

***Acacia longinqua* (Leguminosae: Mimosoideae), a new phyllodinous species with Australian affinities from Wetar Island, Indonesia**

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ABSTRACT. *Acacia longinqua* G.J.Leach & Maslin, which belongs to *Acacia* sect. *Juliflorae*, is described from two collections from Wetar Island, Indonesia. This species is most closely related to *Acacia elachantha* M.W.McDonald & Maslin and *A. leptocarpa* A.Cunn. ex Benth. from which it differs most obviously in having a lower stature, generally shorter phyllodes with minor veins frequently anastomosing to form clearly elongated vein islands, generally smaller pods and seeds with the funicle not clearly thickened into an aril. It also has affinities with *Acacia gonoclada* F.Muell. from which it differs most obviously in mature branchlets less prominently angled and glabrous, phyllodes shallowly recurved with the minor veins more widely spaced and forming an elongated reticulum, and spikes less densely flowered. The three relatives are all widespread in northern Australia with *Acacia leptocarpa* extending to the island of New Guinea.

Keywords. Lesser Sunda Islands, Malesia, Mimoseae, taxonomy

Introduction

The first published reference to the new species described here from Wetar Island (which is located in the Lesser Sunda Island group, Maluku Province, Indonesia) was that of Nielsen (1992: 59) who included it within his circumscription of *Acacia leptocarpa* A.Cunn. ex Benth. *Acacia leptocarpa* was then known to be widespread in northern and northeastern Australia with outliers on the island of New Guinea (fide Pedley 1975: 19) which lies about 2000 km east of Wetar. Nielsen's treatment was based on the first known herbarium collection of the species that was made in 1990 by staff of the Australian Tree Seed Centre in Canberra, namely, *B.V. Gunn & M.W. McDonald BVG 1989*. In correspondence with the second author (B.R.M.) in 1992, Ivan Nielsen clarified his taxonomic decision concerning the species in the following ways: "*Gunn & McDonald BVG 1989* seems to be a form of *A. leptocarpa* from an exposed habitat, as far as I can judge from the xerox [of the specimen that he had been provided]. The phyllodes are three veined and the specimen falls within the

variation of that species except for the short spikes and slightly more narrow seeds.” The species was subsequently mentioned by McDonald & Maslin (1997: 317) who considered that it was probably new and related to their new species, *Acacia elachantha* M.W.McDonald & Maslin.

The only other material of the new species known to us was collected by Clyde Dunlop and the first author (G.J.L.) during a botanical survey in the north-central region of Wetar Island. The flora survey was part of an environmental impact assessment commissioned by PT Prima Lirang Mining for development of the Kali Kuning mine adjacent to the then existing Lerokis mine site. The subsequent report (Leach & Dunlop, 1993) recorded 235 plant species which more than doubled the then known number of plant species recorded from Wetar Island. The top set of the herbarium voucher specimens was deposited at the Bogor Herbarium as per the permit conditions.

Leach & Dunlop (1993) regarded this species of *Acacia* as new and recognised its relationship to another widespread species of northern Australia, *A. gonoclada* F.Muell.

The new species described here belongs to *Acacia* section *Juliflorae* (Benth.) C.Moore which is one of seven sections recognised for the genus by Pedley (1978). Although this infrageneric classification is a convenient way of grouping the almost 1,100 species of *Acacia*, it is largely an artificial scheme that does not define monophyletic groups (Murphy, 2008). A synopsis of this infrageneric classification is provided in Murphy & Maslin (2023). Species of *Acacia* section *Juliflorae* are defined as having multi-veined phyllodes and flowers arranged in cylindrical spikes. A majority of the 295 species of *Acacia* section *Juliflorae* are confined to Australia where they are widespread and also form a conspicuous element of the arid zone landscapes; Hnatiuk & Maslin (1988) discuss details of the phylogeographic patterns of species-richness of *Acacia* and its sections within Australia.

Including the species described here there are only 18 species of *Acacia* that occur naturally outside Australia, of which 10 species belong to *Acacia* section *Juliflorae* and these are distributed in islands of the Pacific, New Guinea and southern islands of Indonesia, with half of them also occurring within Australia. The five *Juliflorae* taxa that are exclusively extra-Australian are *Acacia* × *mangiiiformis* Maslin & L.A.J.Thomson (New Guinea island), *A. peregrinalis* M.W.McDonald & Maslin (Papua New Guinea), *A. spirorbis* subsp. *spirorbis* (Pacific islands) and two species that are endemic on Wetar Island, namely, *A. wetarensis* Pedley and the new species that is described here. The two Wetar Island endemics occur in different sub-groups of *Acacia* section *Juliflorae*: *A. wetarensis* belongs to the informal *A. aulacocarpa* A.Cunn. ex Benth. sub-group (McDonald & Maslin, 2000) and the new species described here belongs to the informal *A. cowleana* Tate sub-group (McDonald & Maslin, 1997). Within Australia these two sub-groups of species predominate in the northern tropical/sub-tropical and arid zone parts of the country.

Taxonomy

Acacia longinqua G.J. Leach & Maslin, **sp. nov.**

TYPE: Indonesia, Maluku Province, Wetar Island, Kali Kuning River, 7°42'S 126°18'E, 13 May 1993, *G.J. Leach & C.R. Dunlop GJL 3771* (holotype DNA; isotypes BO, BRI, CANB, K, L, NSW, PERTH [03241521], SING). (Fig. 1)

[*Acacia leptocarpa* auct. non A.Cunn. ex Benth.: Nielsen, Fl. Males., ser. 1, 11(1): 47–57 (1992), pro parte, as to *Gunn & McDonald BVG 1989*.]

Shrub spindly, to 1.5 m high. **Bark** smooth, reddish (in crown). **Branchlets** slender, at extremities 3–4 angled, and very sparsely hairy with appressed hyaline simple hairs, but soon becoming terete and glabrous, reddish brown, not resinous. **Stipules** minute (c. 1 mm long), caducous. **New shoots** glabrous, resinous upon initiation but (at least when dry) not viscid. **Phyllodes** narrowly elliptic, narrowed towards the base, 75–105(–120) × 10–16(–18) mm, 6–10 times as long as wide, shallowly to obviously falcately recurved, thinly coriaceous, glabrous; *longitudinal veins* numerous and normally dull yellowish when dry, with 2 main veins more prominent than the rest and often a sub-prominent vein on their adaxial side, the main veins confluent or contiguous for a short distance above the pulvinus but remaining separate from the margins, the sub-prominent vein visible only in lower half of phyllode; *minor veins* mostly parallel to main veins and ± widely spaced (mostly 0.3–0.6 mm apart and (1–)2–3(–4) per linear mm), rather frequently anastomosing to form longitudinally orientated, clearly elongated vein islands mostly 4–7 mm long; *marginal vein* narrow but discrete, dull yellow; *apices* obtuse with a callosity to 1 mm long; *pulvinus* 2–4 mm long, glabrous to sparsely hairy. **Gland** 1, situated on upper margin of phyllode 0–2 mm above pulvinus, obscure, circular, c. 0.3 mm diam. **Inflorescences** comprising 1 or 2 pedunculate spikes arising within axil of phyllodes; *spikes* somewhat interrupted, with the receptacle often visible between flowers, 17–20(–32) mm long at anthesis (when dry), golden yellow; *peduncles* 6–10 mm long, glabrous or sparsely appressed-hairy; *receptacles* mostly glabrous, rarely some sparsely hairy. **Flowers** 5-merous; *calyx* (0.3–)0.4(–0.7) mm long, gamosepalous, dissected for c. ¼ or less of its length into ± broadly triangular, mostly glabrous lobes, calyx tube without obvious veins and often having few, short hyaline hairs mostly at base; *corolla* 1.3–1.5 mm long, dissected for c. 2/3 of its length, glabrous, veins not visible or midvein very indistinct; *ovary* densely pubescent. **Pods** normally 20–30(–40) × 2–2.7(–3) mm, linear, conspicuously raised over the seeds and mostly slightly constricted between them (few pods straight-edged), straight to very shallowly curved, thinly coriaceous-crustaceous to ± chartaceous, dark brown, smooth to slightly wrinkled, very sparsely appressed-hairy as on branchlets, marginal vein not prominent, veins on surface of valves not visible or very obscure, basal stipe slender and 1–2 mm long, apex acute. **Seeds** (1–)2–4 per pod, longitudinally aligned in pods, obloid, 3.5–4 × 1.5–2 mm, dark brown to black, shiny; *pleurogram* obscure; *areole* elongated u-shaped, open at hilar end, 2–3 × 0.6–0.8 mm; *funicle* linear and fleshy but not expanded into a prominent aril at attachment to seed, 2–3 times folded beneath the

seed, less than $\frac{1}{2}$ the length of the seed when unexpanded, cream coloured to very pale yellow when dry (fresh colour unknown).

Distribution. Endemic to Wetar Island, Maluku Province, Indonesia, where it has been collected from only two localities c. 40 km apart, one in the north-central area of the island, the other in the southwest of the island. In addition to the type location, the species was recorded as observed in the nearby Lerokis mine site (Leach & Dunlop, 1993). Judging from this distribution, the rugged terrain and from the distinctive vegetation type in which this species grows (see below) it would not be surprising if *Acacia longinqua* is shown in the future to be more common on Wetar than current knowledge indicates.

Habitat. Recorded from 200–600m on steep, rocky ridges in open woodland on clay soils. The associated species comprise *Eucalyptus alba* Reinw. ex Blume, *E. urophylla* S.T.Blake and at least sometimes, *Acacia wetarensis* Pedley. Common associates also include perennial shrubs such as *Styphelia acuminata* (R.Br.) Spreng. (Ericaceae) and *Gompholobium subulatum* Benth. (Fabaceae) and grasses such as *Eriachne pallescens* R.Br., *Themeda arguens* (L.) Hack. and *Eulalia leschenaultiana* (Decne.) Ohwi. The aforementioned species constitute a distinctive vegetation type, one that shows strong affinities with the Australian flora.

Phenology. The paucity of collections prevents our providing a meaningful assessment of flowering and fruiting phenology for this species. All that can be said is that the two collections known to us have both flowers (mostly in bud) and fruits with mature seed when collected in May and August.

Etymology. From the Latin *longinquus* (feminine *longinqua*) meaning distant in time or space; alluding to the geographical separation from its Australian relatives and the time it has been evolving on its own.

Provisional IUCN conservation assessment. *Acacia longinqua* is known from two herbarium specimens collected at locations about 40 km apart and an observational record near the type specimen location. These records are all from *Eucalyptus urophylla* woodland. Wetar Island is not well surveyed botanically and the extent of the vegetation type described above is not known. Although mining continues on the island, there is no data to assess the extent, if any, of threats to the species, nor are there data on population numbers or dynamics. The appropriate status is therefore considered to be ‘Data Deficient’ (IUCN Standards and Petitions Committee, 2024).

Additional specimen examined. Indonesia: **Maluku:** Wetar Island, “Taletti”, 45 minutes walk north of Telemar Village, 7°54’S 125°58’E, 21 Aug. 1990, *Gunn & McDonald BVG 1989* (CANB, PERTH).

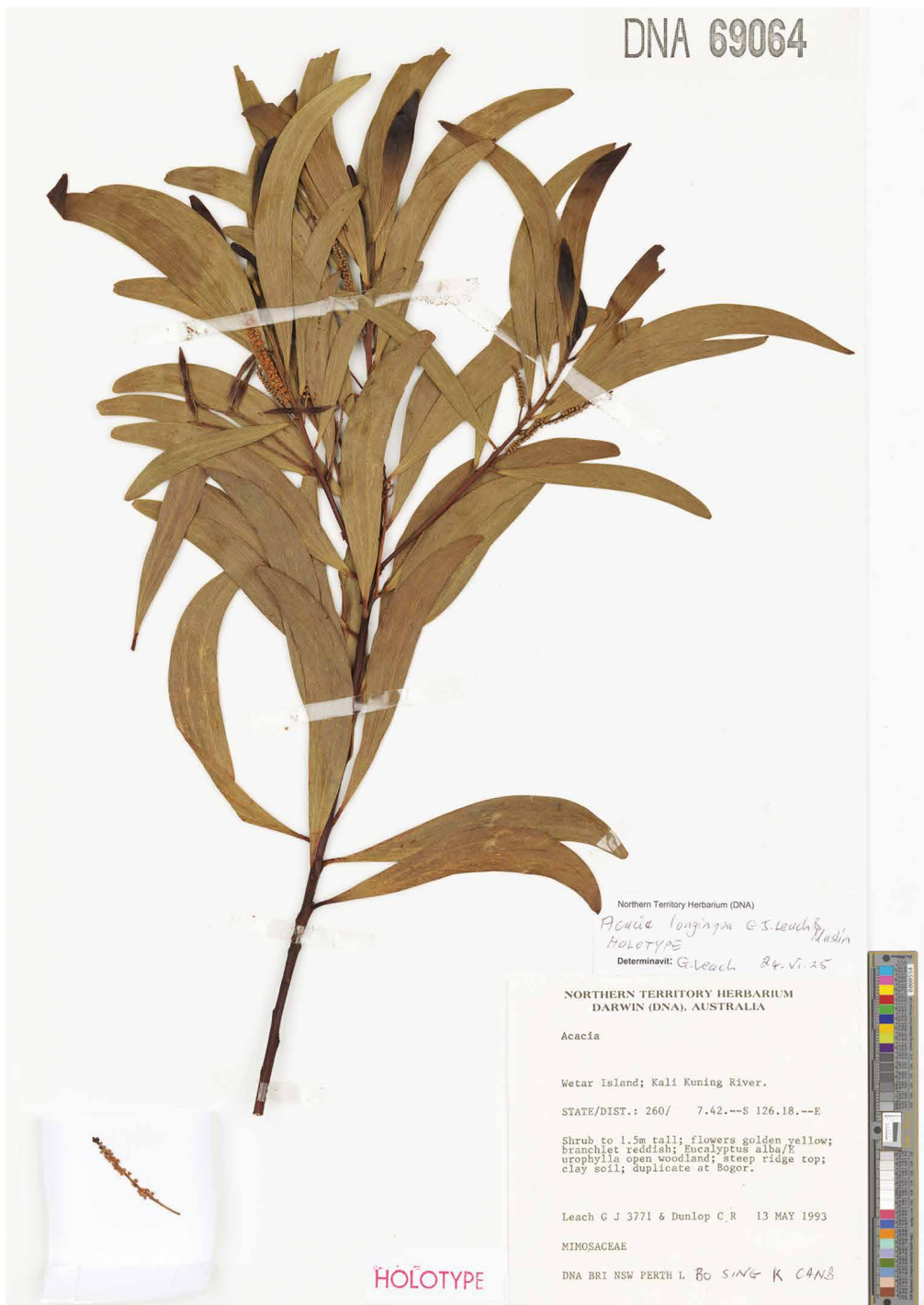


Fig. 1. Holotype of *Acacia longinqua* G.J. Leach & Maslin.

Notes. *Acacia longinqua* belongs to *Acacia* section *Juliflorae* (Benth.) C.Moore and is morphologically most closely related to *A. elachantha* and *A. leptocarpa* (which belong to the above-mentioned informal *A. cowleana* sub-group of species) and also has affinities with *A. gonoclada* F.Muell. The three relatives are all widespread in northern Australia with *Acacia leptocarpa* extending to New Guinea.

The new species has clear affinities to the Australian flora and occurs on Wetar Island within vegetation that includes distinctive Australian taxa such as *Eucalyptus*, *Styphelia* and *Gompholobium*. *Eucalyptus* is the dominant genus of the tree layer in this vegetation and is a poor seed disperser (Booth, 2017). The description of this phyllodinous species of *Acacia* provides further evidence that this vegetation type is probably remnant from a period when this area was connected by land bridges with the Australian landmass.

The more important characters that *Acacia longinqua* shares with *A. elachantha* and *A. leptocarpa* are: phyllodes rather large, falcately recurved and longitudinally pluriveined (with main 3 veins more prominent than the rest and normally running together at the phyllode base but remaining separate from the margins, the minor veins somewhat widely spaced with at least some anastomosing), spikes rather interrupted, flowers 5-merous, calyx gamosepalous and shallowly dissected into broadly triangular lobes. These three species also have similar carpological features (apart from pod length).

Table 1 summarises the ways in which these three relatives can most readily be distinguished from *Acacia longinqua*, and further details are provided below.

Acacia leptocarpa is typically a tree (to 15 m tall); phyllodes are generally larger (normally 12–21 cm long and 1–3.5 cm wide), more conspicuously tapered at their base and possess minor veins that are generally more widely spaced (0.5–1 mm apart), only occasionally anastomosing and do not form vein-islands; spikes longer (normally 35–70 mm); pods much longer (8–15 cm) and rather strongly curved to variously twisted; and seed funicle/aril in its unexpanded state is more than ½ the length of the seed.

Acacia elachantha is normally a larger shrub (2–3 m) or small tree 5–6(–8) m tall; phyllodes are often longer (8–19.5 cm) and possess few (but consistently present) anastomosing minor veins that do not form vein-islands or few vein-islands imperfectly developed; gland (at base of phyllodes) oblong-elliptic, larger (0.8–1.5 × c. 0.7 mm) and more prominent; pods generally larger (mostly 4–8 cm long and 3–3.5 mm wide); and funicle expanded into a conspicuous aril at attachment to seed. McDonald & Maslin (1997) recognised *Acacia elachantha* as comprising two distinctive variants, the typical (hairy) variant and a glabrous variant (which now has been assigned the informal name within Australia of *A. sp.* “Urangandie”. It should be noted here that aforementioned characters for *Acacia elachantha* apply to both these variants. The typical variant can be further and very easily distinguished from *Acacia longinqua* by the sericeous indumentum found on the new shoots, upper branchlets and intermediate-aged phyllodes and *A. sp.* “Urangandie” by its glabrous and lightly pruinose branchlet apices, widely spaced (mostly 0.5–0.8 mm apart) minor veins on phyllodes and glabrous ovaries. Further details concerning these two variants are provided in McDonald & Maslin (1997: 315–317).

Table 1. Principal morphological characters distinguishing *Acacia longinqua* and its relatives as discussed in the text, namely, *A. elachantha*, *A. gonoclada* and *A. leptocarpa*. Note: 1) The attributes for *A. elachantha* include those for both the typical (hairy) and glabrous variants of the species, as noted in text. 2) Data presented here is derived from herb. DNA and PERTH specimens, McDonald & Maslin (1997), and from descriptions provided in Flora of Australia Online (continuously updated).

Character	<i>Acacia elachantha</i>	<i>Acacia gonoclada</i>	<i>Acacia leptocarpa</i>	<i>Acacia longinqua</i>
Habit	Shrub 2–3 m or small tree 5–6(–8) m tall	Shrub or tree to 4 m tall	Tree to 15 m tall	Shrub to 1.5 m tall
Penultimate branchlets	Terete, glabrous or sericeous	Obviously angled; hoary	Terete, glabrous	Terete; sparsely appressed-hairy or glabrous
Phyllode length	8–19.5 cm	5–13.5 cm	12–21(–27) cm	7.5–10.5(–12) cm
Phyllode curvature	Falcately recurved	Straight or shallowly incurved	Falcately recurved	Falcately recurved
Phyllode minor vein anastomoses	Few; not forming vein-islands or vein-islands imperfect	Rare; not forming vein-islands	Rare; not forming vein-islands	Rather frequent; forming elongated vein-islands
Distance apart phyllode minor veins	0.2–0.7 mm	< 0.1–0.2 mm	0.5–1 mm	0.3–0.6 mm
Phyllode base	Narrowed but not obviously tapered	Narrowed but not obviously tapered	Obviously tapered	Narrowed but not obviously tapered
Phyllode gland shape	Oblong-elliptic	Circular or oblong-elliptic	Circular or oblong-elliptic	Circular
Phyllode gland size	0.8–1.5 × c. 0.7 mm	0.5–1 mm long	0.3–0.5 mm long, obscure	c. 0.3 mm diam.
Spike length	15–33 mm	10–50 mm	35–70 mm	17–20(–32) mm
Spikes	Somewhat interrupted (flowers sub-densely arranged)	Not interrupted (flowers close together)	Somewhat interrupted (flowers sub-densely arranged)	Somewhat interrupted (flowers sub-densely arranged)
Pod length	4–8 cm	2–4.5 cm	8–15 cm	2–3(–4) cm

Table 1 (continued).

Character	<i>Acacia elachantha</i>	<i>Acacia gonoclada</i>	<i>Acacia leptocarpa</i>	<i>Acacia longinqua</i>
Pod curvature	Straight to shallowly curved	Straight to very shallowly curved	Strongly curved to variously twisted	Straight to very shallowly curved
Seed funicle/aril length (unexpanded)	Less than ½ to ± equalling length of seed	Less than ½ the length of the seed	More than ½ the length of the seed	Less than ½ the length of the seed
Seed aril prominence	Prominent	Prominent	Prominent	Not prominent
Seed aril colour (when fresh)	Bright yellow	White	Bright yellow-orange	Unknown (very pale yellow when dry)

Acacia gonoclada resembles *A. longinqua* particularly in its carpological features and it was Leach & Dunlop (1993) who first recognised this relationship. However, *Acacia gonoclada* can be distinguished from the new species in the following ways: branchlets more obviously angled and hoary; phyllodes straight or shallowly incurved and possessing more closely spaced minor veins (4–7 per mm) that rarely anastomose and never form a reticulum; and spikes more densely flowered with the receptacle not visible between flowers.

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