

A new species of *Indigofera* (Fabaceae: Faboideae) from Central Australia

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Abstract

A new species, *Indigofera centralis* Peter G. Wilson & Rowe (Fabaceae), is described and illustrated from Central Australia, west of the Finke Gorge National Park in the Northern Territory. It resembles some other inland species but differs most conspicuously by the relatively larger flowers. Relationships with other species are discussed and a key to pinnate species in the McDonnell Range Bioregion is provided

Introduction

Eleven species of *Indigofera* were recognised by Maconochie (1981) in the *Flora of Central Australia*. Further species relevant to the area have been added (Wilson 1987, Wilson and Rowe 2010, 2015) and some species concepts amended. The species described here was first recognised as new based on a specimen collected in 1988 from near Areyonga. However, a 19th century collection has since been identified among specimens in the Melbourne herbarium.

Taxonomy

Indigofera centralis Peter G. Wilson & Rowe, *sp. nov.*

Diagnosis. Similar in aspect to *Indigofera helmsii* in having the upper surface of leaflets and the fruit ± glabrous but differs by the longer flower, staminal tube and fruit, the only slightly ridged branchlets and the lack of persistent, recurved stipules.

Type. Northern Territory: Central South: James Range, 13 km S of Areyonga, *P.K. Latz 11592*, 21 Sep 1989 (holo DNA, barcode A0086347). Isotypes: BRI, MEL 0279395A, *n.v.*

[*Indigofera* A83977 Areyonga, Albrecht *et al.* (1997), White *et al.* (2000)]

[*Indigofera* sp. Areyonga (D.J.Parsons 30) NT Herbarium: <http://eflora.nt.gov.au/factsheet?id=2304>]

Photograph. Northern Territory eFlora fact sheet (<http://eflora.nt.gov.au/factsheet?id=2304>)

Erect, spindly shrub, 1.5–3 m high, 1.2–1.5 m diameter, with woody rootstock; young stems terete to slightly ridged, green to dark brown, strigose with moderately dense to dense, generally fine or very small, appressed, equally biramous hairs. *Leaves* pinnate, (5–)9–13 leaflets; stipules triangular, not thickened or spinescent, (1.5–)2.5–5(–7) mm long, glabrescent (some hairs present when young) but often with dense clusters of club-shaped hairs in their axils, not persistent; petiole 6–11.5 mm long; rachis slightly furrowed, multicellular hairs between leaflet pairs dense, conspicuous, orange to red or dark brown, club-shaped. *Leaflets* opposite; stipellae absent (very rarely with a stipel-like projection 0.1–0.2 mm long); lamina elliptical to obovate, 8–22 mm long, 4–8 mm wide; upper surface green, glabrous; lower surface green (generally paler than above) with sparse, appressed hairs; apex obtuse and mucronate; veins not prominent. *Inflorescences* (45–)70–115 mm long, longer than leaves; peduncle 17–28 mm long; bracts triangular, 1.5–2.5 mm long; flowers pink to purple; pedicel 1.5–2 mm long. *Calyx* 2.5–4 mm long, with subequal lobes less than the length of the tube, clothed with sparse to moderately dense, white to brown, appressed hairs. *Standard* purple, ovate to orbicular, 9.5–12.5 mm high, 10–11 mm wide. *Wings* oblong to spatulate, 10–12 mm long, (2.5–)3.5–4 mm wide. *Keel* 11.5–13 mm long, 3.7–4.5 mm deep; apex acute to rounded; lateral pockets 1.5–2 mm long; hairs sparse, hyaline (rarely a few pale brown), at the tip and margin ciliate. *Staminal tube* 7–8 mm long, colourless. *Ovary* glabrous. *Pod* spreading, terete to depressed cylindrical, (21–)28–48 mm long, 3–4.5 mm deep, brown, glabrous; apex with a distinct beak to 2.5 mm long; endocarp spotted. *Seed* cuboid, 8–11 per fruit. **Fig. 1.**

Additional specimens examined. NORTHERN TERRITORY: Central South: 26 km W of Palm Valley Campground, *Latz 19662*, 4 Apr 2004 (NSW 708041, NT A0105940); 22 km ENE of Areyonga, *Matthews 927*, 24 July 1992 (NSW 262486); 30 km NE of Areyonga, *Parsons 30*, 21 June 1988 (DNA A0083977); c. 1 km SW of Gilbert Springs windmill, *Schubert 13*, 30 Mar 2003, (DNA, NT n.v.); *loc. cit.*, *Schubert 52*, 24 Dec 2004 (DNA, NT n.v.); Areyonga Valley, 6 km WNW of Finke Gorge N.P. western boundary, *Schubert 230*, 11 Dec 2007 (DNA, NT n.v.); 13 km SW of Palm Valley Campground, Finke Gorge N.P., *Schubert 392*, 31 Aug 2010 (DNA, NT n.v.); near the Finke, Gosses Range, *Schwartz 7* & *Schultze* (MEL 586462).

Notes. Herbarium specimens of this species have a somewhat similar aspect to several other species from drier parts of Australia but differ particularly in having much larger flowers. Of these similar species, *I. gilesii* is the only one that approaches *I. centralis* in flower size. Its standard and keel are 6.5–8.5 (vs 9.5–12.5) mm long and its staminal tube is 5.5–7 (vs 7–8) mm long. There is also a certain superficial similarity to forms of *I. australis* that have large leaflets, but the two taxa are easily distinguished on flower size and are geographically well separated.

Distribution and habitat. This species was first recognised as new based on a specimen collected near Areyonga in 1988. However, a 19th century collection from ‘near the Finke, Gosses Range’ has since been located in the Melbourne herbarium. This was collected by W. F. Schwarz and L. Schultze, who were German missionaries at Hermannsburg between 1877 and 1889. The known range encompasses an area of roughly 420 square kilometres, west of Hermannsburg. Habitat notes on one collection, *Latz 19662* from west of Palm Valley, indicate that the species was found as scattered individuals in a sandstone gorge, growing with *Callistemon pauciflorus* R.D.Spencer & Lumley and *Callitris glaucophylla* Joy Thomps. & L.A.S.Johnson. Other collections record it from dry, rocky, stream beds and gullies. The species is said to resprout after fire according to collector’s notes (*Latz 19662*).

Phenology. The Northern Territory eFlora fact sheet for this taxon (<http://eflora.nt.gov.au/factsheet?id=2304>) indicates that flowering does not occur in particular seasons and it is presumably dependent on rainfall events.

Conservation status. A conservation code of 1V was suggested by Albrecht *et al.* (1997), following the coding system of Briggs and Leigh (1996). White *et al.* (2000) upgraded this to 2K because further populations had been located and recommended that there be further investigation of potential threats. The species is now known from around six populations, but the species is still poorly known. It does not occur in any reserve, although the eFlora fact sheet reports that it is in cultivation in the Alice Springs Desert Park. The most recent review of its conservation status (Cowie *et al.* 2017) assessed it as data deficient (DD).

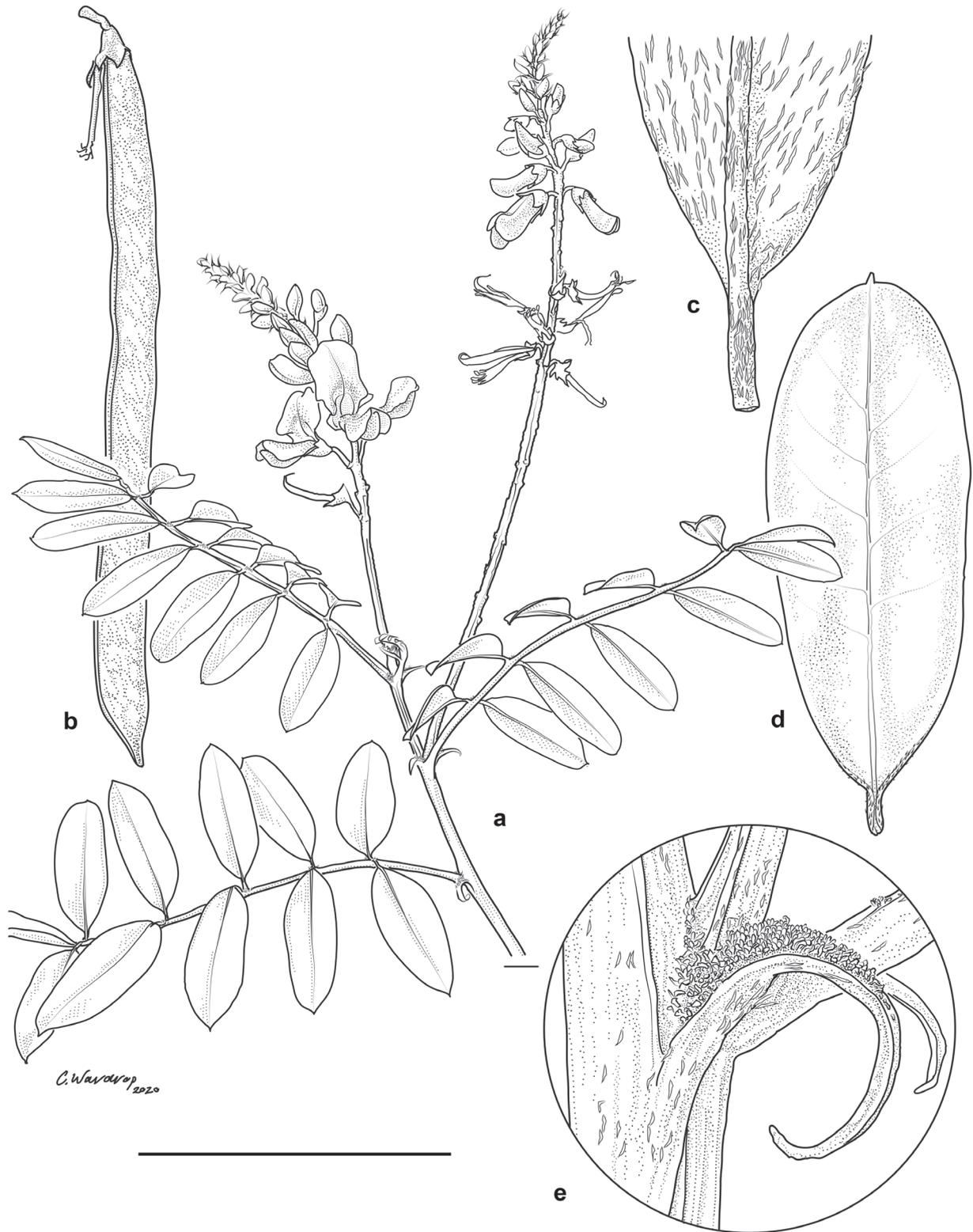


Fig. 1. *Indigofera centralis*: a. flowering stem; b. fruit; c. detail of abaxial leaf surface showing biramous hairs; d. adaxial leaf surface; e. recurved stipules showing club shaped hairs in axil. Scale bar: a = 40mm; b = 20mm; c, e = 5mm; d = 12.5mm. Material: a. *Latz 11592* (DNA, barcode A0086347); b, c, e. *Latz 19662* (NSW 708041); d. *Matthews 927* (NSW 262486).

Identification key to species in the McDonnell Range Bioregion with pinnate leaves and opposite leaflets

1. Gland-tipped hairs always present, at least on the ovary or fruit; pod 1.5–2 mm diameter *I. colutea*
- 1: Gland-tipped hairs absent; pod 2 mm or more in diameter 2
2. Leaves usually with 5 leaflets (range 3–9); flowers red.....*I. georgei*
- 2: Leaves usually with 7 or more leaflets; flowers other colours, rarely red..... 3
3. Upper surface of leaflets green, glabrous or sparsely appressed-hairy; pods \pm glabrous..... 4
- 3: Upper surface of leaflets grey-green, moderately to densely hairy; pods variously hairy 5
4. Young stems terete to slightly ridged; stipules not persistent; standard 9.5–12.5 mm long; pod 28–48 mm long..... *I. centralis*
- 4: Young stems distinctly four-angled; stipules persistent; standard 5–6.5 mm long; pod 18–30 mm long*I. helmsii*
5. Staminal tubes < 4.5 mm long..... 6
- 5: Staminal tubes \geq 5 mm long..... 8
6. Flowers dull red; stipules somewhat thickened at base..... *I. erubescens*
- 6: Flowers pink to purple; stipules not thickened or persistent 7
7. Erect shrub; bracts 3–5.5 mm long, flowers deep purplish pink *I. basedowii*
- 7: Perennial subshrub; bracts to 2.5 mm long, flowers pink to mauve *I. psammophila*
8. Stipules with persistent, thickened bases 9
- 8: Stipules not thickened, not long-persistent; leaves very densely hairy *I. leucotricha*
9. Inflorescences usually 80–150 mm long, much exceeding the leaves.....*I. gilesii*
- 9: Inflorescences usually 15–50 mm long, not, or a little, longer than leaves*I. cornuligera* subsp. *cornuligera*

Comment

Indigofera gilesii is similar to *I. cornuligera* in its thickened stipules and its flower colour but has a more open habit and longer inflorescences. The distribution of *I. gilesii* extends well into Western Australia (see Fig. 4 in Wilson & Rowe 2015) and likely intergrades with *I. cornuligera* and, possibly, *I. erubescens* in the western part of the bioregion.

Indigofera erubescens and *I. cornuligera* differ in flower colour, distribution and habit, with the latter species tending to be a more compact shrub with short internodes and pink to purplish flowers, generally restricted to areas south of the McDonnell Range Bioregion, extending into South Australia, while the former is a more open shrub with longer internodes and reddish flowers, generally restricted to areas north of the McDonnell Range Bioregion, extending into Queensland. However, some plants, especially those found in the McDonnell Range itself, appear to be somewhat intermediate. For example, the numerous specimens collected from Standley Chasm have the habit typical of *I. cornuligera* (compact shrub with relatively short internodes and strongly thickened stipule bases) but with the much smaller, red flowers typical of *I. erubescens*.

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References

- Albrecht DE, Duguid AW, Latz PK, Coulson H, Barritt MJ (1997) *Vascular Plant Checklist for the Southern Bioregions of the Northern Territory: Nomenclature, Distribution and Conservation Status*. (Parks & Wildlife Commission of the Northern Territory)
- Briggs JD, Leigh JH (1996) *Rare or Threatened Australian Plants*, edn. 4 (CSIRO: Canberra) <https://doi.org/10.1071/9780643105270>
- Cowie ID, Cuff NJ, Lewis DL, Jobson P (eds) (2017) *Checklist of the Vascular Plants of the Northern Territory*. (Northern Territory Herbarium, Department of Environment and Natural Resources: Palmerston)
- Maconochie JR (1981) Tribe V. Indigofereae. Pp. 157–158, in Jessop J (ed.) *Flora of Central Australia*. (Reed: Sydney)
- White M, Albrecht D, Duguid A, Latz P, Hamilton M (2000) *Plant species and sites of botanical significance in the southern bioregions of the Northern Territory*. Vol. 1: significant vascular plants. Report to the Australian Heritage Commission. (Arid Lands Environment Centre: Alice Springs)
- Wilson PG (1987) Taxonomic notes on some Australian species of *Indigofera* (Fabaceae–Faboideae). *Journal of the Adelaide Botanic Gardens* 10:119–126
- Wilson PG, Rowe R (2010) New taxa and typifications in *Indigofera* (Fabaceae) for South Australia. *Journal of the Adelaide Botanic Gardens* 24: 67–73
- Wilson PG, Rowe R (2015) Additional taxa of *Indigofera* (Fabaceae: Indigofereae) from the Eremaean Botanical Province, Western Australia. *Nuytsia* 25: 251–284

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