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ROYAL BOTANIC GARDENS VICTORIA

Acacia ureniae (Fabaceae: Caesalpinioideae), a new, rare wattle from eastern Victoria

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Introduction

A visit in January 2019 to privately owned bushland in the Cobungra (eastern Victoria) district allowed for a botanical survey in an area that has, to date, received little attention. Although the higher altitude parts of Cobungra, traversed by the Great Alpine Road, are readily accessible in many places, the Cobungra River has few points of easy approach. The visited property, 'Sinza', comprises ca. 40 ha of mature, subalpine woodland, mostly of northerly and north-westerly aspect, ranging from about 930 to 1000 m a.s.l. Numerous species of interest, including several listed as threatened under the Victorian Government Flora and Fauna Guarantee Act 1988, and others while not formally listed, acknowledged as vulnerable or endangered in the state (DEPI 2014) occur on the property. A surprising find was an *Acacia*, vegetatively superficially resembling some forms of *Acacia longifolia* (Andrews) Willd. or *A. melanoxylon* R.Br., but clearly neither of those species. The plants were in early bud. A subsequent visit to the property in October 2019 allowed collection of flowering specimens and an assessment of its local abundance.

Searches in the National Herbarium of Victoria, Royal Botanic Gardens Victoria (MEL), showed it to be distinct from any named species. A further two collections of the same entity, from sites within ca. 15 km of the Cobungra occurrence, were found at MEL, having previously been

Abstract

Acacia ureniae, a new species of the '*Acacia longifolia* group' from the Cobungra area in eastern Victoria is described, illustrated and mapped, and its habitat, distinctions from inferred related species and rarity are discussed. Its distinguishing characteristics include distinctive phyllode venation with the vein reticulum forming more-or-less isodiametric areoles and a lack of an obvious gland on the phyllode margin.

Keywords: Taxonomy, isodiametric reticulum, extra floral nectary, new species

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determined as potential hybrids between *Acacia alpina* F.Muell. and *A. dallachiana* F.Muell., and *A. dallachiana* and *A. phlebophylla* F.Muell. ex H.B.Will. respectively. None of these potential 'parent' species is known to occur in near proximity to 'Sinza', and the nearest area where at least two of these species occur in the same general area is at Mt Buffalo (where all three are found in close proximity). The taxon in question shared some obvious characters with these three species, including relatively stiff phyllodes that are conspicuously reticulate-veined, and spicate inflorescences, but several other features of the Cobungra plants are not possessed by any of these three species. The Cobungra wattle is here described as a new species.

Taxonomy

Acacia ureniae N.G.Walsh sp. nov.

Type: **AUSTRALIA.** Victoria, beside the Cobungra River, 4.7 km due N from Cobungra Rd/Great Alpine Rd junction, 8.x.2019, *N.G.Walsh 8970, E.A.James, J.Milne, L.J.Vaughan, P.Symes, A.U'Ren* (holo: MEL 2470075; iso: CANB, K, NSW *distribuendi*)

Erect *shrub* or small *tree* to ca. 5 m high, mostly single-stemmed from base but often branched from shortly above the ground; *bark* with conspicuous lenticels arranged in discontinuous horizontal lines; *branchlets* slightly angular with 3 low ridges excurrent from the base of each pulvinus, glabrous or occasionally with scattered, subappressed fine pale hairs to ca. 0.5 mm long on new growth. *Pulvinus* 2.5–3.5 mm long. *Phyllodes* rather stiffly erect, narrowly elliptic to narrowly obovate, 55–95 mm long, 7–16 mm wide (length-width ratio ca. 5–6.5), mid-green, dull, glabrous, apex obtuse, midvein and usually 2 longitudinal nerves prominent but not or hardly raised, often with 2–4 less distinct, approximately longitudinal nerves branching off from near the base of the more prominent nerves; reticulation obvious between longitudinal nerves with almost isodiametric areoles ca. 0.5–1 mm long and wide; gland absent. *Inflorescences* simple, spicate, 10–25 mm long at anthesis, 2 (or one by abortion) per axil, sessile; *rachis* very sparsely puberulous; *basal bract* solitary, broadly ovate to oblate, pouched, 2.5–3 mm long, brown, glabrous except for densely but minutely fimbriate margin, caducous; *bracts* subtending individual flowers obovate, ca. 1 mm diam., brown, densely and minutely fimbriate on margin, ±peltately attached to rachis by a thick densely pubescent column; *flowers* crowded on spike, obscuring the rachis, 4-merous, ca. 30–60 per spike, *sepals* broadly elliptic, ca. 1.2 mm long, fimbriate, sometimes with a few short hairs near base, united in the basal half; *petals* broadly ovate, ca. 1.5 mm long, glabrous; *stamens* ca. 3 mm long; ovaries normally 1 per flower (but see note below), minutely densely pubescent or sometimes glabrous, *styles* exceeding stamens by ca. 1 mm at anthesis. *Pods* cylindrical to submoniliform, slightly curved, 70–120 mm long, 3–4.5 mm wide, coriaceous but not much thickened, glabrous, to 12-seeded. *Seeds* longitudinal, flattened-ellipsoid, 4–5 mm long, 2.5–3 mm wide, dull, dark brown; *aril* white, ca. 2.5 mm long, compactly complicate with 2 or 3 bends. (Figs 1, 2a)

Specimens examined: Cobungra River, below Mt Higginbotham at junction with Murphys Creek, 13.i.1991, *R.Thomas 306* (MEL 2011776!); Kings Spur Track, 5.i.1991, *E.A.Chesterfield 3029* (MEL 2013215!, NY); Type locality, 17.i.2019, *N.G.Walsh 8907* (CANB!, MEL!); Type locality, 8.x.2019, *N.G.Walsh 8970a, E.A.James, J.Milne, L.J.Vaughan, P.Symes, A.U'Ren* (MEL!, CANB!, NSW!); South bank of the Cobungra River, 4.6 km NNW from Cobungra Rd/Great Alpine Rd junction, 8.x.2019, *N.G.Walsh 8977, E.A.James, J.Milne, L.Vaughan, P.Symes* (MEL!).

Distribution and habitat: Known from the vicinity of the Cobungra River from near its headwater below Mt Higginbotham to Cobungra settlement, and an isolated occurrence in the Dargo River catchment (the next major catchment to the south), ca. 12 km south of the nearest known occurrence.

Along the Cobungra River, *Acacia ureniae* occurs in riparian scrub and subalpine low forest, within ca. 10 m of the normal river level. At the Murphys Creek junction site, near the river's headwaters (MEL 2011776), the habitat is described as a 'cold air drainage zone', with associated species including *Eucalyptus stellulata* Sieber ex DC., *E. perriniana* F.Muell. ex Rodway and *E. dalrympleana* Maiden. At the type locality and nearby occurrences, it occurs in mostly rocky areas (schist and granite) with associated species including *E. pauciflora* Sieber ex Spreng. subsp. *pauciflora*, *Callistemon pityoides* F.Muell., *Grevillea lanigera* A.Cunn. ex R.Br., *Pomaderris phylicifolia* Lodd. ex Link subsp. *ericoides* (Maiden & Betche) N.G.Walsh & Coates, *Correa lawrenceana* Hook. var. *latrobeana* (F.Muell. ex Hannaford) Paul G.Wilson,

Figure 1. *Acacia ureniae*. **a:** flowering branch (from type plant *in situ*); **b:** seed (from *R.Thomas 306* (MEL), scale bar 1 mm); **c:** bark near base of trunk (from type observed plant *in situ*, ca 20 cm diam.).

Prostanthera phylicoides F.Muell. and *Acacia siculiformis* A.Cunn. ex Benth. The habitat at the Kings Spur site (MEL 2013215) is described as 'open *Eucalyptus pauciflora* woodland'. There is no indication of proximity to a watercourse at this site, and the occurrence is noted as an 'isolated specimen'.

Conservation Status: Owing to the difficulty of access to much of the Cobungra River, survey effort through the known range of *Acacia ureniae* is not high, so its conservation status is speculative at best. Near the type locality plants are uncommon—fewer than 100 plants in total were observed, on both sides of the river, along a ca. 1 km stretch searched in October 2019. More than 20 km separate the known occurrences along the Cobungra River, and a further ca. 10 km of potentially suitable habitat exists downstream to where the river enters highly modified farmland. At the type locality, shrubs of selected species, but primarily *Correa lawrenceana*, have been very heavily browsed by Sambar deer (*Rusa unicolor*). To date, no significant damage to plants of *A. ureniae* has been observed, but it is not known to what extent modification of the environment by Sambar may have on its recruitment and survival in the longer term. The known extent of occurrence (*sensu* IUCN 2012) is about 90 sq. km. Ignoring threats, if the number of locations is assumed to be fewer than five, an IUCN threat category of E, endangered, is supported (IUCN 2012). Further searches in the Cobungra and upper Dargo River catchments are required to allow a confident estimation of the species' threat status.

Etymology: The epithet honours Anne U'Ren whose commitment to conservation has ensured that the property supporting the type population of *Acacia ureniae* is preserved into the future. Anne and her husband Jim, have a deep appreciation of the many botanical values of their property and have had a permanent, legally binding conservation covenant applied to its title.

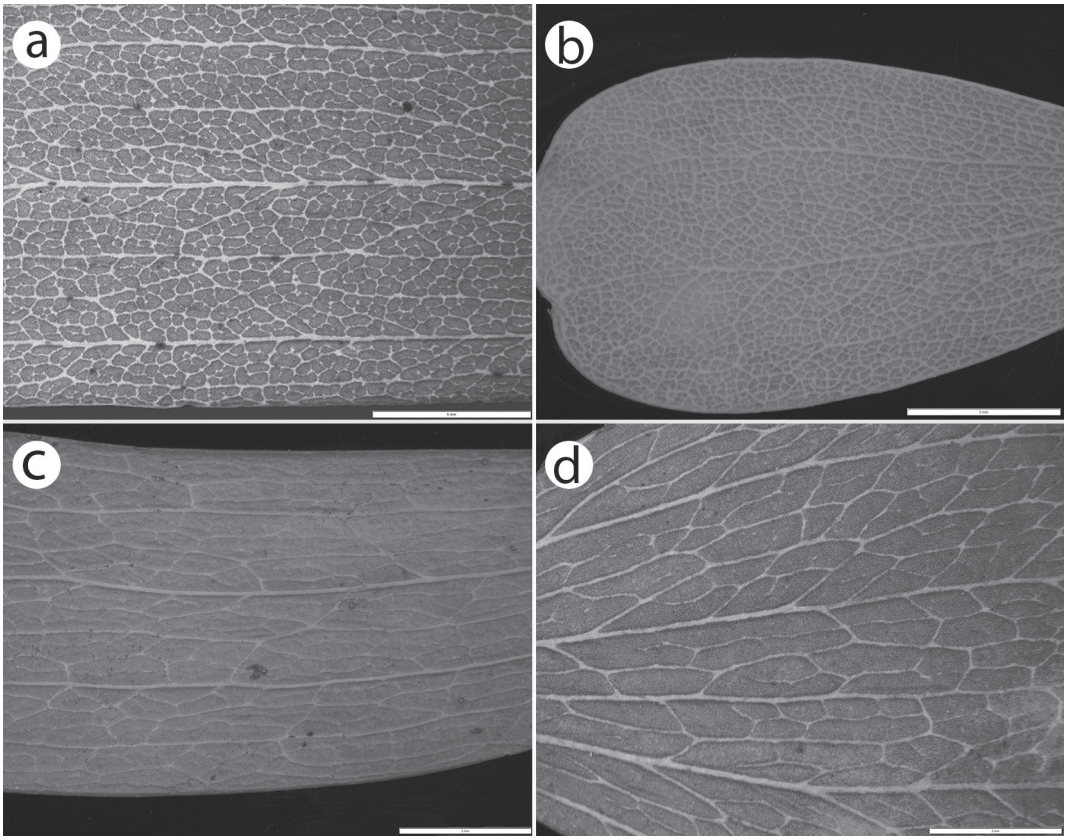

Figure 2. Phyllode reticulum. **a:** *A. ureniae* (from the type); **b:** *A. alpina* (MEL 287714); **c:** *A. dallachiana* (MEL 2063319); **d:** *A. phlebophylla* (MEL 2352868). Scale bars all 5 mm.

Notes: The new species appears most closely related to *Acacia dallachiana* and *A. phlebophylla* in having spicate inflorescences and prominently reticulate secondary venation of the phyllodes. It differs significantly from both of those species in having the reticulum composed of more-or-less isodiametric areoles, whereas both *A. dallachiana* and *A. phlebophylla* have areoles mostly more than three times longer than wide (Fig. 2a, c, d). In those species the nerves that form the boundaries of the areoles are distinctly raised when dry, whereas those of *A. ureniae* are not or only very slightly raised on drying. The apparent lack of a nectary (gland) on the phyllodes and more compact inflorescences are other characters that further distinguish the new species from *A. dallachiana* and *A. phlebophylla*. From *A. dallachiana*, a rare species of north-eastern Victoria and adjacent areas in New South Wales, it further differs in the very compact, upright habit and shorter non-falcate phyllodes (phyllodes of *A. dallachiana* are typically distinctly falcate, 11-20 cm long) and non-pruinose growth tips. From *A. phlebophylla*, which is known only from Mt Buffalo, Victoria (ca. 45 km north-east of the nearest known occurrence of *A. ureniae*), it differs in the much narrower phyllodes (15–60 mm wide in *A. phlebophylla*) and much denser flower spikes (the rachides of the flower spikes of *A. phlebophylla* are clearly evident between individual flowers at anthesis).

Other, superficially similar members of the "Acacia longifolia group" (Brown *et al. 2010*) – a monophyletic plurinerved, spicate-inflorescence group of *Acacia* species from south-eastern Australia (e.g. *A. floribunda* (Vent.) Willd., *A. longifolia*, *A. maidenii* F.Muell., *A. mucronata* Willd. ex H.L.Wendl., *A. obtusifolia* A.Cunn.) either lack a distinct phyllode reticulum, or as in *A. dallachiana* and *A. phlebophylla*, the reticulum comprises elongate areoles. Furthermore,

each of these species, other than *A. floribunda* and sometimes *A. mucronata*, have distinct glands on the phyllode margins. *Acacia alpina*, another member of this group, does share with *A. ureniae* more or less isodiametric areoles (Fig. 2b), but it is a low, often nearly prostrate shrub (rarely to ca 1.5 m high) of more elevated sites (above 1300 m), and has generally shorter (to 50 mm long), relatively broader phyllodes (length-width ratio typically about 2) that are usually glaucous to some extent. The marginal gland on the phyllode is often indistinct, but generally present and terminates a moderately prominent near-basal nerve. Presumed hybrids of *A. alpina* with *A. dallachiana* and *A. phlebophylla* have been collected from Mt Buffalo (MEL 2296005!, MEL 2071016! respectively). They bear a superficial resemblance to *A. ureniae* and the phyllode venation pattern renders more or less isodiametric areoles. However, they differ in the phyllodes being distinctly obovate with raised secondary venation and evident marginal glands, and the flower spikes with fewer, less crowded flowers. A note on MEL 2071016 states '*A. alpina* adjacent to hybrid plants, *A. phlebophylla* within ca. 20 m. Hybrids apparently sterile – both putative parent spp. with pods at time of collection'. The general geographic proximity of *A. alpina*, *A. dallachiana*, *A. phlebophylla* and *A. ureniae* does, however, suggest an ancient centre of origin in the vicinity and/or perhaps a hybridogenous origin of one or more of these species. The uniformity of plants at the Cobungra locality, and the absence of any of *A. alpina*, *A. dallachiana* and *A. phlebophylla* nearby indicates that, if of hybrid ancestry, *A. ureniae* is now a stable species. DNA analysis could help to determine if hybridisation has contributed to its evolution.

Acacia ureniae is very unusual in occasionally producing polygynous flowers (e.g. *N.G.Walsh 8970a et al.*). Up to six ovaries per flower have been observed, but, based on observations to date, normally the flowers have single ovaries, the normal state for *Acacia* (and indeed Fabaceae). Polygynoecy is known in the Western Australian species *A. celastrifolia* Benth., where flowers typically have three to five ovaries (Maslin 2001), but in that species it appears to be the normal condition. It is not closely related to *A. ureniae*, and is a segregate of the widespread, mostly southern Australian species, *A. myrtifolia* (Sm.) Willd.

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Postscript

'Sinza' was revisited in February 2020, following the catastrophic bushfires of summer 2019/2020. Of an estimated 80 plants of *A. ureniae* seen in the 2019 survey of the property, only four were found alive. It is not yet known if the populations on the upper Cobungra River and along Kings Spur (represented by MEL collections *R.Thomas 306* and *E.A.Chesterfield 3029* respectively) were burnt in the same fires, but they are close to, if not within the fire boundary. It is presumed that a new cohort will grow from soil-stored seed – the larger plants that were at Sinza were cohorts from the alpine fires of 2002/2003 – but to some extent, this will depend on favourable conditions for seedling development, rendering the suggested conservation status of Endangered as, at least in the short term, possibly conservative. Further searches are required and conservation seed collections strongly recommended.

References

Brown, G.K., Clowes, C., Murphy, D.J. & Ladiges, P.Y. (2010). Phylogenetic analysis based on nuclear DNA and morphology defines a clade of eastern Australian species of *Acacia s.s.* (section *Juliflorae*): the '*Acacia longifolia* group'. *Australian Systematic Botany* 23: 162–172.

DEPI (2014). *Advisory List of rare or threatened plants in Victoria 2014*. Department of Environment and Primary Industries, East Melbourne, Victoria.

IUCN (2012). *IUCN Red List categories and criteria, version 3.1*, 2nd edn. International Union for the Conservation of Nature, Gland and Cambridge.

Maslin, B.R. (2001). *Acacia celastrifolia*. *Flora of Australia* 11A: 441.