

PYLAISIADELPHACEAE

Helen P. Ramsay¹

Pylaisiadelphaceae Goffinet & Buck, *Monogr. Syst. Bot.* 98: 238 (2004).

Type: *Pylaisiadelpha* Cardot

Autoicous or, rarely, dioicous. Plants slender to robust, glossy, forming compact yellowish or green mats. Stems creeping, pale to orange-red, elongate, pinnately branched, in T.S. with an outer sclerodermis and thin-walled inner cortical cells; central strand usually absent; branches suberect to complanate, densely foliate. Rhizoids smooth, papillose, red. Pseudoparaphyllia filamentous or absent. Leaves appressed to erect-spreading or complanate, ovate to lanceolate, falcate or falcate-secund in some species; apex acute or long-acuminate. Laminal cells rhomboidal to elongate, linear, smooth, prurulose or papillose; alar cells thin to thick-walled, with a few non-inflated rectangular to quadrate cells (e.g. *Taxithelium*), or basal alars well defined and inflated (e.g. *Wijkia*). Flagelliform branches occasionally produced (*Isocladiella* and *Wijkia*); filiform gemmae produced in some species.

Perigonia on branches. Perichaetia on stems or at the base of branches; inner perichaetial leaves often long-acuminate. Calyptra cucullate, smooth. Seta long-exserted, pigmented. Capsules suberect to nodding; exothecial cells non-collenchymatous. Peristome double, diplolepidous-alternate; exostome of 8 or 16 lanceolate papillose teeth; endostome segments 8 or 16, papillose, ±the same length as the exostome teeth; cilia 0–2. Spores small, thin-walled, less than 20 µm diam. (mostly 12–15 µm).

The segregation of the Pylaisiadelphaceae from the Sematophyllaceae, as defined by Goffinet & Buck (2004) and Goffinet *et al.* (2008, 2012), and based on molecular and morphological studies, has been widely adopted. Previously, Ramsay *et al.* (2002a, b, 2004) included all Australian genera in the Sematophyllaceae. Now, however, the Pylaisiadelphaceae is circumscribed to include 15 genera, six of which are known from Australia, viz. *Clastobryum*, *Isocladiella*, *Isopterygium*, *Taxithelium*, *Trismegistia* and *Wijkia*.

Although they are similar in many ways, the Pylaisiadelphaceae can be distinguished from the Sematophyllaceae by their longer setae, non-collenchymatous exothecial cells, small alar cells that are usually not inflated, and predominantly filamentous pseudoparaphyllia. Iwatsuki & Ramsay (2009) did not accept the inclusion of *Isopterygium* in Pylaisiadelphaceae and returned it to the family Hypnaceae. However, following consultation with W.R. Buck (pers. comm.), *Isopterygium* is now included in the Pylaisiadelphaceae based on morphological and molecular evidence. Since molecular data show stronger correspondence with gametophytic rather than sporophytic characters, there is now a greater need for understanding attributes such as the origins and types of pseudoparaphyllia, ornamentation (e.g. papillae and mammillae), as well as leaf morphology, characters not examined previously in great detail for pleurocarpous mosses (Câmara & Kellogg, 2010).

References

- Akiyama, A. (2010), Taxonomic revision of the genus *Trismegistia* (Pylaisiadelphaceae, Musci), *Humans & Nature* 21: 1–77.
- Anderson, L.E. & Crum, H.A. (1981), *Mosses of Eastern North America* 2: 1105–1126.
- Bartram, E.B. (1939), The mosses of the Philippines, *Philipp. J. Sci.* 68: 1–437.

¹ c/- National Herbarium of New South Wales, Mrs Macquaries Road, Sydney, New South Wales 2000.

- Bartram, E.B. (1952), North Queensland mosses collected by L.J. Brass, *Farlowia* 4: 235–247.
- Beever, J., Allison, K.W. & Child, J. (1992), *The Mosses of New Zealand*, 2nd edn 146–148.
- Brotherus, V.F. & Watts, W.W. (1918), The mosses of North Queensland, *Proc. Linn. Soc. New South Wales* 43: 544–567.
- Câmara, P.E.A.S. (2011a), A re-circumscription of the moss genus *Taxithelium* (Pylaisiadelphaceae) with a taxonomic revision of subgenus *Vernieri*, *Syst. Bot.* 36: 7–21.
- Câmara, P.E.A.S. (2011b), A review of *Taxithelium* subgenus *Taxithelium* (Bryophyta, Pylaisiadelphaceae), *Syst. Bot.* 36: 824–835.
- Câmara, P.E.A.S. & Kellogg, E.A. (2010), Morphology and development of leaf papillae in Sematophyllaceae, *Bryologist* 113: 22–33.
- Gangulee, H.C. (1980), *Mosses of Eastern India and Adjacent Regions* 3: 1824–1932.
- Goffinet, B. & Buck, W.R. (2004), Systematics of the Bryophyta (mosses): from molecules to a revised classification, *Monogr. Syst. Bot.* 98: 205–239.
- Goffinet, B., Buck, W.R. & Shaw, A.J. (2008), Morphology and classification of the Bryophyta, in B.Goffinet & A.J.Shaw (eds.) *Bryophyte Biology*, 2nd edn, 55–138. Cambridge University Press, Cambridge.
- Goffinet, B., Buck, W.R. & Shaw, A.J. (2012), *Classification of the Bryophyta*. [<http://www.eeb.uconn.edu/people/goffinet/Classificationmosses.html>]
- Iwatsuki, Z. & Ramsay, H.P. (2009), The genera *Isopterygium* Mitt. (Bryopsida, Hypnaceae) and *Isopterygiopsis* (Hedw.) Z.Iwats. (Bryopsida, Plagiotheciaceae) in Australia, *Telopea* 12: 371–384 (2009).
- Ramsay, H.P. & Cairns, A. (2006), Habitat, distribution and the phytogeographical affinities of the mosses in the Wet Tropics Bioregion, north-east Queensland, Australia, *Cunninghamia* 8: 371–408.
- Ramsay, H.P., Schofield, W.B. & Tan, B.C. (2002a), The genus *Taxithelium* (Bryopsida, Sematophyllaceae) in Australia, *Austral. Syst. Bot.* 15: 583–596.
- Ramsay, H.P., Schofield, W.B. & Tan, B.C. (2002b), 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.
- Ramsay, H.P., Schofield, W.B. & Tan, B.C. (2004), The family Sematophyllaceae (Bryopsida) in Australia. Part 2. *Acroporium*, *Clastobryum*, *Macrohymenium*, *Meiotheciella*, *Meiothecium*, *Papillidiopsis*, *Radulina*, *Rhaphidorrhynchium*, *Trichosteleum*, *Warburgiella*, *J. Hattori Bot. Lab.* 95: 1–69.
- Rosario, R.M. del (1979), *Moss Flora of the National Botanic Garden, Philippines* 1–133.
- Tan, B.C. & Chang, Y. (2004), Molecular contribution to the systematic position of *Mastopoma scabrifolium* (Broth. in Muell.) B.C.Tan & Tran Ninh. (Sematophyllaceae, Bryopsida), *Cryptog. Bryol.* 25: 301–308.
- Tan, B.C., Ramsay, H.P. & Schofield, W.B. (1996), A contribution to Australian Sematophyllaceae (Bryopsida), *Austral. Syst. Bot.* 9: 319–327.
- Tsubota, H., Akiyama, H., Yamaguchi, T. & Deguchi, H. (2001a), Molecular phylogeny of the Sematophyllaceae (Hypnales, Musci) based on chloroplast *rbd* sequences, *J. Hattori Bot. Lab.* 90: 221–240.
- Tsubota, H., Akiyama, H., Yamaguchi, T. & Deguchi, H. (2001b), Molecular phylogeny of the genus *Trismegistia* and related genera (Sematophyllaceae, Musci) based on chloroplast *rbd* sequences, *Hikobia* 13: 529–549.
- Wu, P.-C. & Jia, Y. (eds) (2004), *Flora Bryophytorum Sinicum* (in Chinese) Science Press, Beijing.

Wu, P.-C., Crosby, M. & He, S. (eds) (2005), *Moss Flora of China* (English version) 8: 3–79 [Sematophyllaceae]; 80–260 [Hypnaceae].

Key to Genera

- 1 Caducous flagelliform branchlets in leaf axils on branches **ISOCLADIELLA**
- 1: Caducous flagelliform branchlets lacking or present only at the apices of branches2
 - 2 Secondary and tertiary branches often profusely developed and attenuate; laminal cells pluripapillose over lumina and lateral walls..... **WIJKIA**
 - 2: Secondary and tertiary branches sparingly developed, short or long but not attenuate; laminal cells smooth, unipapillose or uniseriately papillose over lumina only3
- 3 Leaves tristichous or spirally ranked; filamentous gemmae abundant on some branches; alar cells pigmented, thick-walled, in 1 row; laminal cells smooth or weakly unipapillose..... **CLASTOBRYUM**
- 3: Leaves in various arrangements but not distinctly ranked; filamentous gemmae absent or rare; alar cells weakly or clearly defined; laminal cells smooth or uniseriately papillose over the lumina.....4
 - 4 Laminal cells uniseriately papillose over the lumina; leaves usually strongly complanate.....
..... **TAXITHELIUM**
 - 4: Laminal cells smooth; leaves not strongly complanate5
- 5 Leaf margins irregularly and strongly toothed **TRISMEGISTIA**
- 5: Leaf margins entire **ISOPTERYGIUM**