

# THUIDIACEAE

Andries Touw<sup>1</sup>

**Thuidiaceae** Schimp., *Syn. Musc.* 493 (1860), as Thuidiaeae.

Type: *Thuidium* Schimp.

Dioicous or monoicous. Plants forming wefts of regularly once-pinnate to tripinnate fronds. Central strand in stem usually present, consisting of a few small cells, often poorly defined. Distinction between paraphyllia, pseudoparaphyllia and appendages of the leaves often unsatisfactory. Stem paraphyllia mostly dense, polymorphous, uniseriate or pluriseriate, simple or branched; cells mostly papillose or prorate, oblate to oblong, occasionally linear; apical cell truncate, rounded or acute. Branch paraphyllia shorter or lacking. Foliose pseudoparaphyllia ovate to lanceolate, triangular, or deltoid, often appendiculate. Stem leaves mostly strongly differing in size and shape from branch leaves, mostly triangular or broadly triangular, mostly longitudinally plicate, often ending in a pluricellular uniseriate hair. Costa single, strong, reaching far into the acumen, but rarely reaching the leaf tip, adaxially smooth and mostly situated in a groove, abaxially prominent, appendiculate near insertion, often ending in a spine or a projecting pluripapillose cell; distal epidermal cells mostly longer than the adjacent laminal cells; branch leaf costa shorter, more often projecting abaxially. Margin nearly always recurved below, mostly weakly ornamented, often bearing appendages similar to paraphyllia near the insertion of the leaf. Areolation uniform, but mostly a little longer at the leaf base and in the acumen than in midleaf; cells mostly mammillose and papillose on both faces, less often prorate or adaxially smooth. Alar groups usually not differentiated. Median leaf cells isodiametric to oblong, to 12 µm wide, in stem leaves mostly isodiametric to twice as long as wide; in branch leaves shorter, mostly isodiametric or nearly so. Apical cell truncate, rounded or acute.

Inner perichaetial leaves mostly plicate and gradually long-acuminate; shoulders often strongly ornamented. Seta usually smooth, mammillose or spinose. Capsules exerted, ellipsoidal to cylindrical, mostly weakly curved. Walls of exothecial cells thin to strongly incrassate, mostly weakly or not at all collenchymatous. Stomata superficial, situated in the collum region. Peristome hypnoid, complete or specialised and ±reduced, particularly in epiphytes. Spores smooth or minutely papillose, c. 8–18 µm, often larger in epiphytic species. Operculum conical, mostly rostrate. Calyptra either cucullate, smooth and mostly naked (occasionally pilose), or campanulate and scabrous or bearing long bristles.

[Unique properties of small genera mostly confined to the temperate parts of the Northern Hemisphere have been omitted from this description.]

The Thuidiaceae is a small, cosmopolitan family with its centre of diversity in Asia; *Thuidiopsis* is the only genus with a Gondwanan distribution. *Thuidium* and *Pelekium*, each with more than 20 species, are by far the largest genera. Opinions vary regarding familial limits, but all Australian species belong to the very core, consisting of taxa formerly accommodated in *Thuidium sensu amplo*. While species have a reputation of being difficult to separate, this is largely due to the long-time confusion between *Thuidiopsis furfurosa* and *T. sparsum*, and with *Thuidium cymbifolium* as well. The presence in Australia of *Thuidium plumulosum*, *T. subglaucinum*, *Pelekium investe*, *P. synoicum* and *P. velatum* was not confirmed until quite recently. Therefore, older literature records should be viewed with caution as they are often incorrect.

---

<sup>1</sup> Naturalis Biodiversity Center, section Nationaal Herbarium Nederland, P.O. Box 9517, 2300 RA Leiden, The Netherlands.

The number of ultimate branchlets mentioned in descriptions relates to their number at one side of a penultimate branch. Cells of the leaf margin can bear several papillae in species having unipapillate median leaf cells; small or depauperate plants can show a reduction in the number and size of paraphyllia and pseudoparaphyllia, and in the length of the acumen of the stem leaves.

### References

Touw, A. (1993), Notes on tropical Asia Thuidiaceae, with two new Malesian species of *Thuidium* s.l., *J. Hattori Bot. Lab.* 74: 193–204.

Touw, A. (2001a), A review of the Thuidiaceae (Musci) and a realignment of taxa traditionally accommodated in *Thuidium* sensu amplo (*Thuidium* Schimp., *Thuidiopsis* (Broth.) M.Fleisch., and *Pelekium* Mitt.), including *Aequatoriella* gen. nov. and *Indothuidium* gen. nov., *J. Hattori Bot. Lab.* 90: 167–209.

Touw, A. (2001b), A taxonomic revision of the Thuidiaceae (Musci) of tropical Asia, the western Pacific, and Hawaii, *J. Hattori Bot. Lab.* 91: 1–136.

Touw, A. & Falter-Van den Haak, L. (1989), A revision of the Australasian Thuidiaceae (Musci), with notes on species from adjacent regions, *J. Hattori Bot. Lab.* 67: 1–57.

### Key to Genera

- 1 Monoicous; sporogones and gametocidia usually present; stems rarely exceeding 5 cm in length; paraphyllia simple, occasionally with 1 or 2 short branches, mostly to 5 cells long; axillary hairs with a single distal cell ..... **PELEKIUM**
- 1: Dioicous; sporogones usually absent; stems in most species exceeding 8 cm in length; paraphyllia simple or branched, when all simple mostly more than 5 cells long ..... 2
  - 2 Paraphyllia strongly branched; branches mostly far longer than the unbranched basal part; axillary hairs with up to 5 distal cells; leaf cells abaxially papillose, adaxially smooth or ornamented near the leaf margin and on folds only; seta and calyptra smooth and naked (except in *T. plumulosum*); stem leaves often piliferous..... **THUIDIUM**
  - 2: Paraphyllia mostly unbranched, occasionally with 1 or 2 short lateral branches; axillary hairs with 1 or 2 distal cells; cells papillose on both leaf faces..... 3
  - 3 Stem leaves broadly rounded cordate-triangular, narrowly acuminate; margins broadly recurved; axillary hairs with 1 or 2 distal cells; setae smooth; calyptrae cucullate, smooth, often sparingly ciliate by paraphysal hairs ..... **THUIDIOPSIS**
  - 3: Stem leaves mostly triangular to ovate; margins  $\pm$ plane; axillary hairs with a single distal cell; setae spinose; calyptrae campanulate, scabrous, bearing a few scattered hairs..... **AEQUATORIELLA**