

## Two new species of *Indigofera* (Fabaceae: Faboideae) from western Queensland

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### Abstract

Two new species of *Indigofera* are described from western Queensland, one of which also extends into the Northern Territory. *Indigofera erubescens* Peter G. Wilson & Rowe, is a species sometimes confused with *I. brevidens* and, to a lesser extent, *I. helmsii* but readily distinguished from both by its rather small, red flowers; *Indigofera queenslandica* Peter G. Wilson & Rowe, is a species superficially similar in parts of its range to *I. leucotricha* in having a rather dense, greyish indumentum. Both species are illustrated and their conservation status discussed.

### Introduction

In the first Flora of Queensland (Bailey 1900), only one endemic species of *Indigofera* with pinnate leaves was recognised from the area west of the Great Divide and south of Gulf of Carpentaria watershed. This species was the very broadly circumscribed *I. brevidens* Benth., which was considered at that time to occur in all mainland states except Victoria. The species, in the strict sense, is restricted to central northern New South Wales and Queensland but the early broad use has made *I. brevidens* the most widely misapplied *Indigofera* name in Australia. Bailey's broad concept already included Mueller's species *I. lasiantha* (nom. illeg., now *I. leucotricha*), collected from Coopers Creek by A.C. Gregory in 1858, and he also recognised *I. brevidens* var. *galegoides* R.Br. ex Benth., collected by Robert Brown from the Cumberland Islands. This taxon was later described by Domin (1926) as *I. tryonii*, which was also named from specimens collected from off-shore islands, the Percy Isles in the Northumberland group. This species has since been collected from inland locations in the South Kennedy district. More recently (1975), the first Queensland collection of *I. georgei* was made, south-west of Quilpie, and further new species have been described from the region: *I. psammophila* (Wilson 1990) and *I. oxyrachis* and *I. haematica* (Wilson 1994). The two new species described below, *I. erubescens* and *I. queenslandica*, have both been identified as *I. brevidens* fairly frequently, and specimens of *I. queenslandica* have been determined as *I. leucotricha* from time to time. Adding the western records of *I. pratensis* sens. lat., *I. australis* and bona fide *I. brevidens* to these brings the number of endemic, pinnate-leaved species from this region to around a dozen.

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

**Diagnosis:** *I. brevidente* similis et cum ea olim confusa sed corollis rubris brevioribusque facile distinguitur.

**Holotype:** Queensland: Mitchell: 17.5 km N of Jundah turnoff on Windorah–Warbreccan road, P.G. Wilson 392 & R. Pickering, 22 Sep 1989 (NSW). Isotypes: BRI, CANB, K.

*I. uncinata* Ewart & Kerr p.p., excl. lectotype.

Erect, open shrub or subshrub, (0.3–)0.75–2(–3) m high, with woody rootstock; young stems terete, grey or green to brown, strigose to tomentose with dense, appressed or shortly spreading, equally biramous hairs. Leaves pinnate, (5–)7–11(–15) leaflets; stipules triangular (sometimes thickened), (1–)2–4 mm long, glabrescent or sparsely pubescent, generally not spinescent, persistent (tips often breaking off to leave the somewhat thickened base); petiole 3.5–10 mm long; rachis furrowed, multicellular hairs between leaflet pairs moderately dense, inconspicuous to conspicuous, red to dark brown, club-shaped. Leaflets opposite; stipellae rarely absent, generally inconspicuous, 0.2–0.8 mm long; lamina obovate, (3–)5–15(–21) mm long, (2–)3–8(–11) mm wide; upper surface grey to green, with sparse to moderately dense, appressed hairs; lower surface grey to green (generally paler than above), with moderately dense, appressed hairs; apex obtuse and mucronate; veins not prominent. Inflorescences (11–)50–150 mm long, generally longer than leaves; peduncle (3–)7–15(–25) mm long; bracts triangular, 1–2 mm long; flowers dull red, very rarely pinkish or white; pedicel 0.8–1.5 mm long. Calyx 1.5–3 mm long, with subequal lobes less than the length of the tube, clothed with moderately dense, grey to almost black, appressed hairs. Standard dull red, ovate to orbicular, 5–6.5 mm high, 5.5–6.5 mm wide. Wings spatulate or narrowly obovate, 5–6 mm long, 1.8–2.5 mm wide, with a small patch of simple hairs on the upper surface near point of attachment. Keel 5–6.2 mm long, 2–2.5 mm deep; apex acute to apex rounded; lateral pockets 0.6–1 mm long; hairs moderately dense, hyaline to dark brown, at the tip, along the bottom and margin ciliate. Staminal tube 3–4 mm long, colourless or free ends and tube pigmented. Ovary glabrous to moderately hairy. Pod spreading to descending, terete, (10–)20–30(–36) mm long, 2.5–4 mm deep, brown, strigose to glabrescent; hairs sparse to moderately dense, appressed; apex shortly pointed; endocarp spotted. Seed (4–)7–10 per fruit. Fig. 1.

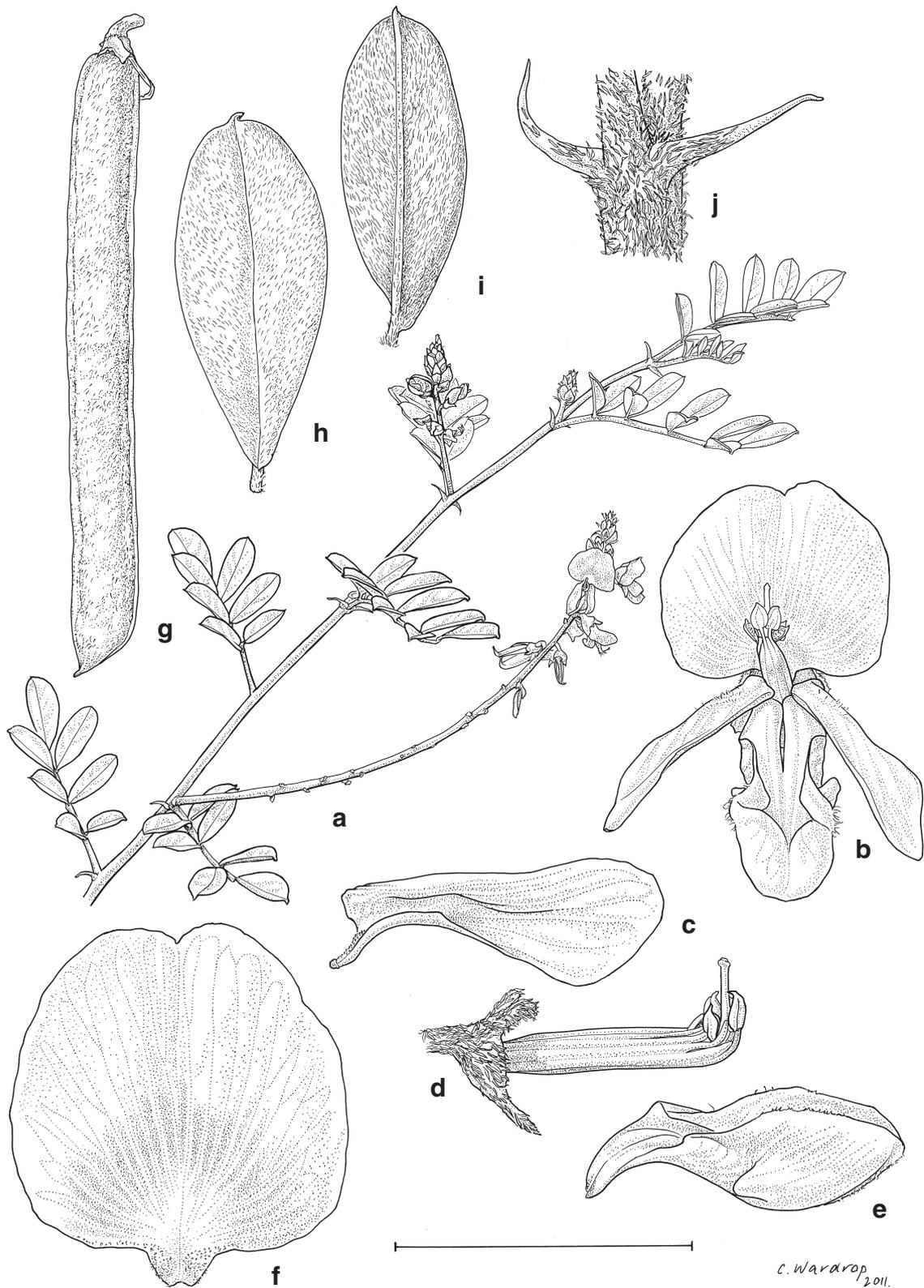
**Notes:** this species has been confused with *I. brevidens* which it resembles in habit and indumentum, but it is readily distinguished from it by the much smaller flowers (5–6.5 mm cf. 6.5–9 mm), which are usually red (very rarely white), and the variably thickened stipules with persistent bases. This stipule character occurs in a number of other species, including *I. cornuligera*, but *I. erubescens* differs from that species in its slender, more open habit, as well as the much smaller flowers. Specimens collected by Ewart from Taylor Range, included by Ewart & Kerr (1926) under their *I. uncinata*, are referable to this species. In some parts of the MacDonnell Ranges plants occur that appear to be intergrades between this species and *I. cornuligera*. For example, the numerous specimens from Standley Chasm have features that are somewhat intermediate between these species, having the typical habit of *I. cornuligera* (compact shrub with relatively short internodes and markedly thickened stipules) but with the much smaller flowers typical of *I. erubescens*.

The epithet is a participle derived from the Latin verb *erubesco*, to become red, a reference to the red flowers of this species.

**Distribution and habitat:** the range of this species includes western Queensland (Burke, Gregory North and Gregory South districts) and the Northern Territory (south of the Short Range and, mostly, north of the MacDonnell Ranges). It is usually found on hills or rocky ground, but sometimes occurs in creek lines at the base of ranges.

**Conservation status:** a widespread species; not under threat.

**Selected specimens:** Queensland: Burke: Spring Creek, c. 25 km N of Mt Isa, Wilson 650 & Rowe, 12 Sep 1990 (BRI, NSW); 1.4 km S of Slaty Creek on the Cloncurry–Duchess road, Wilson 635 & Rowe, 11 Sep 1990 (NSW). Gregory North: Selwyn Range, at Chatsworth–Toolebuc homestead turnoff, Neldner 1567, Oct 1984 (BRI); Warlus VI, adjacent site H146, c. 20 km N of Alderley, Purdie 1491, 23 Sep 1978 (BRI); Skull Hole, about 20 km S of Winton, Nicolson 374, 20 Aug 1988 (BRI). Gregory South: South Galway, about 45 miles SW of Windorah, Everist 4041, 21 June 1949 (BRI, CANB). Northern Territory: Barkly Tableland: 5.3 km N of Hayward Creek on the Stuart Hwy N of Three Ways, Wilson 662 & Rowe, 13 Sep 1990 (DNA, NSW). Central North: 68 miles [c. 109 km] S Tennant Creek, Must 269, 20 July 1968 (AD, BRI, CANB, MEL, NSW); Elkedra Station. 32 km towards Hatches Creek on jump up, Henshall 2739, 10 Aug 1979 (DNA, CANB, MEL); Near Barrow Creek, Gauba 546, 7 Oct 1950 (AD, CBG, MEL, NSW); Native Gap, Hann Range, Wilson 699 & Rowe, 15 Sep 1990 (AD, DNA, NSW). Central South: Ormiston Gorge, Wilson 704 & Rowe, 16 Sep 1990 (DNA, NSW); c. 18 km SE of Alice Springs, Craven 4308, 14 Jun 1976 (BRI, CANB, PERTH); Palm Valley, 12 miles SW of Hermannsburg Mission, Lazarides 5288, 15 May 1955 (AD, BRI, MEL, NSW).



**Fig. 1.** *Indigofera erubescens*. **a**, habit; **b**, flower (keel and wings ‘tripped’); **c**, wing; **d**, lateral view of calyx and androecium; **e**, keel; **f**, standard; **g**, fruit; **h**, pinna, adaxial surface; **i**, pinna, abaxial surface; **j**, stipules. (**a**, from photograph taken at type locality; **b**–**f** from Wilson 660 & Rowe; **g** from Must 269; **h**, **i** from Nicolson 374; **j** from Wilson 635 & Rowe). Scale bar: **a** = 40 mm; **b**, **j** = 7.5 mm; **c**–**f** = 5 mm; **g** = 15 mm; **h**, **i** = 12 mm.

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

**Diagnosis:** *I. leucotrichae* valde similis sed foliolis ellipticis vel obovatis (vice plerumque cuneato) indumento paginam non omnino tegetibus differt.

**Holotype:** Queensland: Warrego: Boss Gorge, 22 km south of 'Listowel Valley', P.G. Wilson 363 & R. Pickering, 18 Sep 1989 (NSW). Isotypes: BRI, CANB, K, MEL.

*Indigofera* sp. Aramac (E.J.Thompson+ JER177).

*Indigofera* sp. St Anns Homestead (E.J.Thompson+ BUC500).

Erect shrub, 0.3–2 m high, with woody rootstock; young stems terete, grey-green or yellowish to brown, hirsute with very dense, spreading, equally to unequally biramous hairs. Leaves pinnate, (7–)9–17(–25) leaflets; stipules triangular, 2–5 mm long, pubescent, not spinescent, often persistent; petiole 3–12 mm long; rachis flattened or furrowed, multicellular hairs between leaflet pairs sparse, sometimes just 1 or 2 in each leaflet axil, inconspicuous, red to brown, club-shaped. Leaflets opposite; stipellae absent; lamina elliptical to obovate, (3–)5–15(–22) mm long, (1.5–)3–8(–11) mm wide; upper surface green to grey, with moderately dense to dense, spreading hairs; lower surface green to grey (paler than above), with dense, spreading hairs; apex obtuse and mucronate or apiculate; veins not prominent. Inflorescences (13–)30–120 mm long, shorter to longer than leaves; peduncle 4–25 mm long; bracts ovate or triangular, 1–3 mm long; flowers pink to purple; pedicel (0.3–)1–2.2 mm long. Calyx 2.3–4.8 mm long, with subequal lobes less than the length of the tube to lobes equal to the length of the tube, clothed with moderately dense to dense, grey to almost black, appressed to spreading hairs. Standard purple, ovate (sometimes broadly), (6.2–)7.5–10(–11.9) mm high, 6–7.6 mm wide. Wings oblong to spatulate, 7.5–11.1 mm long, (1.7–)2–3 mm wide. Keel 6–10(–11.4) mm long, 2.6–3.6 mm deep; apex beaked, acute or rounded; lateral pockets 0.4–1.2 mm long; hairs sparse to moderately dense, hyaline to dark brown, at the tip, along the bottom and margin ciliate. Staminal tube 5.5–7.7 mm long, colourless. Ovary densely hairy. Pod ascending to descending, terete, (15–)25–45 mm long, 2.5–3.5 mm deep, grey to brown, tomentose; hairs moderately dense to dense, appressed to spreading; apex acute or shortly beaked; endocarp spotted. Seed (5–)8–10 per fruit. Fig. 2.

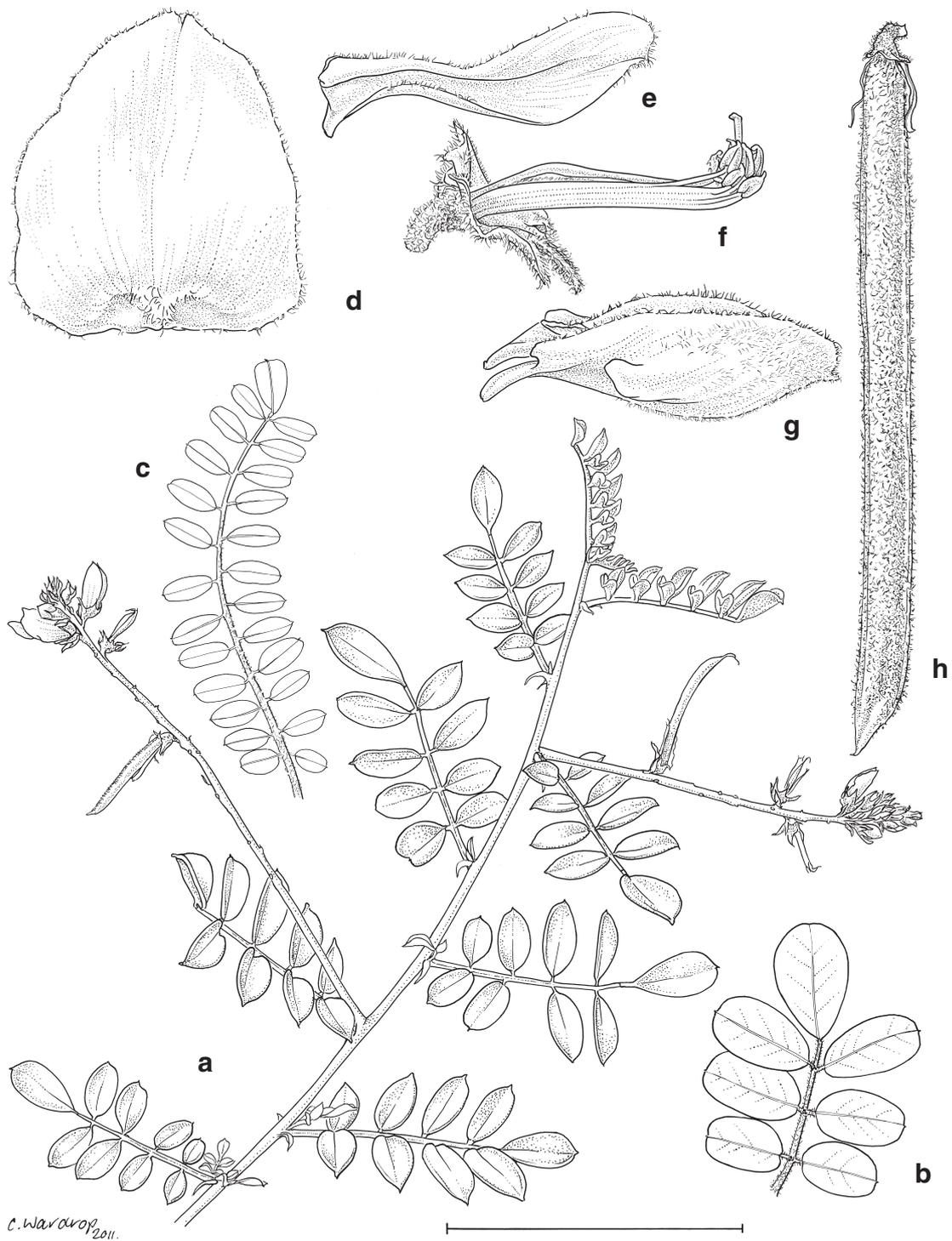
**Notes:** this is a quite variable species across its range. In the south-west of Queensland the leaflets tend to be larger and fewer in number, and the indumentum yellowish to brown; in the north-east the leaflets are smaller and more numerous, and the indumentum greyer. The specimens showing the greatest morphological difference, *Wilson 448* & *Pickering*, from west of Eromanga, with 7–11 leaflets up to 20 mm long and *Wilson 587* & *Rowe*, from south-west of Eungella Reservoir, with 19–23 leaflets 5–7 mm long (see Fig. 2 b, c) seem, nevertheless, to be the extremes of  $\pm$  continuous variation.

This taxon is superficially quite similar to *I. leucotricha* but that species has predominantly cuneate leaflets with a very dense indumentum that completely covers their surface, and fruits that are generally shorter (usually 20–35 cf. 25–45 mm long) and deeper (3–4.5 cf. 2.5–3.5 mm), and contain fewer seeds (4–8 cf. 8–10). Overall flower colour and dimensions are quite similar but *I. queenslandica* tends to have a longer keel, wings and staminal tube, the latter correlating with a longer ovary and fruit. The greatest convergence in leaf characters are, in fact, between the most widely separated populations, while in south-western Queensland, where the two species can be found within the same general area, *I. queenslandica* has larger, elliptical to obovate leaflets and dark brown hairs on new growth and young fruit.

**Distribution and habitat:** this species is apparently restricted to Queensland where it is known from the Montgomery Range (19°20'S, 144°47'E) and the Kerlong Range (21°34'S, 148°11'E) in the east, in an area that runs  $\pm$  diagonally to the Eromanga district in the far south-west. It is commonly found in open eucalypt woodland and shrubland on a wide range of substrates, particularly sandy or gravelly soils derived from sandstone but it has also been recorded on clay soils, basalts, laterite and limestone. It seems to prefer the slopes of ranges or small gorges and creeklines.

**Conservation status:** does not appear to be under immediate threat.

**Selected specimens: Queensland:** Burke: 'Warang' Holding, White Mountains, head of Torrens Creek, c. 37 km NNW of Torrens Creek township, *Fell 1392*, 1 Aug 1988 (BRI). Gregory South: 22.7 km from 'Cooma' turn-off on road to 'Plevna Downs', *Wilson 448* & *Pickering*, 25 Sep 1989 (BRI, NSW); Chandos Bore, *Wilson 428* & *Pickering*, 24 Sep 1989 (BRI, NSW). Leichhardt: Crows Apple Scrub, Rookwood, *Forster 7971* & *McDonald*, 20 Apr 1991 (BRI, MEL, NSW); Anvil Peak, Hodgson Range, *Forster 7220*, 24 Aug 1990 (BRI, MEL, NSW); Kerlong Range, c. 38 km NNE of Goonyella adjacent 'Burton Downs', *Wilson 587* & *Rowe*, 8 Sep 1990 (BRI, CANB, NSW). Mitchell: Aramac Ranges, c. 1 km W of road junction to 'Fortuna', *Wilson 520* & *Rowe*, 6 Sep 1990 (BRI, CANB, NSW). North Kennedy: Dip Creek, 'Pandanus Creek' Holding, c. 30 km NW of junction of Clarke and Broken Rivers, *Fell 146516*, 2 Sep 1988 (BRI). South Kennedy: Red Mountain, c. 40 km W of Clermont, *Wilson 557, 558* & *Rowe*, 7 Sep 1990 (BRI, NSW); 140 km SE of Charters Towers, 9.5 km W of



**Fig. 2.** *Indigofera queenslandica*. **a**, habit; **b**, leaf (SW end of range); **c**, leaf (NE end of range); **d**, standard; **e**, wing; **f**, lateral view of calyx and androecium; **g**, keel; **h**, fruit. (a from Wilson 363 & Pickering; b from Wilson 448 & Pickering; c from Wilson 587 & Rowe; d–g (from spirit material) & h from Wilson 519 & Rowe). Scale bar: a–c = 40 mm; d–g = 8 mm; h = 20 mm.

St Anns homestead, *Thompson BUC 500 & Sharpe*, 11 June 1992 (BRI, NSW). Warrego: SE Part of 'Milo' Station, c. 20 km NW of Adavale, *Lepschi 1128 & Snee*, 13 Oct 1993 (AD, CANB, NSW); Boss Gorge, *Wilson 519 & Rowe*, 5 Sep 1990 (BRI, CANB, NSW).

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