



Lepidozia bragginsiana, a new species from New Zealand (Marchantiopsida)

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Abstract

Molecular and morphological data support the recognition of a new *Lepidozia* species related to *L. pendulina* and also endemic to New Zealand, which we dedicate to Dr John Braggins. *Lepidozia bragginsiana* can be distinguished from closely related and other similar species by its bipinnate branching, the narrow underleaf lobes, typically uniseriate toward their tip on both primary and secondary shoots, the asymmetric underleaves on primary shoots that are usually narrower than the stem and also possess basal spines and spurs, the production of spurs and spines, or even accessory lobes, on the postical margin of primary and secondary shoot leaves; and by the relatively small leaf cells with evenly thickened walls. *Lepidozia bragginsiana* is an inhabitant of hyper-humid forest habitats where it occupies elevated microsites on the forest floor. A lectotype is proposed for *L. obtusiloba*.

Introduction

The Lepidoziaceae Limpricht in Cohn (1877: 310) is perhaps the most comprehensively treated family within Australasian liverworts, having been subject to intensive and ongoing study and revision (e.g. Schuster 1980, 2000; Schuster & Engel 1987, 1996; Engel & Glenn 2008, Engel & Merrill 2004, Engel & Schuster 2001, Cooper *et al.* 2011, 2012). One of the most species rich genera is *Lepidozia* (Dumortier 1831: 69) Dumortier (1835: 19) with around 80 species worldwide and 23 in New Zealand (Engel & Glenn 2008). Recent phylogenetic study of the family (Heslewood & Brown 2007, Cooper *et al.* 2011, 2012a, 2012b) is proving exceptionally useful for resolving a higher order classification that reflects phylogenetic relationships (Cooper 2013) and a major bibliographic initiative is building a comprehensive nomenclatural resource (von Konrat *et al.* 2010, Söderström *et al.* 2012, Cooper *et al.* 2013). The publication of the Liverwort Flora of New Zealand and associated treatments is stimulating interest in New Zealand liverworts by enabling and encouraging people to look at and understand their plants within a regional context, with the result that potentially new entities are sometimes discovered. To date species discovery within the Lepidoziaceae, as in most liverwort groups, has proceeded on the basis of morphological data alone (e.g. Schuster 1980, 2000; Schuster & Engel 1987, 1996; Renner *et al.* 2006; Meagher 2006, 2008, 2011), and molecular data have not yet been specifically applied to species discovery. However, standard practice for phylogeny reconstruction involves representative sampling of species across taxonomic groups ideally including multiple individuals from each species to ensure data quality. This approach led to the inclusion of several representatives of the New Zealand species *Lepidozia pendulina* (Hooker 1818: 60) Lindenb. in Gottsche *et al.* 1845: 208) in the phylogeny of Cooper *et al.* (2012a). One of these specimens was found to possess a unique combination of characters among New Zealand species (see *recognition* below), and sequence data did not support a close relationship between it and any other species (Fig. 1 and Cooper *et al.* 2012a). Further investigation of herbarium material and further survey work in the South Island confirmed the existence of two morphological groups within *Lepidozia pendulina*. We therefore describe the species as new to science and dedicate it to Dr John Braggins who was instrumental in its discovery. *Lepidozia bragginsiana* possesses a combination of characters somewhat intermediate between *L. pendulina* and *L. obtusiloba* Stephani (1909: 598). Comparison with *L. obtusiloba* prompts our lectotypification of this species. Throughout the manuscript herbarium acronyms follow Thiers (2014).

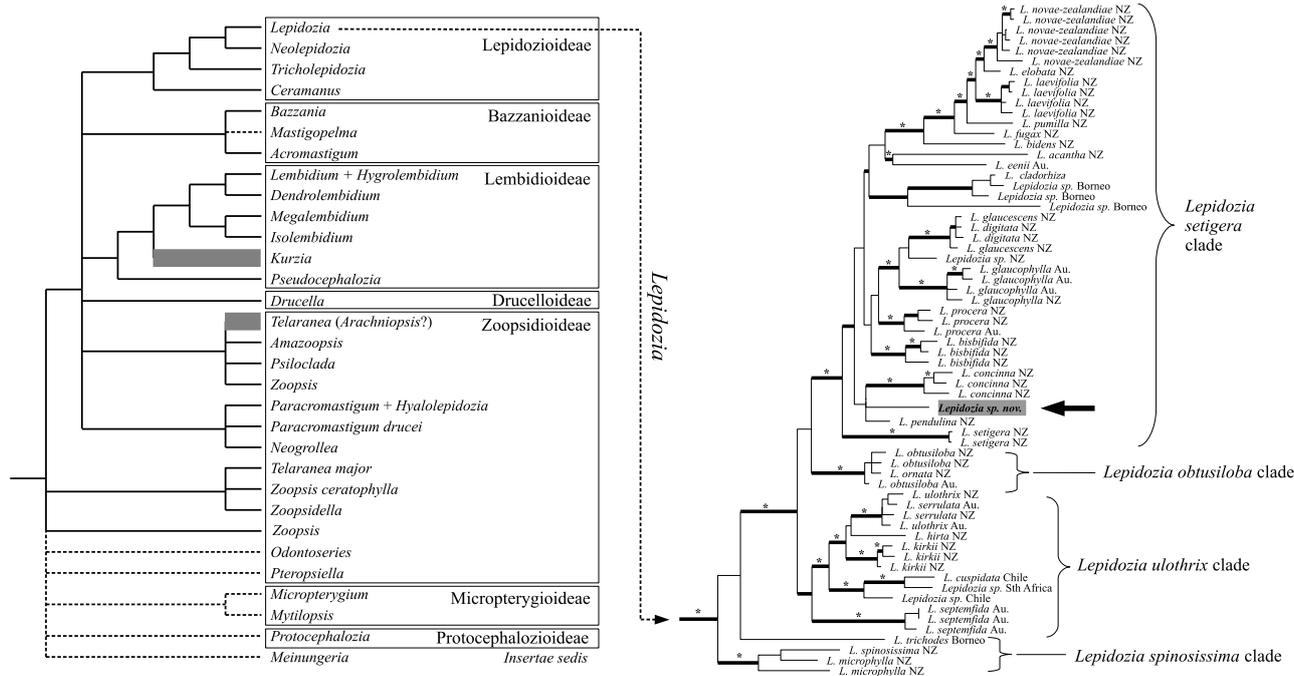


FIGURE 1. Phylogenetic placement of *Lepidozia bragginsiana* sp. nov. Left: summary of current phylogenetic knowledge of Lepidoziaceae showing the position of *Lepidozia* within a well supported Lepidozioideae (re-drawn from Cooper (2013)). Right: expansion of the phylogeny of *Lepidozia* (re-drawn from Cooper et al. (2012a)). The phylogenetic position of *Lepidozia bragginsiana* sp. nov. is indicated by the arrow.

Lepidozia bragginsiana E.D.Cooper et M.A.M.Renner sp. nov. Figs 2, 3A, 4A–C.

Type:—New Zealand, South Island, Westland, Grey River catchment, Papanoa Range, Blackball Stream, Blackball Road, 42°20'22"S 171°23'44"E, 230 m, 17 Feb 2012, M.A.M. Renner 6190 (holotype: AK; isotypes: NSW, F).

Diagnosis:—Distinctive within *Lepidozia* in its bipinnate branching, erect primary shoots and turf forming habit; leaves with an auriculate antical base and occasional production of accessory spurs or projections on the postical margin, projections often small and tooth-like but variably taking a range of forms through to having the size and shape of the adjacent postical leaf-lobe; leaf-lobe cells with evenly and continuously thickened cell walls, underleaves of primary shoots equal or narrower in width to stem, with a small projection on each side of the medial or upper disc margin, lobes attenuate, to 0.5× the underleaf length, often asymmetrically lobed, 4(-6) cells wide at their base; underleaves on secondary shoots wider than stem, with rounded to toothed bases, slightly larger in absolute size than underleaves on primary shoots, symmetrically lobed.

Description:—Plants erect, rigid, with ventrally secund branches, pale green to golden yellow-green, shoots robust, to 2 cm wide (branch extremity to branch extremity). Branching mostly of the *Frullania*-type, pinnate or bipinnate, the latter with branches typically originating from the side of the branch toward the shoot apex, secondary shoots almost equal to the primary shoots in stature, though often becoming flagelliform; branch half-leaf 2-lobed, acroscopic margin faintly and irregularly denticulate, often one or both margins with a triangular or spine-like tooth near the disc base, first branch underleaf (3–)4-lobed, inserted on ventral lateral side of main axis in a position half way between leaves and underleaves of main shoot. Ventral intercalary branching rare and sporadic. Stems rigid, 400–520 µm diameter on main shoots, 155–270 µm diameter on branches, cortical cells in 1 layer of slightly larger, quadrate cells with evenly thickened, yellow-brown pigmented cell walls, external cell wall differentially thickened, approximately twice as thick as internal cell walls, internal to the cortical layer are 3–4 tiers of smaller cells whose walls are continuously but unevenly thickened, these cells transition to larger cells whose walls are thickened by triangular or bulging trigones, and faint continuous medial thickenings. Leaves slightly concave, contiguous to imbricate, weakly spreading to appressed to stem, the insertion distinctly incubous; on primary shoots 850–1150 µm at longest point, 1100–1450 µm at widest point, on secondary shoots 680–880 µm at longest point, 740–1125 µm at widest point; asymmetrically 4-lobed, dorsal lobe divided to 0.33, ventral lobe divided to 0.75, lobes broadly attenuate, acute, divergent to widely divergent, the ventral lobe postically displaced, widely divergent as a ‘claw’ particularly on primary shoot leaves, the dorsal lobes entire, 8–12 cells wide at base, the lobes terminating in a uniseriate row of 3–4 cells slightly longer than wide and

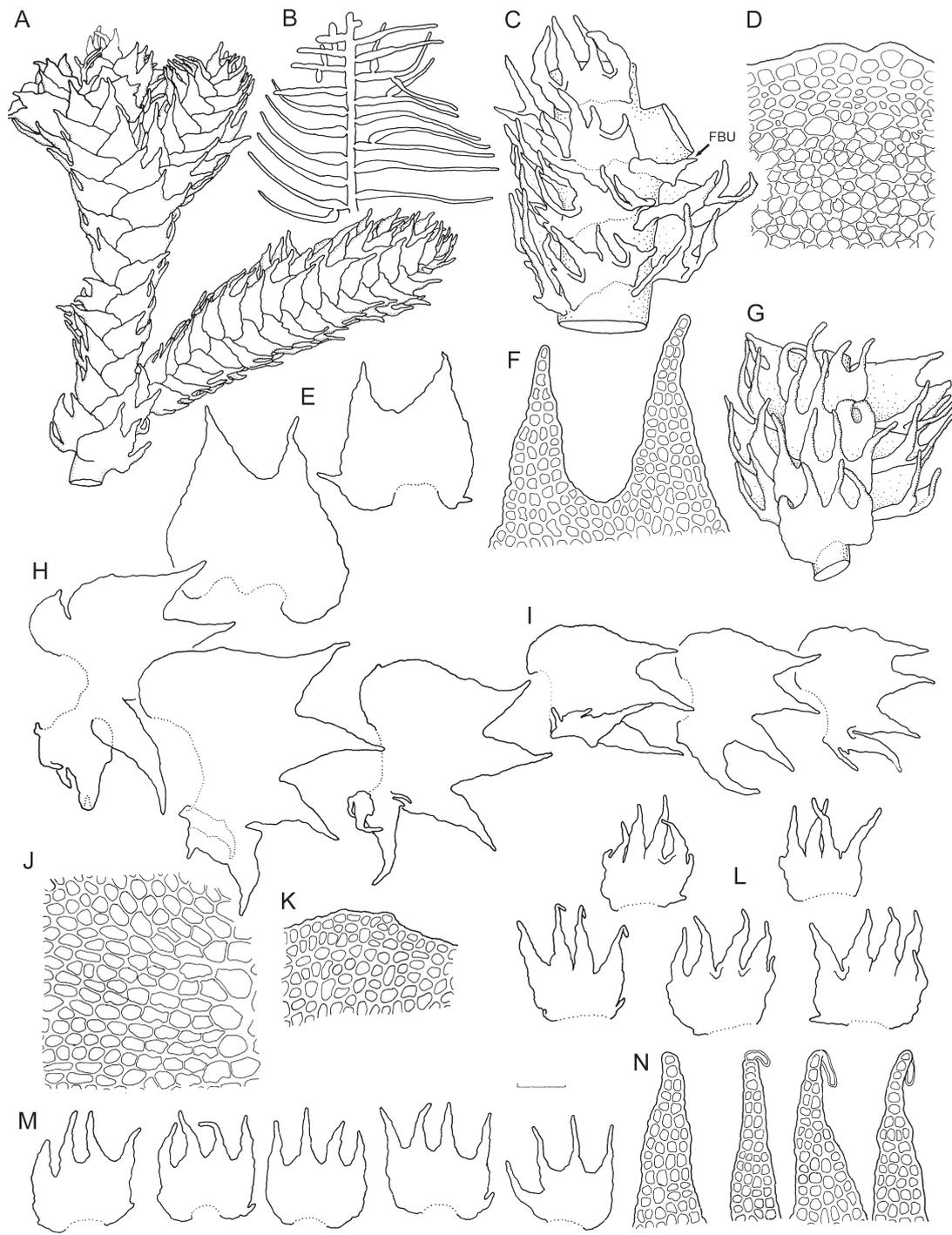


FIGURE 2. Line drawing of *Lepidozia bragginsiana* sp. nov. A: Dorsal view of shoot showing primary and secondary shoots originating from Frullania-type branches (1800 μ m). B: Cladogram showing irregular bipinnate branching of shoot system (4000 μ m). C: Segment of primary shoot showing asymmetrical underleaves and base of Frullania-type branch (first branch underleaf indicated) (750 μ m). D: Part of stem transverse section from primary shoot showing weakly differentiated cortical layer (120 μ m). E: Two Frullania-type branch half leaves from primary shoot, illustrating slight asymmetry and variable production of basal spines (750 μ m). F: Antical pair of leaf lobes from leaf on primary shoot (120 μ m). G: Segment of secondary shoot showing symmetrical underleaves (750 μ m). H: Three leaves from primary shoot, illustrating variable production of spurs and spines on postical margin (750 μ m). I: Three leaves from secondary shoot, illustrating variable production of spurs and spines on postical margin to lesser extent than on leaves from primary shoots (750 μ m). J: Cells from mid-leaf, showing evenly thickened walls and slight enlargement toward leaf base (120 μ m). K: Cells from leaf margin, showing weak tooth on dorsal margin (120 μ m). L: Five underleaves from primary shoot, illustrating asymmetry, narrow base, and variable production of spurs and spines on basal margins (750 μ m). M: Five underleaves from secondary shoot, illustrating more symmetry, 'lobed' base, and infrequent production of basal spurs and spines (750 μ m). N: Lobe apices from primary shoot underleaf, illustrating the clawed papilla at each lobe apex (120 μ m). All from *Brown 08/266* (NSW).

thick-walled; disc distinctly asymmetrical, 17–25 cells high at dorsal sinus, 6–12 cells high at ventral sinus, the dorsal margin broadly ampliate, more or less cordate at base, acroscopic margin typically faintly and irregularly denticulate, occasionally with a single triangular tooth at one third from the base, particularly on primary shoot leaves; basicopic margin entire to toothed with one or more accessory spurs, spines, or (rarely) lobes particularly on primary shoot leaves. Cells of dorsal disc margin and lobes isodiametric to rectangular, 12–15 µm long and wide, forming indistinct border 2–7 cells wide, wider on dorsal margin; cells of mid-disc distinctly thick-walled 18–20 µm wide by 22–25 µm long; basal cells larger still; cell surfaces smooth, unornamented. Oil-bodies not known. Underleaves on main shoots spreading to squarrose, 460–640 µm tall, 370–700 µm wide, symmetrically or weakly asymmetrically 4-fid to 0.5–0.66 (median sinus), sinuses sharp, plane or reflexed, lobes narrow, attenuate, acuminate, 4–6 cell rows wide at base, margins entire but the septa of marginal cells usually weakly thickened and swollen, sharp at apex with a uniseriate row of 2–6 cells, disc 6–13 cells high at median sinus, the margins with a prominent triangular to spine-like tooth at the base. Underleaves on branch shoots spreading, usually symmetrically 4-fid to 0.5 (median sinus), rarely asymmetrical, sinuses U-shaped, plane, lobes 4 cell rows wide at base, attenuate, margins entire, disc 8–15 cells high at median sinus, the margins usually entire, subcordate at base, often with a single triangular to spine-like tooth. Asexual reproduction absent. Reproductive structures not seen.

Etymology:—named to honour Dr John E. Braggins (1944-), for his contribution to botany and bryology in New Zealand (see Anon. 2013). In particular the name recognises John’s role in guiding the liverwort collecting expeditions of many overseas researchers in New Zealand, including the trip that yielded the specimen from which his *Lepidozia* species was first recognised. It also recognises the inspiring role John has played in mentoring and encouraging a younger generation of bryologists trained in New Zealand.

Recognition:—The combination of bipinnate branching and asymmetric leaves with a wide sinus between the 3rd and 4th lobes, are characters that have been associated with *L. pendulina*, a large and widespread forest inhabiting species. The shared possession of these two characters may lead to confusion between *L. bragginsiana* and *L. pendulina*, and may explain the comment regarding branching variability by Engel & Glenny (2008) that small, poorly developed populations of *L. pendulina* have secondary branches weakly developed or absent. In our experience, *L. pendulina* is always a large, robust plant with a characteristic shoot architecture including well-developed secondary branches. In the field the combination of bipinnately branched shoot systems with remote and widely spreading leaves on primary shoots is diagnostic of *L. pendulina* (Fig. 3).

Other characters separating *L. pendulina* from *Lepidozia bragginsiana*, include 1) leaves lacking appendages on postical margin vs with appendages; 2) absence of a well-defined field of large cells in middle and base of leaf disc vs presence of such; 3) triangular underleaf lobes 10–13 cells broad at their base vs attenuate underleaf lobes 4 cells broad at their base (Fig 4).

Sporadic bipinnate branching also occurs in *L. obtusiloba*. Characters separating *L. bragginsiana* from *L. obtusiloba* and *L. pendulina* are summarized in Fig. 4.

The presence of ornamentation on the basal underleaf margins, and particularly the postical margin of the leaf lobe, has been associated with *L. ornata* Engel in Engel & Schuster (2001: 49). However, in *L. ornata* 1) the shoots are pinnately branched, and branching may be irregular and secondary shoots may differ in stature; 2) the sinus between 1st and 2nd leaf lobes is shallow, as in *L. obtusiloba*; 3) the 4th lobe points in same direction as other lobes; 4) the antical half of leaf is patent but lies in plane with the stem; 5) the underleaf margin at bottom of sinus between underleaf lobes is reflexed; 6) the underleaf lobes are typically 4–6 cells broad at base, and broader toward the apex; 7) accessory lobes on underleaves lobe-like rather than spine or spur-like; 8) the same is true for leaves; 9) accessory lamellae and flattened paraphyllia like appendages may occur on surface of leaf disc; 10) the underleaf lobe apices are obtuse, ending in one, two, or more cells, rarely if ever with uniseriate apical portion, and 11) the lobes are two or more cells wide for their entire length.

While the single accession of *L. ornata* included in the phylogeny nests within a clade alongside individuals of *L. obtusiloba*, we accept species status for *L. ornata* on the basis of morphological and ecological differences from *L. obtusiloba* (Engel & Schuster 2001). New Zealand’s Southern Alps are geologically young as probably are the alpine habitats within which *L. ornata* grows. Recent divergence and incomplete lineage sorting may explain the nestedness of morphological entities in this instance.

The presence of a well-defined field of large disc cells and deeply divided underleaves with acute lobe apices are distinctive features shared by *L. concinna* Colenso (1886: 244) and *L. bragginsiana*. *Lepidozia concinna* differs from *L. bragginsiana* in 1) underleaves on main branches symmetrically divided, wider than stem and narrowed to their insertion vs asymmetrically divided, as wide or narrower than the stem, and adnate, 2) lack of accessory armature on the basal margin of the underleaves vs present, 3) lack of accessory armature on postical leaf margin vs present, 4) lack of indistinct tooth on dorsal leaf margin vs usually present, 5) the generally lower leaf disc, 12–19 vs 17–25 cells high 6) pinnate vs bipinnate branching.

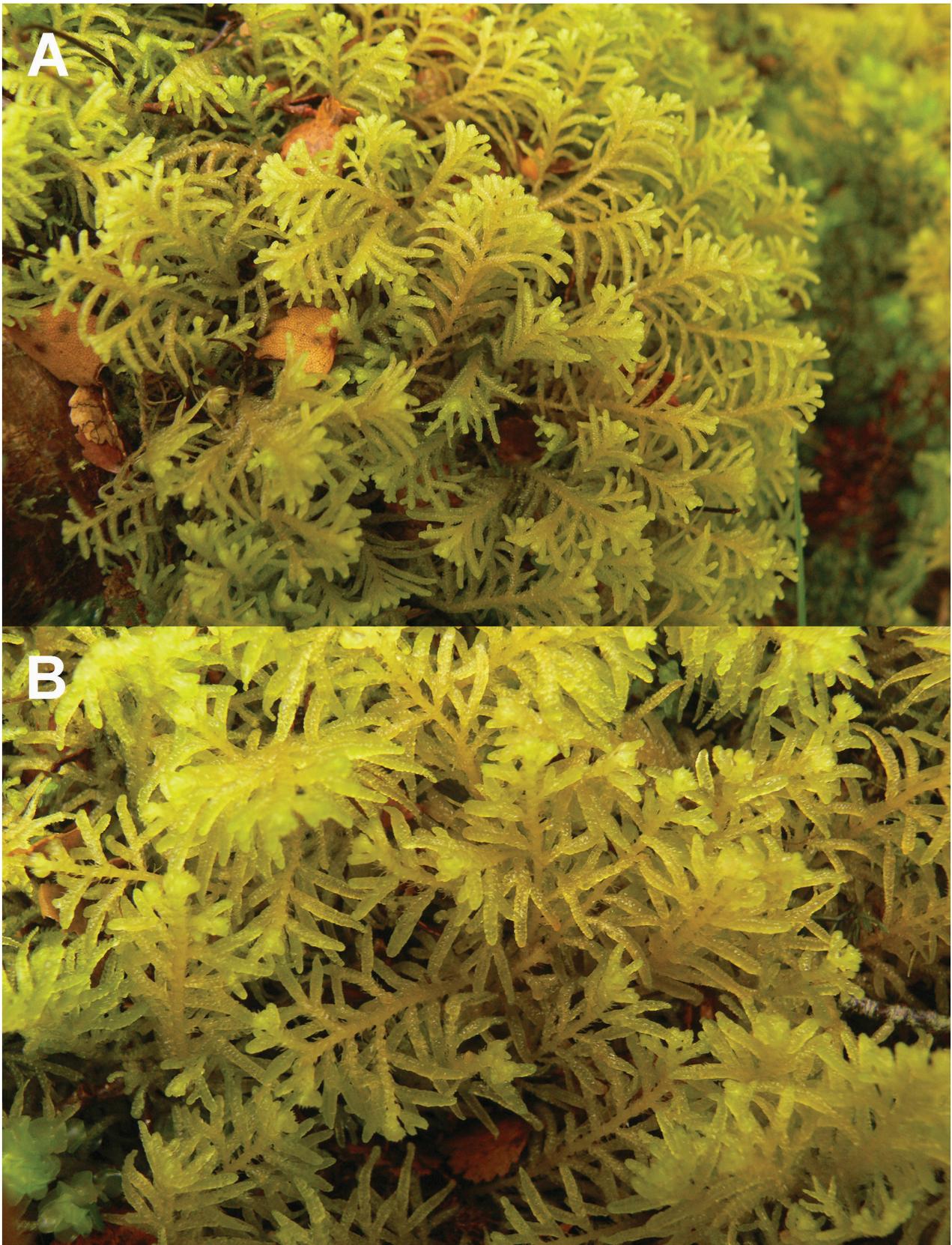


FIGURE 3. Photographs of *L. bragginsiana* (A) and *L. pendulina* (B) in situ at Cross Creek showing the erect, bipinnately ramified shoots with imbricate appressed leaves on primary shoots in *L. bragginsiana*, and remote widely spreading leaves on primary shoots in *L. pendulina*.

The erect habit and presence of ventrally secund branches are shared by *Lepidozia obtusiloba* and *L. bragginsiana*. However, *L. obtusiloba* can be distinguished from *L. bragginsiana* by its underleaves divided to 0.25 with triangular lobes, the shallow sinus between the first and second leaf lobes, and the apex of the 4th leaf lobe pointing in the same direction as the other lobes.

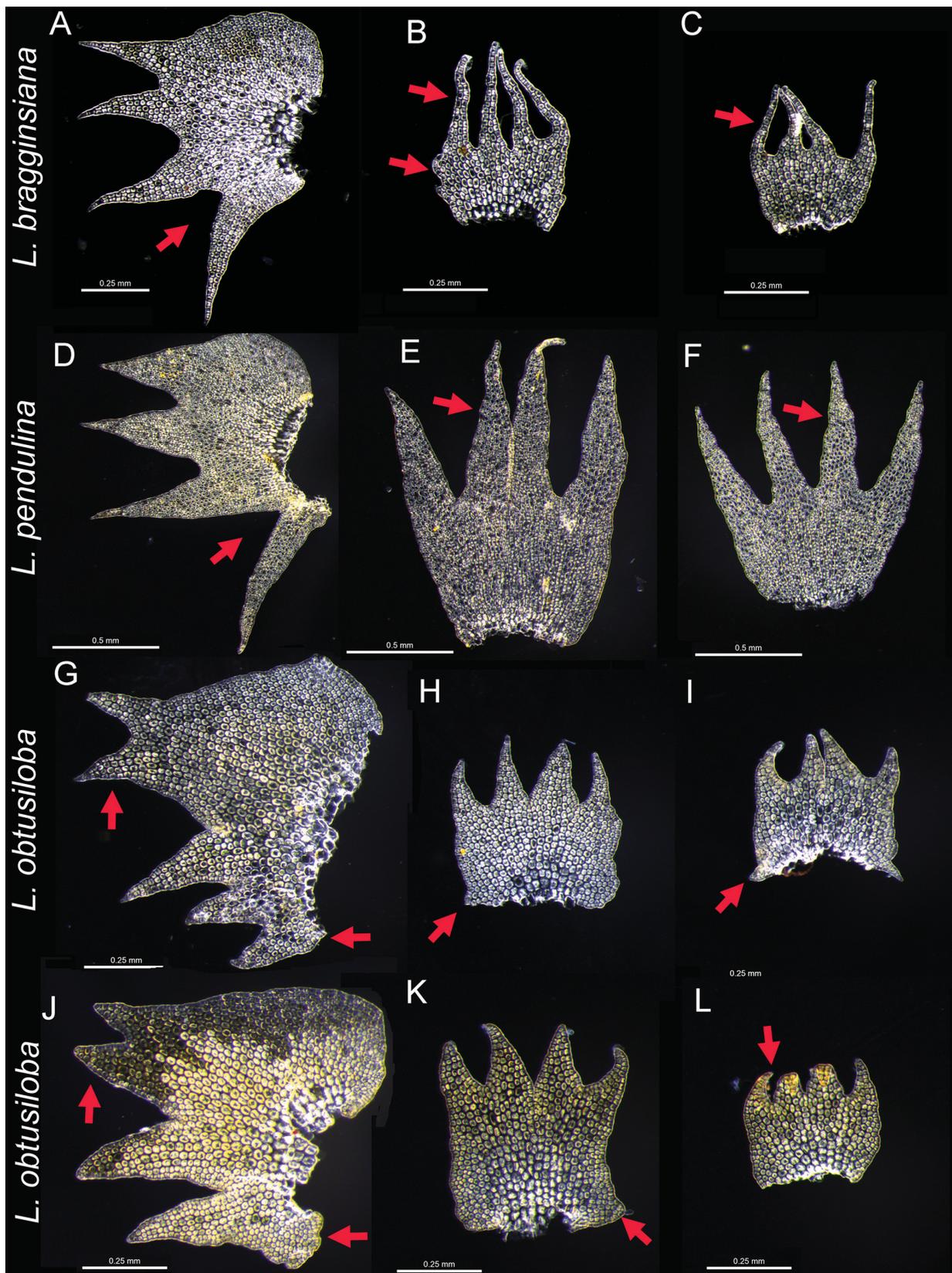


FIGURE 4. Leaves and underleaves for *Lepidozia bragginsiana*, *L. pendulina* and *L. obtusiloba*. Red arrows indicate morphological features differentiating the three species. *Lepidozia bragginsiana* (NSW895516): A: Leaf from primary shoot. B: Underleaf from primary shoot. C: Underleaf from secondary shoot. Scale bar 0.25 mm, note that A is slightly lower magnification than B–C. *Lepidozia pendulina* (NSW895389): D: Leaf from primary shoot. E: Underleaf from primary shoot. F: Underleaf from secondary shoot. Scale bars 0.5 mm. *Lepidozia obtusiloba* (NSW895373, collected in the Upper Otira River, approximately the species type locality): G: Leaf from primary shoot. H: Underleaf from primary shoot. I: Underleaf from secondary shoot. Scale bar 0.25 mm. *Lepidozia bragginsiana* (NSW895393): A: Leaf from primary shoot. B: Underleaf from primary shoot. C: Underleaf from secondary shoot. Scale bar 0.25 mm.

Distribution and ecology:—*Lepidozia bragginsiana* seems to be widespread in hyper-humid forested habitats on the western side of the Southern Alps in New Zealand's South Island, from Nelson in the north to Fiordland. The species also occurs in the North Island as far north as Mt Te Aroha but does not appear as common there as in the south. The species is probably more widely distributed and may eventually be found in suitable habitats in the central and southern North Island and on Stewart Island/Rakiura. *Lepidozia bragginsiana* occurs across a wide elevational range, from c. 200 m to 1000 m, and grows in association with both podocarp-broadleaf and beech forests, so long as these are sufficiently wet. *Lepidozia bragginsiana* occupies raised microsites on the forest floor, such as hummocks and soil-mounds, rotting logs, and the bases of tree trunks. Occasionally it may live on humus covered tree trunks, particularly larger trees where epiphytic bryophyte mats are well-developed. The preference for raised microsites is apparently consistent across the range of this species, Child's collection (*J. Child* 2876) from Siberia River was from on old logs in wet beech forest and was recorded as being abundant, the species was epiphytic in forest on Sewell Peak, and at Key Summit grew on an old log. At the type locality *Lepidozia bragginsiana* grew atop a boulder on the floor of forest with emergent *Libocedrus* Endlicher (1847: 42) and *Dacrydium* Lambert (1806: 93) over a 14–18 m tall canopy of *Quintinia* de Candolle (1830: 5) and *Weinmannia racemosa* Linné (1781: 227), on a steep slope with NE aspect. *Lepidozia bragginsiana* often grows in association with other large *Lepidozia* species, including *L. microphylla* (Hooker 1818: 80) Lindenbergh in Gottsche et al. (1845: 202), *L. spinosissima* (Hooker & Taylor in Taylor 1846: 373) Mitten in Hooker (1854: 146), and *L. pendulina*, with these species occupying depressions and hollows adjacent to the raised microsites it occupies. A typical pattern is observed at Cross Creek in Haast Pass where *L. bragginsiana*, *L. obtusiloba* and *L. pendulina* all co-occur, the first two occupying raised microsites including hummocks, logs and stumps and tree trunk bases, while the last occupies flat sites and depressions (Fig. 5). Between these microsites the species abut, and intermix across the boundaries between these zones.

Remarks:—In the key to species presented by Engel & Glenny (2008) *Lepidozia bragginsiana* will usually key to *L. pendulina* on the basis of its bipinnate shoot systems (Fig. 2B). We propose the following couplets as an aid to species identification in conjunction with Volume 1 of the Liverwort Flora of New Zealand:

- 21b. Leaves conspicuous, wider than stem, patent or appressed to stem, sinus between 3rd and 4th lobes divided to 0.65–0.922.
- 22a. Sinus between 3rd and 4th lobes on leaves from primary shoots wide, 4th lobe apex pointing postically, at nearly 90° to other leaf lobe apices. Underleaves divided to 0.5 their length.....23.
- 22b. Sinus between 3rd and 4th lobes on leaves from primary shoots narrow, 4th lobe apex pointing in more or less the same direction as other leaf lobe apices. Underleaves divided to 0.25 their length.....*Lepidozia obtusiloba*.
- 23a. Leaves on primary shoots remote and widely spreading. Accessory armature on postical leaf margin always absent. Underleaves on primary shoots with spreading lobes, lobes narrowly triangular, more than 4 cells broad to near the apex and 10–13 or more cells broad at their base*Lepidozia pendulina*.
- 23b. Leaves on primary shoots imbricate and appressed. Accessory armature on postical leaf margin often present, particularly on leaves from primary shoots, as irregular spurs or spines. Underleaves on primary shoots with parallel or convergent loans, lobes attenuate, 1–3 cells broad throughout their upper half, and uniseriate for 5–10 cells toward their apex, 4–6 cells broad at their base*Lepidozia bragginsiana*.

Nomenclature: *Lepidozia bragginsiana* is not known to be represented in the type material of any other *Lepidozia* species.

Specimens examined:—NEW ZEALAND: NORTH ISLAND, South Auckland Province, Mt Te Aroha, 37°32'S 175°45'E, 900–940 m, 12 Mar 1995, *J.J. Engel* 22140, F; Gisborne Province, Urewera National Park, Panekiri Range, summit of Pukenui in vicinity of Panekiri Bluff, 38°47'S 177°4'E, 1180 m, 24 Mar 1997, *J.J. Engel* 23321, F; Urewera National Park, track to Whatakaka Hut from Lake Waikaremoana, north of western extremity of lake, 38°42'S 177°00'E, 1160 m, 23 Mar 1997, *J.J. Engel* 23298, F; Wellington Province, Ruahine Range, Pohangina Valley, 40°10'S 175°50'E, c. 900 m, 16 Nov 1969, *J. Child* H201, F1034799; SOUTH ISLAND: Nelson Province, Mt Duppa, 41°14'S 173°30'E, c. 1100 m, 1 Feb 1981, *J. Child* H3389, F1086726; Canterbury Province, Arthurs Pass National Park, near Bealey Glacia Vista, 23 Jan 1971, *J.J. Engel* 6839, F1104555; Arthurs Pass National Park, Bealey Valley Track, 42°55'S 171°33'E, 900 m, 5 Mar 1997, *J.J. Engel* 22873, F; Westland, Grey County, Paparoa Range, cirque on east flank of Mt Priestly, 960 m, 13 Apr 1983, *A.J. Fife* 5573, F1104682; Westland, Paparoa Range, Mt Sewell, 3000 ft, 23 Aug 1975, *J. Child* H2783, BM, F1034957; Tributary of Siberia River, opposite and downstream of Siberia Hut, 2500 ft, 17 Jan 1976, *J. Child* 2876, as *L. concinna* BM; Key Summit, 3000 ft, 15 Apr 1974, *J. Child* 2585, BM; Haast Pass, Cross Creek, 2008, *E.A. Brown* 08/266, NSW; Westland Province, Camp Creek west of Alexander Range, 42°42'S 171°33'E, 840 m, Dec 1982, *A. Reif* C170D, F1062778; *ibid*, *A. Reif* C187C, F1063049; *ibid*, 1040 m, *A. Reif* C216C, F1063054; *ibid*, 1030 m, *A. Reif* C255B, F1063060; *ibid*, 1020 m, *A. Reif* C127C, F1062799; *ibid*, 980 m, *A. Reif* C254B, F1063059; *ibid*, 950 m, *A. Reif* C214F, F1063053; *ibid*, 700 m, *A. Reif* C232E, F1063055; *ibid*, 585 m, *A. Reif* C282D, F1063073; *ibid*, 770 m, *A. Reif* C249E, F1062777; Westland

Province, Arthurs Pass National Park, north of Kellys Creek near highway 73, above campground north of Otira, 42°48'S 171°34'E, 420–475 m, 5 Jan 1983, *J.J. Engel 18353*, F1105966; south Westland, Lake Ellery, 44°5'S 168°43'E, c. 60 m, 12 Dec 1981, *J. Child H4574*, F1088411; Southland Province, Fiordland National Park, Moraine Creek track, area north of Morain Creek, west of Hollyford River, 44°44'S 168°5'E, 610 m, 16 Mar 1997, *J.J. Engel 23218*, F; Fiordland National Park, off track along East Branch of Eglinton River, SE of Mt Eglinton, 45°04'S 168°01'E, 440 m, 20 Jan 1983, *J.J. Engel 18760*, F1105967; Fiordland, between Te Anau and Homer Tunnel, 9 Feb 1955, *R.E. Hatcher 1560*, F1106026; Southland Province, Cascade Creek, near Lake Gunn, tributary of Eglinton River, 44°55'S 168°6'E, c. 400 m, 14 Apr 1974, *J. Child H2591*, F1034966; *ibid.*, *J. Child H2598*, F1034987; Fiordland, head of Lake McKerrow, 24 Jan 1955, *R.E. Hatcher 828*, F1106022; Lake Manapouri, south arm, 20 Apr 1970, *J. Child H251*, F1034645; Otago Province, Beans Burn, tributary of Dart River, 44°35'S 168°15'E, 400 m, 23 Aug 1972, *J. Child s.n.*, F1033346; Turret Peak, Earnslaw, 44°38'S 168°23'E, c. 600 m, 19 Aug 1973, *J. Child H2469c*, F1033545; tributary of Siberia Stream, opposite and downstream from Siberia Hut, 44°13'S 169°3'E, c. 800 m, 17 Jan 1976, *J. Child H2892*, F1034636.



FIGURE 5. Photograph of habitat at Cross Creek, with *L. obtusiloba* on raised microsites, and *L. pendulina* in depressions.

Lepidozia obtusiloba Steph., Sp. Hepat. 3: 604, 1909 (Stephani 1909).

Type:—Nova Zeland (ins. merid) Westland, top of Otira Gorge, amongst rocky boulders, 2350 ft, 11 Feb 1903, *T.W.N. Beckett 301*.
Lectotype (designated here): CHR585840! Isolectotypes: ex herb Levier 4607, G-000149! WELT-H003162!

Other type-series specimens:—Nova Zeland (ins. merid) Westland, top of Otira Gorge, among rocky boulders, 2350 ft, 11 Feb 1903, *T.W.N. Beckett s.n.*, ex herb Levier 4598. Paralectotype: G-000150! New Zealand, Otira Gorge, Westland, on bark of *Fuchsia* trees, 2700 ft, *T.W.N. Beckett 348*, det *L. obtusiloba* Steph. n.sp. 1904. Paralectotype: CHR585841!

Nomenclature:—The syntype series of *Lepidozia obtusiloba* comprises two gatherings by T.W. Naylor Beckett from the upper Otira Gorge, one *Beckett 301* from among rocky boulders, the other *Beckett 348* from the bark of a *Fuchsia* tree. Both gatherings have been split, and duplicates now reside in CHR, FH, G, BM, and WELT.

Recognition:—*Lepidozia obtusiloba* has leaf and underleaf margins crenulated due to bulging trigones between marginal cells, a region of enlarged cells at leaf base indistinct or absent, first two leaf lobes closely spaced, isodiametric terminal cells on underleaf lobes and leaf lobes, no accessory teeth on lobes or underleaves, and a more or less longitudinal-incubous leaf insertion line.

Remarks:—*L. obtusiloba* is apparently named for the obtuse underleaf lobe apices, which sometimes do appear obtuse. However, closer inspection reveals this is the result of each lobe's apex being adaxially reflexed, a feature particularly pronounced on underleaves from secondary shoots. This is a characteristic feature of the lectotype and other topotype material of *L. obtusiloba*.

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