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Xanthostemon melanoxylon (Myrtaceae), a new species from the Solomon Islands

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Abstract

A new species from the Solomon Islands, ***Xanthostemon melanoxylon***, which is effectively restricted to lowland rainforest on ultramafic substrates, is described and its conservation status and relationships discussed.

Introduction

The genus *Xanthostemon* comprises approximately 47 species that are distributed from Australia and New Caledonia through to Sulawesi and the Philippines (Wilson 1996). The single Solomon Islands species was collected as early as 1958 but has remained unnamed despite first being mentioned in the literature following the Royal Society expedition to what was then known as the British Solomon Islands Protectorate in 1965 (Whitmore 1966, 1969). The heartwood of this tree, commonly known locally as *Tubi*, is extremely hard, durable and very dark, and has been compared with ebony. It is of great traditional importance, being used for walking sticks and, particularly, carved posts used to decorate buildings (Henderson & Hancock 1988). This endemic species has a limited distribution and is, therefore, rare. Increasing demand for the wood as a marketable resource has more recently raised conservation concerns due to the possibility of unsustainable harvesting. A conservation strategy for *Tubi* was finalised recently (Bulahite 2004) and the species has now acquired some level of legal protection. A formally published name is required for this species, and this is provided here.

Xanthostemon melanoxylon Peter G. Wilson & Pitisopa, ***sp. nov.***

a X. novoguineense colore ligni ebeneo, venis folii patentibus (vice rectangularibus) reticulo minus prominenti, floribus maioribus (petalis sepalisque maioribus, staminibus longioribus plus numerosis, stylo longiore) differt.

Type: Solomon Islands: Choiseul: Posarae [c. 7°21°S 157°14°E], *F. Pitisopa 13*, 17 March 2005 (holo NSW; iso CANB, BRI, USP, US, K, MO, NY, P, L).

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Tree to 35 m high and 80 cm dbh; outer bark shortly fibrous to scaly, brownish orange, outer blaze red-brown; inner blaze and sapwood mid-brown; heartwood dark brown to black. Young shoots and twigs sericeous, becoming puberulent. Leaves spirally arranged; petiole 5–10 (–19) mm long; lamina obovate to elliptical, (45–)50–90(–145) mm long, (18–)20–45 mm wide, (length:breadth ratio 1.65–2.8:1), subcoriaceous to coriaceous, secondary venation not particularly prominent, branching at 50–60° to the primary vein, apex obtuse to acute or acuminate, puberulent when young, ±glabrescent (hairs often persistent on petiole and midrib); oil glands numerous, conspicuous. Inflorescences crowded at apex of seasonal growth unit, subtended by somewhat reduced foliage leaves, axillary, axes densely white-puberulent; unit inflorescences triads or, rarely, metaxytriads (Briggs & Johnson 1979); peduncles 5–9 mm long; pedicels 3.5–6 mm long; bracteoles narrowly obovate, 3.3–4.2 mm long, 1.1–1.3 mm wide. Hypanthium cup-shaped, puberulent, 4.5–5 mm in diameter, c. 2–3 mm deep, just exceeding the summit of the ovary. Petals (4–)5, red, ovate to obovate, 6.5–7.1 mm long, 4.0–6.1 mm wide, margins ciliate with white hairs. Sepals (4–)5, deltoid to semicircular, somewhat unequal, 1.8–3.6 mm long, 2.0–3.5 mm wide, subglabrous on the outer surface. Stamens c. 30–32, mostly in a single series around the rim of the hypanthium, filaments 17–28 mm long, anthers 0.9–1.1 mm long, connective broad with a conspicuous large gland at the apex and probably other, smaller glands in the connective. Ovary 2.5–3 mm diameter, semi-superior, attached by its broad base, 3(–4)-locular, glabrous. Style 29–35 mm long, exceeding anthers by c. 5–10 mm; stigma narrower than the style. Placentas oblong to elliptical, projecting horizontally to the locular wall; ovules c. 22 per loculus, attached at the apex of the placenta and arranged in an uninterrupted whorl. Fruit broad-ovoid, 7–10 mm diameter, 5–7 mm high; hypanthium initially partly enclosing the base of the fruit; placentas bilaterally flattened, extending at most two-thirds of the way to the capsule wall. Seeds (not seen fully mature), ± deltoid, c. 3 mm long. (Fig. 1).

Selected specimens: Solomon Islands: Isabel Province: St George (San Jorge) Island, *Trenaman BSIP 307*, July 1958 (CANB, BRI n.v.). Choiseul Province: Boeboe, *Pitisopa 1–8*, 18 Nov 2004 (NSW); Posarae, *Pitisopa 9–12*, 18 Nov 2004 (NSW).

Derivation of name: the epithet is derived from the Greek *melas -anos*, black, and *xylon*, wood, in reference to the distinctive hard, dark heartwood.

Common names: *Tubi* (Isabel province – Bugotu, Maringe, Kia, Gao languages); *Rie* (Choiseul province – Avaso, Babatana languages). The common name 'Ebony' has also been used more recently for this species in trade in the Solomon Islands and some other countries due to the similarity of the wood to that of the true ebonies, *Diospyros* spp.

Distribution: this species has only been recorded from southern Isabel Province (San Jorge island and the southern part of Santa Isabel island) and Choiseul Province (south-eastern part of the island of Choiseul). A recent survey (Bulahite 2004) identified nine sites in Isabel Province and six in Choiseul.

Habitat: this species is mostly found in low diversity lowland forest on ultramafic-derived soils but has been recorded as occurring infrequently in rainforest on other soils. Ultramafic-derived soils are deep, freely draining yellowish-red or -brown clays and loams, typically with high mineral levels (chromium and nickel or magnesium). Ultramafic outcrops occur principally in the south of Santa Isabel (and adjacent San Jorge) and southern Choiseul, with a few scattered occurrences on Guadalcanal, the Florida Islands and San Cristobal. On these sites, the forest diversity is low and

Fig. 1. *Xanthostemon melanoxylon*. **a,** flowering shoot; **b,** capsules; **c,** leafy shoot; **d,** leaf; **e,** detail of leaf surface. (a from *Pitisopa 13* [8/18]; b, c from digital photos taken by Basil Gua; d, e from *Pitisopa 10*). Scale bar: a = 30 mm; b = 24 mm; c = 90 mm; d = 60 mm; e = 20 mm.

usually dominated by *Gymnostoma papuanum* and *Dillenia crenata*. In addition to the *Xanthostemon*, the only other species restricted to ultramafic sites (but not necessarily occurring at all sites) are *Hydriastele hombronii* (Arecaceae), *Myrtella beccarii* (Myrtaceae), and *Pandanus lamprocephalus* (Whitmore 1969, Hancock & Henderson 1988, Mueller-Dubois & Fosberg 1998).

Conservation status: the survey mentioned above (Bulahite 2004) indicates that there are reasonable stocking levels of *X. melanoxylon* at most locations visited but these populations are vulnerable to various threats, particularly logging, fire and mining. Over-harvesting is an unsustainable practice and can also lead to erosion and damage to the soil profile. Illegal logging of trees has been mitigated by a recent Forest Bill that has improved monitoring of such activities. Fire is also a possible threat since past burning of the vegetation on ultramafic sites has reportedly resulted in exposure of the soil surface over large areas and loss of upper soil horizons by sheet erosion (Lee 1969) that may lead to replacement of forest by open heath vegetation (Whitmore 1966). The recent survey (Bulahite 2004) found that most populations showed a good spread of age classes but fire damage at some sites had resulted in the death of all trees in affected parts of the populations. Some of these sites showed good regeneration from seed but these would be vulnerable to repeat burning. There are substantial nickel reserves on San Jorge Island, which is almost wholly composed of ultramafic rocks and their derived sediments, and prospecting licences have been issued. Exploitation of these mineral deposits could have a significant impact on the island's remaining *Tubi* populations.

Relatively recently, on 31 August 2005, regulations were gazetted that added *Tubi* to the list of protected species under the Forest Resources & Timber Utilisation Act (FR&TUA) (Protected Species) (Amendment) Regulations 2005 (Andrewartha pers. comm.).

Relationships: species of *Xanthostemon* fall into four groups based on placentation (Wilson 1990). Red flowered species (excluding the red-flowered segregate genus *Purpureostemon*) all have the horizontally projecting, rod-like placentas of the type species, *X. paradoxus*. Including this new species, there are only a relatively small number of red-flowered species in the genus and these can be divided into those that have a vesiculate hypanthium and those that do not. *Xanthostemon melanoxylon* lacks a vesiculate hypanthium and, on this criterion, is most closely related to *X. novoguineensis* from western New Guinea, a species that appears, from limited available site data, not to favour ultramafic sites. *Xanthostemon melanoxylon* can be distinguished from *X. novoguineensis* (based on published descriptions) by the heartwood colour, the angle of the secondary veins (50–60° compared with c. 90°), the less dense leaf reticulum, and the larger flowers (petals, sepals and style longer, stamens longer and more numerous). *Xanthostemon confertiflorus*, a red-flowered species from Sulawesi that does occur on ultramafic soils (Meijer 1983, van Balgooy & Tantra 1986, Proctor 2003), has a vesiculate hypanthium and is, therefore, more closely related to *X. speciosus*, that is also found on ultramafic substrates from the Philippines (Palawan and Culion/Busuanga).

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