

DIPHYSCIACEAE

Josephine Milne¹ & Niels Klazenga²

Diphysciaceae M.Fleisch., in H.G.A.Engler, *Syllabus*, 8th edn 88 (1920).

Type: *Diphyscium* D.Mohr

Small dioicous plants. Stems short and erect, unbranched, with well-developed leaves.

Perichaetial leaves strongly differentiated, with a long-excurrent costa and an often fimbriate margin. Calyptra minute, cucullate. Seta very short. Capsules immersed, disproportionately large, ventricose-bulging. Peristome occasionally absent, usually consisting of 16 very short exostome teeth and a conspicuous 16-pleated conical endostome. Spores globose, finely papillose.

According to Buck & Goffinet (2000), this family consisted of *Diphyscium*, *Theriotia* Cardot and *Muscofloschuetzia* Crosby. However, more recent phylogenetic studies recognised only *Diphyscium*, with *Theriotia* and *Muscofloschuetzia* being reduced to synonymy (Magombo, 2002). The latter arrangement has been accepted by Goffinet *et al.* (2012).

The Diphysciaceae occurs throughout much of the Northern Hemisphere, as well as Malesia, Chile and tropical Australia. Species usually grow on soil, decaying wood and on rocks in or along streams in rainforest; they are rarely epiphytic. One species is known from north-eastern Australia (Milne, 2006).

References

- Buck, W.R. & Goffinet, B. (2000), Morphology and classification of mosses, in A.J.Shaw & B.Goffinet (eds), *Bryophyte Biology* 71–123.
- Eddy, A. (1990), *A Handbook of Malesian Mosses* 2: 239–243.
- Goffinet, B., Buck, W.R. & Shaw, A.J. (2012), *Classification of the Bryophyta* [<http://www.eeb.uconn.edu/people/goffinet/Classificationmosses.html>].
- Hyvönen, J. (1989), The bryophytes of Sabah (North Borneo) with special reference to the BRYOTROP transect of Mount Kinabalu. VI. Polytrichaceae and Buxbaumiaceae (Bryopsida), *Willdenowia* 18: 569–589.
- Magombo, Z.L.K. (2002), New combinations and synonyms in the moss family Diphysciaceae, *Novon* 12: 501–503.
- Magombo, Z.L.K. (2003), Taxonomic revision of the moss family Diphysciaceae M.Fleisch. (Musci), *J. Hattori Bot. Gard.* 94: 1–86.
- Milne, J. (2006), The genus *Diphyscium* in Australia, *J. Bryol.* 28: 194–197.
- Stone, I.G. (1982), Some new and noteworthy records of mosses mostly from Queensland, Australia, *Austrobaileya* 1: 511–520.

¹ Royal Botanic Gardens Melbourne, Birdwood Avenue, South Yarra, Vic. 3141.

² Royal Botanic Gardens Melbourne, Birdwood Avenue, South Yarra, Vic. 3141.

DIPHYSCIUM

Diphyscium D.Mohr, *Observ. Bot.* 34 (1803); *Ind. Musc. Crypt.* 3 (1803); from the Greek *di* (two) and *physis* (a bladder), in reference to the space between the capsule wall and the spore sac resulting in a double bladder.

Type: *D. foliosum* (Hedw.) D.Mohr.

Leaves contorted when dry, linear-lingulate to spatulate or panduriform, obtuse to acute; margin entire, crenulate or serrate; costa broad, percurrent or excurrent. Lamina bistratose; cells rounded to quadrate, with thickened walls; basal cells rectangular.

Perichaetial leaves strongly differentiated, with a long-excurrent costa; margin often fimbriate. Capsules sessile, emergent, asymmetrically ovoid, narrowed towards the mouth; annulus differentiated; operculum short-rostrate. Peristome consisting of 16 very short exostome teeth and a large conspicuous conical endostome with thickened dorsal ridges.

Diphyscium includes 15 species and one additional subspecies (Magombo, 2002), most occurring in the Northern Hemisphere; one species in north-eastern Qld.

When sterile, *Diphyscium* can be confused with some members of the Pottiaceae, but it is easily recognised by the bistratose leaves. Fertile plants are unmistakable due to the strongly differentiated perichaetial leaves with long-excurrent costae, and the large, immersed, asymmetrical capsule.

***Diphyscium mucronifolium* Mitt. ex Dozy & Molk., *Bryol. Javan.* 1: 35, pl. 26 (1855)**

T: near Tanjong Kubong, "ad rupes arenosas humidias in rivulo Sungei", Dinding, Labuan, Sarawak, [Malaysia], *Motley*; holo: L n.v.

Illustrations: A.Eddy, *op. cit.* 242, fig. 323; J.Milne, *op. cit.* 195, fig. 1.

Plants to c. 10 mm tall, forming short turfs, dark olive-green, brown to black when dry. Leaves increasing in size from the base, slightly contorted when dry, erecto-patent when moist, linear-lingulate to spatulate or panduriform, 4.0–5.5 mm long, 0.62–0.85 mm wide; apex acute, obtuse or mucronate; margin entire, thickened, often undulate; costa orange-brown, often hyaline at the base, conspicuous abaxially when dry, percurrent to excurrent. Laminal cells thick-walled, oval to almost quadrate, 6–12 µm long; basal cells rectangular.

Outer perichaetial leaves acuminate; inner leaves notched; margin often fimbriate on the shoulders, often crenulate at the base. Endostome translucent, papillose, constricted and twisted near the top. Spores 10–14 µm diam.

Occurs in rainforest in north-eastern Qld; grows on rocks, especially granite. Also in India, Sri Lanka, Malesia, SE and East Asia, New Caledonia and in eastern and south-eastern U.S.A.

Qld: Mossman River Gorge, near Mossman, *B.O. van Zanten 681427* (CANB); Goldsborough Track, Mt Bellenden Ker, *I.G.Stone 24599* (MEL); Mt Haig, Danbulla S.F., *I.G.Stone 22300, 22220* (MEL); Myall Ck, Cape Tribulation, *M.Godwin & I.G.Stone 22988* (MEL); Mt Bellenden Ker, *W.A.Sayer 5200* (NY).

Diphyscium mucronifolium can be distinguished from the Malesian species *D. longifolium* Griff. by having leaf margins that are entire rather than coarsely serrate. While numerous plants were found with perichaetia, only one Australian collection possessed perigonia.