

## SCLERODONTIUM

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*Sclerodontium* Schwägr., *Sp. Musc. Frond.*, Suppl. 2, 1: 124 (1824); from the Greek *scleros* (hard) and *odontion*, the diminutive of *odous* (a tooth), presumably in reference to some property of the peristome teeth.

Type: *S. pallidum* (Hook.) Schwägr.

*Leucoloma* sect. *Dicnemoloma* Renault, *Prodr. Fl. Bryol. Madagascar* 61 (1898); *Leucoloma* sect. *Dicnemoloma* (Renauld) Paris, *Index Bryol.*, Suppl. 1: 115 (1900); *Dicnemoloma* (Renauld) Renault, *Rev. Bryol.* 28: 86 (1901). Type: *L. sieberianum* (Spreng.) A.Jaeger [= *S. pallidum* (Hook.) Schwägr.]

Dioicous. Plants dull green, forming rough mats. Stems creeping, with ascending tips, and with many erect mainly monopodial innovations, reddish brown, densely foliose, lacking tomentum; central strand present. Leaves ovate-lanceolate to narrowly ovate-lanceolate, canaliculate, occasionally subtubulose near the apex, frequently ending in a hyaline hair-point or swollen clavate gemma, when dry often slightly rugose; alar patches differentiated; margin entire throughout; border consisting of up to 4 (–8) rows of linear hyaline cells; costa subpercurrent to excurrent, in cross section with 4 guide cells and 1 or 2 layers of stereids on either side. Upper laminal cells isodiametric, irregularly shaped because of mostly strongly pitted walls, papillose at least abaxially, descending along the margins; basal juxtacostal cells elongate to linear, thick-walled, pitted, smooth; alar cells brown, with strongly thickened lateral walls.

*Sclerodontium* includes two species occurring in southern Malesia, Australasia, New Caledonia, Brazil and the Kerguelen Islands (Indian Ocean). *Sclerodontium* differs from the closely related but much more speciose *Leucoloma* by the quadrate, papillose, upper laminal cells that descend along the margins, rather than along the costa, and by the asymmetrical to curved capsules.

*Sclerodontium* fits comfortably in the Dicranaceae due to its asymmetrically split peristome teeth and its differentiated, strongly coloured alar patches. However, the creeping growth form is anomalous here, being more reminiscent of *Racomitrium* (Grimmiaceae) or *Hedwigia* and *Hedwigidium* (Hedwigiaceae).

### Reference

Crum, H.A. (1986), A survey of the moss genus *Sclerodontium*, *Hikobia* 9: 289–295.

Leaves ending in a swollen deciduous tip; laminal cells adaxially smooth, except those near apex and on gemmae (with stellate papilla) ..... **1. S. clavinerve**  
Leaves not ending in a deciduous tip; laminal cells adaxially with multiple simple papillae close to the walls; laminal cells near apex with a simple curved papilla..... **2. S. pallidum**

### 1. *Sclerodontium clavinerve* (Broth.) H.A.Crum, *Hikobia* 9: 294 (1986)

*Leucoloma clavinerve* Müll.Hal. ex Broth., *Öfvers. Förh. Finska Vetensk.-Soc.* 35: 36 (1893); *Dicnemoloma clavinerve* (Broth.) Renault, *Essai Leucoloma* 44 (1909). T: Petrie's Quarries, Brisbane, Qld, *H.Tryon* 798; holo: H-BR n.v.; iso: MEL 33083.

Stems to c. 4 cm long. Leaves curved towards the stem or falcate-secund when dry, spreading when moist, ovate-lanceolate, often slightly undulate when dry, ending in a deciduous swollen papillose gemma, occasionally terminating in a hair-point. Upper laminal cells isodiametric, quadrate to irregularly shaped because of pitted walls, adaxially smooth;

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cells along the margin in the basal part of the leaf abaxially with simple papillae (sometimes numerous), the papillae becoming more complex and stellate distally, covering almost the entire lumen towards the leaf apex and on the gemma. Perichaetia and sporogones unknown.

Occurs in eastern Qld and north-eastern N.S.W.; grows on rock and on dead wood. Also in Brazil.

Qld: 7.5 miles [c. 12 km] S of Arcadia Rd, near turn-off to Carnarvon Gorge, *I.G.Stone 5041* (MEL 2148161); Stones Country Resource Reserve, 17 km E of Gurulmundi, *D.W.Butler, J.Wang & D.Jermyn BRY01* (MEL 2139079). N.S.W.: off Alstonville road, 3.5 miles [c. 5.5 km] from Ballina, *W.W.Watts 4443* (H).

In addition to a gemma on leaf apices, *S. clavinerve* differs from *S. pallidum* in the shorter and comparatively broader leaves, the lack of adaxial papillae, except near the leaf apex where they are similar to the abaxial ones, and the most distal papillae being compound and stellate. While many specimens of *S. pallidum* appear to have slightly swollen leaf tips, these are not gemmae. Thus, they lack the constriction that is always present below the gemmae of *S. clavinerve*, the do not become detached as readily, and they have simple curved papillae, rather than compound stellate ones.

*Sclerodontium clavinerve* has never been found with sporogones, and the fact that it appears to rely on rather large gemmae for reproduction probably excludes long-range dispersal as an explanation for its disjunct distribution. Indeed, it supports Crum's (1986) assertion that its occurrence in restricted areas of Australia and Brazil represents relict populations.

## 2. *Sclerodontium pallidum* (Hook.) Schwägr., *Sp. Musc. Frond.* Suppl. 2, 1: 124 (1824) subsp. **pallidum**

*Leucodon pallidus* Hook., *Musci Exot.* 1: pl. 172 (1823); *Trematodon pallidus* (Hook.) Spreng., *Syst. Veg.* 4(1): 162 (1827); *Neckera pallida* (Hook.) Müll.Hal., *Syn. Musc. Frond.* 2: 113 (1850); *Dicnemon pallidum* (Hook.) Sull., *Musci U.S. Explor. Exped.* 5 (1859); *Dicnemoloma pallidum* (Hook.) Wijk & Margad., *Taxon* 9: 50 (1960). T: Port Jackson, N.S.W., coll. unknown; holotype: BM n.v.; iso: JE n.v., fide H.A.Crum, *Hikobia* 9: 291 (1986).

*Dicranum sieberianum* Hornsch. ex Spreng., *Syst. Veg.* 4(2): 322 (1827); *Leucoloma sieberianum* (Hornsch.) A.Jaeger, *Ber. Thätigk. St. Gallischen Naturwiss. Ges.* 1870–71: 410 (1872) [Ad. 1: 114]; *Dicnemoloma sieberianum* (Spreng.) Broth., *Nat. Pflanzenfam.*, 2nd edn, 10: 212 (1924). T: New Holland [Australia], *F.Sieber 16*; iso: BM n.v., JE n.v., fide H.A.Crum, *loc. cit.*

*Dicranum incanum* Mitt. ex Hook.f., *Handb. New Zealand Fl.* 2: 410 (1867); *Leucoloma incanum* (Hook.f.) Mitt. ex A.Jaeger., *Ber. Thätigk. St. Gallischen Naturwiss. Ges.* 1870–71: 410 (1872) [Ad. 1: 114]; *Dicnemoloma incanum* (Hook.f.) Renauld, *Essai Leucoloma* 44 (1909). T: North Island, New Zealand, *Sinclair*; iso: NY n.v., H n.v., fide H.A.Crum, *loc. cit.*

*Dicranum strictipilum* Müll.Hal., *Hedwigia* 36: 361 (1897); *Leucoloma strictipilum* (Müll.Hal.) Paris, *Index Bryol.*, Suppl. 233 (1900); *Dicnemoloma strictipilum* (Müll.Hal.) Renauld, *Essai Leucoloma* 44 (1909). T: Sydney, N.S.W., *Mrs Kayser*; holotype: not located, fide H.A.Crum, *loc. cit.*

*Leucoloma imbricatum* Broth. & Geh., in V.F.Brotherus, *Öfvers. Förh. Finska Vetensk.-Soc.* 40: 160 (1898); *Dicnemoloma imbricatum* (Broth. & Geh.) Renauld, *Essai Leucoloma* 44 (1909). T: Mt Dromedary, N.S.W., 1880, *F.Reader*; holotype: H-BR n.v., fide H.A.Crum, *loc. cit.*

Illustrations: G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 147, pl. 22 (1976), as *Dicnemoloma pallidum*; H.A.Crum, *op. cit.* 292, figs 1–8; D.Meagher & B.Fuhrer, *A Field Guide to the Mosses and Allied Plants of Southern Australia* 81 (2003).

Stems to c. 6 cm long. Leaves curved towards the stem or falcate-secund when dry, falcate-secund when moist, ovate-lanceolate to narrowly ovate-lanceolate, 2.3–2.8 mm long (below hair-point), often slightly undulate when dry; tips of longer leaves often recurved to reflexed, pointing to all sides, the hair-point often up to 1 mm long. Upper laminal cells isodiametric, quadrate to irregularly shaped because of pitted walls, adaxially with numerous simple papillae, mostly close to the walls; cells along the margin in the basal part of the leaf abaxially with simple papillae (sometimes numerous), more distal on the leaf with solitary compound stellate papillae, and towards the apex with simple curved papillae that point towards the leaf apex.

Perichaetia large and conspicuous, conical; perichaetial leaves  $\pm$ scarious, not papillose; innermost leaves ending in hair-like tip. Calyptra cucullate, reaching halfway down the theca. Sporogones solitary; seta to c. 20 mm long; capsules ellipsoidal, asymmetrical to curved; stomata absent; annulus not differentiated. Peristome teeth reddish, narrowly triangular, asymmetrically bifid in the upper half; outer side cross-striolate; inner side smooth. Spores 25–35  $\mu$ m diam., papillose.

Occurs in south-eastern S.A., eastern Qld, N.S.W., A.C.T., Vic. and Tas.; grows in drier forest types, almost always on rocks, occasionally on dead wood. Also in the Kerguelen Islands (Indian Ocean), Lord Howe Island, New Caledonia and New Zealand.

S.A.: Waterfall Gully, Mt Lofty, *A.C.Beaglehole 15032* (MEL). Qld: Little Millstream Falls, near Ravenshoe, *I.G.Stone 19799* (MEL); Caves Circuit, Binna Burra end, Lamington Natl Park, *N.Klazenga 6027* (MEL). N.S.W.: 19 km from Batemans Bay, *H.Streimann 973* (CANB, MEL). Vic.: Genoa Peak, Croajingolong Natl Park, *N.Klazenga 5206* (MEL). Tas.: Rocky Cape, *J.H.Willis* (MEL 37982).

*Sclerodontium pallidum* would be easily recognised by its creeping growth form and its dull light green leaves with a glossy costa, if it were not so variable. The leaves are dull because of the short, strongly ornamented cells, and the costa is glossy due to the epidermal cells being much longer and smooth, except near the apex.

*Sclerodontium pallidum* is very variable in its leaf size and shape, leading to considerable variability in habit. While many specimens, especially from drier, more southerly habitats have hair-points, most specimens do not. Hair-pointed leaves often have reduced ornamentation of the laminal cells and they can lack the characteristic curved papillae. Instead, the laminal cells closest to the apex either have low simple papillae or they lack these. The hair-point itself is always smooth. On very rare occasions the laminal cells apparently lack papillae on the adaxial side.

An aberrant specimen from northern New South Wales [Mt Warning, *H.Streimann 295* (MEL 1033208)] has the leaf cell pattern of *Leucoloma* with isodiametric and papillose cells descending along the costa, and elongate smooth cells ascending a long way up the margin, giving the appearance of a much wider border. However, it has the ornamentation of *S. pallidum* with typical curved papillae towards the leaf apex, as well as slightly curved capsules on long setae. *Leucoloma molle*, has entirely different features and in Australia is restricted to the wet tropics. Another anomalous specimen from Wilsons Promontory, Victoria [*D.Meagher s.n.* (MEL 240110)] has elongate cells with multiple compound papillae right through to the apex.

Crum (1986) recognised *S. pallidum* subsp. *celebesiae* (Broth.) H.A.Crum, which occurs in southern Malesia. This differs from subsp. *pallidum* in its uniformly smaller and narrow-leaved plants.