

## SYRRHOPODON

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*Syrrhodon* Schwägr., *Spec. Musc. Suppl.* 2(1): 110 (1824); from the Greek *syrrho* (to close the eye) and *odon* (a tooth), in reference to the narrow, connivent, horizontal peristome teeth of some species that 'close' the mouth of the capsule when dry.

Lecto: *S. gardneri* (Hook.) Schwägr.

Plants tufted, solitary or gregarious. Stems erect or inclined, simple or forked. Rhizoids brown to red-purple. Leaves bordered by elongate hyaline cells, or border lacking; margins mostly pluristratose if border lacking; cells of limb isodiametric; teniolae rare. Gemma receptacles and highly modified gemmiferous leaves rare; gemmae clavate or filamentous.

Calyptra cucullate, deciduous. Capsules exserted. Peristome present or absent.

A genus of approximately 80–90 species worldwide; pantropical but with some temperate affinities; the majority of species confined to the Neotropics or the Palaeotropics, but a few pantropical. Nineteen taxa in Australia, mostly in the Northern Territory and northern Queensland. Subgenus *Pseudocalymperes* Broth. (including in Australia only *S. parasiticus*) is occasionally recognised at the generic level, as *Calymperopsis* (Müll.Hal.) M.Fleisch.

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### Key

- 1 Margins at leaf shoulders dentate, serrate or ciliate on at least some leaves (usually most) .....2
- 1: Margins at leaf shoulders entire or nearly so .....8
- 2 Leaves bearing delicate cilia ±all around ..... **13. S. ciliatus**
- 2: Leaves ornamented only at or near the shoulders .....3
- 3 Leaf border lacking elongate hyaline cells.....4
- 3: Leaf border composed entirely or in part of elongate hyaline marginal cells .....5
- 4 Leaves sharply dentate-serrate at the shoulders..... **17. S. gardneri**
- 4: Leaves long-ciliate at the shoulders ..... **16. S. perarmatus**
- 5 Plants robust, dark; leaves more than 5 mm long, mostly stiffly erect when wet and dry, their bases usually glossy red-brown; cancellinae small, mostly eroded..... **3. S. croceus**
- 5: Plants small, delicate; leaves mostly less than 5 mm long, contorted or spreading-patent when dry, spreading-ascending when moist, their bases concolorous; cancellinae conspicuous, intact .....6
- 6 Cells of limb each with a single simple papilla; leaf shoulders with delicate cilia ..... **12. S. armatus**
- 6: Cells of limb bearing multifid papillae; cilia present or lacking on shoulders .....7
- 7 Plants medium-sized, pale green; leaves spreading to patent when wet and dry, not otherwise contorted, lying straight on microscope slide, plane, or involute only in upper portion ..... **1. S. spiculosus**
- 7: Plants small, often brownish or rusty; leaves curled-contorted when dry, mostly falcate and involute on microscope slide..... **11. S. trachyphyllus**
- 8 Cancellinae occupying half or more of the leaf length .....9
- 8: Cancellinae occupying less than half of the leaf length .....11
- 9 Limb helically twisted when dry ..... **10. S. platycerii**
- 9: Limb straight or variously contorted when dry but not helically twisted .....10
- 10 Leaf margins conspicuously evenly serrate in upper half..... **9. S. confertus**
- 10: Leaf margins entire, or toothed at the apex only ..... **7. S. involutus**
- 11 Leaf margins lacking elongate hyaline cells .....12
- 11: Leaf margins composed (at least in part) of elongate hyaline cells .....13
- 12 Leaves monomorphic, narrowly linear-acuminate; cells smooth ..... **15. S. aristifolius**
- 12: Leaves dimorphic, broadly linear; cells papillose..... **18. S. stoneae**
- 13 Elongate hyaline cells of leaf margin ±covered by a network of shorter square-rectangular cells; plants grass-like; leaves stiffly erect, straight, not or little-contorted when dry..... **4. S. muelleri**
- 13: Elongate hyaline cells of leaf margin exposed; plants scarcely grass-like; leaves variously contorted or straight when dry.....14

- 14 Leaves distinctly serrate in at least the upper 25% ..... **6. S. tristichus**
- 14: Leaves entire, or toothed only at the extreme apex ..... 15
- 15 Cells of limb smooth or mostly unipapillose..... 16
- 15: Cells of limb pluripapillose ..... 18
- 16 Leaves spreading-patent when wet and dry; limb conspicuously toothed abaxially by crests of papillose-projecting cells in oblique rows; leaf cells mostly unipapillose..... **2. S. albovaginatus**
- 16: Leaves erect to erect-appressed when dry; limb lacking abaxial rows of teeth; cells smooth or unipapillose (but papillae sometimes bifid or trifid)..... 17
- 17 Leaf cells conspicuously papillose with tall simple or apically divided papillae, the abaxial papillae curved distally; gemmae fusiform-clavate, adaxial on leaf tips..... **8. S. cyrtacanthos**
- 17: Leaf cells smooth or inconspicuously unipapillose with low undivided straight papillae; gemmae filamentous, adaxial at mid-leaf..... **14. S. parasiticus**
- 18 Limb helically twisted when dry ..... **10. S. platycerri**
- 18: Limb straight to variously contorted when dry but not helically twisted..... 19
- 19 Leaves erect to spreading-patent wet and dry, not otherwise contorted ..... **1. S. spiculosus**
- 19: Leaves variously contorted when dry, not spreading-patent..... 20
- 20 Leaves lying straight on microscope slide, neither involute nor folded; shoulders entire ..... **5. S. prolifer**
- 20: Leaves folded-falcate on microscope slide, usually at least some inconspicuously toothed on the shoulders..... **11. S. trachyphyllus**

**1. Syrrhopodon spiculosus** Hook. & Grev., *Edinburgh J. Sci.* 3: 226 (1825)

T: Singapore, *Dr Wallich*: iso: NY.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 241, figs 56–61; 242, figs 62–65; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 179, figs 60–61; A.Eddy, *op. cit.* 70, fig. 208A–D, G–H, J.

Plants to 4 cm or more tall, but usually shorter, green to brownish, in loose tufts. Stems erect. Rhizoids red. Leaves not much contorted when dry, erect-spreading to patent when wet or dry, linear to narrowly linear, to 4 mm or more long (usually shorter); costa often spinose abaxially and adaxially, especially distally; margins often erect or slightly involute distally, toothed or ciliate at the shoulders but often entire, entirely or partly bordered with hyaline cells; cells of limb mostly papillose (rarely ±smooth) with often stout bulging multifid papillae, the papillae sometimes peg-like and forward-pointing, especially distally on the adaxial surface of the leaf; cancellinae scalariform. Gemmae clavate, rare. Sporogones not seen in Australian material.

Occurs in northern N.T., widely distributed and common in Arnhem Land from Melville Is. south to Katherine Gorge. Grows in monsoon forest and protected gorges on shaded rock faces in seepage areas, occasionally on soil or bark, below 300 m alt.; also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

N.T.: Tarracumbie Falls, Melville Is., *H.Streimann 42415* (CANB, NY); Barramundie Falls, Kakadu Natl Park, *I.G.Stone 23466*, *S.Kelly & A.Gollings* (LAF, MEL, MELU); Walkers Ck, Pethericks Nature Park, *J.Russell-Smith 1293* (DNA, MELU); tributary of Chilling Ck, Daly R., *J.Russell-Smith 7243 & D.Lucas* (CANB, DNA); Katherine Gorge, Katherine Gorge Natl Park, *I.G.Stone 23323* (MELU).

Plants of *S. spiculosus* can appear to be very similar to those of *S. albovaginatus* because the leaves of both species have spreading-patent leaves when wet and dry. However, the leaves of the latter have entire shoulders in contrast to the usually toothed shoulders of *S. spiculosus*. Furthermore, the leaf cells of *S. spiculosus* bear multifid papillae, but the papillae of *S. albovaginatus* are simple, and leaves of *S. spiculosus* lack the striking obliquely transverse abaxial rows of tooth-like cells characteristic of *S. albovaginatus*.

*Syrrhopodon spiculosus* is extremely variable and has accumulated a large synonymy over its range. Australian populations tend to be less coarse and robust than those from regions to the north and west, and they tend to have fewer and less conspicuous cilia-teeth on the leaf shoulders; in some specimens teeth are virtually lacking on most or all leaves, e.g. in

*Russell-Smith 7243* (CANB) and *Stone 23467* (MELU), which at first glance seem to have leaves with entire shoulders. However, careful study reveals some leaves with at least occasional teeth on the shoulders. Were it not that *S. spiculosus* is so notoriously variable, specimens such as the two cited above could be taken to represent an undescribed taxon. Furthermore, the large peg-like distally pointing abaxial papillae, characteristic of the species in other parts of its range, are often lacking in Australian specimens, which in some cases have nearly smooth cells with only low inconspicuous papillae. In Australia, *S. spiculosus* is mainly restricted to specialised protected habitats remote from one another, so that it seems to occur primarily as isolated relictual populations.

## 2. *Syrrhodon albovaginatus* Schwägr., *Spec. Musc. Suppl.* 2(1): 112 (1824)

T: Rauwack, [Maluku Islands (Moluccas), Indonesia], *Gay*; holo: G; iso: BM, FH-Fleischer.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 231, figs 18–23; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 169, fig. 46; A.Eddy, *op. cit.* 68, fig. 207.

Plants to 2 cm tall, but mostly shorter, pale, glaucous green, forming low mats or tufts. Stems erect, mostly simple. Rhizoids red. Leaves  $\pm$ patent when wet and dry, short-linear from a broader base, 2–3 mm long; margins entire (but often appearing toothed above due to projecting papillae on adjacent laminal cells), bordered all around with hyaline cells; cells of the limb markedly unipapillose with simple papillae; large tooth-like abaxial papillae usually conspicuously arrayed in rows oblique to the costa; cancellinae scalariform. Gemmae clavate, rare.

Calyptra c. 2 mm long. Seta reddish, c. 5 mm long. Capsules c. 1.5 mm long; operculum slenderly long-rostrate, c. 1 mm long. Peristome teeth yellow, fragile, slenderly pointed, c. 120  $\mu$ m long, strongly papillose, fenestrate, with faint transverse bars. Spores 9–12  $\mu$ m diam., finely granular.

Occurs in north-eastern Qld in wet-mesophyll forest between Cape Tribulation and Mt Bellenden Ker; grows on rotted logs, stumps, tree roots and bases and on humus, from near sea level to an altitude of c. 200 m; most frequent at lower elevations. Also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

Qld: Bloomfield Rd, 2–4 km N of Cape Tribulation, *W.D.Reese 17365* (LAF, MELU); Mossman Gorge, *I.G.Stone 15859* (MELU); Mt Bellenden Ker, *I.G.Stone 24197, 24202* (MELU); 37 km NW of Innisfail, *W.D.Reese & I.G.Stone 17136* (LAF).

*Syrrhodon albovaginatus* is quite rare in Australia, where it is only known from the specimens cited above. See comments under the somewhat similar *S. spiculosus* for distinctions from that species.

## 3. *Syrrhodon croceus* Mitt., *J. Proc. Linn. Soc., Bot., Suppl.* 1: 41 (1859)

*Calymperidium croceum* (Mitt.) M.Fleisch., *Musci Fl. Buitenzorg* 1: 219 (1904). T: Singapore, *Wallich*; syn: NY; in insula Labuan, [Malaysia], *Motley*; syn: H, NY.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 247, figs 80–86; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 183, figs 68–69; A.Eddy, *op. cit.* 63, fig. 203.

Plants to 2.5 cm tall (mostly shorter), green to yellowish green or brownish, in loose bristly tufts and cushions. Stems erect, simple or forked. Rhizoids reddish brown to purple. Leaves usually straight and stiffly erect when wet and dry, occasionally somewhat contorted when dry, mostly 5–9 mm long, often red-gold at the base and with the cancellinae eroded; limb linear to broadly linear, irregularly bistratose; leaves somewhat dimorphic, gemmiferous ones narrower, tubular and more rigid than vegetative leaves; leaf margins conspicuously thickened, bordered all around with hyaline cells, often coarsely and irregularly toothed with paired teeth, but sometimes almost entire; teeth particularly coarse, conspicuous and often retrorse-spreading just above the leaf shoulders; cells of the limb thick-walled, smooth to bulging or papillose abaxially, markedly mammillose-papillose adaxially, the papillae often multifid; cancellinae scalariform to rounded distally. Gemmae fusiform-clavate, common. Sporogones uncommon, not seen in Australian material.

Rather common in north-eastern Qld from the Iron Range S to Cardwell; grows in rainforest on living and dead trees, also in mangroves and on boulders, from sea level to c. 800 m. Also in the Seychelles, South Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

Qld: Mt Tozer, *J.R.Clarkson 2912* (BRI, MELU, MO); Noah Head (Mairdja Botanical Walk), Cape Tribulation Natl Park, *H.Streimann 45776* (CANB, NY); Mossman Gorge, *I.G.Stone 8975* (MELU); Babinda, The Boulders, *W.D.Reese 17055* (LAF); Hinchinbrook Is., near Cardwell, *I.G.Stone 14911* (MELU).

*Syrrhopodon croceus* is easy to distinguish by its bristly-erect habit and the often highly pigmented leaf bases with the cancellinae often eroded; in *S. muelleri*, with an often similar habit, the leaves have entire margins, among other differences. The leaves of *S. croceus* are sometimes almost 'petiolate,' i.e. constricted between the broad base and the limb.

#### 4. *Syrrhopodon muelleri* (Dozy & Molke.) Sande Lac., *Bryol. Javan.* 2: 224 (1870)

*Calymperidium muelleri* Dozy & Molke., *Bryol. Javan.* 1: 51 (1856). T: Java, [Indonesia], *Holle*, *holo*: L; *iso*: H.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 248, figs 87–93; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 183, figs 70–71; A.Eddy, *op. cit.* 90, fig. 223.

Plants mostly 7–12 mm tall, yellowish green, forming thin tufts. Stems erect, mostly simple, very short and the plants appearing 'stemless'. Rhizoids sparse, brown to reddish brown. Leaves stiffly erect- spreading when wet and dry, occasionally twisted, narrowly linear, 8–15 mm long; margins entire, bordered all around with hyaline cells; cells of limb smooth to finely pluripapillose; cancellinae very narrow, scalariform. Gemmae common, clavate, abaxial and adaxial on leaf tips. Sporogones not seen in Australian specimens.

Not uncommon in north-eastern Qld from just S of Cooktown to Tully; grows on trees, rarely on soil, in complex mesophyll vine forests to c. 800 m. Also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

Qld: Big Tableland, 28 km S of Cooktown, *H.Streimann 46357* (CANB, NY); Whyanbeel Rd, Miallo, *W.D.Reese 14860* (LAF, MELU); lower E slope, Mt Bellenden Ker, *I.G.Stone 24176* (MELU); Mt Bartle Frere, *D.H.Norris 42703* (BRI, CANB, HSC); Frenchmans Ck, S of Cairns, *W.W.Watts 361* (MEL).

*Syrrhopodon muelleri* is a small and usually inconspicuous moss resembling a miniature *S. croceus*. The straw-coloured plants, 'stemless' habit, erect, entire-margined, often twisted leaves, and small persistent cancellinae are very distinctive. See also comments under the somewhat similar *S. aristifolius*.

#### 5. *Syrrhopodon prolifer* Schwägr., *Sp. Musc. Frond.* 2(2): 99 (1827)

Two varieties of *S. prolifer* occur in Australia. They can be separated as follows:

Leaves 2–5 mm long; cells of limb with low inconspicuous papillae on both surfaces ..... **5a. var. prolifer**  
Leaves 1.5–2.0 mm long; cells of limb with a tall stout multifid papilla on both surfaces .....  
..... **5b. var. mossmanensis**

##### 5a. *Syrrhopodon prolifer* Schwägr. var. **prolifer**

T: Serra dos Orgos, Brazil, Jan. 1823, *Beyrich*; *iso*: BM, GOET, JE, NY.

Illustrations: S.Orbán & W.D.Reese, *Bryologist* 93: 439, figs 3, 4 (1990); W.D.Reese & P.-J.Lin, *op. cit.* 349, fig. 75.

Plants to 3 cm tall (usually much shorter), pale green or darker, forming loose tufts. Stems erect, simple or forked. Rhizoids red to brownish. Leaves nearly straight or variously contorted when dry, erect-spreading when moist, linear to linear-acuminate from a slightly broader base, 2–5 mm long; margins entire except at the leaf tip, bordered all around with hyaline cells; cells of limb pluripapillose with low papillae on both surfaces; cancellinae rounded to acute distally. Gemmae uncommon, clavate, adaxial on leaf tips. Sporogones not seen in Australian material.

Occurs in north-eastern Qld at Thornton Peak. The single Australian specimen grew on a tree at 1200 m; pantropical.

Qld: Thornton Peak, *D.H.Norris 43960* (HSC, LAF).

*Syrrhopodon prolifer* var. *prolifer* should be sought at moderate to high elevations in north-eastern Queensland. *Syrrhopodon trachyphyllus* is similar, but its leaves are often incompletely bordered and are usually toothed at the shoulders; *S. muelleri*, also rather similar, has stiffly erect leaves, a 'stemless' habit, and leaf cells that are at most only finely papillose.

**5b. *Syrrhopodon prolifer* Schwägr. var. *mossmansensis* W.D.Reese, *Bryologist* 92: 303 (1989)**

T: Lower High Falls, N of Mossman, Qld, 16°28'S, 145°16'E, on tree trunk, *W.B.Schofield, I.G.Stone & M.I.Schofield 90033*; holo: UBC; iso: LAF, MELU, NSW; para: Mossman River Gorge, 4 miles [c. 6.5 km] W of Mossman, on huge tree in virgin lowland rainforest, *W.A.Weber B-32371* (COLO, LAF, MELU).

Illustrations: W.D.Reese, *loc. cit.* figs 4–6; S.Orbán & W.D.Reese, *op. cit.* 441, figs 11, 12.

Plants in loose turfs, pale, glaucous green, slender, to c. 7 mm tall. Stems red below, erect, very short. Rhizoids red. Leaves twisted and contorted when dry, mostly 1.5–2.0 mm long, linear to linear-lanceolate from a slightly broader base; limb c. 1.5 times the length of the sheath, often with low dense tangles of short dark red rhizoids at the tips on adaxial surface; margins entire, bordered all around with elongate hyaline cells; cells at mid-leaf c. 6 × 5 µm, each bearing a tall stout multifid papilla abaxially and adaxially; cancellinae acute distally. Gemmae very scarce, clavate, mingled with rhizoids adaxially on leaf tips. Sporogones unknown.

Occurs in north-eastern Qld near Mossman in complex mesophyll vine forests. Grows on trunks of large trees in humid sites along streams and rivers to c. 500 m; also in Papua New Guinea.

Qld: along Whyanbeel Rd into mountains, W of Miallo, *W.D.Reese 17415, 17428, 17429, 17430* (LAF, MELU); *loc. id.*, *I.G.Stone 25400* (MELU); Mossman Gorge, just W of Mossman, *W.D.Reese 17400* (LAF, MELU); *loc. id.*, *I.G.Stone 25411* (MELU).

This variety differs from var. *prolifer* in its shorter leaves, the cells of which bear tall, stout, multifid papillae; in the latter the leaf cells have low papillae. Variety *mossmansensis* grows at comparatively low elevations (to c. 500 m), in contrast to the var. *prolifer* which was collected at 1200 m in Australia.

**6. *Syrrhopodon tristichus* Nees ex Schwägr., *Sp. Musc. Frond.* Suppl. 4: 311b (1842)**

T: "In Java [Indonesia] lectum misit Nees ab Esenbeck, praeses soc. Leopold"; iso: BM.

*Syrrhopodon parvicaulis* Müll.Hal. ex Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 42: 95 (1900). T: in montosis Mo Roka, distr. Moresby, British New Guinea [Port Moresby, Papua New Guinea], *L.Loria s.n.*; lecto: H; isolecto: BM, FH, H, NY, S.

*Syrrhopodon kindelii* Broth. & Paris, in V.F.Brotherus, *Öfvers. Förh. Finska Vetensk.-Soc.* 51: 9 (1909). T: Pic des Sources, Mt Dzumac and La Plaine des Lacs, New Caledonia, *Kindel s.n.*; holo: H; iso: S.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 230, figs 11–17; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 169, fig. 45; A.Eddy, *op. cit.* 79, fig. 215; 80, fig. 216.

Plants slender, to 8 cm tall, pale green to yellowish or brown, often appearing soft and silky, forming loose tufts. Stems erect to inclined or decumbent, mostly simple. Rhizoids red to reddish brown. Leaves often tristichous, not or little contorted, flexed and spreading when wet and dry, slenderly long-acuminate from a broader base, mostly 5–8 mm long; margins thickened, mostly conspicuously toothed to spinose in upper 50–67%, rarely entire, strongly bordered all around with elongate hyaline cells, but these sometimes obscured by smaller overlying cells; shoulders rarely with a few low teeth; cells of limb nearly smooth to prominently papillose abaxially and adaxially; cancellinae large, mostly rounded distally. Gemmae very sparse, rare, short-clavate, warty, abaxial and adaxial on leaf tips. Sporogones not seen in Australian material.

Occurs at altitudes of 1000–1600 m on the highest mountain peaks in north-eastern Qld (Mt Bellenden Ker, Thornton Peak and Mt Lewis); grows on the trunks of small to medium-sized trees in elfin forest; also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

Qld: E slope of Thornton Peak, NE of Daintree, *D.H.Norris 44081* (HSC, LAF); Mt Lewis, *I.G.Stone 19589* (MELU); nr Telecom Stn, Mt Bellenden Ker, *I.G.Stone 15573* (MELU); *loc. id.*, *W.D.Reese 17466, 17468* (LAF, MELU).

The large size of the plants and flexed leaves with prominent marginal teeth make this species easy to recognise. This moss has been known in Australia under the name *S. parvicaulis* Müll.Hal., a synonym of *S. tristichus* described from Papua New Guinea.

### 7. *Syrrhopodon involutus* Schwägr., *Sp. Musc. Frond.* Suppl. 2(1): 117 (1824)

T: Rauwack, [Maluku Islands (Moluccas), Indonesia], on rotting wood, *Gaudichaud*; holo: G; iso: BM.

*Syrrhopodon rufescens* Hook. & Grev., *Edinburgh J. Sci.* 3: 227 (1826); *Leucophanella rufescens* (Hook. & Grev.) M.Fleisch., *Musci Fl.Buitenzorg* 4: 1705 (1923). T: Singapore, *Dr Wallich*; holo: BM.

*Syrrhopodon revolutus* Dozy & Molk., *Ann. Sci. Nat., Bot.*, sér. 3, 2: 315 (1844). T: Java and Borneo, *P.W.Korthals*; holo: L.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 238, figs 43–48; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 179, fig. 57; A.Eddy, *op. cit.* 56, fig. 198; 57, fig. 199.

Plants small, pale green to whitish, often in compact sods. Stems erect, forked, commonly crowded. Rhizoids red. Leaves 1–2 mm long, straight and imbricate with a reduced limb, or the limb well developed, contorted when dry, and as long as the sheath; margins erect, involute or revolute, entire, bordered by elongate hyaline cells; cells of limb smooth or prominently unipapillose; cancellinae large, comprising much of the leaf, scalariform. Gemmae scarce, scanty, fusiform-clavate; adaxial along costa near the leaf tip. Sporogones not seen in Australian specimens.

This common Palaeotropical moss occurs in north-eastern Qld from Cairns to Cardwell. Grows in notophyll vine forest on *Acacia* and *Melaleuca* trunks in coastal regions and in mesophyll vine forest on trees, rotting wood, boulders, mostly at low elevations but up to c. 1000 m.

Qld: Johnstone R., Dec. 1882, *Berthoud* (NY); N of Bramston Beach, Graham Range Natl Park, *W.D.Reese 17088* (LAF); S of Mission Beach, Kennedy Bay, *I.G.Stone 19990* (MELU); Murray Falls, 27 km SW of Tully, *H.Streimann 45636* (CANB, NY); Dalrymple Ck, Cardwell, *I.G.Stone 21412* (MELU).

This species is characterised by its small plants forming soft, pale, compact cushions, and by the very small leaves with the limb usually greatly reduced. However, forms with the limb as long as the sheath also occur. This species has been known in Australia as *S. revolutus* Dozy & Molk. and *S. rufescens* Hook. & Grev., both names treated here as synonyms of *S. involutus*. The related *S. confertus* is easily differentiated by its toothed leaf margins.

### 8. *Syrrhopodon cyrtacanthos* W.D.Reese, *Bryologist* 95: 95 (1992)

T: Roaring Meg Creek, Qld, on bark (with its accumulated soil) of *Syzygium dactylophlebium*, alt. c. 1200 ft [c. 700 m], 1984, *M.Godwin s.n.* in herb. MELU sub *I.G.Stone 23001*; holo: MELU.

Illustrations: W.D.Reese, *op. cit.* 94, figs 1–5; 95, fig. 6.

Plants small, glaucous green, to 5 mm tall, gregarious. Stems erect, simple. Rhizoids dark red. Leaves ascending, straight and little-contorted when wet and dry, linear-acuminate from a slightly broader base, 2–3 mm long; apex acute; costa excurrent into a pale sharp subula, spinose abaxially near the apex, mostly smooth below but irregularly spinose adaxially and with occasional spines along flanks abaxially, in section showing 2 or 3 guide cells, lacking enlarged outer cells except in spine bases; leaf margins entire, involute distally, bordered all around with elongate hyaline cells; cells at mid-leaf quadrate to rectangular, thick-walled, c. 11.6 × 7.7 μm, adaxially unispinose with tall sharp undivided papillae, abaxially unipapillose with stout sharp or peg-like simple or apically divided papillae, in the distal part of leaf the

abaxial papillae tall and slightly to strongly curved, pointing distally; cancellinae narrow, scalariform. Gemmae adaxial near leaf tips; well-developed gemmae not seen.

Perigonia axillary, gemmiform, of several tiny reddish leaves enclosing a few antheridia. Perichaetia and sporogones not seen.

This endemic moss occurs in known only from the type locality in north-eastern Qld. Grows on bark in cloudy rainforest near a stream; known only from the very meager type collection.

The minute and inconspicuous plants of this species are distinctive because of their entire leaf margins and heavily armed leaf cells, which distally bear sharp abaxial papillae curved toward the leaf tip. The adaxial papillae are tall and simple, but some of the abaxial papillae on the proximal portion of the lamina are short and peg-like with divided tips. Broadly similar species of *Syrrhopodon* in Australia with entire leaf margins include *S. prolifer* and *S. involutus*. The former has uniformly pluripapillose cells with much shorter, non-spinose papillae, while the latter has a very short limb with the cells smooth or unipapillose, but the papillae when present are low and inconspicuous.

### **9. *Syrrhopodon confertus* Sande Lac., *Verh. Kon. Ned. Akad. Wetensch., Afd. Natuurk., Tweede Sect.* 13: 4 (1872)**

T: "Banca ad arbores inter Klappa et Yjang-Tara", *Kurz*; lecto: L; Sumatra, [Indonesia], *P.W.Korthals*; syn: L. *Syrrhopodon amoenus* Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 42: 94 (1900); *Leucophanella amoena* (Broth.) M.Fleisch. *Musci Fl. Buitenzorg* 4: 1705 (1923). T: British New Guinea [Papua New Guinea], *Mrs. Musgrave in herb. Binstead*; holo: H; iso: BM, S.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 237, figs. 37–42; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 175, fig. 56; A.Eddy, *op. cit.* 60, fig. 201.

Plants small, pale green, in soft compact glossy tufts and cushions to 2 cm tall. Stems erect, forked. Rhizoids red. Leaves not contorted, 2–3 mm long, narrowly acuminate from a broader base, spreading-ascending when wet and dry; margins of limb bordered with elongate hyaline cells, evenly serrate by projecting cells, the teeth mostly close together and conspicuous, occasionally remote, single, or especially near leaf tips, double; cells of limb papillose, the papillae mostly multifid; cancellinae very conspicuous, scalariform. Gemmae very scarce, short-fusiform, adaxial along the costa at the leaf tip. Sporogones not seen in Australian specimens.

Occurs in north-eastern Qld from Cape Tribulation to Tully; usually in wet complex mesophyll vine forest on tree trunks, stumps, logs, boulders and tree ferns mostly at low elevations but up to c. 1000 m. Also, in the northern Indian Ocean, SE Asia, Indonesia, Papua New Guinea and south-western Oceania.

Qld: Mossman R Gorge, 4 miles [c. 6.5 km] W of Mossman, *W.A.Weber B-32373* (COLO, LAF, NY); 2 miles [c. 3.2 km] W of Mossman, *D.H.Norris 42605* (BRI, CANB, LAF); Frenchmans Ck, *W.W.Watts Q385* (MEL); above Majuba Ck, Mt Bartle Frere, *I.G.Stone 18958* (MELU); El Arish, *I.G.Stone 20049, 20050* (MELU).

*Syrrhopodon confertus* is a neat little plant easily recognised by its habit; under the microscope the small leaves with conspicuous regular serrations are distinctive. Although *S. involutus* is similar in gross appearance and habitat, its entire leaf margins readily distinguish it from *S. confertus*. *Syrrhopodon confertus* was formerly known in Australia under the name *S. amoenus* Broth., a synonym described from New Guinea.

### **10. *Syrrhopodon platycerii* Mitt., *Fl. Vit.* 388 (1873)**

T: Lord Howe Island, on *Platycerium* (*M'Gillivray and Milne, Herb. Hooker*); holo: NY; iso: BM, H, S.

*Syrrhopodon novae-valesiae* Müll.Hal., *Hedwigia* 37: 119 (1898). T: Sydney, N.S.W., Domina Kayser in Hb. Geheeb; serius Herriott 1881 in Hb. Melbourne; Richmond River, N.S.W., 1881, *Fawcett*; Trinity Bay, Qld, 1886, *W.A.Sayer*, in eodem Hb., forma *microcarpa*.; lecto (here chosen): *Fawcett* 1881 (H).

Illustration: W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 175, fig. 48.

Plants small, dark green, in soft low turfs and cushions. Stems erect, simple or forked. Rhizoids red to reddish brown. Leaves 2–3 mm long, neatly helically twisted above when dry, straight when wet, short-pointed from a broader base; margins heavily bordered all



around with hyaline cells, toothed in upper third or less; cells of limb very thick-walled, papillose on both surfaces with tall stout multifid papillae; cancellinae large, conspicuous, rounded distally, not scalariform. Gemmae scarce, clavate, adaxial along the costa.

Calyptra cucullate, long-rostrate. Seta yellow, c. 5 mm long. Capsules cylindrical, 1.0–1.5 mm long; operculum slenderly long-rostrate. Peristome of low imperfect transversely barred teeth. Spores c. 16–18  $\mu\text{m}$  diam., smooth.

This endemic species occurs in eastern Qld from the Windsor Tableland to the N.S.W. border, and in N.S.W. from Richmond River to Port Hacking; also in Lord Howe Island. Grows mainly on *Platynerium* fern bases in coastal areas.

Qld: Windsor Tableland, *I.G.Stone 16060* (MELU); Tully Falls, *W.W.Watts 461* (MEL); Eungella Natl Park, W of Mackay, *I.G.Stone 18089* (MELU). N.S.W.: Fernleigh, Richmond R., *W.W.Watts 1248* (NY); *loc. id.*, 1873, *W.W.Watts* (MEL); Port Hacking, *T.Whitelegge 238* (MEL).

This neat little moss is easy to recognise due to the regularly twisted (when dry) leaf tips and its preference for the leaf bases of *Platynerium* ferns as a habitat. Colonies are commonly fertile, which is unusual for *Syrrhopodon*. However, neither perigonia nor antheridia have been found.

In 1876 Geheeb published the name “*Syrrhopodon novae valesiae* C. Mull.”, without description and thus a *nomen nudum*. The plants to which Geheeb referred were evidently collected by a “Dr. Kayser” in the vicinity of Sydney and were among the collections (syntypes) cited by Müller much later when he formally described *S. novae-valesiae* in 1898. Another of the syntypes Müller listed for his *S. novae-valesiae*, “Trinity Bay, Sayer, 1886”, was cited by him as “*forma microcarpa*”. Because the name was not accompanied by a description it is also a *nomen nudum*. This name was listed as “*S. novaevalesiae* C. Muell. fo. *microcarpa* Geh. (*nom. nud.*)” by Streimann & Curnow (1989), who cite Bailey (1913) and Geheeb (1876) as references. Geheeb (1876), however, did not mention fo. *microcarpa* and Bailey (1913) only cited the name as “*Syrrhopodon novae-valesiae* C.M., f. *microcarpa*” without identifying an author for the combination. The name as used by Bailey should properly be cited as *S. novaevalesiae* Müll.Hal. f. *microcarpa* F.M.Bailey, and without a description or reference to a specimen it is a *nomen nudum*. It is likely that Bailey took the name from the Sayer specimen that Müller had annotated as “fo. *microcarpa*”. In any event, we do not accept f. *microcarpa* in this treatment.

### 11. *Syrrhopodon trachyphyllus* Mont., *Syll. Gen. Sp. Cryptog.* 47 (1856)

T: Singapore, *Gaudichaud*; iso: BM, NY, S.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 244, figs 66–73; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 183, figs 65–66; A.Eddy, *op. cit.* 75, fig. 212; 76, fig. 213.

Plants small, dark green to brownish or rusty, in low tufts or turfs. Stems erect, mostly simple, to 10 mm tall. Rhizoids red. Leaves oblong to ligulate from slightly broader base, 1.5–2.0 mm long, involute and uncinately curled when dry, involute and curved when moist; margins bordered with hyaline cells, but the border often weak and incomplete, usually distinctly toothed or ciliate at the shoulders but the teeth sometimes low, inconspicuous, or lacking; cells of limb papillose with multifid papillae; cancellinae small, rounded to somewhat scalariform distally. Gemmae small, scanty, cylindrical-clavate, adaxial near the leaf tip, rarely also abaxial.

Calyptra c. 1.2 mm long. Seta red, 3–4 mm long. Capsules brown, obliquely ovoid, c. 1 mm long; operculum slenderly rostrate, c. 0.5 mm long. Peristome teeth slender, imperfect, fragile, papillose,  $\pm$ jointed, yellowish, 48–72  $\mu\text{m}$  long. Spores 9–10  $\mu\text{m}$  diam., smooth.

Occurs near Katherine Gorge in northern N.T. and in north-eastern Qld from E of Mareeba S to NW of Ingham. Grows on tree bases, roots, rock and soil from sea level to c. 500 m, usually in mesophyll vine forest. Also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

N.T.: 30 km NE of Katherine Gorge, *G.E.Kantak & S.P.Churchill 699* (LAF, NY). Qld: near Cairns, Nov. 1890, *C.Wild* (BRI); Majuba Ck, Mt Bartle Frere, *I.G.Stone 18949* (MELU); Tully Falls, *W.W.Watts Q462* (H, LAF); WNW of Ingham, *H.Streimann 28786* (CANB).

At first glance this moss, with its low stature and uncinete-curved leaves, is a mimic of the extremely common *S. armatus*, and the two species can occur intermixed. However, the leaf cells of *S. trachyphyllus* have multifid papillae in contrast to the simple papillae of *S. armatus*, and the its leaf shoulders are not as routinely or heavily armed with teeth or cilia as are those of *S. armatus*. The commonly rusty color of *S. trachyphyllus* differs from the usually glaucous green appearance of *S. armatus*, although plants of the latter can occasionally be brownish. Sporogones are very rare in Australian specimens of *S. trachyphyllus*; they were seen only in *Reese et al. 17139* (LAF, MELU).

## 12. *Syrrhopodon armatus* Mitt., *J. Linn. Soc., Bot.* 7: 151 (1863)

T: Bagroo river and banks of the Nunn, Africa, on dead bark, *Mann*; syn: Bagroo River (BR, NY); syn: Nunn (NY).

*Syrrhopodon fimbriatus* Müll.Hal., *Linnaea* 37: 151 (1872), *hom. illeg., non S. fimbriatus* Mitt., *J. Linn. Soc., Bot.* 12: 122 (1869). T: Brisbane River, Qld, 1864, *A.Dietrich*; *n.v.*

*Syrrhopodon fimbriatulus* Müll.Hal., *J. Mus. Goddeffroy* 3(6): 52 (1874); *Linnaea* 38: 557 (1874), *nom. nov. pro S. fimbriatus* Müll.Hal.

*Calymperes armatum* Broth., in *W.W.Watts & T.Whitelegge, Proc. Linn. Soc. New South Wales* 27(suppl.): 59 (1902), *nom. nud.*, *non Calymperes armatum* Broth., *Denkschr. Akad. Wiss. Wein Math. Nat. Kl.* 83: 282 (1924).

*Syrrhopodon cairnensis* Broth. & Watts, *Proc. Linn. Soc. New South Wales* 43: 551 (1918). T: Babinda, Cairns District, Qld, on tree trunks, July 1913, *W.W.Watts 313a*; iso: H.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 245, figs 74–79; W.D.Reese & J.K.Bartlett, *J. Bryol.* 12: 210, fig. 1; pl. 1 (1982); W.D.Reese, T. Koponen & D.H.Norris, *op. cit.* 183, fig. 67; A.Eddy, *op. cit.* 77, fig. 213B. [all as *S. fimbriatulus*]

Plants small, pale green, often appearing glaucous, to 10 mm tall, forming thin or dense cushions and turfs. Stems erect, forked. Rhizoids red. Leaves uncinete or curled when dry, straight when moist, ligulate-linear from slightly broader base, 2–3 (–4) mm long; costa often conspicuously spinose-papillose abaxially; leaf margins erect-involute, bordered with hyaline cells, entire above, conspicuously toothed-ciliate at the shoulders, cilia delicate, often retrorse, sometimes reduced or virtually lacking; cells of limb unipapillose with simple papillae, the papillae often tall and conspicuous; cancellinae broadly acute to rounded distally. Gemmae small, cylindrical-clavate, in low dense pads on the adaxial surface of leaf tips. Sporogones not seen in Australian material.

Widespread and common, occurring in northern N.T. and in eastern Qld and N.S.W. as far south as Jervis Bay. Grows on tree trunks, rotted wood, logs, stumps, soil and rock, mostly at low elevations but to c. 1000 m. Widely distributed in the Palaeotropics; also in New Zealand (North Island).

N.T.: Black Jungle, Humpty Doo, *J.Russell-Smith 1257* (DNA, MELU). Qld: Restoration Beach, c. 5 km SW of Cape Weymouth, *J.R.Clarkson 2947* (BRI, MELU, MO); Bloomfield Rd, 2–4 km N of Cape Tribulation, *W.D.Reese 17370* (LAF, MELU); Pimpana, July 1887, *C.Wild* (MEL, NSW). N.S.W.: 5 km SE Bherwerre Trig., Jervis Bay, *H.Streimann 5040* (CANB).

The most common and widespread *Syrrhopodon* in Australia, *S. armatus* is characterised by its pale green, glaucous appearance, uncinete-curved leaves mostly with conspicuous cilia on the shoulders, often spinose costae, and unipapillose cells. It appears to be the only species of Calymperaceae to have reached New Zealand.

## 13. *Syrrhopodon ciliatus* (Hook.) Schwägr., *Sp. Musc. Frond. Suppl.* 2, 1: 114 (1824)

*Weissia ciliata* Hook., *Musci Exot.* 2: 7 (1820). T: “ex insula Ternatae accepit D. Dicksonus” [Maluku Islands (Moluccas), Indonesia]; BM *n.v.*

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 240, figs 49–55; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 179, figs 58–59; A.Eddy, *op. cit.* 61, fig. 202.

Plants to 2 cm tall, pale yellowish green, in loose or dense tufts or turfs. Stems erect, simple or forked. Rhizoids red. Leaves strongly dimorphic (but gemmiferous specimens rare); vegetative leaves spreading-recurved when wet and dry, ligulate to linear or oblong, 2–3 mm long; margins bordered with hyaline cells and bearing long delicate cilia from shoulders almost to the apex; gemmiferous leaf highly modified, seta-like, tubular; cells of limb smooth; cancellinae scalariform. Gemmae fusiform, in tight clusters on tips of gemmiferous leaves. Sporogones not seen in Australian material.

Rare in northern N.T. and eastern Qld; grows in monsoon vine forest on the ground and tree roots and in shaded escarpments on rock wall seepages. Also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

N.T.: Curtain Falls, 'Petherick's Rainforest', 38 km SE of Batchelor, *H.Streimann 48186* (CANB, NY, S); Wangi Falls, Litchfield Natl Park, *J.Russell-Smith 6465 & Lucas* (CANB, DNA). Qld: "Whitterton 1892", (without further details) (H).

*Syrrhopodon ciliatus* is so distinctive, with its smooth cells, conspicuously ciliate leaves, and highly modified gemmiferous leaves, that it cannot be mistaken for any other Australian *Syrrhopodon*. Although evidently very rare in Australia, it is common and often abundant elsewhere in its range.

#### 14. *Syrrhopodon parasiticus* (Brid.) Besch., *Ann. Sci. Nat., Bot.*, sér. 8, 1: 298 (1896)

*Bryum parasiticum* Brid., *Musc. Rec.* 2(3): 54 (1803). T: Jamaica, *O.Swartz*; iso: BM, NY.

*Syrrhopodon watsii* Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 42: 93 (1900); *Calymperopsis watsii* (Broth.) M.Fleisch., *Biblioth. Bot.* 80: 5 (1913). T: Wardell Road, Richmond River, N.S.W., *W.W.Watts 2420*; holo: NSW; iso: S.

Illustrations: W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 175, figs 51–52; A.Eddy, *op. cit.* 89, fig. 222; W.D.Reese & P.J.-Lin, *op. cit.* 363, figs 120–128.

Plants to 10 mm tall, dark green, solitary or gregarious. Stems erect, mostly simple. Rhizoids brownish. Leaves 3–4 mm long, somewhat dimorphic; vegetative ones narrow and elongate, linear to lanceolate; gemmiferous ones shorter and broader, often deltoid and forming a terminal coma; leaves not much contorted when dry, involute and curved, erect-spreading when moist; margins entire, bordered at least in part with hyaline cells, the border often incomplete, weak, or lacking on some leaves; cells of limb smooth to unipapillose with simple papillae; cancellinae very acute distally. Gemmae common, often abundant, filamentous, borne along the costa on adaxial surfaces of usually modified leaves. Sporogones not seen in Australian material.

Occurs in eastern Qld from Mossman down the east coast into northern N.S.W.; grows on twigs and the bark of trees, usually sparse, from sea level to 1000 m. Pantropical.

Qld: Danbulla S.F., *I.G.Stone 19014* (BRI, MELU); Wopen Ck, near Innisfail, *I.G.Stone 23974* (MELU); 3 km S of Nambour, *H.Streimann 9398* (CANB); Helidon, Dec. 1888, *C.Wild* (MEL). N.S.W.: Pimlico, Richmond R., *W.W.Watts 2420* (NSW).

*Syrrhopodon parasiticus* is inconspicuous in the field because it never grows in large quantities. However, well-developed stems can bear a conspicuous terminal coma of enlarged, deltoid, gemmiferous leaves. The habit of the plants, bordered leaves, filamentous gemmae, and smooth or unipapillose cells combine to characterise this species.

#### 15. *Syrrhopodon aristifolius* Mitt., *J. Linn. Soc., Bot.* 10: 176 (1868)

T: Upolu, Samoa, on trees (1000–2000 ft), May 1867, *T.Powell 89*; holo: NY; iso: BM, FH, NY, S.

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 250, figs 94–100; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 183, fig. 72; A.Eddy, *op. cit.* 92, fig. 224.

Plants small, to 10 mm tall, light green to brownish, solitary, or gregarious in loose wiry tufts. Stems very short, erect, forked. Rhizoids dark red to brown. Leaves glossy, loosely curled-contorted when dry, spreading-ascending when moist, 6–10 mm long, often 'petiolate', linear to acuminate-subulate from a small slightly wider base; cells smooth; costa occasionally long-excurrent into a naked subula; leaf margins lacking hyaline cells, slightly

thickened, entire below, entire to doubly toothed above; leaf cells smooth; cancellinae often indistinct, eroded in older leaves, typically obliquely truncated distally so that they extend further up along margins than along costa. Gemmae pale, inconspicuous, fusiform-cylindrical, adaxial near leaf tips. Sporogones not seen in Australian material.

Uncommon in north-eastern Qld from the Windsor Tableland to the Kirrama Range near Cardwell; grows on tree trunks and twigs, and on logs, up to c. 1000 m alt. Also in Asia, Malesia (including Papua New Guinea), the Philippines and Oceania.

Qld: Windsor Tableland, *I.G.Stone 16101* (MELU); lower E slope Mt Bellenden Ker, *I.G.Stone 24499, 24516* (MELU); *loc. id.*, *W.D.Reese 17116* (LAF); Cardstone H-tree Rd, W of Tully, *I.G.Stone 24018* (MELU); Kennedy Falls track, NW of Cardwell, *I.G.Stone 24668* (MELU).

*Syrrhopodon aristifolius* is easy to recognise by its 'stemless' habit, often 'petiolate' leaves, small, inconspicuous, obliquely truncate cancellinae, smooth leaf cells, and a lack of hyaline marginal cells. *Syrrhopodon muelleri* is also 'stemless', but that species has prominently thickened leaf margins bordered by elongate hyaline cells and well-defined persistent cancellinae, among other differences.

#### **16. *Syrrhopodon perarmatus* Broth., in V.F.Brotherus & W.W.Watts, *Proc. Roy. Soc. New South Wales* 49: 133 (1915)**

T: Santo, New Hebrides [Vanuatu], 1909, *Bowie* (Herb. W.W.Watts 89); lecto: H; isolecto: FH, H, NSW; Aneityum, Oct. 1911, *Gunn* (Herb. Watts 193, Herb. Lillie 697); syn: BM, H, NSW; Aneityum, May-June 1913, *Gunn* (Herb. Watts 410); syn: BM, NSW, S; Futuna, Oct. 1912, *Gunn* (Herb. Watts 292); syn: H, NSW.

Illustrations: W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 179, figs 63, 64; A.Eddy, *op. cit.* 78, fig. 214.

Plants brownish green, to 3 cm tall, forming loose to dense tufts. Stems erect, simple. Rhizoids brown. Leaves stiffly flexuous to straight when wet and dry, narrowly linear from a slightly broader base, 6–10 mm long; limb composed mostly of costa and thickened leaf margins, bistratose here and there; margins thickened, lacking hyaline cells, densely and irregularly toothed throughout, the shoulders long-ciliate; leaf cells mammillose-papillose on both surfaces; cancellinae acute distally. Gemmae not seen. Sporogones not present in the Australian specimen.

Occurs in N.S.W.(?); also in Papua New Guinea, Fiji, the Solomons Islands and Vanuatu where it grows on trees and stumps at altitudes up to c. 1000 m.

N.S.W.: "Sydney, Bro. Collie" (NY–Herb. Mitten).

*Syrrhopodon perarmatus* is a striking moss due to its long, narrow, toothed leaves with very long, dense cilia on the shoulders. It is known from Australia only from the specimen cited above, which was collected long before *S. perarmatus* was first described and lay unnamed in Mitten's herbarium for many years. An Alexander Collie was a collector with Captain F.W.Beechey, who did visit Australia. This species has apparently become extinct in Australia since it has never been collected there again. It is possible that the specimen at NY is mislabeled, and that it was actually collected elsewhere.

#### **17. *Syrrhopodon gardneri* (Hook.) Schwägr., *Sp. Musc. Frond.* Suppl. 2, 1: 110 (1824)**

*Calymperes gardneri* Hook., *Musci Exot.* 2: 146 (1819). T: Nepal, *D.Gardner s.n.*, comm. Dr Wallich (BM).

Illustrations: H.Mohamed & W.D.Reese, *op. cit.* 226, figs 1–6; W.D.Reese, T.Koponen & D.H.Norris, *op. cit.* 169, figs 41, 42; A.Eddy, *op. cit.* 82, fig. 217.

Plants slender to robust, in tufts and cushions, green above, brown or blackish below. Stems to 4 cm tall. Rhizoids dark red to purple, commonly abundant and conspicuous. Leaves fragile, contorted when dry, 4–5 mm long, linear-lanceolate from a broader base; margins thickened, coarsely toothed, the shoulders with sharp spreading or ascending teeth; median cells of limb square, abaxial surface pluripapillose, adaxial mammillose-papillose, mostly c. 8–11 µm wide; cancellinae distinct, rounded to somewhat acute distally, sharply demarcated distally from adjacent green cells. Gemmae not seen. Sporogones not known from Australia.

Occurs in Arnhem Land, N.T. where it grows on rock in shaded gorges in monsoon forest. Pantropical.

N.T.: Humfly Gorge, 53 km E of Jabiru, *J.Russell-Smith & Lucas 3791* (CANB, DNA, LAF); Baroalba Ck, 15 km SSE of Jabiru airfield, *H.Streimann 42356* (CANB, NY).

Although the pantropical *S. gardneri* is very common in many parts of its range, it is extremely rare in Australia, where it is known only from the two specimens listed above. This species was newly reported for Australia by Reese *et al.* (1991). It is distinguished from all other Australian *Syrrhopodon* by its usually abundant and conspicuous dark red rhizoids, sharply dentate-serrate leaf shoulders, and the absence of elongate marginal hyaline cells.

### 18. *Syrrhopodon stoneae* W.D.Reese, *Bryologist* 92: 302 (1989)

T: trail up Mt Bartle Frere from Josephine Falls, 17°26'S, 145°52'E, on fallen tree trunk, *W.B.Schofield & M.I.Schofield 79707*; holo: UBC; iso: LAF, MELU, NSW; para: *loc. id.*, on fallen tree trunk by stream, *W.B.Schofield & M.I.Schofield 79652*, LAF, MELU, NSW, UBC.

Illustrations: W.D.Reese, *loc. cit.* figs 1–3.

Plants sordid dark green to blackish green. Rhizoids dark red. Stems c. 6–8 mm tall. Leaves dimorphic; some leaves small, vegetative, mostly 2.5–3.5 mm long; most leaves larger and gemmiferous, narrowed at tips and with the narrow lamina often somewhat reflexed along the costa (as in *Calymperes afzelii*), stiffly secund and involute when dry, linear, 4–5 mm long, lacking evident shoulders; leaf margins thickened at mid-leaf, lacking hyaline cells, stoutly denticulate above, entire or slightly serrulate below; median cells thick-walled, c. 10–12 × 10 μm, adaxially highly mammillose-papillose, abaxially minutely uni- to pluripapillose; cancellinae somewhat indistinct, not sharply demarcated distally from green cells of limb. Gemmae scanty, clavate, adaxial on tips of gemmiferous leaves.

Sporogones unknown.

This endemic moss is known only from the type locality in north-eastern Qld; grows on fallen tree trunks in rainforest at c. 300 m elevation.

*Syrrhopodon stoneae* is characterised by its dimorphic leaves, red rhizoids, thickened, denticulate leaf margins, rather indistinct cancellinae, and the absence of marginal elongate hyaline cells. It is possible that *S. stoneae* actually belongs to *Calymperes*; however, red rhizoids are rather rare in that genus but common in *Syrrhopodon*.

### Name of Uncertain Application

*Syrrhopodon mammillosus* Müll.Hal.

Listed from Qld by Scott & Stone (1976), but we have seen no Australian specimens of this taxon. Mohamed & Reese (1985) placed the name *S. mammillosus* into synonymy under *S. trachyphyllus* Mont., but later (Mohamed & Reese, 1988) reinstated it as a distinct species, citing it only from New Caledonia and Malaysia. See Streimann & Curnow (1989) for literature citations for *S. mammillosus* from Australia.

### Excluded Name

*Syrrhopodon clavatus* Schwägr., *Sp. Musc. Frond.* 2(2): 97 (1827)

T: “In Nova Hollandia lectum dedit cl. A. Menzies”; *n.v.*

From its description, both at first publication of the name as cited above, and later [*Sp. Musc. Suppl.* 3(2): 2, Tab. 299b and associated legend with another description and illustration], this moss is clearly a species of *Hypodontium*. Its second description, on an unnumbered page with the legend for Tab. 299 (“CCXCIX”), gives the specimen citation as “In Nova Hollandia legit Gu. Sieber”. Franz Wilhelm Sieber did collect in Australia and also in southern Africa, and it is likely that attribution of the specimen to Australia was in error, perhaps due to mislabeling. *Hypodontium* is presently known only from southern Africa and

has never been reported from Australia. Schwägrichen's reference to A.Menzies in the type description could be interpreted to mean that the [Sieber] specimen was given to Schwägrichen by Menzies, who apparently did not collect in Australia. Wijk *et al.* (1967) show *S. clavatus* as a synonym of *Thyridium fasciculatum* (Hook. & Grev.) Mitt., and attribute this to Paris (*Index Bryol.* 1246, 1898). However, Paris must have been misled by the fact that Schwägrichen's Tab. 299, cited above, includes figures of both species. *Syrrhopodon incompletus* Schwägr. was excluded from the Australian flora by Reese *et al.* (1986: 197).