SCHLOTHEIMIA

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Schlotheimia Brid., *Muscol. Recent.*, Suppl. 2: 16 (1812); named in honour of palaeobotanist Ernst Fredrick von Schlotheim (1764–1832).

Type: *S. torquata* (Hedw.) Brid.

Dioicous (pseudautoicous with dwarf males). Plants forming dense spreading mats, dull, olive-green to chestnut-green or brown to reddish green or reddish brown above and reddish below. Stems creeping, with erect branches covered by a rufous tomentum of thick-walled papillose rhizoids, simple or rarely branched by innovations beneath the perichaetia. Branch leaves erect-imbricate or spirally twisted when dry, ±rugose, erect-spreading to spreading-reflexed when moist; oblong to lanceolate-oblong, strongly keeled; margin reflexed below, entire; costa strong, excurrent or ending in or just below the apex; upper laminal cells uniform across lamina, short, elliptical to rounded-quadrate, smooth, the marginal cells oblate to quadrate, the juxtacostal cells in 2 or 3 rows; basal laminal cells elongate-rectangular to hexagonal-rhomboidal, straight, thick-walled, porose, smooth or papillose, hyaline to yellow. Gemmae not seen.

Perichaetial leaves differentiated or not. Calyptra large, campanulate, with trapezoidal basal lobes covering the capsule at maturity, smooth, glabrous. Setae erect, long, twisted to the left, smooth. Capsules on erect secondary branches, long-exserted, ribbed or not, with numerous stomata in neck; annulus present in at least one species; operculum convex. Peristome double; exostome teeth 16, linear, revolute when dry; endostome segments 16–32, irregular, broad, blunt, 1/2–2/3 the length of the exostome. Spores isomorphic or anisomorphic.

A genus of c. 130 species, predominantly in the Southern Hemisphere (New Zealand, South America, Africa, Madagascar, Malesia and Australia). Two species are known from eastern and south-eastern Australia where they occur as epiphytes and on shaded rocks in wet forest; also close to the sea or brackish inlets. The genus differs from *Macromitrium* in the large, campanulate calyptra covering the capsule until maturity and the dense, red-brown tomentum of thick-walled, papillose rhizoids covering the stems.

References

Vitt, D.H. (1989), The genus *Schlotheimia* (Orthotrichaceae: Bryopsida) in Australia and New Zealand, *Bryologist* 92: 282–298.

Vitt, D.H., Koponen, T. & Norris, D.H. (1993), Bryophyte flora of the Huon Peninsula, Papua New Guinea. LIII. *Ulota* and *Schlotheimia* (Orthotrichaceae, Musci), *Acta Bot. Fenn.* 148: 5–25.

Branch leaves transversely strongly rugose above when dry; perichaetial leaves similar to vegetative leaves; capsules ribbed..... **1. S. brownii**

Branch leaves not rugose when dry; perichaetial leaves twice as long as vegetative leaves, sheathing the setae; capsules smooth ..... **2. S. funiformis**

1. Schlotheimia brownii Schwägr., *Sp. Musc. Frond.*, Suppl. 2, 2: 52 (1826)

Macromitrium brownii (Schwägr.) Müll.Hal., *Bot. Zeitung (Berlin)* 3: 544 (1845). T: "In Nova Hollandia legit et dedit L.R.Brown" [Port Jackson, N.S.W., 1803]; holo: G.

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Schlotheimia baileyi Broth., *Oefvers. Förh. Finska Vetensk.-Soc.* 33: 98 (1891). T: Bellenden Ker Range, Qld, 1889, *F.M.Bailey 612*; holo: H-BR; iso: BM, BRI.

Illustrations: D.H.Vitt, *op. cit.* 291, figs 30–36; 292, figs 37–38, 42–43, 45.

Plants chestnut-green to dark reddish brown above; branches 6–8 mm tall; dwarf male plants 2–4 mm tall. Branch leaves imbricate-flexuose and tightly spirally twisted around the branch when dry, transversely rugose above, erect-spreading to spreading-reflexed when moist, narrowly oblong to lanceolate-oblong, strongly keeled in lower two-thirds, keeled above, 1.1–2.4 mm long; apex obtuse to retuse or mucronate; margin plane to reflexed below, entire; costa strong, ending in or just below the mucro; upper laminal cells uniform across lamina, in precise rows at angles of 60–90° to costa, flat, rounded-quadrate to subquadrate, 6–9 × 4–8 µm, smooth; juxtacostal cells in 2–4 oblique longitudinal rows; basal laminal cells 30–50 × 5–8 µm, smooth or with a small terminal papilla.

Perichaetial leaves similar to vegetative leaves. Calyptra 4-lobed below. Setae 4.5–5.0 mm long. Capsules long-exserted, cylindrical, 8-ribbed along their entire length, widest at the mouth when old; exothecial cells short (2–4: 1), thick-walled, in bands of narrower and wider cells; annulus 1 or 2 rows of thin-walled cells. Peristome double; exostome teeth 16, linear, conical when moist, revolute when dry; endostome segments 16–32, 1/2–2/3 the length of the exostome teeth, broad, irregularly shaped. Spores isomorphic, (16–) 20–40 (–50) µm diam., coarsely papillose. *n* = 11, *fide* H.P.Ramsay, *in* G.C.S.Clarke & J.G.Duckett, *Bryophyte Systematics* 14: 303–304 (1979).

Occurs in eastern Qld and N.S.W.; also in Lord Howe Island and New Caledonia. Mainly epiphytic on *Nothofagus* (rarely on *Eucalyptus*), and also on rocks; collected from sea level to 1400 m.

Qld: summit of Mt Bellenden Ker, 1889, *F.M.Bailey* (BRI). N.S.W.: Ballina, *W.W.Watts 5709* (NSW); Apple Tree Bay, Bobbin Head, *H.P.Ramsay 2/77* (NSW).

Although the protologue of *Schlotheimia brownii* cited only "Nova Hollandia" as the type locality, the holotype in Schwägrichen's herbarium (G) has the locality as "Port Jackson 1803" [Sydney, N.S.W.]. *Schlotheimia baileyi*, from the higher elevations of Mt Bellenden Ker (Qld) is synonymous, these northern populations having more loosely arranged leaves typical of more tropical, epiphytic plants. The New Zealand species *S. knightii* Müll.Hal. is closely related.

2. Schlotheimia funiformis Taylor ex Dixon, *Notes Roy. Bot. Gard. Edinburgh* 120: 94 (1948)

T: "Nov. Hollandia", [Australia], "Herb. Edinb. (138)"; holo: E; iso: BM.

Illustrations: D.H.Vitt, *op. cit.* 292, figs 37, 41, 44; 294, figs 47–51.

Plants olive-green above, chestnut-brown to reddish green below; branches to 10 mm tall. Branch leaves erect-imbricate, funiculate, not rugose, tightly spirally arranged above when dry, erect-spreading when moist, oblong to ligulate-oblong, strongly keeled to apex, 1.2–1.5 mm long; apex obtuse, mucronate; margin entire; costa ending in the mucro; upper laminal cells in 14 or 15 rows across lamina, flat, rounded-quadrate to subquadrate, 6–9 × 4–8 µm, smooth; juxtacostal cells elongate; basal laminal cells 25–50 × 6–7 µm.

Perichaetial leaves conspicuous, loosely erect-sheathing, ovate-lanceolate, 2–3 mm long, with an acute mucronate apex. Calyptra to 8-lobed below, smooth. Setae 6–7 mm long. Capsules long-exserted, broadly cylindrical, 1.7–1.8 mm long, smooth; exothecial cells uniform, very short (3–4: 1), thick-walled, with a narrow mouth and rim cells in 5 or 6 differentiated rows. Peristome double; exostome teeth 16, linear, conical when moist, partially revolute when dry; endostome segments 16, 2/3–3/4 the length of the exostome teeth, narrow, irregularly shaped, with an acute apex. Spores distinctly anisomorphic, 12–34 µm diam., coarsely papillose. Chromosome number not known.

This endemic species occurs in north-eastern Qld, in the border ranges between Qld and N.S.W and in northern coastal areas of N.S.W.; grows on bark and rock.

Qld: confluence of Echo Ck and Davidson Ck, Cardwell Ra., SE of Ravenshoe, *H.Streimann 29105* (BRI, CANB, HO, NSW); Mt Baldy, near Atherton, *H.Streimann 29220* (CANB); Darling Downs, *R.D.Hoogland 11810* (CANB, NSW). N.S.W.: Weeping Rocks, New England, *H.Streimann 47697* (CANB).

Schlotheimia funiformis differs from *S. brownii* in having non-rugose leaves with obtuse, mucronate apices, smooth basal cells, conspicuous, erect perichaetial leaves twice the length of vegetative leaves, smooth rather than ribbed capsules, 8-lobed calyptrae and distinctly anisomorphic spores.