

***Poranthera moorokatta* (Phyllanthaceae), a rare new species
from Perth, Western Australia**

Russell L. Barrett

Botanic Gardens and Parks Authority, Kings Park and Botanic Garden,
West Perth, Western Australia 6005
School of Plant Biology, Faculty of Natural and Agricultural Sciences, The University of Western Australia,
Crawley, Western Australia 6009
Western Australian Herbarium, Department of Environment and Conservation,
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
Email: russell.barrett@bgpa.wa.gov.au

Abstract

Barrett, R.L. *Poranthera moorokatta* (Phyllanthaceae), a rare new species from Perth, Western Australia. *Nuytsia* 22(6): 399–407 (2012). *Poranthera moorokatta* R.L.Barrett is described as a new species recently discovered in *Banksia* woodland in Kings Park, in the heart of the Perth metropolitan area. *Poranthera moorokatta* is morphologically allied to *P. triandra* J.M.Black, a woodland species distributed from Lake King in Western Australia to the Grampians in Victoria, and perhaps also to *P. dissecta* Halford & R.J.F.Hend., a species from granite outcrops in south-east Western Australia.

Introduction

The genus *Poranthera* Rudge has recently been revised by Halford and Henderson (2005) who recognised 15 species. The genus belongs to Phyllanthaceae tribe Poranthereae and is probably sister to *Notoleptopus* Voronts. & Petra Hoffm. (Vorontsova *et al.* 2007). I discovered a new taxon, described herein as *P. moorokatta* R.L.Barrett, in October 2005 in *Banksia* woodland in Kings Park, just three kilometres from the Perth Central Business District. The discovery was made while photographing the tiny annual herb *Phyllangium paradoxum* (R.Br.) Dunlop, when attention was drawn to plants of a small *Poranthera* with red-green petioles and fruit, in contrast to taller, green plants of *P. microphylla* Brongn. *s. lat.*, which were also present. Study of specimens at the Western Australian Herbarium (PERTH) showed that there was one previous collection of this taxon, from *Banksia* woodland at Ellenbrook. Considerable morphological variation in *P. microphylla* was noted, but none of the forms approached *P. moorokatta*. Further study of the *P. microphylla* species complex is warranted.

Discovery of a new species in an area of well-documented urban bushland (Bennett & Dundas 1988; Barrett & Pin Tay 2005) came as a significant surprise. Currently known from only two locations, questions remain as to whether this species is more widespread, and simply overlooked due to its small stature, or whether it is truly rare and locally restricted in distribution. Three other plant species are known to have their main centre of distribution in Kings Park, with only a few small populations

occurring outside this reserve, and all within the greater Perth metropolitan area, viz. *Acacia benthamii* Meisn., *Jacksonia sericea* Benth. and *Dodonaea hackettiana* W.Fitzg. (Barrett & Pin Tay 2005). *Poranthera moorokatta* may also be similarly restricted.

Banksia woodlands are becoming increasingly rare on the Swan Coastal Plain and discovery of species like this emphasise the value of maintaining bushland remnants in an expanding urban environment (Keighery 2011b). Extensive surveys of the Swan Coastal Plain over the last 20 years have turned up a number of new species (e.g. Keighery 2001, 2002, 2011a; Shepherd & Barker 2009; Obbens 2011) and more can be expected. This species is named herein in preparation for a new edition of *Perth plants* (Barrett & Pin Tay 2005).

Methods

Descriptions are based on dried herbarium specimens following Halford and Henderson (2005). Measurements of < 15 cm were made using digital callipers certified accurate to 3/100th of a millimetre and rounded where appropriate. Measurements less than, or spanning, 1.5 mm are given to two decimal places. It is noted that the number of available collections is relatively few and measurements outside the current known range can be expected. Illustrations are based on photographs of live plants and from herbarium material. Seeds were imaged using a Zeiss 1555 VP Scanning Electron Microscope (SEM) at the Centre for Microscopy and Microanalysis, The University of Western Australia, and a Jeol JCM 5000 NeoScope bench top SEM at Kings Park and Botanic Garden.

Taxonomy

The key provided by Halford and Henderson (2005) needs to be altered at step 5. The following couplets are provided to allow identification of *P. moorokatta*.

- | | | |
|------------|--|----------------------|
| 5. | Calyces mostly 3-lobed, or if 4- or 5-lobed then with 1 or 2 lobes much smaller than other 3; seeds granulate (W.A., N.T., S.A.) | 5A |
| | Calyces 5-lobed, rarely 4-lobed; lobes all \neq equal in dimensions;
seeds tuberculate or striate | 6 |
| 5A. | Stipules deeply dissected; leaves petiolate, opposite; seeds with many peaked mounds, the bases adjoining and faces furrowed..... | P. moorokatta |
| | Stipules entire or slightly toothed distally; leaves <i>c.</i> sessile, alternate;
seeds with scattered low mounds, well spaced and finely granular | P. triandra |

Poranthera moorokatta R.L.Barrett, *sp. nov.*

Typus: Kings Park, Perth, Western Australia [precise locality withheld for conservation reasons], 6 November 2005, R.L. Barrett 2958 (*holo*: PERTH 07245378; *iso*: BRI, CANB).

Poranthera sp. Kings Park (R.L.Barrett 2958), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed 20 July 2012].

Illustration. R.L. Barrett & E. Pin Tay, *Perth Plants*, p. 129, Figures 10–12 (2005), as *Poranthera* sp.

Monoecious, erect *annuals*, 16–47 mm tall. *Stems* sparingly branched; branchlets smooth, glabrous, 0.17–0.28 mm across, with leaf scars obscure. *Leaves* shortly petiolate, opposite, widely spaced along branchlets; stipules white-red, narrow-triangular, 0.88–1.73 mm long, deeply 2–4-lobed; laminae obovate or ovate, 1.9–5.0 mm long, 1.1–3.0 mm wide, flat or the margins slightly recurved towards the petiole, smooth and glabrous adaxially and abaxially, slightly discolorous; midrib obscure adaxially, slightly raised abaxially; base attenuate; apex obtuse to rounded; petiole 1.0–3.4 mm long, reddish. *Flowers* in short dense terminal umbel-like racemes; racemes solitary; rachis *c.* 0.35 mm long; bracts narrow-obovate, 1.35–1.75 mm long, 0.36–0.58 mm wide, obtuse to rounded. Male flowers with pedicels *c.* 0.4 mm long; calyx tube *c.* 0.25 mm long; lobes 3, colour when living pale pink to white, narrow-triangular, *c.* 0.28 mm long, *c.* 0.1 mm wide, concave-convex, acute at apex; petals 3, colour when living pale pink, erect, ovate, *c.* 1 mm long, *c.* 0.2 mm wide, \pm acute; glands obscure; stamens 3, filaments *c.* 0.16 mm long, straight; anthers *c.* 0.09 mm long; rudimentary ovary a minute hemispherical dome. Female flowers with pedicels 0.6–0.7 mm long, extending to 3.6 mm long in fruit; calyx lobes 3, colour when living green-red, narrow-ovate or oblong, 0.38–0.47 mm long, 0.08–0.10 mm wide, concavo-convex, acute at apex; petals obscure or absent; ovary depressed-globose, *c.* 0.60 mm across, 6-lobed, emarginate distally, rough; styles each 0.30–0.35 mm long, divided almost to the base (3, appearing 6), slender. *Capsules* depressed-globose, 0.48–0.72 mm long, 0.85–1.05 mm wide, prominently 6-lobed, emarginate distally, rough. Seeds wedge-shaped, *c.* 0.37 mm long, *c.* 0.33 mm wide, *c.* 0.29 mm across; testa densely granulate/papillose, pale brown to cream, lacking a waxy coating. (Figures 1, 2A, C, E)

Diagnostic characters. Similar to *P. triandra*, differing in the petiolate opposite leaves, deeply dissected stipules, less deeply lobed capsule, more slender calyx lobes. Habit similar to *P. microphylla*, differing in its dissected stipules. Allied to *P. dissecta* Halford & R.J.F.Hend., differing in the seeds being granulate.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 6 Oct. 2005, R.L. Barrett 2835 (BRI, PERTH); 22 Oct. 1999, M. Trudgen & R. Archer MET 20335 (PERTH).

Distribution and habitat. Known only from two locations. At the type location in Kings Park, Perth, it grows in open *Banksia menziesii* - *B. attenuata* woodland on white silica sand in open spaces between shrubs, not in shaded areas or in areas of high litter cover. Not as locally widespread as *P. microphylla* which co-occurs at the type location. Other associated species are *Acacia pulchella*, *Alexgeorgea nitens*, *Allocasuarina fraseriana*, *Anigozanthos manglesii*, *Burchardia congesta*, *Caesia micrantha*, *Calandrinia brevipedata*, *C. granulifera*, *Centrolepis aristata*, *C. drummondii*, *Conostylis setigera*, *Crassula colorata*, *Daviesia nudiflora*, *Desmocladius flexuosus*, *Drosera porrecta*, *Eucalyptus marginata*, *Haemodorum paniculatum*, *Hibbertia huegellii*, *H. hypericoides*, *Homalosciadium homalocarpum*, *Jacksonia sternbergiana*, *Levenhookia pusilla*, *Mesomelaena pseudostygia*, *Monotaxis grandiflora*, *Phyllangium paradoxum*, *Philothea spicata*, *Phyllanthus calycinus*, *Poranthera microphylla*, *Quinetia urvillei*, *Scaevola canescens*, *S. repens*, *Sowerbaea laxiflora*, *Stylidium androsaceum*, *S. carnosum*, *S. piliferum*, *S. repens*, *S. neurophyllum* ms, *Trachymene pilosa* and *Xanthorrhoea brunonis*.

The Ellenbrook population was recorded as occurring with *Astartea* aff. *fascicularis*, *Banksia littoralis*, *Calothamnus lateralis*, *Centrolepis aristata*, *Melaleuca preissiana*, *Pericalymma ellipticum* var. *ellipticum* and *Phyllangium paradoxum* in a shallow dampland on mixed grey and white sand with scattered leaf litter.



Figure 1. *Poranthera moorokatta* at the type location. A – habitat; B – bracts; C – fruit; D, E – habit; F – flower. All scale bars = 5 mm.

Phenology. Flowering and fruit recorded for late September to early November.

Etymology. ‘Mooro Katta’ is a local Noongar name for Mt Eliza, Kings Park, meaning ‘home hill’, and is used here as a noun in apposition.

Conservation status. Listed by Smith (2012) as Priority Two under the Department of Environment and Conservation’s (DEC) Conservation Codes for Western Australian Flora, under the name *P. sp.* Kings Park (R.L.Barrett 2958). Known only from two populations. One is within reserved urban bushland with an estimated stable population of 2,500 plants from 2005–2007. Most of the population was burnt by a wildfire in January 2009. The species responded poorly to this fire, with about an 80% reduction in recruitment in the burn area in spring 2009 and only a small increase in 2010 and 2011. The second location has not been assessed for population size, but is an area of rapid urban expansion. Potentially threatened by weed invasion or changes in vegetation cover density, and by urban sprawl. The species requires urgent assessment to determine if its conservation status should be upgraded to Threatened.

Affinities. *Poranthera moorokatta* differs from *P. triandra* in having dissected stipules and in seed characters. The seed tubercles of *P. triandra* are angular, white and somewhat irregularly arranged on the surface and in two dense rows on the margin (Figure 2B, D, F), whereas those of *P. moorokatta* are rounded, more or less regularly arranged and the same colour as the seed body. *Poranthera moorokatta* differs from *P. dissecta* (Figure 3A, C, E) in its erect habit, petiolate leaves, tuberculate seeds and habitat preferences.

Notes. Easily overlooked due to the small stature of the plant. Growing with *P. microphylla* (*s. lat.*) at the type location, and possibly previously confused with smaller plants of *P. microphylla* and ignored. *Poranthera microphylla* differs in having entire stipules and seeds with mounds covered by a white waxy layer (Figures 3B, D, F; 4). Further surveys on the Swan Coastal Plain have so far failed to locate any additional populations.

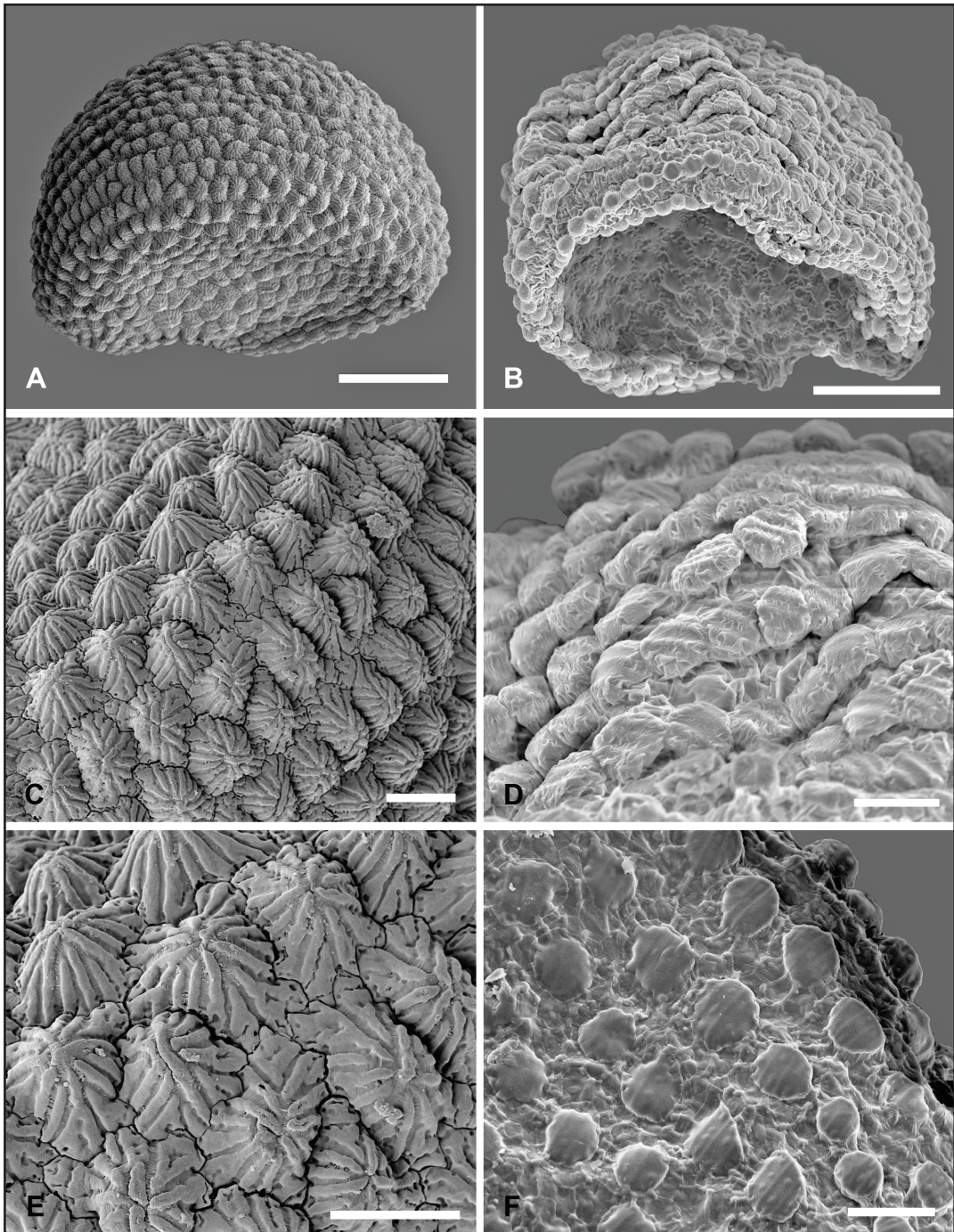


Figure 2. Scanning electron micrographs of *Poranthera* seeds. A, C, E – *P. moorokatta* (R.L. Barrett RLB 2958, PERTH); B, D, F – *P. dissecta* (Hj. Eichler 20286, PERTH). Note seed of *P. dissecta* is immature and misshapen, mature seed unknown. Scale bars: A, B = 100 μ m; C–F = 20 μ m.

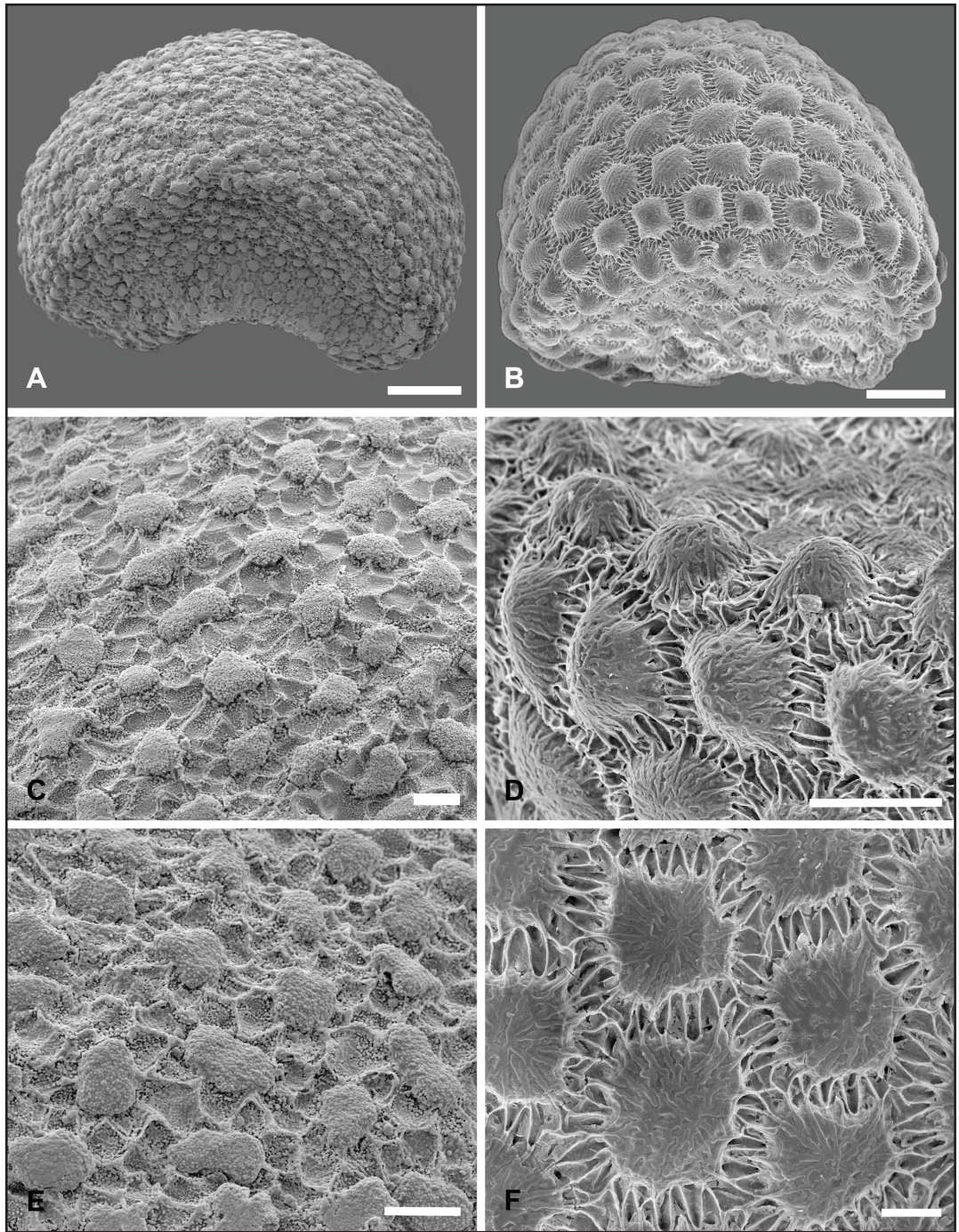


Figure 3. Scanning electron micrographs of *Poranthera* seeds. A, C, E – *P. triandra* (A.S. Weston 8760 & M. Trudgen, PERTH); B, D, F – *P. microphylla* (s. lat.) Moresby Range, Geraldton (D. & N. McFarland NM 1307, PERTH). Scale bars: A, B = 100 μ m; C, E, F = 20 μ m; D = 50 μ m.

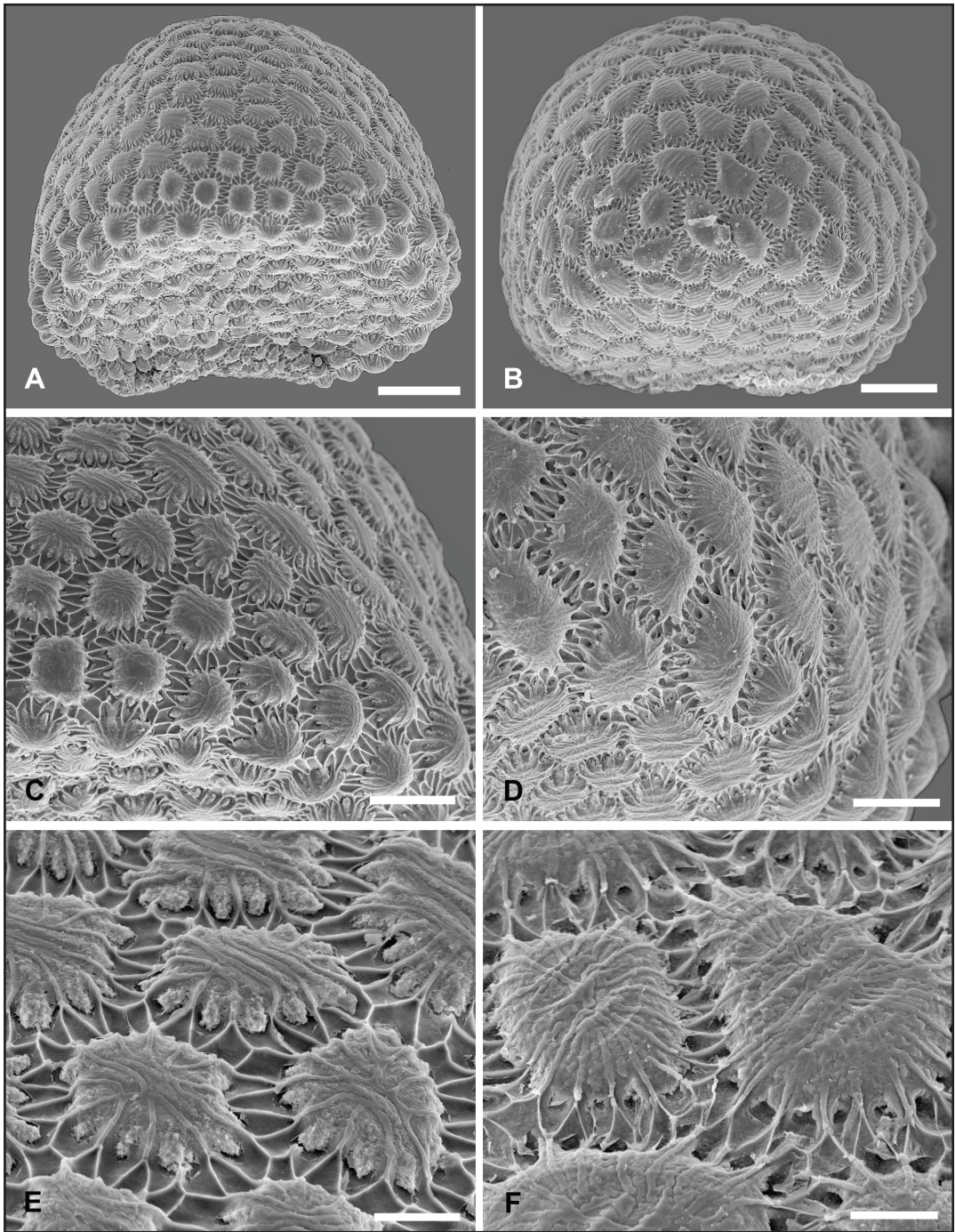


Figure 4. Scanning electron micrographs of *Poranthera* seeds. A, C, E – *P. microphylla* (*s. lat.*) Maida Vale, Perth (*V. English* VE 03, PERTH); B, D, F – *P. microphylla* (*s. lat.*) Dunsborough (*H. Cole* 700, PERTH). Scale bars: A, B = 100 µm; C, D = 50 µm; E, F = 20 µm.

Acknowledgments

John Kuo, Centre for Microscopy and Microanalysis, The University of Western Australia, is thanked for assistance in using the SEM. Kevin Thiele is thanked for permission to sample seeds from the Western Australian Herbarium collection for SEM examination. David Halford is thanked for supplying seed of *Poranthera* species for SEM studies and for comments on an earlier draft of the manuscript. Zoe Davies and Ian Telford are thanked for critically reading the manuscript.

References

- Barrett, R.L. & Pin Tay, E. (2005). *Perth plants. A field guide to the bushland and coastal flora of Kings Park and Bold Park, Perth, Western Australia*. (Botanic Gardens and Parks Authority: West Perth.)
- Bennett, E.M. & Dundas, P. (1988). *The bushland plants of Kings Park Western Australia*. (Kings Park Board: Perth.)
- Halford, D.A. & Henderson, R.J.F. (2005). Studies in Euphorbiaceae s. lat. 6. A revision of the genus *Poranthera* Rudge (Antidesmeae, Porantherinae) in Australia. *Austrobaileya* 7: 1–27.
- Keighery, B.J. (2011a). Below the knees biodiversity and how we survey it. In: Sarti, K. (ed.) *Perth's Banksia woodlands: precious and under threat. Proceedings of a symposium on the ecology of these ancient woodlands and their need for protection from neglect and destruction*. pp. 59–64. (Urban Bushland Council (WA) Inc.: West Perth.)
- Keighery, G.J. (2001). A new subspecies of *Isotropis cuneifolia* (Fabaceae). *Nuytsia* 13: 471–474.
- Keighery, G.J. (2002). A new species of *Blennospora* (Asteraceae: Gnaphalieae) from the Swan and Scott Coastal Plains of Western Australia. *Nuytsia* 15: 33–36.
- Keighery, G.J. (2011b). Banksia woodlands: a Perth icon. In: Sarti, K. (ed.) *Perth's Banksia woodlands: precious and under threat. Proceedings of a symposium on the ecology of these ancient woodlands and their need for protection from neglect and destruction*. pp. 3–10. (Urban Bushland Council (WA) Inc.: West Perth.)
- Obbens, F.J. (2011). Five new species of *Calandrinia* (Portulacaceae) from Western Australia with additional information on morphological observations. *Nuytsia* 21: 1–23.
- Shepherd, K.A. & Barker, R.M. (2009). A new species of *Hakea* (Proteaceae) from the Swan Coastal Plain, Western Australia. *Nuytsia* 19: 253–258.
- Smith, M.G. (2012). *Threatened and Priority Flora list for Western Australia*. (Department of Environment and Conservation: Kensington, Western Australia.)
- Vorontsova, M.S., Hoffmann, P., Maurin, O. & Chase, M.W. (2007). Molecular phylogenetics of tribe Poranthereae (Phyllanthaceae; Euphorbiaceae sensu lato). *American Journal of Botany* 94: 2026–2040.
- Western Australian Herbarium (1998–). *FloraBase—the Western Australian Flora*. Department of Environment and Conservation, Perth. <http://florabase.dec.wa.gov.au/> [accessed 15 July 2012].

