

A new species of *Gomphrena* (Amaranthaceae) from the Bonaparte Archipelago, Western Australia

Russell L. Barrett^{1,2,3,4,5} and Joanne Palmer⁴

¹Botanic Gardens and Parks Authority, Kings Park and Botanic Garden, West Perth, Western Australia 6005

²Western Australian Herbarium, Department of Parks and Wildlife,
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983

³School of Plant Biology, Faculty of Science, The University of Western Australia, Crawley, Western Australia 6009

⁴Current address: Australian National Herbarium, Centre for Australian National Biodiversity Research,
National Research Collections Australia, CSIRO, GPO Box 1600, Canberra, Australian Capital Territory 2601

⁵Corresponding author, email: russell.barrett@csiro.au

Abstract

Barrett, R.L. & Palmer, J. A new species of *Gomphrena* (Amaranthaceae) from the Bonaparte Archipelago, Western Australia. *Nuytsia* 26: 143–147 (2015). *Gomphrena splendida* R.L. Barrett & J. Palmer is described as a new species endemic to islands of the Bonaparte Archipelago in the north-west Kimberley region of Western Australia. This new species has a highly restricted distribution. It is unusual among the Australian species of *Gomphrena* L. in being a large, fleshy, perennial with very large flowers, giving this species significant horticultural potential in tropical areas. A modified key and images are presented.

Introduction

The genus *Gomphrena* L. has been revised for Australia by Palmer (1998) who recognised 33 species in the region. The year this revision was published Andrew Mitchell discovered what appeared to be a distinctive new species on two islands in the Bonaparte Archipelago, off the Kimberley coast in Western Australia, while conducting surveys for the Australian Quarantine Inspection Service. It remained known only from Mitchell's collections until additional populations were found in 2007 and 2008 by the lead author and others during a survey of the Maret Islands and surrounding area for INPEX Operations Australia Ltd (Henson *et al.* 2014). Many collections were made, and all suitable habitats between Bigge and Berthier Islands in the south and Bougainville Peninsula in the north were searched on foot or, in the case of coastal cliffs, from a boat using binoculars.

These surveys found a species that appears to be confined to coastal habitats, rarely occurring more than 200 m from the ocean, and growing on some islets that are near impossible to land on, discounting the notion that the species could be an introduction. Consultation of major Floras and works on *Gomphrena* have failed to identify any similar taxa elsewhere in the world. While the vegetative features of the plant are remarkably distinct, the floral morphology suggests a close affinity to the Australian endemic species *G. flaccida* R.Br. (Palmer 1998). Unique among the Australian species, this new taxon is a perennial with very broad, somewhat fleshy leaves and thickened stems, similar in appearance to the Brazilian species *G. glabratooides* (Suess.) J.C. Siqueira and *G. globosa* L. Plants can grow up to 1.5 m across and carry several hundred inflorescences, giving a very attractive appearance. We conclude

that this is a distinctive new species, endemic to islands of the Bonaparte Archipelago, and describe it here as *G. splendida* R.L.Barrett & J.Palmer.

Methods

The description was prepared based on herbarium specimens at CANB and PERTH, supplemented with field observations.

Modified key to *Gomphrena* in Australia

The couplets 32–34 of the key provided by Palmer (1998) require modification as follows.

- 32. Bracts sessile on rachis; outer 3 tepals glabrous or with sparse hairs covering some of length 33
- 32. Bracts attached to rachis by a small, hairy stalk up to 3 mm long; outer 3 tepals covered with dense hairs for some or most of length, or glabrous 33a
- 33. Biennial or short-lived perennial with a basal rosette of leaves; bracts and bracteoles opaque white for 3/4 to almost entire length; bracteole apex straight 4. *G. rosula*
- 33. Annual herb without a basal rosette; bracts and bracteoles translucent throughout or opaque white for up to 1/2 of length; bracteole apex more or less recurved 3. *G. flaccida*
- 33a. Large, perennial herb with broad leaves > 7 mm wide; outer 3 tepals glabrous *G. splendida*
- 33a. Annual herb with narrow leaves < 7 mm wide; outer 3 tepals covered with dense hairs for some or most of length 34
- 34. Bracts triangular-ovate, 4.5–9.5 mm long, glabrous (Pilbara and east Kimberley WA, Victoria River area NT) 5. *G. affinis*
- 34. Bracts broadly ovate, 1.5–5 mm long, hairy (Gulf of Carpentaria and central Qld) 35

Taxonomy

Gomphrena splendida R.L.Barrett & J.Palmer, *sp. nov.*

Type: North Maret Island, Western Australia, [precise locality withheld for conservation reasons], 28 February 2007, *R.L. Barrett* RLB 9048 (*holo:* PERTH 08615152; *iso:* BRI, CANB, DNA, K, MEL).

Gomphrena sp. Maret Islands (A.A. Mitchell 5414), Western Australian Herbarium, in *FloraBase*, <http://florabase.dpaw.wa.gov.au/> [accessed 1 March 2014].

Perennial herb with thickened rootstock, basal stems to 12 mm thick, erect to spreading, up to 1 m high and 1.5 m wide, multi-stemmed; stems sparsely appressed-hairy to glabrescent except for a dense tuft of erect hairs in the leaf axils. *Leaves* bright green, slightly discoloured, cauline, sessile or with petiole to 14 mm long; lamina lanceolate to ovate or oblong, 37–156 mm long, 11–47 mm wide; sparse, appressed to spreading, rough hairs above, sparse, spreading to erect, soft hairs below; leaves subtending inflorescence bract-like, ovate to oblong, 8–17 mm long, 6–11 mm wide. *Inflorescence* terminal or rarely axillary, sessile within the uppermost 2–4(–8) leaves or pedunculate; spikes solitary, semi-globose to globose, 26–40 mm long, 30–51 mm wide, not or scarcely elongating. *Floral bracts* lanceolate to narrowly ovate, 8–9 mm long, c. 2 mm wide, stalked on a pilose rachis, margin entire, acuminate, lamina glabrous, translucent throughout to opaque white in upper third, except white,

prominent, excurrent midnerve. *Bracteoles* lanceolate to narrowly ovate, 5–8 mm long, 3–3.5 mm wide, distinctly shorter than tepals, margin entire, acuminate to aristate, flat, glabrous, translucent throughout to opaque white in upper third, except white, prominent, excurrent midnerve. *Tepals* narrowly oblong, 9.2–15.5 mm long, 1.6–2.6 mm wide, inner tepals very slightly shorter than outer, margin entire, acute, revolute on drying, glabrous; bright pink, sometimes with a few dark red streaks or pale green towards the base of the midnerve; midnerve terminating as a narrow vein at tepal apex. *Stamens* 5, 6.5–12 mm long; filaments united for 3/4 to 7/8 of length in a tube longer than the fruit, woolly in lower half inside, glabrous above and outside; free portion 1.8–2.4 mm long, margin entire, acute; anthers 2.4–2.8 mm long; pseudostaminodes absent. *Style* 6.7–9.3 mm long; stigma 0.4–0.8 mm long. *Fruit* ovoid, 3.2–3.8 mm long, 1.3–1.9 mm wide. *Seed* compressed-obovoid to compressed-ellipsoid, 2.2–2.4 mm long, 1.3–1.5 mm wide. (Figure 1)

Diagnostic characters. Distinguished from all Australian species by the following combination of characters: perennial *subshrub*; *leaves* broad, 37–156 mm long, 11–47 mm wide; *inflorescence* large, 26–40 mm long, 30–51 mm wide, not elongating; *bracts*, *bracteoles* and *tepals* glabrous; *staminal tube* woolly in lower half inside.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons]: 17 Apr. 2007, R.L. Barrett & A. Cross RLB 9046 (PERTH); 27 May 2007, R.L. Barrett, N. Evelegh, J.J. Alford & S. Walker RLB 9044 (CANB, PERTH); 27 May 2007, R.L. Barrett, N. Evelegh, J.J. Alford & S. Walker RLB 9045 (DNA, PERTH); 19 Apr. 2007, M. Henson & V. Levien per R.L. Barrett RLB 9047 (PERTH); 16 May 1998, A.A. Mitchell 5414 (CANB, PERTH); 16 May 1998, A.A. Mitchell 5421 (CANB, PERTH); 24 Apr. 2007, R. Orifici & V. Yeomans per R.L. Barrett RLB 9049 (PERTH); 17 Apr. 2008, S. Reiffer SR 14 (PERTH).

Phenology. Some flowering and fruiting apparently occurs year-round, but peaks from February to August.

Distribution and habitat. Known only from a few islands and surrounding islets in the northern part of the Bonaparte Archipelago, off the Kimberley coast in Western Australia. The named islands include Albert, Berthier, North Maret, South Maret, Turbin and West Montalivet Islands (Henson *et al.* 2014). This species grows on shallow beach sands, on lateritic and loam soils over basalt, often on cliffs (Figure 1A–C), and always in very close proximity (< 200 m) to the ocean.

Conservation status. *Gomphrena splendida* was recently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, as *Gomphrena* sp. Maret Islands (A.A. Mitchell 5414) (Western Australian Herbarium 1998–). Extensive searches were undertaken for this species by INPEX Operations Australia Ltd in the northern Bonaparte Archipelago and adjacent mainland and it appears to be restricted to these few islands. Surveys for this species led by the lead author and M. Henson located about 40 localised populations, with about 7,500 mature plants located on six named islands and a number of small, unnamed islets in the Bonaparte Archipelago.

Etymology. The epithet is from the Latin *splendidus* (splendid), in reference to the showy flowers and attractive leaves and habit of this species, which suggest it has great horticultural potential.

Notes. The thick, perennial rootstock and stems of this species is very distinctive (Figure 1D), as are the broad, somewhat fleshy leaves (Figure 1E). *Gomphrena splendida* co-occurs with *G. canescens* (Moq.) Druce subsp. *canescens* and is somewhat similar in appearance due to the large, bright pink



Figure 1. *Gomphrena splendida*. A – flowering plant in coastal grassland on basalt soils on Berthier Island; B – flowering plant on laterite boulders on South Maret Island; C – flowering plant on beach sand on South Maret Island; D – thickened, perennial stems with clustered leaves; E – broad, almost fleshy leaves; F – inflorescence; G – view of inflorescence from above, with potential pollinator; H – flowers; I – comparative images of *G. canescens* subsp. *canescens* showing similar inflorescence (top) and narrower leaves (bottom). Photographs by R.L. Barrett.

inflorescence (Figure 1I), but the latter can be distinguished by its annual habit, narrower leaves 1–5(–6) mm wide (*cf.* 11–47 mm wide), hairy tepals (*cf.* glabrous), the presence of pseudostaminodes (*cf.* absent) and the inside of the staminal tube being glabrous (*cf.* woolly in lower half).

Gomphrena splendida appears to be closely related to *G. flaccida* based on its combination of floral characters, and also grows in close proximity, but this latter species is an annual, has narrower spikes 12–28 mm wide (*cf.* 30–51 mm wide), narrower leaves 1–7(–13) mm wide and glabrous staminal tube.

The Brazilian species *G. glabratooides* and *G. globosa* are superficially similar due to their broad leaves and pink flowers, but differ significantly in floral characteristics and no direct relationship is suggested here.

The very large heads of flowers show horticultural merit (Figure 1B, G). Several plants were grown from cuttings at Kings Park and Botanic Garden in Perth; however, after growing well for a few years they eventually succumbed to frost (D. Grown pers. comm.). The species is likely to make an attractive horticultural plant in frost-free areas.

Gomphrena splendida is commonly visited by butterflies and other potential pollinators that obtain small amounts of nectar from the flowers. The most common visitor is the Fuscous Swallowtail (*Papilio fuscus* subsp. *canopus* Westwood). The Large Grass-yellow (*Eurema hecabe* L.), Northern Pencil-blue (*Candalides gilberti* Waterhouse), White Migrant (*Catopsilia pyranthe* L.) and day-active moths in the family Arctiidae have also been observed visiting the flowers for nectar.

The vernacular name of Splendid Bachelor Buttons is recommended.

Acknowledgements

Preparation of this paper was funded by the Botanic Gardens and Parks Authority as part of the 50th anniversary celebrations of the Western Australian Botanic Garden at Kings Park. Rob Davis and Kelly Shepherd are thanked for comments that improved the manuscript. Fieldwork for this research was funded by INPEX Operations Australia Ltd. The following people conducted extensive surveys for this species and their assistance is gratefully acknowledged: Jeremy Fitzpatrick, Martin Henson, Jennifer Langmead, Kelli McCreery, Angela Mercier, Sharnya Thomson, Vanessa Yeomans (RPS); Julian Kruger, Vicki Levien, Scott Walker (Astron Environmental Services); Jeni Alford, Brian Morgan, Raimond Orifici (Biota Environmental Sciences Pty Ltd); Mandy Cross, Kirstin Wiseman (Parsons Brinckerhoff); Nick Eveleigh (Rockwater Pty Ltd). The crew of the *MV Taka II* and *MVN.W. Fortescue* provided excellent support during the surveys.

References

- Henson, M., Kenneally, K.F., Griffin, E.A. & Barrett, R.L. (2014). Terrestrial flora. In: Comrie-Greig, J. & Abdo, L. (eds) *Ecological studies of the Bonaparte Archipelago and Browse Basin*. pp. 19–102. (INPEX Operations Australia Ltd: Perth.)
- Palmer, J. (1998). A taxonomic revision of *Gomphrena* (Amaranthaceae) in Australia. *Australian Systematic Botany* 11: 73–161.
- Western Australian Herbarium (1998–). *FloraBase—the Western Australian Flora*. Department of Parks and Wildlife. <http://florabase.dpaw.wa.gov.au/> [accessed 8 April 2014].



Barrett, Russell L and Palmer, J. 2015. "A new species of *Gomphrena* (Amaranthaceae) from the Bonaparte Archipelago, Western Australia." *Nuytsia: journal of the Western Australian Herbarium* 26, 143–147.
<https://doi.org/10.58828/nuy00727>.

View This Item Online: <https://www.biodiversitylibrary.org/item/287913>

DOI: <https://doi.org/10.58828/nuy00727>

Permalink: <https://www.biodiversitylibrary.org/partpdf/342307>

Holding Institution

Western Australian Herbarium

Sponsored by

Atlas of Living Australia

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Western Australian Herbarium

License: <http://creativecommons.org/licenses/by-nc-sa/4.0/>

Rights: <http://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.