

PHILONOTIS

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Philonotis Brid., *Bryol. Univ.* 2: 15 (1827); presumably from the Greek *philo* (loving), and *notis* (dampness or water), in reference to the moist places in which this moss grows.

Type: *P. fontana* (Hedw.) Broth.

Dioicous. Plants very small to medium-sized or large, densely tufted. Stems simple, sparingly branched, or with subfloral innovations, tomentose below; rhizoids ±lightly papillose. Leaves unranked, densely imbricate to widely spread on stems, erect to squarrose, rarely slightly twisted, unchanged when dry or wet, ovate-lanceolate to linear-lanceolate, acuminate to acute; margin plane or recurved, denticulate-papillose to serrate; costa usually strong, failing below apex to long-excurrent; laminal cells rectangular to long-hexagonal, commonly with subquadrate basal marginal cells, ±papillose (usually from projecting cells ends); apical cells usually longer and narrower than basal cells.

Capsules erect to pendulous, subglobose to short-cylindrical; operculum convex, with or without an umbo. Peristome absent or double; exostome teeth 16; endostome irregular. Spores globose, reniform or ovoid, densely papillose. $n = 6$, *fide* H.P.Ramsay, in A.Löve *Taxon* 16: 557 (1967), as *Philonotis harrisii* Geh., *nom. nud.*; Eungella Range, Qld, H.P.Ramsay 58/63 (SYD).

A genus of c. 170 species worldwide; seven are recognised in Australia, and three are endemic. Griffin & Buck (1989) synonymised *Bartramidula* Bruch & Schimp. with *Philonotis*. Scott & Stone (1976) describes the genus as having a high degree of plasticity within species, and with numerous *nomina nuda* the genus requires further revision in Australia.

While the genus is readily recognised, differentiation between the species can be difficult. Plants are either yellow-green or, in the case of *P. scabrifolia*, white to glaucous green. Tomentum is often irregular and patchy on the lower half of the stem.

References

Koponen, T. & Norris, D.H. (1996), Bryophyte flora of the Huon Peninsula, Papua New Guinea. LVII. *Fleischerobryum* and *Philonotis* (Bartramiaceae, Musci), *Acta Bot. Fenn.* 156: 1–21.

Scott, G.A.M. & Stone, I.G. (1976), *The Mosses of Southern Australia* 322–341.

1	Plants very small; laminal cells smooth.....	1. <i>P. australiensis</i>
1:	Plants usually larger; laminal cells papillose	2
2	Laminal cells with a large central papilla; plants white to glaucous green (1:)	5. <i>P. scabrifolia</i>
2:	Laminal cells papillose from projecting cell ends; plants usually yellow-green	3
3	Costa failing below apex (2:).....	4
3:	Costa percurrent to excurrent.....	5
4	Leaves lanceolate; apex acute (3).....	2. <i>P. hastata</i>
4:	Leaves linear-lanceolate; apex broadly acuminate.....	3. <i>P. pallida</i>
5	Leaves narrowly triangular-lanceolate; costa long-excurrent (3:)	6. <i>P. slateri</i>
5:	Leaves triangular-lanceolate to ovate-lanceolate; costa percurrent to excurrent	6
6	Leaf margin recurved; apex acute to acuminate (5:).....	7. <i>P. tenuis</i>
6:	Leaf margin plane; apex acute.....	4. <i>P. pyriformis</i>

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1. *Philonotis australiensis* D.G.Griffin & W.R.Buck, *Bryologist* 92: 376 (1989)

Glyphocarpa pusilla Hook.f. & Wilson, *London J. Bot.* 3: 544 (1844); *Bartramia pusilla* (Hook.f. & Wilson) Müll.Hal., *Syn. Musc. Frond.* 1: 480 (1848); *Bartramidula pusilla* (Hook.f. & Wilson) Paris, *Index. Bryol.* 116 (1894). T: Tas., *D.Lyall*; holo: BM? *n.v.*

Bartramidula weymouthii Broth., *Pap. & Proc. Roy. Soc. Tasmania* 1902: 115 (1903); *Bartramidula pusilla* var. *weymouthii* (Broth.) Rodway, *Pap. & Proc. Roy. Soc. Tasmania* 1913: 194 (1914). T: on roadside bank, Port Cygnet, Lyndoch, Tas., Sept. 1889, *W.A.Weymouth*; holo: H-BR *n.v.*

Illustrations: D.G.Catcheside, *Mosses of South Australia* 286, fig. 171 (1980), as *Bartramidula pusilla*; D.Meagher & B.Fuhrer, *Field Guide to the Mosses and Allied Plants of Southern Australia* 165 (2003).

Plants very small, to 5 mm tall, tufted, pale to glaucous green above, yellow to brown below. Stems erect, rarely branched. Leaves erect-spreading, ovate-lanceolate to linear-lanceolate, acuminate, 0.22–0.60 mm long, 0.115–0.200 mm wide; margin entire to bluntly denticulate above; costa failing below apex; laminal cells short-rectangular, losing shape towards apex and margin, thick-walled, smooth, 12–60 × 7–6 µm.

Setae erect, to 10 mm long. Capsules erect to pendulous, globose to oblong, rarely urceolate, wrinkled or occasionally slightly furrowed; operculum convex, umbonate. Peristome absent. Spores globose, densely papillose, 44–70 µm diam.

This minute, endemic species occurs in W.A., S.A., Vic. and Tas. It has been reported from N.S.W. (Scott & Stone, 1976), but no specimens could be examined to confirm this; however, its occurrence there is not unlikely. *Philonotis australiensis* grows on moist soils in sheltered habitats.

W.A.: Preston R., *D.H.Norris* 25667 (CANB). S.A.: 13 km NE of Cleve, *H.Streimann* 54692 [*Musci Australas. Exsicc.* 380] (CANB). Vic.: Teddys Lookout, Lorne, *W.W.Watts* 1080 (NSW). Tas.: Mt Wellington, *W.A.Weymouth* 550 (CANB).

2. *Philonotis hastata* (Duby) Wijk & Margad., *Taxon* 8: 74 (1959)

Hypnum hastata Duby, in A.Moritz, *Syst. Verz.* 132 (1846). T: locality unknown; *n.v.*

Philonotis imbricatula Mitt., *J. Proc. Linn. Soc., Bot., Suppl.* 1: 61 (1859); *Bartramia imbricatula* (Mitt.) Müll.Hal., *Linnaea* 36: 12 (1869). T: Ceylon [Sri Lanka], *Gardner*; lecto: NY *n.v.*, *fide* T.Koponen & D.H.Norris, *Acta Bot. Fenn.* 156: 7 (1996).

Philonotula jardinii Besch., *Ann. Sci. Nat. Bot., sér. 7*, 20: 29 (1894); *Philonotis jardinii* (Besch.) Paris, *Index. Bryol.* 923 (1897). T: Tahiti, Society Islands, 1852 ex Herb. E.Jardin; holo: BM *n.v.*, *fide* T.Koponen & D.H.Norris, *Acta Bot. Fenn.* 156: 7 (1996).

Bartramia laxissima Müll.Hal., *Syn. Musc. Frond.* 1: 480 (1849), *nom. illeg.*; *Philonotis laxissima* (Müll.Hal.) Mitt., *J. Proc. Linn. Soc., Bot., Suppl.* 1: 61 (1859), *nom. illeg.* T: Java, [Indonesia]; homotypic with *P. hastata*, *fide* T.Koponen & D.H.Norris, *Acta Bot. Fenn.* 156: 7 (1996).

Illustration: T.Koponen & D.H.Norris, *op. cit.* 8, fig. 3 (1996).

Plants usually densely tufted. Stems minute, c. 5 mm tall, sparingly branched. Leaves imbricate, erect to erect-spreading, lanceolate, acute, 0.55–0.71 mm long, 0.15–0.27 mm wide; margin recurved towards apex, entire to crenulate at base, doubly denticulate-papillose to serrulate above; costa weak, usually failing below apex, denticulate-papillose; basal laminal cells mostly subquadrate to short-rectangular, mammillose; basal cells closer to costa elongate-rectangular, smooth, 14–44 × 7–14 µm; apical cells generally narrower, rectangular to rhomboidal, papillose by projecting cell ends, 25–46 × 6–14 µm. Sporophyte not seen.

This species grows on rocks in Qld. It has also been reported for N.T., but no specimens were available to confirm this; also in Lord Howe Is., SE Asia, Malesia and Madagascar.

Qld: Fishery Ck, *H.Flecker 2172* (CANB); North Toohey Ck, *H.Flecker 3381* (CANB); Freshwater Ck, Cairns Intake, *H.Flecker 5253* (CANB).

The leaves of *P. hastata* are comparatively short and broad. This, along with the short costa and the acute apex, distinguish it from other Australian species.

3. *Philonotis pallida* (Hampe) A.Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1877–78: 437 (1879)

Bartramia pallida Hampe, *Linnaea* 40: 307 (1876). T: subtropical east Australia, [Qld], *Eaves*; holo: *n.v.*

Plants slightly tufted. Stems c. 25 mm tall, string-like. Leaves widely spaced on the stem, wide-spreading, less commonly erect-spreading, linear-lanceolate, broadly acuminate, 0.6–0.9 mm long, 0.11–0.15 mm wide; margin plane to slightly recurved, singly or doubly serrate from the base, less commonly denticulate-papillose; costa failing below apex, denticulate-papillose dorsally towards the apex; outer basal laminal cells short-rectangular; inner basal cells rectangular, rarely hexagonal, 26–42 × 6–9 µm; upper cells 26–40 × 4–6 µm, papillose by projecting cell ends. Sporophyte not seen.

This very rare endemic species occurs in Qld and on soil in Vic.

Vic.: Mt William, *coll. unknown* (NSW 416473, 416474).

Few cells are found between the costa and the margin as the leaves are quite narrow. The leaf apices are also rather narrow but somewhat rounded.

4. *Philonotis pyriformis* (R.Br.bis) Wijk & Margad., *Taxon* 11: 222 (1962)

Bartramia pyriformis R.Br.bis, *Trans. & Proc. New Zealand Inst.* 32: 146 (1900). T: Rocks dripping with water, near Lake Te Anau; New Zealand, Jan. 1890, *R.Brown*; holo: *n.v.*

Plants densely tufted, 2–20 cm tall. Leaves imbricate, erect-spreading to squarrose, often falcate-secund, lanceolate, acute, 1.5–2.3 mm long, 0.4–0.8 mm wide; margin plane, singly denticulate-papillose to serrate; costa short-excurrent, denticulate-papillose dorsally towards the apex; laminal cells rectangular or long-hexagonal; basal cells 50–108 × 10–22 µm; upper cells 21–96 × 6–12 µm, papillose due to projecting cell ends. Sporophyte not seen.

Occurs on rock in very moist habitats in eastern Vic.; also in New Zealand.

Vic.: Greens Ck, Waterfall, *C.B.Kay* (MEL 1036824); between Mt Beauty and Bogong, *C.B.Kay* (MEL 1025346); Greens Ck, 3 miles [c. 4.8 km] NE of Bogong, *C.B.Kay* (MEL 1036823).

This species can be very similar to *P. tenuis*, but it is more robust, and the leaves are more often falcate-secund. The costa is short-excurrent from an acute apex, while *P. tenuis* usually has a finer apex. Scott & Stone (1976) listed this as “Tas (doubtful)”, and while I have seen many Tasmanian specimens of *Philonotis*, none were of *P. pyriformis*.

5. *Philonotis scabrifolia* (Hook.f. & Wilson) Braithw., *Brit. Moss. Fl.* 2: 215 (1895)

Hypnum scabrifolium Hook.f. & Wilson, *London J. Bot.* 3: 552 (1844); *Fl. Antarct.* 1: 138: 60, fig. 6 (1844). T: Lord Auckland’s group [Auckland Is.], *D.Lyall* 26; holo: BM.

Bartramia appressa Hook.f. & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 89, t. LXXXVI, fig. 5 (‘1855’) [1854]; *Philonotis appressa* (Hook.f. & Wilson) Mitt., *J. Proc. Linn. Soc., Bot.* 4: 81 (1860). T: Fall of Waitangi, Bay of Islands, [New Zealand], *J.D.Hooker* 367; syn: BM; Wairapa Valley, [New Zealand], *W.Colenso* 825; syn: BM.

Bartramia remotifolia Hook.f. & Wilson, in J.D.Hooker, *Fl. Tasman.* 2: 193, t. CLXXIV, fig. 3 (1859); *Philonotis remotifolia* (Hook.f. & Wilson) A.Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1873–74: 83 (1875). T: Gullies Rd, Browns R., Tas., *A.F.Oldfield* 36; syn: BM; Elliot Rivulet, near Cumming’s Head, Western Mtns, Tas., *W.Archer*; syn: *n.v.*

Bartramia catenatula Hampe, *Linnaea* 30: 631 (1860); *Philonotis catenatula* (Hampe) Paris, *Index. Bryol.* 919 (1896). T: “n alp. mont. Cobboras, 6000”, [Vic.], *F.Mueller* 142; holo: BM.

Bartramia glaucescens Müll.Hal., *Genera Musc. Frond.* 334 (1901), *nom. nud.*, non *Bartramia glaucescens* Hornsch.; *Philonotis glaucescens* Watts & Whitel., *Proc. Linn. Soc. New South Wales* 30 (Suppl.): 155 (1906), *nom. nud.*, non *Philonotis glaucescens* (Hornsch.) Broth. Based on: Upper Owens R., [Vic.], syn: *n.v.*; “Pyers” [Tyers] R., Gippsland, [Vic.], syn: *n.v.*; Genoa R., [Vic.], *coll. unknown* 238, syn: NSW (NSW 416300).

Illustrations: D.G.Catcheside, *Mosses of South Australia* 290, fig. 174 (1980); D.Meagher & B.Fuhrer, *Field Guide to the Mosses and Allied Plants of Southern Australia* 115 (2003); R.D.Seppelt, *The Moss Flora of Macquarie Island* 77, fig. 30 (2004).

Plants tufted, white to glaucous green. Stems with subfloral innovations or sparingly branched, c. 20 mm tall. Leaves imbricate, wide-spreading, lanceolate to ovate-lanceolate; apex acuminate and commonly incurled; stem leaves 0.7–1.3 mm long, 0.36–0.97 mm wide; branch leaves smaller, 0.36–0.75 mm long, 0.15–0.36 mm wide; margin slightly recurved towards the apex, papillose; costa excurrent; laminal cells \pm uniform, short-rectangular to subquadrate, with a large central papillae, $10\text{--}26 \times 8\text{--}10 \mu\text{m}$.

Setae 15–20 mm long. Capsules usually horizontal, ovoid, sulcate, \pm arcuate; operculum convex, umbonate. Peristome double. Spores reniform, papillose, $30\text{--}34 \times 22\text{--}26 \mu\text{m}$ diam.

Occurs in S.A., N.S.W., A.C.T., Vic. and Tas.; uncommon in moist, shaded habitats, on soil or, occasionally, on rock. It has also been reported for W.A., but no specimens were examined to confirm this; also in New Zealand, South America and southern Africa.

S.A.: Hindmarsh Valley Falls, Southern Lofty Ra., *D.G.Catcheside* 53.265 (AD). N.S.W.: Murphys Track, Dora Dora State Forest, 18 km SE of Holbrook, *H.Streimann* 43152 (CANB); Mongo, 20 km SE of Braidwood, *H.Streimann* 5133 (CANB). A.C.T.: Molonglo Gorge, 15 km E of Canberra, *H.Streimann* 1833 (CANB). Vic.: Bogong High Plains road, 31 km NW of Omeo, *H.Streimann* 50627 (CANB). Tas.: Myrtle Gully, Collinsvale, *A.V.Ratkowsky* B425 (CANB).

This is the most distinctive Australian species of *Philonotis* due to its white to glaucous green colour and the subquadrate laminal cells with central papillae. Scott & Stone (1976) assumed that *P. glaucescens* (Hornsch.) Broth. was conspecific with *P. scabrifolia*, but they did not examine any specimens. In fact, the American *P. glaucescens* is a distinct species which Scott and Stone confused with the *nomen nudum* *P. glaucescens* Watts & Whitel.

6. *Philonotis slateri* (Hampe) A.Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1877–78: 437 (1879)

Bartramia slateri Hampe, *Linnaea* 40: 306 (1876). T: banks of Brisbane R., Qld, *Slater*; syn: *n.v.*

Bartramia tortifolia Müll.Hal., *Genera. Musc. Frond.* 339 (1901), *nom. illeg.*; *Philonotis tortifolia* Watts & Whitel., *Proc. Linn. Soc. New South Wales* 30 (Suppl.): 157 (1906). T: Richmond R., N.S.W., Herb. C.Mueller 1882; syn: BM; Federal-Mullumbimby, N.S.W., *W.W.Watts* 2121; isosyn: NSW; Marshalls Falls, Richmond R., N.S.W., *W.W.Watts* 1114; isosyn: NSW; Alstonville Cutting, Richmond R., N.S.W., *W.W.Watts* 1010; isosyn: NSW; Bagnlow road, Richmond R., N.S.W., *W.W.Watts* 2023; isosyn: NSW.

Plants sparingly to densely tufted. Stems simple or sparingly branched or with subfloral innovations, to 40 mm tall. Leaves widely spaced on stem, erect-spreading to wide-spreading, narrowly lanceolate to narrowly triangular-lanceolate, with a strongly acuminate apex, 1.0–1.7 mm long, 0.1–0.3 mm wide; margin \pm reflexed, denticulate-papillose to serrulate; costa usually long-excurrent, denticulate-papillose; basal laminal cells rectangular (rarely hexagonal), \pm papillose, $18\text{--}48 \times 8\text{--}14 \mu\text{m}$; outer basal cells short-rectangular to subquadrate, $7\text{--}16 \times 7\text{--}10 \mu\text{m}$; median and apical cells narrower and more elongate, papillose by projecting cell ends, $22\text{--}76 \times 3\text{--}10 \mu\text{m}$. Setae to 30 mm long. Capsules horizontal to cernuous, short-cylindrical, \pm arcuate, sulcate; operculum convex or sharply conical, with or without an umbo. Peristome double. Spores ovoid, globose or reniform, papillose, $21\text{--}24 \mu\text{m}$ diam.

This endemic species grows on soil in south-eastern Qld and north-eastern N.S.W.

Qld: near Murrwillumbah, *W.Forsyth* 717 & *s.n.* (NSW). N.S.W.: Tintenbar Brooklet, Richmond R., *W.W.Watts* 308 (NSW); Alstonville Cutting, 5 miles [c. 8 km] from Ballina, *W.W.Watts* 5047 (NSW).

Philonotis slateri is characterised by its narrow, widely spaced leaves, each with a long-excurrent costa.

7. *Philonotis tenuis* (Taylor) Reichardt, *Reise Novara, Pilze, Leber-Laubm.* 1(3): 178 (1870)

Bartramia tenuis Taylor, *Phytologist* 1: 1095 (1844). T: Norfolk Is., *A.Cunningham*; holotype: BM (5 slides at CANB).

Bartramia fertilis Mitt., *Hooker's J. Bot. Kew Gard. Misc.* 8: 260 (1856); *Philonotis fertilis* (Mitt.) Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 69 (1882). T: Bogong Range, Vic., *F.Mueller* 112 syn: NY? *n.v.*;

Australian Alps, 1855, *F. Mueller 133*, syn: NY *n.v.*? *Bartramia pseudomollis* Müll.Hal., *Linnaea* 37: 150 (1872); *Philonotis pseudomollis* (Müll.Hal.) A.Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1873–74: 82 (1875). T: Brisbane R., Qld, 1864, *A. Dietrich*; holo: *n.v.*

Bartramia dicranellacea Müll.Hal., *Genera. Musc. Frond.* 342 (1901); *Philonotis dicranellacea* (Müll.Hal.) Watts & Whitel., *Proc. Linn. Soc. New South Wales* 30 (Suppl.): 155 (1906). T: Lavender Bay, Sydney, N.S.W., Oct. 1884, *T. Whitelegge 143*; iso: NSW.

Philonotis austrofalcata Broth. & Watts, *Proc. Linn. Soc. New South Wales* 37: 373 (1912). T: Yarrangobilly Caves, N.S.W., *W.W. Watts 8702, 8854*; syn: NSW.

Philonotis rigens Broth., *Pap. & Proc. Roy. Soc. Tasmania* 1913: 195 (1914). T: near Sorell, Tas., *coll. unknown*; holo: H-BR *n.v.*

Illustrations: G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 339, pl. 63 (1976); H.Streimann, *The Mosses of Norfolk Island* 8, fig. 2 (2002); R.D.Seppelt, *The Moss Flora of Macquarie Island* 79, fig. 31 (2004).

Plants densely tufted. Stems 5–35 mm tall, simple or with subfloral innovations. Leaves imbricate to well spaced on stem, erect to wide-spreading, rarely slightly falcate-secund, triangular-lanceolate to ovate-lanceolate, acute to acuminate, 0.7–1.5 mm long, 0.2–0.5 mm wide; margin reflexed, singly or doubly denticulate-papillose to serrate; costa percurrent to excurrent, denticulate-papillose; basal laminal cells rectangular (to long-hexagonal), smooth or with apical papillae, 16–50 (–80) × 8–20 µm; outer basal cells short-rectangular to subquadrate, 10–16 × 10–12 µm; median and upper cells narrower and usually longer, papillose at apex, 26–62 × 4–10 µm.

Setae c. 20 mm long. Capsules horizontal to cernuous (rarely erect), sub-globose to short-cylindrical (rarely urceolate), ±slightly arcuate, sulcate; operculum convex. Peristome double. Spores ovoid, globose or reniform, markedly papillose, 18–26 µm.

A common species on rock and soil in all States and Territories; also in Lord Howe Is., Norfolk Is., New Zealand and Africa.

W.A.: c. 5 miles [c. 8 km] S of Nannup, *D.H. Norris 25889* (CANB). N.T.: Chewings Ra., *P.K. Latz 7129B* (CANB). S.A.: Gran-Gran Caves, near Millicent, *L.D. Williams 3373* (CANB). Qld: Broken R., Eungella Natl Park, *H. Streimann 64170* (CANB). N.S.W.: Wardell Ferry, Richmond R., *W.W. Watts 5605* (NSW). A.C.T.: Murrumbidgee R., below Kambah Pool, *D.G. Catchside 64.89* (CANB). Vic.: Ershore R., *W.W. Watts 1057* (NSW). Tas.: Mt Wellington, *W.A. Weymouth s.n.* (CANB).

Leaves of *P. tenuis* vary from broadly triangular-lanceolate with a percurrent costa and highly reflexed margins to narrowly lanceolate with an excurrent costa and only slightly reflexed margins.

H.N.Dixon (*Proc. Roy. Soc. Queensland* 53: 32, 1942) stated that *P. pseudomollis* was “very doubtfully distinct from *P. tenuis*”. I have not had the opportunity to see the type of *P. pseudomollis*, but from other named specimens it appears to fall within the range of variability of *P. tenuis*, being a more narrow-leaved form of this highly variable species.

Doubtful Names

Philonotis longiseta (Michx.) Britton, *Bryologist* 14: 44 (1911)

Reported by Scott & Stone (*The Mosses of Southern Australia* 340, 1976) without a locality. The record cannot be verified.

Philonotis fontanoides Broth. & Watts, *Proc. Linn. Soc. New South Wales* 37: 374 (1912), *nom. illeg.* (later homonym)

T: Swamp, Kiandra Rd, about 48 miles [c. 78 km] from Tumut, N.S.W., *W.W. Watts 8873, 8879*; *n.v.*

This is likely to fall into synonymy with one of the foregoing species.

Philonotis subluteola Müll.Hal., *Enum. Bryin. Exot.* 93 (1889), *nom. nud.*

Original collection not known.

This is probably a species of *Breutelia*.