

## SEMATOPHYLLUM

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*Sematophyllum* Mitt., *J. Linn. Soc., Bot.* 8: 5 (1864); from the Greek *semation*, the diminutive of *sema* (a mark, flag or sign) and *phyllon* (a leaf), in reference to the distinct alar region of the leaves.

Type: *S. demissum* (A. Wilson) Mitt.

Dioicous or, rarely, autoicous. Plants slender to coarse, forming dense dull or ±glossy green to yellowish green mats. Main stems creeping, red; branches erect-ascending crowded, irregularly subpinnately to pinnately divided. Stem and branch leaves similar, appressed, erect or spreading, occasionally secund, never falcate when dry, ±concave, ovate-lanceolate or oblong, never tubulose, blunt, ecostate, short or broadly pointed, acute or acuminate, entire or faintly denticulate on the upper margin. Laminal cells in the distal third (including the acumen) rhomboidal, oval-oblong, fusiform [L:W < 7:1], smooth; alar region well developed, with a distinct basal row of straight slightly elongate inflated cells, their walls hyaline or pigmented; supra-alar cells several, quadrate.

Perichaetia on main stems; inner perichaetial leaves with short to subulate-pointed apices. Calyptra smooth, cucullate. Seta long, red, occasionally yellow-orange or purple, smooth. Capsule small, ±erect to horizontal, ovoid to elongate; exothecial cells collenchymatous; operculum slenderly rostrate from a swollen base. Peristome diplolepidous, double, alternate; exostome teeth 16, lanceolate-subulate, cross-striate dorsally; lamellae well developed; teeth incurved between the segments when dry; endostome of 16 segments from a low or high basal membrane, the same length as the teeth, keeled; cilia 1 or 2, slender, occasionally rudimentary or absent. Spores small to medium-sized.

This widely distributed genus of c. 200 species occurs in temperate to tropical regions; five species and an additional variety are known from Australia. Although substrata include tree trunks, branches and fallen logs, *Sematophyllum* is less common on rock.

A cladistic analysis of the Sematophyllaceae by Hedenäs & Buck (1999) emphasised the need for a thorough revision of the genus *Sematophyllum* itself. Based on the six species studied, only two of which occur in Australia, the genus was found not to be monophyletic: "It may well be that *Sematophyllum* needs to be divided into several genera" (Hedenäs & Buck, 1999). The authors also suggested that at least one new genus, centred around the South American species *S. subsimplex* (Hedw.) Mitt. would be required. This genus, having affinities with their subfamily Wijkioideae (now in Pylaisiadelphaceae) rather than the subfamily Sematophylloideae, has yet to be described.

### References

- Beever, J., Allison, K.W. & Child, J. (1992), *The Mosses of New Zealand* 147–150. University of Otago Press, Dunedin.
- Hedenäs, L. & Buck, W.R. (1999), A phylogenetic analysis of the Sematophyllaceae, *Lindbergia* 24: 103–132.
- Ramsay, H.P., Schofield, W.B. & Tan, B.C. (2002), The family Sematophyllaceae (Bryopsida) in Australia. Part 1. Introduction, family data, key to genera and the genera *Wijkia*, *Acanthorrhynchium*, *Trismegistia* and *Sematophyllum*, *J. Hattori Bot. Lab.* 90: 1–50.

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## Key

- 1 Leaves erect-spreading; alar region with cells numerous, in several rows, pigmented, quadrate, and irregularly thick-walled ..... **1. S. homomallum**
- 1: Leaves subsecund or secund, falcate or not; alar region with a single basal row of a few larger rectangular or oval cells, thin or thick-walled.....2
- 2 Plants epiphytic on bark; leaves ovate or linear-lanceolate, to 1.5 mm long, secund, not falcate; apices acute or acuminate.....3
- 2: Plants subaquatic on wet rock faces in or near streams or on damp soil; leaves ovate-lanceolate, 1.5–2.0 mm long, subsecund and falcate, with acuminate apices .....4
- 3 Leaves ovate; apices acute; apical cells short ..... **4. S. subpinnatum**
- 3: Leaves linear-lanceolate; apices acuminate to long-acuminate; apical cells longer ..... **3. S. subhumile**
- 4 Plants glossy, bright pale-green or yellowish green; leaves to 1.5 mm long; apices broadly acute to short-acuminate; seta papillose above, smooth below..... **2. S. jolliffii**
- 4: Plants not glossy, golden-brown; leaves 1.5–2.0 mm long; apices acuminate; seta uniformly smooth ..  
..... **5. S. uncinatum**

### 1. *Sematophyllum homomallum* (Hampe) Broth., *Nat. Pflanzenfam.*, 2nd edn, 11: 433 (1925)

*Leskea homomalla* Hampe, *Icon. Musc.* 6. (1844); *Hypnum homomallum* (Hampe) Müll.Hal., *Syn. Musc. Frond.* 2: 336 (1851); *Pylaisia homomalla* (Hampe) A.Jaeger, *Ber. Tatig. St. Gallischen Naturwiss. Ges.* 1876–77: 307 (1878) [Ad. 2:373]; *Rhaphidorrhynchium homomallum* (Hampe) Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 84 (1882); *Rhaphidostegium homomallum* (Hampe) Broth., *Nat. Pflanzenfam.* I, 3: 1114 (1908). T: Perth, W.A., 19 Aug. 1839, *L.Preiss* 2465; holo: BM; iso: MEL.

*Hypnum drummondii* Taylor ex Hook.f. & A.Wilson, *London J. Bot.* 3: 555 (1844); *Leskea drummondii* Taylor ex Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 84 (1882), *nom. inval.* (in synonym.). T: New Zealand, *J.D.Hooker*; lecto: BM (Herb. Wilson 1347), *fide* A.Fife (July, 1992).

*Hypnum keysii* Kiaer ex F.M.Bailey, *Syn. Queensland Fl.*, Suppl. 1: 69 (1886), *nom. nud.* Based on: Mt Perry, Qld, *J.Keys* [90] (MEL 34605, 1002402, 1002343).

Illustrations: H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 92: 30, figs 15–17 (2002); W.R.Buck, D.H.Vitt & W.M.Malcolm, *Key to the Genera of Australian Mosses* 34 (2002) [immature specimens?]; D.Meagher & B.Fuhrer, *A Field Guide to the Mosses and Allied Plants of Southern Australia* 83 (2003).

Dioicous. Plants dull bronze-green, forming dense very glossy mats; branches erect, small to robust. Stems to 3 cm long, creeping, radiculose, irregularly pinnate with somewhat cuspidate branches. Leaves ovate-lanceolate to oblong, short and bluntly acuminate, markedly secund, erect, 1.25–1.75 mm long, c. 0.5 mm wide, concave; margins entire, plane and slightly recurved. Laminal cells somewhat thickened, frequently porose, with a narrowly elongate or elliptic lumen, 40–60 × 4–7 µm, transparent; alar region with 3 or 4 rows of orange or yellow irregularly quadrate thick-walled cells; supra-alar cells quadrate.

Perigonia gemmiform in leaf axils on the upper side of the stem. Perichaetial leaves erect, lanceolate, entire. Seta translucent, smooth, 5–8 mm long, yellowish orange and twisted to the left. Capsule erect, cylindrical, ovate or oblong, 1.20–1.75 mm long, with a short tapered neck; exothecial cells with thickening more pronounced on the longitudinal walls giving the capsule a striped appearance. Peristome with the exostome teeth having long-attenuate papillose apices; trabeculae well developed; endostome with a low papillose basal membrane; cilia 1 or 2; operculum finely rostrate. Spores green, 24–27 µm diam. Chromosome number not known.

Occurs in W.A., S.A., Qld (rare), N.S.W., Vic. and Tas.; most common in temperate south-eastern Australia. Usually found on dry exposed rocks, often in coastal habitats, occasionally corticolous on tree bases and branches, much rarer in wet habitats. Also in Sri Lanka, Malesia, Oceania and New Zealand.

W.A.: Mt Frankland, *S.W.Jackson s.n.* (NSW, PERTH); Cape Le Grand, *N.N.Donner AD-C15495* (AD); Margaret River, *A.C.Beauglehole 14371* (MEL). S.A.: Mt Monster, 10 km S of Keith, *R.D.Seppelt 3500* (HO); Marrano Ck, *J.R.Spence 4307* (NSW); Koppio, Eyre Penin., *L.D.Williams 6684* (AD). Qld: Dunk Is., *D.G.Catcheside 76.99* (AD); Binna Burra, Lamington Natl Park, *D.G.Catcheside 65.308* (AD). N.S.W.:

Mittagong, Oct. 1915, *H.Greenwood* (BRI); Lawson, *R.G.Coveny 13843* (NSW). Vic: Seaford, *D.G.Catcheside 53.97* (CANB); Hattah Lakes Natl Park, *A.C.Beauglehole1147n* (MEL). Tas.: Curtis Is., Bass Str., *R.B.Filson 12126, 12150, 12231* (MEL).

Thallus morphology is variable, and while plants are often rather small in exposed situations, they can be much larger in more sheltered habitats. Fertile individuals are comparatively rare in eastern Australia, being far more common in South Australia, where this is the most common *Sematophyllum* species.

The glossy bronze colour of *S. homomallum* is often pronounced, and this species is generally larger and coarser than either *S. subhumile* or *S. subpinnatum*. The 3 or 4 rows of irregularly thick-walled and almost quadrate alar cells are particularly distinctive. Specimens of *S. homomallum* resemble a larger version of the tropical *S. subpinnatum* in almost all gametophytic characters, except for the thick-walled alar cells and overall colour. The longitudinal thickening on the exothecial cells gives the capsule wall a striped appearance similar to *Warburgiella leucocytus*, but the latter has strongly falcate-secund leaves with a long acumen and lacks the diagnostic alar region of *S. homomallum*.

## 2. *Sematophyllum jolliffii* (Hook.f.) Dixon, *Bot. Notiser* 1937: 82 (1937)

*Hypnum jolliffii* Hook.f., *Fl. Tasman.* 2: 213 (1859); *Stereodon jolliffii* (Hook.f.) Mitt., *J. Linn. Soc., Bot.* 4: 87 (1860); *Rhaphidostegium jolliffii* (Hook.f.) A.Jaeger, *Ber. Tatig. St. Gallischen Naturwiss. Ges.* 1876–77: 391 (1878) [Ad. 2:457]; *Rhaphidorrhynchium jolliffii* (Hook.f.) Broth., *Nat. Pflanzenfam.*, 2nd edn, 11: 28 (1925). T: North Island, New Zealand, 1853, *Dr Jolliffe*; holo: NY.

Illustrations: J.Beever, K.W.Allison & J.Child, *Mosses of New Zealand* 65, pl. 33 (1992); H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 36, fig. 18.

Dioicous. Plants robust, bright pale green to yellowish green, glossy, with a metallic lustre, forming dense flat mats. Stems to 16 cm long or longer. Branches 5–8 cm long, complanate and markedly cuspidate towards the tips. Leaves 1.50–1.75 mm long, c. 0.75 mm wide, loosely or closely imbricate, erecto-patent or spreading, secund, concave, ecostate; apex broadly acute to short-acuminate; margins plane or broadly inflexed on one side in the lower part, entire or slightly denticulate. Laminal cells smooth; apical cells short, midleaf and lower cells oblong-linear to narrowly elliptic; alar region well developed, with a basal row of 2 or 3 large inflated thin-walled cells.

Inner perichaetial leaves with a broad acute apex. Seta short, 10–15 mm long, slightly papillose above, smooth below. Capsule c. 1 mm long, ovoid, constricted below the mouth; operculum with an oblique rostrum. Peristome with exostome teeth narrowly lanceolate, becoming gradually attenuated to a blunt apex, papillose; endostome of narrow subulate segments; cilia not seen. Spores 16–20 µm diam. Chromosome number not known.

Uncommon in temperate south-eastern Australia (N.S.W., Vic. and Tas.), where it occurs on wet ground and emergent rocks in streams, occasionally submerged. Also in New Zealand.

N.S.W.: Budawang Ra., 25 km W of Milton, *H.Streimann 1307* (CANB, HO); Fitzroy Falls, *W.B.Schofield 79062, 79268 & M.I.Schofield* (NSW); Grand Canyon Walk, Blackheath, *W.B.Schofield 81028, M.I.Schofield, H.P.Ramsay & P.M.Selkirk* (NSW). Vic.: Mount Rosea Ck, Grampians, *A.C.Beauglehole 30375B* (MEL); Upper Yarra Falls, *A.W.Thies FN1577P* (MEL). Tas.: Milhouse Falls, *W.A.Weymouth 164* (HO); Liffy Falls, *H.P.Ramsay R1824* (NSW).

Comparatively short and broad leaf apices distinguish non-fruiting plants of *S. jolliffii* from other Australian species, except *S. homomallum* and *S. subpinnatum*. However, these two species are terrestrial or epiphytic, and not associated with rocks in and near streams. Furthermore, *S. homomallum* has numerous, small, pigmented, thick-walled alar cells.

*Sematophyllum jolliffii* resembles *S. uncinatum* in general morphology, but it is usually bright pale green or yellowish green and glossy, even lustrous. Branch tips of *S. jolliffii* are short and cuspidate, whereas those of *S. uncinatum* are long and slender. Although both species occupy wet habitats, *S. uncinatum* grows on wet rock faces and stones, but is not truly aquatic.

### 3. *Sematophyllum subhumile* (Müll.Hal.) M.Fleisch., *Musc. Buitenzorg* 4: 1264 (1923)

*Hypnum subhumile* Müll.Hal., *Syn. Musc. Frond.* 2: 330 (1851). T: Nilgheris [Nilgherries], India, G.S.Perrotet; lecto: H-BR, *vide* Ramsay *et al.* (2004).

*Rhaphidostegium aciculum* Broth. ex Dixon, *Rev. Bryol. Lichénol.*, n.s., 2: 27 (1929); *Hypnum aciculum* Müll.Hal. *Rev. Bryol. Lichenol.* n.s. 2: 27 (1929); *Sematophyllum aciculum* (Broth. ex Dixon) Dixon, *J. Bot.* 71: 250 (1933). T: Ballina, N.S.W., June 1898, W.W.Watts 1987; holotype: BM.

*Rhynchostegium elachistos* Besch., *Ann. Sci. Nat., Bot.*, sér. 5, 18: 242 (1873); *Rhaphidorrhynchium elachistos* (Besch.) Broth., in Thériot, *Bull. Acad. Int. Geogr. Bot.* 13: 86 (1904); *Sematophyllum elachistos* (Besch.) Broth., *Nat. Pflanzenfam.*, 2nd edn, 11: 432 (1925).

*Rhaphidostegium luciduloides* Dixon, *Rev. Bryol. Lichénol.*, n. s., 2: 26 (1929), *nom. nud.* Based on: Greenwich, Sydney, N.S.W., 23 Apr. 1884, W.Forsyth (NSW).

*Rhaphidostegium lucidendroides* Naveau, *Rev. Bryol. Lichénol.*, n. s., 1: 39 (1928), *nom. nud.*

*Rhaphidostegium calocarpum* Müll.Hal. ex Burges, *Proc. Linn. Soc. New South Wales* 60: 93 (1935), *nom. nud. in synonym.* Based on: Double Bay, N.S.W., Aug. 1884, T.Whitelegge 60 (NSW).

Illustrations: B.C.Tan & P.But, *J. Bryol.* 795, fig. 4: 1–4 (1997); H.Streimann, *The Mosses of Norfolk Island* 141, fig. 63 (2002); H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 19, figs 36–40; Y.Jia, P.-C.Wu & B.C.Tan, *Moss Flora of China* (English version) 8: 55, pl. 609, figs 1–14 (2005).

Dioicous. Plants pale yellow-green, densely caespitose; stems creeping, 1–2 cm long; branches 3–4 mm long. Leaves linear-lanceolate, gradually short- to long-acuminate, concave, 1.0–1.5 mm long, c. 0.5 mm wide; margins plane to narrowly reflexed, strongly secund at apices of stems and branches. Laminal cells narrowly linear, 40–70 × 4–7 µm [L:W 7–10:1]; alar region with a basal row of subquadrate or oblong and slightly to moderately inflated cells; supra-alar cells small, occasionally ascending margin. Gemmae occasionally on leaf margins of both varieties.

Perichaetial leaves erect, lanceolate, acuminate. Seta smooth, to 10 mm long, red. Capsule erect, to 1 mm long, obovate, expanded at the apex and exposing the peristome. Exostome teeth lanceolate, narrowing to a hyaline apex, papillose, short-trabeculate; endostome segments folded along the midline, subulate, faintly papillose, with a moderately high basal membrane; cilia 1 or 2. Spores 10–16 µm diam. *n* = 11, *vide* Ramsay *et al. op.cit.* 7, fig. 3e (2002).

The smaller size, yellowish green colour and narrower acuminate leaves, often secund at branch apices distinguish this moss from other Australian *Sematophyllum* species. The type specimen of *S. aciculum* is essentially a stunted xerophytic form of *S. subhumile* from exposed and comparatively dry tree trunks. Indeed, Australian populations of *S. subhumile*, apart from the more xerophytic *aciculum* morph, are often larger than tropical Asian specimens, while their stem apices are more pointed and the leaves have more acuminate apices.

Two varieties are recognised.

Inner perichaetial leaves with entire margins ..... var. **subhumile**  
Inner perichaetial leaves with serrulate margins ..... var. **contiguum**

#### 3a. *Sematophyllum subhumile* (Müll.Hal.) M.Fleisch. var. **subhumile**

The type variety tends to have leaves with acute to short-acuminate apices, and an alar region of numerous, subquadrate, but scarcely inflated cells. These characters are variable, so the most reliable diagnostic character is the entire (as opposed to serrulate) upper margins of the perichaetial leaves.

Most common in temperate latitudes of Australia (southern W.A., N.S.W., A.C.T., Vic. and Tas.), but it also extends into Qld and subtropical Lord Howe Island and Norfolk Island. Mainly on tree bark, logs and rock in rainforest and fern gullies. Also in temperate and tropical Asia, southern Africa, Pacific islands and New Zealand.

W.A.: Gingarup, Feb. 1911, *J.Staer* (NSW). Qld: Browns Ck, Cape Weymouth, *H.Streimann* 56445, 56450 (CANB); Daintree R., 1882, *T.Pentzke* (NY); Mount Spec Natl Park, *B.C.Tan* 94-677A *et al.* (FH, NSW). N.S.W.: near Adelina Falls, Blue Mtns, *B.C.Tan* 94-816 *et al.* (FH); Fitzroy Falls, Mittagong, *B.C.Tan* 94-873, 94-880 (FH, NSW); Whian Whian S.F., *W.B.Schofield* 80734 (NSW). A.C.T.: Tidbinbilla, *D.G.Catcheside*

65.411 (AD). Vic.: Lorne, W.W.Watts V1020, V1095, V1097 (NSW); Nigretta Falls, D.G.Catcheside AD-C27035 (AD). Tas.: S end of Pirates Bay, W.A.Weymouth 166 (HO, MEL); Northeast Is., Kent Group, Bass Str., J.S.Whinray (MEL).

**3b. *Sematophyllum subhumile* (Müll.Hal.) M.Fleisch. var. *contiguum* (Mitt.) B.C.Tan, W.B.Schofield & H.P.Ramsay, *Nova Hedwigia* 67: 219 (1998)**

*Hypnum contiguum* Hook.f. & A.Wilson, *Fl. Tasman.* 2: 213 (1859), *nom. illeg.*; *Stereodon contiguus* Mitt., *J. Linn. Soc., Bot.* 4: 87 (1859); *Sematophyllum contiguum* (Mitt.) Mitt., in Seeman, *Fl. Vit.* 398 (1873); *Rhaphidostegium contiguum* (Mitt.) Paris, *Index Bryol.* 1090 (1897). T: Tas., R.C.Gunn 51; lecto: BM, *fide* Ramsay *et al.* (2002: 41); syn: Tas., A.F.Oldfield (BM).

*Sematophyllum nanobolax* Müll.Hal. ex Paris, *Index Bryol., Suppl.* 307 (1900), *nom. nud.* Based on: Pedders Gully, Kangaroo Pt, Tas., W.A.Weymouth 734 (HO).

Illustrations: J.Beever, K.W.Allison & J.Child, *Mosses of New Zealand* 149, fig. 81h (1992), as *S. contiguum*; H.P.Ramsay, W.B.Schofield & B.C.Tan, *op. cit.* 38, figs 19a2, f, g, k, 21.

The type specimens of *S. contiguum* differ from *S. subhumile* in having more acuminate leaf apices, in addition to serrulate perichaetial leaf margins, and fewer, oblong, inflated alar cells. Given the considerable variability exhibited by *S. subhumile*, Ramsay *et. al.* (2002) interpreted these differences worthy of only varietal recognition.

Uncommon but widespread in eastern Australia (Qld, N.S.W., A.C.T., Vic. and Tas.), and in W.A.; also in South America, Oceania and New Zealand.

W.A.: Beedelup Falls, A.C.Beaglehole 14511, 14489 (MEL). Qld: Cammoo Caves, W.B.Schofield 90453A & M.I.Schofield (NSW); Bunya Mountains Natl Park, W.B.Schofield 90640, 90643 (NSW); Binna Burrra, I.G.Stone 12786 (MEL); Dunk Is., D.G.Catcheside (AD). N.S.W.: near Banjo Ck, Doyles River S.F., D.H.Vitt 27562 (NSW); Wentworth Falls, Blue Mtns, M.Fuller 96 (CANB); Majors Ck, L.G.Adams 1961 (BM, BRI, CANB, MEL, NSW). A.C.T.: Lees Ck Gully, N.T.Burbidge 6996, 7000 (CANB); Bushrangers Ck, L.A.Craven 1935 (CANB). Vic.: Otway Ra., A.C.Beaglehole 74260 (MEL). Tas.: Kangaroo Pt, W.A.Weymouth 734 (HO).

Specimens at MEL and NSW, originally named *S. crassiusculum* (Brid.) Broth. (H.P.Ramsay, *Telopea* 2: 497, 1984), represent *S. subhumile* var. *contiguum*.

**4. *Sematophyllum subpinnatum* (Brid.) E.Britton, *Bryologist* 21: 28 (1918)**

*Leskea subpinnata* Brid., *Musc. Recent. Suppl.* 2: 54 (1812). T: Hispaniola, Cuba, C.Wright 106.

*Sematophyllum caespitosum* Mitt., *J. Linn. Soc., Bot.* 12: 479 (1869); *Rhaphidostegium caespitosum* (Mitt.) Besch., *Ann. Sci. Nat., Bot., sér.* 6, 3: 247 (1876). T: not located.

*Rhaphidostegium ovale* Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 33: 107 (1890). T: Tringilburra Ck, Bellenden Ker Ra., Qld, 1889, F.M.Bailey 613; holo: BRI; iso: NSW.

*Rhaphidostegium pseudodemissum* Müll.Hal. ex Burges, *Proc. Linn. Soc. New South Wales* 60: 93 (1935), *nom. nud.* in synon. Based on: North Shore, Sydney, N.S.W., Apr. 1884, T.Whitelegge 2757; Fitzroy Falls, N.S.W., Nov. 1884, T.Whitelegge 2756 (NSW).

Illustrations: H.C.Gangulee, *Mosses of Eastern India and Adjacent Regions* 3: 1881, fig. 957 (1980); L.E.Anderson & H.A.Crum, *Mosses of Eastern North America* 1114, fig. 549 (1981); Y.Jia, P.-C.Wu & B.C.Tan, *Moss Flora of China* (English version), *Sematophyllaceae* 8: 57, pl. 610, figs 1–12 (2005).

Autoicous. Plants small to medium-sized, sparingly branched, forming rather dull green or yellowish green mats. Stems to 4 cm long, ascending to erect, narrowly complanate; branches short, blunt, ascending, the apices curved, appearing paler above and darker below. Leaves crowded, erect, lax, imbricate when dry, oval, 1.33–2.00 mm long, 0.65–0.76 mm wide, somewhat concave; apices obtuse to acute; margins entire, plane to narrowly reflexed at the base. Upper laminal cells oblong-linear to elliptic, thick-walled at the apex, 7–10 × 2–3 µm; midleaf and lower laminal cells narrowly elongate. 30–40 × 5–6 µm; alar area with a row of 3–6 small yellow vesicular cells on either side of the leaf base; supra-alar cells quadrate, smaller, biseriate.

Perichaetial leaves erect, comparatively narrow, ecostate, entire. Seta to 10–15 mm long, purple. Capsule suberect to inclined, oblong-cylindrical, symmetrical, scarcely arcuate, c. 1.3 mm mm long and 0.7 mm wide, constricted below the mouth; operculum conical, rostrate. Peristome with incurved lanceolate exostome teeth; endostome segments yellow, densely

papillose, not perforated; cilia absent or single. Spores 23–35 µm diam., papillose.  $n = 10$ , *vide* H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 90: 7, fig. 3b (2002).

Occurs in northern W.A., N.T. and eastern Qld, and in eastern N.S.W. and Vic. Also in North and South America, India, East Asia, Malesia and the Pacific islands.

W.A.: Barker River, *D.J.Edinger* 493 (PERTH). N.T.: 6.5 km SE of Jim Jim Falls, Kakadu Natl Park, *L.A.Craven* 5809 (CANB); Edith Falls, Katherine Gorge Natl Park, *L.A.Craven* 6763 (CANB). Qld: Mt Lewis, *B.O. van Zanten* 681132 (GRO, NSW); Frenchmans Ck, *W.W.Watts* Q399 (NSW); Mount Hypipamee Crater Natl Park, near Atherton, *B.C.Tan* 94-516 (FH, NSW); Blue Waters Ck, 39 km S of Ingham, *I.G.Stone* 28368 (MEL). N.S.W.: Katoomba Falls, Blue Mtns, *W.B.Schofield* 79636, *M.I.Schofield* & *H.P.Ramsay* (NSW); NE of Captains Flat, *L.G.Adams* 2078 (BM, CANB, COLO, TNS); Myocum, *W.W.Watts* 4322, 4334, 4321 (NSW). Vic.: Wilsons Promontory, *I.G.Stone* 9348 (*D.H.Ashton*) (MEL).

W.R.Buck (*Mem. New York Bot. Gard* 82: 369, 1998) reduced the well-known Old World species, *S. caespitosum*, to synonymy under *S. subpinnatum*. Specimens in Australian herbaria previously reported as *S. caespitosum* require checking to confirm their correct placement in *S. subpinnatum* [e.g. A.Stoneburner, R.Wyatt, D.G.Catcheside & I.G.Stone, *Bryologist* 96: 96 (1993); D.G.Catcheside & I.G.Stone, *J. Adelaide Bot. Gard.* 11: 16 (1988); M.Lazarides, L.A.Dunlop, C.R.Adams & N.Byrnes, *Occas. Pap. Australian National Parks & Wildlife Service* 15: 5 (1988)].

*Sematophyllum subpinnatum* is characterised by the curved branch apices that are paler above and darker below, the dullness of the plants, obtuse to acute leaf apices and comparatively short, thick-walled apical laminal cells. *Sematophyllum subhumile* usually has yellowish green plants, leaves that are strongly secund at the stem and branch apices, and leaf apices that are acuminate and have more elongate apical cells.

##### 5. *Sematophyllum uncinatum* I.G.Stone & G.A.M.Scott, *J. Bryol.* 7: 604 (1973)

*Hypnum tenuirostre* Hook., *Musci Exot.* 2: pl. 111 (1819); *Rhaphidorrhynchium tenuirostre* (Hook.) Broth., *Nat. Pflanzenfam.*, 2nd edn, 11: 428 (1925); *Sematophyllum tenuirostre* (Hook.) Dixon, *Bot. Notiser* 1937: 83 (1937), *nom. illeg.* (later homonym). T: Dusky Sound, New Zealand, *A.Menzies* 82; holo: BM (Hooker); iso: BM (Wilson), BM (Turner).

*Rhaphidostegium tingiringense* Geh. ex Burges, *Proc. Linn. Soc. New South Wales* 60: 93 (1935), *nom. nud.* Based on: Tingiringense [Tingaringy], N.S.W., *W.Bauerlen* 189 (MEL, NSW).

Illustration: H.P.Ramsay, W.B.Schofield & B.C.Tan, *J. Hattori Bot. Lab.* 92: 44, fig. 22 (2002).

Dioicous. Plants robust, growing in dense soft glistening golden to yellow-brown mats. Stems long, to 8 cm, prostrate, irregularly and unequally subpinnately branched; branches usually 2–3 cm long, narrowly spreading, flexuose, mostly falcate and slightly hooked at the tips. Leaves ovate-lanceolate, 1.5–2.0 mm long, 0.4–0.6 mm wide, crowded, subsecund, falcate from a constricted base, tapering to a broadly acuminate apex, markedly concave; margins plane, narrowly recurved at the extreme base, entire or slightly denticulate above. Laminal cells narrowly linear-rhomboidal, with blunt ends, slightly vermicular, smooth or with slightly projecting ends, 40–80 × 4–5 µm; apical cells short and narrowly rhomboidal; cells towards the base short and somewhat rectangular, with thicker walls; alar region with a basal row hyaline or yellowish inflated and narrow cells, with narrow yellow cells across the insertion.

Perichaetia on stems or branches; perichaetial leaves numerous, lanceolate, short-pointed, entire or faintly denticulate, wide-spreading. Seta 15–20 mm long, red, slender, smooth, slightly twisted to the left. Capsule c. 1.5 mm long, horizontal to pendulous, ovoid; annulus lacking. Peristome with lanceolate exostome teeth, gradually narrowed, with a grooved median line, densely transversely striolate; dorsal trabeculae projecting laterally; ventral trabeculae projecting radially in the upper part of tooth; endostome segments with the basal membrane c. half the height of segments; cilia 1 or 2, shorter than segments. Spores 14–20 µm diam., smooth. Chromosome number not known.

Occurs in southern temperate Australia (W.A., N.S.W., Vic. and Tas.) where it grows on wet rock faces in or beside streams. Also in southern South America and New Zealand.

W.A.: Yallingup, *I.G.Stone* 23556 (MEL). N.S.W.: Katoomba Falls, *D.H.Vitt* 27139 & H.P.Ramsay (NSW); Cambewarra Mtn, 3 June 1903, *W.W.Watts s.n.* (NSW); Fitzroy Falls, *W.B.Schofield* 79062 (NSW). Vic.: Grampians, *A.C.Beaglehole* 4224, 4222, 4225 (MEL); Mt Buffalo, Dec. 1952, *K.W.Atkins s.n.* (MEL). Tas.: St Patricks R., *R.Gunn* 1600 (HO); Liffey Falls, *D.H.Vitt* 29330 (NSW); Flinders Is., 10 Apr. 1954, *J.H.Willis* (MEL); Cradle Mtn, *D.G.Catcheside* 86.96 (AD).

*Sematophyllum uncinatum* is a highly distinctive, robust, golden brown moss growing on wet rocks. The vegetative leaves taper to broadly acuminate apices, and the perichaetial leaves are short-pointed and subentire.

Streimann & Klazenga (*Cat. Australian Mosses* 156, 2002) noted that while Stone & Scott (*Mosses of Southern Australia* 604, 1973) included this species in *Sematophyllum*, the latter authors felt that it should be part of *Rhaphidorrhynchium* were that genus to be accepted. However, Ramsay *et al.* (2002) retained it in *Sematophyllum* because while the subsecund leaves and the frequently long leaf acumen resemble those of *Rhaphidorrhynchium*, the latter has flexuose or strongly falcate-secund leaves, as well as narrower leaves and leaf apices. There are also cellular differences, *Rhaphidorrhynchium* having shorter laminal cells while those of *Sematophyllum* are longer and narrower. Finally, the exothecial cells of *Rhaphidorrhynchium* are strongly collenchymatous, unlike those of *Sematophyllum* which are subcollenchymatous.

Small, immature plants of *S. uncinatum* can resemble *Warburgiella leucocytus*. However, the latter is never hygrophilous, and it has papillose setae and sharply denticulate perichaetial leaf acumens.

#### Excluded Names

Bartram (*Farlowia* 4: 244, 1952) reported *S. saproxylophilum* (Müll.Hal.) M.Fleisch. from North Queensland, having seen specimens at FH collected by L.J.Brass. However, these and other specimens named as *S. saproxylophyllum* (e.g. at CANB), represent other species, hence Ramsay *et al.* (2002) excluded this moss from the Australian bryoflora.

*Rhaphidostegium pseudohomomallum* Müll.Hal., was reported from Australia by W.Forsyth (*Proc. Linn. Soc. New South Wales* 24: 683, 1900). However, specimens at NSW with this name, including those listed in Forsyth, are either *S. subhumile* or *S. subpinnatum*.