

# CALYMPERACEAE

William D. Reese† & Ilma G. Stone†

**Calymperaceae** Kindb., *Gen. Eur. N. Amer. Bryin.* 11 (1897)

Type: *Calymperes* Sw.

Dioicous, rarely monoicous. Small to medium-sized or robust mosses in thin to dense tufts or mats, occasionally gregarious or solitary; mostly corticolous. Stems erect, simple or forked, or prostrate and with erect-ascending branches. Rhizoids brown to red-purple, lacking tubers. Axillary hairs few to numerous per axil, 2–14 cells long, the lower 1 or 2 cells short and faintly tinged with brown, or only the lower cross walls coloured, or the cells hyaline; upper cells elongate, hyaline. Leaves generally variously contorted when dry, spreading-ascending when moist, elongate, typically consisting of a well-defined expanded-clasping hyaline lower lamina (sheath), and an elongate green upper lamina (limb); exterior cells of lower lamina often elongate, interior cells (comprising the cancellinae) numerous, large, hyaline, devoid of protoplasts at maturity and variously porose; costa percurrent to excurrent, in T.S. showing a median row(s) of guide cells with abaxial and adaxial fields of stereid cells; margins of limb mostly thickened, toothed or entire, unbordered or bordered entirely or in part with elongate hyaline cells in 1 or more layers; cells of limb mostly isodiametric, smooth or papillose; intramarginal files of differentiated cells (teniolae) present or lacking in leaves. Gemmae commonly present, seriate-multicellular, adaxial (rarely abaxial) on tips (or more proximal) of mostly unmodified leaves, but highly modified gemmiferous leaves characteristic in some species, especially of *Calymperes*.

Perigonia lateral, gemmiform, consisting of a few highly reduced leaves enclosing the antheridia. Perichaetia terminal but often overtopped by renewed growth of the stem and then appearing lateral; perichaetial leaves scarcely differentiated. Calyptra naked, cucullate and deciduous (*Mitthyridium*, *Syrrhopodon*), or accrescent, twisted around seta at base and encasing the capsule, the spores then escaping through vertical fissures in the upper part of the calyptra (*Calymperes*). Seta usually solitary, smooth, straight, mostly elongate. Capsules mostly cylindrical and exserted, usually with a few stomata at the base; operculum rostrate. Peristome present or absent, only poorly or irregularly developed in some species; when present single, consisting of 16 slender often imperfect articulated teeth, the teeth papillose or granular on the outer and sometimes inner surfaces. Spores green, spherical, mostly 12–20 µm, granular.

A pantropical family of 3–5 genera and about 150 species worldwide in the traditional sense used here, but sometimes expanded to include other genera. Forty-two taxa occur in Australia, mostly in the Northern Territory and northern Queensland, but two are known from northern Western Australia and one species (also known from North Island, New Zealand) as far south as approximately 36°S in south-eastern New South Wales.

The Calymperaceae are treated here in the traditional sense as comprising three genera: *Calymperes*, *Mitthyridium* and *Syrrhopodon*. One or more of the assorted genera with 'leucobryoid' leaves, including *Arthrocnemum*, *Exodictyon*, *Exostratum*, *Leucophanes* and *Octoblepharum*, have been recommended by various authors, e.g. Andrews (1947) and Crosby & Magill (1981) for inclusion in the Calymperaceae. We prefer to recognise the family in its traditional homogeneous concept as treated by Reese *et al.* (1986), Menzel & Schultze-Motel (1990) and others, i.e. excluding those genera named above. See Eddy (1990) and Reese *et al.* (1986) for further discussion of the concept of the Calymperaceae.

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[http://www.anbg.gov.au/abrs/Mosses\\_Online/Calymperaceae\\_family.pdf](http://www.anbg.gov.au/abrs/Mosses_Online/Calymperaceae_family.pdf) (2012)

## References

- Andrews, A.L. (1947), Taxonomic notes VI. The Leucobryaceae, *Bryologist* 50: 319–326.
- Crosby, M.R. & Magill, R.E. (1981), *A Dictionary of Mosses*, 3rd printing. Missouri Botanical Garden, St. Louis.
- Eddy, A. (1990), *A Handbook of Malesian Mosses. Volume 2. Leucobryaceae to Buxbaumiaceae*. London.
- Menzel, M. & Schultze-Motel, W. (1990), The bryophytes of Sabah (North Borneo) with special reference to the BRYOTROP transect of Mount Kinabalu. XI. Calymperaceae (Bryopsida), *Willdenowia* 19: 475–542.
- Reese, W.D. & Lin, P.-J. (1991), A monograph of the Calymperaceae of China, *J. Hattori Bot. Lab.* 69: 323–372.
- Reese, W.D. & Stone, I.G. (1987), New records of Australian Calymperaceae and keys to Australian species of *Calymperes*, *Mitthyridium*, and *Syrrhopodon*, *J. Bryol.* 14: 487–493.
- Reese, W.D. & Stone, I.G. (1995), The Calymperaceae of Australia, *J. Hattori Bot. Lab.* 78: 1–40.
- Reese, W.D., Koponen, T. & Norris, D.H. (1986), Bryophyte flora of the Huon Peninsula, Papua New Guinea. XIX. *Calymperes*, *Syrrhopodon* and *Mitthyridium* (Calymperaceae, Musci), *Acta Bot. Fennica* 133: 151–202.
- Reese, W.D., Streimann, H. & Russell-Smith, J. (1991), New records of Australian Calymperaceae (Musci), *Bryologist* 94: 88–89.

## Key to Genera

- 1 Plants bearing sporogones .....2
- 1: Plants lacking sporogones.....4
- 2 Calyptra persistent, twisted around the seta below the capsule and with vertical slit-like apertures above; peristome lacking..... **CALYMPERES**
- 2: Calyptra cucullate, deciduous; peristome present or absent .....3
- 3 Stems usually repent, often rhizome-like, with ascending-erect branches; leaves bordered (often broadly so) by elongate hyaline cells, the border unistratose ..... **MITTHYRIDIDIUM**
- 3: Stems erect, neither creeping nor rhizome-like, simple or forked; border of elongate hyaline cells present or absent, if present then narrow and bi- to multistratose .....**SYRRHOPODON**
- 4 Leaves bordered entirely or in part by elongate hyaline cells (border weak, incomplete or  $\pm$ lacking on some leaves of some specimens) .....5
- 4: Leaves lacking elongate hyaline marginal cells.....7
- 5 Stems usually repent, often rhizome-like, with ascending-erect branches; border of hyaline cells on leaves often broad, always unistratose..... **MITTHYRIDIDIUM**
- 5: Stems mostly erect, neither repent nor rhizome-like, simple or forked; border of hyaline cells narrow, mostly bi- to multistratose .....6
- 6 Plants very small; leaves strongly dimorphic, gemmiferous ones narrow, stiffly erect, almost elaminate; border of hyaline cells incomplete, unistratose, often present only near leaf shoulders .....**Calymperes subintegrum**
- 6: Plants small to robust; leaves  $\pm$ monomorphic; border of hyaline cells mostly well-developed, usually bi- to multistratose.....**SYRRHOPODON**
- 7 Leaves bearing intramarginal files of differentiated elongate mostly hyaline cells (teniolae); teniolae sometimes indistinct or obscured or  $\pm$ lacking in some leaves of some specimens..... **CALYMPERES**
- 7: Leaves lacking teniolae .....8

- 8 Plants very small to medium-sized, commonly bearing abundant fusiform uniseriate-multicellular gemmae on the modified tips of gemmiferous leaves; gemmiferous leaves often strongly differentiated from vegetative leaves and almost always present even though gemmae may have dehisced .....9
- 8: Plants medium-sized to robust; gemmae mostly lacking or inconspicuous; gemmiferous leaves, if present, not markedly different from vegetative leaves ..... 10
- 9 Rhizoids dark red ..... **Syrhopodon stoneae**
- 9: Rhizoids brown to reddish brown ..... **CALYMPERES**
- 10 Cells of limb ±transversely elongate, at least in part ..... **CALYMPERES**
- 10: Cells of limb isodiametric to somewhat vertically elongate ..... **SYRRHOPODON**