

SCHISTIDIUM

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Schistidium Bruch & Schimp., *Bryol. Europ.* 3: 93 (1845), *nom. cons.*; diminutive of the Greek *schistos* (divided), perhaps in reference to the calyptra being divided at the base.

Type: *S. maritimum* (Turner) Bruch & Schimp., *typ. cons.*

Autoicous, acrocarpous. Plants small to medium-sized, growing in cushions or turfs. Stems frequently subapically branched, densely foliose; central strand present or absent. Leaves \pm appressed when dry, erecto-patent when wet, ovate-lanceolate to broadly ovate-lanceolate, with or without a hyaline point; margin mostly recurved on one or both sides; costa strong, subpercurrent to excurrent. Laminal cells with straight to sinuose walls.

Perichaetial leaves similar in shape to vegetative leaves, but variously enlarged. Calyptra mitrate to cucullate, not quite covering the operculum. Sporogones solitary. Capsules sessile, ellipsoidal to broadly cylindrical or obovoid, systylos; stomata present at the base, phaneropore; annulus differentiated, revoluble. Peristome teeth triangular, entire to variously perforate, papillose; operculum rostrate from a hemispherical base. Spores spherical to ellipsoidal, smooth or papillose.

A bipolar to almost cosmopolitan genus of c. 60 species, *Schistidium* is most diverse at higher latitudes and latitudes. Its principal distinguishing character, sessile and systylos capsules, means that after dehiscence the operculum remains attached to the top of the columella. No vegetative characters can consistently and reliably distinguish species of *Schistidium* from those of *Grimmia*. Two species are known from south-eastern Australia.

Following Blom's (1996) research on the *S. apocarpum* complex in Scandinavia, in which c. 30 species were recognised, the taxonomy of *Schistidium* has been in a state of flux. Although limited in their geographical scope, Blom's results have been widely applied in the Northern Hemisphere. Moreover, the genus has also been shown to be more diverse in the Southern Hemisphere than previously assumed (Ochyra, 1998). While this has not been the case in Australia and New Zealand, the taxonomic results of Fife's (2000) treatment of the genus for New Zealand are adopted here.

References

- Blom, H.H. (1996), A revision of the *Schistidium apocarpum* complex in Norway and Sweden, *Bryophytorum Biblioth.* 49: 1–33.
- Bremer, B. (1980), A taxonomic revision of *Schistidium* (Grimmiaceae, Bryophyta) 1, *Lindbergia* 6: 1–16.
- Fife, A.J. (2000), A synopsis of the New Zealand species of *Schistidium* (Grimmiaceae; Musci), with observations on a little known species of *Racomitrium*, *New Zealand J. Bot.* 38: 191–204.
- Ochyra, R. (1998), New names and combinations in *Schistidium* (Musci, Grimmiaceae), *Fragm. Florist. Geobot.* 43: 103–108.
- Ochyra, R. (2003), *Schistidium lewis-smithii* (Bryopsida, Grimmiaceae) – a new species from the maritime Antarctic, with a note on the Australian *S. flexifolium*, *Nova Hedwigia* 77: 336–372

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Leaf apices with a weak to strong hyaline point, rarely all leaves lacking hyaline points; upper part of leaves unistratose with bistratose margins; capsules oblong-ellipsoidal, c. twice as long as wide; plants growing in dry habitats **1. *S. apocarpum***
 Leaf apices lacking a hyaline point; upper part of leaves largely bistratose; capsules broadly cylindrical to obovoid, c. 1.5 times as long as wide; plants subject to periodic immersion **2. *S. flexifolium***

1. *Schistidium apocarpum* (Hedw.) Besch., *Bryol. Europ.* 3: 99 (1845)

Grimmia apocarpa Hedw., *Sp. Musc. Frond.* 76 (1801). T: Europe; *n.v.*

Grimmia mutica Hampe, *Linnaea* 30: 631 (1860); *G. apocarpa* var. *mutica* Paris, *Index Bryol.* 518 (1894), *nom. illeg.*; *Schistidium australiense* Ochyra, *Fragm. Florist. Geobot.* 34: 105 (1998). T: “rocks of the Mitchells River, Mt Wellington et Sealers Cove”, Vic., *F.Mueller*; BM *n.v.*

Grimmia truncatoapocarpa Müll.Hal., *Hedwigia* 37: 163 (1898); *Schistidium truncatoapocarpum* (Müll.Hal.) Ochyra, *Fragm. Florist. Geobot.* 43: 107 (1998). T: Paramatta [Parramatta], N.S.W., *T.Whitelegge*; holo: B(?), destroyed.

Grimmia antipodum Müll.Hal., *Hedwigia* 37: 165 (1898); *Schistidium antipodum* (Müll.Hal.) Ochyra, *Fragm. Florist. Geobot.* 43: 105 (1998). T: Frocy’s Gully, Tas., Nov. 1890, *W.A.Weymouth* [in Hb. Burchard], *n.v.*

Grimmia readeri Broth., in H.G.A.Engler & K.A.E.Prantl, *Nat. Pflanzenfam.* I, 3: 448 (1902); *G. atricha* Müll.Hal., *Hedwigia* 37: 162 (1898), *non* Müll.Hal. & Kindb. (1892); *Schistidium atrichum* Ochyra, *Fragm. Florist. Geobot.* 43: 105 (1998), *non* W.A.Weber (1976); *Schistidium readeri* (Broth.) Ochyra & J.Muñoz, *J. Bryol.* 22: 142 (2000). T: near Melbourne, Vic., Aug. 1886, *F.M.Reader*; iso: MEL?

Grimmia atrichoides Paris, *Index Bryol.* 2(2): 266 (1904), *nom. illeg.* (superfluous). T: *n.v.*

Illustration: A.J.Fife, *New Zealand J. Bot.* 38: 193, fig. 1 (2000).

Plants 0.5–5.0 cm tall, dark green or reddish brown, yellowish brown or dark brown, forming loose mats on dry rocks. Stems with lower leaves usually intact. Leaves erect-appressed to somewhat curved when dry, erecto-patent when wet, ovate-lanceolate, 1.8–3.2 mm long, 0.5–0.8 mm wide, V-shaped, keeled, smooth, ending in a weak to long denticulate hyaline point, this rarely lacking in all leaves; margin recurved in the proximal two-thirds, plane above, double-layered in the upper half, entire throughout or with some small teeth at the apex; costa subpercurrent to excurrent. Upper lamina unistratose; laminal cells isodiametric to oblong, 9–20 × 8–12 µm, with sinuose walls, distally shorter, rounded and not or weakly sinuose, smooth or weakly papillose abaxially.

Capsules oblong-ellipsoidal. Peristome teeth pointing outward when dry, usually not perforate. Spores spherical, 10–15 µm diam., smooth.

Known from south-eastern Qld, N.S.W., Vic. and Tas.; usually on dry rocks at altitudes up to 1700 m. Also in New Zealand and Macquarie Island.

Qld: Bunya Mtns, *I.G.Stone 17461* (MEL). N.S.W.: Jenolan Caves, *N.Klazenga 5950* (MEL). Vic.: Basalt Pinnacles, Byaduk State Park, *I.G.Stone 9473* (MEL). Tas.: Marakoopa Cave road, *I.G.Stone 25243* (MEL).

The most reliable means of distinguishing *S. apocarpum* from *S. flexifolium* is its hyaline leaf tips, and while many Australian specimens lack these on most of their leaves, entirely muticous plants are rare, and a short hyaline tip can always be observed under the compound microscope.

The oldest available name for the Australasian material appears to be *S. australiense* (basonym: *Grimmia mutica*). However, I have not yet seen the type of *G. mutica*, and I am unable to confirm its true identity. Consequently, *S. apocarpum* is retained for the moment in the Australian bryoflora, while admitting that Australian “*S. apocarpum*” is not conspecific with *S. apocarpum* in the Northern Hemisphere, which includes the type. The type of *S. truncatoapocarpum*, the second-oldest available name is conspecific with *S. australiense*.

2. *Schistidium flexifolium* (Hampe) Ochyra, *Fragm. Florist. Geobot.* 43: 105 (1998)

Grimmia flexifolia Hampe, *Linnaea* 30: 632 (1860). T: Snowy River, Vic., *F.Mueller*; holo: BM *n.v.*; iso: MEL.

Illustration: A.J.Fife, *New Zealand J. Bot.* 38: 196, fig. 2 (2000), as *S. rivulare* var. *rivulare*.

Plants 1.5–3.0 (–5.0) cm tall, olive-green to almost black, forming loose mats on wet rocks. Stems with the lower leaves usually eroded. Leaves erect-appressed to somewhat curved when dry, erecto-patent when wet, ovate-lanceolate, (2.0–) 2.6–3.3 mm long, (0.6–) 0.7–1.0 mm wide, U-shaped below, V-shaped above, keeled, smooth, mucicous; margin broadly revolute in the basal 40–60%, plane above, double-layered in the upper half, entire; costa subpercurrent to percurrent. Upper lamina largely bistratose; laminal cells isodiametric to short-oblong, 7–20 (–35) × 5–11 µm, with sinuose walls, more distal cells shorter, rounded, not or weakly sinuose, smooth to bulging abaxially.

Capsules broadly cylindrical to ellipsoidal or ±hemispherical. Peristome teeth pointing outward when dry, ±perforate above. Spores spherical to ellipsoidal, (12–) 15–20 (–25) µm diam./long, smooth.

Occurs in south-eastern S.A., south-eastern Qld, N.S.W., Vic. and Tas.; grows on rocks subject to frequent flooding, in creek beds, under waterfalls and in subalpine and alpine areas. Also in New Zealand.

S.A.: Torrens Gorge, Southern Lofty Ra., *D.G.Catcheside 52.198* (MEL). Qld: Lamington Natl Park, *I.G.Stone 11995* (MEL). N.S.W.: Rutherford Ck, 12 km WNW of Bemb O'Briens Crossing, aka, *K.R.Thiele 989* (MEL). Vic.: Genoa R., 3.5 km W of Genoa, *N.Klazenga 5233* (MEL); Lerderderg State Park, *V.Stajsic 3509* (MEL). Tas.: Meander R., 23 km SSW of Deloraine, *T.J.Entwistle 2574a* (MEL).

Schistidium flexifolium is readily recognised by its aquatic, saxicolous habitat.

Excluded Name

Schistidium rivulare (Brid.) Podp., *Beih. Bot. Centralbl.* 28: 207 (1911)

Grimmia rivularis Brid., *J. Bot. (Schrader)* 1800(1): 276 (1801). T: Europe; *n.v.*

Status Uncertain

Schistidium stirlingii (Müll.Hal.) Ochyra, *Fragm. Florist. Geobot.* 43: 107 (1998)

Grimmia stirlingii Müll.Hal., *Hedwigia* 37: 163 (1898). T: Omeo, Vic., alt. 2500–3000 pedum, ad rupes, 1883, *J.Stirling*; not located.