

***Melaleuca* (Myrtaceae) of Western Australia: five new species, three new combinations, one new name and a new state record**

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Abstract

Craven, L.A., Lepschi, B.J. & Cowley, K.J. *Melaleuca* (Myrtaceae) of Western Australia: five new species, three new combinations, one new name and a new state record. *Nuytsia* 20: 27–36(2010). Recent work has resulted in the recognition of five new species of *Melaleuca* from the south-west of Western Australia: *M. genialis* Lepschi, *M. ochroma* Lepschi, *M. protrusa* Craven & Lepschi, *M. sophisma* Lepschi, and *M. ulicoides* Craven & Lepschi. Reassessment of the taxonomic status of three previously described taxa shows that specific rank is warranted and the following three new combinations are made: *M. acutifolia* (Benth.) Craven & Lepschi, *M. calcicola* (Barlow ex Craven) Craven & Lepschi, and *M. spectabilis* (Barlow ex Craven) Craven & Lepschi. *Melaleuca citrina* Turcz. is a later homonym of *M. citrina* (Curtis) Dum.Cours. and the replacement name *M. lutea* Craven is provided. *Melaleuca viminalis* (Sol. ex Gaertn.) Byrnes, hitherto known only from eastern Australia has recently been collected from the Kimberley region of northern Western Australia.

Introduction

Melaleuca L. is one of the larger genera of Myrtaceae and, as it is currently circumscribed, contains about 280 species. The genus is predominantly Australian with indigenous taxa also occurring in Malesia, New Caledonia, Lord Howe Island and Tasmania. Recent molecular studies (Brown *et al.* 2001; Edwards *et al.* in press; Ladiges *et al.* 1999) have indicated that the conventional circumscription of *Melaleuca* should be reconsidered; this is presently being addressed by the first author and R.D. Edwards. Since the publication of an enumeration of *Melaleuca* in Australia and Tasmania (Craven & Lepschi 1999), two new species have been described from eastern Australia (Craven & Ford 2004; Craven *et al.* 2003 [published 2004]), a study of the broombush (*M. uncinata* R.Br.) complex resulted in description of a further seven new species of the genus (Craven *et al.* 2004a), and *Callistemon* R.Br. has been included in *Melaleuca* (Craven 2006, Craven in press). Recent collectors in the southwest of Western Australia have made collections of several novel species and these are described below. In addition, new consideration of three described taxa and one previously known, but as yet undescribed, entity has concluded that the taxonomic status of these plants should be raised, and status should be given, respectively.

Nomenclatural studies have shown that the name *Melaleuca citrina* Turcz. is a later homonym of *M. citrina* (Curtis) Dum.Cours. and a new name, *M. lutea* Craven, is provided below. *Melaleuca viminalis* (Sol. ex Gaertn.) Byrnes has been collected in two widely separate districts within the Kimberley region in the north of the state; previously, this species was only known from Queensland.

Taxonomy

Melaleuca acutifolia (Benth.) Craven & Lepschi, *comb. et stat. nov.*

Melaleuca lateriflora var. *acutifolia* Benth., *Fl. Australiensis* 3: 136 (1867); *M. lateriflora* subsp. *acutifolia* (Benth.) Barlow ex Craven, *Austral. Syst. Bot.* 12: 889 (1999). *Type*: Western Australia: Drummond 5th coll. 140 (*holo*: K, *n.v.*).

Notes. The differences in both morphology and geographic distribution between the typical form of *M. lateriflora* Benth. and its var. *acutifolia* were regarded by Barlow (Quinn *et al.* unpublished) to be sufficient for taxonomic recognition at subspecific, rather than varietal, level was warranted and the necessary taxonomic adjustment was effected in Craven & Lepschi (1999). Following comment by our colleague M. Hislop and field observations by the first and second authors, the taxonomic position of this taxon has been re-considered and it is concluded that specific rank is more appropriate. The differences between the two species are: *M. acutifolia*: leaves 3.9–8 times as long as wide, the blade 7–25 mm long and lunate, subclinate or transversely narrowly elliptic (approaching transversely linear) in transverse section, petals distinctly clawed; *M. lateriflora*: leaves 1.2–3.2 times as long as wide, the blade 4–12 mm long and transversely linear in transverse section, petals obscurely clawed.

Melaleuca calcicola (Barlow ex Craven) Craven & Lepschi, *comb. et stat. nov.*

Melaleuca apodocephala subsp. *calcicola* Barlow ex Craven, *Austral. Syst. Bot.* 12: 860 (1999). *Type*: Western Australia: 5 km SW of Clyde Hill, 18 Oct. 1970, *Aplin* 4274 (*holo*: CANB; *iso*: PERTH).

Notes. The differences between the two subspecies of *M. apodocephala* Turcz., i.e., subsp. *apodocephala* and subsp. *calcicola*, have been reassessed and it is now concluded that specific rank is warranted for subsp. *calcicola*. The differences between the two species are: *M. apodocephala*: stamens 6–13 per bundle, 1.5–3.5 mm long, the bundle claw 0.2–0.3 mm long; fruit 3.5–5 mm wide; cotyledons subobovulate (almost planoconvex); *M. calcicola*: stamens 12–23 per bundle, 5–5.5 mm long, the bundle claw 1–1.5 mm long; fruit 4.5–7.5 mm wide; cotyledons obovulate.

Melaleuca genialis Lepschi, *sp. nov.*

A *Melaleuca tinkeri* Craven foliis trichomatibus, sectione transversali transverse oblongis usque transverse late ellipticis, lobis calycis transverse semiellipticis, petalis trichomatibus, et cotyledonibus planoconvexis differt.

Typus: NE of Wagin, Western Australia [precise locality withheld for conservation reasons], 26 October 2001, *N. Gibson, K. Brown & A. Webb* 3848 (*holo*: PERTH; *iso*: CANB, distribuendi).

Melaleuca sp. Dongolocking (G.J.Keighery & N.Gibson 2896), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed June 2010].

Shrub to 1.2 m tall. Branchlets glabrescent, puberulous to lanuginulose-puberulous. Leaves alternate, 6.7–10 mm long, 0.8–1.1 mm wide, 6.8–14.4 times as long as wide, subsessile to shortly petiolate, blade hairy, puberulous to sericeous-lanuginulose, linear to linear-obovate, in transverse section transversely broadly elliptic or transversely oblong, the base truncate, the apex acute but not pungent, midrib present, lateral veins absent, the oil glands moderately densely to densely distributed, distinct,

scattered. Inflorescences capitate, pseudoterminal, with 5–7 triads, 11–14 mm wide, bracteoles absent. Hypanthium pubescent, 1.5–1.7 mm long. Calyx lobes abaxially hairy, pubescent to puberulous, not costate, transversely semi-elliptic, 0.5 mm long, with a scarious marginal band 0.1 mm wide otherwise herbaceous. Petals deciduous, 0.8–1.1 mm long. Staminal ring absent. Stamens 2–5 per bundle, filaments pink to mauve to purple, 4–5 mm long, the bundle claw 0.8–1.5 mm long, 0.2–0.4 times as long as the filaments. Style 6–7.5 mm long. Ovules 6–7 per locule. Fruit 2.5–3.3 mm long, with the distal rim having obtuse sepaline teeth. Seeds brown with membranous testa, cotyledons planoconvex.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 13 Oct. 1999, *G.J. Keighery & N. Gibson* 2896 (CANB, PERTH *n.v.*).

Phenology. Flowers and fruits on specimens collected in October.

Distribution and habitat. *Melaleuca genialis* is known only from the two cited collections from Dongolocking Nature Reserve, near Wagin in south-western Western Australia (Figure 1). It grows in open woodland over shrubland on brown clay or grey gravelly clay.

Conservation status. Recently listed as Priority Two under the the Department of Environment and Conservation (DEC) Conservation Codes for Western Australian Flora. The IUCN Red List category Vulnerable (IUCN, 2001) is applicable as the populations of the species are thought to be few; perhaps there is only a single population as the species presently is known only from Dongolocking Nature Reserve.

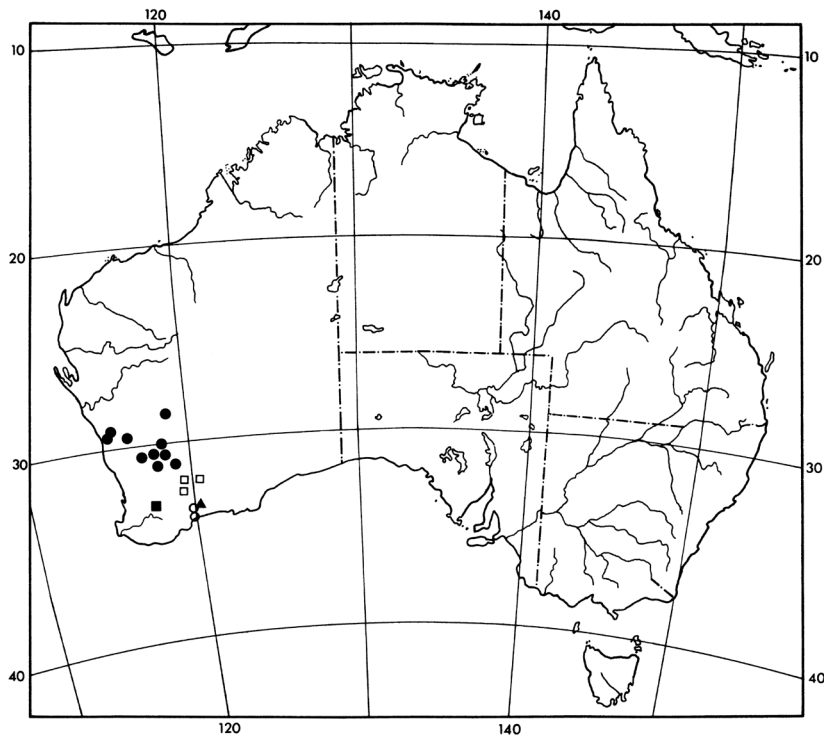


Figure 1. Distribution of *Melaleuca genialis* (■), *M. ochroma* (□), *M. protrusa* (●), *M. sophisma* (▲) and *M. ulicoides* (○) in Western Australia.

Etymology. From the Latin *genialis*, delightful, jovial, pleasant, genial, in reference to the Western Australian Herbarium Database Team of the mid–late 1990s: Sue Carroll, Meriel Falconer and Kaye Veyard, all of whom possess these qualities in abundance.

Notes. *Melaleuca genialis* may be related to *M. tinkeri* Craven from which it can be distinguished as follows: *M. genialis*: leaves hairy, the blade transversely oblong to transversely broadly elliptic in transverse section, calyx lobes transversely semi-elliptic, petals hairy, cotyledons planoconvex; *M. tinkeri*: leaves glabrescent, the blade transversely elliptic to transversely narrowly elliptic in transverse section, calyx lobes broadly ovate or triangular, petals glabrous, cotyledons obvolvate.

In herbarium annotations, on labels, etc., this species has been variously called *Melaleuca* sp. Wagin or *Melaleuca* sp. Dongolocking (G.J.Keighery & N.Gibson 2896).

Melaleuca lutea* Craven, *nom. nov.

Replaced name: *Melaleuca citrina* Turcz., *Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg* 10: 341 (1852), *nom. illeg.*, non Dum.Cours. (1802). *Type:* Western Australia: *Drummond* 5th coll. 148 (*holo:* KW; *iso:* BM, G, K, MEL, W).

Notes. Dumont de Courset (1802) published the combination *M. citrina* (Curtis) Dum.Cours. 50 years before the publication of *M. citrina* Turcz. (Turczaninow 1852) and, under the ICBN (McNeill *et al.* 2006), the latter name must be replaced.

Etymology. From the Latin *luteus*, yellow, in reference to the flower colour of this species.

Melaleuca ochroma* Lepschi, *sp. nov.

A *Melaleuca subfalcata* Turcz. foliis trichomatibus strictis, sectione transversali vade lunata; hypanthio trichomatibus strictis; staminibus 4.3–7.2 mm longis; et stylo 6.5–7.2 mm longo differt.

Typus: E of Hyden, Western Australia [precise locality withheld for conservation reasons], 31 October 2000, *B.J. Lepschi & L.A. Craven* 4469 (*holo:* CANB; *iso:* PERTH).

Shrub 0.7–2.5 m tall; bark hard, fibrous. Branchlets glabrescent, densely to very densely lanuginulose to lanuginose-pubescent. Leaves alternate, 13.5–19 mm long, 1–1.3 mm wide, 11–17 times as long as wide, shortly petiolate, blade glabrescent, densely to very densely lanuginulose to lanuginose-pubescent, linear, though narrowly obovate when young, in transverse section shallowly lunate, the base truncate, the apex acute and pungent, the veins obscure, the oil glands densely distributed, distinct, scattered. Inflorescence spicate, axillary, with 17–35 monads, 13–19 mm wide, bracteoles absent. Hypanthium puberulous, 1.2–2.2 mm long. Calyx lobes abaxially hairy, pubescent to sericeous-pubescent, not costate, triangular or broadly ovate, 1.4–1.6 mm long, with a scarious marginal band 1–3 mm wide otherwise herbaceous. Petals deciduous, 2.4–3.5 mm long. Staminal ring absent. Stamens 13–24 per bundle, 2-seriate, filaments pink to mauve, 4.3–7.2 mm long, the bundle claw 4.1–4.6 mm long, 0.9–1.7 times as long as the filaments. Style 6.5–7.2 mm long. Ovules 66–79 per locule. Fruit 3–4.4 mm long, with the distal rim flat or more or less so. Seeds brown with coriaceous testa, cotyledons planoconvex.

Other specimens examined. WESTERN AUSTRALIA: Frank Hann National Park, [precise locality withheld] 12 Nov. 2001, *M. Hislop* 2476 (CANB, PERTH); 13 Nov. 1989, *B.H. Smith* 1251 (CANB, MEL *n.v.*, PERTH *n.v.*).

Phenology. Flowers and fruit on specimens collected in October and November.

Distribution and habitat. *Melaleuca ochroma* occurs in southwestern Western Australia near Mt Holland, south of Southern Cross in Frank Hann National Park, and east of Hyden towards Norseman (Figure 1). It grows in *Melaleuca* shrubland (at the type locality, with nine other species of this genus) with emergent mallee eucalypts, in very open mallee over dense shrubs of *Melaleuca lateriflora*, *M. sapientes* and *Grevillea huegelii*, and in *Eucalyptus wandoo* woodland, on brown clay, whitish sandy-clay, brown clay loam, and sandy loam.

Conservation status. Recently listed as Priority Three under DEC Conservation Codes for Western Australian Flora. The IUCN Red List category Vulnerable (IUCN, 2001) is applicable as the populations of the species are thought to be few, although at least several of them occur in protected areas and all occur in areas that are not suitable for agricultural use.

Etymology. From the Greek *ochroma*, paleness, wanness, in reference to the pale, washed out colour of the staminal filaments.

Notes. *Melaleuca ochroma* is putatively closely related to *M. subfalcata* Turcz. The two species differ in the following features: *M. ochroma*: leaves with straight hairs, in transverse section shallowly lunate; hypanthium hairs straight; stamens 4.3–7.2 mm long; style 6.5–7.2 mm long; *M. subfalcata*: leaves with crisped or flexuous-crisped hairs, in transverse section depressed obovate or transversely semielliptic; hypanthium hairs flexuous or crisped; stamens 8–13 mm long; style 7.5–14 mm long.

Melaleuca protrusa Craven & Lepschi, *sp. nov.*

A *Melaleuca hamata* Fielding & Gardner hypanthio sericeo vel sericeipubescenti, stylo 4.7–5.5 mm longo, et fructibus apice protrusis differt.

Typus: 119.1 km NE of Paynes Find on the Sandstone road (22.8 km SW of the Diemal-Youanmi road), Western Australia, 24 October 2000, *W. O'Sullivan* 1122 (*holo:* CANB; *iso:* L, PERTH *n.v.*).

Shrub 1.8–4 m tall; basal bark papery. Branchlets glabrous. Leaves alternate, 40–90 mm long, 0.9–1.5 mm wide, 26–100 times as long as wide, subsessile to short-petiolate, blade glabrescent, sericeous to (rarely) sericeous-pubescent, linear, in transverse section transversely broadly elliptic, the base parallel, the apex acuminate with a recurved mucro, midrib present, lateral veins absent, the oil glands not visible. Inflorescences capitate, pseudoterminal or lateral, with 10–16 triads, 7–11 mm wide, bracteoles absent. Hypanthium sericeous, or sericeous-pubescent, 1.3–1.8 mm long. Calyx lobes abaxially glabrous, not costate, broadly elliptic, 0.5–0.8 mm long, scarious throughout. Petals caducous, 0.8–1.8 mm long. Staminal ring absent. Stamens 3–5 per bundle, filaments cream to yellow, 3–4 mm long, the bundle claw 1.8–2.6 mm long, 0.5–0.6 times as long as the filaments. Style 4.7–5.5 mm long. Ovules 14–28 per locule. Infructescence appearing rough or cobbled due to the protrusive fruit apices; fruit 2–3 mm long, with the distal rim flat or more or less so. Seeds brown with membranous testa, cotyledons planoconvex.

Selected other specimens examined. WESTERN AUSTRALIA: *c.* 7.6 km E of the road junction at Youanmi towards Sandstone, 21 Jul. 1999, *J.R. Connors & D. Nicolle* 1041 (CANB); Peroe Farm, W of Mullewa, 30 Sep. 1999, *R. Davis* 9042 (CANB, PERTH *n.v.*); Petrudor Rock, SE of Dalwallinu on main track through reserve, 17 Sep. 1999, *M. Hislop* 1671 (CANB, PERTH *n.v.*); *c.* 1 km E of

Burakin East Road on Booralaming–Kulja road, c. 10.5 km E of Burakin, 6 Sep. 1997, *B.J. Lepschi & T.R. Lally* 3512 (CANB, MEL, PERTH); on the Paynes Find-Sandstone road, 7.8 km NE of the Mount Magnet Road, 24 Oct. 2000, *W. O'Sullivan* 1125 (A, CANB, MEL, PERTH *n.v.*); on the Paynes Find-Sandstone road, 7.8 km NE of the Mount Magnet Road, 24 Oct. 2000, *W. O'Sullivan* 1126 (BRI, CANB, P, PERTH *n.v.*); E of Snake Soak Tank (off Welbungin-Wialki road, SW of Wialki, 1 Nov. 2000, *W. O'Sullivan* 1151 (CANB, G, NSW, PERTH *n.v.*); on vermin proof fence road, 2.5 km N of Wanarra road, at junction of track to Lake Monger lookout, 29 Apr. 2001, *W. O'Sullivan & D. Huxtable* 1367 (CANB, PERTH *n.v.*); W of Wattoning North Road (NW of Mukinbudin), 19 Apr. 2002, *W. O'Sullivan* 1639 (CANB, PERTH *n.v.*); on Corinthia East road, 1.5 km East of Bullfinch road (between Bullfinch and Southern Cross), 1 Oct. 2002, *W. O'Sullivan* 1901 (AD, CANB, L, PERTH *n.v.*); Morrison road, 9.2 km E of Mukinbudin-Bullfinch road, 3 Dec. 2003, *W. O'Sullivan* 2111 (CANB, PERTH *n.v.*).

Phenology. Flowers on specimens collected from September to October and December; fruit on specimens collected in April, July and from September to December.

Distribution and habitat. *Melaleuca protrusa* occurs in southwestern Western Australia in an area bounded by Mullewa and Dallwallinu, east to Sandstone and Southern Cross (Figure 1). It grows in open tree-mallee over shrub thicket, on either brown sandy loam, sandy clay-loam, clay, gravelly sand or gravelly loam over granite.

Conservation status. Under the DEC Conservation Codes for Western Australian Flora criteria, *M. protrusa* is not listed as it does not satisfy any of the listed criteria for conservation. The IUCN Red List category Least Concern (IUCN 2001) is applicable as the populations of the species are numerous and widely spread.

Etymology. From the Latin, *pro-*, forward and *trusus*, thrust, in reference to the apices of the fruiting hypanthia that protrude from the closely packed, more or less spheroidal fruit clusters, a diagnostic feature of the species.

Notes. *Melaleuca protrusa* is a member of the *M. uncinata* R.Br. group, the broombush species group, that was recently revised by Craven *et al.* (2004a). Within this group it appears to be most closely related to *M. hamata* Fielding & Gardner from which it may be distinguished by the following suite of character states: *M. protrusa*: hypanthium sericeous or sericeous-pubescent; style 4.7–5.5 mm long; fruit apex protrusive, the infructescence appearing rough or cobbled; *M. hamata*: hypanthium puberulous or pubescent, or lanuginose- to lanuginulose-pubescent; style 6.5–11.5 mm long; fruit apex not protrusive, the infructescence appearing smoothish.

In herbarium annotations, on labels, etc., this species has been variously called *Melaleuca* WOS ‘minefruit’, *Melaleuca* sp. Mine fruit (W. O'Sullivan 1629), or has been identified as *Melaleuca uncinata* R.Br. or *Melaleuca hamata* Fielding & Gardner.

Melaleuca sophisma Lepschi, *sp. nov.*

Melaleuca cliffortioides Diels ramulis glabris, foliis reflexis 3–5-venatis, floribus triadis, hypanthio glabro, stylo 6.8–10.6 mm longo; et fructibus 1.7–3 mm longis differt.

Typus: Kundip, Western Australia [precise locality withheld for conservation reasons], 5 November 2004, *G.F. Craig* 6146 (*holo:* PERTH; *iso:* CANB, gfc¹, distribuendi).

¹ G.F. Craig personal herbarium.

Melaleuca sp. Kundip (G.F. Craig 6020), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed June 2010].

Shrub to 1–2 m tall; bark rough, deeply fissured towards base, grey. Branchlets glabrous. Leaves alternate, reflexed, 3.1–6.3 mm long, 1.1–2.1 mm wide, 1.7–5 times as long as wide, sessile, blade early glabrescent, ciliate on youngest growth only, ovate, in transverse section lunate, the base truncate, the apex acute, recurved to incurved, not pungent, the veins 3–5, the oil glands densely distributed, distinct, more or less in rows. Inflorescences capitate, axillary, with 3–5 triads, 13–18 mm wide, bracteoles present on each flower. Hypanthium glabrous, 1.3–2.2 mm long. Calyx lobes abaxially glabrous, costate, triangular or broadly ovate, 1.2–1.4 mm long, with a scarious marginal band 1 mm wide otherwise herbaceous. Petals deciduous, 2–2.3 mm long. Staminal ring absent. Stamens 12–15 per bundle, filaments white at anthesis but darkening to cream or yellow with age, 6.9–9 mm long, the bundle claw 3.7–4.7 mm long, 0.5–0.6 times as long as the filaments. Style 6.8–10.6 mm long. Ovules 17–21 per locule. Fruit 1.7–3 mm long, with the distal rim having obtuse sepaline teeth. Seeds white with coriaceous testa, cotyledons planoconvex.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 21 Sep. 2005, *S. Barrett* 1402 (PERTH); 17 Dec. 2003, *G.F. Craig* 6020 (PERTH); 5 Nov. 2004, *G.F. Craig* 6147 (PERTH); 2003, *Landcare Services* LCS 10298 (PERTH).

Phenology. Flowers on specimens collected from November to December; fruit on specimens collected in September, November and December.

Distribution and habitat. *Melaleuca sophisma* occupies a very restricted range in the Kundip district in southwestern Western Australia (Figure 1). It grows in mallee to mallet shrubland over heath on brown sandy loam or grey clay loam with stony schist and quartz.

Conservation status. Listed as Priority One under DEC Conservation Codes for Western Australian Flora as *Melaleuca* sp. Kundip (G.F. Craig 6020) by Smith (2010). The IUCN Red List category Vulnerable (IUCN 2001) is applicable as there are few known populations of the species.

Etymology. From the Greek *sophisma*, false conclusion, fallacy, in reference to the similarity of the species to *M. cliffortioides* Diels with which the plant at first was associated.

Notes. *Melaleuca sophisma* superficially resembles *M. cliffortioides* but can be distinguished from this species in the following features: *M. sophisma*: branchlets glabrous; leaves reflexed, veins 3–5; flowers in triads; hypanthium glabrous; style 6.8–10.6 mm long; fruit 1.7–3 mm long; *M. cliffortioides*: branchlets hairy; leaves spreading, veins 9–11; flowers in monads; hypanthium hairy; style *c.* 13 mm long; fruit 4–5 mm long.

Melaleuca spectabilis (Barlow ex Craven) Craven & Lepschi, *comb. et stat. nov.*

Melaleuca longistaminea subsp. *spectabilis* Barlow ex Craven, *Austral. Syst. Bot.* 12: 889 (1999). *Type:* Western Australia: 17 km N of outskirts of Geraldton on the North West Coastal Highway, 2 Oct. 1988, *J.M. Fox* 88/098 (*holo:* CANB; *iso:* K, MEL, PERTH, WELT *n.v.*).

Notes. Craven & Lepschi (1999) recognised two subspecies within *M. longistaminea* (F.Muell.) Barlow ex Craven. Given the differences in their respective phenotypes, their taxonomic status has

been reconsidered and subsp. *spectabilis* is here raised to species rank. The differences between the two species are: *M. spectabilis*: floral bract subtending the monad (i.e., the flower) 5–8 mm long; bracteoles subtending each flower 5–8 mm long, linear, narrowly obovate, linear-elliptic, or linear-obovate; petals 4.5–6.5 mm long; cotyledons planoconvex; *M. longistaminea*: floral bract 1.5–2.7 mm long; bracteoles 1.5–1.8 mm long, elliptic, narrowly elliptic, or narrowly ovate; petals 3–3.7 mm long; cotyledons obvolvate.

The name *Melaleuca spectabilis* Raeusch. (Raueschel 1797), possibly referable to *Metrosideros* Banks ex Gaertn., is a *nomen nudum* and has no nomenclatural standing under the ICBN (McNeill *et al.* 2006).

Melaleuca ulicoides Craven & Lepschi, *sp. nov.*

A *Melaleuca coronicarpa* D.A.Herb. foliis 5-venatis, vena media pagina abaxiali prominenti; hypanthio sericeo; staminibus 13–17 mm longis; stylo 15–18 mm longo; in fructu lobis calycis sublignosis differt.

Typus: SSW of Ravensthorpe, Western Australia [precise locality withheld for conservation reasons], 1 November 1965, A.S. George 7224 (*holo*: CANB; *iso*: PERTH).

Melaleuca sp. Gorse (A.S. George 7224), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed June 2010].

Shrub to 0.6–1 m tall. Branchlets glabrescent, pubescent. Leaves alternate, 3.9–12 mm long, 1.1–2.7 mm wide, 2.3–7.5 times as long as wide, sessile, blade glabrescent, ciliate and long pubescent to sericeous-pubescent, narrowly triangular to narrowly ovate, in transverse section lunate, the base truncate, the apex narrowly acute with a pungent mucro, the veins 5 but mostly obscure except for the midrib, the oil glands densely distributed, distinct. Inflorescences capitate, terminal, with 1–3 monads, 5–20 mm wide, bracteoles present on each flower. Hypanthium sericeous, 2–3 mm long. Calyx lobes abaxially glabrescent, sericeous, costate, broadly or transversely ovate, 1.6–2.1 mm long, with a scarious marginal band 0.2–0.4 mm wide otherwise herbaceous. Petals deciduous, 3–4.5 mm long. Staminal ring present. Stamens 18–28 per bundle, filaments cream, 13–17 mm long, the bundle claw 4.2–11.2 mm long, 0.2–0.9 times as long as the filaments. Style 15–18 mm long. Ovules 30–52 per locule. Fruit 2.7–4 mm long, with the distal rim having round sepaline teeth. Seeds brown with membranous testa, cotyledons planoconvex.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 7 Nov. 1969, K.M. Allan 173 (PERTH); 16 Feb. 1998, G.F. Craig 3444 (PERTH); 18 Feb. 1998, G.F. Craig 3444B (PERTH); 20 Feb. 1998, G.F. Craig 3675 (PERTH); 20 Feb. 1998, G.F. Craig 3675B (CANB, gfc, PERTH); Oct. 1969, K. Newbey 2915 (PERTH).

Phenology. Flowers on specimens collected from October to November; fruit on specimens collected in November and February.

Distribution and habitat. *Melaleuca ulicoides* occurs in southwestern Western Australia from near Hopetoun north to the Ravensthorpe area (Figure 1). It grows in open mallee and heath, on brown loamy clay with small gravel and laterite.

Conservation status. Recently listed under DEC Conservation Codes for Western Australian Flora as Priority Two. The IUCN Red List category Vulnerable (IUCN, 2001) is applicable as there are relatively few populations of the species.

Etymology. The specific epithet is derived from the generic name *Ulex*, in reference to the similarity in habit between this plant and gorse, *Ulex europaeus* L.

Notes. *Melaleuca ulicoides* is distinctive due to the densely congested branchlets. The species is related to *M. coronicarpa* and the two may be distinguished as follows: *M. ulicoides*: leaves 5-veined, the midrib prominent on the abaxial surface; hypanthium sericeous; calyx lobes sericeous; stamens 13–17 mm long; style 15–18 mm long; in fruit, the calyx lobes developed into subwoody teeth (i.e., into sepaline teeth); *M. coronicarpa*: leaves 7–17-veined, the midrib plane on the abaxial surface; hypanthium pubescent or lanuginose-pubescent; calyx lobes pubescent; stamens 6–11.5 mm long; style 7.2–11.2 mm long; in fruit, the calyx lobes persistent and immersed in the hypanthium wall.

In herbarium annotations, on labels, etc., this species variously has been called *Melaleuca* sp. Gorse (A.S.George 7224), *Melaleuca coronicarpa* ‘gorse’, or *Melaleuca coronicarpa* subsp. *rigens* extreme ‘gorse-like biotype’ Barlow & Thiele.

Melaleuca viminalis (Sol. ex Gaertn.) Byrnes, *Austrobaileya* 2: 75 (1984)

Metrosideros viminalis Sol. ex Gaertn., *Fruct. sem.* pl. 1: 171, t. 34, fig. 4 (1788); *Callistemon viminalis* (Sol. ex Gaertn.) G.Don, in Loudon, *Hort. brit.* 197 (1830).

Specimens examined. WESTERN AUSTRALIA: Gundarara Creek, west Kimberley, 19 Aug. 2001, *W. O’Sullivan & D. Dureau* 50 (CANB, PERTH *n.v.*); on unnamed creekline N of Prince Regent River (tributary), 21 Aug. 2001, *W. O’Sullivan & D. Dureau* 71 (CANB, PERTH *n.v.*); on unnamed creekline N of Prince Regent River, 21 Aug. 2001, *W. O’Sullivan & D. Dureau* 78 (CANB, PERTH *n.v.*); Revolver Creek Falls, 52 km and SSW of Kununurra, Feb. 1998, *T. Handasyde* 99 038 (KNR.)².

Distribution and habitat. *Melaleuca viminalis* occurs in the Kimberley region of Western Australia, in Queensland and in New South Wales. In Western Australia it has been collected in a stony riverbed in rapids with sandstone rocks overlying volcanics, in the creekline of sandstone gorges in sand among rocks, and around a pool below a waterfall. Associated plant species include *Celtis* L. sp., *Albizia lebbek* (L.) Benth., *Lophostemon* Schott sp., *Timonius timon* (Spreng.) Merr., *Pandanus aquaticus* F.Muell., *Melia azedarach* L., *Syzygium* Gaertn. spp., and *Ficus* L. sp.

Conservation status. Recently listed under DEC Conservation Codes for Western Australian Flora as Priority Two. Under the IUCN Red List categories (IUCN 2001), however, the category Least Concern is applicable as nationally the species is not threatened.

Notes. The cited collections of *M. viminalis* in Western Australia are of particular interest as the species was previously known only from Queensland and New South Wales, where the majority of collections have been made east of the Great Dividing Range. The most westerly indigenous occurrence known until now is in the Boulia district, Queensland, although there is a record from Lawn Hill Creek, Queensland which requires verification as the plant may have been cultivated in a homestead garden. The Western Australian populations occur at localities distant from possible places of cultivation and cannot be regarded as originating from plants introduced from eastern Australia.

² Dept. of Environment and Conservation Regional Herbarium at Kununurra.

At one of the west Kimberley locations (Gungarara Creek), *M. viminalis* occurred with an undescribed species of *Backhousia* Hook. & Harv. (Myrtaceae), the first species of this genus discovered in Western Australia. The botanical exploration of the Kimberley region is hampered by difficulties in gaining access due to the rugged nature of the country but its flora is being increasingly enriched by the discovery of genera and/or species that a few decades ago were considered restricted to northeastern and/or eastern Australia. *Melaleuca viminalis* and the undescribed *Backhousia* sp. are two such species.

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References

- Brown, G.K., Udovicic, F. & Ladiges, P.Y. (2001). Molecular phylogeny and biogeography of *Melaleuca*, *Callistemon* and related genera (Myrtaceae). *Australian Systematic Botany* 14: 565–585.
- Craven, L.A. (2006). New combinations in *Melaleuca* for Australian species of *Callistemon* (Myrtaceae). *Novon* 16: 468–475.
- Craven, L.A. (in press). *Melaleuca* (Myrtaceae) from Australia. *Novon*.
- Craven, L.A. & Ford, A.J. (2004). A new species of *Melaleuca* (Myrtaceae) from northern Queensland, Australia. *Muelleria* 20: 3–8.
- Craven, L.A., Holmes, G. & Sankowsky, G. (2003) [published 2004]. *Melaleuca uxorum* (Myrtaceae), a new species from north-eastern Australia. *Muelleria* 18: 3–5.
- Craven, L.A. & Lepschi, B.J. (1999). Enumeration of the species and infraspecific taxa of *Melaleuca* (Myrtaceae) occurring in Australia and Tasmania. *Australian Systematic Botany* 12: 819–927.
- Craven, L.A., Lepschi, B.J., Broadhurst, L. & Byrne, M. (2004a). Taxonomic revision of the broombush complex in Western Australia (Myrtaceae, *Melaleuca uncinata* s.l.). *Australian Systematic Botany* 17: 255–271.
- Dumont de Courset, G.L.M. (1802). *Melaleuca citrina*. In: *Le botaniste cultivateur*. Vol. 3, p. 282. (J.J. Fuchs: Paris.)
- Edwards, R.D., Craven, L.A., Crisp, M.D. & Cook, L.G. (submitted). cpDNA data confirm that *Melaleuca* L. (Myrtaceae) is not monophyletic. *Taxon*.
- IUCN Species Survival Commission (2001). *IUCN Red list categories and criteria*. Version 3.1. (IUCN: Gland, Switzerland.)
- Ladiges, P.Y., McFadden, G.I., Middleton, N., Orlovich, D.A., Treloar, N. & Udovicic, F. (1999). Phylogeny of *Melaleuca*, *Callistemon*, and related genera of the *Beaufortia* suballiance (Myrtaceae) based on 5S and ITS-1 spacer regions of nrDNA. *Cladistics* 15: 151–172.
- McNeill, J., Barrie, R.R., Burdet, H.M., Demoulin, V., Hawksworth, D.L., Marhold, K., Nicolson, D.H., Prado, J., Silva, P.C., Skog, J.E., Wiersema, J.H. & Turland, N.J. (eds) (2006). *International Code of Botanical Nomenclature (Vienna Code) adopted by the Seventeenth International Botanical Congress Vienna, Austria, July 2005*. Regnum Vegetabile vol. 146. (A.R.G. Gantner: Ruggell, Liechtenstein.)
- Quinn, F.C., Cowley, K.J., Barlow, B.A. & Thiele, K.R. (unpublished). Contributions to a revision of *Melaleuca* (Myrtaceae). 11–15. Unpublished manuscript.
- Raeuschel, E.A. (1797). *Melaleuca spectabilis*. In: *Nomenclator botanicus*. 3rd ed., p. 142. (Johann Gottlob Feind: Leipzig.)
- Smith, M.G. (2010). *Declared Rare and Priority Flora List for Western Australia*. (Department of Environment and Conservation: Kensington, WA.)
- Turczaninow, P.K.N.S. (1852). *Melaleuca citrina*. *Bulletin de la classe Physico-mathématique de l'Académie Impériale des*