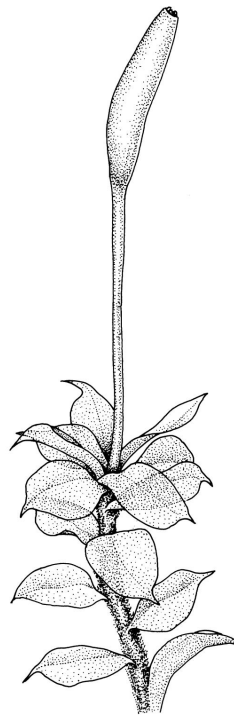


FLORA OF NEW ZEALAND
MOSSES

SPLACHNACEAE



A.J. FIFE

Fascicle 18 – JUNE 2015

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Cover image: *Tayloria purpurascens*, habit with capsule. Drawn by Rebecca Wagstaff from A.J. Fife 6919, CHR 406855, and M.J.A. Simpson 1109, CHR 106044.

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Introduction

Members of the Splachnaceae are morphologically attractive species which produce unattractive odours and grow on unattractive substrates, usually decaying faeces and animal carcasses. They are unique among mosses for having symbiotic relationships with flies (dipterans) that facilitate spore dispersal. The capsules of many, probably most, species produce volatile substances attracting spore-dispersing flies. All of the species occurring in New Zealand produce such odours. The sporophytes are often highly coloured and have a modified “hypophysis” of sterile tissue that is often dramatically enlarged. The family is interpreted taxonomically to include six or seven genera of which one, *Tayloria*, is represented in N.Z. by four species. All of our species are restricted to the southern hemisphere. One, *T. purpurascens* (Hook.f. & Wilson) Broth., is thought to be endemic to N.Z.; the other three are shared with Tasmania, with one of these occurring also in mainland Australia and cooler parts of South America.

Typification

The following lectotypification is made in accordance with the International Code of Nomenclature for Plants, Algae and Fungi.

***Eremodon robustus* Hook.f. & Wilson, Bot. Antarct. Voy. II (Fl. Nov.-Zel.) Part II: 93 (1854)**

Lectotype (designated here): N.Z., Bay of Islands, A. Sinclair s.n., BM! Of the three syntypes only the Sinclair collection is present in the Wilson herbarium and unquestionably of N.Z. origin.

Splachnaceae

Plants medium-sized to robust, erect, in dense or loose tufts, usually on decaying animal matter. **Stems** often fleshy, in cross-section with a well-developed central strand, thick-walled cortical cells, and large, parenchymatous medullary cells, usually densely beset with smooth or papillose rhizoids. **Leaves** soft, wide- or erect-spreading when moist, crisped when dry, mostly broad, ovate-lanceolate, elliptic, oblong, or obovate, mostly plane, entire, dentate, or rarely spinose to lacinate at margins, mostly unbordered; **upper laminal cells** large, smooth, and thin-walled, mostly oblong-hexagonal, not or weakly differentiated at margins, becoming larger and more oblong towards leaf base; **alar cells** not differentiated. **Costa** single, strong, ending below the apex to excurrent. **Axillary hairs** present but often obscured by rhizoids.

Autoicous or **dioicous**. **Perichaetia** terminal, with the leaves mostly little differentiated. **Perigonia** terminal and \pm discoid, with filiform or clavate paraphyses. **Setae** elongate (or rarely very short in non-N.Z. species); **capsules** erect or nearly so, symmetric, highly variable in shape but usually with an elongate or highly inflated neck (hypophysis) and a smaller urn, stegocarpous (in N.Z. species) or rarely cleistocarpous; **stomata** present, superficial and 2-celled, often abundant; **annulus** weakly differentiated or lacking; **operculum** bluntly conic or convex, rarely absent. **Peristome** single, either erect or strongly reflexed when dry, the 16 teeth often paired, or rarely unpaired and bifid, variably pigmented and ornamented. **Calyptra** nearly always mitrate and smooth above. **Spores** small, smooth or weakly ornamented, sometimes dispersed in clusters.

Taxonomy: The Splachnaceae include 6 (Goffinet et al. 2009) or 7 genera and c. 70 species. The family is predominantly distributed in temperate to cold parts of the northern hemisphere, temperate parts of the southern hemisphere, and high elevations in the neotropics. One genus, *Tayloria*, and 4 species are documented from N.Z.; a fifth species in this genus is endemic to Tasmania.

Members of the Splachnaceae characteristically grow on decaying faeces, animal carcasses or on highly nitrogen-enriched sites (such as bird perches). Quoting Crum & Anderson (1981): “the differentiated ‘neck’ of the capsule is an outstanding characteristic of the family. It reaches its greatest development in the large bladderlike or skirtlike [hypophysis] of [the northern hemisphere genus] *Splachnum*.” This fascinating family is unique among mosses for having specialised symbiotic relationships with insects (dipterans) that facilitate spore dispersal. Approximately half of the species in the family have fly-dispersed spores (Marino et al. 2009). These species have highly modified, often highly coloured sporophytes that produce volatile and sometimes aromatic compounds that attract flies. Their spores are often cohesive and released in irregular clusters. Marino et al. (2009) suggest there is an inverse relationship between size and showiness of the hypophysis and the complexity of their volatile odours. All species of *Tayloria* in N.Z. have sporophytes producing dung- or carrion-like odours.

Tayloria Hook., *J. Sci. Arts (London)* 2: 144 (1816)

Type taxon: *Tayloria splachnoides* (Schwägr.) Hook.

Plants medium-sized to robust, erect, pale or bright-green, often with secondary pigmentation, forming dense or loose tufts, usually on decaying organic matter. **Stems** not or sparsely branched, commonly to c. 40 mm (rarely more), in cross-section with 1–2 layers of cortical cells and a central strand, densely beset with smooth or papillose, brown or \pm purple rhizoids. **Leaves** increasing in size and more crowded at stem apex, obovate, elliptic, or lingulate, wide- or erect-spreading, crisped when dry, entire, toothed, or spinose, variable in apical form, often narrower in male plants; **upper laminal cells** relatively large, smooth, oblong-hexagonal, becoming larger and more oblong towards leaf base, not or weakly differentiated near margins; **alar cells** not differentiated. **Costa** ending below the apex to long excurrent. **Axillary hairs** filamentous, the distal two cells often golden, cylindrical, with each cell c. 90–120 μ m.

Dioicous in N.Z. species. **Perichaetial leaves** \pm larger and weakly comose, not otherwise differentiated. **Perigonia** terminal (but sometimes overtopped by innovations), with widely-spreading or erect bracts, many antheridia and filiform paraphyses. **Setae** elongate (or rarely very short in non-N.Z. species), straight or flexuous, mostly smooth, scarcely twisted, in cross-section with 2–5 cortical layers and a central strand; **capsules** erect or nearly so, variable in shape but often cylindrical or obovoid, with a weakly or well-defined neck that is either as wide as the urn or sometimes greatly expanded to form an enlarged hypophysis, variably pigmented, the urn often contracted when dry; **columella** sometimes protruding beyond the mouth when mature and dry; **stomata** present in neck, superficial and 2-celled, sometimes few; **annulus** weakly differentiated, falling with the operculum; **operculum** bluntly conic. **Peristome** single, variably inserted, with 16 teeth, in N.Z. species paired

and fused to form 8 broadly triangular and compound teeth, variably pigmented and ornamented; **preperistome** sometimes present. **Calyptra** mitrate, smooth above, fimbriate and constricted at base in N.Z. species. **Spores** small, spherical, smooth or finely ornamented.

Taxonomy: *Tayloria* is a genus of approximately 40 species; it has a worldwide distribution with modest concentrations in the Andes and eastern Asia. If the high altitude neotropical species are segregated into their own genus (*Brachymitrium*), as is sometimes done, the genus is confined to the cooler parts of the northern and southern hemispheres. Four species are documented from N.Z.

The four species occurring in N.Z. were placed in the subgenus *Eremodon* by Brotherus (1924), with the subgenus exhibiting an exclusively austral (southern South America and Australasia) distribution. According to Brotherus, this subgenus is characterised by often dioicous sexuality, costae mostly ending below the leaf apex, non-protruding columellae, smooth calyptrae, and short, paired, and fused peristome teeth which are usually reflexed when dry. There are, however, some discrepancies between Australasian species and Brotherus' subgeneric concept.

In light of these inconsistencies, A. Koponen (1977; 1978) proposed a new subgenus, *Pseudotetraplodon*, based largely on peristome and other sporophyte characters. *Tayloria octoblepharum*, a species with reflexed peristome teeth, was selected as the type of the subgenus, in which she placed seven other species (including *T. tasmanica*) with distributions in the Andes, southern South America, Australasia, New Guinea, and the Celebes. Because the intra-generic classification of *Tayloria* and the Splachnaceae as a whole remains in flux (cf. Goffinet & Shaw 2002), no infrageneric groupings are adopted here.

Three of the four N.Z. species have smooth rather than papillose rhizoids (viewed under the optical microscope); this conflicts with the observations of Goffinet (2006) and the generic description of Brotherus (1924).

Etymology: The generic name commemorates Thomas Taylor, the co-author, with W. J. Hooker, of the *Bryologia Britannica*.

- | | |
|----|---|
| 1 | <p>Leaf margins coarsely toothed to ± spinose; perigonial bracts conspicuous, rigidly erect, narrowly lanceolate <i>T. callophylla</i></p> |
| 1' | <p>Leaf margins entire (sometimes weakly and obtusely toothed above); perigonial bracts less conspicuous, not rigidly erect, mostly spreading, usually lanceolate from an oblong base 2</p> |
| 2 | <p>Leaves aristate, not reflexed at apex; costa long-excurrent into a golden and non-reflexed arista of variable length; stems and basal portions of the costae bright pink; peristome teeth recurved when dry
..... <i>T. octoblepharum</i></p> |
| 2' | <p>Leaves cuspidate, apiculate or acuminate, not aristate, usually with a recurved or squarrose apex; costa not long-excurrent; stems and basal portions of the costae either lacking secondary pigments or purple; peristome teeth mostly incurved or erect when dry (but recurved in <i>T. tasmanica</i>) 3</p> |
| 3 | <p>Capsules narrowly elliptic, with narrow and tapered neck 1/3–1/2 the total capsule length, purple-brown or chestnut throughout; setae 10–15(–25) mm, smooth; peristome teeth incurved or erect when dry; leaves broadly obovate, rather abruptly tapered to a slender, reflexed or squarrose apiculus; costa ending below leaf apex; widespread <i>T. purpurascens</i></p> |
| 3' | <p>Capsules very broad, with a conspicuous, strongly expanded, and pale grey hypophysis; setae 6–10 mm, scabrous; peristome teeth recurved when dry; leaves ovate-lanceolate, gradually tapered to an acute, cuspidate, or short acuminate apex; costa percurrent or short excurrent; rare and known only from Stewart I. <i>T. tasmanica</i></p> |

***Tayloria callophylla* (Müll.Hal.) Mitt., *Trans. Roy. Soc. Victoria* 19: 65 (1882)**

≡ *Dissodon callophyllus* Müll.Hal., *Bot. Zeitung (Berlin)* 9: 546 (1851)

≡ *Splachnum callophyllum* (Müll.Hal.) Hook.f. & Wilson, *Bot. Antarct. Voy. III. (Fl. Tasman.) Part II* 198 (1859)

Lectotype: Tasmania: "Mt. Wellington, V. D. L." ("Stern Tree Valley"), *S. Mossman* 824, 1850, NY. (Designated by Goffinet, 2006.) Not seen. Isolectotype: BM-Wilson!

= *Eremodon robustus* Hook.f. & Wilson in Wilson, *Bot. Antarct. Voy. II (Fl. Nov.-Zel.) Part II* 93 (1854)

Lectotype: N.Z., Bay of Islands, *A. Sinclair s.n.*, BM! Of the three syntypes only the Sinclair collection is present in the Wilson herbarium and unquestionably of New Zealand origin.

Plants robust, pale green often suffused with purple, forming dense tufts. **Stems** not or sparsely branched, green or suffused with purple, 10–40(–90) mm, in cross-section pentagonal, beset with dark purple, smooth rhizoids. **Leaves** widely spreading to squarrose, moist, from a weakly sheathing base, crisped when dry, oblong-obovate to broadly elliptic, sometimes narrower at stem apex, abruptly tapered to a slender acumen, strongly toothed to spinose in upper $\frac{3}{4}$ or more, (2.3–)3.0–4.0 × 1.0–2.0(–2.3) mm; **upper laminal cells** thin-walled, weakly porose, oblong-hexagonal, c. 45–110 µm long, becoming shorter towards apex and margins, becoming larger and more oblong below, not arranged in diagonal files. **Costa** concolourous, c. 90 µm wide at $\frac{1}{3}$ above base, often dilated below, terminating in or below the base of the acumen. **Axillary hairs** inconspicuous.

Diocious. Perichaetial leaves not differentiated. **Perigonia** terminal, with strongly differentiated, erect and lanceolate bracts surrounding many antheridia intermixed with filiform, 6–7-celled paraphyses.

Setae 10–15 mm, straight, smooth, c. 240 µm diam.; **capsules** erect, narrowly ellipsoid, with a weakly defined neck c. $\frac{1}{2}$ the total capsule length, c. 5 mm long, red-brown at maturity; **exothecial cells** oblate-lunate throughout or irregular near base of urn, uniformly thick-walled; **stomata** restricted to a band at top of the neck; **annulus** not seen; **operculum** as per genus. **Peristome teeth** inserted below the mouth, erect or incurved when dry, yellow, longitudinally fused to form 8 compound teeth, broadly triangular with an obtuse apex, c. 260–300 × 80–90 µm, longitudinally striate on outer surface, finely papillose to irregularly striate on inner surface; **preperistome** not seen. **Calyptra** as per genus, c. 1.5 mm. **Spores** globose, 9–12 µm, smooth.

Illustrations: Plate 1. Goffinet 2006, fig 17, a–d; Seppelt et al. 2013, pl. 33.

Distribution: NI: N Auckland, including offshore islands (LB, GB), S Auckland (Coromandel Peninsula, Mangōnuī County), Hawke's Bay (*s.loc.*), Wellington (Eastbourne); SI: Nelson (Cobb Valley, Stockton Plateau), Westland (Croesus Track, Lake Hochstetter, Ōkārito).

Australasian. Tasmania*.

Habitat: Commonly associated with kānuka or manuka scrub, but growing in a variety of other forest types, including those dominated by kauri (including "gumlands"), *Weinmannia*, southern beech, and podocarps. Often on duff or humus, occasionally on rotten logs or tree fern caudices. Few herbarium records record the presence of faeces. On North I. from near sea level to c. 760 m (Moehau, South Auckland L.D.) and on South I. to 1030 m (Cobb Valley, Nelson L.D.).

Notes: *Tayloria callophylla* is best documented from areas north of 38°S, with only scattered collections known from south of this latitude. The only Hawke's Bay record is an early and unlocalised collection by Jolliffe (BM). The South I. occurrence of this species was questioned by Sainsbury (1955a) but there is a single early and unlocalised *T. Kirk* collection from Westland (CHR 217814, probably made in 1884 or 1885), as well as a few post-1989 collections from Nelson and Westland L.D.

The type locality is clearly stated in the protologue to be Mt Wellington in Tasmania. Seppelt et al. (2013) stated their belief that this is the only Tasmanian collection of the species. Earlier authors (Rodway 1914, p. 99; Sainsbury 1955b; Dalton et al. 1991) have raised doubt about the Tasmanian provenance of the type collection and, indeed, about the occurrence of the species on that island. However, concordance of the locality data on the isotype with that in the protologue supports the view that the Mossman-collected type is Tasmanian in origin. There is also a 19th century Tasmanian collection by Oldfield of the synonymous *Eremodon robustus* Hook.f. & Wilson in BM. The existence of the Oldfield collection corroborates the presumption that *T. callophylla* occurs in Tasmania, despite a lack of modern collections (Seppelt et al. 2013).

Recognition: The strongly toothed, broadly obovate to elliptic, and often purple-tinged leaves, and the narrowly ellipsoid capsules with incurved peristome teeth, make this species unmistakable in a N.Z.

(and Tasmanian) context. The strongly differentiated, erect, and lanceolate bracts of the terminal perigonia are also striking and distinctive.

Tayloria purpurascens is sporophytically similar but rarely confused here; it can be readily distinguished by leaf margin differences. *Goniobryum subbasilare*, a species occasionally confused, has much narrower leaves with doubly-toothed margins.

Tayloria callophylla is similar in some respects to *T. magellanica* (Brid.) Mitt. This South American species, however, has narrower, more lanceolate leaves, which lack a distinct acumen, and generally shorter and more obtuse marginal teeth.

Etymology: The epithet refers to the “beautiful leaves” of this striking species. Some authors (e.g., Dixon 1926; Sainsbury 1955a) have incorrectly altered the epithet to *callophylla*.

***Tayloria octoblepharum* (Hook.) Mitt., *Trans. Roy. Soc. Victoria* 19: 65 (1882)**

≡ *Splachnum octoblepharum* Hook., *Musci Exot.* 2, 167 (1819)

≡ *Eremodon octoblepharis* (Hook.) Hook.f. & Wilson, *Bot. Antarct. Voy. II* (Fl. Nov.-Zel.) Part II 94 (1854)

Holotype: Tasmania (Van Diemen's Land): trunks of fallen trees, base of Table Mountain, *Mr. [R.] Brown*, (“H. 3007”), BM-K! Isotype: BM-Wilson! Rod Seppelt & Lyn Cave (pers. comm., 16 Mar. 2015) have suggested that the “Table Mountain” of the protologue probably refers to Mt. Wellington. Although there is an extant Table Mountain in the midlands of Tasmania, there is no evidence that Robert Brown visited there.

= *Splachnum octoblepharum* var. *major* Hook.f. & Wilson, *Bot. Antarct. Voy. I*. (Fl. Antarct.) Part I 124 (1845)

≡ *Tayloria octoblepharum* var. *major* (Hook.f. & Wilson) Watts & Whitel., *Proc. Linn. Soc. New South Wales* 30 (Supplement): 108 (1906)

Lectotype: Campbell's Island, *J.D. Hooker*, NY (Designated by Goffinet, 2006; not seen.) Isolectotype: BM!

= *Splachnum plagiopus* Mont., *Ann. Sci. Nat. Bot. sér.* 3, 4: 121 (1845)

≡ *Dissodon plagiopus* (Mont.) Müll.Hal., *Syn. Musc. Frond.* 2, 551 (1851)

Type: N.Z., Auckland Is., *Hombroon s.n.*, BM!

= *Splachnum octoblepharum* var. *pyriforme* Hook.f. & Wilson, *Bot. Antarct. Voy. I*. (Fl. Antarct.) Part I 123 (1845)

Lectotype: Campbell's Island, *J.D. Hooker*, NY (Designated by Goffinet, 2006; not seen.) Isolectotype: BM!

Plants medium to robust, bright green to golden-green, pink below; rarely dirty brown throughout.

Stems usually unbranched, pink, (7–)10–15(–25) mm, beset with purple-brown, smooth rhizoids.

Leaves spreading when moist, moderately crisped and ± ridged (due to abaxially protruding costa) when dry, narrowly obovate to ± elliptic (but widest above middle), gradually tapered to a long, slender, golden arista (to 2 mm and sometimes >½ the total leaf length), entire, recurved to ± revolute at margins, 3.0–4.5 × 0.8–1.5(–2.5) mm; **upper laminal cells** firm-walled, oblong-hexagonal, 45–60(–75) µm, slightly larger near costa, scarcely differentiated at margins, becoming longer (to c. 180 µm) and more regularly oblong towards base. **Costa** pink at base, becoming concolourous with lamina above, 100–120 µm wide at ⅓ above leaf base, extending into the base of the arista and excurrent, strongly protruding abaxially, in cross-section lacking stereids. **Axillary hairs** inconspicuous.

Diocious. Perichaetial leaves not differentiated. **Perigonia** terminal, but often overtopped by innovation and several per plant, ± globose, with bracts weakly differentiated, ovate-lanceolate, erect spreading, with numerous 4–5-celled filiform paraphyses. **Setae** 3–14 mm, straight (rarely flexuous), smooth, variable (200–350 µm) in diameter, scarcely twisted when dry, pale brown; **capsules** erect or inclined, symmetric or somewhat asymmetric due to curvature of neck, with a short cylindrical to obovoid urn and a well-developed neck ½ – ⅔ (–¾) the total capsule length, (2.0–)2.5–5.0(–8.0) mm, smooth, dirty green-brown when fresh, becoming dark brown or black on drying; **exothecial cells** ± isodiametric, thick-walled (occasionally thicker at corners), c. 25 rows oblate below mouth; **stomata** few, **columella** protruding beyond mouth when dry; **annulus** weakly differentiated, falling with operculum; **operculum** as per genus. **Peristome teeth** inserted below the mouth, recurved when dry, orange to pale yellow-brown, longitudinally fused to form eight broadly triangular compound teeth, extending c. 225–275 µm beyond the mouth, c. 150–180 µm wide, finely papillose-baculate on outer surface; **preperistome** present as papillose fragments. **Calyptra** as per genus, becoming split up one side with age, c. 1.0 mm. **Spores** ± globose, 12–15 µm, smooth.

Illustrations: Plate 1. Wilson & Hooker 1845, tab. LVII, fig. iv (as *Splachnum octoblepharum*); Goffinet 2006, fig. 17, h–k; Seppelt et al. 2013, pl. 35.

Distribution: NI: N Auckland, including offshore islands (GB), S Auckland, Gisborne, Hawke's Bay, Wellington; SI: Marlborough, Canterbury, Westland (Kelly Range, Paparoa Range), Otago, Southland; St; Ch; A; C; M.

Australasian. Tasmania*, mainland Australia*, Chile*.

Habitat: On dung of various animals (deer, horse, cow, pig), decayed carcasses, humus or peat, rotten wood, and tree fern stumps in coastal, tussock, scrub or forest habitats. Ranging from near sea level to c. 1400 m on both main islands. *Tayloria octoblepharum* often grows mixed with *T. purpurascens*.

Notes: *Tayloria octoblepharum* is exceedingly variable with respect to stature, including seta and capsule length, and, to lesser extent, the amount of swelling of the urn. This variability has resulted in several published names. The golden aristae composed of the usually long excurrent costae, the narrow, entire leaves, and the striking salmon-pink colouration of the lower costae and stems facilitate recognition both in the field and herbarium. Bright purple pigmentation occurs, with only very rare exceptions, only in the rhizoids, in contrast to *T. purpurascens* where the pigments are also deposited in laminal cell walls. The tendency of the capsule urn to blacken before the neck also facilitates recognition of *T. octoblepharum*. When fresh the mature capsules are a dirty green-brown, but the greenish hue fades and the capsules become darker upon drying; they emit a rank and powerful, unpleasant odour.

According to Anne Gaskett (pers. comm. Feb. 2015), in south-western Tasmania *T. octoblepharum* capsules produce odours mimicking those normally produced by rotting vegetation/herbivore dung (indoles, cresols, and phenols) and attract flies belonging predominantly to the families Heleomyzidae and Muscidae.

Plants with dark brown pigmentation, and wider than typical leaves (rarely to 2.5 mm) occur rarely, and are perhaps associated with very wet environments. Such plants often show transition to a more typical morphology in their upper parts.

A unusual substrate has been noted for this species in Tasmania where one mid-19th century collection (seen in BM) was made from "the Bones & decayed clothing of a Bushranger, at the base of the Western Mountains, with two double-barrelled Guns & Pistols lying by his side".

Etymology: The epithet derives from the Greek and means eight-haired, a reference to the peristome. The epithet is a noun in apposition rather than an adjective and hence the often-used form "*octoblepharis*" is not correct.

***Tayloria purpurascens* (Hook.f. & Wilson) Broth., Nat. Pflanzenfam. [Engler & Prantl] 1 (3) 502 (1903)**

≡ *Splachnum purpurascens* Hook.f. & Wilson, *London J. Bot.* 3: 539 (1844)

≡ *Dissodon purpurascens* (Hook.f. & Wilson) Müll.Hal., *Syn. Musc. Frond.* 2, 550 (1851)

≡ *Eremodon purpurascens* (Hook.f. & Wilson) Hook.f. & Wilson, *Bot. Antarct. Voy. II* (Fl. Nov.-Zel.) Part II 94 (1854)

Lectotype: Campbell's Island, in moist bogs, amongst grasses, altitude 1000 ft., *J.D. Hooker*, BM! (Designated by Goffinet 2006.) Isolectotypes: BM-K!

= *Splachnum purpurascens* var. *minor* Hook.f. & Wilson, *Bot. Antarct. Voy. I*. (Fl. Antarct.) Part I 123 (1845)

Holotype: Auckland Islands, *J.D. Hooker*, ("Wilson no. 53"), BM! Isotypes: BM!, BM-K!

= *Dissodon purpureus* Müll.Hal., *Gen. Musc. Frond.*, 124 (1900)

Type: N.Z.: near Greymouth, *R. Helms*, 1888, H-Br!

Plants variable in size, bright green to bright red-purple. **Stems** unbranched, typically 15–30 µm, beset with red-brown, smooth rhizoids. **Leaves** erect- to wide-spreading and nearly plane when moist, more erect and crisped when dry, becoming ± larger toward stem apex, broadly obovate, rather abruptly tapered to a reflexed or squarrose apiculus (0.5–0.9 mm long in well-developed leaves), plane or weakly recurved at margins, entire or weakly and obtusely toothed above, (2.3–)2.5–3.3 × (1.0–)1.5–2.0(–2.5) mm (exclusive of apiculus; leaves of male plants usually narrower than those of female plants); **upper laminal cells** thin-walled, weakly porose, oblong-hexagonal, in upper third c. (60–)75–105 µm, often becoming shorter towards the margins, arranged in ill-defined diagonal files, becoming longer and more oblong below. **Costa** rather ill-defined and stout, c. 100 µm wide at 1/3

above leaf base, dilated below, usually ending below the base of the apiculus. **Axillary hairs** inconspicuous.

Dioicous. Perichaetial leaves not differentiated. **Perigonia** terminal, ± globose, with ovate-lanceolate, widely-spreading bracts surrounding many antheridia intermixed with filiform, 6–7-celled paraphyses. **Setae** 10–15(–25) mm, straight, smooth, c. 300 µm diam., not twisted when dry, orange to red-purple; **capsules** erect, narrowly ellipsoid, with a tapering neck $\frac{1}{3}$ – $\frac{1}{2}$ the total capsule length, c. 3.5–6 mm long, dark purple-brown or chestnut; **exothecial cells** oblate, very thick-walled, in ill-defined ranks; **columella** not or rarely protruding; **stomata** restricted to a narrow band at top of the neck; **annulus** weakly differentiated, apparently falling with the operculum; **operculum** rounded-conic. **Peristome teeth** inserted below the mouth, incurved or erect when dry, pale yellow- or red-brown, paired and longitudinally fused to form eight compound teeth, each pair broadly triangular and extending c. 175–200 µm beyond the mouth, c. 140 µm wide, finely and irregularly striolate on outer surface, sometimes ± vertically striolate above; **preperistome** not seen. **Calyptra** as per genus, 1.3–1.7 mm. **Spores** ± globose, 9–12 µm diam., smooth.

Illustrations: Plate 2. Wilson & Hooker 1845, tab. LVII, fig. v (as *Splachnum purpurascens*); Goffinet 2006, fig. 17 e–g.

Distribution: NI: S Auckland (Taupō), Gisborne (Lake Waikaremoana), Taranaki (single unlocalised collection), Wellington; SI: Nelson, Marlborough, Canterbury, Westland, Otago, Southland; St; Ch; Sn; A; Ant; C.

Probably endemic. Recorded from mainland Australia by Goffinet (2006) on the basis of a single poorly documented N.S.W. collection.

Habitat: Occurring in a wide variety of vegetation types, including *Leptospermum/Kunzea* scrub, southern beech forest, broadleaved forest, and pākihi. It occurs on faeces of both herbivores (cattle, goats, etc.) and carnivores, and on decayed carcasses. A large fraction of collections are recorded from humus (on ledges, stumps, etc) and fail to mention the presence of dung; this is probably due to an advanced state of faecal decomposition. Often growing mixed with *T. octoblepharum*. It has an altitudinal range from near sea level (at least on South I. and subantarctic islands) to c. 1800 m (Travers Saddle, Nelson L.D.), but appears to be less frequent in the alpine zone than at lower elevations.

Notes: The only specimen seen from Taranaki is an unlocalised collection made by Miss J. Heywood in Feb. 1915 (BM). A possible Hawke's Bay specimen was collected by Sainsbury at Waimarino (BM). No material from Tasmania or mainland Australia has been seen.

Recognition: *Tayloria purpurascens* varies markedly with respect to stature, pigmentation, and to a lesser degree, leaf form. Occasional forms occur with little or no secondary pigmentation, and leaf apiculi more strongly developed than usual, which could be confused with *T. octoblepharum*. The generally more obovate leaf form, non-excurrent costa, the reflexion of the apiculus, and the lack of salmon-pink pigmentation in the costa base are usually sufficient to permit its recognition, even in the absence of capsules. Perigonal bracts are considerably more ovate-lanceolate than the vegetative or perichaetial leaves, but they are erect-spreading, rather than rigidly erect as in *T. callophylla*.

There is a tendency for material from the subantarctic islands to have leaves which are less markedly obovate, and lurid rather than purple. *Hooker* 53 (from the Auckland Is), the type of "var. minor", and *C. Meurk s.n.*, 13 Feb. 1971 (from Campbell I.) are examples of this expression, which is not deemed worthy of taxonomic recognition.

Etymology: The epithet *purpurascens* means becoming purple.

***Tayloria tasmanica* (Hampe) Broth., Nat. Pflanzenfam. [Engler & Prantl] 1 (3) 512 (1903)**

≡ *Tetraplodon tasmanicus* Hampe, *Linnaea* 40: 302 (1876)

Type: Tasmania, "Mount. tovers Lake Peddu", Tasmaniae, frustula 1875 legit Schuster", BM 983027 (Viewed online at JSTOR; discussed below.)

Plants bright green above, red-purple below, forming dense tufts. **Stems** unbranched or branched by innovation, to at least 25 mm, beset with dark red, papillose rhizoids. **Leaves** erect-spreading when moist, strongly crisped when dry, scarcely increasing in size towards stem apex, green throughout or suffused with red, ovate-lanceolate, gradually tapered to an acute or short acuminate apex, mostly reflexed at apex, plane at margins, entire, mostly c. 2.2–3.1(–3.5) × 0.5–1.3 mm (on female shoots, including excurrency; leaves of male plants smaller); **upper laminal cells** thin-walled, not porose,

oblong-hexagonal, (27–)45–75 µm in upper third, usually shorter towards margins, not arranged in diagonal files, becoming longer and more oblong below. **Costa** clearly defined, c. 100 µm wide at 1/3 above leaf base, percurrent or excurrent into a cusp or short acumen. **Axillary hairs** conspicuous, mostly 5-celled and remaining attached to stem, pigmented, with terminal cells cylindric and mostly 75–90 µm.

Dioicous. Perichaetial leaves not differentiated. **Perigonia** terminal, usually overtopped by innovation, the bracts differentiated, widely spreading, lanceolate from an oblong base, c. 1.2 mm, surrounding many antheridia intermixed with filiform, 5–6-celled paraphyses. **Setae** 6–10 mm, straight, scabrous in lower half or more, c. 350–450 µm diam., scarcely twisted when dry, red-brown at maturity; **capsules** erect, with a very broad, ± globose, pale grey (both fresh and dry) hypophysis topped by a narrow, tapered and red-brown urn, c. 2.3–2.5 × 1.4–1.6 mm, with the hypophysis c. 2/3 the total capsule length; **exothecial cells** oblate, very thick-walled, in ill-defined ranks; **hypophysis** composed of pale spongy cells, the surface pale grey (both fresh and dry) in upper half or more, red-brown below; **stomata** and **annulus** not seen; **columella** not seen, not obviously protruding; **operculum** as per genus. **Peristome** recurved when dry, detail not seen. **Calyptra** not seen. **Spores** ± globose, c. 18 µm, smooth.

Illustrations: Not illustrated. Goffinet 2006, fig. 18, a–d; Seppelt et al. 2013, pl. 36.

Distribution: St (Freshwater Flat).

Australasian. Tasmania*.

Habitat: Known in N.Z. from only a single collection made by C.D. Meurk in January 2013 (CHR 625004). The plant grew with *Campylopus acuminatus* var. *kirkii* on a boggy trackside at an elevation of c. 2 m. The substrate of the moss was quite leached sandy material on a dune or levee and no faeces or decomposed flesh was apparent. *Leptospermum scoparium* occurred in the immediate vicinity (C.D. Meurk, pers. comm., Feb. 2013). The Stewart I. collection is the first verified gathering of this very attractive species outside Tasmania. According to Goffinet (2006), the plant grows “on damp soil in heathland, bryophyte-dominated peatland and in alpine scrub... from sea level to about 1200 m” in Tasmania. He further stated: “It is surprising that none of the collections are reported to grow on dung or other animal remains... It is possible that lack of evidence for coprophily is an artefact due to the species only being collected when capsules are produced, which may occur long after the decomposition of the substratum.” Lyn Cave (pers. comm., Feb. 2013) believes that *T. tasmanica* grows primarily but not exclusively on wombat dung in Tasmania.

Notes: According to Anne Gaskett (pers. comm., Feb. 2015), observations made in south-western Tasmania suggest that *T. tasmanica* produces odours usually associated with rotting meat or carnivore dung (dimethyl disulphide) and none of those associated with rotting vegetation/herbivore dung (indoles, cresols, and phenols), suggesting that this species might be a carnivore dung or carcass specialist.

The report of this species from Macquarie I. by Goffinet (2006) was based on a misinterpretation of an 1893 collection by L. Rodway (WELT M032030) from Macquarie Harbour in western Tasmania.

The collection data on BM 983027 (presumably the holotype as it is accompanied by Hampe’s handwritten description) states the collector to be Schaffer, rather than Schuster (as per the protologue). The detail viewable in the JSTOR [<http://plants.jstor.org>, accessed 3 Mar. 2015] digital photographs of this specimen is sufficient to permit assignment of the type specimen to the modern concept of *Tayloria tasmanica* (Hampe) Broth. Goffinet (2006) tentatively and reasonably interpreted the locality data to mean “mountain towards L.[ake] Pedder”.

Etymology: The species epithet refers to the Tasmanian provenance of the type.

References

- Brotherus, V.F. 1901–1909: Musci (Laubmoose) II Spezieller Teil. In: Engler, A.; Prantl, K. (ed.) *Die natürlichen Pflanzenfamilien*. Teil 1. Abt. 3. Engelmann, Leipzig. 277–1246.
- Brotherus, V.F. 1924: Musci (Laubmoose). II. Spezieller Teil. In: Engler, A. (ed.) *Die natürlichen Pflanzenfamilien*. Edition 2. Bd 10. Engelmann, Leipzig. 143–478.
- Crum, H.A.; Anderson, L.E. 1981: *Mosses of Eastern North America*. Columbia University Press, New York.
- Dalton, P.J.; Seppelt, R.D.; Buchanan, A.M. 1991: An annotated checklist of Tasmanian mosses. In: Banks, M.R.; Curtis, W.M. (ed.) *Aspects of Tasmanian Botany – a Tribute to Winifred Curtis*. Royal Society of Tasmania, Hobart. 15–32.
- Dixon, H.N. 1926: Studies in the bryology of New Zealand, with special reference to the herbarium of Robert Brown. Part IV. *Bulletin, New Zealand Institute* 3(4): 153–238.
- Goffinet, B. 2006: Splachnaceae. In: McCarthy, P.M. (ed.) *Flora of Australia*. Vol. 51 Mosses 1. Australian Biological Resources Study and CSIRO Publishing, Canberra & Melbourne. 173–181.
- Goffinet, B.; Buck, W.R.; Shaw, A.J. 2009: Morphology, anatomy, and classification of the Bryophyta. In: Goffinet, B.; Shaw, A.J. (ed.) *Bryophyte Biology*. Edition 2. Cambridge University Press, Cambridge. 55–138.
- Goffinet, B.; Shaw, A.J. 2002: Independent origins of cleistocarpy in the Splachnaceae: analyses of cpDNA sequences and polyphyly of the Voitiioideae (Bryophyta). *Systematic Botany* 27: 203–208.
- Hampe, E. 1876: Musci novi Musei Melbournei. Continuatio. *Linnaea* 40: 301–326.
- Hooker, J.D.; Wilson, W. 1844: Musci Antartici; being characters with brief descriptions of the new species of mosses discovered during the voyage of H.M. Discovery ships, Erebus and Terror, in the southern circumpolar regions, together with those of Tasmania and New Zealand. *London Journal of Botany* 3: 533–556.
- Hooker, W.J. 1816 ("1817"): Some account of *Tayloria splachnoides*, a new moss allied to the genus *Splachnum*. *Journal of Science and the Arts. London* 2(3): 144–147.
- Hooker, W.J. 1819–1820: *Musci Exotici, containing figures and descriptions of new or little known foreign mosses and other cryptogamic subjects*. Vol. 2. Longman, Hurst, Rees, Orme and Brown, London.
- Koponen, A. 1977: *Tayloria* subgen. *Pseudotetraplodon*, subgen. nov., and new combinations in *Brachymitrium*, *Moseniella* and *Tayloria* (Splachnaceae, Musci). *Annales Botanici Fennici* 14: 193–196.
- Koponen, A. 1978: The peristome and spores in Splachnaceae and their evolutionary and systematic significance. *Bryophytorum Bibliotheca* 13: 535–567.
- Marino, P.; Raguso, R.; Goffinet, B. 2009: The ecology and evolution of fly dispersed dung mosses (Family Splachnaceae): manipulating insect behaviour through odour and visual cues. *Symbiosis* 77: 61–76.
- Mitten, W. 1882: Australian mosses, enumerated by William Mitten, Esq. *Transactions of the Royal Society of Victoria* 19: 49–96.
- Montagne, C. 1845: Cinquième centurie de plantes cellulaires exotiques nouvelles. *Annales des Sciences Naturelles. Botanique sér. 3, 4*: 86–123.
- Müller, C. 1850–1851: *Synopsis Muscorum Frondosorum omnium hucusque cognitorum*. Vol. 2. Alb. Foerstner, Berlin.
- Müller, C. 1851: Die, von Samuel Mossman im Jahre 1850, in Van Deimen's Land, Neuseeland und Neuholland gemachte Laubmoossammlung. *Botanische Zeitung (Berlin)* 9: 545–552, 561–567.
- Müller, C. 1900 ("1901"): *Genera Muscorum Frondosorum*. Eduard Kummer, Leipzig.
- Rodway, L. 1914: *Tasmanian Bryophyta*. Vol. 1, Mosses. Royal Society of Tasmania, Hobart.
- Sainsbury, G.O.K. 1955a: A handbook of the New Zealand mosses. *Bulletin of the Royal Society of New Zealand* 5: 1–490.
- Sainsbury, G.O.K. 1955b: Notes on Tasmanian mosses from Rodway's herbarium: IV. *Papers and Proceedings of the Royal Society of Tasmania* 89: 21–35.
-

-
- Seppelt, R.D.; Jarman, S.J.; Cave, L.H.; Dalton, P.J. 2013: *An Illustrated Catalogue of Tasmanian Mosses. Part 1*. Tasmanian Herbarium, Tasmanian Museum and Art Gallery, Hobart.
- Watts, W.W.; Whitelegge, T. 1906 ("1905"): Censu Muscorum Australiensium : a classified catalogue of the frondose mosses of Australia and Tasmania, collated from available publications and herbaria records (Part II). *Proceedings of the Linnean Society of New South Wales 30 (Supplement)*: 91–163.
- Wilson, W. 1854 ("1855"): Musci. In: Hooker, J.D. *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror, in the years 1839–1843, under the command of Captain Sir James Clark Ross*. II. Flora Novae-Zelandiae. Part II. Flowerless plants. Lovell Reeve, London. 57–125.
- Wilson, W. 1859 ("1860"): Musci. In: Hooker, J.D. *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839–1843, under the command of Captain Sir James Clark Ross*. III. Flora Tasmaniae. Part II. Monocotyledones and acotyledones. Lovell Reeve, London. 160–221.
- Wilson, W.; Hooker, J.D. 1845 ("1847"): Musci. In: Hooker, J.D. *The Botany of the Antarctic Voyage of H.M. Discovery Ships Erebus and Terror in the Years 1839–1843, under the command of Captain Sir James Clark Ross*. I. Flora Antarctica. Part I. Botany of Lord Auckland's Group and Campbell's Island. Reeve, Brothers, London. 117–143.

Conventions

Abbreviations and Latin terms

Abbreviations	Meaning
A	Auckland Islands
A.C.T.	Australian Capital Territory
<i>aff.</i>	allied to (<i>affinis</i>)
agg.	aggregate
Ant	Antipodes Islands
a.s.l.	above sea level
<i>auct.</i>	of authors (<i>auctorum</i>)
B	Bounty Islands
C	Campbell Island
c.	about (<i>circa</i>)
cf.	compare with, possibly the species named (<i>confer</i>)
<i>c.fr.</i>	with fruit (<i>cum fructibus</i>)
Ch	Chatham Islands
<i>comb. nov.</i>	new combination (<i>combinatio nova</i>)
D'U	D'Urville Island
et al.	and others (<i>et alia</i>)
et seq.	and following pages (<i>et sequentia</i>)
ex	from
fasc.	fascicle
<i>fide</i>	according to
GB	Great Barrier Island
HC	Hen and Chicken Islands
Herb.	Herbarium
hom. illeg.	illegitimate homonym
I.	Island
ibid.	in the same place (<i>ibidem</i>)
incl.	including
<i>in herb.</i>	in herbarium (<i>in herbario</i>)
<i>in litt.</i>	in a letter (<i>in litteris</i>)
<i>inter alia</i>	among other things (<i>inter alia</i>)
Is	Islands
K	Kermadec Islands
KA	Kapiti Island
LB	Little Barrier Island
L.D.	Land District or Districts
<i>leg.</i>	collected by (<i>legit</i>)
loc. cit.	in the same place (<i>loco citato</i>)
l:w	length:width ratio
M	Macquarie Island
Mt	Mount
<i>nec</i>	nor
NI	North Island
no.	number
nom. cons.	conserved name (<i>nomen conservandum</i>)
nom. dub.	name of doubtful application (<i>nomen dubium</i>)
nom. illeg.	name contrary to the rules of nomenclature (<i>nomen illegitimum</i>)
nom. inval.	invalid name (<i>nomen invalidum</i>)
nom. nud.	name published without a description (<i>nomen nudum</i>)
<i>non</i>	not
N.P.	National Park
N.S.W.	New South Wales
N.T.	Northern Territory (Australia)
N.Z.	New Zealand
op. cit.	in the work cited (<i>opere citato</i>)
pers. comm.	personal communication

PK	Poor Knights Islands
P.N.G.	Papua New Guinea
<i>pro parte</i>	in part
Qld	Queensland
q.v.	which see (<i>quod vide</i>)
RT	Rangitoto Island
S.A.	South Australia
<i>s.coll.</i>	without collector (<i>sine collectore</i>)
<i>s.d.</i>	without date (<i>sine die</i>)
sect.	section
SEM	scanning electron microscope/microscopy
<i>sensu</i>	in the taxonomic sense of
SI	South Island
<i>sic</i>	as written
<i>s.l.</i>	in a broad taxonomic sense (<i>sensu lato</i>)
<i>s.loc.</i>	without location (<i>sine locus</i>)
Sn	Snares Islands
<i>s.n.</i>	without a collection number (<i>sine numero</i>)
Sol	Solander Island
sp.	species (singular)
spp.	species (plural)
<i>s.s.</i>	in a narrow taxonomic sense (<i>sensu stricto</i>)
St	Stewart Island
<i>stat. nov.</i>	new status (<i>status novus</i>)
subg.	subgenus
subsect.	subsection
subsp.	subspecies (singular)
subsp.	subspecies (plural)
Tas.	Tasmania
TK	Three Kings Islands
U.S.A.	United States of America
var.	variety
vars	varieties
Vic.	Victoria
viz.	that is to say (<i>videlicet</i>)
vs	versus
W.A.	Western Australia

Symbols

Symbol	Meaning
µm	micrometre
♂	male
♀	female
±	more or less, somewhat
×	times; dimensions connected by × refer to length times width
>	greater than
<	less than
≥	greater than or equal to
≤	less than or equal to
=	heterotypic synonym of the preceding name
≡	homotypic synonym of the preceding name
!	confirmed by the author
*	in distribution statements, indicates non-N.Z. localities from which material has been confirmed by the author

Technical terms conform to Malcolm, B.; Malcolm, N. 2006: *Mosses and other Bryophytes: an Illustrated Glossary*. Edition 2. Micro-Optics Press, Nelson.

Abbreviations for Herbaria follow the standard abbreviations listed in *Index Herbariorum*.

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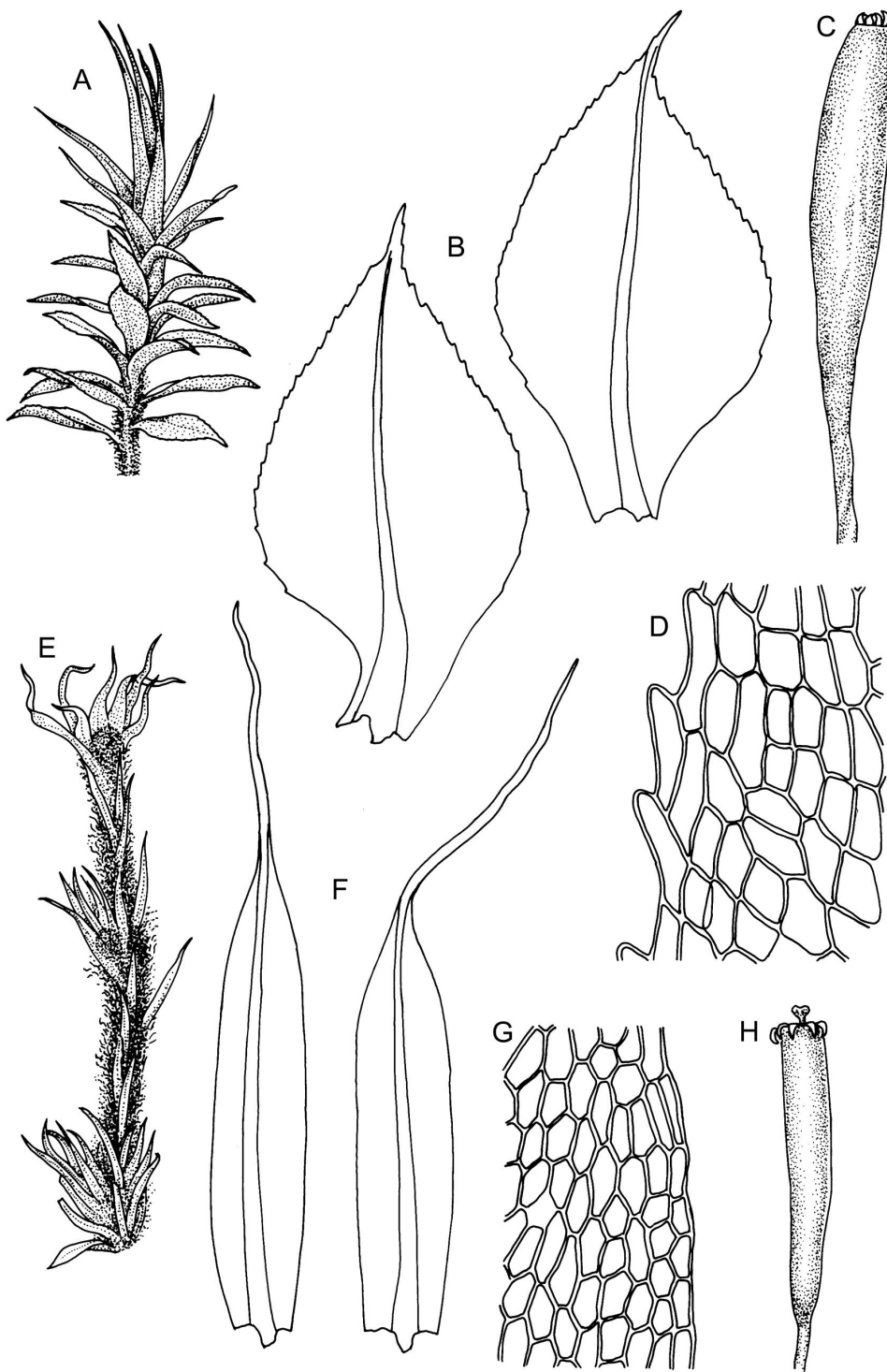


Plate 1: Tayloria. A–D: *T. callophylla*. A, habit of ♂ plant. B, leaves. C, capsule dry. D, upper laminal cells at margin. **E–H: *T. octoblepharum*.** E, habit of ♂ plant. F, leaves. G, upper laminal cells at margin. H, capsule, dry. *T. callophylla* drawn from J.E. Beaver 23-23, CHR 104712. *T. octoblepharum* drawn from A.J. Fife 8234, CHR 439180.

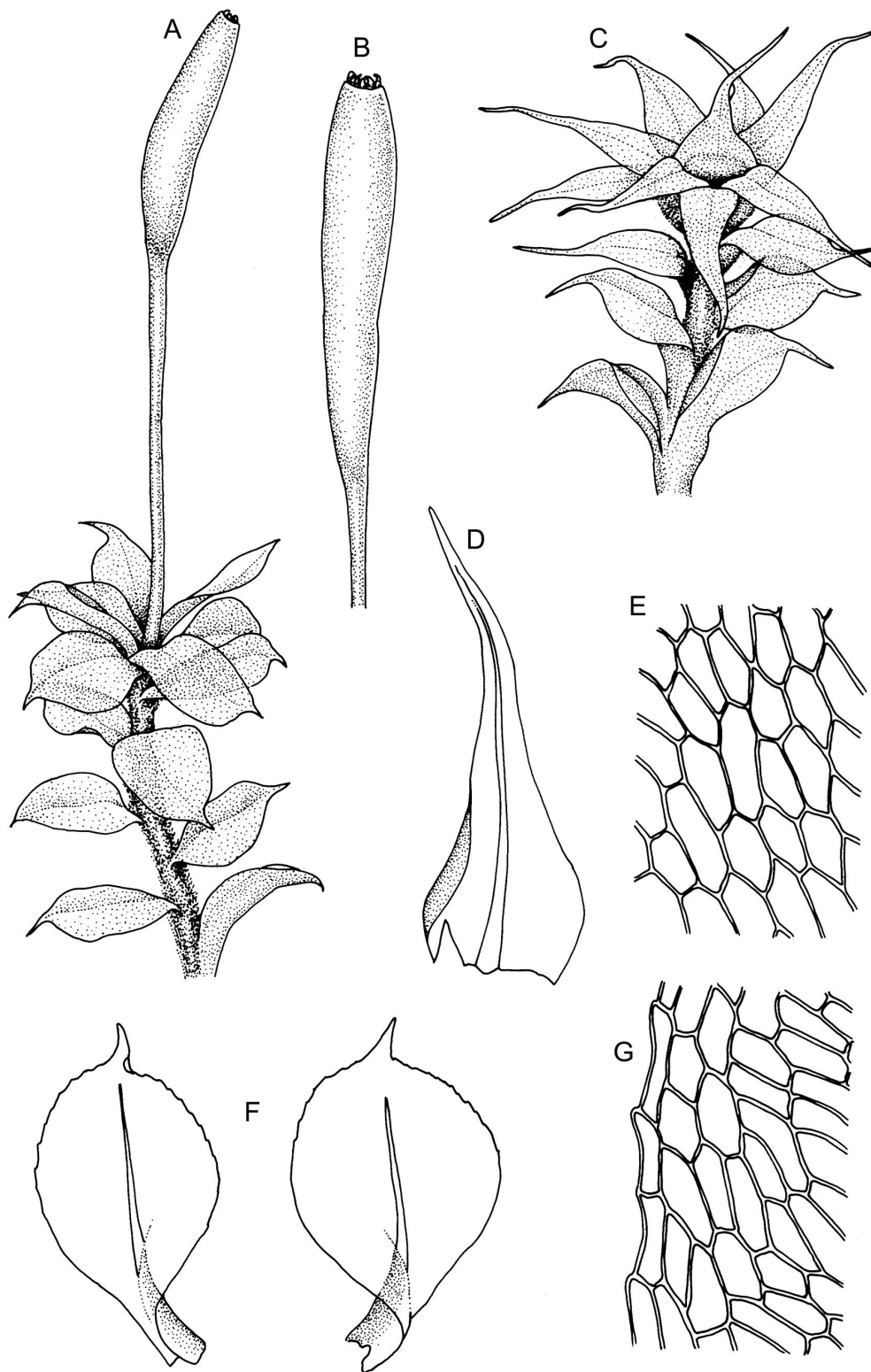
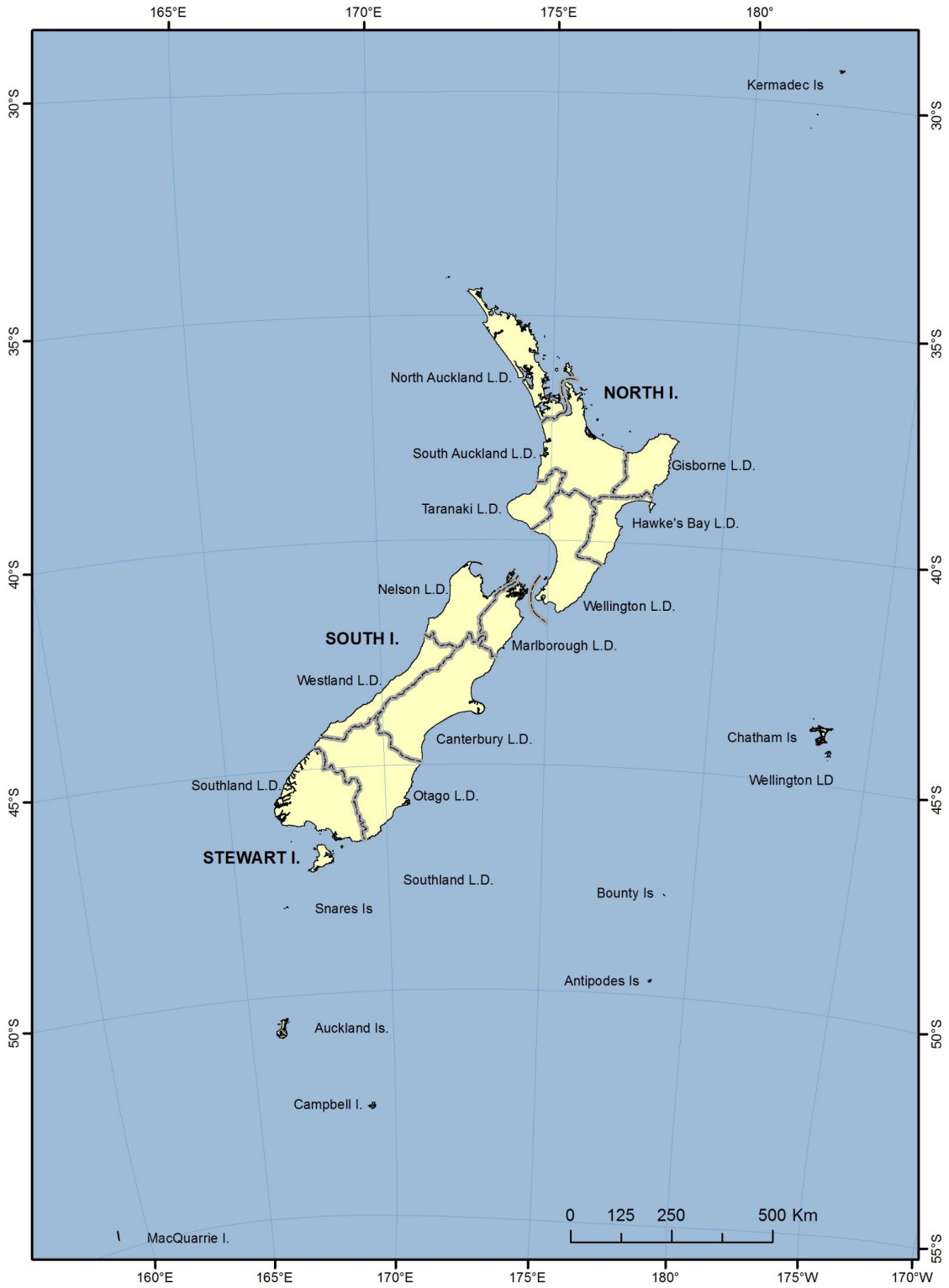
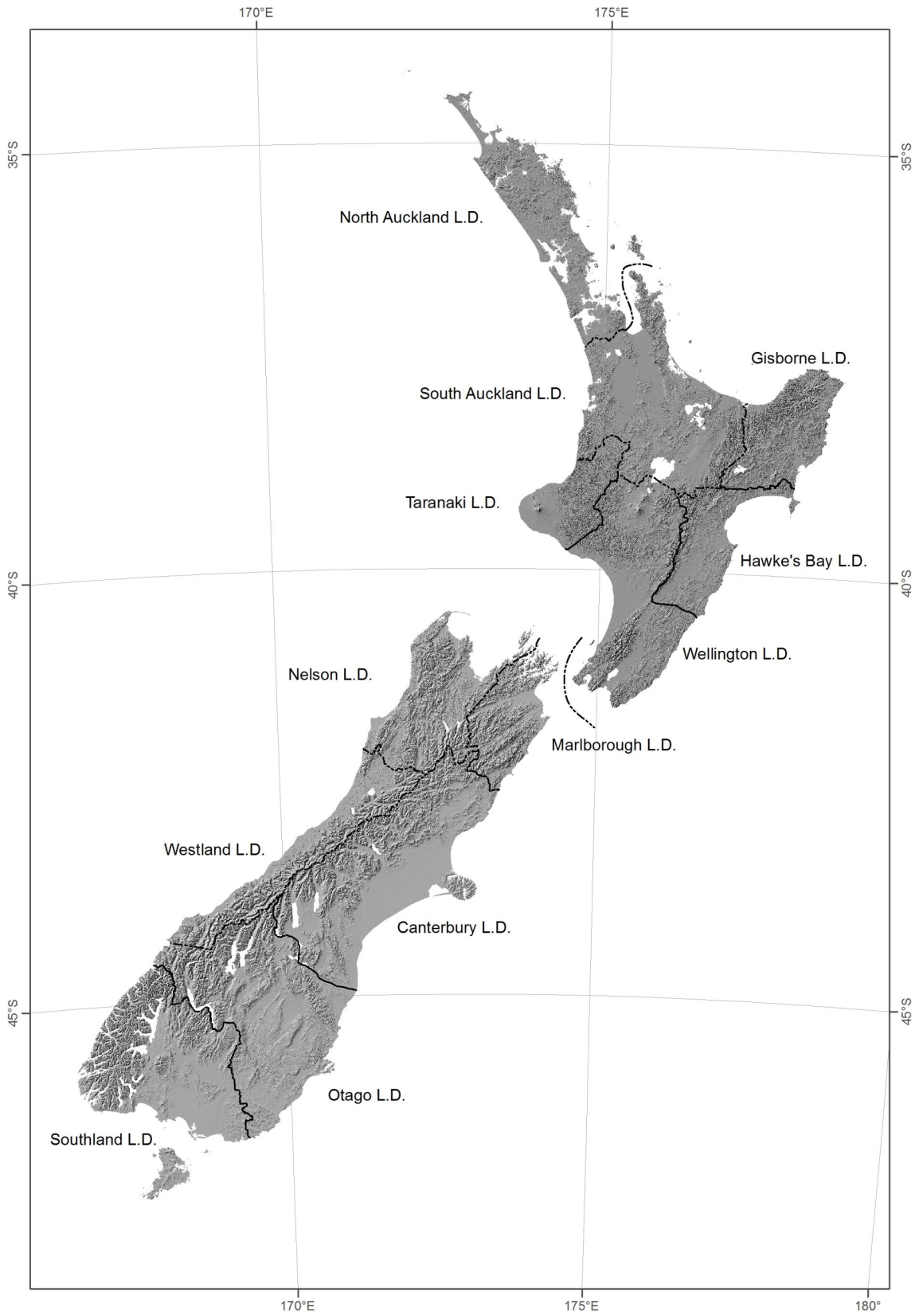


Plate 2: Tayloria. A–G: *T. purpurascens*. A, habit with capsule. B, capsule, dry. C, habit of ♂ plant. D, perigonal bract. E, mid laminal cells. F, leaves. G, upper laminal cells at margin. Drawn from A.J. Fife 6919, CHR 406855, and M.J.A. Simpson 1109, CHR 106044.



Map 1: Map of New Zealand and offshore islands showing Land District boundaries



Map 2: Map of main islands of New Zealand showing Land District boundaries

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Page numbers are in **bold** for the main entry, and *italic* for synonyms.

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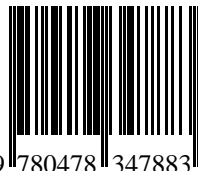
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