

LOPIDIUM

Hans (J.D.) Kruijer¹

Lopidium Hook.f. & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 119 ('1855') [1854]; from the Greek *λοπίς* (*lopis*, a scale); the authors did not give any reference or indication as to which part of the plant they had in mind when they invented the name *Lopidium* for their new genus.

Hypopterygium subg. *Lopidium* (Hook.f. & Wilson) Bosch & Sande Lac., *Bryol. Jav.* 2: 8 (1861); *Hypopterygium* sect. *Lopidium* (Hook.f. & Wilson) Mitt., *J. Linn. Soc., Bot.* 12: 329 (1869); *Lophidium* Brid. ex Rodway, *Pap. & Proc. Roy. Soc. Tasmania* 1913: 237 (1914), *nom. illeg. incl. gen. prior., err. pro Lopidium* Hook.f. & Wilson.

Lecto: *L. concinnum* (Hook.) Wilson.

Plants pinnate to bipinnate, occasionally tripinnate, flabellate or weakly dendroid, rarely simple. Stipe tomentose at base. Frond rhomboidal to ovate to shortly linear-elliptic, glabrous; rudimentary branches absent; axes terete; central strand present or absent; axillary cavities present or absent; inclusions colourless to olivaceous or reddish brown; axillary hairs 2–4-celled. Foliation complanate except for the stipe base and innovations (occasionally not complanate in *L. concinnum*). Leaves in 3 ranks, dull; apex obtuse or acute or acuminate; costa simple, nearly percurrent to excurrent; laminal cells collenchymatous, isodiametric, transversely hexagonal or hexagonal; walls incrassate.

Calyptra cucullate, white, pale ochraceous or partly brown, glabrous or set with paraphyses, partly membranous, partly fleshy. Setae horizontal or ascending, straight to uncinata, ochraceous to brown, mammillose. Capsules erect to pendulous, ochraceous to brown; rostrum oblique. Exostome present; endostome not ciliate or rudimentary-ciliate by 1 (or 2) plates; basal membrane reaching no more than one-third the length of the exostome.

A genus of two species, both of which occur in Australia. *Lopidium struthiopteris* occurs mainly in the Palaetropics, while *L. concinnum* is a (warm-) temperate species of the Southern Hemisphere. Species show great variability in the size of the plant, the length of the stipe, rachis and branches, and the degree of ramification and the number of branches, a character that has a considerable impact on the shape of the frond.

Gemmae always absent; monoicous; paraphyses absent or present in mature perichaetia, never extending; exostome teeth at least 70 µm wide; calyptra glabrous.....**1. L. concinnum**

Gemmae present; dioicous; paraphyses present in mature perichaetia, frequently longer than perichaetial leaves; exostome teeth less than 70 µm wide; calyptra set with paraphyses**2. L. struthiopteris**

1. *Lopidium concinnum* (Hook.) Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 119 ('1855') [1854]

Leskea concinna Hook., *Musci Exot.* 1: t. 34 (1818); *Hookeria concinna* (Hook.) Hook. & Grev., *Edinburgh J. Sci.* 2: 232 (1825); *Hypopterygium concinnum* (Hook.) Brid., *Bryol. Univ.* 2: 711 (1827). T: "Dusky Bay" [Dusky Sound], South Island, New Zealand, 1791, *A.Menzies s.n.*; holo: BM (sub nos 84 and *H. 1529a*); iso: BM (fragments sub no. *H. 1529b*), G? (*n.v.*), S; iso?: NY (Herb. Mitten, *s. loc.*). Several annotations in Wilson's herbarium attached to the specimens with the number *H. 1529b* refer to them as original specimens and duplicates of the holotype.

Lopidium pallens Hook.f. & Wilson, in J.D.Hooker, *Fl. Nov.-Zel.* 2: 119 ('1855') [1854]; *Hypopterygium pallens* (Hook.f. & Wilson) Mitt., *Hooker's J. Bot. Kew. Gard. Misc.* 8: 265 (1856); *Hypopterygium pallens* (Hook.f. & Wilson) Reichardt, *Reise Novara, Pilze, Leber-Laubm.* 1(3): 194 (1870), *nom. illeg.* (later homonym). T: Hutt Valley, Wellington, North Island, New Zealand, *D.Lyall 126*; lecto: BM, *fide* J.D.Kruijer, *Blumea*, Suppl. 13: 255 (2002); Waikahi, New Zealand, *J.Sinclair s.n.*; syn: BM; Ship Cove, New Zealand, *D.Lyall s.n.*; syn: BM; Bay of Islands, North Island, New Zealand, *J.D.Hooker 386* ("New Zealand,

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Antarct. Exp. 1839–43”); syn: BM; Auckland, North Island, New Zealand, *J.Sinclair s.n.*; syn: BM; Wellington, North Island, New Zealand, *D.Lyall 112*; syn: BM; Milford Sound, South Island, New Zealand, *D.Lyall 23*; syn: BM; Bligh’s Sound, South Island, New Zealand, *D.Lyall 184*; syn: BM.

Hypopterygium hyalinolimbatum Müll.Hal. ex Kindb., *Hedwigia* 40: 281 (1901), *nom. nud.* (in synonym.) [*H. pallens* (Hook.f. & Wilson) Mitt. subsp. *plumarium* (Mitt.) Kindb.]; *Lopidium hyalinolimbatum* M.Fleisch., *Hedwigia* 63: 213 (1922), *nom. nud.*; *H. hyalolimbata* Müll.Hal. ex Burges, *Proc. Linn. Soc. New South Wales* 60: 88 (1935), *nom. illeg.*, *orthogr. err. pro H. hyalinolimbatum* Müll.Hal. ex Kindb. Based on: Moss Vale, N.S.W., 8 Nov. 1884, *T.Whitelegge s.n.* [MEL (sub no. 189, “on rocks”), S].

Illustrations: B. & N.Malcolm, *Mosses and other Bryophytes* 1, 78, 86, 156 (2000); J.D.Kruijer, *Blumea*, Suppl. 13: 50, pl. 3b; 257, fig. 37; 258, fig. 38; 270, fig. 41B (2002); W.R.Buck, D.H.Vitt & W.M.Malcolm, *Key to the Genera of Australian Mosses* 37 (2002).

Monoicous (or dioicous), unisexual (in Australia). Plants not gemmiferous. Stipe to 2.0 (–2.5) cm long. Frond to 5 (–9) cm long; central strand absent; axial cavities absent, cortical or central, 5–9 (T.S.); terminal cell of axillary hairs suborbicular to rectangular, short to elongate, (10–) 15–35 × (7–) 10–15 µm, smooth. Frond leaves ovate to oblong or lanceolate-ovate, 0.5–3.5 mm long, (0.2–) 0.5–1.5 mm wide; distal ones occasionally caducous; margin weakly serrate-dentate to moderately serrate; teeth 1-celled, to 40 µm long; border entire or interrupted near the leaf apex, colourless; laminal cells 7–20 × 7–20 µm.

Paraphyses of mature perichaetia absent or filiform or leaf-like, to 1.3 mm long, to 0.2 mm wide, shorter than the perichaetial leaves. Calyptra 1.2–2.5 mm long, glabrous. Setae 3.5–6.0 mm long. Capsules subglobose to cylindrical, 0.7–2.0 mm long, 0.4–1.0 mm wide; operculum 0.9–1.4 mm long. OPL: PPL: IPL = 4: 2: 4–6c. Exostome teeth 390–600 µm long, 75–90 µm wide. Basal membrane reaching one-third of the exostome. Spores 11–20 µm. *n* = 12, *vide* H.P.Ramsay, in A.Löve, *Taxon* 16: 559 (1967); H.P.Ramsay, *Austral. J. Bot.* 22: 327, 328 (1974); G.A.M.Scott & I.G.Stone, *The Mosses of Southern Australia* 401 (1976), based on material from N.S.W.

Occurs in N.S.W., Vic. (to 1130 m altitude) and Tas. (to 500 m), and possibly in southern Qld; restricted to the east and south of the Great Dividing Range. Grows on trunks, stem bases and the branches of trees; also on tree ferns and on rocks; less frequently terrestrial or on exposed roots, in forests, often in shaded or wet habitats. Also in New Zealand, Chile, Bolivia and Brazil, and doubtfully in Norfolk Is. (Kruijer, 2002).

N.S.W.: Nadgee State Forest, *H.Streimann 38183* (CANB, NY). Vic.: Turtons Rd, Otway Ra., *H.Streimann 2453* (CANB, L). Tas.: Hellyer Gorge, *W.A.Weber & D.McVean B-33365* (GRO, NICH, NY).

One specimen was possibly collected in southern Qld [Moreton Bay (MEL)], but its collector is unknown and mislabelling cannot be ruled out.

Plants show great variability in the length and density of the leaves and amphigastria. Deeply shaded plants often have distant leaves and amphigastria, and are frequently weakly branched with a few, short and distant branches. Fruiting specimens were frequently found.

According to Kruijer (2002) most plants belong to an informal “anisophyllous” variant of *L. concinnum* which is characterised by having an anisophyllous foliation and asymmetrical, ovate to ovate-oblong lateral leaves. Other plants belong to an “isophyllous” variant with partly or entirely isophyllous foliation with symmetrical, ovate to lanceolate-ovate lateral leaves. Isophyllous plants are often dioicous, predominantly male, and frequently have caducous frond leaves. Plants that belong to the anisophyllous variant are less often dioicous and have less frequently caducous leaves. The two variants are not sharply defined, and intermediates are known.

2. *Lopidium struthiopteris* (Brid.) M.Fleisch., *Musc. Buitenzorg* 3: 1073 (1908)

Hypnum struthiopteris Brid., *Muscol. Recent.*, Suppl. 2: 87 (1812); *Pterygophyllum struthiopteris* (Brid.) Brid., *Muscol. Recent.*, Suppl. 4: 151 ('1819') [1818]; *Hookeria struthiopteris* (Brid.) Arn., *Disp. Méth. Mousses* (preprint) 56 (1825 [1826?]); *Mém. Soc. Hist. Nat. Paris*, sér. 2, 2: 305 (1826); *Hypopterygium struthiopteris* (Brid.) Brid., *Bryol. Univ.* 2: 716 (1827). T: In Insula Borboniâ hábitat [Réunion], *P. Commerson(?) s.n.*; holotype: B (destroyed); isotype: not located with certainty; Réunion, *P. Commerson s.n.*; neotype: BM, *vide* J.D. Kruijer, *Blumea*, Suppl. 13: 265 (2002).

Lopidium pinnatum Hampe, *Linnaea* 38: 672 (1874); *Hypopterygium pinnatum* (Hampe) A. Jaeger, *Ber. Tätigk. St. Gallischen Naturwiss. Ges.* 1874–75: 150 (*Gen. Sp. Musc.* 2: 66) (1876); *Hypopterygium struthiopteris* (Brid.) Brid. subsp. *pinnatum* (Hampe) Kindb., *Hedwigia* 40: 282 (1901); ?*Hypopterygium planatum* Müll. Hal. ex Mitt., in F. Mueller, *Fragm.* 11 (Suppl.): 114 (1881), *nom. inval.*, *err. pro H. pinnatum* (Hampe) A. Jaeger?; *Hypopterygium planatum* Hampe ex Mitt., *Trans. & Proc. Roy. Soc. Victoria* 19: 76 (1882), *nom. inval.*, *err. pro H. pinnatum* (Hampe) A. Jaeger; *Lopidium planatum* Hampe ex Mitt. ex Streimann & Klazenga, *Cat. Austral. Mosses* 112 (2002), *nom. inval.*, *err. pro H. planatum* Hampe ex Mitt. T: Mt Elliot, Qld, *K. Fitzalan s.n.*; holotype: BM; isotype: MEL ("parce intermixitum"), S (sub no. 8).

Hypopterygium daymanianum Broth. & Geh., in V. Brotherus, *Oefvers. Förh. Finska Vetensk.-Soc.* 40: 193 (1898); *Hypopterygium struthiopteris* (Brid.) Brid. subsp. *daymanianum* (Broth. & Geh.) Kindb., *Hedwigia* 40: 283 (1901); *Lopidium daymanianum* (Broth. & Geh.) M. Fleisch., *Musc. Buitenzorg* 3: 1071 (1908). T: Mt Dayman, Milne Bay Prov., [Papua] New Guinea, 1894?, *W.E. Armit Jnr s.n.*; holotype: H n.v.; isotype: FH (ex Herb. Geheeb), S (sub 658, ex Herb. Brotherus).

Illustrations: H. Mohamed & H. Robinson, *Smithsonian Contr. Bot.* 80: 41, figs 151–158; 42, figs 159–168 (1991); M.L. So, *Mosses & Liverworts of Hong Kong* 61 (1995); J.D. Kruijer, *Blumea*, Suppl. 13: 50, pl. 3a; 269, figs 39, 40; 270, fig. 41A (2002).

Dioicous. Plants frequently gemmiferous. Stipe to 3 cm long. Frond to 6 cm wide; central strand present or absent; axial cavities absent, (sub)central, 1 or 2 (T.S.); terminal cell of axillary hairs suborbicular to narrowly elliptic, short, 10–20 × 7–15 µm wide. Frond leaves ovate to lanceolate-ovate, (0.3–) 1.0–2.5 mm long, (0.1–) 0.4–1.0 mm wide, not caducous; margin entire or weakly serrate to moderately serrate-dentate; teeth 1 or 2-celled, to 18 µm long; border absent, interrupted or entire; laminal cells 5–20 (–25) × 5–15 µm.

Paraphyses of mature perichaetia leaf-like, to 2.5 mm long, 0.05 mm wide, at least a few longer than the perichaetial leaves. Calyptra 2.1–2.5 mm long, set with paraphyses. Setae 4–10 mm long. Capsules barrel-shaped to cylindrical, 1.9–3.1 mm long, 0.6–1.0 mm wide; operculum

1.2–2.0 mm long. OPL: PPL: IPL = 4: 2: (4?)6–8c. Exostome teeth 300–345 µm long, 50–60 µm wide. Basal membrane reaching c. 10% the height of the exostome. Spores 13–19 µm. *n* = 11, *vide* S. Inoue, *Misc. Bryol. Lichenol.* 8: 112 (1979), based on Japanese material.

Occurs in eastern Qld and north-eastern N.S.W.; grows on tree trunks, also on treelets, branches and climbers, occasionally on tree ferns, rock (granite, limestone, conglomerate and sandstone) and rotting logs, rarely on soil; found in forest, usually in deep or partial shade, but occasionally in open habitats. Also in Africa, Indo-Malaysia, warm-temperate parts of China and Japan and Melanesia.

Qld: Mt Finnegan, *L.J. Brass 20093* (FH); Walter Hill Ra., *H. Streimann 30553* (CANB, L, NY); Lamington Natl Park, *B.M. Thiers 1205* (NY). N.S.W.: Briggsdale, *H. Streimann 6633* (CANB).

Lopidium struthiopteris was reported from Tasmania by W. Mitten (*J. Proc. Linn. Soc., Bot.* 4: 96, 1860) and from New Zealand, Tasmania and Chile by J.D. Hooker (*Handb. New Zealand Fl.* 489, 1867), because they erroneously considered this species to be conspecific with *L. pallens* Hook.f. & Wilson.

The dimensions of the frond leaves, the shape of the leaf apex and the extent of the leaf border show great variability. The border of branch leaves is frequently less well developed than that in rachis leaves. The absence of a leaf border or the presence of a faint or interrupted border occurs most frequently in small plants or small stems of medium-sized or large plants. A border is frequently absent in the leaves of minute plants. Small plants occur at every altitude, but large plants are possibly restricted to higher elevations.

A variant found most commonly in Qld is represented by ± slender plants that have only a few distant branches. The branches and lateral frond leaves are usually erecto-patent.

The 'normal' variant of *L. struthiopteris* predominates in most other parts of the distributional area of the species, but it also occurs in Qld. Plants are moderately to densely branched and have several to numerous, closely set branches. The branches are patent to widely patent. The lateral frond leaves similarly often patent to widely patent, and are less frequently erecto-patent than in the 'Queensland' variant. The two variants are not sharply defined and intermediates are known (Kruijer, 2002).

Doubtful Species

Lopidium nematosum (Müll.Hal.) M.Fleisch., *Hedwigia* 63: 213 (1922)

Hypopterygium nematosum Müll.Hal., *J. Mus. Godeffroy* 3: 80 (1874); *H. struthiopteris* (Brid.) Brid. subsp. *nematosum* (Müll.Hal.) Kindb., *Hedwigia* 40: 282 (1901). T: N.S.W., *Mrs Kayser s.n.*; holo: B (destroyed); iso: not located.

This is probably conspecific with one of the two accepted *Lopidium* species (Kruijer, 2002).