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A new species of *Melaleuca* (Myrtaceae) from northern Queensland, Australia

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Abstract

Melaleuca sylvana Craven & A.J. Ford is described from the Herberton-Ravenshoe area in northern Queensland. A key to the microphyllous species of *Melaleuca* in northern Queensland is provided.

Introduction

During field studies in northern Queensland by the first author in 2001, the second author drew attention to an unusual microphyllous *Melaleuca* that occurred in the Herberton region on the western edge of the Atherton Tableland. The population was visited and specimens collected for later study in the herbarium. In the field it was observed that the plants were superficially similar to *M. monantha* (Barlow) Craven but differed from that species in having, inter alia, a more typical tree-like habit and larger fruit. *Melaleuca monantha* typically occurs as densely crowned, multistemmed plants although some collectors have noted on specimen labels that the plants were trees (but without indicating whether they were multibranched or not). The Herberton plants we observed were sparsely crowned and single-stemmed.

Subsequent comparison of the Herberton material with herbarium specimens of *M. monantha* established that they differed in a number of characters. The more distinctive of these are listed in Table 1. In view of these differences, which are consistent with, if not exceeding, differences accepted for species segregation in other *Melaleuca* complexes in the *Flora of Australia* account of the genus (Craven *et al*. in press), it is concluded that the Herberton specimens represent a previously unknown species of *Melaleuca*, described below as *M. sylvana*.

Taxonomy

Melaleuca sylvana Craven & A.J. Ford, *sp. nov*.

A *M. monantha* (Barlow) Craven hypanthio longiore (2-2.2 mm longo), filamentis staminalibus longioribus (7-8.5 mm longis), stylo longiore (8-10 mm longo), et hypanthio in fructu longiore (4-4.25 mm longo) differt.

Type: Australia: Queensland: Cook District: Powerline access road, W of Herberton, c. 1.85 km along road from the Herberton-Watsonville road, 6 December 2001, *Craven & Ford 10430* (holotype BRI; isotypes A, ASU, B, BISH, CANB, E, G, L, MEL, NSW, P, US).

Tree or shrub to 5 m tall, open-crowned. *Bud scales* absent. *Branchlets* glabrous, terete, excavated (i.e. impressed) adjacent to the leaf blade. *Leaves* decussate, imbricate, amplexicaul, peltate, ascending (blade is appressed proximally at the point of attachment to the branchlet but is ascending distally), distinctly dorsiventral, 1.5-3.7 mm long, 0.9-1.7 mm wide, 1.4-2.3 times as long as wide, sessile; *leaf blade* glabrescent, the indumentum

Table 1. Differences between two species of *Melaleuca*

Character	*M. monantha*	*M. sylvana*
Habit	Densely foliaged shrub or tree	Open shrub or tree to 5 m tall to 7 m tall
Leaf hairs	Spreading	Ascending
Leaf blade	Angular-obovate	Rounded-obovate (never angular)
Leaf blade vein number	5-7	7-11
Hypanthium	1.3-1.8 by 1.1-1.3 mm	2-2.2 by 1.9-2 mm
Calyx lobes	0.5-0.7 mm long	0.8-1 mm long
Petals	Obscurely clawed	Distinctly clawed
Petals	1.2-1.6 mm long	2 mm long
Petals	Oil glands absent	Oil glands present
Staminal filaments	4.5-6.8 mm long	7-8.5 mm long
Staminal bundle claw	2-3.5 mm long	4.25-4.5 mm long
Staminal filaments	Free portion inserted in the distal half to three-quarters of the bundle claw	Free portion inserted in the distal quarter of the bundle claw
Anthers	0.2-0.3 mm long	0.4-0.6 mm long
Style	5-6 mm long	8-10 mm long
Ovules	20 per locule	27-30 per locule
Infructescence	6 mm in diameter	9 mm in diameter
Fruiting hypanthium	2-3.2 by 2.5-4 mm	4-4.25 by 4.25-5 mm
Seed	0.8-0.9 mm long	1.1-1.3 mm long
Cotyledons c.	1/2 the length of the embryo c.	1/3 the length of the embryo

with minute very ephemeral puberulous hairs on the distal abaxial surface and deciduous cilia on the margin, dull-glossy to dull, greenish or brownish, obovate or broadly obovate (to obovate-elliptic), in transverse section lunate (i.e. concavoconvex), sublunate or strongly so, in lateral view straight to recurved (the apex slightly incurved), the base truncate, the apex truncately acuminate to obtusely and shortly acuminate or acuminate, the 7-11 veins parallel; oil glands moderately dense to sparse, distinct or obscure, circular. *Inflorescence* a head or short spike of (1-)2-10 monads inserted interstitially in the median to distal axils of the reproductive seasonal growth flush, 8-18 mm wide, the rachis puberulous, each monad subtended by a foliage leaf and the flower by a pair of bracteoles. *Hypanthium* glabrous, pale orange, costate-cylindrical to cup-shaped, proximally not compressed, 2-2.2 mm long, 1.9-2 mm wide. *Calyx lobes* 5, abaxially glabrous, costate, herbaceous in the proximal-central zone and scarious in a narrow marginal band 0.1-0.2 mm wide, the margin ciliate, very broadly ovate to very broadly triangular, 0.8-1 mm long, persistent at least until the immature fruit stage. *Petals* deciduous, glabrous, pure white, sometimes flushed cream, distinctly but very shortly clawed, subcircular, 2 mm long, margin ciliate; oil glands circular. *Stamens* in 5 bundles, imperfectly 2-seriate, 9-12 per bundle, staminal ring absent; *filaments* glabrous, pure white, 7-8.5 mm long, the bundle

claw 4.25-4.5 mm long and 0.5-0.6 times as long as the filaments, the free part of the filaments inserted on the claw margin only and in the distal quarter of the claw; *anthers* generally uniform in size, oblong, 0.4-0.6 mm long, the connective not prominently glandular. *Ovary wall* adnate to the hypanthium for the proximal one-quarter only; placentation axile-median (although very near the base of the locule); *ovules* 27-30 per locule. *Style* glabrous, straight or more or less so, 8-10 mm long, the stigma punctiform. *Infructescence* longer than wide to shorter than wide, 9 mm in diameter. *Fruiting hypanthium* subglobose, depressed subglobose or urceolate, 4-4.25 mm long, 4.25-5 mm wide, 0.8-0.9 times as long as wide, 2-2.5 mm wide at the orifice; calyx lobes replaced by sepaline teeth; staminophore not prominent, the inner distal wall of the staminophore with 5 reflexed free antesepalous triangular processes; valves inserted. Seed angular narrowly obovoid to narrowly obovoid, 1.1-1.3 mm long, the testa membranous; embryo with the cotyledons about one third its length, the cotyledons obvolute.

Etymology: The epithet is derived from the Latin *sylva*, wood, forest, woodland, in reference to the habitat in which this species is commonly found.

Phenology: Flowering period: December. Fruits apparently present in all months (collected in February, March, June and December).

Other specimens examined: **AUSTRALIA**: **QUEENSLAND**: COOK District: Baal Gammon, 29 March 1980, *Hyland 10370* (QRS); 3 June 1997, *Forster, Booth & Jensen 21214* (BRI). Toys Creek, W of Herberton, powerline access road, 4 February 1996, *Forster & Ryan 18443* (CANB); June 1996, *Ford 1739* (CANB, QRS); 25 May 1997, *Sankowsky & Sankowsky 1576* (BRI); 25 July 1998, *Bean 13732* (BRI). NORTH KENNEDY District: Mt Ronald, S of Ravenshoe, 23 December 1998, *McDonald s.n.* (AQ666176) (BRI). Mt. Ronald road, off Wooroora road, SW of Ravenshoe, 27 January 2004, *Ford & Hewett 4286* (BRI, CANB).

Distribution and ecology: *Melaleuca sylvana* has been recorded from two regions in the Herberton-Ravenshoe area on the western and southern side of the Atherton

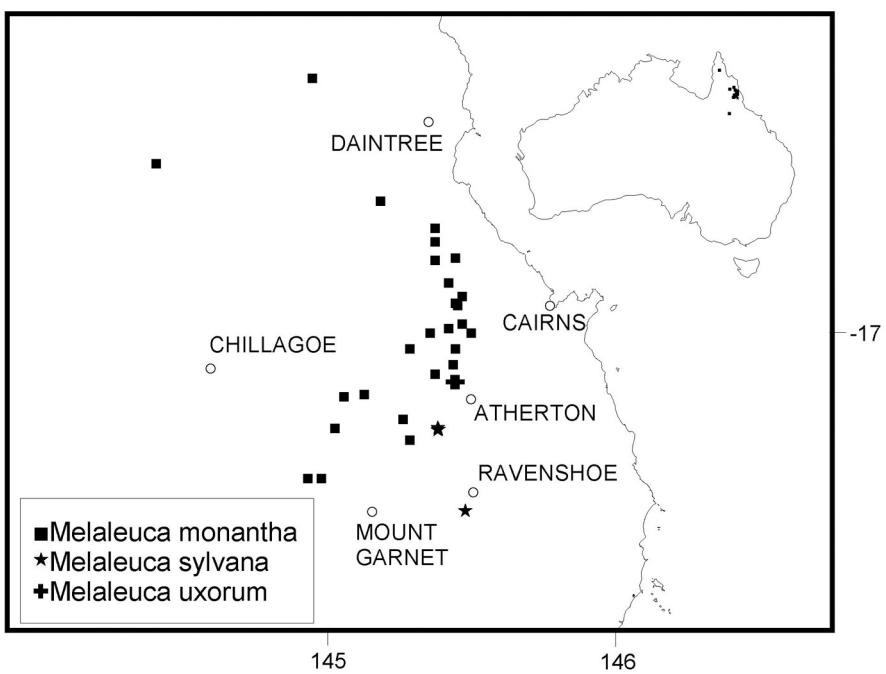

Figure. 1. Distributions of *Melaleuca* species. The inset map of Australia shows the entire distribution of *M. monantha*.

Tableland, on the Wet Tropics-Einasleigh Uplands bioregional boundary, at altitudes of (800-)1020-1050 m (Fig. 1). It has been recorded as occurring in open forest, in heath on rhyolite, in low open woodland of *Eucalyptus abergiana* and *E. shirleyi* with a closed heathland of *Melaleuca* and *Micromyrtus* on weathered rhyolite, in *Casuarina inophloia-Callitris*-eucalypt woodland on rhyolite, and in grassy woodland of *Eucalyptus citriodora*, *E. crebra* and *E. mediocris* on soil derived from rhyolite.

Conservation status: *Melaleuca sylvana* is currently not recorded in any protected area and lies outside the World Heritage Area of northeastern Queensland. We recommend that a detailed search be undertaken in adjacent habitats to fully assess the conservation status of this poorly known species.

Notes: The species is closely related to *M. monantha* from which it differs, inter alia, in the features given in Table 1. Also, *M. monantha* typically occurs in flat to slightly undulating areas at altitudes less than 700 m and on poorly drained soils with impeded drainage that suffer prolonged seasonal inundation. In contrast, *M. sylvana* typically occurs on steep rocky hillsides at altitudes above (800-)1000 m and the soils, although poorly drained, would rarely if ever experience inundation. *Melaleuca sylvana* has been observed to resprout after fire, with profuse epicormic and lignotuber shoots. In such instances the habit of the plant is more shrubby and less tree-like as a result of the periodic exposure to burning.

In the identification keys given in Craven & Lepschi (1999), *M. sylvana* keys out in Key 1 to *M. monantha* (Barlow) Craven. It may be inserted into Key 1 by replacing the second lead of couplet 6 with the following:

6a. Hypanthium 1.3-1.8 mm long; staminal filaments 4.5-6.8 mm long; style 5-6 mm long; fruiting hypanthium 2-3.2 mm long.....*M. monantha* (Barlow) Craven
6a. Hypanthium 2-2.2 mm long; staminal filaments 7-8.5 mm long; style 8-10 mm long; fruiting hypanthium 4-4.25 mm long .....*M. sylvana* Craven & A.J. Ford

It is noteworthy that *M. sylvana* is the third species of the *M. minutifolia* F. Muell. species group to be recorded from the Atherton Tableland (Herberton Range) area. *Melaleuca monantha* was the first species to be recognised from this area (Craven & Lepschi 1999) and *M. uxorum* Craven, G. Holmes & Sankowsky the second (Craven *et al.* 2004). The distributions of the three species are shown in Fig. 1. This biological richness may be due in part to the environmental diversity experienced towards the western side of the Tableland; here altitude, climate and geology interact to produce considerably different localised vegetation types which in turn may foster evolutionary activity leading to speciation in lineages such as the present *Melaleuca* example. *Melaleuca sylvana* co-occurs with other significant and localised northern Queensland sclerophyllous endemic species such as *Micromyrtus delicata* and *Homoranthus porteri*. The Herberton Range is well known also for harbouring a distinctive warm-temperate floristic element in an otherwise tropical landscape. This is due to the elevation and the distance from maritime influences, which creates a more varied and extreme climate that is more similar to the Sydney Basin (for example) than the nearby tropical rainforested hillsides. The warm-temperate element includes such species as *Chorizema parvifolium*, *Melichrus urceolatus* and *Mirbelia speciosa*.

Key to the microphyllous species of *Melaleuca* in Queensland north of Lat. 20° S

1. Leaves more than 5 mm long ..... non-microphyllous *Melaleuca* spp.
1. Leaves less than 5 mm long
   2. Leaves decussate
      3. Flowers in triads .....*M. uxorum* Craven, G. Holmes & Sankowsky
      3. Flowers in monads

4. Branchlets hairy; style 1.5-2 mm long .....*M. foliolosa* A. Cunn. ex Benth.
4. Branchlets glabrous; style 5-10 mm long
    5. Hypanthium 1.3-1.8 mm long; staminal filaments 4.5-6.8 mm long; style 5-6 mm long; fruiting hypanthium 2-3.2 mm long ....*M. monantha* (Barlow) Craven
    5. Hypanthium 2-2.2 mm long; staminal filaments 7-8.5 mm long; style 8-10 mm long; fruiting hypanthium 4-4.25 mm long ....*M. sylvana* Craven & A.J. Ford

2. Leaves alternate
    6. Hypanthium glabrous; leaves sessile and peltate; trunk and major branch bark fibrous .....*M. tamariscina* Hook.f.
    6. Hypanthium usually hairy (rarely glabrescent); leaves sessile but not peltate; trunk and major branch bark papery .....*M. bracteata* F. Muell.

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