

The status of *Albizia lebbek* (Fabaceae: Mimosoideae) in Western Australia

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SHORT COMMUNICATION

The Raintree, Siris or Indian Siris (*Albizia lebbek* (L.) Benth.) occurs from east Africa through south-east Asia to northern Australia (Nielsen 1985). The species is widely planted in the tropics and is now pan-tropical in distribution and naturalised in many tropical countries, making its exact original range obscure (Nielsen 1985). As with many pan-tropical species this has made determining the status in Australia problematic. The species is currently listed as native to Western Australia, and the author was requested to attempt to ascertain whether weedy and native populations occur in the State as guidance for management in reserves, where the species was behaving as an invasive weed.

Status in Australia

Bentham (1864) in his *Flora Australiensis* treatment of *Albizia* recorded only *A. canescens* Benth., as native to Australia. He noted that *Albizia lebbek* was present around Brisbane (presumably cultivated, although not stated and no collection was cited). This has led to the species often being regarded as naturalised in Australia, including in the recent *Flora of Australia* treatment (Cowan 1998), where four species of *Albizia* are recorded as present in Australia and *A. lebbek* is listed as entirely naturalised with older and more recent introductions. However, Bentham was apparently unaware of a very early collection of *A. lebbek* from Careening and Brunswick Bay in the Kimberley of Western Australia made in 1820 by Allan Cunningham, the botanist with Phillip Parker King on the Mermaid. Duplicates of the collection *A. Cunningham* 301 are present in CANB (CANB 259077.1, *n.v.* and NSW 581819, photo seen!). Both of these collections were determined by Cowan for his treatment in the *Flora of Australia*. This is before European settlement of Northern Australia. Other later, but still early collections, were made from Thursday Island, Queensland in 1883 and 1885.

The species is now regarded as native to tropical Australia by most authorities and the current Australian Plant Census list (Council of Heads of Australasian Herbaria 2006–) gives the species as native and naturalized in Western Australia, native to the Northern Territory and naturalized for Queensland. Individual state and territory sources provide more detail and slightly different conclusions, as follows.

In the Northern Territory *A. lebbek* is listed as native (Dunlop *et al.* 1995), but uncommon in sandy coastal vine thickets (Liddle *et al.* 2004). In Queensland, *A. lebbek* is regarded as native only to

North Queensland (Cook Pastoral District, Cape York Peninsula), but widely naturalised outside the native range in north and east Queensland (Brown 2021). The species is noted as being particularly weedy around Charters Towers and Townsville. Naturalised material in Queensland is thought to have resulted from seed imported from Asia, most likely India (Zich *et al.* 2020).

Wheeler *et al.* (1992) noted that this species is probably native to Australia, hence Western Australia, but widely planted. *Florabase* (Western Australian Herbarium 1998–) followed this allocation, listing the species as native to Western Australia. Hussey *et al.* (2007) noted that *A. lebbeck* is native and naturalised in Western Australia.

Weed status World-wide

Albizia lebbeck is recorded as naturalised in tropical South America, United States (California and Florida), several Caribbean Islands, La Reunion and many Pacific Islands (Cook, Hawaii, Fiji, New Caledonia and Tonga). It is a serious and declared weed in Florida, Puerto Rico, Bahamas, Venezuela and South Africa (Randall 2017).

Status in Western Australia

The Kimberley Rainforest Survey (Kenneally *et al.* 1991) found that *A. lebbeck* was an uncommon component of sandy near-coastal vine thickets from the islands off the northern tip of the Dampier Peninsular and coastal sites west of Kalumburu. It is found in vine thickets on Kimberley islands (Lyons *et al.* 2014) from Sunday Island to Sir Graham Moore Island. Populations occur inland in scattered localities especially in the gorges of the Wuanaamin Miliwundi Ranges. Normally inland populations are found alongside rivers, rocky sites (limestone and basalt), but rarely in savanna woodland (perhaps because of frequent fires). An interesting common name for the species was noted for cultivated material at Kings Park Botanic Garden – Broome Rain Tree. Unfortunately, the species is not native to Broome; Kimberley Rain Tree would be a better choice.

This species, with other woody weeds such as *Leucaena leucocephala* (Lam.) de Wit, is proving to be a serious invasive species in the Darram Conservation Park, around Lake Kununurra. The management plan recorded *A. lebbeck* as present in over 326 hectares of the reserve (Ord Land and Water 2012), seeding prolifically from previous plantings especially after floods. The flat indehiscent pods are also widely dispersed by the wind especially during storms. *Albizia lebbeck* has been subject to removal from the Darram Conservation Park as a naturalised alien for over a decade.

Because the species was listed as native to Western Australia, the author was requested to attempt to ascertain and map weedy and native populations as guidance for management of these and other conservation reserves. Removal of a native species requires a formal clearing permit, unless the plants are adversely affecting conservation/biodiversity values of a reserve and there is an approved management plan that identifies the species as an issue. This issue is clarified in advice for the management of *Typha orientalis* C.Presl (Passaretto 2019).

Albizia lebbeck is widely planted throughout Western Australia, from Perth to Kununurra, including apparently widely as shade trees around homesteads on northern pastoral stations, as evidenced by collections from Lake Violet Station, Charnley River Homestead, Mount Elizabeth Station and Mitchell Plateau Mining Camp.

Naturalised populations are known from Exmouth: *G.J. Keighery & K. Lilburn s.n.* (BRI, PERTH 09428534, 09428526); Dampier: *G.J. & B.J. Keighery* 899 (PERTH 07851871); Port Hedland: *E.T. Bailey* 1-53 (PERTH 01653644); Broome: *L.S.J. Sweedman* 6967 (K *n.v.*, PERTH 08032637); Derby: *G.J. Keighery* 17503 (CANB, PERTH 09100318) and Kununurra: *T. Handasyde* TH 8288 (BRI *n.v.*, CANB *n.v.*, DNA *n.v.*, NSW *n.v.*, PERTH 09294325, 09294333), *I. Radford* IR *s.n.* (BRI *n.v.*, CANB *n.v.*, DNA *n.v.*, PERTH 09294309).

Characteristics of Alien *A. lebbek* (key characters for the naturalised plants are in bold)

Deciduous unarmed **tree, to 30 m**, in open sites forming a spreading habit, occasionally multi-stemmed, to 25 m tall and 30 m across with low branching. Capable of developing root suckers and densely coppicing from cut stumps. Bark rough, grey, flaky, inner bark reddish. Stems terete, green, puberulous-pubescent when young, rapidly becoming glabrous and grey-brown. Leaves bipinnate with (1–)2–4(–5) pairs of pinnae along a **rachis 8–9 cm long**. Pinnae comprise a rachilla 5–10 cm long, bearing 3–11 pairs of asymmetric (midrib closest to abaxial margin), oblong to elliptic-oblong **leaflets 4.5–6.5 cm long, 1.5–3.5 cm wide**, nycastic when young, fixed in older leaves. Inflorescence terminal or axillary and then often 2 or more per axil, consisting of a 5–9 cm diameter semi-globular cluster of 15–40 flowers; peduncles 5–10 cm long. Flowers fragrant; pedicels 1.5–4.5 mm long; calyx puberulous 3.5–5 mm long; corolla 5–11 mm long, terminating in 5 triangular lobes pubescent at apex; filaments numerous, 1.5–3 cm long, fused at the base, predominantly white to cream in colour, tipped pale green, becoming dark yellow with age. Pods flat, glabrous, coriaceous, indehiscent, **12–35 cm long, 4–8 cm wide**, undulating along sutures, light yellowish-brown when mature, containing 3–12 seeds. Seeds brown in colour, flattened, ellipsoidal, 6–11 mm long, 6–9 mm wide and 1–1.5 mm thick.

In general alien *A. lebbek* plants are single stemmed tall trees, with larger, longer leaves and leaflets that are always glabrous at maturity, compared to the native populations. Their canopies are dark green and dense compared to native plants. Their seed pods are also larger. However, these characteristics are only readily discernible in population samples. Some inland populations along rivers in the Kimberley are tall trees and are very difficult to allocate to native or naturalised plants.

As noted by Zich *et al.* (2020) it will become increasingly difficult to differentiate overseas and weedy populations in the future, unless a genetic marker can be found, making it essential that plantings of *A. lebbek* are not undertaken near native populations in conservation reserves.

Conclusions

In Western Australia *Albizia lebbek* should be regarded as native to the Kimberley, in the IBRA regions (Department of the Environment 2013) of Dampier, Central Kimberley and North Kimberley, but not the Ord-Victoria Plains or the Victoria-Bonaparte IBRA regions. Elsewhere in Western Australia and also in some situations within the native range as noted above, plants of the species are cultivated and/or naturalised and are probably of overseas origin. As a result, these populations have been annotated as ‘Weedy Biotype’ in PERTH collections. Thus, *Florabase* (Western Australian Herbarium 1998–) currently lists the species as both native and naturalised.

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