

HYPOPTERYGIUM

*Hans (J.D.) Kruijer*¹

Hypopterygium Brid., *Bryol. Univ.* 2: 709 (1827); from the Greek *ύπο* (*hypo*-, under) and *πτερυγιον* (*pterygion*, a little wing), in reference to the amphigastria.

Hypopterygium Brid. sect. *Euhypopterygium* Müll.Hal., *Syn. Musc. Frond.* 2: 3 (1850), *nom. illeg.* [*Hypopterygium* Brid. sect. *Hypopterygium*]; *Hypopterygium* Brid. subg. *Euhypopterygium* Bosch & Sande Lac., *Bryol. Jav.* 2: 10 (1861), *nom. illeg.* [*Hypopterygium* Brid. subg. *Hypopterygium*]; *fide* R. van der Wijk *et al.* (*Index Musc.* 3: 178, 1964), based on *Hypopterygium* Brid. sect. *Euhypopterygium* Müll.Hal. Lecto: *Hypopterygium laricinum* (Hook.) Brid. [= *Hypopterygium tamarisci* (Sw.) Brid. ex Müll.Hal.].

Hypopterygium Brid. sect. *Pseudotamariscina* Kindb., *Hedwigia* 40: 285 (1901), as *Pseudo-Tamariscina*; *Hypopterygium* Brid. subsect. *Pseudotamariscina* (Kindb.) M.Fleisch., *Musc. Buitenzorg* 3: 1080 (1908), as *Pseudo-Tamariscina*. T: *Hypopterygium tasmanicum* Kindb. [= *H. didictyon* Müll.Hal.].

Hypopterygium Brid. subg. *Euhypopterygium* Kindb., *Hedwigia* 40: 284 (1901), *nom. illeg.*; *Hypopterygium* Brid. sect. *Euhypopterygium* (Kindb.) M.Fleisch., *Musc. Buitenzorg* 3: 1080 (1908), *nom. illeg.*, incl. type of *Hypopterygium* Brid., *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 139 (2002).

Hypopterygium Brid. sect. *Tamariscina* Kindb., *Hedwigia* 40: 287 (1901), *nom. illeg.*; *Hypopterygium* Brid. subsect. *Tamariscina* (Kindb.) M.Fleisch., *Musc. Buitenzorg* 3: 1083. (1908), *nom. illeg.*, incl. type of *Hypopterygium* Brid., *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 139 (2002).

Plants pinnate to umbellate. Stipe tomentose or glabrous above base. Frond transversely (ob-) ovate to elliptic, glabrous (partly tomentose in one species); ramification pinnate to bipinnate (or partly tripinnate); rudimentary branches absent; axes terete; central strand present; axial cavities absent; axillary hairs 2–4-celled. Foliation partly or entirely complanate. Leaves in 3, 8 or 11 (or rarely more) ranks at stipe and in 3 ranks at rachis and branches, dull or slightly glossy; costa simple, reaching 67–80% the length of the lateral leaves, one-third to excurrent in amphigastria; laminal cells prosenchymatous (partly parenchymatous in one species), hexagonal, thin-walled.

Calyptra cucullate, white to ochraceous, glabrous, partly membranous, partly fleshy. Setae ascending to erect, straight to uncinat, ochraceous to (reddish) brown, smooth; base narrow. Capsules cernuous to pendulous, ochraceous or brown; rostrum oblique. Exostome present; endostome ciliate; basal membrane reaching 30–50% of the length of the exostome.

A genus of seven species in mainly humid, tropical and subtropical regions of both hemispheres; also in warm-temperate regions of the Southern Hemisphere and East Asia and along the western and north-eastern coasts of the Pacific Ocean. Represented in Australia by three non-endemic species.

Reference

Pfeiffer, T., Kruijer, J.D., Frey, W. & Stech, M. (2000), Systematics of the *Hypopterygium tamarisci* complex (Hypopterygiaceae, Bryopsida): implications of molecular and morphological data. *Studies in austral temperate rain forest bryophytes* 9, *J. Hattori Bot. Lab.* 89: 55–70.

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- 1 Stipe and basal frond leaves in 8 ranks; dorsal leaves present in basal part of rachis; laminal cells parenchymatous to prosenchymatous, rectangular or hexagonal; terminal cell of axillary hairs usually short-linear to linear, smooth or covered with white substances (cells with white substances visible as white dots with hand lens) **1. H. didictyon**
- 1: Stipe and basal frond leaves in 3 or 11 (or more) ranks; dorsal leaves absent; laminal cells prosenchymatous, hexagonal; terminal cell of axillary hairs short to elongate, never short-linear or linear, smooth or weakly covered with white substances (only visible with light microscope) 2
- 2 Dioicous; plants usually strongly palmate to umbellate, rarely flabellate, not gemmiferous; stipe frequently more than 15 mm long; distal frond leaves weakly to coarsely serrate-dentate, not caducous; teeth usually more than 20; border green (1:) **2. H. discolor**
- 2: Monoicous or dioicous; plants pinnate to bipinnate (or partly tripinnate), palmate or umbellate, gemmiferous or not; stipe less than 15 mm long; distal frond leaves entire or weakly serrate to weakly serrate-dentate, occasionally caducous in palmate to umbellate plants; teeth fewer than 20; border colourless **3. H. tamarisci**

1. *Hypopterygium didictyon* Müll.Hal., *Syn. Musc. Frond.* 2: 9 (1850)

Hypopterygium didictyon Müll.Hal. ex Berthier, *Rev. Bryol. Lichénol.* 38: 546 ('1971–72') [1972], *nom. illeg. orthogr. err. pro H. didictyon* Müll.Hal. T: Hermite Island, Cape Horn, Magellanes Prov., Chile, J.D.Hooker s.n., *Antarct. Exped. 1839–43*; holo: B (destroyed); lecto: L, *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 144 (2002); isolecto: BM (s.n., sub nos 163 and W. 154), E (n.v.), H (n.v.), S (sub nos 23 and 24 in Herb. Kindberg), TDC.

Hypopterygium novaeseelandiae Müll.Hal., *Bot. Zeitung (Berlin)* 9: 562 (1851), as *novae-seelandiae*. T: "ad corticem arborum dejectarum sylvarum prope Kaipara" [(Wairoa) Forests, Kaipara Harbour], North Island, New Zealand, 1850, S.Mossman 722; holo: B (destroyed), lecto: NY, *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 144 (2002); isolecto: BM (sub no. 22, which is probably an error for no. 722), JE? (s.n., s. loc.).

Hypopterygium smithianum Hook.f. & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 118 ('1855') [1854]; *H. smithii* Wilson ex Kindb., *Enum. Bryin. Exot.* 20 (1888), *nom. illeg. orthogr. err. pro H. smithianum* Hook.f. & Wilson]. *Hookeria rotulata* auct. non Hedw.: J.E.Smith, *Trans. Linn. Soc. London* 9: 279 (1808); according to Hooker & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 118 ('1855') [1854]; J.E.Smith (*loc. cit.*) identified a plant from New Zealand collected by A.Menzies which was almost certainly a syntype of *H. smithianum*. T: "Dusky Bay" [Dusky Sound], South Island, New Zealand, 1791, A.Menzies 74; lecto: BM, *fide* J.D.Kruijer, *Blumea* Suppl. 13: 144 (2002); isolecto: BM; Bay of Islands, North Island, New Zealand, A.Cunningham "etc."; syn: not located; East Coast and interior, North Island, New Zealand, W.Colenso s.n.; syn: not located with certainty, probably W.Colenso 2535, BM (s. loc.) and W.Colenso 2560, BM (s. loc.); East Coast and interior, North Island, New Zealand, J.Sinclair s.n.; syn: not located with certainty, possibly the original material of *H. pallidisetum* Wilson, *nom. nud.* (in synonym.), in BM; Port William, Stewart Island, [New Zealand], 1850, D.Lyall 80; syn: BM.

Hypopterygium glaucum Sull., *Proc. Amer. Acad. Arts* 3: 184 (1855); *H. novaeseelandiae* Müll.Hal. var. *glaucum* (Sull.) Dixon, *Bull. New Zealand Inst.* 3(5): 295 (1927); *H. novaeseelandiae* Müll.Hal. f. *glaucum* (Sull.) Vitt, *New Zealand J. Bot.* 12: 205 (1974). T: New Zealand, U.S. *Exploring Exped. Wilkes 1838–42*; holo: FH? (not located); iso: BM, NY.

Hypopterygium tasmanicum Müll.Hal. ex Kindb., *Hedwigia* 40: 285. (1901). T: Tas., May 1890, Bochart s.n.; holo: S (sub no. 12); iso: B (destroyed).

Illustrations: K.W.Allison & J.Child, *Mosses of New Zealand* pl. 29 (1971); C.M.Matteri, *Bol. Soc. Argent. Bot.* 15: 242, pl. 3 (1973); J.D.Kruijer, *Blumea*, Suppl. 13: 147, fig. 16; 148, fig. 17 (2002).

Dioicous. Plants palmate or umbellate, not gemmiferous. Stipe to 15 mm long, tomentose, glabrous when young. Frond to 3.5 cm wide, glabrous or partly tomentose; branches not caducous; terminal cell of axillary hairs usually rectangular, rarely elliptic, elongate to short-linear to linear, 40–95 × 5–15 µm, smooth or covered with a white substance. Stipe leaves in 8 ranks. Frond leaves in 8 ranks in the basal part of the rachis, in 3 ranks in the distal part of the frond, transverse-ovate to oblong, (0.2–) 0.5–2.0 mm long, 0.2–1.5 (–2.0) mm wide; distal ones occasionally caducous; margin entire to coarsely serrate-dentate; teeth 1-celled, to 20 µm long; border entire, colourless; laminal cells 20–95 × 5–30 µm.

Calyptra 2.7–3.9 mm long. Setae 12–18 mm long. Capsules ellipsoidal, 1.1–2.4 mm long, 0.7–1.5 mm wide; operculum 2.0–2.5 mm long. OPL: PPL: IPL = 4: 2: 6–8c. Exostome teeth (440?–) 630–640 µm long, (120–) 140–160 µm wide. Spores 9–16 µm. *n* = 6, *fide* M.E.Newton, *J. Bryol.* 7: 399, 400 (1973), as *H. novae-seelandiae*.

Occurs in N.S.W., Vic. and Tas. and rare in S.A; at elevations up to 1660 m. Also in New Zealand, Auckland Is.; Campbell Is., Chatham Is. and southern South America; doubtfully in Norfolk Is. Grows on soil, rocks, rotting logs and tree trunks in forest and scrubby woodland, frequently near streams and in humid habitats.

S.A.: Mt Gambier, *Wilhelmi* s.n. (BM, RO). N.S.W.: White Rock Mtn, *J.H.Willis* s.n. (MEL). Vic.: Errinundra R., *H.Streimann* 36592 (B, CANB, NY). Tas.: Mt Wellington, *R.A.Bastow* 147 (MEL, NSW); Wylds Craig, *D.A. & A.V.Ratowsky* B44e (CANB, GRO, NY).

The collection from S.A. (BM and RO) is credited to F.Mueller, but it was probably collected by Wilhelmi (*fide* E.Hampe, *Linnaea* 28: 215, 1856).

Fruiting specimens were frequently found.

This species was included in G.A.M.Scott & I.G.Stone's (*The Mosses of Southern Australia* 396, 1976) circumscription of *H. rotulatum*.

2. *Hypopterygium discolor* Mitt., in J.D.Hooker, *Handb. New Zealand Fl.* 2: 488 (1867)

T: "Wairoa forests Kiapara" [Kiapara Harbour], North Island, New Zealand, *S.Mossman* s.n.; lecto: NY, *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 163 (2002); Auckland, North Island, New Zealand, *C.Knight* s.n.; syn: not located; (excluded from syntypes: Auckland, North Island, New Zealand, *Jupp* s.n. NY [= *H. didictyon* Müll.Hal.]).

Hypopterygium scottiae Müll.Hal., *Linnaea* 35: 619 (1868). T: "Ash Island ad or. flum. Hunter [Hunter R.] litor. orient. Novae Hollandiae", N.S.W., *H.Scott* s.n.; syn: B (destroyed); lecto: BM; *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 163 (2002); isolecto: NY; Brisbane River, "Austral. or. aeq." [Qld], *A.Dietrich* s.n. syn: B (destroyed); isosyn: BM, BM ("1864"), JE, JE ("1865"), MEL (sub no. 451), NY, W.

Illustrations: J.D.Kruijer, *Blumea*, Suppl. 13: 164, fig. 20; 166, fig. 21 (2002).

Dioicous. Plants palmate to umbellate (rarely flabellate), rarely gemmiferous. Stipe to 30 mm long, tomentose at base; stipe leaves in 3 ranks (rarely 11 ranks in basal third of stipe). Frond to 3.5 cm wide, glabrous; branches not caducous; terminal cell of axillary hairs elliptic to rectangular, short to elongate, 30–70 × 10–30 µm, smooth or weakly covered with a white substance. Frond leaves in 3 ranks, transverse-ovate to elliptic, 0.5–1.5 mm long, 0.5–1.5 mm wide, persistent; margin (entire to) coarsely serrate-dentate; teeth 1 (or 2)-celled, to 40 µm long; border entire, green; laminal cells 15–60 × 15–25 µm.

Calyptra 2.0–2.5 (–3.0) mm long. Setae 9–40 mm long. Capsules barrel-shaped to narrowly ellipsoidal, 1.4–2.0 (–2.5) mm long, 0.9–1.5 mm wide; operculum 1.5–2.0 mm long. OPL: PPL: IPL = 4: 2: 6–10c. Exostome teeth 540–640 µm long, 125–160 µm wide. Spores 10–15 µm.

Occurs in coastal areas of eastern Qld and N.S.W. at elevations up to 330 m. Grows mainly on sandy soil in riverine rainforest, monsoon forest with a dense shrubby understorey and dry monsoon scrub, most frequently in shade, and near streams or in other damp places. Also in New Zealand (North Island), but not collected there since the nineteenth century.

Qld: Bundaberg, *H.Smithurst* 270 (MEL, NSW); Fraser Is., *C.Borough* 4 (CANB, L). N.S.W.: Ballina, *W.W.Watts* 3412 (NSW).

A report from Mt Gambier, S.A. (W.Mitten, *Trans. & Proc. Roy. Soc. Victoria* 19: 76, 1882) could not be verified. However, it was presumably based on a misidentification of *H. tamarisci* or *H. didictyon*. An erroneous report from Tasmania (H.W.Lett, *J. Bot.* 42: 252, 1904) was based on a misidentification of *H. tamarisci*.

Gemmiferous plants are rare and are usually damaged, while fruiting specimens are common in most collections with female plants.

3. *Hypopterygium tamarisci* (Sw.) Brid. ex Müll.Hal., *Syn. Musc. Frond.* 2: 8 (1850)

Hypnum tamarisci [Sw. ex] Sw., *Fl. Ind. Occid.* 3: 1825 (1806); Sw., *Prodr.* 141 (1788), *nom. inval.* (pre-starting point); *Hookeria arbuscula* Arn., *Disp. Méth. Mousses* (preprint) 56 (1825 [1826?]); *Mém. Soc. Hist. Nat. Paris*, sér. 2, 2: 305 (1826), *nom. illeg.* (later homonym), *non* Sm., *Trans. Linn. Soc. London* 9: 280, t. 23, fig. 3 (1808) [= *Camptochaete arbuscula* (Sm.) Reichardt]. T: Jamaica, O.Swartz s.n.; holo: UPS n.v.; iso: G, S, W (damaged).

Hypopterygium rotulatum (Hedw.) Brid. var. *incurvum* Brid., *Bryol. Univ.* 2: 714 (1827). T: “Nova Hollandia” [Australia], 1822; holo: B, ex Herb. A.P. de Candolle, s. coll.; iso: JE, ex Herb. Bridel, s. coll., s. dat.

Hypopterygium tenellum Müll.Hal., *Bot. Zeitung (Berlin)* 12: 557 (1854); *H. rotulatum* auct. *non* Hedw.: Montagne, *Ann. Sci. Nat. Bot.*, sér. 2, 17: 243 (1842), *fide* C.Müller, *Bot. Zeitung (Berlin)* 12: 558 (1854); *H. rotulatum* Mont. ex Okamura, *J. Coll. Sci. Imp. Univ. Tokyo* 36, 7: 25 (1915), *nom. nud.* (in synon.). [*Hypopterygium tenellum* Müll.Hal.]; given as a synonym, but probably meant as a misidentification. T: Nilgiri Hills, Tamil Nadu, India, Schmid s.n.; lecto: JE, *fide* T.Pfeiffer et al., *J. Hattori Bot. Lab.* 89: 65–66 (2000); isolecto: B (destroyed), BM, NY; Nilgiri Hills, Tamil Nadu, India, Perrottet s.n.; syn: B (destroyed), BM.

Hypopterygium muelleri Hampe, *Linnaea* 28: 215 (1856); *Pterobryon muelleri* (Hampe) Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 81 (1882). T: “In lapidibus ad ripam fluminis Buchan humidam” [Buchan R.], Vic., Mar. 1854, F.Mueller s.n. holo: BM (not located); holo?: MEL, *fide* J.D.Kruijer, *Glasgow Naturalist* 23(2): 16 (1997), sub no. 40; iso: MEL, WELT, both sub. nos 40 and 111. Types of *Hypopterygium muelleri* are absent from E.Hampe’s herbarium (BM) and were not located in other herbaria, except for two specimens in MEL and one in Sainsbury’s herbarium in WELT; see also T.Pfeiffer et al., *J. Hattori Bot. Lab.* 89: 68 (2000). The potential holotype is provided with annotations by E.Hampe. There is no evidence that another specimen from Buchan R. (in TDC) belongs to the type material, because its collector is unknown.

Hypopterygium viridulum Mitt., in J.D.Hooker, *Handb. New Zealand Fl.* 2: 487 (1867). T: Akaroa, Banks Penin., Canterbury, “Middle Island” [South Island], New Zealand, Kerr s.n.; lecto: NY, *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 200 (2002); Wellington, North Island, New Zealand, Stephenson s.n.; syn: not located with certainty; Wangaroa, North Island, New Zealand, Kerr s.n.; syn: not located; New Zealand, Stephenson 11b; syn?: NY; New Zealand, Stephenson 20; syn?: BM; NY.

Hypopterygium rigidulum Mitt. subsp. *balantii* Müll.Hal. ex Kindb., *Hedwigia* 40: 295 (1901); *H. rigidulum* Mitt. var. *balantii* Kindb. ex Streimann & J.Curn., *Austral. Fl. & Fauna Ser.* 10: 213 (1989), *nom. inval., err. pro* *H. rigidulum* Mitt. subsp. *balantii* Müll.Hal. ex Kindb. T: Botanical Garden of Berlin: palm house of the “Flora”, Charlottenburg, Berlin, Germany, “ad truncum *Balantii antarctii*”, 13 Nov. 1885, H.Graef s.n.; lecto: S, *fide* J.D.Kruijer, *Glasgow Naturalist* 23(2): 16 (1997) (sub. nos 45 and 33 in Herb. Kindberg); isolecto: B (destroyed), JE; Botanical Garden of Berlin: palm house of the “Flora”, Charlottenburg, Berlin, Germany, “ad truncum [putrid?] *Balantii antarctii*”, Nov. 1888, H.Graef s.n.; syn: B (destroyed); S (sub. nos 45 and 33 in Herb. Kindberg), JE.

Hypopterygium scottiae Müll.Hal. subsp. *denticulatum* Kindb., *Hedwigia* 40: 296 (1901). T: Toowoomba, Qld, but erroneously presented as being located in “Van Diemensland” [Tas.], [C.]H.Hartmann s.n., “distr. Rehmann n. 20”; holo: S.

Illustrations: F.M.Bailey, *Compr. Cat. Queensland Pl.* 665, fig. 635 (1913); J.D.Kruijer, *Blumea*, Suppl. 13: 48, pl. 2e & f; 210, fig. 29; 211, fig. 30; 212, fig. 31; 213, fig. 32; 214, fig. 33; 220, fig. 34 (2002); H.Streimann, *The Mosses of Norfolk Island* 103, fig. 47; 105, pl. 20 (2002).

Dioicous or monoicous and unisexual or (in part) bisexual. Plants pinnate to palmate or umbellate, gemmiferous or not. Stipe to 15 mm long, tomentose at base. Frond to 3.5 cm wide, glabrous; branches caducous or not; terminal cell of axillary hairs suborbicular to elliptic, short to oblong (or elongate), 20–75 × 10–30 µm, smooth. Stipe leaves in 3 or 11 (or more) ranks. Frond leaves in 3 ranks, transversely elliptic to ovate or elliptic, (0.1–) 0.7–1.2 mm long, (0.1–) 0.3–1.0 mm wide; distal ones occasionally caducous; margin entire to weakly (or coarsely) serrate-dentate; teeth 1-celled, to 15 (–30) µm long; border entire, colourless; laminal cells 20–60 × 10–25 µm.

Calyptra 1.5–2.5 mm long. Setae 4.0–14.5 mm long. Capsules ovoid to ellipsoidal or urceolate, 1.3–2.3 mm long, 0.7–1.2 mm wide; operculum 1.3–1.8 mm long. OPL: PPL: IPL = 4: 2: 6(–8)c. Exostome teeth 360–630 µm long, 105–130 µm wide. Spores 12–17 µm. *n* = 9, 18, c. 27 and 36, based on material from Mt Wilson, N.S.W., *fide* H.P.Ramsay, *Proc. Linn. Soc. New South Wales* 91: 220–230 (1967), as *H. rotulatum* (Hedw.) Brid.

Occurs in S.A., Qld, N.S.W., A.C.T., Vic. and Tas.; also in Lord Howe Is. and Norfolk Is.; a widespread pantropical and warm-temperate species. Grows on rocks (basalt, limestone and sandstone), the trunks of trees and palms, tree ferns, less often on rotting logs, vines and climbers, or on soil, usually in dry to wet forests, frequently near streams, in moist or wet

places, or in semi-shaded and shaded habitats. Found at altitudes up to 1660 m, but only to 480 m in Vic. and Tas.

S.A.: Naracoorte Caves, *A.J.Downing 0944* (MACQ). N.S.W.: Cann Valley Hwy, *H.Streimann 058506* (L). A.C.T.: Tidbinbilla Nature Reserve, *H.Streimann 1065* (B, CANB). Vic.: Mt Drummer, *D.Verdon 1253* (L). Tas.: St. Marys, *J.Curnow 2448* (CANB).

In Qld and north-eastern N.S.W. plants smaller than 1.5 cm predominate at every altitude, and medium-sized plants occur mostly at 500–1000 m; plants larger than 4.5 cm are rare. In south-eastern N.S.W., Vic. and Tas. small and medium-sized plants are almost equally abundant at all elevations.

Almost every plant has entire, weakly serrate or serrate-dentate leaves, but the frond leaves of a few plants from two localities near Proserpine, Qld are moderately to coarsely (serrate to) serrate-dentate. These plants did not grow under exceptional conditions.

The species shows considerable morphological variation across its global range. Regional and some ecological variation is especially noticeable in life form, size, sexuality and the presence or absence of propagules. Two informal variants of *H. tamarisci* can be recognised in Australia (Pfeiffer *et al.*, 2000; Kruijer, 2002). These are not sharply defined, and intermediates frequently occur in every part of the distributional range of the species.

‘*Australasian*’ variant: Monoicous (or dioicous). Plant (pinnate to) palmate or umbellate, frequently gemmiferous. Costa of frond amphigastria reaching 33–67% of amphigastrium length (to excurrent). Branches occasionally caducous. Equally frequent on rocks and as an epiphyte, less common on soil and rotting logs. Distribution: Qld, N.S.W., A.C.T., Vic., Tas., Lord Howe Is., Norfolk Is., New Zealand, New Caledonia.

‘*Australian*’ variant: Dioicous. Plant pinnate to bipinnate (or partly tripinnate), not gemmiferous. Costa of frond amphigastria reaching 67% of amphigastrium length to excurrent. Branches not caducous. Most frequent on rocks, less common on soil, rotting logs and as an epiphyte. Distribution: Qld, N.S.W., A.C.T., Vic., Tas.

The ‘*Australasian*’ variant predominates in Qld and north-eastern N.S.W. The variants have equal occurrence in south-eastern N.S.W. and Vic., and the species is rare in Tas.

Doubtful Species

Hypopterygium rotulatum (Hedw.) Brid., *Bryol. Univ.* 2: 713 (1827)

Leskea rotulata Hedw., *Sp. Musc. Frond.* 213, t. 51, figs 8–13 (1801). T: “*Insulae meridionales*”, *coll. unknown* [absent from the Hedwig-Schwägrichen herbarium in G; not located elsewhere]; lecto: The illustrations in Hedwig (1801), *vide* J.D.Kruijer, *Blumea*, Suppl. 13: 250 (2002).

Hedwig’s description and illustrations of *H. rotulatum* do not differentiate this taxon from other *Hypopterygium* species, and they have caused considerable confusion (Kruijer, 2002). Specimens from Australia that had been identified as *H. rotulatum* proved to be either *H. didictyon* or *H. tamarisci*. H.N.Dixon’s (*Bull. New Zealand Inst.* 3(5): 296, 1927) *H. rotulatum* agrees with *H. tamarisci*. Reports of *H. rotulatum* in G.A.M.Scott & I.G.Stone (*The Mosses of Southern Australia* 396, 1976) are referable to *H. didictyon* and *H. tamarisci*.