after a fire remains to be seen. Two collections were made from this area, viz. *Beyers 176* and *McDonald 1780*. In all the material collected by McDonald, the basal portion of the hypanthium is glabrous as in all collections from other localities. However, in the material collected by Beyers the basal portion of the hypanthium on the outside is tomentose like the rest of the flower. This variation in hairiness needs further investigation before it can perhaps be formally expressed taxonomically.

#### Etymology

The specific epithet, *sociorum*, is derived from the Latin *socius*, meaning associate or colleague. This

species is dedicated to colleagues Ted Oliver and Dave McDonald, who on field trips always scouted for fresh *Lachnaea* material for the first author.

#### Diagnostic characters and relationships

*Lachnaea sociorum* is closely related to *L. ericoides* Meisn. Both have a similar inflorescence and floral structure. In both species the lower portion of the hypanthium is glabrous (except for the one collection of *L. sociorum*, *Beyers 176*, where it is tomentose). In *L. sociorum* the leaves are usually lanceolate to narrowly elliptic, abaxially faintly 3-ribbed, with an acute, glabrous apex, the sepals adaxially tomentose and the stigma penicillate. In *L. ericoides*, on the other hand, the leaves are narrowly

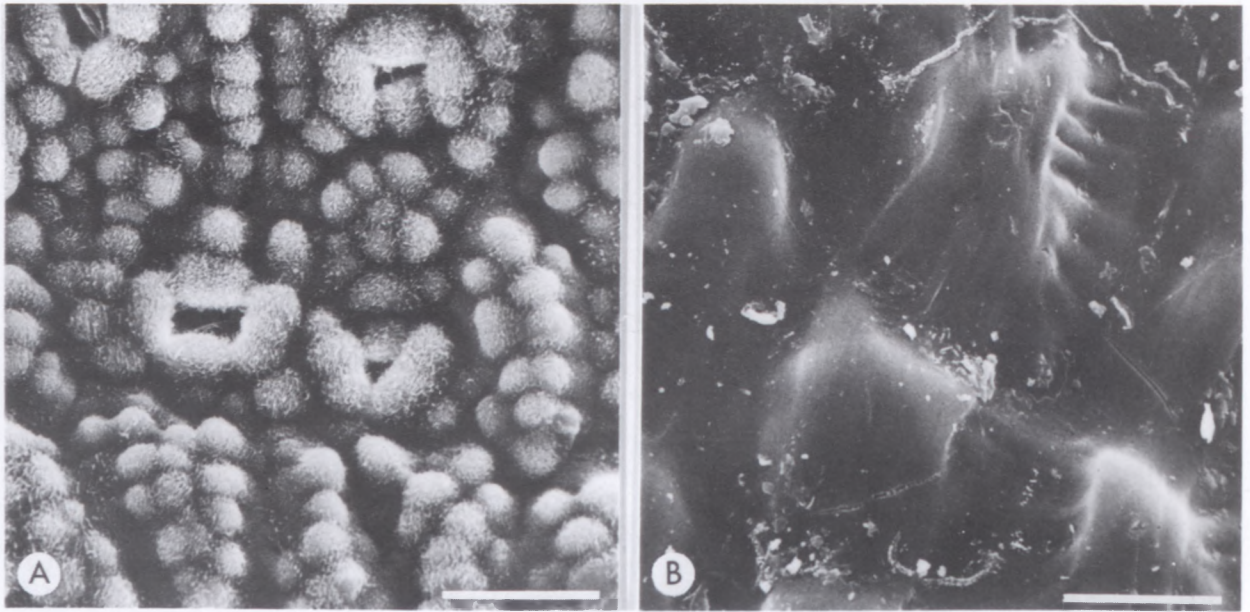


FIGURE 10.—*Lachnaea sociorum*, McDonald 2059. SEM micrographs of leaf surfaces illustrating papillate cuticular relief: A, adaxial surface with dense flake-like wax deposit; B, abaxial surface with sparse flake-like wax deposit. Scale bar: 2 µm .

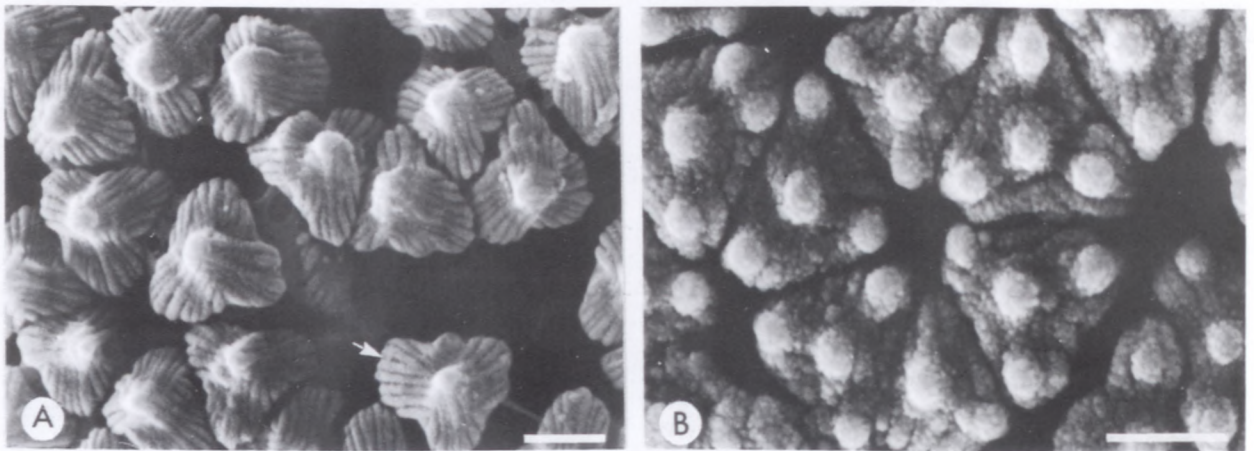


FIGURE 11.—*Lachnaea sociorum*. SEM micrographs of acetolized pollen grains illustrating crotonoid tectum. A, suprapectal subunits with single spinule, sides emarginate and with surface striate, note cross-links between muri (ridges), indicated by an arrow, McDonald 2059; B, suprapectal subunits, each with usually four spinules, sides straight and surface granular-striate, Oliver 10524 . Scale bar: 1 µm .

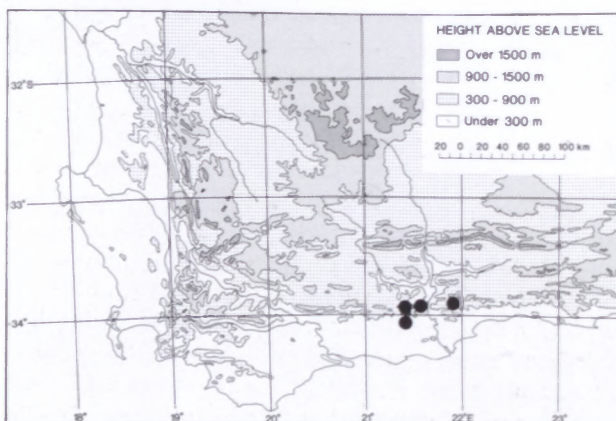


FIGURE 12.—Known distribution of *L. sociorum*.

elliptic to obovate, abaxially keeled, with a rounded, tufted apex, the sepals adaxially sericeous-tomentose and the stigma capitate with elongated papillae. The leaf anatomy of these two species is very similar except that in transverse section the leaves of *L. ericoides* are deeply concave adaxially and the extraxylary fibre strands capping the lateral vascular bundles are not as prominent as in *L. sociorum* (Beyers & Van der Walt 1995: fig. 8a).

#### Specimens examined

WESTERN CAPE.—3321 (Ladismith): Langeberg, Paardeberg, 1 100 m, (–CD), 11-08-1977, Haynes 1401 (NBG); E of Garcia's Pass on northern side of Langeberg, Tygerberg, west of Huisrivier, 300 m, (–DC), 15-12-1989, Beyers 176 (BOL, K, NBG, NY, PRE, Z), 17-12-1988, McDonald 1780 (BOL, NBG, PRE); Langeberg, Bergfontein area, lower slopes of Kokposberg, 425 m, (–DC), 30-10-1990,

*McDonald 1963* (PRE, NBG); Langeberg, Bergfontein, S-facing mid-slopes of Koksposberg, 379 m. (-DC), 18-01-1991, *McDonald 2059* (BOL, K, NBG, NY, PRE); Riversdale Dist., Langeberg, W of Witelsberg, upper Witelsrivierkloof, 610 m. (-DC), 01-09-1994, *Oliver 10524* (BOL, NBG, PRE); Langeberg, lower SW slopes of Witelsberg, N of Koksposberg, 488 m, (-DC), 01-09-1994, *Oliver 10536* (BOL, K, NBG, PRE, Z); Mossel Bay Road to Perdekop before forest plantation, 600 m, (-DD), 17-10-1978, *Bond 1578* (NBG), 3421 (Riversdale); Riversdale, Farm Gavelsbos, mountain slope, SW aspect, stony soil, 307 m, (-AB), 08-09-1984, *Bohnen 8479* (NBG, PRE). Grid ref. unknown: Riversdale Flower Show, 01-09-1994, *comm. Oliver* (NBG); Riversdale Div., Langeberg, 01-10-1923, *Muir 2824* (BOL), *Muir 3053* (PRE).

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#### REFERENCES

- BEYERS, J.B.P. & VAN DER WALT, J.J.A. 1995. The generic delimitation of *Lachnaea* and *Cryptadenia* (Thymelaeaceae). *Bothalia* 5: 65-85.
- ERDTMAN, G. 1966. *Pollen morphology and plant taxonomy. Angiosperms*. Almqvist & Wiksell, Stockholm.
- JACKSON, B.P. & SNOWDON, D.W. 1990. *Atlas of microscopy of medicinal plants, culinary herbs and spices*. Belhaven Press, London.

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