Telopea 12(4) 453–461

New species of *Eugenia* and *Gossia* (Myrtaceae: Myrteae) from Papua New Guinea

Neil Snow[1] and Peter G. Wilson[2]

[1] *Herbarium Pacificum, Bishop Museum, 1525 Bernice Street, Honolulu, HI 96817, U.S.A.*
Email: neil.snow@bishopmuseum.org
[2]*National Herbarium of New South Wales, Royal Botanic Gardens, Sydney, NSW 2000 Australia.*
Email: peter.wilson@rbgsyd.nsw.gov.au

Abstract

Two new species of Myrtaceae are proposed for Papua New Guinea: ***Eugenia craveniana*** N. Snow & Peter G. Wilson and ***Gossia yelana*** N. Snow & Peter G. Wilson.Each species is known from a single gathering. *Eugenia craveniana* is contrasted with *E. reinwardtiana* and *E. salomonica*, congeneric species also occurring in Papuasia. *Gossia yelana* represents the seventh confirmed species of the genus for New Guinea, but none of the species appear to be common there. Although fruiting material is needed to unambiguously place both species into their respective genera, a suite of other characters and the process of elimination allow us to propose them as new species. A conservation designation of Vulnerable is proposed for both species.

This paper represents Contribution No. 2009–012 to the Pacific Biological Survey.

Introduction

Ongoing curatorial work at Bishop Museum and the Royal Botanic Gardens, Sydney, has revealed two taxa that do not fit into currently recognised species limits among the flora of Papua New Guinea. The purpose of this paper is to propose one new species each for *Eugenia* and *Gossia*, discuss their distributions, and comment on morphologically similar species.

Methods

Collections of material were examined primarily from BISH, NSW, and in some cases from other institutions. Comparisons of the new taxa were made with congeneric species of the two genera known from Australia, New Caledonia, and New Guinea. Measurements were taken primarily from dried material, although fruiting or flowering material was rehydrated in boiling water. Although the description for each species is

 ISSN0312-9764

based on limited material, enough diagnostic characters are present to place each into its genus and distinguish it from congeners with reasonable certainty.

The species concept and terminology follow Snow (1997, 2008) and Snow et al. (2003). Geographical names follow Motteler (2006).

Eugenia craveniana N. Snow and Peter G. Wilson, ***sp. nov.***

Ab *E. reinwardtiana* marginibus foliorum undulatis et pedicellis plerumque glabris differt.

Type: Papua New Guinea: Central: Mori River, 245 m, 14 Feb 1969, *E. E. Henty & Y. Lelean NGF41872* (holo BISH; iso A, BRI, CANB, K, LAE n.v., NSW).

Trees to c. 22 m high, d.b.h. c. 35 cm. Trunk fluted and twisted; crown rounded from erect branches. Outer bark mottled, light grayish-brown, smooth, peeling in irregular flakes; inner bark pinkish to straw colored, thin. Branchlets rounded, not winged, light grayish-brown, smooth, glabrous, lacking evident oil glands. Leaves dark green when fresh, concolorous to slightly discolorous when dry, surfaces matte, more or less evenly distributed along branchlets, coriaceous. Stipules consisting of 2–several very broadly and basally swollen, dark reddish hair-like structures (intermediate between type "B" and type "C" stipules [Snow et al. 2003: 6–7; see also Fig. 1i]). Petioles 2.1–3.2 mm, more or less round in transverse section, eglandular, splitting irregularly transversely with age, glabrescent with dibrachiate hairs. Leaf venation brochidodromous. Leaf blades (3.0–) 4.5–7.0 cm × (1.1–) 2.0–3.8 cm, narrowly elliptic to obovate; base cuneate, apex obtuse to acute; secondary and tertiary veins raised above and below; margins undulate; upper surface bearing sparse dibrachiate hairs, becoming glabrous, oil glands small, barely visible, midvein narrowly but steeply raised in its center but flat on the edges; lower surface glabrous, oil glands small, barely visible, intramarginal vein prominent, c. 0.5 mm from edge at midpoint of leaf blade. Inflorescence terminal or mostly lateral, of one to several solitary flowers arising from highly condensed short shoots and thus appearing fasciculate (Fig. 2). Anthopodia and metaxyphylls (sensu Briggs and Johnson 1979) absent. Peduncles 5.5–14 mm × 0.5–0.7 mm, ascending to erect, glabrous or bearing sparse and short dibrachiate hairs distally below base of hypanthium, more or less rigid, smooth to faintly striate. Bracteoles 2, 0.4–0.6 mm × ≤ 0.3 mm, narrowly triangular, opposite to disjunct opposite, ascending, much shorter than hypanthium, early caducous, shortly but irregularly hairy apically. Hypanthium c. 1.3 mm long, obconic, hairs dibrachiate and sparse; smaller oil glands common, round, larger oil glands of irregular size and shape and somewhat pustulate (these possibly representing fungal growth). Calyx lobes 4, 0.7–1.3 mm, fused below but distinct in bud, broadly rounded, obtuse, moderately to densely sericeous above and conspicuously ciliate on margins, sparsely sericeous below. Petals 4, 3–3.5 mm, widely obovate to oblate, moderately sericeous above, glabrous below, oil glands lacking. Staminal disk 1.4–2 mm diameter, glabrous. Stamens 40–50, multiseriate; filaments 1–2.5 mm long, most with 1–several light elliptic glands; anthers c. 0.5 mm, globose, basi- or sub-basifixed, connective eglandular. Styles c. 3.5 mm, glabrous, prominently glandular. Locules 2, placentation axile, placenta capitate, ovules 5–7 per placenta. Fruit unknown. Figure 1.

Geographical distribution. The species is known only from the type gathering. The reliability of the coordinates given on the collection label (10°10'S, 148°20'E) is uncertain. If the collection was made near Mori Station, it likely is closer to 10°06'S, 148°30'E. Geologically, this part of the Papua Peninsula appears to fall somewhere

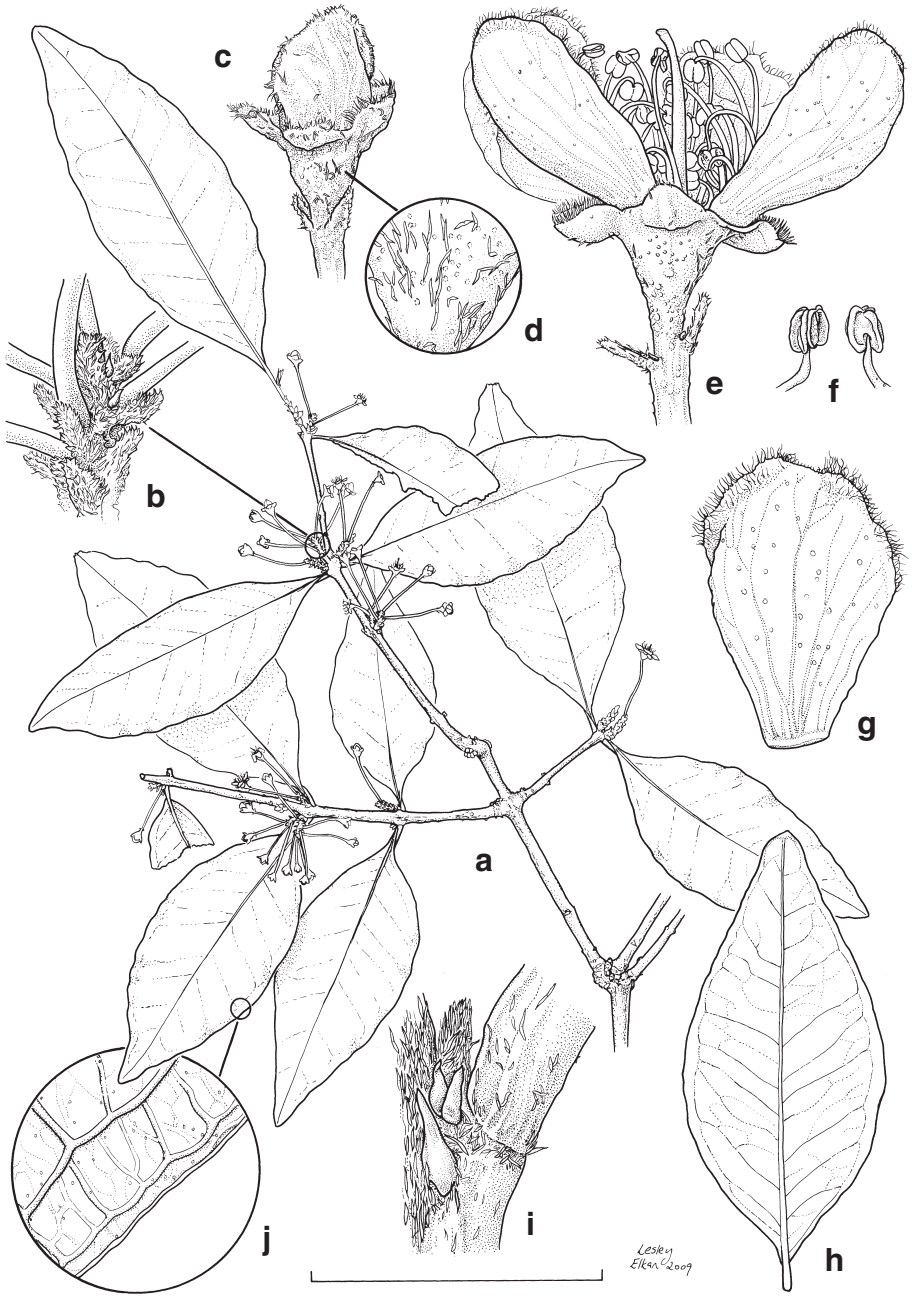

Fig. 1. *Eugenia craveniana*. **a**, habit; **b**, short, bracteate flowering shoot; **c**, flower bud; **d**, detail of hypanthium showing dibrachiate hairs; **e**, open flower; **f**, stamen; **g**, petal; **h**, leaf showing venation; **i**, detail of node showing distinctive stipules; **j**, detail of intramarginal venation. (all from *Henty & Lelean NGF 41872*). Scale bar: a = 50 mm; b, c, e, j = 4 mm; d, f, i = 2 mm; g = 3 mm; h = 30 mm.

near the boundaries of the western part of the Kutu terrane and the eastern edges of the Port Moresby terrane, the transitional area of which is poorly known (Pigram & Davies 1987).

Phenology. Flowering in early February; probably fruiting late February onwards.

Habitat and ecology. The specimen label indicates the locality is among limestone hills at c. 245 metres (800 feet on label).

Conservation. Given that *Eugenia craveniana* is known only from the type gathering, and that designations of Data Deficient (IUCN 2005) are probably inappropriate for remote areas in the tropics, and considering the recommendations of Callmander et al. (2005), we propose a designation of Vulnerable (D2) given the restricted area of occupancy (less than 20 km^2) and limited number of collections (fewer than 5).

Etymology. The specific epithet honours our colleague Lyn A. Craven (b. 1945) of the Australian National Herbarium (CANB), a longtime student of Myrtaceae (e.g., Hartley and Craven 1977; Craven 1980, 1987a,b, 2001, 2003, 2006; Craven & Jones 1991; Craven et al. 2004; Biffin et al. 2006), a previous collector of plants in Papua New Guinea, and one who has assisted the authors in their studies of Myrtaceae.

Comparison with other species in the region. The undulate leaf margin of *E. craveniana* is not shared with other species of *Eugenia* from Papuasia. Its twisted and fluted main bole is shared with some specimens of *E. salomonica* (White 1951), although not all specimens of the latter at BISH are reported to have buttresses or

Fig. 2. *Eugenia craveniana*. Close up of short, bracteate flowering shoots from holotype.

fluted trunks. The one known locality of *E. craveniana* is on the Australian craton. In contrast, the confirmed range of *E. salomonica* is from islands located north of the New Britain Trench or east of the North New Hebrides Trench. As currently known, *E. salomonica* ranges from Mussau Island of the St. Matthias group (e.g., *D. Lepofsky 437* at BISH) and Bougainville of Papua New Guinea (White 1951) to the Solomon Islands, where it is known on Santa Isabel (White 1951) and the small island of Tömotu Noi of the Santa Cruz (= Nendö ; see Motteler 2006: 46–47) Islands (e.g., *J. M. Powell 19865* at BISH). Its occurrence in New Guinea was overlooked by Govaerts et al. (2008).

Notes. *Eugenia craveniana* is tentatively placed in *Eugenia* because of its abbreviated bracteate inflorescence of uniflorous flowers, which are 4-merous, its bilocular ovary and peltate placenta with relatively few ovules, and dibrachiate hairs, all of which characterise a large percentage of species in *Eugenia* (excluding *Hexachlamys* O. Berg) (e.g., Landrum & Kawasaki 1997). The species resembles some in *Gossia* but does not match any species of *Gossia* known from Australia, New Guinea, or the Solomon Islands (Snow et al. 2003; Snow 2005, 2006). Examination of mature fruit would enable a definitive generic placement to be made, but because dibrachiate hairs are uncommon among baccate genera in Australia and New Guinea, and other characters of the flower are not aberrant in *Eugenia* (excluding *Hexachlamys*), we are confident placing the new species in *Eugenia* pending the hopeful re-collection of the species in fruit.

The stipule-like structures dry to a deep maroon color. On emerging branchlets they are scale-like and somewhat rounded. On older branchlets, and in the axils of bracteoles, the bases of the hair-like projections are notably swollen ("type B" stipules in Snow et al. 2003). This stipule type does not occur on *E. reinwardtiana* or *E. salomonica*.

Gossia yelana N. Snow and Peter G. Wilson, ***sp. nov.***

Gossia salomonensi similis sed foliis ellipticis (vice ovatis) tantum breviter acuminatis, petalis maioribus, bracteolis multo latioribus non caducis, axe florifero breviore contracto bracteas angustiores praedito differt.

Type: Papua New Guinea: Papuan Islands: Rossel (Yela) Island, Nanga Bay, 11°20'S, 154°10'E, altitude sea level, 11 Oct. 1966, *A. Gillison NGF25378* (holo BISH; iso BRI, CANB, LAE n.v., NSW).

Trees to c. 4.5 m high. Bark of main stem smooth, brownish-grey. Branchlets rounded, wingless, light brownish-gray, smooth, sparsely sericeous becoming glabrous, oil glands sparse and small. Petioles 4–5 mm long, channeled above, somewhat glandular when young, glabrous at maturity. Leaves coriaceous, concolorous or slightly discolorous, surfaces matte or slightly glossy above. Leaf venation brochidodromous. Leaf blades 4–60 × 18–25 mm, elliptic; base cuneate, apex acute to obtusely acuminate, margin flat to slightly revolute, surface flat to slightly undulate; adaxial surface glabrous, oil glands slightly raised, midvein impressed proximally, becoming flush distally; abaxial surface glabrous, oil glands slightly raised, secondary and tertiary veins visible but thin, intramarginal vein faint, 0.5–1.5 mm from edge of margin at midpoint of blade. Inflorescence of (1–)2–4 monads borne in the axils of bracts on short brachyblasts (highly contracted, shortly-bracteate axes), either at the shoot apex or on older wood below the leaves; anthopodia absent, metaxyphylls absent. Peduncles (7.5–)12–17 mm long, rigid, straight to slightly curved, glabrous to very sparsely sericeous. Bracteoles 2, (0.9–)1.1–1.4 × 0.9–1.3 mm, triangular to broadly ovate, more or less erect, rigid, sparsely sericeous and shortly ciliate marginally (hairs bending irregularly).

Hypanthium 1.3–1.7 mm, obconic, oil glands sparse, sparsely sericeous. Calyx lobes 4, 1.1–2.1 × 2.1–3.2 mm, broadly rounded, apex obtuse, slightly imbricate at base, 2 outer lobes somewhat larger than 2 inner lobes, glabrous to very sparsely sericeous. Petals 4, 5–6.5 mm × 2.5–3.5 mm, not clawed, sparsely ciliate on margins, oil glands common. Staminal ring 0.7–1 mm wide, c. 2.8 mm in diameter, shortly villous. Stamens >100, multiseriate, inflexed in bud; filaments up 3–7 mm long; anthers 0.5–0.7 mm, globose to subcylindrical, dehiscence evidently latrorse, dorsifixed towards the base of the connective, which bears a single (often obscure) apical gland. Styles 5–6 mm, glabrous, narrowing to a scarcely capitate stigma. Ovary 2-loclular, placentation axile, placenta capitate, ovules (as far as seen) 12 or more per placenta. Fruit unknown. Figure 3.

Geographical distribution. *Gossia yelana* is known only from Nanga Bay on Yela Island (= Rossel Island [Motteler 2006]). No indication is given of its relative abundance on the collection label. Yela Island is located in the Solomon Sea, and is a geological outlier of the Owen Stanley terrane, which docked with the rest of the New Guinea Peninsula approximately 15 mya (Pigram & Davies 1987).

Habitat and ecology. The herbarium label data indicates *Gossia yelana* was collected from shoreline vegetation and is a low-growing tree 15 feet [c. 4.5 meters] high, associated with *Intsia bijuga* (Colebr.) Kuntze (Fabaceae).

Phenology. Flowering in early February; probably fruiting late February onwards.

Conservation. Given that *Gossia yelana* is only known from a single gathering, and following the rationale above for *Eugenia craveniana,* we propose a conservation status of Vulnerable until more information is available.

Etymology. The specific epithet refers to its occurrence on Yela Island, the alternate name for Rossel Island.

Comparison with similar species. *Gossia yelana* resembles *G. salomonensis*, which is restricted to the small island of Ghizo, New Georgia Group (8°04'36''S, 156°47'35''E). However, *G. salomonensis* has long-acuminate, ovate to narrowly ovate leaves, much narrower, caducous bracteoles and much broader bracts along its brachyblasts (short, flowering shoots). In addition, the brachyblasts of *G. salomonensis* are much less condensed than those of *G. yelana*, in which the bracts are spaced more densely. *Gossia yelana* and *G. salomonensis* also appear to occupy different habitats; the former occurring in coastal forests slightly above sea level, whereas the latter is known only from ridge top forest (c. 165 m) in well drained primary forests, where it may grow to over 9 m tall (Scott 1980).

Notes. The collector's notes indicate that in fresh material the leaves are reportedly shiny green and conspicuously punctate, whereas the petals are white.

The description of *Gossia yelana* brings to seven the number of species in the genus known to occur in New Guinea (*G. eugenioides*, *G. floribunda*, *G. longipetiolata*, *G. randiana*, *G. scottiana*, *G. versteeghii*) (Snow 2006). Unlike some species of *Gossia* from Australia (Snow et al. 2003) and New Caledonia (Snow in prep.), none of the species from smaller islands in the region (*G. aneityensis*, *G. salomonensis*) appear to be ecologically common.

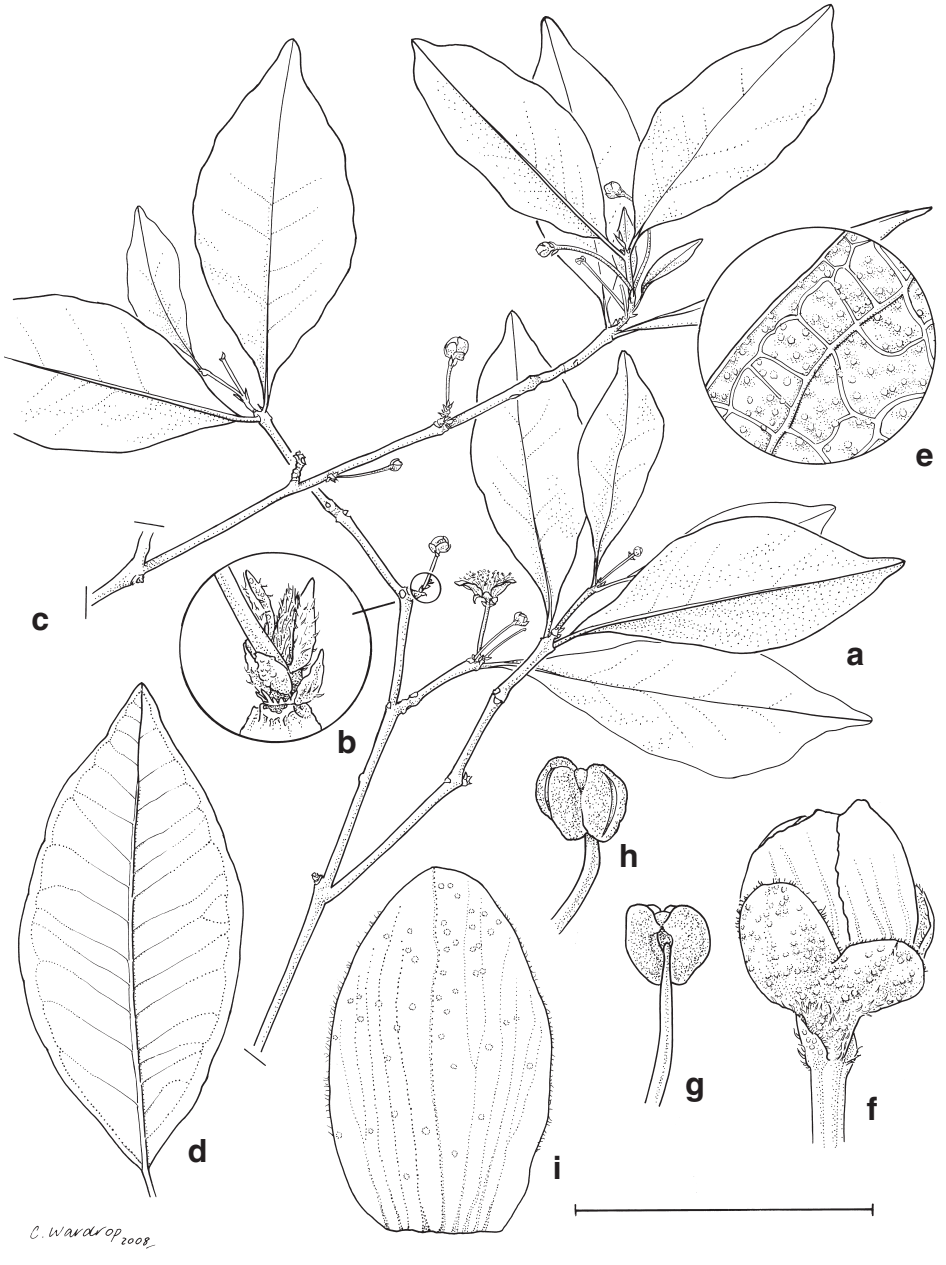

Fig. 3. *Gossia yelana*. **a**, habit; **b**, short, bracteate flowering shoot; **c**, habit; **d**, leaf showing venation; **e**, detail of intramarginal venation; **f**, flower bud; **g**, **h**, stamen, front and back; **i**, petal. (all from *Gillison NGF25378*). Scale bar: a, c = 50 mm; b = 5 mm; d = 30 mm; e = 4 mm; f, i = 6 mm; g, h = 0.2 mm.

Acknowledgments

Our thanks to the curators at BRI and CANB for the loan of relevant specimens of Australasian Myrtaceae. Peter Ashton (A) confirmed the distribution of *Eugenia* in Malesia based on his knowledge of the genus; Emily Wood (A) provided a digital image of an isotype from Harvard; John Dawson (WELTU) confirmed that the new species of *Eugenia* does not match known material from New Caledonia. Mahalo to Arnold Hori (BISH) for capturing the digital image, and to Lesley Elkan and Catherine Wardrop for the excellent illustrations. We thank Eve Lucas (K) and Barry Conn (NSW) for their constructive comments.

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Manuscript received 30 June 2009, accepted 04 November 2009