

EPHEMERUM

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Ephemerum Hampe, *Flora* 20: 285 (1837), *nom. cons.*; the name refers to the ephemeral habit of these mosses.

Lecto: *E. serratum* (Hedw.) Hampe

Dioicous or rhizautoicous. Plants 0.5–2.5 mm tall, acaulescent or almost so, with a conspicuous protonema. Leaves 2–12, the outer bract-like, oval to narrowly lanceolate, the inner perichaetial leaves linear, lanceolate, spatulate or ligulate, acute to finely acuminate; costa absent, rudimentary or more well developed, sometimes excurrent in an awn, usually absent towards the leaf basal.

Perigonia gemma-like, on rhizoids, often with associated the protonema. Calyptra campanulate, papillose or smooth, with 1–4 splits at the base, sometimes cucullate; vaginula subglobose, rarely ellipsoidal. Capsules cleistocarpous, ±globose, rarely ellipsoidal; stomata present at base. Spores usually papillose.

A genus of about 30 species which is widely distributed in temperate regions of both hemispheres. Represented in Australia by six species, two of which are endemic.

The protonema is often more conspicuous than the gametophores, and the vegetative leaves are usually much smaller than the perichaetial leaves. While the latter is the most useful diagnostic feature, perichaetial leaves do not enlarge until after fertilisation. As a result, immature plants can be difficult to determine. The calyptra cells can be tumid at first, but they later collapse and appear ±smooth.

Reference

Stone, I.G. (1996), A revision of Ephemeraceae in Australia, *J. Bryol.* 19: 279–295.

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| 1 | Leaves lanceolate-subulate, costate; margin entire, serrate or denticulate; calyptra usually cucullate; vaginula ellipsoidal or cylindrical..... | 2 |
| 1: | Leaves variously shaped; costa absent or rudimentary; margin dentate, sometimes deeply incised; calyptra usually campanulate; vaginula subglobose | 3 |
| 2 | Perigonia lacking paraphyses; spores 20–30 µm diam.; leaf margin entire to serrate (<i>l</i>) | 6. E. rehmannii |
| 2: | Perigonia with uniseriate filamentous paraphyses mixed with antheridia; spores 25–40 µm diam.; leaf margin serrate to denticulate | 5. E. recurvifolium |
| 3 | Perichaetial leaves mostly less than 1 mm long, narrowly linear or lanceolate, ecostate; margin with simple distant teeth; gametophores ±hidden by protonema (<i>l</i> ;) | 4 |
| 3: | Perichaetial leaves mostly 1.0–2.5 mm long, variously shaped, spatulate or oblong to ligulate; costa rudimentary; margin with very large simple or branched teeth appearing ciliate or lacinate; mature gametophores usually clearly visible above protonema | 5 |
| 4 | Mature gametophores minute, completely hidden by protonema; leaves 1–3; leaf apices entire (<i>3</i>)..... | 1. E. capense |
| 4: | Mature gametophores showing above protonema; leaves 3–6, bifurcated at apex into 2 filamentous toothed or entire prongs | 4. E. furcatum |
| 5 | Perichaetial leaves narrow, ligulate; margin fringed with short and long thorn-like often recurved teeth; bistratose costa almost as wide as lamina; calyptra cells tuberculate (<i>3</i> ;)..... | 3. E. fimbriatum |
| 5: | Perichaetial leaves narrowly oblong, lanceolate or spatulate; margin fringed with sharp or rounded teeth and laciniae composed of large compound antler-like teeth; bistratose costal region narrow in proportion to total width of lamina; calyptra cells tumid or smooth | 2. E. cristatum |

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http://www.anbg.gov.au/abrs/Mosses_online/Ephemeraceae_Ephemerum.pdf (2012)

1. *Ephemerum capense* Müll.Hal., *Flora* 71: 12 (1888)

T: Somerset East, Boschberg, Cape of Good Hope, South Africa, 1882, *Prof. Macowan*; holo: *n.v.*

Illustrations: G.Roth, *Aussereur. Laubm.* 1: pl. 24, fig. 66 (1911); R.E.Magill, *Fl. Southern Africa: Bryophyta* 1(1): fig. 86 (9–16) (1981); I.G.Stone, *J. Bryol.* 19: 286, fig. 4 (1996).

Rhizautoicous. Plants acaulescent, completely obscured by the pale green 2.0–2.5 mm high protonema. Leaves, including perichaetial leaves, only 2 or 3, \pm uniform, linear to linear-lanceolate, to c. 0.6 mm long and 0.1 mm wide, ecostate; margin toothed above, entire to serrulate below; laminal cells \pm rectangular, 50–120 \times 15–20 μ m.

Perigonia usually with a single bract enclosing 1 antheridium. Calyptra campanulate, usually smooth; vaginula subglobose. Capsules c. 400 μ m diam. Spores \pm globose, 40–60 μ m diam., brown.

Occurs in eastern Qld on moist earth banks; also in southern Africa.

Qld: Cania Gorge Natl Park, near Monto, *I.G.Stone 20979* (MEL); Enoggera Ck, Brisbane, *I.G.Stone 4733* (MEL).

This species is readily recognised by the almost leafless plants completely enveloped in a much taller, copious protonema that is loose, cobwebby and not fastigate as in *E. fimbriatum*.

2. *Ephemerum cristatum* (Hook.f. & Wilson) Müll.Hal., *Bot. Zeitung (Berlin)* 5: 101 (1847)

Phascum cristatum Hook.f. & Wilson, in J.D.Hooker, *Icon. Pl. Rar.* 8: 737A (1845). T: Swan River, W.A., *J.Drummond*; lecto: BM, *vide* I.G.Stone, *J. Bryol.* 19: 283 (1996); isolecto: BM.

Ephemerum grosseciliatum Müll.Hal., *Hedwigia* 37: 77 (1898). T: near Melbourne, Vic., 5 July 1884; *F.M.Reader*; lecto: MEL, *vide* I.G.Stone, *J. Bryol.* 19: 283 (1996).

Illustrations: G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 266, pl. 49 (1976); D.G.Catcheside, *Mosses of South Australia* 240, fig. 137 (1980); I.G.Stone, *J. Bryol.* 19: 282, fig. 1; 283, fig. 2 (1996).

Plants pale green to golden-green, scattered or gregarious on an extensive pale green protonema. Leaves 6–10, the perichaetial leaves spatulate, narrowly lanceolate or oblong, 1.0–1.5 mm long, 0.2–0.4 mm wide, often cristate on distal abaxial surface; apex obtuse-mucronate, acute or acuminate; margin above mid-leaf deeply lacinate, dentate-ciliate with sharp or rounded teeth; costa rudimentary, usually 2 or 3 cells wide, failing below apex or excurrent in a long awn, absent below; laminal cells rectangular to rhomboidal, smooth or prorate, firm to thick-walled, 30–200 \times 12–25 μ m.

Calyptra campanulate; cells smooth or tumid. Capsules bright or rusty red. Spores globose or reniform, 40–90 μ m, reddish brown.

Endemic to Australia and known from all States and Territories except A.C.T.; widespread except in montane areas and the far north; grows on damp earth along watercourses or in protected gorges in desert areas. [Recently reported from Iraq \(F.H.Aziz, Seventeen spp. new moss records for the flora of Iraq, *Int. J. Exper. Bot.* 80: 35–46, 2011\).](#)

W.A.: 6.5 km W of Hopetoun, *A.C.Beauglehole 14723* (MEL). N.T.: Rabbit Flat, Tanami Track, *I.G.Stone 16220* (MEL). S.A.: N of Donovans Landing, *A.C.Beauglehole 16230* (MEL). Qld: Coomanglah, *I.G.Stone 21134* (MEL). N.S.W.: 44 km S of Dubbo, *I.G.Stone 4645* (MEL). Vic.: Whipstick area, Bendigo, *I.G.Stone 398* (MEL). Tas.: Brooks Field, *R.A.Bastow* (MEL).

Distinguished from *E. fimbriatum* by the marginal laciniae composed of compound, antler-like teeth and the narrow, rudimentary costa usually with numerous abaxial spines in the upper half of the leaf.

3. *Ephemerum fimbriatum* Müll.Hal., *Linnaea* 37: 145 (1872)

T: Brisbane River, Qld, 1864, *A.Dietrich*; iso: BM.

Illustrations: G.Roth, *Aussereur. Laubm.* 1: pl. 24, fig. 11 (1911); *I.G.Stone, J. Bryol.* 19: 285, fig. 3 (1996).

Plants acaulescent; protonema fastigate, almost as tall or taller than gametophore. Leaves 5–8, narrowly ligulate, the perichaetial leaves up to 1.8 mm long and 0.15 mm wide, tapering to a long toothed awn; margin fringed with short and long thorn-like, sometimes compound, often

recurved teeth to 100 µm long; costa rudimentary, bistratose or occasionally tristratose, almost as wide as lamina, absent below; laminal cells ±rectangular, 80–100 × 15–30 µm.

Cells of calyptra usually tuberculate; vaginula subglobose. Capsules 450–500 µm diam. Spores usually 35–80 µm.

Occurs in north-western W.A., the central gorges of the N.T. and in eastern Qld; grows on damp, shaded earth. Also in New Caledonia.

W.A.: Yannarie R., 149 km S of Onslow, *A.C.Beauglehole* 14030 (MEL). N.T.: Ayers Rock [Uluru Natl Park], *A.C.Beauglehole* 22892 (MEL). Qld: Burpengary, 1888, *C.J.Wild* (MEL); The Gap, Enoggera Ck, Brisbane, *S.T.Blake* 22984 (BRI); Meunga Ck, Galmara, Cardwell, *I.G.Stone* 21995 (MEL).

Mature plants are distinguished from other species of *Ephemerum* by the very long, narrow, mostly bistratose leaves, and the leaf margins with sharp, often recurved teeth and few laciniae.

4. *Ephemerum furcatum* I.G.Stone, *J. Bryol.* 19: 287 (1996)

T: Cane River area, SE of Onslow, W.A., 18 Aug. 1965, *A.C.Beauglehole* 14025; holo: MEL.

Illustration: I.G.Stone, *op. cit.* 288, fig. 5.

Plants acaulescent, c. 1 mm tall, with protonema reaching three-quarters the height of the mature gametophore. Leaves 3–6, 0.4–1.0 mm tall, the perichaetial leaves linear, ecostate; apex usually split into 2 filamentous toothed or entire parts; margin with irregular distant teeth; laminal cells ±rectangular, 80–150 × 20–30 µm in mid-leaf, narrower above.

Perigonia c. 300 µm long. Calyptra campanulate, c. 200 µm, split at the base; vaginula dark, subglobose. Capsules sessile, subglobose to ±globose, apiculate, c. 650 × 450–550 µm. Mature spores not seen.

Endemic to W.A., and so far known only from the type locality.

Readily distinguished from other species by the bifurcated leaf apices.

5. *Ephemerum recurvifolium* (Dicks.) Boulay, *Fl. Crypt. Est. Musc.* 694 (1872)

Phasum recurvifolium Dicks., *Pl. Crypt. Britt.* 4: 1 (1801). T: near Croydon, England, *J.Dickson*; lecto: BM, *vide* I.G.Stone, *J. Bryol.* 19: 290 (1996).

Illustrations: A.J.E.Smith, *Moss Flora of Britain and Ireland* 288, fig. 164 (7–9) (1978); I.G.Stone, *J. Bryol.* 19: 291, fig. 7 (1996).

Plants usually similar to those of *E. rehmannii* (see below). Leaf margin serrate to denticulate, sometimes with 1 or 2 larger teeth at base of awn; costa often more robust, 25–40 µm wide, sometimes rough abaxially, short- or long-excurrent, 3–5 cells thick; laminal cells 30–100 × c. 12–15 µm; basal cells to 20 µm wide.

Perigonia with up to 6 leaves and c. 6 antheridia, interspersed with filamentous paraphyses. Calyptra cucullate; vaginula cylindrical, c. 300 µm long, often reddish brown throughout. Capsules ovoid, with a short oblique apiculus. Spores (25–) 30–40 µm diam., golden, granulose, papillose.

Occurs on soil crust with algae, lichens and other bryophytes in roadside claypans between Wentworth and Broken Hill in south-western N.S.W.; also in Europe, Russia and North Africa.

N.S.W.: Silver City Hwy, S of Broken Hill, 214 km N of Wentworth, *I.G.Stone* 9582 (BM, MEL); *loc. id.*, *I.G.Stone* 11510 (MEL).

6. *Ephemerum rehmannii* (Müll.Hal.) Broth., *Nat. Pflanzenfam.*, 2nd edn, 10: 319 (1924)

Ephemerella rehmannii Müll.Hal., *Flora* 71: 12 (1888). T: Bloemfontein, Orange Free State, South Africa, 1875, *Rehmann*; holo: G n.v.

Illustrations: G.Roth, *Aussereur. Laubm.* 1: pl. 22, fig. 11 (1911), as *Ephemerella rehmannii*; R.E.Magill, *Fl. Southern Africa: Bryophyta* 1(1): fig. 86 (17–23) (1981); I.G.Stone, *J. Bryol.* 19: 289, fig. 6 (1996).

Plants to 2.8 mm tall. Leaves 6–10, the perichaetial leaves erect, recurved or twisted, narrowly lanceolate, 0.5–2.5 mm long; apex acuminate, sometimes awned; margin usually bluntly toothed above, entire to distantly serrulate below; costa long-excurrent or subpercurrent, 20–35 µm wide, sometimes rough abaxially, 3 or 4 cells thick; laminal cells rectangular, linear-rhomboidal or prosenchymatous, 25–100 × 8–15 µm, shorter above, often narrower at margin.

Perigonia bud-like; leaves and antheridia 2–4; paraphyses lacking. Calyptra smooth, cucullate with 1 or 2 splits, 450–550 µm long; vaginula narrowly ellipsoidal, c. 250 µm long, coloured around rim. Capsules often ellipsoidal, 500–600 µm long. Spores 20–30 µm diam., sharply papillose, pale brown.

Widespread but sporadic; occurs in W.A from the Shark Bay area to Feysville, probably in S.A and southern Qld (specimens very immature), in N.S.W. and in northern Vic. Also in southern Africa.

W.A.: Shark Bay, *I.G.Stone 8018* (MEL); Murchison Gorge, *I.G.Stone 6151 p.p.* (MEL). N.S.W.: Willow Tree Ck, Limestones via Attunga, 9 Sept. 1991, *A.Downing* (CANB). Vic.: Boundary Bend, *I.G.Stone 1384* (MEL); Copi Plain, S of Wyperfeld, *G.A.M.Scott* (MEL).

The protonema is less obvious than in other Australian species; it forms a small tuft often infiltrated with soil at the base of male and female plants. *Ephemerum rehmannii* resembles the less common *E. recurvifolium*, but it usually differs in the narrower leaf cells, perigonia lacking paraphyses and smaller spores with minute, sharp papillae.

Excluded Name

Ephemerum whiteleggei Broth. & Geh., *Oefvers. Förh. Finska Vetensk.-Soc.* 37: 156 (1895)

T: North Shore and Balls Head Bay, Sydney, N.S.W., *T.Whitelegge 45 & 221*; syn: H-BR, MEL, NSW.

This is *Eccremidium minutum* (Mitt.) I.G.Stone & G.A.M.Scott (Ditrichaceae).