New combinations in *Callistemon* (Myrtaceae)

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Introduction

Morphological and molecular studies of genera in the tribe Melaleuceae *sensu* Wilson *et al.* (2005) have extended our knowledge of the phylogeny of the group, but failed to resolve their classification (see Briggs & Johnson 1979; Johnson & Briggs 1983; Johnson & Briggs 1984; Gravolin 1997; Ladiges *et al.* 1999; Orlovich *et al.* 1999; O’Brien *et al.* 2000; Brown *et al.* 2001). Craven (2006) sank *Callistemon* into *Melaleuca*, and provided combinations in *Melaleuca* for Australian species of *Callistemon*. Subsequently, Craven (2009) described several new species of *Melaleuca* that would previously have been placed in *Callistemon*. No combinations exist for these taxa in *Callistemon*. Australian herbaria are divided in their recognition of *Callistemon*, with state herbaria in New South Wales, Victoria, South Australia and Western Australia following the Australian Plant Census (APC 2011) in recognising *Callistemon*, whilst the other state herbaria in Queensland, Northern Territory, Australian Capital Territory, and Tasmania, treat the relevant taxa in *Melaleuca*.

Studies of nuclear SS and ITS-1 DNA (Ladiges *et al.* 1999; Brown *et al.* 2001), and a combined study of morphology and chloroplast *ndhF* DNA (Edwards *et al.* 2010) have shown that *Melaleuca* is polyphyletic, genera of the monophyletic tribe Melaleuceae being nested within it. Edwards *et al.* (2010) pointed out that this presented a classic ‘split-or-sink’ dilemma. They noted that although molecular studies had indicated three major clades within the tribe ‘no morphological support or diagnostic synapomorphies are identified for any of these clades’ and therefore because ‘the circumscription of *Melaleuca* and the generic status of other genera within Melaleuceae, is poorly supported’ they proposed ‘that all genera within the Melaleuceae are synonymised with *Melaleuca*’ (Edwards *et al.* 2010). The difficulty of finding morphological characters to uniquely define what could potentially be many new segregate genera with few representatives gave further support for this decision.

The genera of tribe Melaleuceae *sensu* Wilson *et al.* (2005) are: *Callistemon* (c. 35 spp.), *Conothamnus* (3 spp.), *Lamarchea* (2 spp.), *Melaleuca* (c. 220 spp.), *Beaufortia* (15 spp.), *Calothamnus* (38 spp.), *Eremaea* (15 spp.), *Phymatocarpus* (3 spp.) and *Regelia* (6 spp.). Edwards *et al.* (2010) note that Melaleuceae have never been formally defined.
morphologically and, given the homoplasious nature of the morphological characters surveyed in their study, the situation appears no closer to resolution.

Edwards et al. (2010) justify the sinking of Callistemon on the basis of non-monophyly demonstrated by cpDNA alone. A decision based on this evidence seems premature, especially as their combined analysis, with morphology included, and studies based on nuclear DNA (Ladiges et al. 1999; Brown et al. 2001), recovered a monophyletic Australian Callistemon. The analysis of Edwards et al. (2010) contained relatively few samples of Callistemon and GenBank accession numbers were given for only a small proportion of taxa in that study precluding the independent verification of ndhF sequences and their resulting phylogenies. We therefore concur with Brown et al. (2001) that, Australian species should be retained in Callistemon, and that monophyletic groups may need to be formally recognised within Melaleuca, preferably with morphological characters to diagnose the main clades.

If all genera of the Melaleuceae are subsumed within Melaleuca then this aggregate genus would itself have no morphological characters to uniquely define it, thereby failing a major criterion used to justify the proposed synonymy. Further, the conclusion that, ‘… current species-poor genera may retain recognition at the subgeneric level’ (Edwards et al. 2010), simply transfers this difficulty to a lower rank, raising the possibility of a polyphyletic subgenus Melaleuca that cannot be morphologically defined.

We consider that, in spite of clear difficulties in resolving these issues, current evidence is insufficient to justify the proposal to synonymise all genera of Melaleuceae, and more molecular and morphological evidence is required. Accordingly, the following new combinations are provided for Australian species of Callistemon currently placed in Melaleuca. For readers’ reference we have listed phrase names recognised in the Australian Plant Name Index (APNI 2011) as synonyms. Full synonymy is available in Craven (2009).

**Taxonomy**

**Callistemon hemistictus** (S.T.Blake ex Craven) Udovicic & R.D.Spencer, *comb. nov.*


**Callistemon lazaridis** (Craven) Udovicic & R.D.Spencer, *comb. nov.*


**Callistemon megalongensis** (Craven & S.M.Douglas) Udovicic & R.D.Spencer, *comb. nov.*


Synonym: *Callistemon* sp. Megalong Valley (Craven, Mallison & Douglas 10442) NSW Herbarium

**Callistemon montis-zamiae** (Craven) Udovicic & R.D.Spencer, *comb. nov.*


**Callistemon phratra** (Craven) Udovicic & R.D.Spencer, *comb. nov.*


**Callistemon pungens** Lumley & R.D.Spencer

Synonym: *Melaleuca williamsii* Craven

**Callistemon pungens** subsp. *pungens*

**Callistemon pungens** subsp. *fletcheri* (Craven)

Udovicic & R.D.Spencer, *comb. nov.*


Synonym: *Callistemon pungens* subsp. Fletcheri (P.F.Lumley 1120) Australian National Herbarium

**Callistemon pungens** subsp. *synoriensis* (Craven) Udovicic & R.D.Spencer, *comb. nov.*


Synonym: *Callistemon* sp. Gibraltar Range (R.Johnstone 1738) NSW Herbarium
Callistemon pyramidalis (Craven) Udovicic & R.D.Spencer, comb. nov.

Callistemon quercinus (Craven) Udovicic & R.D.Spencer, comb. nov.

Callistemon sabrina (Craven) Udovicic & R.D.Spencer, comb. nov.

Callistemon serpentinus (Craven) Udovicic & R.D.Spencer, comb. nov.

Callistemon viminalis (Solander ex Gaertner) G.Don

Callistemon viminalis subsp. viminalis
Callistemon viminalis subsp. rhododendron (Craven) Udovicic & R.D.Spencer, comb. nov.
Synonym: Callistemon viminalis subsp. Rhododendron (W.Stanford s.n. CANB 780382)
Australian National Herbarium

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References


