

Plectranthus laetus P.I.Forst. and *P. ventosus* P.I.Forst. (Lamiaceae), new species from Cape York Peninsula, Queensland

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Summary

Forster, P.I. (2015). *Plectranthus laetus* P.I.Forst. and *P. ventosus* P.I.Forst. (Lamiaceae), new species from Cape York Peninsula, Queensland. *Austrobaileya* 9(3): 431–438. Two new species of *Plectranthus* are described from Cape York Peninsula: *P. laetus* P.I.Forst. from Orchid Creek Station and *P. ventosus* P.I.Forst. from the Melville Range at Cape Melville National Park. Both species occur on granite substrates within or adjacent to rainforests.

Key Words: Lamiaceae, *Plectranthus*, *Plectranthus laetus*, *Plectranthus ventosus*, Australia flora, Queensland flora, Cape Melville, Orchid Creek, new species, taxonomy, distribution maps.

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Introduction

Ongoing botanical exploration of remote areas of Cape York Peninsula continues to reveal vascular plants that are new to science. A further two species of *Plectranthus* L.Hér. are described here, both discovered in previously unsurveyed localities on the tops of mountains or ridges, and in habitats akin to the ‘sky island’ concept discussed previously Forster (2014). In each case, access to the localities was by helicopter. The description of these new species brings to 15, the number of species of *Plectranthus* now recognised for the Cape York Peninsula bioregion (<https://data.qld.gov.au/dataset/bioecogeographic-subregions-queensland>). The species previously recognised are *P. apreptus* S.T.Blake, *P. apricus* P.I.Forst., *P. arenicola* P.I.Forst., *P. batianoffii* P.I.Forst., *P. congestus* R.Br., *P. dumicola* P.I.Forst., *P. excelsus* P.I.Forst., *P. foetidus* Benth., *P. megadontus* P.I.Forst., *P. mirus* S.T.Blake, *P. pulchellus* P.I.Forst., *P. scutellarioides* (L.) R.Br. and *P. venustus* P.I.Forst.; ten of the overall total are endemic.

Materials and methods

Fieldwork was undertaken in north Queensland to procure fresh material for specimens and cultivation enabling observation of variation in morphology and phenology. The subsequent descriptions and observations are based on these recent collections and other earlier collections in the Queensland Herbarium (BRI).

Taxonomy

***Plectranthus laetus* P.I.Forst., sp. nov.** with affinity to *P. pulchellus* but differing in the orange sessile glands (versus yellow), the verticillasters with fewer flowers (6–10 versus 12–16), the flowers with corollas that are strikingly blue-purple (versus light purple) and the larger calyces. **Typus:** Queensland. COOK DISTRICT: Orchid Creek Station, Coffee Scrub; SW of Lockhart River, Cape York Peninsula, 30 April 2014, *P.I. Forster PIF41138 & S.L. Thompson* (holo: BRI; iso: CNS, MEL, NSW *distribuendi*).

Perennial herb, stems erect to 50 cm high; foliage scentless when crushed, not clammy; non-glandular and glandular trichomes uncoloured, non-glandular trichomes without prominent raised bases, sessile glands 8-celled, orange. Roots fibrous, somewhat

fleshy and thickened. Stems square, erect to straggling, fleshy, easily snapped, the lower parts up to 13 mm diameter and not noticeably thickened, pink-purple to pink-green, upper parts with persistent indumentum, non-glandular trichomes sparse to dense, antrorse, 6–10-celled up to 1 mm long, glandular trichomes absent, sessile glands sparse. Leaves discolorous, petiolate; petioles 7–19 × 1.5–2 mm, channelled on top, non-glandular trichomes sparse, antrorse, 4–10-celled up to 0.5 mm long, glandular trichomes absent, sessile glands occasional to sparse; laminae lanceolate-ovate to ovate, fleshy, ±flat to slightly keeled, 30–70 × 26–50 mm, crenate with 8–14 teeth up to 4 mm long on each margin, of similar length along margin, secondary teeth poorly developed; tip acute; base obtuse to rounded; upper surface medium-green and somewhat glossy, veins impressed and often pink-purple, non-glandular trichomes sparse, antrorse, 4–8-celled up to 0.5 mm long, glandular trichomes and sessile glands absent; lower surface pale purple to purple-green and with a light hoary silver frosting from indumentum, veins strongly raised, non-glandular trichomes sparse, antrorse, 4–8-celled up to 0.8 mm long, glandular trichomes absent, sessile glands scattered. Inflorescence up to 350 mm long, usually single or with 1 or 2 side branches; axis square in cross-section, pink-purple, non-glandular trichomes sparse, antrorse, 4–8-celled up to 0.5 mm long, glandular trichomes sparse and minute (< 0.2 mm long), sessile glands absent or occasional; bracts broadly ovate, 1.5–1.8 × 7–8 mm, ecomose, margins somewhat irregularly crenate to crenulate due to slightly enlarged bases of trichomes, non-glandular trichomes sparse, antrorse, 4–6-celled up to 0.4 mm long, glandular trichomes absent, sessile glands occasional to scattered; verticillasters 6–10-flowered, 7–20 mm apart; pedicels 4–5 × c. 0.2 mm, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes and sessile glands absent. Flower calyces 2.5–2.8 mm long, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes occasional and very short (< 0.2

mm long), sessile glands sparse. Corolla 9.5–11.5 mm long, blue-purple; tube 5–6 mm long, abruptly curved at 80–90° 2–2.4 mm from the base, slightly inflated upwards, non-glandular trichomes absent or occasional, 2-celled and very short (< 0.2 mm long), glandular trichomes and sessile glands absent; upper lobes suborbicular, erect to weakly reflexed, 1.8–2 × 1.5–1.6 mm, non-glandular trichomes scattered, antrorse, 2–4-celled up to 0.3 mm long, glandular trichomes absent, sessile glands sparse; lateral lobes rounded, c. 0.5 × 0.7–0.8 mm, glabrous; lower lobe oblong-ovate, 5–5.2 × 4–4.2 mm, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.3 mm long, glandular trichomes absent, sessile glands sparse; filaments filiform, 7–8 × c. 0.2 mm, lilac, fused for 4–5 mm from the base; anthers c. 0.4 × 0.3 mm; style filiform, 8–9 × c. 0.2 mm, cream, bifid for c. 0.5 mm. Fruit calyces 4.5–5 mm long; upper lobe broadly ovate, 2–2.2 × 2–2.2 mm; lateral lobes lanceolate, 1.8–2.2 × 0.7–0.8 mm; lower lobes lanceolate-falcate, 2–2.2 × 0.7–0.8 mm. Nutlets ± circular in outline, compressed flattened globose, 0.8–1 mm wide, 0.4–0.5 mm thick, brown, weakly verrucose. **Fig. 1.**

Distribution and habitat: Thus far, *Plectranthus laetus* has been collected from a single locality on Orchid Creek Station, southwest of Lockhart River on Cape York Peninsula in Queensland. Plants commonly grew in diffuse colonies on granite boulders and slabs in the ecotone between woodland dominated by *Corymbia clarksoniana* (D.J.Carr & S.G.M.Carr) K.D.Hill & L.A.S.Johnson, *Eucalyptus cullenii* Cambage and *Melaleuca saligna* Schauer and closed forest (semi-deciduous notophyll vineforest) at altitudes between 380 and 400 m. Some plants were also found under the vineforest canopy, but usually in sunny spots or in close proximity to the margin. Other species in close association at the type locality included *Abelmoschus moschatus* subsp. *tuberosus* (Span.) Borss.Waalk., *Cymbopogon queenslandicus* S.T.Blake, *Desmodium tenax* Schindl., *Glycine* sp. (Bolt Head P.I.Forster PIF8948), *Hibiscus normanii* F.Muell., *Setaria oplismenoides* R.A.W.Herrm., *Solanum intonsum* A.R.Bean and *Vernonia*

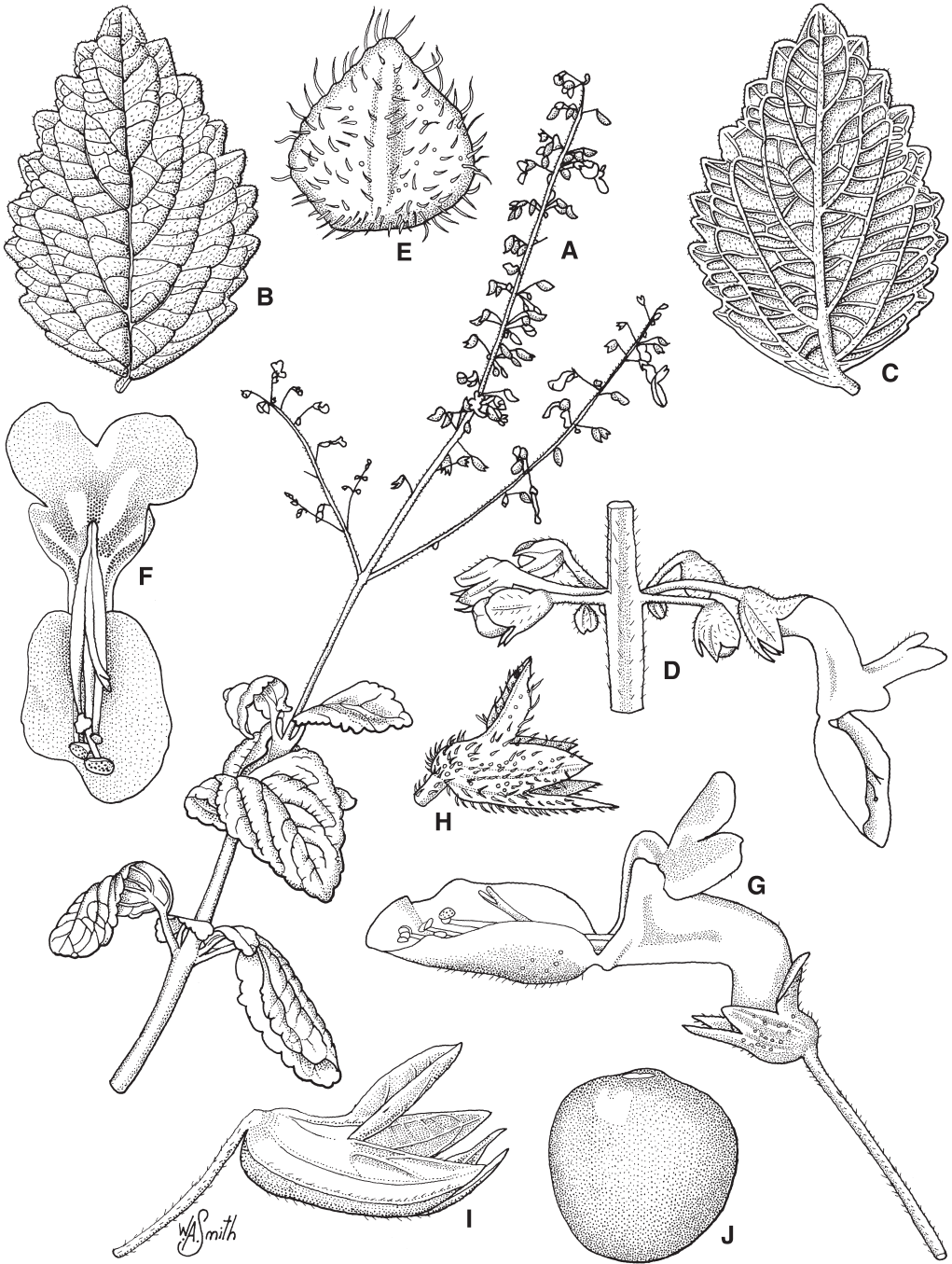
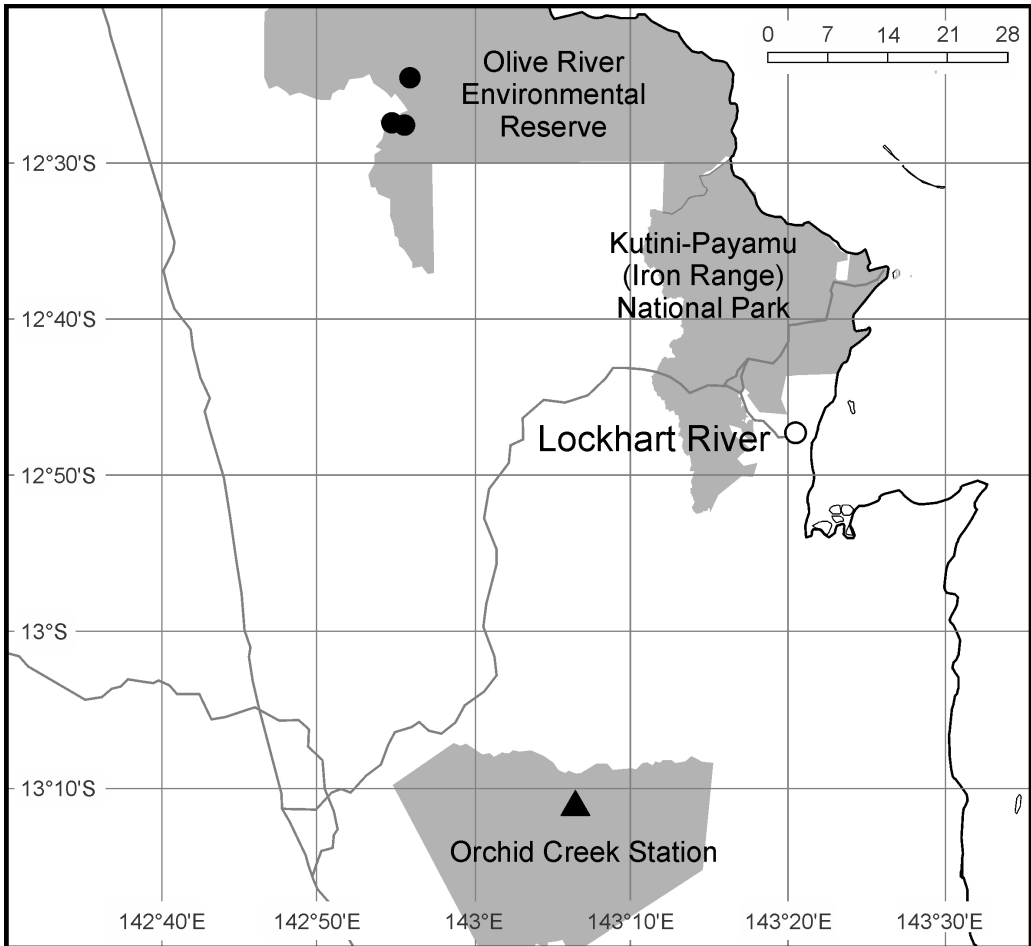


Fig. 1. *Plectranthus laetus*. A. habit of branchlet with flowering and fruiting inflorescence $\times 0.6$. B. adaxial leaf surface $\times 1$. C. abaxial leaf surface $\times 1$. D. verticillaster with buds and flower $\times 4$. E. floral bract $\times 12$. F. face view of flower $\times 6$. G. lateral view of flower $\times 6$. H. lateral view of flowering calyx $\times 8$. I. lateral view of fruiting calyx $\times 8$. J. seed $\times 32$. All from Forster PIF41138 & Thompson (BR1). Del. W. Smith.

junghuhniana J.Kost. This relatively small habitat space is periodically impacted by wildfires undoubtedly resulting in the markedly sharp rainforest margin. Adult plants of the *Plectranthus* are probably killed by these fires, but regenerate *in situ* either from seed or the fleshy rootstocks or *ex situ* by dispersal from adjacent plants within the vineforest canopy.

Notes: *Plectranthus laetus* was first collected in 2014 during a general botanical survey of Orchid Creek Station. The new species appears to be closely related to *P. pulchellus* (Forster 1994) that grows on sandstone substrates (cliff lines) adjacent to spring fed rainforests (evergreen notophyll/mesophyll vineforests) on the Olive River Reserve and from which it is disjunct by *c.* 70 km (**Map 1**).



Map 1. Distribution of *Plectranthus pulchellus* ● and *P. laetus* ▲ on Cape York Peninsula, grey shaded areas are conservation reserves and property boundaries.

Plectranthus pulchellus differs from *P. laetus* mainly in the yellow sessile glands (versus orange) and the verticillasters with a greater number of flowers (12–16 versus 6–10), flowers with corollas that are light purple

(versus blue-purple) and with smaller calyces. There are also other minor differences in the combinations of indumentum composition and cover on the foliage and floral parts; however, the speciation hypothesis is that the two are sister taxa.

Etymology: The specific epithet is derived from the Latin word *laetus* (pleasant), an allusion to the appearance of this plant.

Plectranthus ventosus P.I.Forst., **sp. nov.** with affinity to *P. parviflorus* Willd. but differing in lacking a basal stem tuber (versus present), antrorse non-glandular trichomes on the foliage (versus retrorse) and obovate-rhomboid floral bracts (versus ovate to obovate). **Typus:** Queensland. COOK DISTRICT: ex situ cultivation from Melville Peak, on the ridge between the headwaters of Sweetwater Creek and Temple Creek, Cape Melville National Park, 10 April 2015, *H.B. Hines CM40 & C.J. Hoskin* (holo: BRI).

Perennial herb, stems erect to 15 cm high; foliage scentless when crushed, not clammy; non-glandular and glandular trichomes uncoloured, non-glandular trichomes without prominent raised bases, sessile glands absent. Roots fibrous, somewhat fleshy and thickened. Stems square, erect to straggling, fleshy, easily snapped, the lower parts up to 8 mm diameter and not noticeably thickened, pink-purple to pink-green, upper parts with persistent indumentum, non-glandular trichomes sparse, antrorse, 4–6-celled up to 1 mm long, glandular trichomes sparse, very short with little development of stalks. Leaves discolorous, petiolate; petioles 2–5 × 0.8–1 mm, weakly channelled on top, non-glandular trichomes sparse, antrorse, 4–6-celled up to 1 mm long, glandular trichomes ± stalkless; laminae lanceolate-ovate to ovate, fleshy, ±flat to slightly keeled, 6–25 × 4–20 mm, crenate with 4–6 teeth up to 2 mm long on each margin, of similar length along margin, secondary teeth poorly developed; tip acute; base obtuse to rounded; upper surface medium-green and somewhat glossy, veins impressed, non-glandular trichomes sparse, antrorse, 4–6-celled up to 1 mm long, glandular trichomes absent; lower surface pale green, veins strongly raised, non-glandular trichomes sparse, antrorse, 4–6-celled up to 1 mm long, glandular trichomes sparse and stalked to 0.4 mm long. Inflorescence up to 100 mm long, usually single or with 1 or 2 side branches; axis square in cross-section, pink-purple, non-glandular trichomes occasional,

weakly antrorse, 4–6-celled up to 0.2 mm long, glandular trichomes dense and minute (< 0.2 mm long); bracts obovate-rhomboid, strongly cupped, 0.9–1 × 0.8–1 mm, ecomose, margins somewhat irregularly crenate to crenulate due to slightly enlarged bases of trichomes, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.4 mm long, glandular trichomes occasional, ± sessile; verticillasters 6–10-flowered, 4–14 mm apart; pedicels 2–4.5 × *c.* 0.2 mm, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes ± sessile. Flower calyces 1.8–2 mm long, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes sparse and very short (< 0.2 mm long). Corolla either not opening (cleistogamous) or poorly formed, 2.8–3 mm long, white, with some mauve edging; tube 1.8–2 mm long, ± straight, slightly inflated upwards, non-glandular and non-glandular trichomes absent; upper lobes suborbicular, inflexed, *c.* 0.5 × 0.5 mm, non-glandular trichomes scattered, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes scattered < 0.1 mm long; lateral lobes rounded, *c.* 0.2 × 0.2 mm, glabrous; lower lobe oblong-ovate, 0.8–1 × 0.6–0.7 mm, non-glandular trichomes sparse, antrorse, 2–4-celled up to 0.2 mm long, glandular trichomes absent; filaments filiform, 1.8–2 × *c.* 0.1 mm, lilac, fused for 0.8–1 mm from the base; anthers *c.* 0.2 × 0.1 mm; style filiform, *c.* 1.2 × 0.1 mm, cream, bifid for *c.* 0.2 mm. Fruit calyces 4.5–5 mm long; upper lobe broadly ovate, 1–1.2 × 1.6–1.8 mm; lateral lobes lanceolate, 1–1.2 × *c.* 0.8 mm; lower lobes lanceolate-falcate, 1.2–1.3 × 0.4–0.5 mm. Nutlets ± circular in outline, compressed flattened globose, 0.7–0.8 mm wide, 0.4–0.5 mm thick, brown, weakly verrucose. **Figs. 2 & 3.**

Distribution and habitat: *Plectranthus ventosus* is known so far from a single population at Cape Melville where it was collected on a ridge top (*c.* 590 m altitude) growing amongst scattered large boulders in stunted rainforest immediately adjacent to an exposed boulder field. Substrate is coarse sandy loam derived from Cape Melville granite; however, the plants mainly

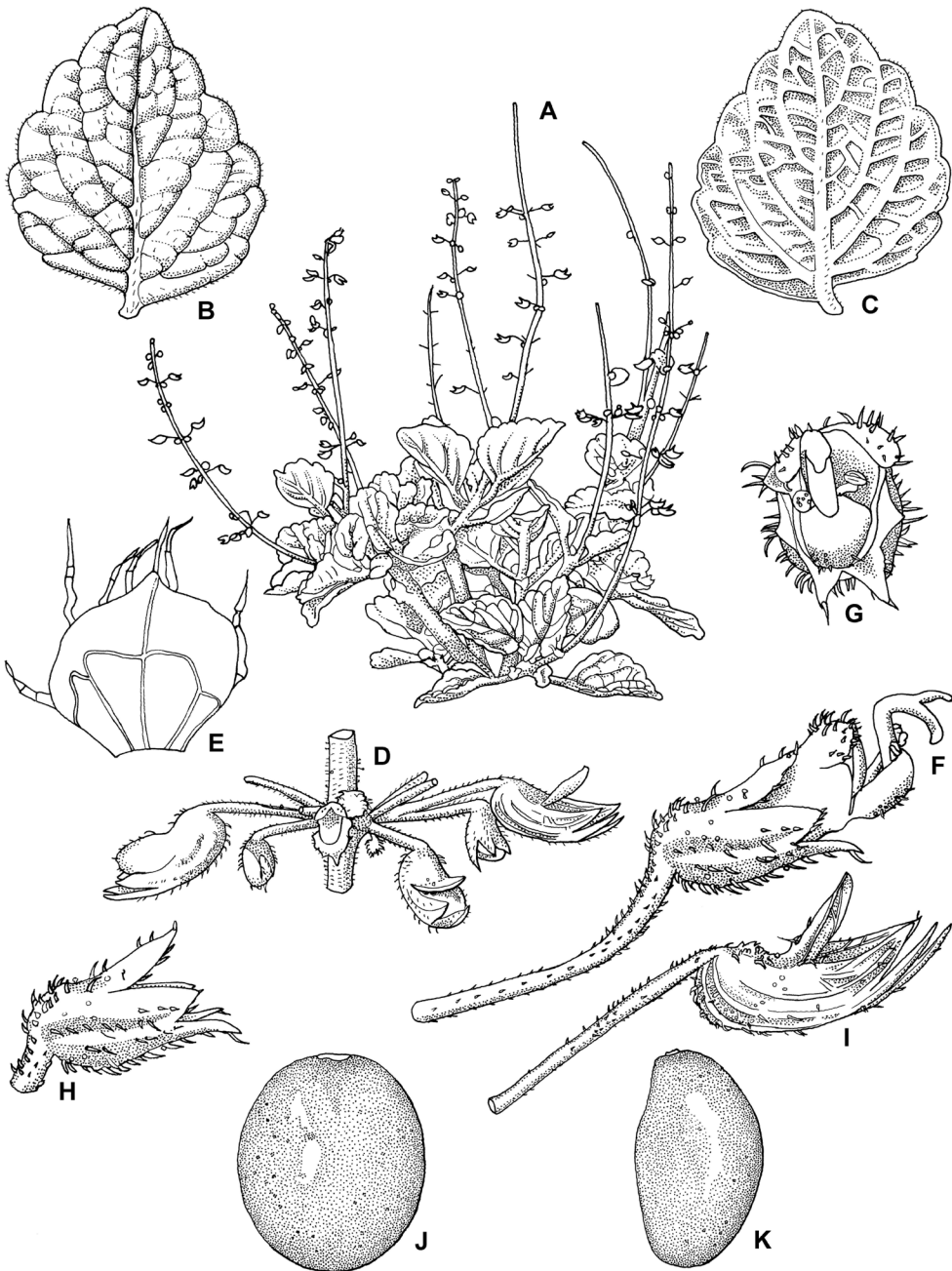


Fig. 2. *Plectranthus ventosus*. A. habit of whole plant with flowering and fruiting inflorescences $\times 0.6$. B. adaxial leaf surface $\times 2$. C. abaxial leaf surface $\times 2$. D. verticillaster with buds and fruiting calyces $\times 4$. E. floral bract $\times 32$. F. lateral view of cleistogamous flower $\times 12$. G. face view of cleistogamous flower $\times 12$. H. lateral view of flower calyx $\times 12$. I. lateral view of fruiting calyx $\times 8$. J. top view of seed $\times 32$. K. lateral view of seed $\times 32$. All from *Hines CM40 & Hoskin (BRI)*. Del. W. Smith.



Fig. 3. *Plectranthus ventosus* in habitat (Hines CM40 & Hoskin [BRI]). Photo: H. Hines.

grew lithophytically on top of the boulders in detritus derived from leaf litter (**Fig. 3**). Two other species of *Plectranthus* occur at Cape Melville, namely *P. dumicola* and *P. megadontus* (**Map 2**); both tend to be at lower altitudes and in more exposed situations.

Notes: *Plectranthus ventosus* was discovered at Cape Melville by Harry Hines and Conrad Hoskin on 15 December 2013 during surveys for amphibians and reptiles. Live material was forwarded to the author and cultivated in Brisbane.

This species appears to be predominantly cleistogamous based on repeated inspection of cultivated material with normally formed inflorescences, verticillasters and buds. Fully formed seeds are present in most

fruiting calyces and although a corolla is formed, it fails to open or appears malformed and dwarfed without proper expansion of the floral organs. Whether this is a case of ‘induced cleistogamy’ (equivalent to ‘pseudocleistogamy’ or ‘ecological cleistogamy’) where floral development is affected by environmental conditions (Culley & Klooster 2007) remains to be seen. All other Australian *Plectranthus* flower normally, although Blake (1971) did observe cleistogamous flowers on *P. parviflorus*. Cleistogamy has not been recorded in the genus in other parts of its extra-Australian range with other Lamiaceae genera recorded as cleistogamous being *Ajuga* L., *Lamium* L., *Salvia* L. and *Scutellaria* L. (Culley & Klooster 2007). Although this *Plectranthus*

occurs in a relatively ‘severe’ habitat, other species of the genus from similar altitudes and latitudes flower normally when cultivated further south (i.e. Brisbane), hence its floral behavior is probably natural.

Inferred relationships of this species are hypothesized to be with species such as *Plectranthus apreptus*, *P. laetus*, *P. parviflorus* and *P. pulchellus*; however, this remains to be tested with non-morphological methods. *Plectranthus ventosus* differs from all these species by the absence of sessile glands on the foliage and floral parts. It is perhaps most similar to *P. parviflorus*; however, that species differs by the possession of a pronounced basal tuber to the stems (absent), retrorse orientated non-glandular trichomes on the foliage (versus antrorse) and floral bracts that are ovate to obovate (versus obovate-rhomboid).

Plectranthus ventosus is surprisingly only the second vascular plant to be recognised as endemic to the boulder fields of the Melville Range at Cape Melville, the other being the iconic *Wodyetia bifurcata* Irvine. The Melville Range is recognised as a significant local centre of diversity for vertebrates with six endemic to these habitats (Hoskin 2013).

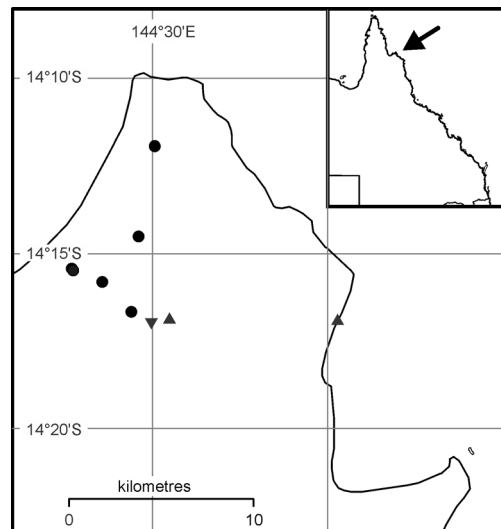
Etymology: The specific epithet is derived from the Latin word *ventosus* (windy), and pertains to the continuous strong winds that buffet and shape the vegetation at Cape Melville Range. These very winds prevented revisitation of this specific locality in 2014 in an attempt to source further material and to ascertain the population extent.

Acknowledgements

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References

- BLAKE, S.T. (1971). A revision of *Plectranthus* (Labiatae) in Australasia. *Contributions from the Queensland Herbarium* 9: 1–120.
- CULLEY, T.M. & KLOOSTER, M.R. (2007). The cleistogamous breeding system: a review of its frequency, evolution, and ecology in angiosperms. *The Botanical Review* 73: 1–30.
- FORSTER, P.I. (1994). Ten new species of *Plectranthus* L’Her. (Lamiaceae) from Queensland. *Austrobaileya* 4: 159–186.
- (2014). Diversity on a tropical sky island: two new species of *Plectranthus* L’Her. (Lamiaceae) from the Hann Tableland, northern Queensland. *Austrobaileya* 9: 207–215.
- HOSKIN, C.J. (2013). A new frog species (Microhylidae: *Cophixalus*) from boulder-pile habitat of Cape Melville, north-east Australia. *Zootaxa* 3722: 61–72.



Map 2. Distribution of *Plectranthus* species at Cape Melville, Cape York Peninsula (area entirely within Cape Melville National Park): *P. dumicola* ●, *P. megadontus* ▲ and *P. ventosus* ▼.