

## Three new species of *Serruria* (Proteaceae) from the southwestern Cape

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**Keywords:** new species, Proteaceae, *Serruria*, southwestern Cape

### ABSTRACT

Three new species of *Serruria* are described, namely, *S. altiscapa* Rourke from the Villiersdorp and Hottentots Holland Mountains, characterised by its unusually tall paniculate inflorescences; *S. gremialis* Rourke, a multistemmed lignotuberous species with adaxially cygneous, basally pubescent styles and cylindrical pollen presenters from the Villiersdorp and Houhoek Mountains as well as the north slopes of the Riviersonderend Range, and *S. balanocephala* Rourke, a single-stemmed re-seeding species from the north slopes of the Langeberg, distinguished by its adaxially cygneous, basally pubescent styles and conic-acute pollen presenters.

### UITTREKSEL

Drie nuwe *Serruria*-spesies word beskryf, naamlik *S. altiscapa* Rourke van die Villiersdorp- en Hottentots-Hollandberge, gekenmerk deur buitengewoon lang, pluimvormige bloeiwyses; *S. gremialis* Rourke, 'n veelstammige spesie met verhoue knolle, adaksiaal swaannekvormige, basaal saagharige style en silindriese stuifmeelaanbieders, van die Villiersdorp- en Houhoekberge en die noordelike hange van die Riviersonderendreeks, en *S. balanocephala* Rourke, 'n enkelstammige hersaaiende spesie van die noordelike hange van die Langeberg, gekenmerk deur adaksiaal swaannekvormige, basaal saagharige style en konies-skerppuntige stuifmeelaanbieders.

### INTRODUCTION

*Serruria* Salisb., is the largest genus of the South African Proteaceae which is endemic to the southwestern and southern Cape. The most recent comprehensive account of the genus recognised 48 species and listed a further 18 as 'imperfectly known species' (Phillips & Hutchinson 1912). Exploration of mountainous areas of the Cape during the present century has brought a number of new taxa to light, several of which have already been described (Rourke 1982, 1990, 1991). This paper enumerates another three new species of *Serruria* prior to the preparation of a complete account of the genus.

***Serruria altiscapa* Rourke, sp. nov., a *S. williamsii* Rourke habitu humili compacto, inflorescentiis paniculatis peraltis 700–1 200 mm, bracteis glabris transverso-ovatis manifeste alatis, perianthioque proximaliter utriculoso differt.**

*Frutex* compactus, rotundatus, 200–300 mm altus, monocaulis. *Folia* 130–230 × 65–140 mm, glabra, tripinnatifida; *petioli* 60–75 mm longi, pulvinis prominentibus; *foliola* 2 mm lata, canaliculata, apices obtusi. *Inflorescentia* panicula crassa capitulis composita 200–1 240 mm longa. *Capitula* ovoidea 35–40 mm in diam. *Bracteae involucales* glabrae, valde transverso-ovatae, 5–6 × 8–10 mm, manifeste alatae, alis hyalinis. *Perianthium* rectum, 15–16 mm longum; *tubus inflatus* 5 mm longus, proximaliter glaber, distaliter sparse sericeus; *ungues* graciles, adpresso-sericei, recurvati post anthesin; *limbi*

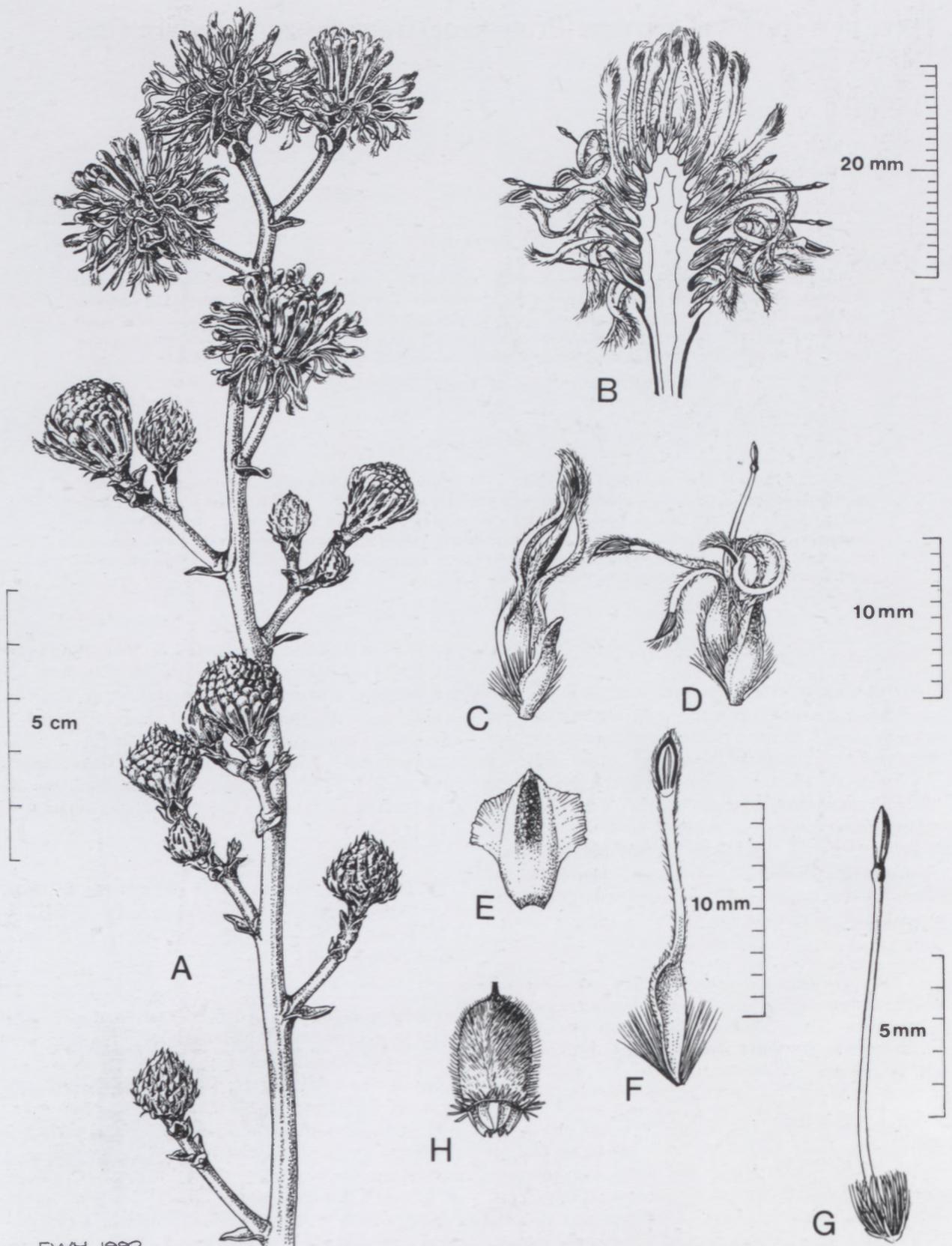
lanceolato-acuti, dense adpresso-sericei. *Stylus* rectus, glaber, 12–14 mm longus. *Stigma* cylindrico-clavatum 1.5 mm longum, proximaliter leviter annulatum. *Ovarium* ovoideum, 1 mm longum, dense villosum. *Squamae hypogynae* lineari-subulatae, 1.5 mm longae. *Fructus* achenium, late cylindricum vel parum obovoideum, villosum, 7–8 × 3 mm, ad apicem rostratum, basis truncata et pedicellata, fimbriata trichomatibus crassis (Figurae 1, 2 & 3).

**TYPE.**—Cape Province, 3319 (Worcester): Blokkop, above Villiersdorp on southeast-facing slopes, (–CD), 2-7-1992, Rourke 1971, (NBG, holo.; BOL, E, K, MO, NSW, PRE, S, STE).

Compact rounded shrub 200–300 mm high with single stout main stem, 10–15 mm in diam., branching near ground level, initially with fine juvenile leaves at base. *Mature leaves* 130–230 × 65–140 mm, glabrous, usually tripinnatifid, petiolate; *petiole* 60–75 mm long with prominent pulvinus; *leaflets* canaliculate on upper surface 2 mm broad, apices obtuse. *Inflorescence* a stout panicle of capitula opening basipetally, 700–1 240 mm long. *Peduncle* up to 900 mm long, terete, glabrous, 4–6 mm in diam. *Capitula* ovoid, 35–40 mm in diam. *Involucral bracts* glabrous, very broadly transverse-ovate, 5–6 × 8–10 mm, prominently winged with hyaline wings. *Receptacle* very narrowly conic-oblong, 15 × 3 mm. *Floral bracts* very broadly transverse-ovate, glabrous, with hyaline wings. *Perianth* straight in bud, 15–16 mm long; *tube* region inflated, 5 mm long, glabrous basally but sparsely sericeous above; *claws* slender, adpressed sericeous, recurved at anthesis; *limbs* lanceolate-acute, densely adpressed sericeous. *Style* straight, glabrous, 12–14 mm long. *Pollen presenter* clavate-cylindric, slightly annulately thickened at junction with style, 1.5 mm long; *stigmatic groove* ter-

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FIGURE 1.—*Serruria altiscapa* Rourke, inflorescence and flowers. A, end of scape showing paniculately arranged capitula opening in basipetal succession; B, longitudinal section through capitulum; C, perianth and floral bract prior to opening; D, perianth and floral bract after opening; E, involutral bract; F, single perianth segment; G, gynoecium; H, mature fruit. A–G, Rourke 1971; H, Rourke 2005.

minal. Ovary ovoid, 1 mm long, sharply differentiated from style, densely villous. Hypogynous scales linear-sulcate, 1.5 mm long. Fruit broadly cylindrical to slightly obovoid, villous achene, 7–8 × 3 mm, beaked terminally, truncate and pedicellate at base with basal fringe of stout trichomes.

*Diagnostic characters:* *Serruria altiscapa* is related to *S. williamsii* Rourke but is readily distinguished by its short, compact habit, its exceptionally tall 700–1 200 mm long inflorescences (hence the specific epithet), by the glabrous, prominently winged transverse-ovate involutral and floral bracts and by the very utriculose perianth tube.



FIGURE 2.—*Serruria altiscapa* Rourke. Vegetative parts, showing basal shoot with emergent inflorescence scape (left) and the strongly lignified persistent remains of previous years' scape (right). Type material, Rourke 1971.

In *S. williamsii* the involucre bracts are clasping and cymbiform with villously fimbriate margins and the inflorescences are usually shorter, from 100–400 mm. In addition, the leaflet apices of *S. altiscapa* are obtuse, unlike the sharply cuspidate leaflet apices in *S. williamsii*.

*Serruria altiscapa* is also related to *S. elongata* (P.J. Bergius) R. Br. On Blokkop above Villiersdorp they occur sympatrically and flower simultaneously, yet there is no evidence of hybridisation, suggesting that there is a strong genetic barrier between the two species.

The annual vegetative growth increments in this species are rather short resulting in a low, compact, rounded form in mature plants. In early winter certain vegetative shoots produce a terminal peduncle 700–1 200 mm long which develops into a large panicle of capitula with second order branching. By early June the capitula begin opening, in centrifugal succession, continuing until maturity in November, by which time a new, short, vegetative growth flush commences. An axillary bud below the fruiting inflorescence develops into a new, short vegetative shoot which then terminates in a further inflorescence the following winter. As the peduncles are highly lignified they persist for several years on the adult plants before decaying. In some plants these lignified peduncles may persist for from three to four years before disintegrating.

*Distribution and habitat:* at present only two occurrences of this species are known from nearly adjacent mountains in the southwestern Cape. Several populations,

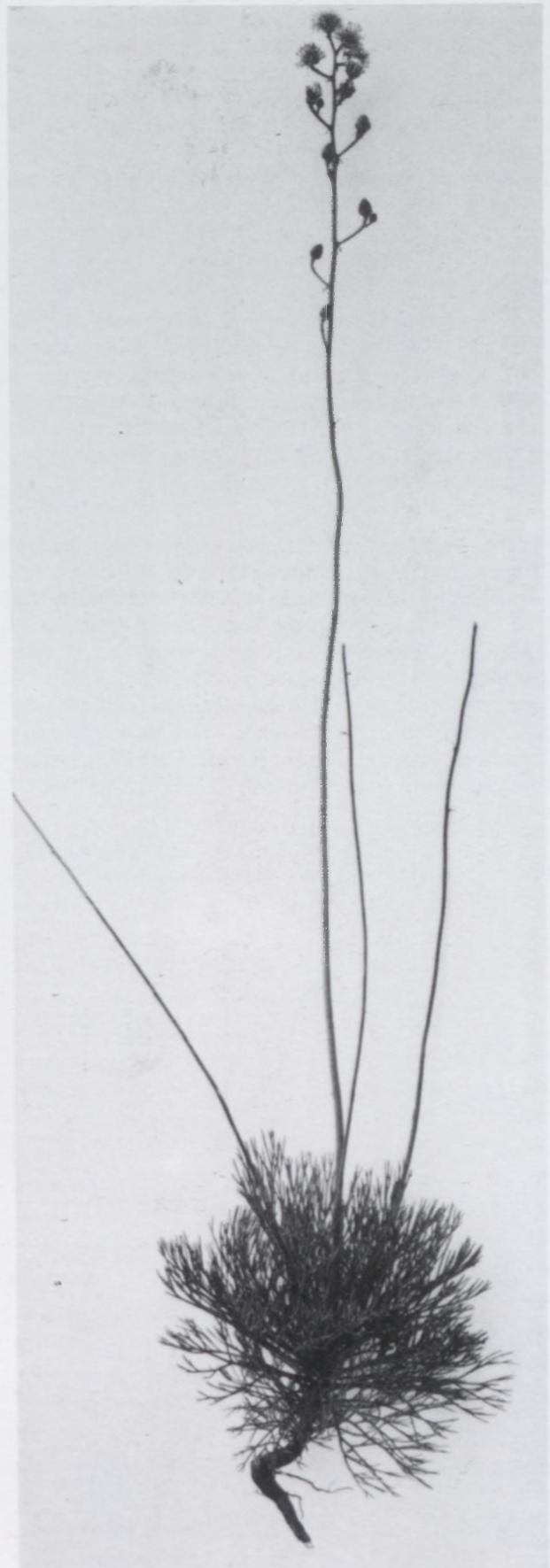


FIGURE 3.—*Serruria altiscapa* Rourke. Complete plant showing habit. Current season's inflorescence and persistent lignified remains of inflorescences from three previous flowering seasons are evident. Type material, Rourke 1971.

each consisting of approximately 300 plants, occur on the middle south slopes of Blokkop above Villiersdorp and about 15 km to the west; there are a few smaller populations on the lower south slopes of the Hottentots Holland Mountains in the Viljoen's Pass-Nuweberg area (Figure 4A). *Serruria altiscapa* grows in mesic mountain fynbos on south-facing slopes at elevations between 700 and 1 100 m. Flowering commences in early June, reaches a peak in August and continues until October. Fruits are shed during November and December.

It is regrettable that at the time of collecting the type material (1992) the main populations of *S. altiscapa* on Blokkop above Villiersdorp were in imminent danger of being choked by *Pinus pinaster* saplings. Unless immediate attention is paid to removing this massive infestation of alien vegetation, *S. altiscapa* has little chance of survival at this locality.

The oldest specimen of this species is a single leafless inflorescence in the Burmann collection of the Delessert herbarium in Geneva (sheet 005770/000143 in G-DEL). The locality given is merely 'Caput bonae Spei' and although no collector's name is mentioned it was probably gathered by H.B. Oldenland (1663–1697). Some 250 years elapsed before T.P. Stokoe obtained further herbarium material in May 1935 since which time only seven subsequent collections have been made, which is surprising considering dramatic growth form of the species.

CAPE.—3319 (Worcester): Blokkop above Villiersdorp, (–CD), Nov., Paterson-Jones s.n. (NBG 122855); Blokkop above Villiersdorp, May, Rourke 1710 (NBG); Blokkop, above Villiersdorp, July, Rourke 1971 (BOL,

E, K, MO, NBG, NSW, PRE, S, STE); Blokkop above Villiersdorp, Nov., Esterhuysen 35578 (BOL); Drakenstein Mts near Villiersdorp, June, Van Breda 1875 (PRE); Blokkop above Villiersdorp Wild Flower Reserve, in fruit, Jan., Rourke 2005 (NBG), 3419 (Caledon); Nuweberg Forest Reserve, (–AA), Aug., Rourke 827 (NBG); between Viljoen's Pass and Somerset Sneeuwkop, Nov. 1942, Stokoe 8609 (BOL); between Viljoen's Pass and Somerset Sneeuwkop, 28-5-1935, Stokoe 3003 (BOL); Nuweberg, towards Boesmanskloof, May, H.C. Taylor 10301 (PRE, STE).

***Serruria gremialis* Rourke sp. nov.**, a habitu multicauli patulo, capitulis manifeste pedunculatis, stylis arcuatis adaxiali in dimidio inferiore pubescentibus, et stigmatibus cylindrico-clavato, distinguitur.

*Frutex* multicaulis e lignotubere, suberectus vel patulus, 300–500 mm altus, ad 1 m in diam. *Rami* erecti ad patentes, puberuli. *Folia* ascendentia vel subpatentia, puberula sed glabrescentia; bipinnatifida ad tripinnatifida, 10–30 × 10–25 mm; petioli 2–12 mm longi; foliola canaliculata, acuta. *Inflorescentia* capitulum globosum 25–30 mm in diam., solitaria et terminalis vel terminalis alioquot capitulis axillaribus; pedunculi 10–60 mm longi. *Bractee involucales* ovato-acutae, dense velutinae. *Perianthium* adaxialiter valde arcuatum, 12–15 mm longum, sericeum vel villosum. *Stylus* cygneus, adaxialiter valde curvatus, 12–15 mm longus, puberulus in dimidio inferiore, glaber et decrescens apicem versus. *Stigma* cylindraco-clavatum, 2 mm longum. *Ovarium* ovoideum 2 mm longum, lanatum. *Squamae hypogynae* subulato-acuminatae, 2 mm longae. *Fructus* achenium ellipsoideum 7–8 mm longum, ad apicem rostratum, basis truncata et pedicellata, fimbriata (Figure 5).

**TYPE.**—Cape Province, 3319 (Worcester): Jonaskop, Rivieronderend Range, lower north slopes below Jonasplaats, (–CD), 30-7-1987, Rourke 1877 (NBG, holo.; BOL, E, K, MO, NSW, PRE, S, STE).

An erect, suberect to slightly sprawling shrublet, 300–500 mm in height, up to 1 m in diam., with multiple stems produced from the crown of a persistent lignotuber. *Branches* erect to sprawling, 2 mm in diam., puberulous. *Leaves*, ascending to subpatent, puberulous initially, later tending to glabrescent or glabrous, bipinnate to tripinnate, 10–30 × 10–25 mm, shortly petiolate; petiole 2–12 mm long; leaflets terete, upper surface canaliculate, apices acute. *Inflorescence* a pedunculate globose capitulum 25–30 mm in diam., solitary and terminal or terminal with up to 3 axillary inflorescences; peduncle 10–60 mm long. *Involuclral bracts* ovate-acute, closely adpressed, cartilaginous, densely velutinous. *Involuclral receptacle* oblong, 10–12 × 3–4 mm. *Floral bracts* broadly ovate, 4–6 × 4–5 mm, apex cuspidate; outer surface lanate proximally, sericeous distally. *Perianth* very strongly adaxially curved, 12–15 mm long; tube glabrous, 2 mm long; claws and limbs sericeous to villous; limbs elliptic, 2 mm long, very strongly adaxially curved. *Style* cygneous, strongly adaxially curved, 12–15 mm long, basal half puberulous, upper half glabrous, carmine, tapering terminally. *Pollen presenter* cylindrical-clavate, 2 mm long; stigmatic groove terminal. *Ovary* ovoid, sharply differentiated from style, 2 mm long, lanate. *Hypogynous scales* subulate-acuminate, 2 mm long. *Fruit* an ellipsoid achene 7–8 × 3 mm, adpressed sericeous, beaked terminally, truncate and pedicellate basally, with basal fringe of trichomes.

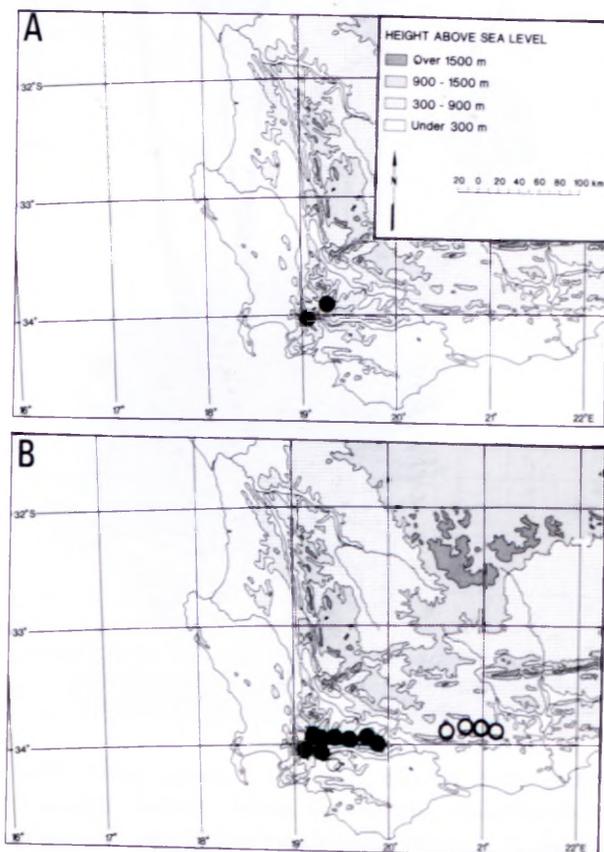


FIGURE 4.—A, distribution of *Serruria altiscapa* Rourke; B, distribution of *S. gremialis* Rourke. ●, *S. balanocephala* Rourke, ○.

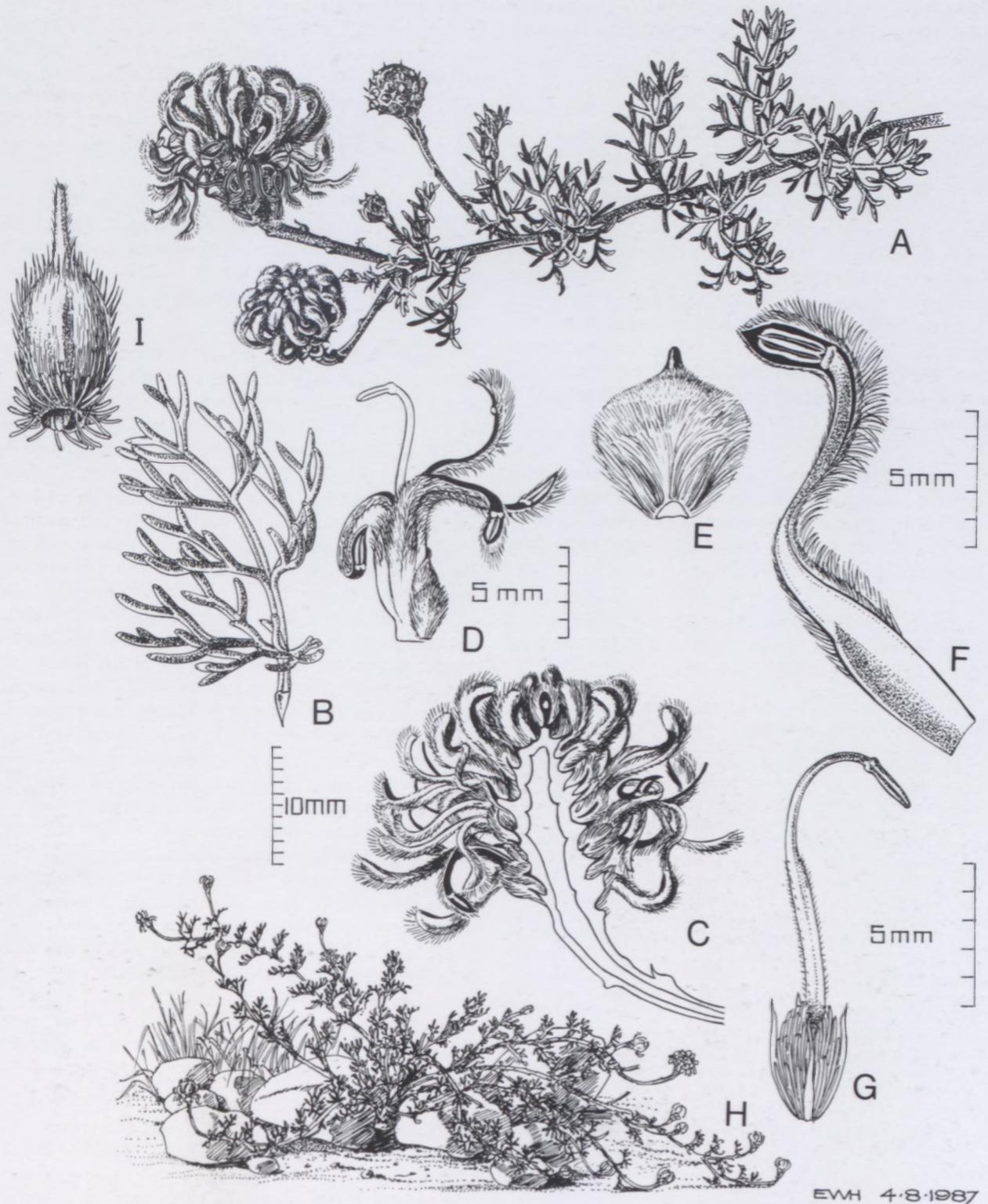


FIGURE 5.—*Serruria gremialis* Rourke. A, flowering shoot; B, leaf; C, longitudinal section through inflorescence; D, open flower and subtending floral bract; E, involucral bract; F, single perianth segment; G, gynoecium; H, habit; I, mature fruit. Type material, Rourke 1877.

**Diagnostic characters:** *Serruria gremialis* is a multi-stemmed lignotuberous species with a suberect to sprawling habit, prominently pedunculate capitula (peduncles 10–60 mm long), strongly adaxially curved perianths, cygneous, strongly adaxially curved styles, puberulous in the lower half and cylindric-clavate pollen presenters 2 mm long.

**Distribution and habitat:** this species occupies a variety of habitats in the Breede River valley from Stettynsberg

along the southern foothills of the Villiersdorp Mountains to Viljoen's Pass, the northern foothills of Groenlandberg, Houhoek and eastwards along Ezeljacht to the Caledon Swartberg. However, its main area of distribution occurs on the northern slopes of the Riviersonderend Mountains from Donkerhoek and Boskloof in the west, eastwards to McGregor reaching Bushman's River at its most easterly limits. Isolated populations also occur on Sandberg near Robertson (Figure 4B). Most populations occur in mesic mountain fynbos at elevations between 270 and 760 m.

Flowering extends over a period of almost eight months, from July to February but is dependant on local factors such as site, aspect and elevation.

*Serruria gremialis* is a relatively common and wide-spread species which was collected as early as the 1830's by Zeyher at Houhoek but was not subsequently recognised as distinct. Meisner (1856) misidentified Zeyher's collection from Houhoek and cited it under *S. elevata* R. Br. (= *S. fucifolia* Salisb. ex Knight). Later, in the *Flora capensis*, Phillips & Hutchinson (1912) cited material belonging to no less than four different species under their concept of *S. acrocarpa* R. Br., including what is here described as *S. gremialis*. It is therefore not surprising that since then herbarium material of the species now known as *S. gremialis* has been identified under a number of different names, particularly as *S. incrassata* Meisn. and *S. acrocarpa* R. Br.

The distribution ranges of *S. gremialis* and *S. acrocarpa* are contiguous and almost mutually exclusive except at one site, namely Silverstream near Boskloof in the western Riviersonderend Mountains where they grow sympatrically (Rourke 2000, 2002).

The epithet *gremialis* (= growing in a cluster from a stump) refers to the species' habit of sprouting multiple shoots from a lignotuber after burning.

CAPE.—3319 (Worcester): French Hoek Pass, Villiersdorp bridge, (–CC), Jan., *Compton 8172* (NBG); on mountain slopes between Villiersdorp and Franschoek, Nov., *Bolus 5240* (BOL); near Genadendal, (–CD), *Burchell 7852* (SAM); Boschjveld Mountains, Worcester side, (–CD), Oct., *Stokoe s.n.* (SAM 67852); Stettynsberg Mountains, (–CD), June, *Stokoe s.n.* (SAM 61894); east slopes of Stettynsberg, (–CD), July, *Esterhuysen 15581* (BOL); Blokkop above Villiersdorp, (–CD), July, *Rourke 1970* (NBG); Jonaskop, Rivier-sonderend Range, lower north slopes below Jonasplaats, (–CD), July, *Rourke 1877* (BOL, E, K, MO, NBG, NSW, PRE, S, STE); Riviersonderend Mts, Boschkloof, overlooking Farm Retreat, Poejenels Valley, (–DC), Nov., *McDonald 1725* (PRE); Robertson Dist., road between Agterkliphogte and Robertson, (–DD), Sept., *Simpson 95* (NBG); Sandberg, near Robertson lower slopes, (–DD), Sept., *Rourke 1987* (NBG). 3419 (Caledon): Viljoen's Pass, (–AA), Nov., *Compton 8172* (NBG); Houhoek, (–AA), April, *Guthrie s.n.* (NBG 105028); Groot Houhoek, (–AA), Dec., *Zeyher 3707* (SAM); Houhoek, (–AA), Feb., *Schlechter 7330* (PRE); Caledon Baths, (–AB), Dec., *Guthrie 3588* (NBG); Silverstream near Boskloof between Villiersdorp and Genadendal, (–AB), Nov., *Esterhuysen 35297* (BOL, NBG); Silver-stream, upper reaches of Waterkloof stream, western Riviersonderend Mts, (–AB), Nov., *Rourke 2000* (NBG); Eseljagt Mountain, (–AB), July, *Rourke 1969* (NBG); Boesmanskloof Pass near McGregor, (–BA), Sept., *Lewis 6069* (NBG); Donkerhoek between Genadendal and Villiersdorp, (–BA), Dec., *Pappe s.n.* (SAM); Bushmans River, (–BB), Sept., *Compton 11914* (NBG).

***Serruria balanocephala* Rourke, sp. nov.**, a habitu monocaule, capitulis pedunculatis terminalibus, stylis basaliter puberulis adaxiale cygneis, stigmatibus conico-acutis et perianthiis villosis, distinguatur.

*Frutex* erectus, monocaulis, 0.5–1.0 m altus. *Rami* erecti, puberuli demum glabrescentes. *Folia* ascendentia, profunde bipinnatifida ad tripinnatifida 40–60 × 15–30 mm; petioli 10–20 mm longi; foliola canaliculata, sparse puberula demum glabra. *Inflorescentia* capitulum globosum pedunculatum et aliquot capitula axillaria. *Capitula* ovoidea 25–30 mm in diam. *Pedunculi* 20–50 mm longi, puberuli, graciles. *Bractae* late ovatae, 5–6 × 2–3 mm, dense lanatae sed apices recurvi, glabri. *Perianthium* adaxialiter valde cygneum, 12–14 mm longum villosum.

*Stylus* cygneus, adaxialiter valde curvatus, 12–14 mm longus, basaliter puberulus. *Stigma* deorsum curvata, ovoideo-acuta, stylo juncta collo angusto. *Ovarium* ovoideum, 1 mm longum dense lanatum. *Squamae hypogynae* subulatae, 1.5 mm longae. *Fructus* achenium anguste ellipsoideum 8–10 × 2–3 mm, dense adpresso-sericeum, ad apicem rostratum; basis truncata et pedicellata, manifeste fimbriata (Figura 6).

TYPE.—Cape Province, 3320 (Montagu); Muurrivier Kloof, north slopes of the Langeberg in the Boosmansbos Wilderness Area, (–DD), 7-9-1990, *Rourke 1933* (NBG, holo.; B, BOL, E, K, MO, NSW, PRE, S, STE).

An erect rounded shrub 0.5–1.0 m in height, up to 1.5 m in diam., with single main stem up to 20 mm in diam., branching near ground level. *Branches* erect, puberulous, tending to glabrescent later, 1.5–2.0 mm in diam. *Leaves* ascending, deeply bipinnatifid to tripinnatifid, 40–60 × 15–30 mm, petiolate; petiole 10–20 mm long. Leaflets terete, canaliculate on upper surface, sparsely puberulous, later glabrescent to glabrous, apices obtuse. *Inflorescence* a single terminal pedunculate capitulum with several axillary pedunculate capitula clustered towards apex of flowering shoot, opening in basipetal succession. *Capitula* ovoid, 25–30 mm in diam., peduncles 20–50 mm long, crisped-puberulous, slender, peduncular bracts ovate-acuminate, glabrescent. *Receptacle* narrowly obconic, 10–12 × 3 mm. *Floral bracts* broadly ovate, 5–6 × 2–3 mm, densely lanate, terminating in thickened slightly recurved glabrous apex. *Perianth* strongly cygneous and adaxially curved, 12–14 mm long; tube laterally compressed, glabrous, 2 mm long; claws strongly incurved, sericeous; limbs ovate-acute, 1 mm long, 3 abaxial limbs villous, adaxial limb adpressed-sericeous. *Style* strongly adaxially cygneous, 12–14 mm long, lower third puberulous, carmine becoming reddish black towards apex. *Pollen presenter* downwardly curved, ovoid-acute, with angular facets, separated from style by narrow neck, dark reddish black; stigmatic groove terminal. *Ovary* ovoid 1 mm long, densely lanate. *Hypogynous scales* subulate, yellow, 1.5 mm long. *Fruit* a narrowly ellipsoid achene, 8–10 × 2–3 mm, densely adpressed-sericeous, beaked terminally, truncate and pedicellate basally with prominent fringe of trichomes.

*Diagnostic characters:* *Serruria balanocephala* is a single-stemmed re-seeder, with an erect, upright habit attaining 1 m in height at maturity with terminal pedunculate capitula. It is distinguished by its adaxially cygneous style, puberulous in the lower half, the conic-acute, slightly faceted pollen presenter and villous perianth.

*Distribution and habitat:* this species has a rather restricted distribution along the northern slopes of the Langeberg Range. It occurs from a few kilometres south-east of Montagu, eastwards to Barrydale and thence to Brandrivier just west of Garcia's Pass, a distance of approximately 80 kilometres, but has not been recorded east of Garcia's Pass (Figure 4B). *Serruria balanocephala* appears to be confined to a narrow belt of dry mountain fynbos, at elevations of approximately 600 to 650 m in the lower northern foothills of the Langeberg, fringing the Little Karoo. Flowering takes place between late August

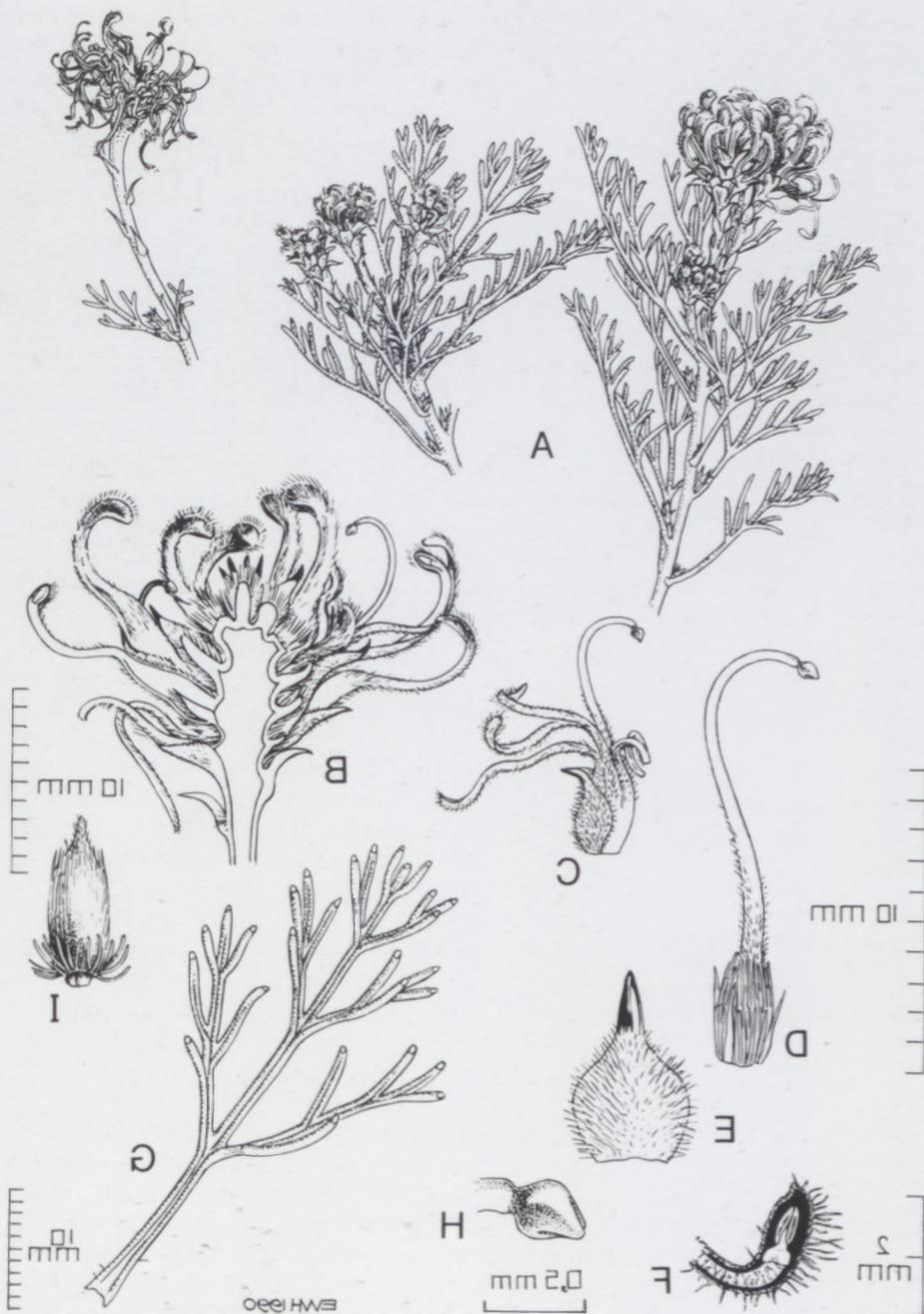


FIGURE 6.—*Serruria balanocephala* Rourke. A, flowering shoot, bud and post pollination phase; B, longitudinal section through inflorescence; C, open flower and subtending floral bract; D, gynoecium; E, involucral bract; F, perianth limb; G, leaf; H, lateral view of conic-acute, slightly faceted pollen presenter; I, mature fruit. Type material, Rourke 1933.

and November. The inflorescences are pinkish silvery and have no perceptible scent.

The epithet *balanocephala* is a compound from the Greek *balanos*, an acorn, and *cephale*, a head, alluding to the distinctive ovoid-acute form of the pollen presenter.

CAPE.—3320 (Montagu): north base of Langeberg Mts, 5–6 miles ESE of Montagu towards Barrydale, (–DC), Aug. 1965, *Dahlgren & Strid* 2268 (NBG); Langeberg above Witbooisrivier, (–DD), Jan., *Burger* 97 (PRE, STE); Grootvadersbos State Forest, north side of Langeberg above Witbooisrivier, (–DD), Sept., *McDonald & Morley* 1013 (STE); Muurrivier Kloof, north slopes of Langeberg near Barrydale, (–DD), Aug., *Rourke* 1881 (NBG); Langeberg Mountain catchment area, Barrydale, municipal area, lower slopes and next to Huis River, (–DD), Oct., *T.J. van der Merwe* 157 (PRE, STE); Muurrivier Kloof, north slopes of Langeberg in Boosmansbos Wilderness Area, (–DD), Sept., *Rourke* 1933 (NBG, B, BOL, E, K, MO, NSW, PRE, S, STE). 3321 (Ladismith): Brandrivier, between Barrydale and Muiskraal, (–CC), 7–9-1967, *Williams* 1054 (NBG).

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