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A new species of *Metrosideros* (Myrtaceae) from Vanuatu and notes on the genus

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Metrosideros Banks ex Gaertner (1788: 170, Myrtaceae) is one of the most widespread tree genus across the Pacific islands and is an emerging model for the study of speciation in tropical trees (Papadopoulos *et al.* 2011; Stacy *et al.* 2014). The material housed at the Muséum National d'Histoire Naturelle in Paris (P) was recently reviewed in order to prepare the evaluation of the New Caledonian species for the IUCN redlist (IUCN 2017) and apply some recent taxonomic changes in the genus (Pillon *et al.* 2015). A new species from Vanuatu came to light and is described below.

Metrosideros tabwemasanaensis Pillon, *sp. nov.* (Figure 1).

This species is most similar to *Metrosideros vitiensis* (Gray 1854: 559) Pillon (2015: 788) from which it differs by leaves that are almost sessile with a cordate base.

Type:—VANUATU. Espiritu Santo: Mount Tabwemasana, 1600 m, September 1971, *Chew RSNH 202*, (holotype P-04681884!, isotypes K, PVNH).



FIGURE 1. *Metrosideros tabwemasanaensis* Pillon. **A.** Branch with fruits and distinctive near-sessile cordate leaves; **B.** Inflorescence triad: one peduncle and three flowers; **C.** Flower; **D.** Dehiscing capsule; **E.** Seeds. A, D & E: *Gillison & Beveridge 3512*; B & C: *Chew 202*. Scale bars: A: 1 cm; B, C, D: 1 mm; E: 0.5 mm.

Tree 5–20 m, with irregularly flat-topped crown (*fide Chew 202*), coppicing (*Gillison & Beveridge 3512*), sympodial growth. Young parts (twigs, leaves) covered with silky grey hair, rapidly glabrescent. Twigs cylindrical, bark grey to dark brown for younger twigs, bark not peeling on herbarium specimens, (“bark brown, scaly” *fide Gillison & Beveridge 3512*, “bark flaky, light grey” *fide Chew 202*), wood reddish, hard (*Gillison & Beveridge 3512*). Leaves leathery with reddish petioles (*Chew 239*), 2–3 × 1.5–3 mm, laminae cordate with the apex pointed and often folded on herbarium specimens, 43–80 × 18–29 mm; secondary and tertiary veins visible on both surfaces, marginal vein visible

but very fine; few glands visible on the lower surface of the leaves, unevenly distributed; margin minutely revolute. Inflorescences compound, typically composed of a pair of primary axes (quite often one missing) branching from the twig, each primary axis with 2–3 pairs of lateral triads, these composed of one peduncle with three flowers. Peduncles 4–10 × 1.5 mm, longer on basal triads. Inflorescence axis and hypanthium covered with white-grey hairs. Bracts ovate, 4–5 × 2–3 mm, sparsely to densely hairy. Flowers red, without a distinct pedicel or subsessile; hypanthium 2.5–3.5 × 2.5–3.5 mm; sepals triangular, 1.5 mm long; petals ovate, 2.5 × 2 mm, stamens 14–18 mm long; style 13–20 mm. Fruit 4 × 5 mm, broader than larger, not ridged, capsule extruding from the calyx. Seeds 3 × 0.3 mm, not winged.

Distribution and habitat:—This species is only known from the upper part (1500–1870 m) of Mount Tabwemasana, the highest peak of Vanuatu, on the island of Espiritu Santo, in ridge vegetation. According to Chew 202, this species is “one of the dominants in the *Metrosideros-Weinmannia* forest”. According to Mueller-Dombois & Fosberg (1998), *Metrosideros* is indeed one of the dominant genera in the montane cloud forest across Vanuatu, including the east side of Tabwemasana, along with *Syzygium* Gaertn., *Weinmannia* L., *Geissois* Labill., *Quintinia* A.DC., and *Ascarina* J.R.Forst. & G.Forst.

Vernacular name:—The label on Gillison & Beveridge 3512 indicates “Apouna name ‘Parauma’”. Apouna does not seem to be the name of a language of Vanuatu, but is the name of a river that takes its source from the north-east slopes of Mount Tabwemasana and reaches the Pacific Ocean in the Big Bay of Santo.

Conservation status:—The species is very localised and could qualify as Vulnerable (VU D2) according to IUCN criteria (IUCN 2017). It occurs in a fairly pristine area, away from human settlements and activities. The most serious threat to the species may be climate change.

Paratypes:—Vanuatu: Espiritu Santo, Mount Tabwemasana, 18 august 1985, Cabalion 2896 (P-04681954!; PVNH), *ibid.* loc. , 1500–1800 m, 27 august 1971, Gillison & Beveridge RSNH 3512 (P-04681953!; NOU, PVNH); *ibid.* loc., 1850 m, 15°21'48"S, 166°45'05"E, 2 november 2006, Plunkett, Sam, Rouhan & Pilon 2097 (P! × 4); *ibid.* loc. 1520–1830 m, September 1971, Chew RSNH 239 (P-04681948!; NOU, PVNH).

Notes on the variation in *Metrosideros vitiensis*

Pillon et al. (2015) segregated *M. vitiensis* from *M. collina* (J.R.Forster & G. Forster 1776: 72) A. Gray (1854: 558) on the basis of molecular phylogenetic analysis and in line with previous work (Wright *et al.* 2001). The latter taxon is now restricted to French Polynesia, Pitcairn (Florence *et al.* 1995), and Rarotonga (Cook Islands, Sykes 2016) and displays considerable morphological variation that calls for a systematic reappraisal. *Metrosideros vitiensis* is the only other species with a natural distribution that spans several archipelagos: Vanuatu, Fiji, and Samoa. It is much less diverse morphologically; the most variable character seems to be the pubescence of the inflorescence. All other *Metrosideros* species occurring in this region are micro-endemics, each known from a single location: *M. gregoryi* Christophersen (1938: 28) from Matavanu crater, Savai'i, Samoa, *M. ochrantha* A.C. Smith (1973: 490) from Mount Kasi, Vanua Levu, Fiji, and *M. tabwemasanaensis* from Mount Tabwemasana, Espiritu Santo, Vanuatu. With the exclusion of the material from the latter species, easily distinguished by its cordate and near sessile leaves, *M. vitiensis* is relatively homogeneous in Vanuatu. The examination of the material at P suggested that most Fijian material falls in two groups: 1) coriaceous leaves with broad and thick petioles, inflorescence pubescence variable; 2) leaves not so coriaceous with narrower, slender petioles and twigs, inflorescences often not very pubescent. The two groups are not clearly separated in elevation and geography, and field observation would be desirable to decide whether they warrant recognition. Somewhat similar variation is observed in Samoa, though not as striking. Both forms have been collected on the top of Mount Pioa (Tutuila).

New synonyms

1. *Metrosideros laurifolia* Brongniart & Gris (1865: 300).

Lectotype (designated by Dawson 1992):—NEW CALEDONIA. Balade, February 1855–1860, Vieillard 515 (P-00104667!).

= *Metrosideros demonstrans* Tison (1877: 462). Lectotype (designated by Dawson 1992):—NEW CALEDONIA. Mont Humboldt, February 1872, Balansa 3407 (P-00057638!) ≡ *Carpolepis laurifolia* (Brongniart & Gris) J.W. Dawson var. *demonstrans* (Tison) J.W. Dawson (1984: 468) ≡ *Metrosideros laurifolia* Brongniart & Gris var. *demonstrans* (Tison) Pillon (2015: 788), *syn. nov.*

Dawson (1992) maintained a distinction between *Carpolepis* (= *Metrosideros*) *laurifolia* var. *laurifolia* and *Carpolepis laurifolia* var. *demonstrans* because of the larger flowers and fruits of the latter. The differences between these forms do not correlate clearly with substrate, elevation or geography, however, and individuals with intermediate traits occur. Thus, the distinction is not maintained here.

2. *Metrosideros vitiensis* (A. Gray) Pillon (2015: 788).

Lectotype (designated by Pillon *et al.* 2015):—FIJI, 1838–142, *Wilkes Explor. Exped., United Exploring Expedition, US47896* (US!) = *Tristania vitiensis* A.C. Smith (1936: 110). Lectotype (designated by Smith 1985):—FIJI, Vanua Levu, Thakaundrove, Mount Mbatini, 700–1030m, 28–29 november 1933, *Smith 684* (BISH) *syn. nov.*

Tristania vitiensis has been treated as a synonym of *Metrosideros collina* var. *fruticosa* J.W. Moore (1963: 24) by Smith (1973, 1985). *Metrosideros collina* is now considered to be restricted to French Polynesia, Pitcairn and Rarotonga, and the type specimen of *Metrosideros collina* var. *fruticosa* is from Raiatea (French Polynesia). Therefore, *Tristania vitiensis* should be treated as a synonym of *Metrosideros vitiensis*, with which it agrees morphologically, rather than *Metrosideros collina*.

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