

A review of generic concepts in the Stilbaceae

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ABSTRACT

The generic concepts in the Cape endemic family Stilbaceae (± 14 species), are reviewed. Proposals by various authors to include *Retzia capensis* Thunb. in the Stilbaceae are supported. *Xeroplana* Briq. and *Eurylobium* Hochst. are shown to be congeneric with *Stilbe* L., resulting in one new combination and one new name in *Stilbe*. Seven currently recognised species of *Stilbe* are enumerated. A key to the genera of the Stilbaceae, as presently understood, is provided. A new genus ***Kogelbergia*** is described to accommodate two species previously assigned to *Stilbe* sect. *Amphistilbe* and two new combinations in ***Kogelbergia*** are proposed.

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INTRODUCTION

The Stilbaceae Kunth, a small family in the Lamiales, is endemic to the southern Western Cape. It is variously regarded as a subfamily within the Verbenaceae by some authors (Cronquist 1981) or as a family by others (Dyer 1975; Dahlgren 1980). The entire family consists of about twelve currently recognised species arranged in six genera.

Four of these (*Eurylobium* Hochst., *Campylostachys* Kunth, *Euthystachys* A.DC. and *Thesmophora* Rourke) are monotypic. While *Campylostachys* and *Thesmophora* are defined on sound morphological characters, *Eurylobium* and *Xeroplana* Briq. (two species) are here considered to be congeneric with *Stilbe* L. On present evidence *Euthystachys* seems sufficiently distinct to be upheld as a monotypic genus but further studies of fresh material from a range of populations are required before an adequate assessment can be made. Over and above these genera there is material of at least one and possibly two further undescribed taxa represented in local herbaria so it is unlikely that the final species count for the family will exceed fourteen.

INCLUSION OF *RETZIA* IN THE STILBACEAE

Before discussing these generic concepts any further, the position of *Retzia* Thunb. must also be considered in any review of the Stilbaceae and its relationships.

Retzia capensis Thunb., a monospecific endemic Cape genus, has been assigned to a wide range of families since it was described by Thunberg in 1776 (see Dahlgren *et al.* 1979, for a detailed review of its past taxonomic history). It has also been treated as a monospecific family (Dyer 1975). Similarly, Cronquist (1981) upheld the Retziaceae as a monospecific family, dismissing any relationship with the Stilbaceae largely on account of the placentation and 'organisation of the gynoecium' in *Retzia*. In a similar view, Takhtajan (1997), while acknowledging that Stilbaceae and Retziaceae are closely related, continued to uphold both as separate families. However, modern data from several different sources now indicate conclusively that *Retzia* is most closely allied to the Stilbaceae.

In a comparative study of iridoid glucosides in *Stilbe ericoides* L. and *Retzia capensis*, biogenetically similar compounds were found in both species (Dahlgren *et al.* 1979). These authors further pointed out that morphological and anatomical evidence also suggested a close relationship between the two families. An extensive investigation of the wood anatomy of several genera in the Stilbaceae has further highlighted the similarities between *Retzia* and the Stilbaceae (Carlquist 1986). More recently, *rbcL* sequences for *Euthystachys* (Stilbaceae) and *Retzia* were found to be very similar, 'differing by only eight substitutions', (Bremer *et al.* 1994), again confirming the close relationship between the two families. Thus morphological, anatomical, phytochemical and molecular evidence supports the inclusion of *Retzia* in the Stilbaceae.

In an updated phylogenetic classification of the flowering plants, Thorne (1992) incorporated *Retzia* into the Stilbaceae, dividing the Stilbaceae in two subfamilies, Retzioideae and Stilboideae. This view is followed in the present treatment and is, similarly, the current opinion of the Angiosperm Phylogeny Group (1998).

STILBACEAE SUBFAMILY STILBOIDEAE

All members of the the Stilbaceae subfamily Stilboideae are small, inconspicuous ericoid shrublets with very small white or pinkish flowers. Although typical components of the Cape fynbos they are never dominant

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and tend to be easily overlooked. Several taxa are rare localised endemics, and some are possibly palaeoendemics. In almost all cases the flowers are extremely small (shorter than 10 mm) which has made the dissecting and interpretation of herbarium material very difficult, often leading to serious misinterpretations of the floral structures (Rourke 1977). During the course of revising the family I have been able to examine a wide range of fresh living material collected in the field which has greatly clarified an understanding of the floral structures.

This review of the generic characters within the family has led to an expanded concept of *Stilbe* which will be discussed here and also the exclusion from *Stilbe* of two species previously known as *Stilbe mucronata* N.E.Br. [more recently as *Stilbe verticillata* (Eckl. & Zeyh.) Moldenke] and *Stilbe phyllicoides* A.DC. It is proposed that they be placed in a new genus, *Kogelbergia* Rourke.

As presently understood the Stilbaceae subfamily Stilboideae consists of five genera, two of which are characterised by having four-lobed corollas (*Campylostachys* and *Thesmophora*) and three which have five-lobed corollas (*Stilbe*, *Euthystachys* and *Kogelbergia*).

CURRENT GENERIC POSITION

The problem of finding a rational generic classification of the Stilbaceae has been known for some time (Dyer 1975; Rourke 1977). In this review an interim solution is provided to satisfy the immediate needs of two generic treatments of the family for 'Seed plants of southern Africa: families and genera' and K. Kubitski's 'The families and genera of vascular plants', currently in progress. A major taxonomic difficulty concerns the present circumscription of *Stilbe*, *Xeroplana*, *Eurylobium* and *Euthystachys*.

Stilbe L.

Two distinct groups can be recognised within *Stilbe* based on the symmetry of the corolla and the presence or absence of pubescence on the corolla lobes.

Stilbe verticillata and *S. phyllicoides* A.DC. have actinomorphic corollas and densely pubescent corolla lobes of equal size [*Stilbe* sect. *Amphistilbe* (Pearson 1901)]. The ovary in both species is single-chambered (but has marginal septum remnants), with two basal ovules.

The remaining species are characterised by prominently bilabiate flowers with two broad, erect posterior corolla lobes and three narrow anteriorly deflected corolla lobes, all of which are quite glabrous [*Stilbe* sect. *Eustilbe* (Pearson 1901)]. The sepals are fused to form a tubular, usually glabrous calyx. The ovary is two-chambered with a single ovule in each chamber. At anthesis one of the ovules and its locule aborts, leaving a single ovule in a single chamber.

It is proposed that the present broad circumscription of *Stilbe* be emended to encompass merely *Stilbe* sect. *Eustilbe* and that the two species currently placed in

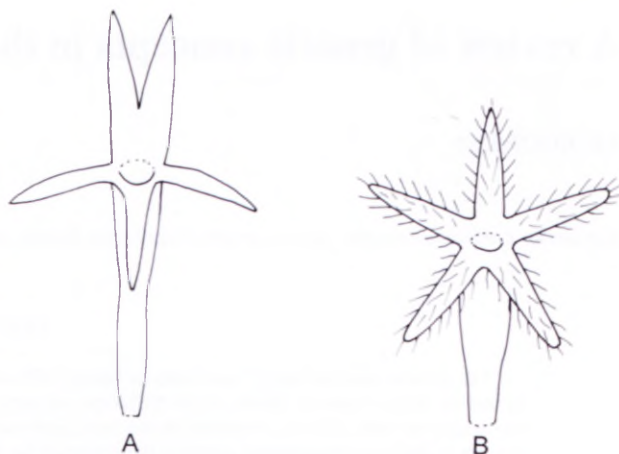


FIGURE 1.—Diagrammatic representation of the differences in corolla structure and pubescence between A, *Stilbe* and B, *Kogelbergia*.

Stilbe sect. *Amphistilbe* be removed to a new genus, herein described as *Kogelbergia* (Figure 1).

Xeroplana Briq.

In *Xeroplana* the corolla is strongly bilabiate with two broad, erect posterior petals, and three narrow anterior petals. The corolla lobes are glabrous. Initially the ovary is two-chambered with a single ovule in each chamber, but the abaxial chamber and ovule soon abort, leaving a single adaxial chamber with a solitary basal ovule. These similarities with *Stilbe* sect. *Eustilbe* have already been noted; moreover, it has previously been pointed out that the generic status of *Xeroplana* is questionable (Rourke 1977). On the basis of gross morphological evidence *Xeroplana* and *Stilbe* sect. *Eustilbe* are congeneric. Consequently, as no rational justification can be found to uphold *Xeroplana*, it is proposed that it be merged with *Stilbe* sect. *Eustilbe* under a modified concept of *Stilbe*, after having removed the two species in *Stilbe* sect. *Amphistilbe* to a new genus, *Kogelbergia*.

Eurylobium Hochst.

Vegetative and floral characters in *Eurylobium* are the same as in *Stilbe* sect. *Eustilbe*, namely, a tubular corolla, strongly bilabiate with two large, erect posterior lobes and three narrower, anteriorly deflected lobes. The corolla lobes are glabrous. The sepals are fused for $\frac{3}{4}$ of their length to form a glabrous, actinomorphic calyx tube. Initially the ovary is bilocular with an ovule in each chamber but at an early stage one of the ovules aborts, leaving the ovary to become unilocular with a single, functional, basally attached ovule. As these characters are the same as in *Stilbe* sect. *Eustilbe*, there is no justification for upholding *Eurylobium* as a monotypic genus.

Euthystachys A.DC.

The single species in this monotypic genus, *E. abbreviata* A.DC. is distinguished by the following characters: soft, pubescent sepals fused for about $\frac{1}{4}$ of their length at the base; an actinomorphic corolla of five, glabrous, equal corolla lobes and a bilocular ovary with a single functional ovule in each chamber.

These characters, though slender, provide sufficient justification for maintaining *Euthystachys* as a monotypic genus at this stage. Nevertheless, there are some differences in the degree of fusion of the sepals in certain collections. Further field work and the study of a range of fresh material is required before the generic status of *Euthystachys* can be adequately assessed.

Under the revised generic concept of *Stilbe* discussed above, two genera in the family, *Xeroplana* Briq. and *Eurylobium* Hochst. fall clearly within the emended circumscription of *Stilbe* and must be reduced to synonymy as indicated below.

SYNOPSIS OF *STILBE*

***Stilbe* P.J.Bergius**, Descriptiones plantarum ex Capite Bonae Spei: 30, t. 4 (1767); H.Pearson: 183 (1901). Type: *Stilbe vestita* P.J.Bergius.

Eurylobium Hochst.: 228 (1842); Walp.: 173 (1845); A.DC.: 608 (1848); H.Pearson: 187 (1901). Type: *Eurylobium serrulatum* Hochst.

Xeroplana Briq.: 336 (1896); H.Pearson: 188 (1901); Rourke: 1 (1977). Type: *Xeroplana zeyheri* Briq.

Ericoid shrublets, 0.5–1.5 m tall, with a single main stem, occasionally multistemmed and lignotuberous. Leaves ericoid, linear-subulate to narrowly lanceolate, ascending, in whorls of 3–5, margins revolute. Inflorescence a dense sessile spike, 10–40 mm long. Flowers white or pink, sessile, subtended by single anterior bract. Floral bracts 2, opposite, foliaceous. Calyx tubular, usually hard, with 5 free lobes occasionally slightly abaxially curved. Corolla tubular, 5-merous, bilabiate with two erect glabrous posterior lobes and three narrower glabrous anterior lobes; interior of throat ringed with dense pubescence, only rarely glabrous. Stamens 4, equal, posterior stamen absent; filaments glabrous, filiform; anthers basifixed. Ovary oblong, laterally compressed, potentially two-chambered but abaxial chamber abortive; adaxial chamber with a single basally attached ovule; style filiform glabrous, slightly adaxially curved; apex occasionally minutely bilobed. Fruit cylindric, laterally compressed, brown, shiny, dehiscing into 2 valves at apex. Seeds ovoid, straw-coloured.

An enumeration of the species of *Stilbe* currently recognised within the new delimitation of the genus is given here.

1. ***Stilbe vestita* P.J.Bergius**, Descriptiones plantarum ex Capite Bonae Spei: 30, t. 4 fig. 6 (1767).

2. ***Stilbe ericoides* L.**, Mantissa plantarum altera: 305 (1771).

3. ***Stilbe albiflora* E.Mey.**, Commentariorum de plantis Africae australioris 1: 279 (1836).

4. ***Stilbe rupestris* Compton** in Journal of South African Botany 10: 127, 128 (1944).

5. ***Stilbe serrulata* (Hochst.) Rourke**, comb. nov.

Eurylobium serrulatum Hochst. in Flora 15: 229 (1842). Type: 'Inter rupes cacuminis montis prope Genadenthal in Colonia Capensis' Dec. 1838, Krauss 1110, TUB6019 (TUB, holo.).

6. ***Stilbe overbergensis* Rourke**, nom. nov.

Xeroplana zeyheri Briq. in Bulletin de l'Herbier Boissier, Sér. 1,4: 336 (1896). Type: Western Cape, on banks of Riviersonderend River at Appelskraal and on adjacent mountains Ecklon & Zeyher sub *Stilbe* sp. nov. no. 8 in herb. Delessert (G, holo.).

The epithet *zeyheri* cannot be used due to the prior existence of *Stilbe zeyheri* Gand. (1913), a synonym of *Stilbe albiflora* E.Mey.

7. ***Stilbe gymnopharyngia* (Rourke) Rourke**, comb. nov.

Xeroplana gymnopharyngia Rourke in Journal of South African Botany 43: 6 (1977). Type: Western Cape, Langeberg Mountains, Riversdale above the Farm Langkloof on 'Annex Langekloof', along summit ridge. Rourke 1451 (NBG, holo., PRE, BOL, K, MO, G, S, iso.).

Key to genera of Stilbaceae

- 1a Corolla tube 45–55 mm long, pubescent externally, orange-red with black tips (subfamily Retziaceae) *Retzia*
- 1b Corolla tube shorter than 12 mm, glabrous externally, uniformly mauve, pink or white (subfamily Stilboideae):
 - 2a Corolla 4-lobed:
 - 3a Sepals free; corolla lobes glabrous *Campylostachys*
 - 3b Sepals fused forming tube; corolla lobes pubescent *Thesmophora*
 - 2b Corolla 5-lobed:
 - 4a Corolla actinomorphic; lobes equal or almost equal:
 - 5a Corolla lobes pubescent *Kogelbergia*
 - 5b Corolla lobes glabrous *Euthystachys*
 - 4b Corolla prominently bilabiate with two larger erect posterior petals and three narrow anterior petals *Stilbe*

KOGELBERGIA, A NEW GENUS IN THE STILBACEAE

As previously mentioned, it is proposed that the two species in *Stilbe* sect. *Amphistilbe* be removed to a new genus, *Kogelbergia*. Its distinguishing characters are discussed here.

Inflorescence structure

Superficially the inflorescence appears to be a sessile, globose capitulum. However, careful dissection of *K. verticillata* indicates that it is paniculate in structure with several highly condensed axillary branches bearing 3 or 4 flowers. The inflorescence structure in all other Stilbaceae subfamily Stilboideae is spicate. It seems probable that although much reduced and condensed, the paniculate inflorescence of *K. verticillata* represents a less specialised condition than the racemose pattern in the rest of the Stilbaceae. In *K. phyllicoides* the inflorescence is a condensed spike with no trace of a paniculate structure.

Corolla

Although the corolla is actinomorphic at anthesis consisting of 5 equal, linear corolla lobes, as the corolla opens, two lobes briefly assume an erect (posterior) position with the remaining three assuming a patent (anterior) position. This condition can only be briefly detected by observing developmental stages in living material and

is soon lost as the flower matures. It seems probable that actinomorphy in the corolla is a plesiomorphic condition with bilateral symmetry and a bilabiate corolla representing the derived condition.

The presence of dense villous pubescence on the linear corolla lobes of *Kogelbergia* is a character highly unusual in the family. All other Stilbaceae except *Thesmophora* and *Retzia*, have completely glabrous corolla lobes. This pubescence is formed by the presence of 1–2 mm long white trichomes on the inner surface, apex, and outer surface of each corolla lobe. Like almost all other Stilbaceae, *Kogelbergia* has a distinctive ring of pubescence in the throat of the corolla. Only three other species in the entire family lack this feature. The dense pubescence on the apices of the corolla lobes appears to be unrelated to the throat pubescence and is regarded here as a completely new character.

Ovary

Typically the ovary in Stilbaceae subfamily Stilboideae is bilocular with a single ovule in each chamber, or initially bilocular but with one abortive ovule in an atrophied or abortive second locule leaving a single functional ovule to develop. In *Kogelbergia* the ovary is unilocular with two basal ovules. However, serial sectioning of the ovary shows clear remnants of a septum in the position where this would normally be expected to be (i.e. at right angles to the axis). The septum breaks down very early in the development of the ovary leaving a unilocular condition which is clearly derived (Figure 2).

Pollen

A review of pollen structure in the Stilbaceae (excluding *Retzia*) showed that the pollen of the ‘*Stilbe mucronata* type’ was quite distinct within the family (Raj

TABLE 1.—Summary of major morphological differences between *Stilbe* and *Kogelbergia*

| <i>Kogelbergia</i> | <i>Stilbe</i> |
|--|--|
| Corolla actinomorphic at anthesis, of 5 equal petals | Corolla strongly zygomorphic, bilabiate with 2 erect posterior petals and 3 patent anterior petal limbs. Corolla lobes not equal |
| Corolla lobes densely pubescent | Corolla lobes glabrous |
| Inflorescence a condensed globose panicle or spike | Inflorescence a spike |
| Ovary single-chambered with two basal ovules | Ovary two-chambered with a single ovule in each chamber, one ovule/chamber often aborting |
| Pollen exine striato-reticulate (Raj 1983) | Pollen exine rugulose, tectate (Raj 1983) |

1983). Instead of having a rugulose exine (as in *Campylostachys*) or tectate-perforate exine as in the remaining species in the family, the exine of *Kogelbergia* (the ‘*Stilbe mucronata* type’) has a striato-reticulate exine, setting it apart from all its congeners (Raj 1983).

Conclusion

Fundamental morphological differences exist between the two species previously known as *Stilbe verticillata* and *Stilbe phyllicoides* and other members of the genus *Stilbe* (Table 1). These are considered sufficient to justify separate generic status. Accordingly, a new genus *Kogelbergia* is described to accommodate these species. Part of the distribution area of one of these species falls within the Kogelberg Nature Reserve, one of the centres of the highest endemism in the Cape Floristic Kingdom.

***Kogelbergia* Rourke**, genus novum *Stilbei* affine, a quo corolla actinomorpha 5 petalis aequalibus lobis dense pubescentibus, et ovario uniloculari ovulis duobus basilaribus, differt. Typus: *Kogelbergia verticillata* (Eckl. & Zeyh.) Rourke.

The genus *Kogelbergia* is distinguished from all other genera by its dense, globose, sometimes inconspicuously branched (apparently paniculate) or spicate inflorescences, the actinomorphic corolla, 5 equal petals densely pubescent at their apices, and the single-chambered ovary with 2 basal ovules. Two species are currently recognised.

***Kogelbergia verticillata* (Eckl. & Zeyh.) Rourke**, comb. nov.

Trichocephalus verticillatus Eckl. & Zeyh., Enumeratio plantarum africae australis 131 (1835). *Stilbe verticillata* (Eckl. & Zeyh.) Moldenke: 474 (1948). Type: in lateralibus montium prope Palmietrivier, supra Grietjiesgat, June, Alt. 4, Ecklon & Zeyher 1003 (SAM, iso!).

Stilbe mucronata N.E.Br.: t. 2526 (1897); H.Pearson: 184 (1901). Type: in declivibus montium Houwhoek, April 1895, 1400 ped., *Bolus* 8409 (K, lecto.! here designated).

Stilbe mucronata N.E.Br. var. *cuspidata* H.Pearson: 184 (1901). *S. verticillata* (Eckl. & Zeyh.) Moldenke var. *cuspidata* (H.Pearson)

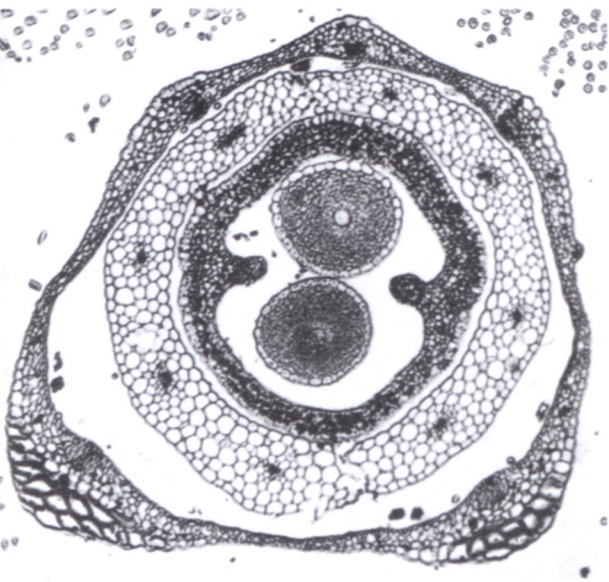


FIGURE 2.—*Kogelbergia verticillata*; cross section through base of ovary showing single chambered ovary with two ovules, x 77. Note remnant of ovary septum placed at right angles to inflorescence axis. Two anterior sepals at base of calyx tube slightly larger than posterior sepals.

Moldenke: 474 (1948). Type: Zwartberg, Caledon, Dec., *Bolus s.n.* (K, holo.).

Stilbe chorisepala Suess.: 56 (1950). Type: Franschhoek Pass, 17-11-1946, *S. Rehm in herb. W. Giess 1377* (M, holo.).

Small, rigid, well-branched shrublet up to 1 m high with a single main trunk up to 50 mm diam. *Flowering branches* 2–3 mm diam., densely lanate initially, later becoming glabrous. *Leaves* in whorls of 5, patent to slightly recurved, ericoid, narrowly lanceolate, 10–12 × 2 mm, apices prominently mucronate, upper surface glabrous when mature, under surface lanate, margins recurved. *Inflorescence* a sessile, globose, much condensed panicle 15–22 mm diam; lateral axes much condensed, bearing 3 or 4 flowers; each flower subtended by a lanceolate-acute, apically mucronate bract and two opposite floral bracts. *Floral bracts* very narrowly oblanceolate, glabrous basally but lanately crinite apically. *Calyx* actinomorphic, tubular, 5 mm long, of 5 equal lobes (but anterior sepals slightly thicker at base), fused into a glabrous tube for 1/4 of their length; free lobes very narrowly oblanceolate, glabrous basally but lanately crinite apically. *Corolla* 8–10 mm long, funnel-form, tubular, tube region glabrous, hyaline, actinomorphic but the 2 posterior petals erect, three anterior petals patent at anthesis; throat fringed with a dense ring of lanate pubescence; lobes at anthesis linear-acuminate, densely tomentose. *Stamens* 4, prominently exserted, 5 mm long, inserted between corolla lobes; posterior stamen absent; anthers versatile, dorsifixed, saggitate. *Ovary* ellipsoid, purple in upper half, bilaterally flattened, single-chambered with 2 basal ovules in chamber; style straight, terete, 6–7 mm long. *Seed* cylindric-ovoid, 2 mm long, surface colliculate, tending to tuberculate basally, pale straw-coloured (Figure 3).

Distribution, habitat and biology

This species ranges in an arc from French Hoek Pass southwards through the Hottentots Holland Mountains to Kogelberg; thence eastwards to the Caledon Swartberg and Genadendal in the Riviersonderend range. Outlying populations occur in the mountains near Napier and Elim with an isolated collection made on the Potteberg. *Kogelbergia* is essentially a montane species occurring mainly above 450 m, but may range from 250–1 150 m. It generally favours moist south-facing habitats and is often found in peaty soil overlying Table Mountain Sandstone. *Flowering time*: May–November. Seeds are shed in January (Figure 4).

Specimens examined

WESTERN CAPE.—3318 (Cape Town): Jonkershoek, east of top of zig-zag path above 2nd waterfall, (–DD), Jan., *Rycroft 146* (PRE). 3319 (Worcester): Franschhoek Pass, (–CC), Nov., *Rehm in herb. W. Giess 1377* (M). 3418 (Simonstown): east of Kogelberg at summit of peak at north end of Five Beacon Ridge, (–BB), June, *Rourke 479* (NBG, PRE); mountains of Sir Lowry's Pass, March, *Burchell 8821* (K, PRE); southeast slopes of Moordenaarskop, (–BD), July, *Boucher 3056*, April, *Boucher 1242* (NBG). 3419 (Caledon): Dwarsberg, Hottentots Holland Mountains, (–AA), Jan., *Rourke 1844* (NBG, PRE); Kathleen Murray Nature Reserve, Nuweberg Forest Reserve, June, *Rourke 1968* (NBG); top of ridge east of Viljoen's Pass, June, *Goldblatt 2049* (NBG); Houwhoek, April, *Schlechter 7574* (K, PRE, SAM), in lateralibus montium prope Palmietrivier supra Grietjiesgat, June, *Ecklon &*

Zeyher 1003 (SAM); Hottentots Holland Mts, July, *Ecklon & Zeyher 2215* (SAM); Lebanon Catchment, Grabouw, June, *Kruger 76* (PRE); Swartberg, Caledon, (–AB), Oct., *Bodkin in herb. Bolus 6785* (NBG, PRE), *Bolus s.n.* (K); Highlands, (–AC), Aug., *Compton 7348* (NBG); Genadendal, (–BA), Dec., *Bodkin in herb. Guthrie 3623* (NBG); Boskloof Farm, eastern ridges of Paardeberg, (–BC), Dec., *Rourke 2053* (NBG); Groot Hagel Kraal, Haelkraal River area, NE of farmstead, (–DA), April, *Oliver 5884* (NBG); Elim, (–DB), April, *Schlechter 7636* (K, PRE, NBG). 3420 (Bredasdorp): Potteberg, Albertsdal Farm, (–BC), May, *Compton 19526* (NBG).

Kogelbergia phylicoides (A.DC.) Rourke, comb. nov.

Stilbe phylicoides A.DC., *Prodromus systematis naturalis regni vegetabilis* 12: 606 (1848); H. Pearson: 183 (1901). Type: Voormansbosch near Swellendam (sub loc. no. 70), *Zeyher 3589 in herb. Boiss.* (G, holo.; K!, SAM!).

Campylostachys phylicoides Sond.: 202 (1847), nom. nud.

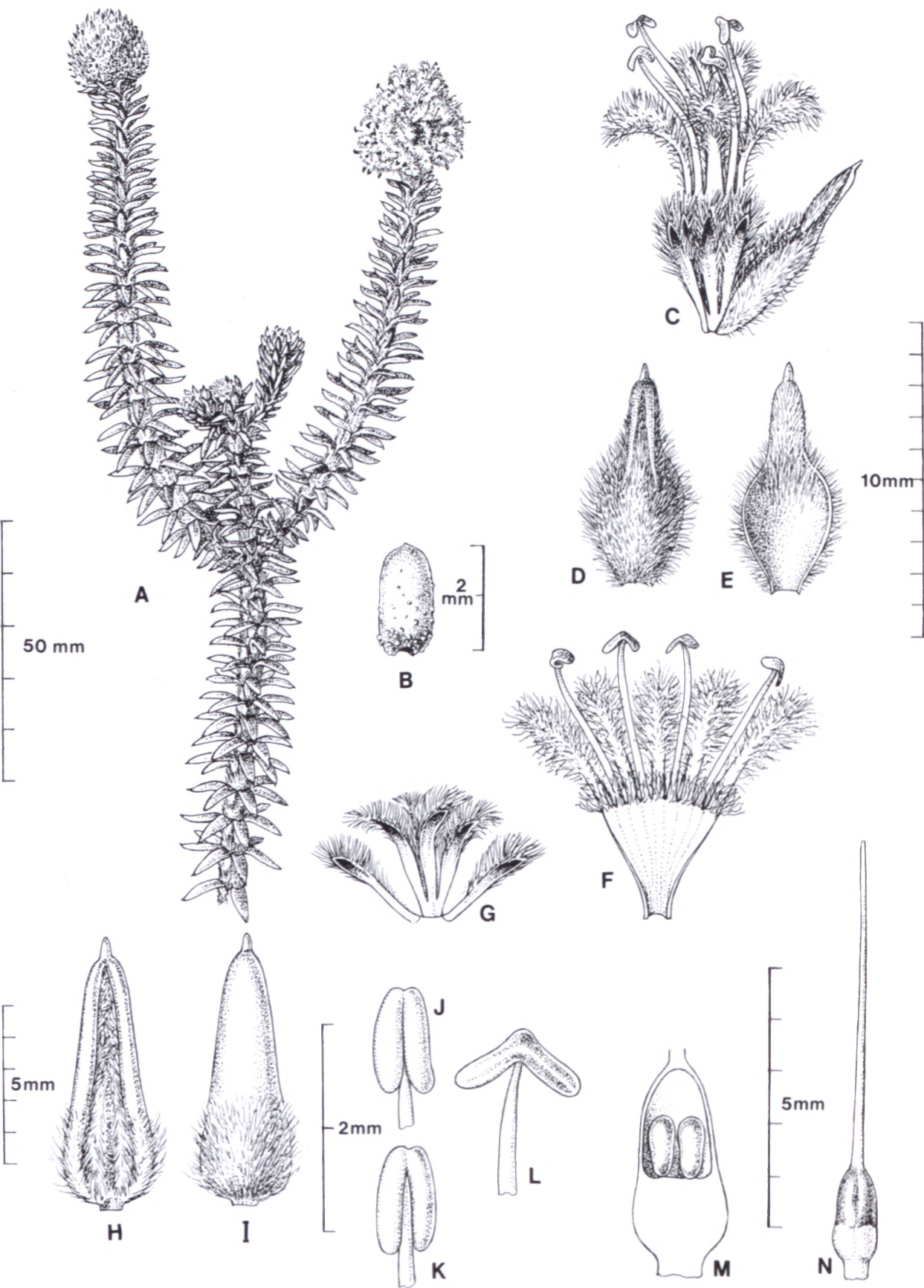
Small, upright, multiple-stemmed, lignotuberous shrublet, 0.5–1.0 m tall. *Flowering branches* sparsely sericeous initially, soon glabrous, 1–3 mm diam.; lower branches covered in prominent leaf scars. *Leaves* in pseudowhorls of 5–7, patent to slightly incurved, ericoid, very narrowly lanceolate-linear, 5–12 × 1 mm, glabrous, apices curved upwards, strongly mucronate. *Inflorescence* a sessile, globose to ovoid terminal spike, 20–25 × 15 mm, usually solitary, occasionally with up to 3 axillary spikes clustered below; each flower subtended by a lanceolate-cymbiform bract, sericeous proximally, apex glabrous, mucronate. *Floral bracts* 2, narrowly lanceolate-acuminate, 5–7 × 1 mm, sparsely sericeous, hyaline. *Flowers* sessile. *Calyx* with 5 sepals; sepals free, narrowly lanceolate, 6–7 × 1 mm, hyaline to papyraceous, upper half sericeous, apices prominently rostrate; posterior sepal smaller than remainder. *Corolla* actinomorphic, 8–10 mm long; lobes narrowly lanceolate-acuminate, patent, densely pubescent mainly on inner surface, 2–3 mm long; tube glabrous 4–5 mm long; throat fringed with dense ring of pubescence. *Stamens* 4, exserted, 5–6 mm long, inserted between corolla lobes; posterior stamen absent; anthers versatile, dorsifixed, saggitate. *Ovary* 1 mm long, ovoid, bilaterally flattened, single-chambered with two basal, erect ovules; style straight, terete, 6 mm long. *Seeds* not seen.

Distribution, habitat and biology

Endemic to the Langeberg Range in the southern Western Cape, *Kogelbergia phylicoides* occurs sporadically on the upper south slopes in mesic mountain fynbos between the Clock Peaks at Swellendam and the Robinson Pass near Mossel Bay (Figure 4). Populations are mostly small, usually consisting of less than 12 individuals, and are generally found at elevations between 425 and 1 100 m. *Flowering time*: October and November.

Specimens examined

WESTERN CAPE.—3320 (Montagu): first path below 10 O'clock Peak, Swellendam, (–CD), Oct., *Wurts 445* (NBG); Langeberg, Swellendam, south slope of 12 O'clock Peak, Oct., *Taylor 7203* (NBG, K); Voormansbosch, (–DC), Oct., *Zeyher 3589* (K, SAM); Zuurbraak Peak, Oct., *Barnard SAM37286* (SAM). 3321 (Ladismith): Garcia's Pass, Riversdale, (–CC), Oct., *Thorne SAM38850*; Garcia's Pass, Oct.,



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FIGURE 3.—*Kogelbergia verticillata*, Rourke 1968. A, flowering shoot; B, mature seed, C, open flower and subtending bract; D, bract, abaxial view; E, bract, adaxial view; F, corolla, opened; G, calyx and two floral bracts; H, leaf, adaxial view; I, leaf, abaxial view; J, K, anthers before dehiscence; L, anther after dehiscence; M, longitudinal section through ovary; N, gynoecium. Scale bars: A, 50 mm; B, J–L, 2 mm; C–G, 10 mm; H, I, M, N, 5 mm.

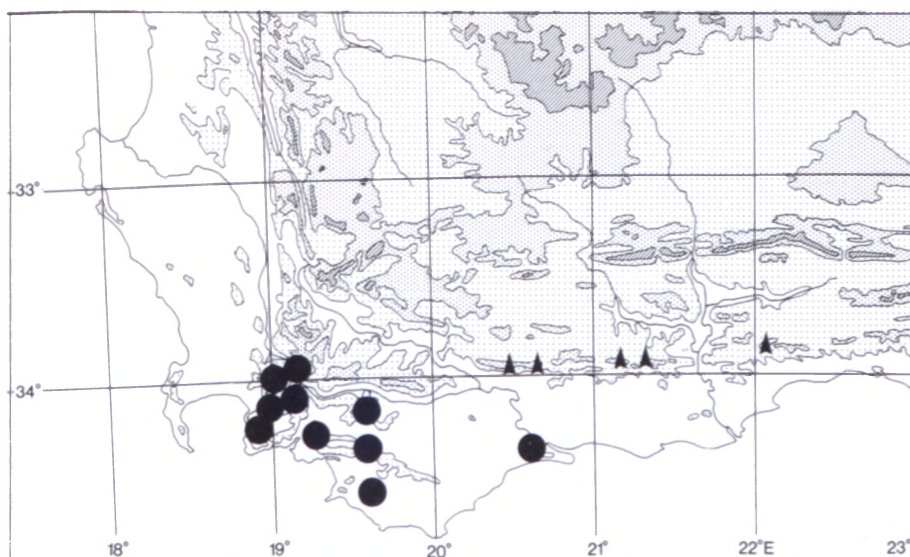


FIGURE 4.—Distribution of *Kogelbergia verticillata*, ●; and *Kogelbergia phylicoides*, ▲.

Galpin 4420 (K, PRE); summit of Kampscheberg, Riversdale, 9-12-1814, Burchell 7127 (K, PRE); lower part of Kampscheberg, 1-12-1814, Burchell 6937 (K); Langeberg Mountains, Riversdale, above Farm Langkloof on 'Annex Langekloof', Nov., Rourke 1446 (NBG). 3322 (Oudtshoorn): Robinson's Pass, Outeniqua's, (-CC), Oct., Bond 1567 (NBG).

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