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***Grevillea bipinnatifida* subsp. *pagna* (Proteaceae),
a new subspecies from south-west Western Australia**

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Abstract

Cranfield, R.J. *Grevillea bipinnatifida* subsp. *pagna* (Proteaceae), a new subspecies from south-west Western Australia. *Nuytsia* 15(2): 187–192 (2004). Restricted to the Swan Coastal Plain of Western Australia, *Grevillea bipinnatifida* subsp. *pagna* Cranfield is described. Leaf variation within *Grevillea bipinnatifida* is also illustrated.

Introduction

The new subspecies described here is only known from a small population of plants confined to a wetland habitat north of Waroona, about 112 km south of Perth, Western Australia. Although known for many years this subspecies was not considered taxonomically distinct until the population was surveyed in 1999. McGillivray & Makinson (1993) considered this subspecies as one of the many variations of *Grevillea bipinnatifida*. Olde & Marriott (1995) recognised this subspecies as the ‘prostrate green-leaved form’ within the variable *Grevillea bipinnatifida* R.Br. This subspecies appears to be distinct with leaf lobes much narrower than in the other variant of *Grevillea bipinnatifida* encountered (Figure 1).

Methods

A wide range of fresh and desiccated material was examined in order to determine the critical leaf characters with which to reliably distinguish between the two subspecies. Figure 2 illustrates the leaf blade measurement characters used to differentiate the subspecies of *Grevillea bipinnatifida*.

Taxonomy

***Grevillea bipinnatifida* R.Br.** *Type:* Swan View, Western Australia, December 1926, C.A. Gardner (*neo*: PERTH 01591584). The original type collection (near the Swan River, 1827, C. Fraser) is missing. See McGillivray & Makinson (1993) for discussion and neotypification.



Figure 1. Leaf variations within *Grevillea bipinnatifida*. A - neotype, B-D - variations, E - subsp. *pagna*. Scale = 1 cm.

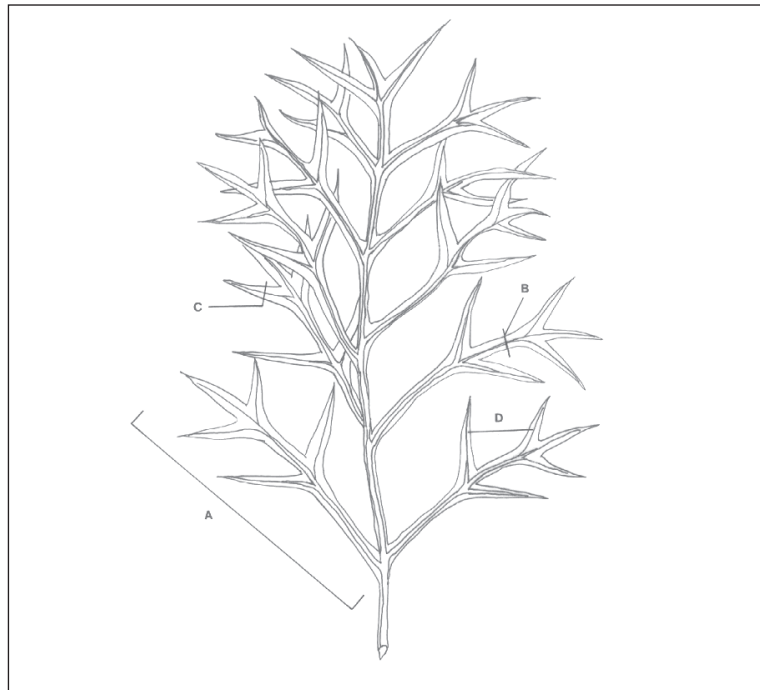


Figure 2. Leaf measurements. A - primary lobe length, B - width of sinus, across both sides of mid rib, C - width of primary lobe, D - width between sinus from mid rib.

Key to the subspecies of *Grevillea bipinnatifida*

1. Primary leaf lobe 5-7 mm wide, opposing sinuses distance of primary lobes 5-10 mm wide **subsp. bipinnatifida**
1. Primary leaf lobe 1-3 mm wide, opposing sinuses distance of primary lobes 0.5-2 mm wide **subsp. pagna**

Grevillea bipinnatifida* R.Br. subsp. *bipinnatifida

Shrub 30 cm to 2 m high, lignotuberous. *Leaves* alternate, bipinnate; petiole 29-38 mm long, lamina 80-150 x 60-110 mm, abaxially glabrous-glabrescent, flat to slightly recurved, midrib and veins obvious, lobes triangular, pungent-pointed, margin flat to slightly recurved. Ultimate lateral lobes triangular, 3-20 mm long, primary lobes (A) 3-10 mm long and 5-7 mm wide (C) with a mucro c. 2 mm long, opposing sinus (B), winged 5-10 mm wide, lateral sinus (D) 10-12 mm wide. *Peduncle* 60-65 mm long; inflorescence rachis 80-100 mm long, 10-30 flowered, dull red-pink; rachises with 1 or 2 flowers per node, glabrescent. *Flowers* acroscopic; pedicel 5-17 mm long, tomentose to villous intermixed with glandular hairs, *perianth* 10-12 mm long, striate ribbed, tomentose. *Anthers* c. 0.75 x 0.75 mm. *Style* red to pink with ventral surface flattened, 22-25 mm long, pubescent to glabrescent, *pollen presenter* lateral to oblique, oblong-obovate, convex; margin undulate. *Ovary* sessile, glandular pubescent, c. 1-2 mm long; nectary horizontal, 1-2 mm long. *Fruit* 17-21 x 10 mm tomentose.

Selected specimens examined (all PERTH). WESTERN AUSTRALIA: Maida Vale, 22 Aug. 1961, T.E.H. Aplin 867; 2 km NW of Darlington, 4 Aug. 1979, P. Armstrong 62; Serpentine No. 1 dam, 4 Sept. 1965, A.C. Beaglehole 12426; Red Hill, 30 Aug. 1978, R.J. Cranfield 415; 4 km S of Gillingarra, 17 Sept. 1983, R.J. Cranfield 4097; Statham, 14 Jul. 1923, H.G. Elliott s.n.; 1 mile W of The Lakes, 20 Sept. 1966, R. Filson 8964; Bindoon, 6 Jun. 1960, C.A. Gardner 12434; Godfrey forest block, 1. Oct. 1998, R. Smith RSS602; Lowden Block, 2 Nov. 1998, R. Smith RSS621.

Distribution. Occurring in the Swan Coastal Plain and northern and central parts of the Jarrah Forest IBRA Bioregions (Thackway & Cresswell 1995) of southwest Western Australia.

Habitat. Soils ranging from grey and red brown clays or clay loams to yellow brown sand or clayey sands associated with laterite gravels, granite sheets or outcrops occurring on the western edge and foot slopes of the Darling Scarp. Open forest to open woodland in elevated areas and shrublands fringing wetlands.

Flowering period. June to September.

Conservation status. Not considered to be threatened.

Notes. Within *Grevillea bipinnatifida* subsp. *bipinnatifida* several variations can be observed in leaf divisions, colour and habitat. The extreme narrowness of the leaf lobes of the new subspecies *pagna*, compared to the much broader lobes of the typical form of *Grevillea bipinnatifida* subsp. *bipinnatifida* provides a basis for a separation at the subspecies level.

Grevillea bipinnatifida subsp. *bipinnatifida* and the new subspecies *pagna* appear not to grow in association with each other. *G. bipinnatifida* subsp. *bipinnatifida* occurs over a wide distribution and a wider range of habitats, while the subspecies *pagna* appears to occur in isolated populations with a restricted habitat. Examination of the PERTH Herbarium material showed that within *Grevillea*

bipinnatifida there are narrow leaf variations that appear to be close to the new subsp. *pagna* but can be segregated on habitat. In all instance the precise locations of these narrow leaved forms were vague, occurring within the boundaries of the Perth outer metropolitan area, 90 km north of the known range of the newly defined subsp. *pagna*. These narrow leaved forms occur on the foot slopes of the Darling Scarp associated with wetland areas of heavy clay/loam soil types.

Further studies of *Grevillea bipinnatifida* subsp. *bipinnatifida* are required and may result in the establishment of additional subspecies.

***Grevillea bipinnatifida* subsp. *pagna* Cranfield, subsp. nov.**

A *Grevillea bipinnatifida* subsp. *bipinnatifida* foliorum lobis ultimis lateralibus angustioribus statim dignoscenda.

Typus: 6.5 km NNW of Waroona, Western Australia, 5 October 1999, *R.J. Cranfield* 14220 (*holo:* PERTH 05344301; *iso:* CANB).

Shrub to 0.70 m high, lignotuberous. *Leaves* alternate, bipinnate; petiole 20-35 mm long, lamina 35-90 x 40-90 mm, abaxially glabrescent, flat to slightly folded, midrib and veins obvious, lobes with a mucro, margin thickened. Ultimate lateral lobes narrowly triangular, 25-55 mm long, primary lobes 8-11 mm long and 1-3 mm wide with a mucro *c.* 1 mm long, opposing sinuses, winged 0.5-2 mm wide, lateral sinus 7-15 mm wide. *Peduncle* 30-50 mm long; inflorescence rachis 30-50 mm long, 10-30 flowered, yellow to pale red; rachis with 1 or 2 flowers per node, glabrescent (hirsute in bud). *Flowers* acroscopic; pedicel 6-7 mm long, villous intermixed with glandular hairs, *perianth* 10-11 mm long, striate ribbed, villous. *Anthers* *c.* 0.75 x 0.75 mm. *Style* red to pink, with the ventral surface flattened, 20-22 mm long, glabrescent, *pollen presenter* oblique, obovate, convex; margin undulate. *Ovary* sessile, pubescent, *c.* 1-2 mm long; nectary horizontal, 1 mm long. *Fruit* 18-19 x 9-10 mm, glabrescent.

Selected specimens examined (all PERTH). WESTERN AUSTRALIA: N of Waroona, 29 Oct. 1997, *R.J. Cranfield* 11441; N of Waroona, 19 Jun. 1996, *R. Davis* 1375; N of Waroona, 20 Oct. 1997, *R. Davis* 4287; N of Mayfield, 1 Oct. 1998, *R. Davis* 6598; N of Waroona, 22 Aug. 1993, *G.J. Keighery* 12970; W of Harvey, 8 Oct. 1979, *T.A. Ottway s.n.*

Distribution. Known only from the type location.

Habitat. Seasonally wet shrubland (*Xanthorrhoea preissii*) over low sedges (*Mesomelaena stygia*) fringed by open Marri woodland, occurring on grey to black sandy clay.

Flowering time. August to October.

Conservation Status. CALM Conservation Codes for Western Australian Flora: Priority One. This species is known only from one or a few populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verge.

Etymology. From the Nyoongar language of the traditional inhabitants of the area *pagna* - forest bush (Bindon & Chadwick, 1992), reflecting the preference of this subspecies to grow as an understorey woodland plant.

Notes. *Grevillea bipinnatifida* subsp. *pagna* has a shorter rachis and leaf characters that tend to be smaller and narrower than those of subsp. *bipinnatifida*. The overall width of the lamina appears to be greater in subspecies *pagna* but this was not conclusive in the material examined. The much narrower primary lobes are considered to be the main distinguishing feature for subspecies *pagna*. Flowering time differences between the two subspecies indicates that subspecies *pagna* flowers much later.

The habitat differences between the two taxa appear to be significant. Subspecies *pagna* is confined to a specific wetland type. Although other possible locations of the habitat exist in the area, distinct differences can be observed in the soil types and the associated vegetation present. Habitat records, although limited, indicate that the occurrence of this subspecies on the western boundary of the Darling Range is restricted. Habitats that support the typical subspecies of *Grevillea bipinnatifida* are far more varied and widespread.

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