ORTHODONTIACEAE

A. Jonathan Shaw

Orthodontiaceae (Broth.) Goffinet, in W.R. Buck & B. Goffinet, Bryophyte Biology 104 (2000).


Type: Orthodontium Schwägr.

Orthodontium is cosmopolitan and comprises two genera, Orthodontium and Orthodontiopsis. Only Orthodontium, with two species, occurs in Australia.

References


ORTHODONTIUM

Orthodontium Schwägr., Sp. Musc. Frond., Suppl. 2, 2: 123 (1827); from the Greek ortho- (erect) and odontos (a tooth), in reference to the erect peristome teeth.

Type: O. lineare Schwägr.


Orthodontiaceae

Paroicous or autoicous. Plants minute to small, to 5 mm long, dull or somewhat glossy, erect, often forming dense turfs. Stems unbranched or forked. Rhizoids smooth, reddish. Leaves erect-spreading to spreading, sometimes somewhat secund, linear-setaceous, linear-lanceolate or narrowly lanceolate; margin serrulate near the apex, lacking a border; costa single, ending below or in the apex; upper median laminal cells elongate-hexagonal to rhomboidal, with thin or firm walls. Gemmae not produced.

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Perigonia small and bud-like, often tinged with red, on short branches (in autoicous species) below the perichaetia, numerous; perigonal leaves short-acuminate from an ovate base. Perichaeta terminal on main stems, sometimes also on short lateral branches; perichaetal leaves scarcely differentiated (leaves gradually longer toward the top of the plant). Setae erect. Capsules erect, short- to long-cylindrical, less commonly pyriform or almost urceolate, with a small and inconspicuous or ±elongate sterile neck, sometimes sulcate when dry; exothelial cells of the urn rectangular, abruptly and conspicuously smaller and very thick-walled near the capsule mouth; annulus poorly developed, in 1 or 2 rows, separating irregularly; operculum conical to oblique-rostrate. Peristome usually double, rudimentary to well developed;

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peristomial formula typically 4: 2: 4; exostome teeth smooth to ±papillose (especially near the apex), bluntly narrow-triangular, rarely rudimentary and irregular, typically hyaline; endostome hyaline, smooth or sometimes papillose above, sometimes rudimentary and adhering to the exostome teeth; basal membrane absent or ±well developed and up to 25–33% the height of the exostome teeth; segments narrow, scarcely tapered to the apex, scarcely keeled and not perforate, in some species rudimentary or absent; clila absent. Spores small to rather large, ±smooth to coarsely roughened.

A almost cosmopolitan genus of 7–10 species, primarily in tropical and southern-temperate regions; two species occur in Australia.

Orthodontium can be recognised by the narrow, setaceous to linear-lanceolate leaves and erect capsules with various reduced peristome teeth. In Australian plants, the exostome teeth can be shorter than the well-developed endostome segments (O. lineare), or the endostome is rudimentary and adhering to the inner surface of the teeth (O. pallens). Australian specimens are generally autoicous, but perigonia are sometimes difficult to find, and some dioicous plants may occur.

References


Plants small to medium-sized; setae (10–) 20–35 mm long; endostome segments well developed, as long as or longer than the exostome ................................................. 1. O. lineare

Plants minute; setae 5–15 mm long; endostome rudimentary, forming an irregular membrane ±adhering to the exostome teeth; segments absent, rarely linear, delicate and irregular .................................. 2. O. pallens


Autoicous or rarely paroicus, or apparently dioicus. Plants small to medium-sized, dull to ±glossy. Leaves linear-setaceous to linear-lanceolate, occasionally more broadly lanceolate, sometimes slightly secund, serrulate to subentire near the apex; upper laminal cells elongate-hexagonal to long-rhomboidal, 75–190 × 7–17 µm, with thin to firm or sometimes thickened walls; basal cells lax and thin-walled to inflated.

Setae (10–) 20–35 mm long. Capsules erect, typically cylindrical, more rarely ovate-cylindrical or narrowly pyriform, to c. 4.5 mm long, often ±sulcate. Peristome double, well
developed; exostome teeth tapered from base to apex, 150–375 µm long, blunt or narrowly acute, hyaline, smooth or ±papillose near the apex; endostome hyaline; basal membrane scarcely exceeding the capsule rim or up to one-third the height of the exostome teeth; segments well-developed, 130–325 µm long, smooth or ±papillose near the apex. Spores 13–19 µm, finely roughened. \( n = 22, \text{fide H.P.Ramsay, Austral. J. Bot. 22: 312 (1974).} \)

Widely distributed and rather common in W.A., S.A. N.S.W., A.C.T., Vic. and Tas.: grows on rotted or burned wood. Also known from South America, southern Africa and New Zealand.

This moss is extremely variable in almost all features, but the peristome is comparatively well developed compared to \( O. \) pallens.

There are no distinguishing features to separate \( O. \) lineare, \( O. \) australe and \( O. \) sulcatum.

Variation in plant size, leaf shape, capsule form (sulcate or not) and peristome development seems to occur independently, such that these taxa cannot be separated by any recurring suite of characters.

\( O. \) lineare was first collected in England in 1911–12 and is now fairly common in many areas of western Europe and southern Scandinavia. It provides one of the most thoroughly studied cases of a weedy moss whose range has greatly expanded during recent times.

2. \( O. \) pallens (Hook.f. & Wilson) Broth., \( Nat. Pflanzenfam. \) I, 3: 544 (1903)

\( Weissia \) pallens Hook.f. & Wilson, in J.D.Hooker, Icon. Pl. Rar. 8: pl. 739A (1845). \ T: W.A., J.Drummond s.n.; holo: BM.


Autoicous. Plants minute to small, to 5 mm, usually dull. Leaves linear-setaceous to linear-lanceolate, sometimes slightly secund, serrulate to subentire near the apex; upper laminal cells elongate-hexagonal to long-rhomboidal, 35–75 × 4–10 µm, with thin to firm walls; basal cells thin-walled, tending to collapse.

Setae (4–) 8–15 mm long. Capsules erect, short-cylindrical or broadly pyriform, rarely almost urceolate, to c. 2.5 mm long, not sulcate. Peristome poorly developed, appearing single although exostome and endostome are usually present; exostome teeth rather short or rudimentary, generally blunt, 65–140 µm long, hyaline, smooth or nearly so; endostome rudimentary, hyaline, usually not forming well-differentiated segments, consisting of an irregular membrane adhering to the inner exostomial surface; segments occasional, slender, smooth, irregular. Spores (15–) 18–30 µm, rather coarsely roughened. Chromosome number not known.

Rare in W.A., N.S.W., A.C.T. and Vic.; grows on burned or rotted wood, sometimes mixed with \( O. \) lineare. Possibly endemic to Australia, but the species is poorly known.


This species is characterised by the very small gametophyte and sporophyte and the narrowly to broadly ovate capsules with a markedly reduced peristome. The capsules of \( O. \) pallens are not sulcate as in most forms of \( O. \) lineare; they are also smaller. The endostome appears to be absent, but consists of a transparent membrane that adheres to the exostome. It either tears
between the exostome teeth or is only formed adjacent to the teeth; no separate basal membrane is visible.

This species can be difficult to distinguish from very small forms of *O. lineare*, especially when fresh capsules with mature peristomes are not available. *Orthodontium pallens* is far less common, and the relationship between the two species required further study. Occasional specimens [e.g. Watts 1087 (NSW); Catcheside 72.176 (AD), duplicate at NSW] that agree in size and capsule shape with *O. pallens* have a few well-formed endostome segments (i.e. a single capsule might have one long segment with the remaining segments rudimentary).