

Three new species of *Taeniophyllum* Blume (Orchidaceae) from northern Queensland

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Summary

Gray, B. (2015). Three new species of *Taeniophyllum* Blume (Orchidaceae) from northern Queensland. *Austrobaileya* 9(3): 382–392. Three diminutive, leafless orchids of the genus *Taeniophyllum* are described as new from northern Queensland, increasing the total species enumerated from mainland Australia to eight, namely *T. clementsii* (D.L.Jones & B.Gray) Kocyan & Schuit., *T. confertum* B.Gray & D.L.Jones, *T. epacridicola* B.Gray sp. nov., *T. explanatum* B.Gray sp. nov., *T. lobatum* Dockrill, *T. malianum* Schltr., *T. muelleri* Lindl. ex Benth. and *T. triquetroradix* B.Gray sp. nov. A key to the mainland Australian *Taeniophyllum* species is provided. All inflorescences of the mainland Australian taxa are also illustrated and provided here for comparison purposes and compliment the key. Line drawings, photographs and distribution maps for the three newly described species are given.

Key Words: Orchidaceae, *Taeniophyllum*, *Taeniophyllum epacridicola*, *Taeniophyllum explanatum*, *Taeniophyllum triquetroradix*, Australia flora, Queensland flora, new species, taxonomy, identification key

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Introduction

Taeniophyllum Blume is a diverse group of small, epiphytic orchids with 229 species widely distributed from Africa through India to Japan southwards through the Malay Archipelago to New Guinea, Australia and extending east to New Caledonia and Tahiti, with the centre of distribution in New Guinea (Schlechter 1982; Seidenfaden & Wood 1992; Margońska & Szlachetko 2010). In Australia, six species are enumerated, namely *T. confertum* B.Gray & D.L.Jones, *T. lobatum* Dockrill, *T. malianum* Schltr., *T. muelleri* Lindl. ex Benth., *T. norfolkianum* D.L.Jones, B.Gray & M.A.Clements and *T. pusillum* (Willd.) Seidenf. & Ormerod (formerly *T. obtusum* Blume; see Seidenfaden 1995) (Gray & Jones 1984; Lavarack & Gray 1985; Clements 1989; Dockrill 1992; Ormerod 1994; Jones 2006; Jones *et al.* 2006). However, two of the six species recorded occur on off shore islands, namely *T. norfolkianum* on Norfolk Island (Jones *et al.* 2006) and *T. pusillum* on

Christmas Island (Clements 1989) and are not included in this paper.

Based on recent molecular findings, Kocyan & Schuiteman (2014) combined *Microtatorchis* Schltr. with *Taeniophyllum*, and in doing so, *Microtatorchis clementsii* D.L.Jones & B.Gray was transferred to *Taeniophyllum clementsii* (D.L.Jones & B.Gray) Kocyan & Schuit., bringing the number of *Taeniophyllum* species recognised for mainland Australia up to five.

Generally, all the Australian *Taeniophyllum* species are small, leafless or with minute scale like leaves covering the stem. They have diminutive flowers, usually bearing only one, rarely two, at a time on a peduncle. The inflorescence is a raceme, often with continuous growth, producing flowers over a long period.

Observations have been carried out by the author over a period of some years, and have led to the discovery of these three novelties described here as *T. epacridicola* B.Gray sp. nov., *T. explanatum* B.Gray sp. nov. and *T. triquetroradix* B.Gray sp. nov. Two of these,

namely *T. explanatum* and *T. triquetroradix*, occur within the Wet Tropics of north-eastern Queensland (Townsville to Cooktown), while *T. epacridicola* is known only from far northern Cape York Peninsula. All three new species are known only from a small number of collections.

Materials and methods

This study is based on examination of living plants in the field, cultivated material, and preserved spirit collections deposited in BRI, CANB and CNS (herbaria acronyms

follow Thiers (continuously updated)). Measurements and illustrations were made based on living root and stem morphology, whereas inflorescence structure and floral characters were studied from live plants and preserved materials in spirit. Length × width measurements are indicated as measurement × measurement mm.

An illustration depicting the inflorescences of all mainland Australian *Taeniophyllum* taxa, including the three new taxa, is provided here for comparison purposes (Fig. 1) and to compliment the key.

Taxonomy

Key to mainland Australian *Taeniophyllum* species

- 1 Sepals and petals fused near the base forming a tube 2
- 1. Sepals and petals free to the base not forming a tube 5
- 2 Roots terete in cross section **T. muelleri**
- 2. Roots triangular or flattened in cross section 3
- 3 Roots triangular in cross section (having a raised longitudinal ridge) . . **T. triquetroradix**
- 3. Roots flattened in cross section 4
- 4 Roots 1.5–2 mm broad; peduncle filiform, 12–25 mm long; rachis filiform; floral bracts small, alternating, c. 0.5 mm apart, all in one plane; flowers c. 2.5 mm long **T. explanatum**
- 4. Roots 1 mm or less broad; peduncle filiform, 2–5 mm long; rachis not filiform, fleshy, parallel sided, twice as wide as peduncle; floral bracts alternating, < 0.5 mm apart; flowers < 2 mm long **T. clementsii**
- 5 Roots 2–3 mm broad; peduncle 2–3 mm long; floral bracts overlapping, hiding the rachis **T. confertum**
- 5. Roots 1.5–4 mm broad; peduncle and rachis not as above 6
- 6 Peduncle, rachis and ovary sparsely covered with erect short-bristly hairs; flowers green, turning yellow with age **T. lobatum**
- 6. Peduncle, rachis and ovary glabrous 7
- 7 Young roots green with rows of white elongate spots; roots 1.5–2.5 mm broad, mostly hanging free from the host, some appressed; peduncle filiform, 20–50(–60) mm long; floral bracts overlapping; flower 7–11 mm wide **T. malianum**
- 7. Young roots green; roots 2–3.5(–4) mm broad, appressed to the host; peduncle and rachis zig-zag from base, not filiform, 5–10 mm long; floral bracts alternating 1–1.5 mm apart; flower 4.5–5 mm wide **T. epacridicola**

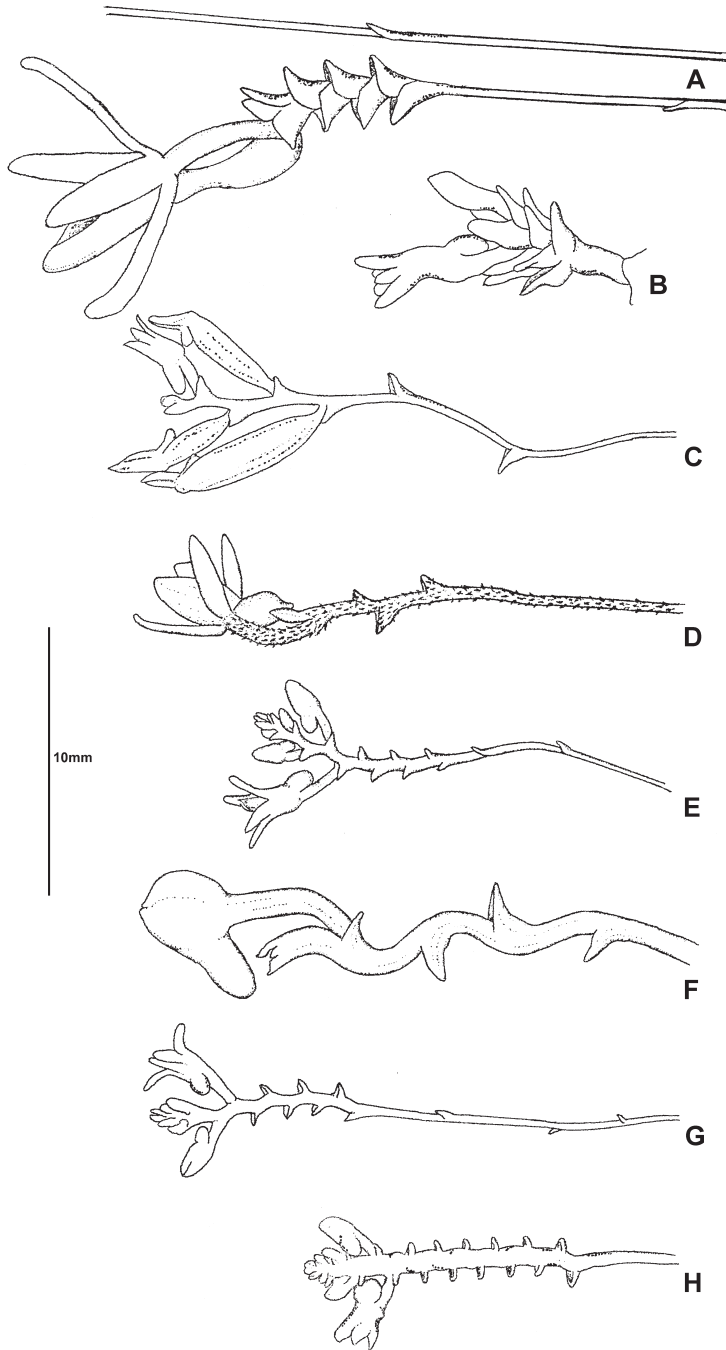


Fig. 1. Lateral views of inflorescences from all mainland Australian *Taeniophyllum* species. A. *T. malianum* cultivated plant (no voucher). B. *T. confertum* from Walker s.n. (CNS). C. *T. muelleri* from Gray BG9661 (CNS). D. *T. lobatum* from Gray BG8584 (CNS). E. *T. triquetroradix* from Gray BG4129 (CNS). F. *T. epacridicola* from Gray BG5235 (CNS). G. *T. explanatum* from Gray BG9674 (CNS). H. *T. clementsii* from Gray BG8508 (CNS). Scale as indicated. Del. B. Gray.

1. *Taeniophyllum epacridicola* B.Gray **sp. nov.** Similar to *T. mangifera* Schltr. but differs in having dorsal sepal and petals clavate, lateral sepals obovate with a sharp apical point and a much larger stigmatic opening. **Typus:** Queensland. COOK DISTRICT: Atherton, cultivated (*ex situ* from Wasp Creek), 11 September 1990, *B. Gray BG5235* (holo: BRI; iso: CNS).

Plant epiphytic. **Roots** usually several, flattened, creeping, 50–150 mm long, 2–3.5(–4) mm broad, greyish green. **Inflorescences** one to several, scape 4–6 mm long. **Rachis** rough, zig-zag, 5–10 mm long, reddish-green. **Floral bracts** alternating triangular 1–1.5 mm apart, reddish green. **Flowers** lasting one day, 4.5–5 mm across, pale creamy yellow. **Sepals** spreading widely free to the base. **Dorsal sepal** concave, elliptic to obovate, *c.* 2.8 × 1.6–1.8 mm. **Lateral sepals** broadly elliptic, acute at the apex, *c.* 2.6 × 1.6 mm, keeled on the back. **Petals** spatulate, *c.* 2 × 1.4 mm. **Labellum** thick and fleshy, deeply concave with raised sides and obtuse at the apex, *c.* 2.2 × 1.8 mm. **Spur** 1.4–1 mm, in line with the labellum. **Column** short and stout, *c.* 1.2 × 1 mm, purplish towards the front. **Anther cap** *c.* 0.8 × 1 mm, beaked at the front. **Pollinia** 4 in unequal pairs. **Capsule** 19–20 × *c.* 4.5 mm, with slight longitudinal ridges. **Figs. 2–4.**

Additional specimens examined: Queensland. COOK DISTRICT: Wasp Creek north of Bamaga, Sep 1989, *Gray BG5120* (CNS); Usher Point, Cape York, Jan 2010, *Gray BG9681 & Baume* (CNS).

Distribution and habitat: *Taeniophyllum epacridicola* is endemic to northern Cape York where it is known from a few localities north of the Jardine River (**Map 1**). Specimens examined in the field grow on twigs and small branches primarily in epacrid dominated shrubland at elevations below 100 m. *T. epacridicola* has also been rarely observed in the margin of the rainforest.

Phenology: Flowering and fruiting has been recorded between July and January.

Notes: *Taeniophyllum epacridicola* is in the section *Taeniophyllum* (synonym: section *Trachyrhachis* Schltr.), and this represents the first record of the section for Australia. The first specimen of *T. epacridicola* examined

was on a fallen branch in the edge of rainforest near Lockerby homestead north of Bamaga in September 1979. However, efforts to locate more material for detailed examination were unsuccessful until a second collection (sterile) was made at Wasp Creek in September 1989 (*Gray BG5120*), and was successfully flowered in cultivation in September 1990 (*Gray BG5235*). In 2008 another population was located at Usher Point by David Baume. This population was revisited in January of 2010 to enable voucher preparation (*Gray BG9681 & Baume*). A single plant (tentatively identified as this species), has been located close to Punsand Bay; however, no fertile specimen has been available to date.

Etymology: *Taeniophyllum epacridicola* is named for its seeming preference to grow in epacrid dominated shrubland consisting of *Leucopogon ruscifolius* R.Br. and *L. yorkensis* Pedley (Ericaceae).

2. *Taeniophyllum explanatum* B.Gray **sp. nov.** Similar to *T. muelleri* Lindl. ex Benth. but differs in having roots flattened in cross-section. **Typus:** Queensland. COOK DISTRICT: Bridle Creek on power line access road, 24 October 2002, *B. Gray BG8339* (holo: BRI; iso: CNS).

Plant epiphytic forming small clumps with 5–30 roots. **Roots** ± flat in cross section, 1.5–2 mm across, up to 10 cm long, dull green. **Inflorescences** filiform, peduncle 12–25 mm × *c.* 0.2 mm with 1–3 bracts. **Rachis** increasing in length as flowering progresses producing 10–30 flowers one at a time; buds, flowers and capsules can be present at the same time. **Floral bracts** acute, alternate, 0.5–0.6 mm long, *c.* 0.5 mm apart and all in one plane. **Flowers** opening singly, *c.* 2.5 mm long including the spur and *c.* 2.5 mm across when open, green. **Sepals** and **petals** connate at the base into a tube *c.* 0.8 mm long, then spreading. **Dorsal sepal** linear to narrowly lanceolate, *c.* 2 × 0.6–0.7 mm, incurved. **Lateral sepals** linear, *c.* 2 × 0.6 mm. **Petals** ovate, *c.* 1.8 × 0.6 mm, incurved, apex acuminate. **Labellum** cymbiform, narrowly triangular, 1.8–2 mm × *c.* 0.5 mm with low erect lobes at the base, apex acute with an inflexed spur *c.* 0.5 mm long. **Spur**

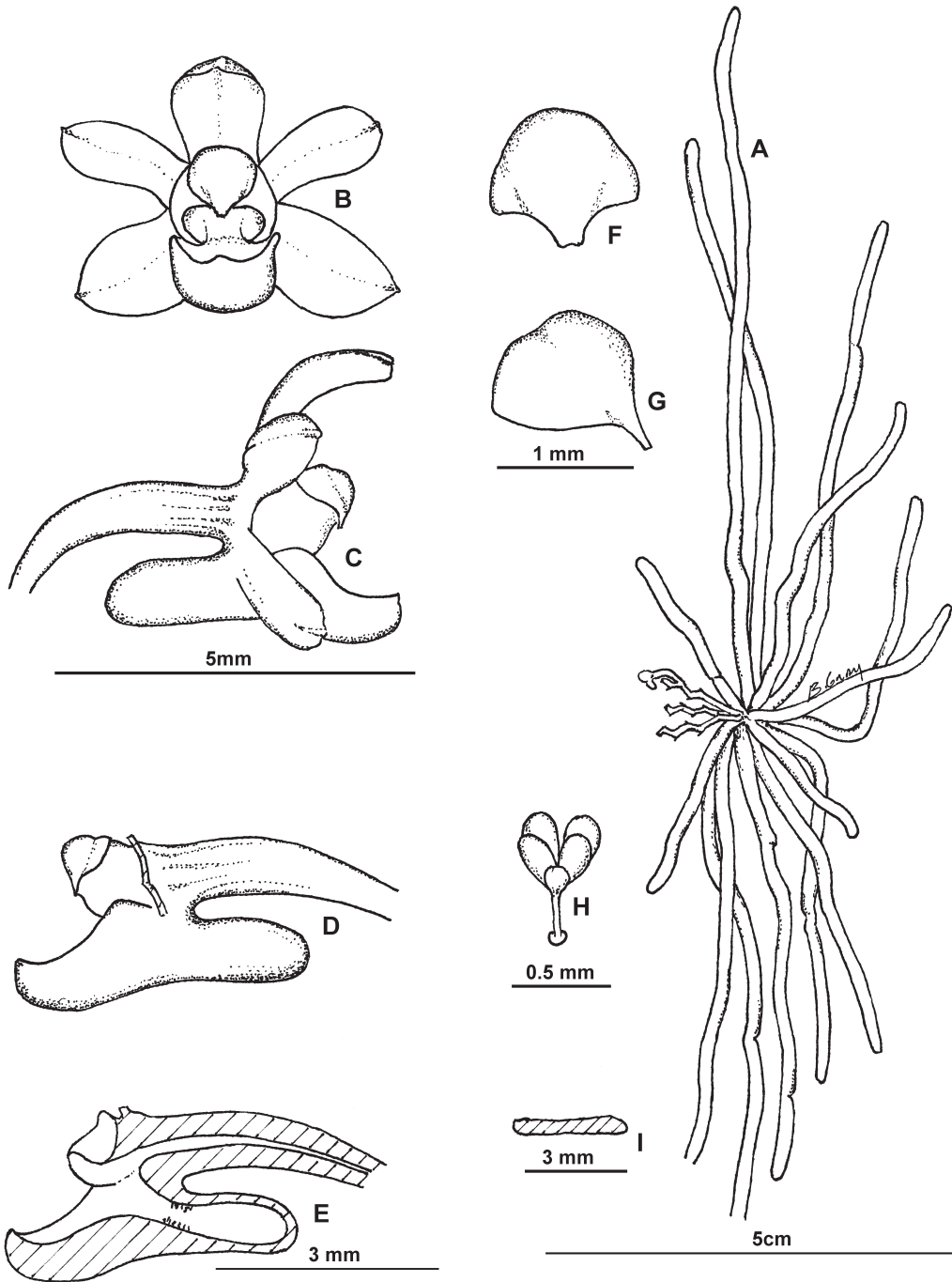


Fig. 2. *Taeniophyllum epacricicola*. A. habit of a mature flowering plant. B. face view of flower. C. lateral view of flower. D. lateral view of column and labellum. E. longitudinal section of flower. F. face view of anther. G. lateral view of anther. H. pollinia. I. transverse section of mature root. All from Gray BG5235 (CNS). Scale as indicated. Del. B. Gray.



Fig. 3. *Taeniophyllum epacridicola*. A fruiting specimen showing flat roots closely appressed to a branch of an understorey tree (Gray BG9681, CNS). Photo: B. Gray.



Fig. 4. *Taeniophyllum epacridicola*. Close-up view of an open flower (Gray BG5235, CNS). Photo: B. Gray.

subglobose, *c.* 0.9×0.7 mm. **Column** domed, *c.* 0.7×0.4 mm, wings forward facing and *c.* 0.3×0.1 mm. **Anther cap** *c.* 0.4×0.3 mm, with 2 prominent humps. **Pollinia** 4 in two pairs, pale yellow. **Capsule** not seen. **Figs. 5 & 6.**

Additional specimens examined: Queensland. COOK DISTRICT: Robson Creek, Danbulla NP, Aug 2014, Ford 6332 (CNS); Bridle Creek on power line access Road, Aug 2009, Gray BG9312 (CNS); Windsor Tableland NP, Oct 2014, Gray BG9674, Baume & Walker (CNS); Mt Windsor Tableland, May 1989, Jones 4377 & Clements (CANB).

Distribution and habitat: *Taeniophyllum explanatum* occurs within the Wet Tropics of Queensland from Mount Windsor Tableland south to Innisfail (**Map 2**) at elevations from 500 to 1000 m, in rainforest, usually on small trees and vines.

Phenology: Flowering has been recorded between May and January.

Notes: *Taeniophyllum explanatum* has only been collected on a few occasions possibly

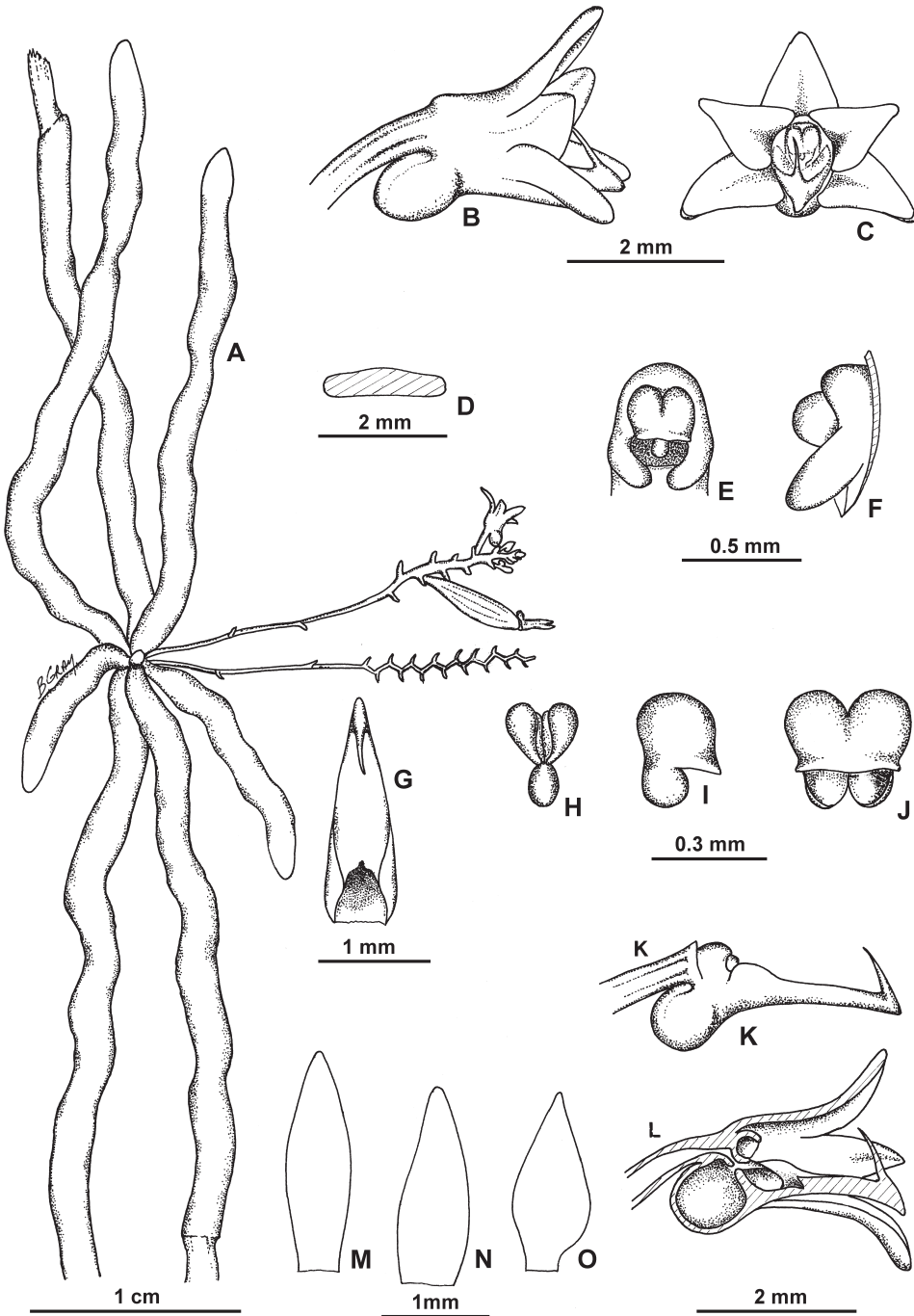


Fig. 5. *Taeniophyllum explanatum*. A. habit of a mature flowering and fruiting plant. B. lateral view of flower. C. face view of flower. D. transverse section of mature root. E. face view of column. F. lateral view of column. G. face view of labellum. H. pollinia. I. lateral view of anther. J. face view of anther. K. lateral view of labellum and column. L. longitudinal section through flower. M. dorsal sepal. N. lateral sepal. O. petal. All from Gray BG8339 (CNS). Scale as indicated. Del. B. Gray.



Fig. 6. *Taeniophyllum explanatum*. Plant showing inflorescences bearing flower buds and open flowers (Gray BG9674, CNS). Photo: B. Gray.

because this small species is easily overlooked in the rainforest. Most of the collections made are from the more accessible understorey; however, a single collection (*Ford 6332*) is from the rainforest canopy.

Etymology: The specific epithet refers to the roots being flat.

3. *Taeniophyllum triquetroradix* B.Gray sp. nov. Similar to *Taeniophyllum muelleri* Lindl. ex Benth. but differs in having roots triangular in cross-section. **Typus:** Queensland. COOK DISTRICT: Ridge above Tinaroo Dam perimeter road, 8 September 1990, *B. Gray BG5238* (holo: BRI; iso: CNS).

Taeniophyllum sp.; Ormerod (1994).

Illustrations: Jones (2006: 454), as *T. confertum* B.Gray & D.L.Jones.

Plants epiphytic, spider like in appearance sometimes proliferating from root tips and forming small colonies. **Roots** 4–10,

appressed to the host, \pm triangular in cross section, 10–60 mm \times 1.5–2 mm, glaucous to greyish green, strongly ridged on the upper surface. **Inflorescences** 1–3(–4); peduncle 5–12 mm long. **Rachis** extending as flowering progresses; 5–20 or more flowered with one or sometimes two open together; buds, flowers and capsules can be present at the same time. **Floral bracts** projecting 0.5–0.6 mm, somewhat fleshy and all in one plane. **Flowers** *c.* 4.5 mm long including the spur and 3 mm in diameter, green, aging to yellowish green. Sepals and petals fused at the base into a tube *c.* 1.4 mm long. **Sepals** spreading, somewhat ovate to narrowly triangular, *c.* 1.5 \times 0.9 mm, acute at the apex. **Petals** spreading, ovate, *c.* 1.4 \times 0.8–0.9 mm, acute at the apex. **Labellum** fleshy, cymbidiform *c.* 1.9 mm long, obscurely three lobed near the base, lateral lobes *c.* 0.3 mm high, midlobe narrowly triangular, acute at the apex with an inflexed spine *c.* 0.6 mm long at the tip. **Spur** elongate-globose, *c.* 1.9 \times 0.9 mm. **Column** domed *c.* 0.7 mm high,

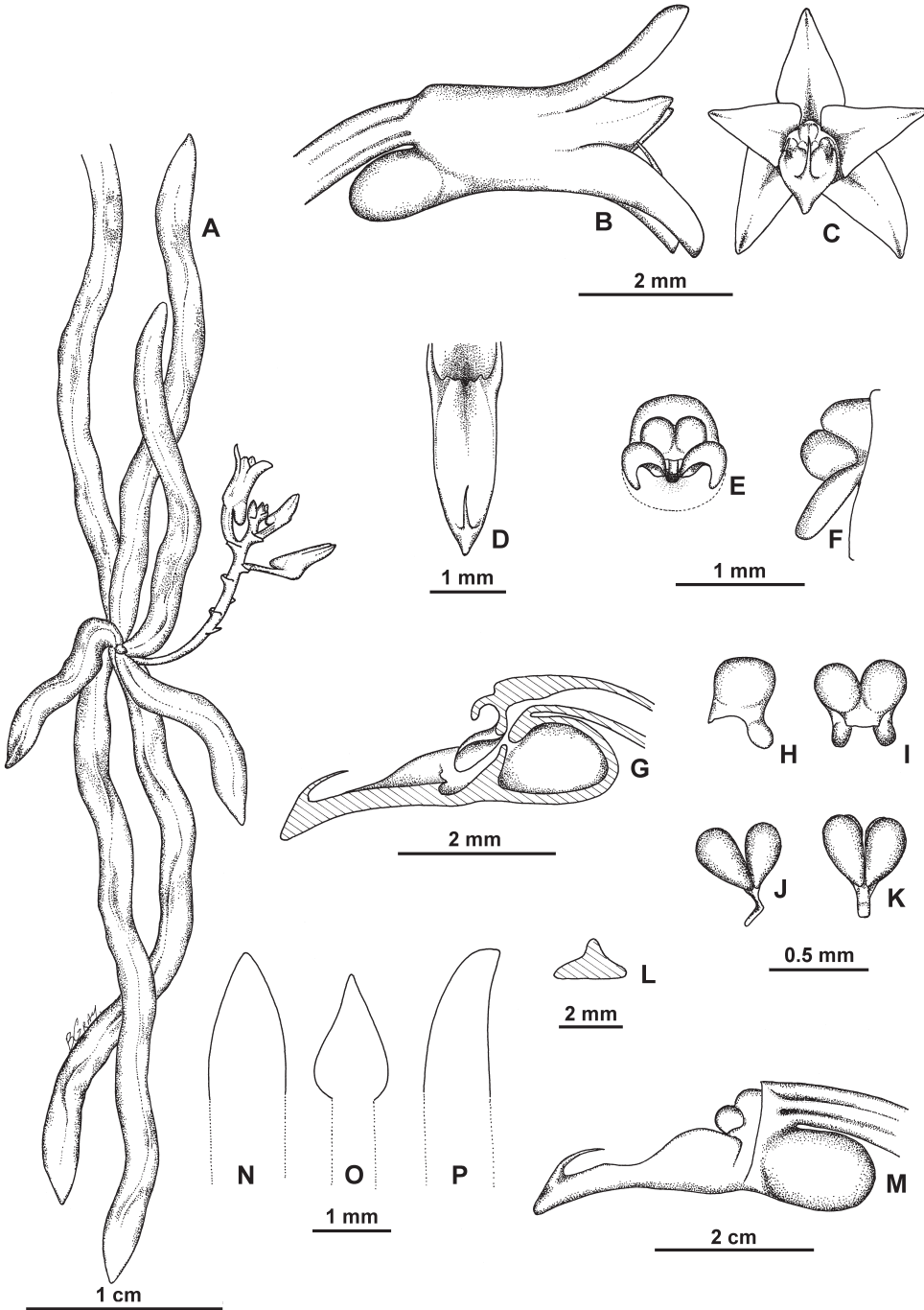


Fig. 7. *Taeniophyllum triquetroradix*. A. habit of a mature flowering plant. B. lateral view of flower. C. face view of flower. D. face view of labellum. E. face view of column. F. lateral view of column. G. longitudinal section of labellum and column. H. lateral view of anther. I. face view of anther. J. face view of pollinia. K. lateral view of pollinia. L. transverse section of mature root. M. lateral view of labellum and column. N. dorsal sepal. O. petal. P. lateral sepal. All from Gray BG5238 (BRI). Scale as indicated. Del. B. Gray.

column wings projecting forward, *c.* 0.4 mm long. **Anther Cap** *c.* 0.5 × 0.5 mm, with two distinct humps. **Pollinarium** *c.* 0.5 mm long. **Pollinia** 4, ovoid, in 2 equal sized pairs, yellow. **Capsule** 11.5–12 × 2–3 mm with 5–6 longitudinal ridges. **Figs. 7 & 8.**

Additional specimens examined: Queensland. COOK DISTRICT: Euluma Creek Road, Julatten, Jan 2003, *Gray BG8424* (CNS); Bushy Creek, Julatten, Aug 1985, *Gray BG4129* (CNS); Cairns Inlet near White Rock, Jul 2013, *Ormerod 008* (CNS).



Fig. 8. *Taeniophyllum triquetroradix*. Close-up view of a flowering specimen in cultivation showing (i) triangular roots with a clear dorsal median ridge, and (ii) an inflorescence bearing a flower bud and an open flower (*Gray BG8424*, CNS). Photo: B. Gray.

Distribution and habitat: *Taeniophyllum triquetroradix* occurs within the Wet Tropics of Queensland between Mossman and Innisfail (**Map 2**) from sea level to 400 m. Plants have been most commonly found in poorly developed, open rainforest, either in

the understorey or the upper canopy based on specimens found on fallen branches; however, it has also been recorded at the edge of mangroves. Some populations have also been observed on trees in open paddocks.

Phenology: Flowers have been observed between July and January.

Notes: *Taeniophyllum triquetroradix* is probably more common than the number of collections indicates because plants are small and often overlooked.

Etymology: The specific epithet refers to the roots which are triangular in cross section.

Acknowledgements

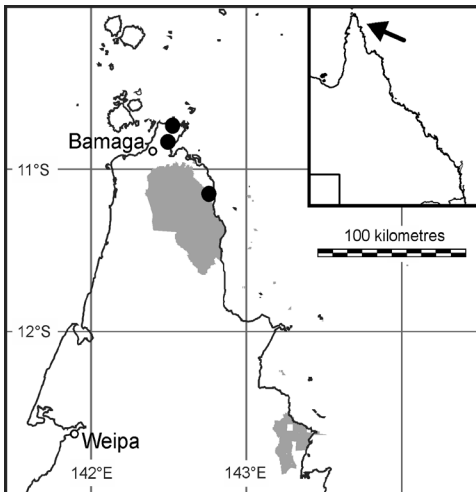
I am grateful to David Baume for his kind help with locating new populations of *Taeniophyllum epacridicola* and *T. explanatum*, and who also assisted me in numerous field trips; James Walker for good company in the field, testing and commenting on the taxonomic key, and his constructive criticism with the manuscript. Special thanks to Yee Wen Low (Singapore Botanic Gardens) and Paul Ormerod (Cairns, Queensland) for help with the initial stage of the manuscript. Professor Darren Crayn and Frank Zich kindly provided me with access to the Australian Tropical Herbarium (CNS) to examine the *Taeniophyllum* collection there; Paul Forster and the curators of the Queensland herbarium (BRI) for making available relevant materials on loan for this study.

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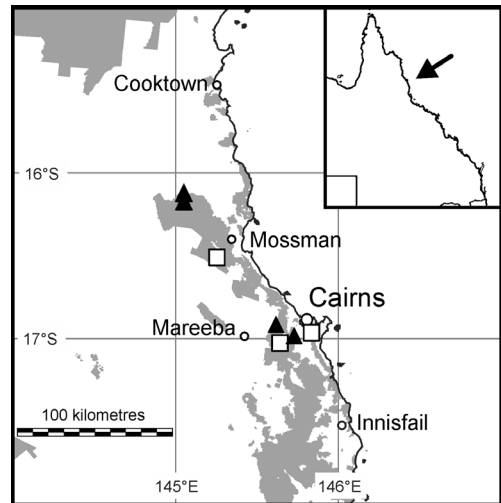
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Map 1. Distribution of *Taeniophyllum epacridicola*, grey shaded areas are conservation reserves.



Map 2. Distribution of *Taeniophyllum explanatum* ▲ and *T. triquetroradix* □, grey shaded areas are conservation reserves.