

FUNARIA

Allan J. Fife¹ & Rodney D. Seppelt²

Funaria Hedw., *Sp. Musc. Frond.* 172 (1801); probably from the Latin *funis* (a rope), in reference to the twisted, cord-like seta.

Lecto: *F. hygrometrica* Hedw.

Autoicous. Plants small to medium-sized, gregarious, yellowish to bright green. Stems reddish brown, occasionally pale, unbranched or with basal innovations; in cross-section with a narrow central strand, a parenchymatous medulla and 1 or 2 rows of scarcely differentiated cortical cells. Leaves often crowded at the top of the stem, erect-spreading, concave, lingulate to ovate or obovate, acute to acuminate; costa ending just below the apex to percurrent or (rarely) slightly excurrent; margins weakly serrate by projecting cell ends near the apex, or the margins entire. Upper laminal cells thin-walled, quadrate to oblong or oblong-hexagonal, longer and laxer below; marginal cells slightly narrower, scarcely differentiated.

Perigonia terminal on short basal branches, with short, usually clavate paraphyses. Perichaetia at stem apices, apparently lacking paraphyses. Calyptra persistent, large, inflated, cucullate with a long beak, smooth. Setae straight or arcuate, smooth, twisted when dry, hygroscopic, brown to reddish brown. Capsules brown to reddish brown, oblong-pyriform, asymmetrical, inclined to pendulous, striate or deeply sulcate when dry; operculum convex, rarely apiculate; annulus of 1–3 rows of large cells, revoluble, deciduous. Stomata usually confined to the neck, consisting of a narrow pore surrounded by a single guard cell. Peristome of 1 or 2 rows of teeth, the 16 exostome teeth lanceolate, spirally twisted, papillose-striolate below, becoming papillose above, brown; endostome segments opposite exostome teeth, often shorter. Spores minutely papillose.

This cosmopolitan genus includes c. 200 species; two are known from Australia.

References

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¹ Landcare Research, P.O. Box 40, Lincoln 7640, New Zealand.

² Australian Antarctic Division, Channel Highway, Kingston, Tasmania 7050, Australia.

Leaves c. 2.5 long and 1 mm wide; setae to 10 mm long; capsules c. 1.5–2.0 mm long and 0.8–1.0 mm wide; mouth c. 0.4 mm wide; spores 23–30 μm **2. *F. microstoma***
 Leaves to 4 mm long and 1 mm wide; setae 15–40 mm long; capsules c. 3 mm long and 1 mm wide; mouth c. 0.8 mm wide; spores 12–20 μm **1. *F. hygrometrica***

1. *Funaria hygrometrica* Hedw., *Sp. Musc. Frond* 172 (1801)

T: Germany; *n.v.*

Funaria calvescens Schwägr., *Sp. Musc. Frond. Suppl.* 1(2): 77 (1816); *Funaria hygrometrica* var. *calvescens* (Schwägr.) Mont., *Ann. Sci. Nat., Bot.*, sér. 2, 12: 54 (1839). T: Europe; *n.v.*

Funaria sphaerocarpa Müll.Hal., *Bot. Zeitung (Berlin)* 9: 546 (1851); *F. hygrometrica* var. *sphaerocarpa* (Müll.Hal.) Watts, *Proc. Linn. Soc. New South Wales* 30 (Suppl.): 117 (1906). T: Green Cape, Twofold Bay, N.S.W., *S.Mossman 831* (cited as *Mossman 834* in protologue); holo: NY.

Funaria papillata Hampe, *Linnaea* 40: 302 (1876). T: near Brisbane, Qld, *Slater*; BM-Hampe.

Illustrations: D.G.Catcheside, *Mosses of South Australia* 229, fig. 128 (1980); D.Meagher & B.Fuhrer, *A Field Guide to the Mosses and Allied Plants of Southern Australia* 155 (2003); B.Malcolm, N.Malcolm, J.Shevock & D.Norris, *California Mosses* 48 (2009).

Autoicous. Stems to 3 cm tall, branching from below. Leaves to 4 mm long and 1 mm wide, widest above the middle, spreading to erect-patent below; upper leaves imbricate, crowded, concave, with a short to long point; margins entire or bluntly toothed, crumpled and slow to wet when dry; costa ceasing below the apex to percurrent. Upper laminal cells lax, thin-walled, irregularly rectangular to quadrate-hexagonal, 30–50 μm wide in mid-leaf; 1 or 2 rows of marginal cells narrower; basal laminal cells rectangular.

Perigonia terminal, later overtopped by a female branch arising by innovation. Setae 15–40 mm long, arcuate when moist, flexuose, twisted when dry and old, strongly hygroscopic. Capsules c. 3 mm long and 1 mm wide, narrowly pyriform, gibbous, asymmetrical; mouth oblique, c. 0.8 mm wide, red-rimmed, striate when fresh, sulcate when dry and empty; operculum low, domed. Annulus large, revoluble. Peristome double and well-developed; exostome teeth orange, spirally curved, joined at the tips to an ephemeral central disc, papillose-striate below, with strong transverse bars projecting into the capsule cavity and protruding at the side of the teeth; endostome segments lanceolate, hyaline, papillose; processes similar to those of exostome. Spores yellow-brown, 12–20 μm , finely papillose but appearing smooth.

Occurs in all States and Territories. Plants form patches or scattered stems on disturbed ground, especially the sites of fires, on burnt wood and old walls; very common in plant nurseries, on rubbish and apparently associated with high potash concentrations. Cosmopolitan.

W.A.: Yalgarup Natl Park, *I.G.Stone 6259*. N.T.: 10 km N of Alice Springs, *P.K.Latz 6355*. Qld: Upper Mowbray River, *Sparvell 5158*. N.S.W.: Gudgenby, *N.T.Burbidge 6771*. Vic.: Warrandyte, *I.G.Stone 535*

Plants with curved or even coiled setae and ripe, pendulous capsules are especially distinctive. *Funaria microstoma* has similar capsules, but the mouth is less than half the diameter of the capsule.

Funaria hygrometrica var. *calvescens* differs only in having more erect setae, stems that are leafy above but becoming bare below and slightly narrower capsules. While some authors retain the var. *calvescens* as distinct, we consider that, pending further studies, there is insufficient basis for this separation.

2. *Funaria microstoma* Bruch ex Schimp., *Flora* 23: 850 (1840)

T: Switzerland; *n.v.*

Funaria salsicola Müll.Hal., *Hedwigia* 41: 120 (1902). T: Dimboola, Vic., 26 July 1896, *F.M.Reader*; CHR-Beckett, MEL, NSW.

Illustration: D.G.Catcheside, *Mosses of South Australia* 230, fig. 129 (1980), as *F. salsicola*.

Autoicous. Plants similar to the preceding species. Leaves to c. 2.5 mm long and 1 mm wide, widest above the middle, spreading to erect-patent below; upper leaves crowded, concave,

broadly oblong-ovate to obovate, with a long slender point; margins entire or bluntly toothed, crumpled and slow to wet when dry; costa ceasing below the apex to percurrent. Upper laminal cells lax, thin-walled, irregularly rectangular, 150–200 × 60–80 µm in mid-leaf; 1 or 2 rows of marginal cells narrower; basal laminal cells rectangular.

Perigonium terminal, later overtopped by a female branch arising by innovation. Setae to 10 mm long. Capsules c. 1.5–2.0 mm long and 0.8–1.0 mm wide, narrowly pyriform, gibbous, asymmetrical; mouth oblique, c. 0.4 mm wide, red-rimmed, striate when fresh, less strongly sulcate than the preceding species when dry and empty; operculum low, domed. Peristome double; exostome teeth orange, spirally curved, joined at the tips to an ephemeral central disc, papillose-striate below, with much less pronounced transverse bars; endostome segments rudimentary, low and membranous or undetectable. Spores yellow-brown, 23–30 µm, rather sparsely ornamented with low rounded papillae.

Occurs in W.A., S.A. and Vic.; apparently halotolerant and found both in seaside marshes and beside inland salt lakes. Also in Europe, NE Asia, North Africa, U.S.A. (California) and Canada (Newfoundland).

W.A.: Poonthoon Pool, Whelia Ck, Mileura Stn, *N.T.Burbidge & A.Kanis 8137*. S.A.: Meningie, *L.D.Williams 1010*.

Funaria microstoma is morphologically close to *F. hygrometrica*, and the two species are almost indistinguishable in the absence of sporophytes.