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Grevillea saxicola (Proteaceae), a new species from the Pilbara of Western Australia

Steven J. Dillon

Western Australian Herbarium, Department of Parks and Wildlife,
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
Email: Steven.Dillon@dpaw.wa.gov.au

Abstract

Dillon, S.J. *Grevillea saxicola* (Proteaceae), a new species from the Pilbara of Western Australia. *Nuytsia* 24: 103–108 (2014). A new species of *Grevillea* R.Br. ex Knight, *G. saxicola* S.J.Dillon, is described. An amendment to an existing key of *Grevillea* is provided to include the new taxon, which has conservation priority.

Introduction

Grevillea R.Br. ex Knight is the third largest genus in Western Australia with 348 taxa, 14 of which occur in the Pilbara region of Western Australia. The last revision of the genus was by Makinson (2000) and since that time a further *c.* 20 taxa have been added to the census of Western Australian plants (Western Australian Herbarium 1998–). Close examination of several *Grevillea* collections from the southern Pilbara revealed a distinct new taxon that had been previously ascribed to either *G. nematophylla* F.Muell. or *G. berryana* Ewart & Jean White. This finding was supported by more recent collections and this new species is described here as *G. saxicola* S.J.Dillon.

Methods

Descriptions and measurements are based on dried herbarium specimens held at the Western Australian Herbarium. When possible, up to five flowers were re-hydrated from each specimen for floral examination. Descriptions and terminology follow that of McGillivray and Makinson (1993) and Olde and Marriott (1993) except that perianth length differs to the definition used by Olde and Marriott (1993) in that it was measured along the suture between the dorsal and ventral tepals to the apex of the limb. The distribution map shows the *Interim Biogeographical Regionalisation for Australia* (IBRA) Version 7 boundaries (Department of the Environment 2013). Precise locality information is withheld due to conservation concerns.

The leaf morphology of *G. saxicola* was compared with two similar taxa, *G. berryana* and *G. nematophylla* subsp. *supraplana* Makinson (see under *Affinities*), to assist with determining which taxonomic rank should be applied to the new entity. The following PERTH herbarium specimens were used: *G. saxicola* – *J. Bull & G. Hopkinson* ONS JIN 39, *J. Bull & G. Hopkinson* ONS JJ 01.01, *E. Carroll & S. Reiffer* GLC 011, *B. Morgan* BMor 1331; *G. berryana* – *R.F. Black s.n.* (PERTH 01447335), *R.F. Black s.n.*

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(PERTH 01762818), *A.S. George* 12003, *C. Payne s.n.* (PERTH 06949193); *G. nematophylla* subsp. *supraplana – A.A. Mitchell* 4153, *S. Petty* 2238. One or two pinnatisect leaves were taken from each specimen and soaked in mildly soapy water for between 48 and 72 hours. The lobes of the leaves were hand-sectioned, the sections mounted on microscope slides and examined under a light microscope. For each species multiple images of a typical leaf section were taken at different focal lengths and then recombined using stacking software.

Leaf morphology

Leaf anatomy has been found to be of taxonomic utility in Proteaceae, and *Grevillea* leaves are categorised anatomically as dorsiventral, unifacial or dipleural (McGillivray & Makinson 1993). The leaf sections show that *G. saxicola* has unifacial leaves (Figure 1A) as has the superficially similar taxon *G. nematophylla* subsp. *supraplana* (Figure 1B). The leaves of both species differ from the dorsiventral leaves of *G. berryana* (Figure 1C) in that the leaf lamina is greatly reduced and the midrib is relatively enlarged. Also of note is that the abaxial parenchyma of both *G. saxicola* and *G. nematophylla* subsp. *supraplana* leaves are not interrupted by a fibre cap, which is a bundle of sclerenchyma that run longitudinally in the leaf at the apex of the vascular bundle, as it is in *G. berryana*. The leaves of *G. saxicola* differ from those of *G. nematophylla* subsp. *supraplana* in that the lamina is more reduced and often does not extend laterally beyond the midrib and the grooves are shallower.

Amendment to the key to *Grevillea* species from the *Hilliana* Group by Makinson (2000)

4. Leaves entire and linear to strap-like, or divided with subterete to linear lobes

5. Leaves smooth or with a single dorsal ridge or planar edge

5A. Pollen presenter circular in face view ..... **290. G. nematophylla**

5A: Pollen presenter oblong to elliptic in face view..... **G. saxicola**

Taxonomy

Grevillea saxicola S.J.Dillon, *sp. nov.*

Type: near Tom Price, Western Australia [precise locality withheld for conservation reasons], 08 December 2012, *E. Carroll & S. Reiffer* GLC 011 (*holo*: PERTH 08414645 (sheet 1 of 2), PERTH 08414653 (sheet 2 of 2); *iso*: NSW).

Grevillea sp. Turee (J. Bull & G. Hopkinson ONS JJ 01.01), Western Australian Herbarium, in *FloraBase*, http://florabase.dpaw.wa.gov.au [accessed 2 January 2014].

Shrub or small *tree*, (1.0–)2.5–7.0 m tall with grey-black, rough bark; young *branchlets* and *leaves* with a dense indumentum of appressed, biramous hairs which are usually white but ferruginous on new growth, becoming glabrous with age. *Leaves* unifacial, ascending to erect or occasionally weeping on older branches, dull grey-green, 70–270(–310) mm long, pinnatisect with 2–8(–9) lobes or occasionally simple; simple leaves and lobes linear, straight to curved or sinuous, 0.8–1.4 mm broad, terete to subterete with a flat to shallowly concave strip on the adaxial surface, apex subacute, straight to curved. *Conflorescences* terminal, erect, simple or paniculate with 2–6(–7) branches; unit conflorescences cylindrical, acropetal to subsynchronous, peduncles 3–12(–16) mm long with a (moderate to) dense indumentum of ferruginous and white, appressed, biramous hairs; rachides 20–68(–82) mm long with a (moderate to) dense indumentum of (ferruginous and) white, appressed, biramous hairs; floral bracts

caducous, ovate to broadly ovate or rarely narrowly triangular, apex acute, 0.6–1.5(–2.0) mm long × (0.2–)0.35–0.75 mm wide, adaxial surface glabrous or with scattered short, erect, glandular hairs concentrated near the apex, abaxial surface with dense indumentum of white, appressed, biramous hairs occasionally intermixed with sparse glandular hairs. *Flower*s transverse on the rachis, perianth and style cream to pale yellow; pedicels (0.9–)1.1–2.3 mm long with a (moderate to) dense indumentum of white, appresssed, biramous hairs; torus 0.8–1.4(–1.7) mm across, oblique at 10–20(–25)°; nectary arcuate, 0.3–0.6 mm high, 0.1–0.3 mm above the torus rim, 0.1–0.25 mm thick at the level of the rim, margin entire and smooth or undulate to crenulate. *Perianth* narrowly ovate below the curve, 4.0–6.0(–6.7) mm long × 0.8–1.45(–1.9) mm wide, outer surface with a sparse to dense indumentum of appressed, biramous hairs, inner surface glabrous or with sparse simple, eglandular hairs; limb ovoid to subglobose, (0.8–)1.0–1.5 mm long × 1.1–1.6(–1.75) mm across; dorsal tepal 5.1–8.4 mm long × 1.1–1.75 mm wide. *Pistil* 5.7–10.0(–12.2) mm long; stipe 0.5–1.5 mm long, glabrous or rarely with scattered biramous hairs; ovary 0.5–0.9(–1.1) mm wide × 0.6–1.0 mm long, sparse to dense indumentum of biramous hairs or rarely glabrous; ovules attached at the midpoint between the medial and basal position; style 4.4–8.1 mm long, strongly curved, glabrous or rarely with scattered hairs in the proximal half; pollen presenter oblique at 50–70(–75)°, obliquely conical, elliptic to obovate in face view, 0.7–1.0 mm long × 0.5–0.8 mm wide × 0.2–0.5 mm high, stigma distally off-centre. *Fruit* compressed, obliquely broadly ellipsoid to obliquely broadly obovoid, (8.7–)10.5–15.2 mm long × (7.0–)8.0–11.7 mm wide, pericarp 1.0–1.3(–1.5) across at the ventral suture, pruinose when fresh, surface irregularly rugulose, glabrous or with scattered minute, biramous hairs. *Seed* surrounded by a wing, overall obliquely obovate, (7.0–)10.0–12.8 mm long × (4.4–)6.0–7.9 mm wide; body obliquely obovate (4.5–)5.4–6.8 mm long × (3.0–)3.4–4.1 mm wide, apex truncate to obliquely emarginate, surface minutely verruculose; wing membranous, (0.6–)0.9–1.9 mm wide at narrowest point, (1.3–)2.1–3.9 mm wide at widest point; raphe conspicuous. (Figure 1A)

Diagnostic features. *Grevillea saxicola* can be distinguished from other Western Australian *Grevillea* species by the following combination of characters: an upright shrub or small tree with grey-black, rough bark; leaves terete to subterete, usually pinnatisect with 2–8 unifacial lobes; peduncles with an indumentum of only biramous hairs; perianth and style cream to pale yellow; pollen presenter oblong-elliptic in face view and oblique at 50–70°.

Selected specimens examined. WESTERN AUSTRALIA [localities withheld for conservation reasons]: 16 Dec. 1976, *K.J. Atkins* 118 (PERTH); 10 Feb. 1977, *K.J. Atkins* 118 (PERTH); 13 Aug. 1980, *K.[J.] Atkins* 1057 (PERTH); 7 Mar. 2008, *J. Bull* 12 (PERTH); 3 Feb. 2011, *J. Bull & G. Hopkinson* ONS JIN 12 (PERTH); 3 Feb. 2011, *J. Bull & G. Hopkinson* ONS JIN 13 A (PERTH); 3 Feb. 2011, *J. Bull & G. Hopkinson* ONS JIN 16 (PERTH); 8 Feb. 2011, *J. Bull & G. Hopkinson* ONS JIN 39 (PERTH); 3 Feb. 2011, *J. Bull & G. Hopkinson* ONS JJ 01.01 (PERTH); 8 Dec. 2012, *E. Carroll & S. Reiffer* GLC002 (PERTH); 28 June 1984, *W. Edgecombe s.n.* (PERTH); 13 Feb. 1987, *F.H. Mollemans* 2237 (PERTH); 14 Apr. 2012, *B. Morgan* BMor 1331 (PERTH); 29 Sep. 2011, *S. van Leeuwen* 4073 (PERTH); 29 Sep. 2011, *S. van Leeuwen* 4125 (PERTH).

Phenology. Flowering from late spring to early autumn.

Distribution and habitat. *Grevillea saxicola* grows in orange-brown to red-brown loam soils on the upper scree/breakaway slopes and crests often associated with banded iron formation outcropping. *Grevillea saxicola* is often found growing in Mulga woodlands. This species has been recorded from the southern Pilbara in Western Australia, in an area from *c.* 40 km east of Paraburdoo to *c.* 50 km west-north-west of Newman (Figure 2).

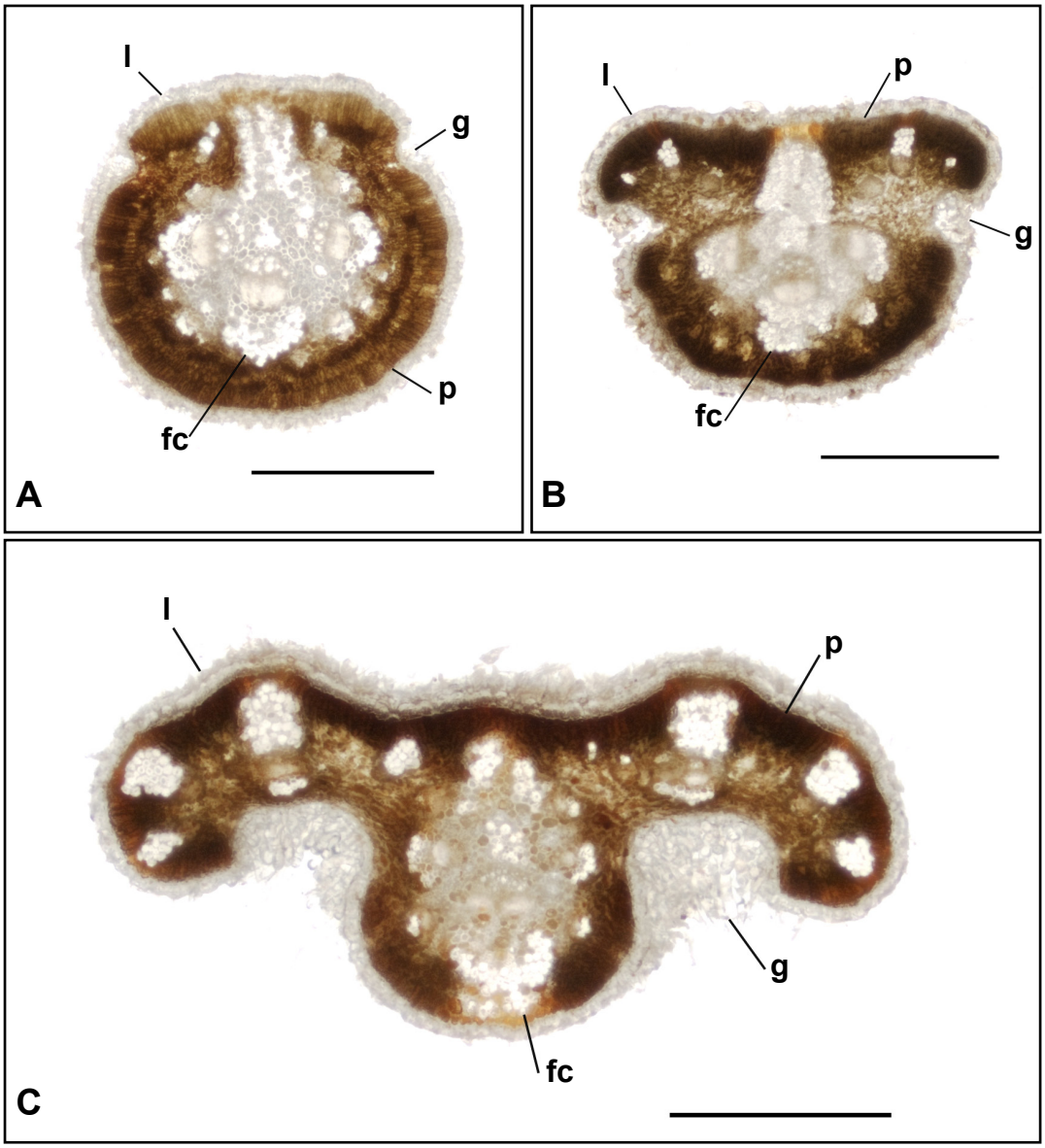

Figure 1. Transverse leaf sections. A – *Grevillea saxicola* (*B. Morgan* BMor 1331); B – *G. nematophylla* subsp. *supraplana* (*A.A. Mitchell* 4153); C – *G. berryana* (*R.F. Black s.n.* (PERTH 01762818)). Scale bars = 0.5 mm. fc = fibre cap, g = groove, l = lamina, p = palisade parenchyma.

Conservation status. Recently listed as Priority Three under Department of Parks and Wildlife Conservation Codes for Western Australian Flora, as *Grevillea* sp. Turee (J. Bull & G. Hopkinson ONS JJ 01.01). It had previously been listed as Priority One (Smith 2013).

Etymology. The specific epithet is from the Latin for 'a dweller among rocks', in reference to this species' preferred habitat.

Affinities. The taxa most similar to *G. saxicola* are *G. berryana* and *G. nematophylla* subsp. *supraplana*. *Grevillea berryana* has flat dorsiventral leaves with recurved margins and distinct grooves on the

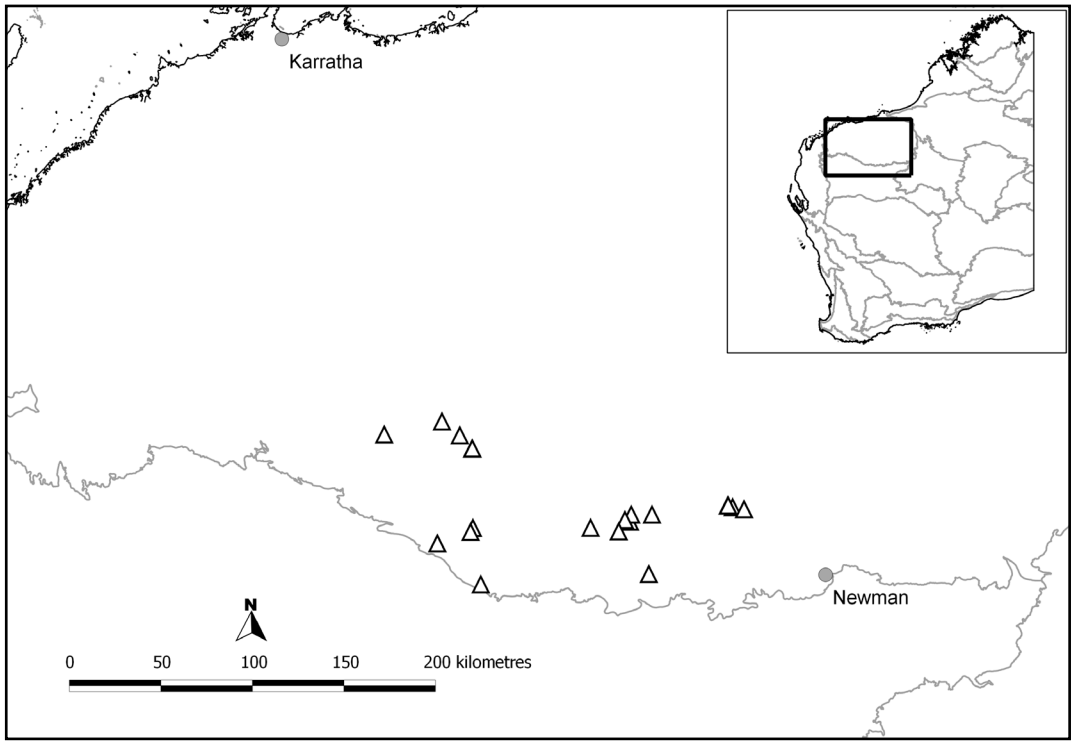

Figure 2. Distribution of *Grevillea saxicola* in the Pilbara of Western Australia.

abaxial surface, larger bracts on which the outer surface is densely glandular-hairy and the rachis and peduncle are moderately to densely glandular-hairy. *Grevillea nematophylla* subsp. *supraplana* has smooth, silvery bark, inflorescences with 5–10 branches, larger bracts with a mix of glandular and non-glandular hairs on the outer surface, a pollen presenter that is circular in face view and is less oblique (20–40° (McGillivray & Makinson 1993) *cf.* 50–70(–75)° for *G. saxicola*), and slightly larger fruit (13–24 mm long (Makinson 2000) *cf.* 10.5–15.2 mm long for *G. saxicola*). *Grevillea nematophylla* (*s. lat.*) in Western Australia has a more southerly distribution than *G. saxicola*.

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References

Department of the Environment (2013). *Australia's bioregions (IBRA)*, IBRA7, Commonwealth of Australia. http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra#ibra [accessed 2 January 2014].

Makinson, R.O. (2000). Proteaceae 2, *Grevillea*. *In*: Wilson, A. (ed.) *Flora of Australia*. Vol. 17A. (Australian Biological Resources Study: Canberra.)

McGillivray, D.J. & Makinson, R.O. (1993). Grevillea*, Proteaceae: a taxonomic revision.* (Melbourne University Press: Carlton, Victoria.)

Olde, P.M. & Marriott, N.R. (1993). New species and taxonomic changes in *Grevillea* (Proteaceae: Grevilleoideae) from south-west Western Australia. *Nuytsia* 9 (2): 237–304.

Smith, M.G. (2013). *Threatened and Priority Flora list for Western Australia*. (Department of Parks and Wildlife: Kensington, Western Australia.)

Western Australian Herbarium (1998–). *FloraBase—the Western Australian Flora*. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au [accessed 8 January 2014].