

***Sphaerolobium pubescens* and *Sphaerolobium rostratum*
(Leguminosae: Mirbelieae), new species from Western Australia**

Ryonen Butcher

Department of Botany, The University of Western Australia, Nedlands, Western Australia 6907

Abstract

Butcher, R. *Sphaerolobium pubescens* and *Sphaerolobium rostratum* (Leguminosae: Mirbelieae), new species from Western Australia. *Nuytsia* 12 (2): 171-178 (1998). Two new species of *Sphaerolobium* from the south-west of Western Australia are here described and distinguished from similar species. *Sphaerolobium pubescens* R. Butcher is a yellow-flowered species possessing spreading white hairs on the calyx, bracts, bracteoles and pedicel and *Sphaerolobium rostratum* R. Butcher has a pink and cream corolla and a distinctive rostrate apex to the keel petal.

Introduction

As currently recognized, the genus *Sphaerolobium* Sm. (Leguminosae: Mirbelieae) contains 14 species, 11 of which are endemic to the south-west of Western Australia and occur between Kalbarri in the north and Israelite Bay in the east, with a marked concentration along the south coast between Margaret River and Albany. Of the three species found in the eastern states, only *S. vimineum* Sm. also grows in Western Australia, *S. acanthos* Crisp being restricted to the Grampians in Victoria and *S. minus* Labill. being found in New South Wales, Victoria, Tasmania, Queensland and the Australian Capital Territory (Hnatiuk 1990; Crisp 1993, 1994). Whilst some recent work has been performed by Crisp (1993, 1994) on members of the group from the eastern states, the genus has not been reviewed in full since Bentham's treatment in "Flora Australiensis" (1864) and there are still a number of unresolved problems with the Western Australian taxa.

This paper is presented as the first in a series which will deal with some of the more problematic areas and pressing changes required in the taxonomy of *Sphaerolobium*. It provides descriptions of two new south-western Australian species that were found while preparing a cladistic analysis and revision of the genus.

Methods

All specimens housed at PERTH were examined and photographs of type material borrowed from Dr M.D. Crisp (ANU) were sighted for 22 of the 24 names listed in "Australian Plant Name Index" (Chapman 1991).

Taxonomy

Sphaerolobium pubescens R. Butcher, *sp. nov.*

Species calyce viridi-griseo pilis albis patulis, corolla lutea, stipite ovarii latissimo a congeneribus diversa.

Typus: Between road and firebreak, 5.1 km south along the Chorkarup–Narrakup road from Chorkarup Rd, Western Australia, 18 November 1996, R. Butcher, J. Wege & F. Valton RB 24 (*holo:* PERTH 04896610; *iso:* CANB).

Sub-shrub to 0.45 m, up to 0.3 m wide, erect; stems slender, terete. *Stipules* absent. *Leaves* opposite to more or less whorled, sessile, linear-subulate, *c.* 1.5 mm long, *c.* 0.5 mm wide, acute, caducous before flowering. *Inflorescence* a dense terminal raceme, basipetal flowering, *c.* 50 mm long, 20–31-flowered, 2 flowers per bract. *Pedicels* *c.* 1.5 mm long. *Bracts* caducous. *Bracteoles* ovate, *c.* 1.6 mm long, *c.* 0.7 mm wide, pubescent, caducous. *Calyx* grey-brown, turbinate, 2.5–4 mm long, with spreading white hairs, the tube much shorter than the upper lip; upper lip fused along *c.* 60% of its length, 2–2.5 mm long, broadly curved; lower lobes lanceolate, 1.5–2 mm long. *Corolla* yellow; standard broadly cordate, 4–6 mm long, 4–6 mm wide, including a broadly triangular claw of 0.3–0.6 mm length, this with flat margins and without callosities, the blade emarginate and auriculate, the eye barely visible with a halo of red-purple; wings broadly spatulate to oblong, 4.5–5.5 mm long, 1.5–2 mm wide, including a claw of *c.* 0.5 mm length, the apex of the blade obtuse, the adaxial spur sharply angled; keel shorter than the wings, 3–4.5 mm long, 2–2.5 mm wide, including a narrow claw of *c.* 1 mm length, the whole not pouched, the apex truncate to obtuse, the adaxial edge straight, oblique, the spur small, the abaxial edge gently arcuate. *Stamens* with filaments 2–3 mm long; anthers rotund, versatile, dorsifixed, 0.35–0.45 mm long. *Gynoeceium* 6–7 mm long including the distinct broad stipe (*c.* 1 mm long, *c.* 0.5 mm wide) and the style (3–4 mm long); ovary glabrous, uniformly pale yellowish green; style geniculate, curving adaxially towards ovary, with an undulate, more or less semicircular (0.6–0.8 mm long, 0.4–0.6 mm wide), fringed subapical wing; stigma shortly tufted. *Pod* at first yellow, brown at maturity, orbicular, broader than long, 2.5–3 mm long, 3 mm wide, obliquely angled towards style. *Seed* black at maturity, more or less oval, *c.* 1.2 mm long, 1.5 mm wide, without an aril, testa smooth. (Figure 1A–H)

Other specimens examined. WESTERN AUSTRALIA: 5.1 km S along Gull Rock Rd from Lower King–Nannarup road, 10 Oct. 1997, R. Butcher & J. Chappill JC 5892 (PERTH); Nutcracker Rd, 600 m W of Denmark–Mount Barker road, 19 Nov. 1996, R. Butcher, J. Wege & F. Valton RB 30 (PERTH); 16 km N of Albany on Hassel Hwy, 21 Oct. 1983, M.G. Corrick 8879 (MEL); Lake Rd, NW Lake William, West Cape Howe, 3 Nov. 1990, G. J. Keighery 11978 (PERTH); 6 km E of Warriup Hill, 23 Oct. 1975, K.R. Newbey 4886 (PERTH); Walpole–Nornalup National Park, Nut Rd, *c.* 0.5 km N of junction with Ficifolia Rd, 16 Oct. 1991, J.R. Wheeler 2786 (PERTH).

Distribution. *S. pubescens* has been found in the Walpole–Nornalup National Park, near Mt Lindesay and Narrakup, in West Cape Howe National Park and east of Albany near Ledge Beach and Warriup Hill in the Green Range. (Figure 2A)

Habitat. *S. pubescens* has been collected from gently undulating areas with well drained sand over clay and relatively high moisture availability, as well as seasonally wet swamp flats. Habitats include low heath communities and sparse, mixed *Casuarina/Eucalyptus* woodland, sometimes with scattered *Nuytsia floribunda* and *Banksia coccinea*. Associated vegetation includes *Pimelea* spp., *Xanthorrhoea preissii*, *X. gracilis*, *Dasyopogon bromeliifolius*, mixed sedges and myrtaceous shrubs.

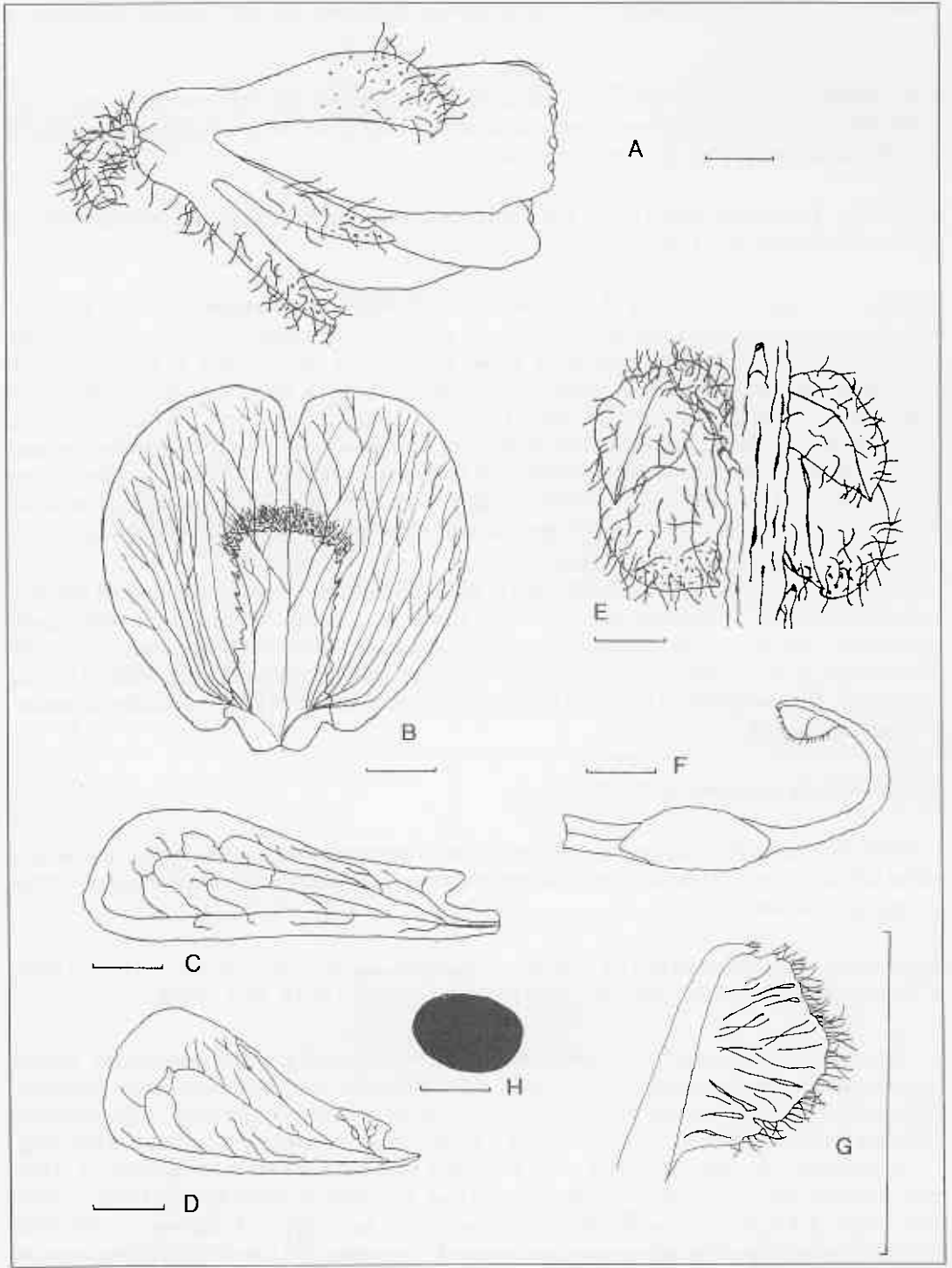


Figure 1. *Sphaerolobium pubescens*. A – single flower showing spreading hairs on the calyx and pedicel; B – standard petal; C – wing petal; D – keel petal; E – two buds illustrating the spreading hairs on the bracteoles; F – gynoecium indicating the short, broad stipe and the broad, fringed styler wing below the stigma; G – undulating styler wing and shortly tufted stigma; H – mature seed. Scale bar = 1 mm. Drawn from R. Butcher, J. Wege & F. Valton RB 24.

Phenology. *S. pubescens* flowers from October through November and sets fruit from November to January.

Conservation status. Although recent collection of *S. pubescens* has expanded its known range somewhat and two populations are in national parks, a Priority Three conservation code is considered appropriate for this species pending further survey.

Etymology. The specific epithet is the Latin word *pubescens* and refers to the hairs on the calyx, bracts, bracteoles and pedicels of this species.

Affinities. *S. pubescens* is easily distinguished from all other *Sphaerolobium* species by the long, spreading hairs on its calyx, bracts, bracteoles and pedicels. Superficially, however, *S. pubescens* resembles the eastern Australian species *S. minus*, as both have small flowers in dense, basipetal, terminal racemes and both possess uniformly brown to grey calyces. *S. pubescens* can be differentiated from *S. minus* by its slightly larger, all yellow flowers (c. 7 mm compared with 5–6 mm long), short, thick stipe and very broad, densely fringed stylar wing. In *S. minus* the flowers have a red area around the standard eye, at the base of the wing petals and sometimes at the apex of the keel, the stipe is long and narrow (1.2–1.7 mm long, 0.2 mm wide compared with 1 mm long, 0.5 mm wide), as is the stylar wing (0.7–1.6 mm long, 0.25–0.4 mm wide compared with 0.6–0.8 mm long, 0.4–0.6 mm wide).

An as yet undescribed taxon with affinities to the *S. macranthum* Meisn. complex which has been collected from near Scott River and the Albany area as well as the Stirling Ranges superficially resembles *S. pubescens* in its inflorescence structure and calyx and corolla colour, but can be easily distinguished by the red base to the wing petals, the prominent keel and the narrower, sparsely fringed stylar wing. The recognition of this taxon awaits a more extensive study of the *S. macranthum* complex to determine its rank.

Sphaerolobium rostratum R. Butcher, *sp. nov.*

Calyx turbinatus vel campanulatus, glaber, viridus et atropunctatus. Corolla rosea et aurantiaca; carina lata, alis et vexillio multo longior, ad apicem rostrata. Ovarium lutea cum maculis virentibus ad brunneis ornatum.

Typus: 600 m west of Peaceful Bay Rd along South Coast Highway, Western Australia, 11 October 1997, R. Butcher & J. Chappill RB 355 (*holo:* PERTH 05053234; *iso:* CANB, MEL, NSW).

Sub-shrub to 1.5 m, width to 0.4 m, erect to sprawling; stems slender, terete. *Stipules* absent. *Leaves* opposite, sessile, linear-subulate, c. 1 mm long, c. 0.4 mm wide, acute, caducous before flowering. *Inflorescence* a loose terminal raceme, basipetal flowering, 150–350 mm long, 5–20-flowered, 2 flowers per bract. *Pedicels* 1.6–1.7 mm long. *Bracts* caducous. *Bracteoles* ovate, c. 3 mm long, c. 1.5 mm wide, caducous. *Calyx* dark green and darkly punctate, turbinate to campanulate, 4–6 mm long, glabrous, the tube equal to or slightly longer than the upper lip; upper lip fused along c. 80% of its length, 2–4 mm long, rounded to truncate; lower lobes lanceolate, 2–3 mm long. *Corolla* pink and cream; standard pink, broadly cordate to orbicular, 5–9 mm long, 6–8 mm wide, including a narrow claw of 2.5–3 mm length, this with prominent callosities at apex and inrolled margins, the blade emarginate, auriculate, with a yellow, semicircular standard eye bordered with red; wings dark pink, oblong, 8–9.5 mm long, 2–4 mm wide, including a narrow claw of 2.5–3 mm length, adaxial spur sharply angled, the apex of the blade obtuse to truncate; keel cream, infused with pale pink, longer than

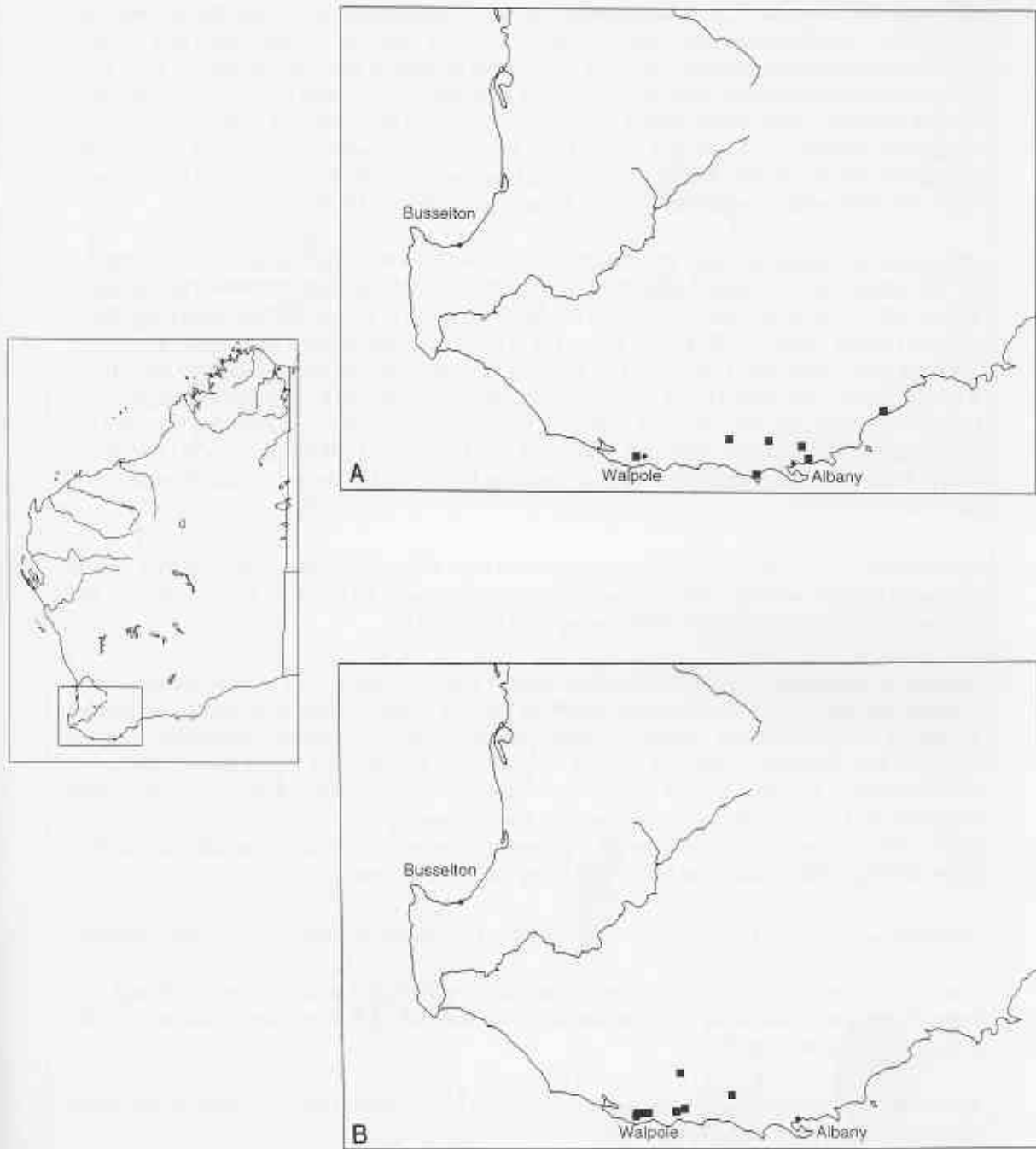


Figure 2. Distribution in the south-west of Western Australia. A – *Sphaerolobium pubescens*. B – *Sphaerolobium rostratum*.

the wings and standard, 9–11 mm long, 4–5 mm wide, including a narrow claw of 2–3 mm length, pouched diagonally from spur towards centre, the apex obtuse with distinct acuminate to rostrate apex (c. 1 mm long), the adaxial edge straight, oblique, adaxial spur triangular, abaxial edge strongly arcuate. *Stamens* with filaments c. 7.5 mm long; anthers narrowly ovate, versatile, dorsifixed, 0.6–0.7 mm long. *Gynoecium* 13–16 mm long including the stipe (3–3.5 mm long, 0.4–0.5 mm wide) and the style (6–7.5 mm long); ovary glabrous, egg-yolk yellow with distinctive green-brown patches from base; style curving adaxially, twisted just below apex, with a flat, narrow (1.5–2 mm long, 0.25–0.5 mm wide), fringed subapical wing; stigma tufted. *Pod* light brown with black patches from base, orbicular, compressed adaxially, c. 4 mm long, c. 3.5–4 mm wide, obliquely angled towards style. *Seed* cream and darkly punctate at first, brown with merging black spots at maturity, obovate, c. 1.7 mm long, c. 2.1 mm wide, arillate, testa smooth; aril c. 0.2 mm long. (Figure 3A–H)

Other specimens examined. WESTERN AUSTRALIA: Walpole–Nornalup National Park, KA 100054, PT.306, 6 Sep. 1988, A.R. Annels 338 (PERTH); Plot 5086, Nornalup Rd, 24.5 km SSW of Rocky Gully, 28 Sep. 1993, A.R. Annels ARA 3943 (PERTH; MJP); 1.7 km E of Bow Bridge on South Coast Hwy, 19 Nov. 1996, R. Butcher, J. Wege & F. Valton RB 31 (UWA); Denmark shire, S boundary of proposed National Park, Nutcracker Rd, 0.5 km W from Denmark–Mount Barker road, 3 Oct. 1991, B.G. Hammersley 538 (PERTH); Walpole–Nornalup National Park, Isle Rd, c. 0.6 km S of South West Hwy, 15 Oct. 1991, J.R. Wheeler 2744 (PERTH); Walpole–Nornalup National Park, Isle Rd, c. 0.5 km S of South West Hwy, 1 Dec. 1992, J.R. Wheeler & S.J. Patrick 3631 (PERTH); 7 km W of Walpole, 2 Apr. 1967, P.G. Wilson 6327a (PERTH); Coalmine Beach, S of Walpole, 28 Oct. 1994, A. Worz 04.10.28.13 (PERTH).

Distribution. *S. rostratum* has been mostly collected from Walpole–Nornalup National Park and its surrounds but two outlying collections have been made from near Mt Lindesay to the north-east and northward towards Lake Surprise on Nornalup Rd. (Figure 2B)

Habitat. *S. rostratum* is commonly found growing in sandy soil and clayey sand in seasonally wet swamps and *Agonis parviceps*/*Bossiaea* shrubland fringing creeks or other moist areas. Associated vegetation in these habitats includes *Homalospermum firmum*, *Xanthosia rotundifolia*, *Kunzea ericifolia* and *Anarthria scabra* as well as *Anigozanthus flavidus* and *Pteridium esculentum* in disturbed sites. The Annels 3943 collection, made from the valley floor, differs in its associated vegetation and includes *Persoonia microcarpa*, *Banksia quercifolia*, *Cosmelia rubra*, *Callistemon glauca*, *Sphenotoma gracile* and *Cephalotus follicularis*, suggesting a different habitat and therefore the possibility of more dispersed collections being made for the species.

Phenology. *S. rostratum* flowers between September and December and fruits from October to January.

Conservation status. *S. rostratum* appears restricted to the Warren Botanical District with only two populations located outside the Walpole–Nornalup National Park. A Priority Three conservation code is therefore recommended.

Etymology. The specific epithet is derived from the Latin word *rostratus* meaning “beaked” and refers to the distinctive apex of the keel petals.

Affinities. *S. rostratum* is superficially similar to *S. grandiflorum* Benth. as both possess large (7–11 mm long) flowers and calyces that are dark green and darkly punctate with the tube approximately equal in length to the upper lobes. *S. grandiflorum* can be differentiated from *S. rostratum*, however, by a distinct black line along the margins of its calyx lobes as well as its

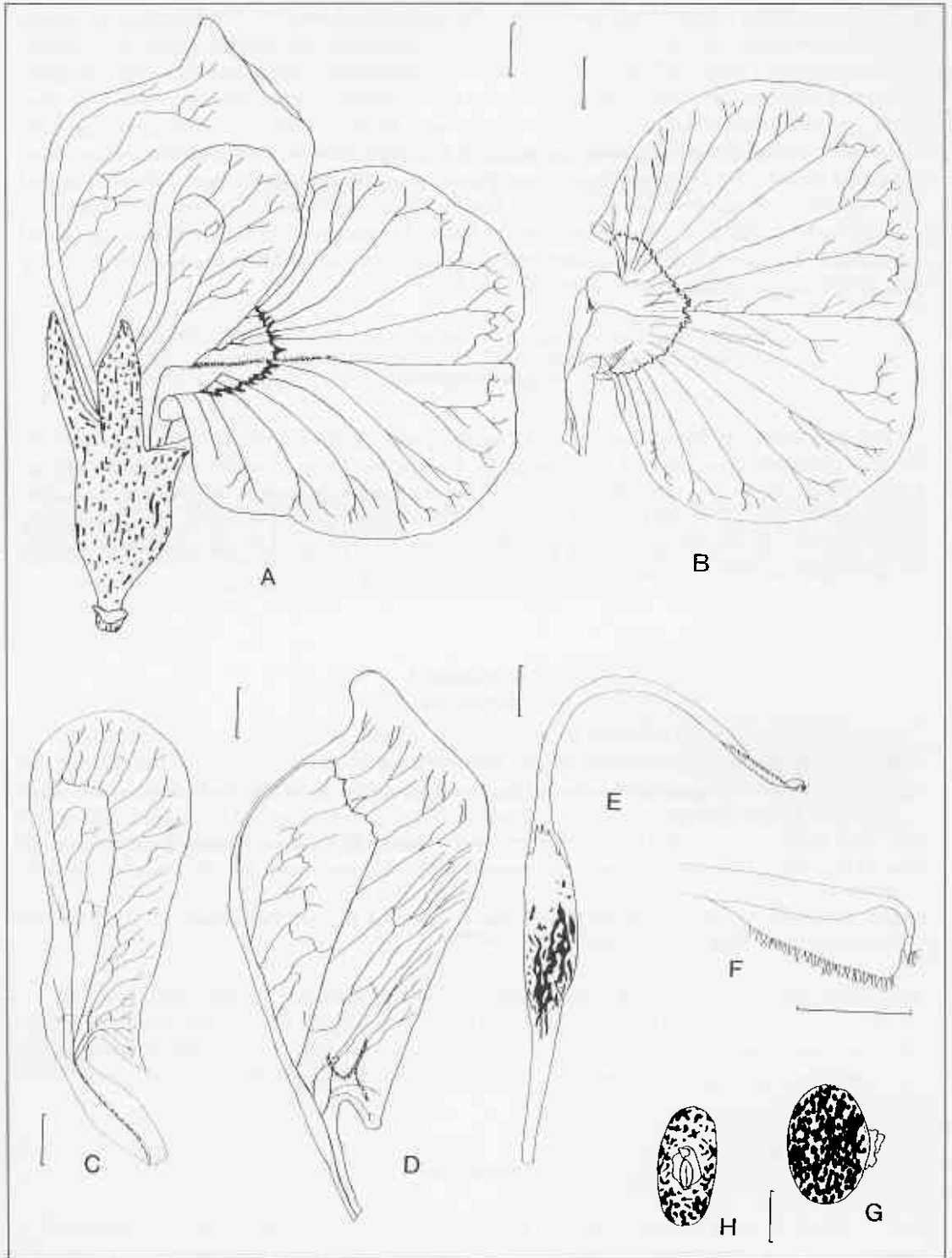


Figure 3. *Sphaerolobium rostratum*. A - single flower illustrating the length of the keel relative to the other petals and the darkly punctate calyx; B - standard petal showing the semicircular eye and the large callosities on the claw; C - wing petal; D - keel petal with rostrate apex; E - gynoecium indicating the long, narrow stipe, the ovary with dark patches from its base and the narrow, twisted stylar wing; F - flat stylar wing with tufted stigma; G - mature seed with cream aril; H - top surface of seed showing aril surrounding hilar fissure. Scale bar = 1 mm. Drawn from R. Butcher & J. Chappill RB 355.

geniculate keel petal with an obtuse apex which is shorter than the standard (7.5–8.5 mm long compared with 9–11 mm long). Additionally, *S. grandiflorum* has a dark green-brown to black ovary and a sharply curved style which twists 360° near the broad, densely fringed stylar wing as pods develop. The green and darkly punctate calyx and prominent keel apex of *S. rostratum* draws comparison with *S. medium* R. Br. but this latter taxon can be easily differentiated by its shorter, somewhat sprawling habit (0.4–0.8 m tall, 0.3–0.6 m wide compared with 0.8–1.5 m tall, c. 0.4 m wide), smaller (6–8 mm long compared with 9–11 mm long) yellow to pink flowers, more dense inflorescences (20–60 compared with 5–20 flowers) and the calyx tube shorter than the lobes. Additionally, *S. medium* has a more or less oblong keel with an acuminate apex, whilst that of *S. rostratum* is broadly curved, rostrate and considerably longer in relation to the other petals. *S. medium* can also be differentiated by its uniformly pale yellowish green ovary and straight, naked style.

Acknowledgements

I wish to thank my Honours supervisor Dr Jenny Chappill at the University of Western Australia for her invaluable comments on previous drafts, Dr Michael Crisp from the Australian National University for the loan of type photographs, and the staff and volunteers at the Western Australian Herbarium for their help in this study. I would also like to thank Mr Paul Wilson for his considerable help with the Latin component and Judy Wheeler for having a keen eye. My thanks also to the referee Dr Jim Grimes, and Dr Barbara Rye for their comments on this manuscript.

References

- Bentham, G. (1864). "Flora Australiensis." Vol. 2. (Reeve & Co.: London.)
- Chapman, A.D. (1991). "Australian Plant Name Index." Australian Flora Series, No. 15. (Australian Government Publishing Service: Canberra.)
- Crisp, M.D. (1993). Reinstatement of *Sphaerolobium minus* (Fabaceae: Mirbelieae). *Tetopea* 5: 335–340.
- Crisp, M.D. (1994). *Sphaerolobium acanthos* (Fabaceae: Mirbelieae), a new species from the Grampians, Victoria. *Muelleria* 8: 151–154.
- Hnatiuk, R.J. (1990). "Census of Australian Vascular Plants." Australian Flora and Fauna Series, No. 11. (Australian Government Publishing Service: Canberra.)