

ACROPORIUM

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Acroporium Mitt., *J. Linn. Soc., Bot.* 10: 182 (1868); from the Greek *akros* (pointed at the tip) and *poros* (a perforation or tube), possibly in reference to the inrolled upper leaf margins forming a tube.

Lecto: *A. brevicuspidatum* Mitt.

Autoicous, dioicous or pseudautoicous. Plants slender to robust, glossy, forming dense yellowish green mats. Stems elongate, creeping, pinnately branched; branches prostrate to suberect, rigid, densely foliate, frequently cuspidate at the tips. Leaves erect to \pm squarrose, wide-spreading, occasionally strongly secund, \pm concave, ovate-lanceolate from a \pm cordate-auriculate base, short- to subulate-pointed, ecostate; apex occasionally subtubular; margin entire or faintly denticulate near the apex. Laminal cells narrowly oblong to linear, smooth, often thickened and porose, or with a single papilla on upper leaf cells; alar region usually with a basal row of 2–5 inflated pigmented cells curving inwards at the base; supra-alar cells present in a few species as 1 or 2 rows of quadrate pigmented cells.

Perigonia on branches. Perichaetia on stems or branches; inner perichaetial leaves erect, from a sheathing base, abruptly or gradually long-pointed; apices serrulate; alar cells not strongly developed. Calyptra cucullate, smooth. Seta elongate, slender, red, tuberculate above, usually strongly papillose. Capsule suberect to nodding, ovoid to elongate or elongate-cylindrical, short-necked; exothecial cells collenchymatous; operculum from a conical base, long, finely rostrate. Peristome double; exostome of 16 lanceolate teeth, finely striate, with a median zig-zag line; endostome segments yellowish; basal membrane broad; segments the same length as exostome teeth, broadly keeled; cilium 1, short, occasionally rudimentary. Chromosome numbers not known.

More than 180 species are currently accepted for this exclusively tropical and subtropical genus. *Acroporium* is common in the Palaeotropics, including Papua New Guinea, and in tropical America and the Pacific; most species are epiphytic in tree crowns, on branches and on decaying logs in rainforest. The four species in Australia are restricted to north-eastern Queensland but also occur in Papua New Guinea.

Species of *Acroporium* can be distinguished by their ovate-lanceolate leaves, concave lamina with incurved to involute margins, a somewhat involute to tubulose apex and a well-defined alar region with a single conspicuous basal row of thin-walled cells, the outermost being curved inwards (Tan, 1994). Median laminal cells are narrowly oblong to elongate, rarely linear, and are arranged in oblique rows, with walls thick. Leaf margins are generally entire, apart from a few teeth near the apex. Perichaetial leaves lack alar cells, but they have a coloured and expanded base sheathing the vaginula. The seta is usually papillose or tuberculate distally.

References

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Key

- 1 Plants slender and sparsely foliate; leaves lanceolate or lanceolate-linear, < 0.5 mm wide2
- 1: Plants robust and densely foliate; leaves broadly ovate to oblong-lanceolate, acute to long-acuminate, > 0.5 mm wide3
- 2 Plants with numerous erect slender penicillate branchlets; branch tips and branches lacking rhizoidal gemmae; setae on primary stems **1. *A. lamprophyllum* var. *percaudatum***
- 2: Plants lacking erect slender branchlets; clusters of rhizoidal gemmae produced on branched and branch tips; setae on secondary stems or branches **2. *A. microcladon* var. *rhizogemmae***
- 3 Leaves broadly ovate to ovate-lanceolate, acute to short-acuminate **3. *A. stramineum***
- 3: Leaves oblong-lanceolate to lanceolate, short- to long-acuminate **4. *A. strepsiphylum***

1. *Acroporium lamprophyllum* Mitt. var. *percaudatum* (E.B.Bartram) B.C.Tan, H.P.Ramsay & W.B.Schofield, *Austral. Syst. Bot.* 9: 321 (1996)

Acroporium percaudatum E.B.Bartram, *Brittonia* 13: 377 (1961). T: Madang District, Lower Ramu-Atitau area, Papua New Guinea, *R.G.Robbins 1377*; holo: FH.

Illustrations: H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 8–9, fig. 3 (2004).

Dioicous. Plants golden, slightly glossy, forming dense mats. Stems long, slender, creeping, closely bipinnate; branches procumbent or suberect, occasionally attenuate. Leaves below attenuate shoot divergent, ovate-lanceolate. Branch leaves erect, often slightly falcate and second, narrowly lanceolate, concave, short-acuminate, above with a minutely denticulate apex, to 1.8 mm long and 0.3 mm wide; margins entire, involute above. Laminal cells narrowly oblong, 32–55 × 5–6 μm, strongly papillose on the abaxial surface, smooth near the insertion; walls thin to thick; alar region with a basal group of 3 or 4 large hyaline or coloured cells that are pigmented across the insertion coloured.

Perichaetia on primary stems; perichaetial leaves abruptly narrowing to an acuminate apex, toothed in the upper half. Seta 15–20 mm long, coarsely papillose above, smooth below. Capsule small, cylindrical, slightly inclined. Spores 20–30 (–36) μm diam.

Known only from Papua New Guinea and north-eastern Qld.

Qld: Mossman Gorge, *B.C.Tan 94-700, 94-702, E.A.Brown & R.G.Coveny* (FH, NSW); *loc. id.*, *W.A.Weber & D.McVean B-31690* (CANB, COLO); Blencoe, Cardwell Ra., *H.Steimann 36867* (CANB); Golboro Track to the Boulders, Bellenden Ker Ra., *W.B.Schofield 90179A* (NSW, UBC); Downey Ck, Innisfail, *I.G.Stone 24704* (MEL).

This variety differs from var. *lamprophyllum* in being larger, more golden in colour and with fewer vertical elongate penicillate shoots. The laminal cells are strongly unipapillose rather than smooth or weakly unipapillose. It is similar in branching habit, leaf orientation and leaf morphology, except that leaves are short- rather than long-acuminate. Sporophytes have not been seen in Australian collections.

The type variety is known from Sri Lanka, SE Asia, Malesia, China and Oceania.

2. *Acroporium microcladon* (Dozy & Molk.) B.C.Tan var. *rhizogemmae* B.C.Tan, W.B.Schofield & H.P.Ramsay, *Nova Hedwigia* 67: 214 (1998)

T: Mossman Gorge, Qld, 1994, *B.C.Tan 94-701*, *E.A.Brown & R.G.Coveny*; holo: NSW; iso: BM, FH, H, NY.

Illustrations: B.C.Tan, W.B.Schofield & H.P.Ramsay, *loc. cit.*, figs 1–7; H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 11, fig. 4.

Plants creeping. Stems pinnate; branches short, 1.5–2.2 mm long. Leaves to 1 mm long and 0.3 mm wide, concave, somewhat ranked, ovate-lanceolate, almost entire. Laminal cells narrowly oblong, 40–50 × 3–4 µm, thick-walled, smooth and occasionally weakly unipapillose; alar cells 2, enlarged, pigmented, with thick walls, a few smaller cells also present; supra-alar cells few. Gemmae segmented, fusiform on the adaxial surface of leaves at or near branch apices.

Perichaetia basal on branches; perichaetial leaf margins clearly toothed in the upper half. Seta 10–15 mm long, smooth. Capsule horizontal, c. 1 mm long and 0.5 mm wide, broadly cylindrical; mouth wide. Peristome with exostome teeth c. 250 µm long, papillose distally; endostome papillose; cilia not seen. Spores 18–20 µm diam.

First described from tree trunks and branches in rainforest in north-eastern Qld, this variety was subsequently reported from Sulawesi (Indonesia), Papua New Guinea and the Solomon Islands by Tan *et al.* (2007).

Qld: summit of Mt Bellenden Ker, *W.B.Schofield 90258* (NSW, UBC); Wopen Ck, *I.G.Stone 15095, 18144, 18165* (MEL); Sullivans Track, Cardwell, *W.B.Schofield 90401, I.G.Stone & M.I.Schofield* (NSW, UBC); Cooroo L.A., 16 km WNW of Innisfail, *H.Streimann 29998* (CANB); Mossman Gorge, *B.C.Tan 94-701 & E.A.Brown & R.G.Coveny* (FH, NSW).

Acroporium microcladon var. *rhizogemmae* exhibits some leaf dimorphism, the predominantly ovate-lanceolate branch leaves often becoming broadly ovate in outline and weakly toothed at the obtuse apex. Distinctive and abundant gemmae are produced from a cluster of rhizoidal branches that grow attached to the adaxial surfaces of the leaves at or near the branch tips, forming a brownish bud-like structure. The gemmae are fusiform, 1–2 mm long and segmented with 3–8 cells having thick, papillose walls.

Leafy specimens lacking rhizoidal gemmae on branch tips have been mistaken for *Clastobryum conspicuum* M.Fleisch. (Stone, 1982; Tan *et al.*, 1996) a species that is no longer accepted in the Australian bryoflora (Ramsay *et al.*, 2004).

3. *Acroporium stramineum* (Reinw. & Hornsch.) M.Fleisch., *Musc. Buitenzorg* 4: 1301 (1923)

Leskea straminea Reinw. & Hornsch., *Nov. Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur.* 14(2): 718 (1826). T: Mt Gedé, Java & Mt Klabat, Celebes (Sulawesi); *n.v.*

Hypnum erythropodium Hampe, *Linnaea* 37: 161 (1872); *Sematophyllum erythropodium* (Hampe) A.Jaeger, *Ber. Thätigk. St. Gallischen Naturwiss. Ges.* 1876–77: 384 (1878) [Ad. 2:450]; *Rhynchostegium erythropodium* (Hampe) Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 89 (1882); *Acroporium erythropodium* (Hampe) Broth., *Nat. Pflanzenfam.*, 2nd edn, 11: 437 (1925). T: on moist rocks, Rockingham Bay, Qld, 28 July 1868, *coll. unknown*; holo: BM.

Illustrations: E.B.Bartram, *Philipp. J. Sci.* 68: pl. 25, fig. 431 (1939); B.C.Tan, *Willdenowia* 24: 282, figs 69–71 (1994); H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 5, fig. 1.

Dioicous or pseudautoicous with dwarf males. Plants medium-sized to robust, glossy, yellowish green to golden green. Stems long, forming compact wefts or tufts; branches prostrate and densely arranged, 5–15 mm long. Stem and branch leaves erect-spreading, 1.5–2.0 mm long, 0.50–0.75 mm wide, slightly secund towards the apex, not conspicuously cuspidate in comal tufts. Leaves ovate to ovate-lanceolate, concave; apex acute to very short-acuminate, subtubulose above; margins entire above, strongly cordate-auriculate at the base, short-acuminate. Laminal cells linear, 55–80 × 3–5 µm, thick-walled, porose towards the ends, some upper cells unipapillose; alar region well developed, with 3–5 enlarged,

pigmented basal cells; outer cells often curved inwards towards the stem; basal cells orange across insertion.

Perichaetia usually on secondary stems and at the base of branches; inner perichaetial leaves lanceolate, denticulate at the apex, abruptly short- to long-acuminate. Seta 10–25 mm, long, papillose above. Capsule suberect, 0.8–1.0 mm long, ovoid, narrowing below the peristome. Peristome with the exostome teeth striate below, papillose above; endostome segments finely papillose. Spores 10–15 µm diam.

Occurs in Sri Lanka, Malesia, China, Oceania and north-eastern Qld, where it is a common epiphyte on stems and branches in upland and montane rainforest from the Windsor Tableland south to Cardwell.

Qld: Majors Falling, Ravenshoe, *W.W.Watts 0588* (NSW); Windsor Tableland, *I.G.Stone 16045, 15975* (MEL); Echo Ck and Davidson Ck, Cardwell Ra, *H.Streimann 29109* (CANB); Kennedy Falls, *W.B.Schofield 90329, 90332* (NSW, UBC); Thornton Peak, *H.Flecker 7081* (CANB); Mt Bartle Frere, *B.O. van Zanten 68.1454A, 68.1525, 68.1502* (GRO, NSW).

This distinctive and comparatively robust *Acroporium* is characterised by its yellowish green to golden green colour and broadly ovate to ovate-lanceolate leaves with mostly acute apices and cordate-auriculate bases; the 3–5 large outer alar cells occur in the auricle, and their tips curve markedly towards the stem. It differs from the rather similar *A. strepsiphylum* which is often more golden in colour and has narrower leaves and more long, slender, acuminate apices.

Sterile plants of *A. stramineum* have often been misidentified as *Eucamptodon scalarirete* (Dixon) B.C.Tan, H.P.Ramsay & W.B.Schofield. However, the latter is smaller and greener, with smaller leaves (c. 1 mm long) that have a diagnostic, ladder-like alar region that is different from that of *A. stramineum*.

4. *Acroporium strepsiphylum* (Mont.) B.C.Tan, in A.Touw, *J. Hattori Bot. Lab.* 71: 353 (1992)

Hypnum strepsiphylum Mont., *London J. Bot.* 3: 632 (1844). T: Buitenzorg, Java, [Indonesia] *M.Miquel 23b*; lecto: PC, fide B.C.Tan (1992); isolecto: BM, FH, L.

Illustrations: E.B.Bartram, *op.cit.* pl. 25, fig. 425 (1939), as *A. secundum*; B.C.Tan, *Wildenowia* 24: 287, figs 78–87 (1994); H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 95: 7, fig. 2 (2004); Y.Jia, P.-C.Wu & B.C.Tan., *Flora of China* 8: 12, pl. 593, figs 1–12 (2005).

Dioicous or autoicous. Plants small to large, glossy, yellow-green to golden green, irregularly branched, forming loose mats or wefts; branches to 2.5 cm long, somewhat complanate. Leaves erect-spreading, often falcate-secund, oblong-lanceolate, 2–3 mm long, 0.2–0.3 mm wide, gradually long-acuminate, minutely denticulate near the subtubulose apices. Laminal cells linear, 45–70 × 3–4 µm, smooth, thick-walled, strongly pitted; alar region with 3 or 4 distinctive basal cells that are large, thin-walled, oblong-reniform, curved inwards at the base; supra-alar cells several, irregular in shape.

Perichaetia on branches; perichaetial leaves abruptly narrowed into a short or long acumen, with little denticulation on one shoulder. Seta at least 15 mm long, smooth below, papillose above. Capsule small, ovate, suberect to inclined.

Occurs in southern and SE Asia, Malesia (incl. Papua New Guinea), China and Oceania. Very rare in montane rainforest in north-eastern Qld.

Qld: W ridge of Thornton Peak, NE of Daintree Natl Park, *D.H.Norris 43914* (NSW, UC); Mount Spec Natl Park, near Townsville, *D.H.Norris 39869* (UC).

Acroporium strepsiphylum, like *A. stramineum*, is a large and somewhat polymorphic species. Its leaves are characteristically narrowly lanceolate to oblong-lanceolate, short- to long-acuminate, and they lack a well-defined cordate base. Its more oblong-lanceolate leaf outline and the longer acuminate apex distinguish it from *A. stramineum*.