

A South American in Australia: *Wissadula contracta* (Malvaceae), a distinctive adventive shrub

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Abstract

The first record of the adventive shrub *Wissadula contracta* (Malvaceae; Malvoideae) is reported from Australia. A population of the species was discovered along a railway line near Redlynch, north of Cairns in Queensland. It is a species of open roadside areas in South America; how it has entered Australia is open to speculation. While the population appears to be self-sustaining, more surveys are needed to establish if the species has become naturalized, or if it has invasive potential. Illustrations for identification and habitat notes are provided.

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Introduction

An invasive species survey along a railway track near Redlynch, north of Cairns, Queensland, in June 2021 included a stockpile area fringing the railway (Fig. 1A-B). In addition to a typical assemblage of weedy species (Table 1), an unfamiliar plant stood out – a shrub c. 1.8 m tall bearing flowers and fruits on terminal and axillary panicles (Fig. 1C), which we identified as *Wissadula contracta* (Link) R.E.Fr., a species of the Malvaceae (Hibiscus) family. This species belongs in subfamily Malvoideae, which includes familiar genera such as *Abelmoschus*, *Abutilon*, *Hibiscus*, *Malva*, *Sida* and *Urena*. Five individuals of *W. contracta* at different stages of maturity were present, suggesting a viable and self-sustaining population.

Wissadula contracta is previously unrecorded in Australia, originating from South America, where it is found in Argentina, Guatemala, Mexico, Venezuela, Peru and Brazil (Bovini & Baumgratz

2016). In its natural range, the species favours open road margins, trails and disturbed areas (Bovini & Baumgratz 2016), but is also recorded in natural vegetation including deciduous thorn woodland (caatinga) in northeast Brazil (da Costa *et al.* 2007).

This species has a complicated naming history. Madagascar was recorded as the site where the type specimen was collected, but it has since been lost. The floras of Java (Backer 1963) and Malesia (Waalkes 1966) also record the species, and report its cultivation for the production of fibre. A primarily Neotropical distribution for this species, and the genus at large, casts doubt that its origins lie in the Old World tropics (Bovini & Baumgratz 2016).

Identification of *Wissadula contracta*

Wissadula contracta is a distinctive plant (Figs. 2A-D). When in flower, the shrub is around 1.5 to 1.8 m tall.

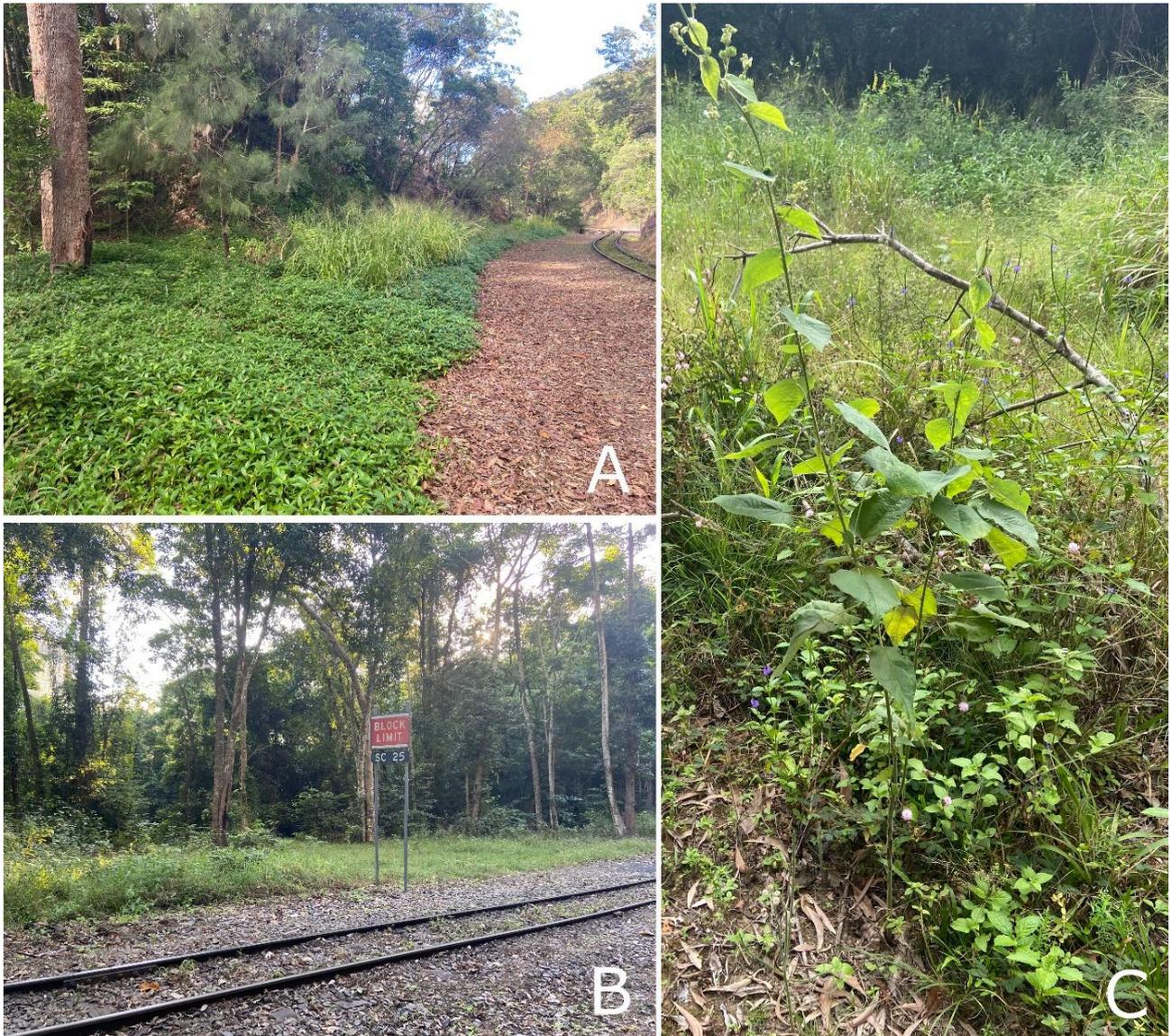


Figure 1. Habitats along railway verges near Redlynch, Cairns.

A and **B**, Habitats dominated by weedy grasses, shrubs and herbs are common along these railway lines - usually disturbed areas adjacent to *Acacia* woodland or lowland rainforest. **C**, the shrubby habit of *Wissadula contracta* (Link) R.E.Fr.

Table 1. List of plants, all being non-native environmental weeds, growing in association with *Wissadula contracta*.

Family	Species
Asteraceae	<i>Ageratum</i> spp.
Poaceae	<i>Axonopus compressus</i>
Fabaceae	<i>Crotalaria pallida</i>
Plantaginaceae	<i>Mecardonia procumbens</i>
Poaceae	<i>Megathyrsus maximus</i> var. <i>maximus</i>
Fabaceae	<i>Mimosa pudica</i>
Polygalaceae	<i>Polygala paniculata</i>
Rubiaceae	<i>Richardia brasiliensis</i>
Plantaginaceae	<i>Scoparia dulcis</i>
Verbenaceae	<i>Stachytarpheta cayennensis</i>
Fabaceae	<i>Stylosanthes</i> spp.

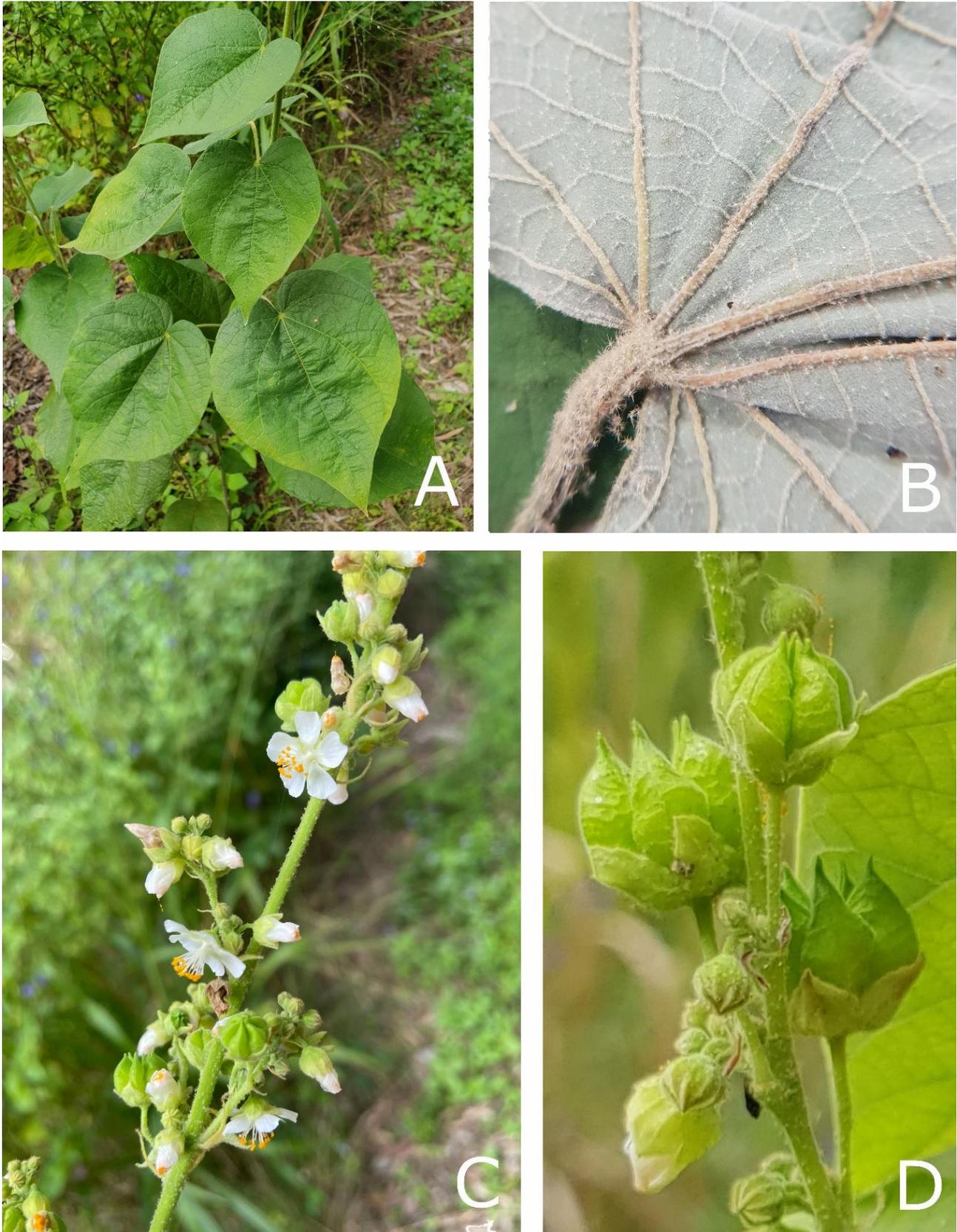


Figure 2. Profile of *Wissadula contracta*.

A – Leaves towards the base. **B** – close up of the underside of the leaf lamina with stellate hairs.

C – the inflorescence is a dense panicle with flowers borne on individual pedicels and bracts subtending each pedicel. **D** – the fruits are schizocarps with five mericarps.

Leaves are simple, heart-shaped (cordate), borne on long petioles (0.8-8.0 cm) and are alternate and spirally arranged along the stem. The leaf stalk is pulvinate, i.e., it is distinctly thicker where it meets the leaf lamina (Fig. 2B). The leaves are also subtended by a pair of narrowly triangular stipules, ending in a point. Leaves nearer the base (the proximal end) tend to be larger, becoming smaller and more lance-like (cordate-lanceolate) along the stem approaching the terminal inflorescence (Fig. 1B, 2A). The leaf lamina has smooth margins, palmate venation, is green above and glaucous underneath (Figs. 2A-B), measuring 3.5-8.0 cm in length and 2.5-7.5 cm at the widest point. The glaucousness of the leaf under-surface results from dense coverings of star-shaped (stellate) hairs which obscures the lamina (Fig. 2B). Stellate hairs also occur on the stems and inflorescences, but at a lower density than leaf under-surfaces.

Terminal and axillary inflorescences are found on the same plant (Fig. 1B) and have a complex structure comprising of a condensed panicle, with flowers borne on individual pedicels, each subtended by a bract (Fig. 2C). Sepals are green, with five lobes fused around the midpoint. The corolla of the flowers is white, with free petals. Male parts (androecium) consist of partially fused filaments, forming a short tube at the base with free portions at the apex (Fig. 2C). In sharp contrast to the white petals, the stamens bear bright orange pollen (Fig. 2C). The fruits are schizocarps, or fruits that split off into separate segments (mericarps) when dry and ripe; individual mericarps are three-seeded (Fig. 2D).

In the field, the species is most recognizable through a combination of characters, principally cordate to cordate-lanceolate leaves, presence of two to three reduced leaves on the distal region of the branches, congested inflorescences, white flowers and the five-part fruits. Superficially, the species may be mistaken for other members of the Malvaceae such as *Sida* and *Abutilon*, but the lack of teeth on the leaf margins, paniculate inflorescence and distinctive fruits distinguishes *W. contracta* from species of those genera.

Record. 16°53.306'S, 145°41.052'E Redlynch, QLD., east flank of railway at an altitude of 135 m a.s.l, 18 JUN. 2021 G Horner, DYP Tng collectors, single fertile specimen (Fig. 3). The specimen will be deposited in the Queensland Herbarium (BRI), Mt Coot-Tha, Brisbane.



Figure 3. Pressed specimen of *Wissadula contracta* collected from Redlynch.

Note the distinctly greyish leaf undersides and the conspicuously smaller leaves bearing inflorescences (condensed panicles) in their axils. Top left: an excised inflorescence with a fruit.

Discussion

It is most likely that *Wissadula contracta* is an introduced species in Australia. The fact that the list of associated plants in the locality we found the specimen are primarily environmental weeds lends support to this suggestion.

While we cannot say for sure how the species got into Australia, we speculate that the species may be an historical introduction. Kamerunga and Redlynch, approximately 600 m northeast of the record was formerly the site of the Kamerunga State nursery, later renamed the Kamerunga Research Station. The nursery was established in 1889, as an initiative of the newly formed Queensland Dept. of Agriculture, with an emphasis on experimenting with tropical crops with a commercial interest (Anon 2005). Ebenezer Cowley, the first director, introduced a wide range of economic tropical crops, including fibre plants, to assess their economic potential (Stephens 1984). In 1940, the

grounds were reacquired by the Queensland Dept. of Agriculture and stocked for use as a Horticultural Research Station which existed until recently (QDPI 1987). During these early periods, *W. contracta* may have been introduced to the area by railway workers, livestock or visitors walking the railway track.

Wissadula is poorly known in Australia; a search of Atlas of Living Australia (2021) records showed no observations under *Wissadula*, and there are no specimens at BRI or the Australian Tropical Herbarium. The Malvaceae section of the Queensland Plant Census 2020 lists a single record of a different species, *Wissadula grandifolia*, as being doubtfully naturalized (Guymer 2020). The census states that “Doubtfully naturalised” species have populations that may be in the early stages of naturalisation and not yet established in the landscape, or their continued existence in the landscape may be doubtful (Brown & Bostock 2020). Given we observed one small but viable population of *W. contracta*, the species probably falls under the same ‘doubtfully naturalized’ category.

With a documented preference for disturbed areas (Bovini & Baumgratz 2016), it is not implausible that the species may be recorded in other locations. We have not found any evidence of the species becoming a serious weed within its distributional range, but follow-up surveys for new populations of *W. contracta* will help to better understand its potential range and invasive potential, and to develop recommendations for its management.

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References

- Anon. 2005. *Cairns Plan 2005*. https://www.cairns.qld.gov.au/__data/assets/pdf_file/0020/6716/District.pdf, viewed 7 July 2021.
- Atlas of Living Australia. 2021. <http://www.ala.org.au>, accessed 30 June 2021.
- Backer CA. 1963. Malvaceae (*Wissadula*). In: *Flora of Java*, eds. CA Backer, RC Bakhuizen van den Brink, p. 424. Rijksherbarium: Leiden.

- Bovini MG, Baumgratz JFA. 2016. Taxonomic revision of *Wissadula* (Malvoideae, Malvaceae) in Brazil. *Phytotaxa* 243: 201-234.
- Brown GK, Bostock PD. 2020. *Introduction to the Census of the Queensland Flora. 2020*. Queensland Department of Environment and Science, Queensland Government.
- da Costa RC, de Araújo FS, Lima-Verde LW. 2007. Flora and life-form spectrum in an area of deciduous thorn woodland (caatinga) in north-eastern, Brazil. *Journal of Arid Environments* 68: 237-247.
- Guymer GP. 2020. Malvaceae. In *Census of the Queensland Flora 2020*, eds. GK Brown & PD Bostock. Queensland Department of Environment and Science, Queensland Government. <https://www.data.qld.gov.au/dataset/census-of-the-queensland-flora-2020/resource/ebca558a-c015-425a-826e-343c878ac000>, accessed 30 June 2021.
- Queensland Department of Primary Industries (QDPI). 1987. *Kamerunga Horticultural Research Station: Centenary Open Day*. Queensland Department of Primary Industries: Redlynch.
- Stephens SE. 1984. *Horticulture in Far North Queensland*. <http://rffcarchives.org.au/Next/PeoplePlaces/NQHortHistory5-84.htm>, viewed 9 July 2021.
- Waalkes JB. 1966. Malesian Malvaceae revised. *Blumea* 14: 1-213.