

DESCRIPTION OF NEW OR RARE TASMANIAN  
HEPATICÆ

(COLLECTED BY R. A. BASTOW, Esq., F.L.S. ;)

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(Plates XXXVI. to XLIII.)

FRULLANIA DIPLOTA. TAYL.

Tayl. Nov. Hep. in Lond. Journ. of Bot., p. 405, n. 11 (1846). G. L. N. Syn., Hep. Suppl., p. 780 (1847).

Flores dioici; bractææ 2-jugæ lobis subacutis lobulis acuminatis basi uni-laciñiatis; perianthia obovata, triquetra, brevi rostellata, amenta ♂ globosa; antheridia albida.

Habitat, Mount Knocklofty, Hobart, July, 1885. 208.

On face of cliffs with an *Andreaea*.

Van Diemen's Land, J. D. Hooker, 1820. (Ex. herb. Tayl.)

Obs.—Fortunately possessing Taylor's original specimens of this species (Interior of New South Wales, Cunningham, 1836; Van Diemen's Land, J. D. Hooker, 1820), we have been enabled to arrive at a satisfactory diagnosis.

From *F. congesta*, H. f. and T., Falkland Island, it is distinguished by its more regular sub-bipinnate ramification, not irregularly branched, the remarkable areolation of leaf, which Dr. Taylor noted, the basal cells being very large when compared with the other portion of the leaf. In *F. congesta* the cells are uniform throughout, rather larger than the middle ones of *F. diplota*.

The leaves of both *F. congesta* and *F. diplota* are more or less apiculate on the young branches, evidently overlooked by Taylor in his description of *F. diplota*. The same remark is true with *F. lobulata*. (See Gott. Syn. Hep., p. 445.)

In *Frullania congesta* the underleaves are approximate, more obovate, and segments not so acute as in *F. diplota*.

Description of Pl. I.—Fig. 1, portion of stem  $\times$  64 (Van Diemen's Land, J. D. Hooker, Herb. Tayl.); 2, ditto  $\times$  64 (R. A. Bastow); 3, ditto  $\times$  64 (Interior of N. S. Wales, R. Cunningham, Herb. Tayl.); 4, portion of leaf  $\times$  290 (R.A.B.); 5, ditto  $\times$  290 (Interior N.S.W.); 6, bract and bracteole  $\times$  51 (R.A.B.); 7, perianth  $\times$  24 (R.A.B.); 8, portion of leaf of *Frullania congesta*  $\times$  290.

## LEPIDOZIA CAPILLARIS (Sw.) VAR. GENICULATA.

[*Lepidozia geniculata* Pears. MSS.]

Densely cæspitose, flagelliferous, gracile, small (2), scandent, olive-brown ; stems irregularly bipinnate, rigid ; leaves subtransverse, approximate teeth inflexed, geniculate, palmately-quadrifid to  $\frac{3}{4}$  their length, with a spur at one or both basal angles ; underleaves large, ovate, quadrate, trifid, rarely quadrifid ; inflorescence ♀ on short postical branches ; bracts oblong-oval or ovate-acute, apices bidentate, margins sparingly dentate ; perianth very long and narrowly cylindrical, composed of one layer of cells, trigonous, mouth laciniate-ciliate.

Dioicous? Densely cæspitose, erecto-precumbent, flagelliferous, flagella postical, leafless, radicellose, minute, yellowish olive-brown. Stems irregularly bipinnate, rigid, apex recurved, a cross section showing 12 large, quadrate, dark-walled cortical cells, interior ones smaller, hyaline, 6 and 7 cells in diam. The young branches appear with the leaves to be frontally compressed. Leaves transversely inserted, crowded above, approximate or loosely imbricated, and slightly incubous on the lower part of the stems, geniculate, basal portion patent, teeth erect or inflexed, sub-verticillate, when flattened out palmately-quadrifid, with a short spur on one, very rarely on both basal angles, much rarer still an additional smaller one is present ; branch leaves trifid, segments  $\frac{3}{4}$ ths of the leaf long, subulate (at apex one cell, at base 3 and 4 cells broad and 10 to 12 cells long) ; entire portion of leaf 4 cells deep ; cells minute, guttulate, subquadrate or oblong-quadrata. Underleaves large, breadth of stem at base, ovate or oblong-quadrata, trifid, sometimes quadrifid, on terminal branches often bifid. Involucre cladocarpous, postical, branches short. Bracts oblong-oval, ovate-acute, apex bidentate, margin sparingly denticulate or with two acute teeth. Perianth very long, half the length of the whole plant, narrowly cylindrical, very delicate texture, composed of a single layer of cells, 40 to 50 cells in circumference, upper portion trigonous ; mouth laciniate-ciliate, about 15 cilia, 2-4 single cells long, 2-3 cells broad at the base. Pistillidia few.

Measurements : Stems,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, .125 to .15 mm diam., with leaves .3 mm diam. ; outer cells, .03 mm ; leaves, .275 mm long  $\times$  .275 mm broad ; segments, .2 mm long, .05 mm to .075 mm broad at base, .25  $\times$  .25 seg. .2, .225  $\times$  .225 seg. .15, .25  $\times$  .2 seg. .15 ; cells, 1.65 mm .02 mm  $\times$  .015 mm, .015  $\times$  .015, .0125  $\times$  .0125 ; underleaves, .225 mm long  $\times$  .15 mm broad ; seg. .15 mm long, .15  $\times$  .1 ; bracts, .9 mm long  $\times$  .6 mm broad, .9  $\times$  .5, .7  $\times$  .4 ; perianth, 3.5 mm long  $\times$  .5 mm broad ; cilia, .2 mm to .3 mm long.

Hab., St. Crispin's Well, Mount Wellington, January 11th, 1886. 295.

Obs.—Differs from the type in the more transverse insertion and peculiarly sudden inflexion of the leaf, the palmatifid portion rising at nearly right angles with the base; leaves quadrifid, shorter and broader at the base, to which is attached a short or reflexed spur, on one or both sides, and the extremely long perianth. From *Lepidozia truncatella* (Nees) which has basal teeth on both sides of the leaf, by the oblique insertion of the leaves in that species, not inflexed and the much shorter triangular teeth.

In *Lepidozia nemoides*, Tayl., the leaves are erecto-patent, the teeth more slender, and composed of one or (near the base) two series of oblong cells.

[*LEPIDOZIA VERTICELLATA* CARR., MSS.]

This is a taller (2in. and more) and more rigid form, main stems dark brown, polished, with distant whorled leaves, branches short, spreading, bearing 2-3 short *ramuli*, on which the leaves are more closely imbricated; base of the leaves and under leaves of the main stem generally spurred. This form is referred by Mr. Mitten and others to *Lepidozia capilligera*, but anyone who will examine the engraving of that species in Lindenberg's Sp. Hep., Pl. IV., will find that *L. capilligera* belongs to the section in which the leaves are inserted obliquely like *L. praenitens*, and not to the section with verticellate leaves with transverse insertion. The recurved hooklets at the bases of the leaves and stipules are probably intended to enable the plant to climb and affix itself to other hepaticæ and mosses.

*L. quadrifida*, Tayl., from Auckland Island, seems to me to be the true *L. capilligera*, Lindenb.! This is growing with *L. capillaris* from Mount Wellington.

[*CEPHALOZIA (ZOOPIS) LEITGEBIANA* n. sp.].

Dioicous; fronds irregularly branched, distantly bipinnate, silvery green, creeping; stems linear, sub-compressed, formed of large, tumid cells, flagelliferous, branches lateral and postical; leaves succubous, sub-ulate, divided to the base into two segments, connivent, upper twice the size of the lower, triangular or broadly subulate, lower subulate, cells large, reticulate, quadrate-rotund; under leaves binate, elliptic-oblong, sometimes bearing a smaller cell at the apex; involucre postical; bracts, 3 pairs, much larger than the leaves, bifid, with a short outer tooth; perianth ovate

trigonous, of a single layer of cells, mouth laciniate-ciliate; androecium lateral, terminal on proper branches; perigonial leaves, bifid, with the lower segment incurved, antheridia 1-2, minute, oval.

Del. Leitg. Mittheil. des Naturw. Ver. für Steiermark, 1876  
Über Zoopsis, fig. 10.

Dioicous. Fronds slender, densely entangled, growing in flattish, shining, hyaline patches, pale green to white, prostrate, flagelliferous, flagella postical, radicellose, microphyllous. Stems irregularly ramosc or subbipinnate, vertibrate, slightly flattened, branches lateral or postical, patent, distant, cortical cells 5, large, hyaline, central bundle of cells, 6 or 7, much smaller and longer, chlorophyllose. Rootlets few, slender, white, proceeding from base of underleaves. Leaves succous, sublongitudinal, distant, alternate, patent, decurrent at the base, divided to the base, or nearly so, into two subulate unequal jointed lobes, antical lobe inserted below and seated upon the former, shorter, awl-shaped, inflexed, sinus acute, leafy portions 3 cells broad, cells large, tumid, subquadrate, with rounded angles, hyaline, catenulate. Underleaves everywhere present, binate, the cells nearly parallel; sometimes a smaller terminal cell is met with. Involucre cladocarpous on short postical branches, 4 or 5 on a stem, bracts 3 pairs, much larger than the leaves, oblong quadrate, bifid, divided down to rather more than  $\frac{1}{3}$ , sinus acute, segments subulate, an exterior tooth near the base of the segments, bracteole simple, subulate, or bifid, oval-oblong. Perianth trigonous, ovate-oblong, composed of one layer of cells, 40 cells round, mouth laciniate-ciliate, about 4 segments 10 cilia.

Male spikes terminal on proper lateral branches. Perigonial leaves deeply and unequally bifid, the lower (antical) segment inflexed, and enclosing 1-2 minute oval antheridia.

Measurements: Stems,  $\frac{1}{2}$  to 1 in. long, .2 mm diam., .25 mm  $\times$  .17 mm, .225 mm  $\times$  .175 mm; cortical cells, .125 mm  $\times$  .075 mm, .125 mm  $\times$  .1 mm; interior, .01 mm; leaves, .4 mm long  $\times$  .3 mm broad; seg. upper, .275 mm long, lower .2 mm long; cells, 1-12 mm, .1 mm  $\times$  .07 mm, .1  $\times$  .06, .1  $\times$  .05, .08  $\times$  .06, .06  $\times$  .06; underleaves, .15 mm long  $\times$  .075 mm broad, .1 mm long  $\times$  .075 mm broad; bracts, 2.25 mm long  $\times$  .6 mm broad; seg., 1 mm long, 2  $\times$  1; seg., 1, 1.7  $\times$  .9 broad; seg., 1'; bracteole, 2 mm long  $\times$  .4 mm broad, 1.6 mm long  $\times$  .9; perianth, 2 mm long  $\times$  .8 mm broad; ciliæ, .5 mm to .7 mm long; pistillidia, .2 mm long  $\times$  .075 mm broad; perigonial leaf, .5 mm long  $\times$  .35 mm broad; antheridia, .1 mm  $\times$  .075.

Habitat.—New Zealand, Dr. Buchanan (Herb. Leitgeb); 304, St. Crispin's Well, Mount Wellington, Hobart, Tasmania. R. A. Bastow.

Balls-head Bay, Sydney, N.S.W., T. Whitelegge, June, 1885, ♂ and ♀ cum per.

Obs.—Prof. Leitgeb, of Graz, in the course of his valuable researches upon the structure of the Hepaticæ, mentions (*Über Zoopsis Mittheil. des Naturw., ver für Steiermark*, 1876, p. 9) that he had found amongst a collection of Hepaticæ received from Dr. Buchanan, New Zealand, a tuft which, according to his view, was a *Zoopsis* with perfectly developed leaves, a portion of a stem of which he figures (fig. 10). A glance showed at once that our plant was identical with it.

Further on in this interesting paper Prof. Leitgeb considers its relationship to the other species belonging to this group, *Z. argentea* (Tayl.) Hook. f. and *Z. setulosa* (Leitg.), without raising it to the rank of a species. The large perfectly distinct succubous bifid leaves induce us to do so, for whatever doubts there may have been prior to the researches of Lindberg, Spruce, and Leitgeb as to the including of *Zoopsis* amongst the foliose hepaticæ, there can be none in this interesting plant, to which, with Prof. Leitgeb's permission, we attach his name.

*Cephalozia (Zoopsis) Leitgebiana* is more slender and of a less silvery aspect than the two known species and shrinks more when dry.

It supplies a connecting link between *Zoopsis* and *Cephalozia*.

In *Zoopsis argentea* the only trace of leaf structure consists of very narrow oblong cells, which are placed longitudinally on alternate tubercles at the sides of the main stems, while in *Zoopsis setulosa* (Leitg.) the lateral tubercles each bear a sharp terminal seta like the claw of a crab, the large cortical cells of the stem giving it a vertebrate appearance, like the backbone of a cartilaginous fish (ray or shark) are present in all the species, as well as the simple binate underleaves. The structure is very carefully described in Prof. Leitgeb's paper, *Über Zoopsis*, Graz, 1876, with figures. Prof. Leitgeb appears to consider the three forms as modifications of one species, and this view may be accepted in a Darwinian sense.

Description of Pl. III.—Fig. 1, plants nat. size; 2, ditto  $\times 16$ ; 3-4, cross section of stem  $\times 85$ ; 5, leaf, antical view  $\times 85$ ; 6, leaf, postical view  $\times 85$ ; 7-8, under leaves  $\times 85$ ; 9, bract  $\times 24$ ; 10, bracteole  $\times 24$ ; 11, perianth  $\times 24$ ; 12, cross section of perianth  $\times 24$ ; 13, pistillidium  $\times 85$ ; 14, perigonial leaf  $\times 85$ ; 15, antheridium  $\times 85$ .

## CHILOSCYPHUS LIMOSUS n. sp.

Dioicous; tufts shallow, depressed, sordid green; stems sparingly branched; leaves complanate, nearly opposite, imbricate, ovate-triangular, rounded at the apex, sometimes retuse, decurrent; underleaves connate with the adjacent leaves, patent, cuneate-quadrata, divided half way into 4 acute, equal segments; involucral bracts connate about half way, irregularly dentate; perianth cyathiform, slightly alate, mouth wide, tri-laciniate-lobate, irregularly sinuate dentate; androecium amentiform, minute; antheridia single, oval.

Dioicous. Plants forming shallow, entangled tufts, attached to the surface of moist earth, of a dull green colour. Stems prostrate, linear, complanate, of moderate size, sparingly branched (on a cross section, showing 8 cells in diam., 20 to 25 cells in circumference). Leaves sub-opposite, imbricate, plane or slightly convex, ovate-triangular, entire, apex rounded, truncate, or rarely slightly retuse, antical margin of leaf decurrent, at angle of  $60^\circ$  postical border undulate 908; cells of a medium size, hexagonal, trigones very minute. Underleaves connate with the adjacent leaves, rarely with one only, about 1.5 smaller than the leaves, decurved, subquadrate, from a cuneate base, quadrifid for half its length, very rarely with an additional marginal tooth. Perigynium on a short lateral branch proceeding from an underleaf bearing one pair of bracts, with an additional bracteole, which are connate for the lower half. Bracts irregularly ovate, unequally dentate. Perianth cyathiform, mouth wide, tri-laciniate, on section the perianth is composed of one layer of 120 to 130 cells in circumference, slightly winged near the apex, wing 6 cells wide; mouth wide, with 3 or 4 segments, irregularly dentate. Capsule not seen.

Androecium amentiform, proceeding from below an underleaf, small, with 3 or 4 pairs of leaves, antheridia single, oval.

Measurements: Stems,  $\frac{3}{4}$  in. to  $1\frac{1}{2}$  in. long, with leaves spread out 3.5 mm broad; stem, .2 mm to .25 mm diam.; leaves, 2.2 mm long  $\times$  1.7 mm broad at base, 1.8 mm  $\times$  1.4 mm, 1.6 mm  $\times$  1.5 mm, 1.6 mm  $\times$  1.4 mm; cells, .045 mm  $\times$  .04 mm, .04  $\times$  .04, .04  $\times$  .035, .04  $\times$  .03, .035  $\times$  .03, .04  $\times$  .025; trigones, .005; bract, 1.25 mm high  $\times$  1.5 mm broad; perianth, 3 mm long  $\times$  1.5 mm wide at mouth, 2.5 mm  $\times$  1 mm; under leaves, 1 mm long  $\times$  .5 mm broad; segments, .4 mm long, .9  $\times$  .6; seg., .4, .8  $\times$  .6; seg., .4, .8  $\times$  .5; seg. .5, .7  $\times$  .5; seg. 3, .5  $\times$  .3; seg. .3.

Hab., Muddy places by stream, Proctor's-road, Brown's River, Nov., 1885.

Obs.—Differs from the entire leaved form of *Chiloscyphus supinus*, Hook. f. et Tayl., figured by Mr. Mitten, Fl. N. Zel.

2 xcix. f. 2, in the shape of the underleaves, by which character it may be easily recognised.

Many of the perianths have a flap hanging from the suture, giving it a pseudo-alaate appearance.

Description of Pl. IV.—Fig. 1, plants nat. size; 2, portion of stem  $\times 16$ , antical view; 3, portion of stem  $\times 16$ , postical view; 4, portion of leaf  $\times 290$ ; 5, 6, 7, underleaves  $\times 24$ ; 8, bract  $\times 16$ ; 9, perianth  $\times 16$ ; 10, cross section of portion of perianth  $\times 85$ , showing the pseudo-wing character; 11, mouth of perianth, explanate,  $\times 16$ .

[*JUNGERMANIA BASTOVII* n. sp.]

Monoicous, cladocarpous, pale glaucous green; stems slightly branched, creeping, filiform, rigid; branches lateral, leaves approximate, nearly transverse, subsecund, subquadrate, ovate, convexo-conduplicate, divided half way down into two acute spreading segments, sinus acute, margin entire; exstipulate; involucre on short lateral branches; bracts larger than the leaves, notched at the base; perigonial leaves 4-6 pairs, turgid at the base, monandrous.

Monoicous, laxly creeping amongst other mosses and hepaticas, of a dull, pea-green colour, nearly white when dry. Stems half an inch to an inch long, slightly branched, flagelliferous, wiry, showing upon a cross section 10 to 12 cells in diam., cells of equal size, nucleate, cortical cells about 24; branches lateral, rooting at intervals up to apex, rootlets white, short. Leaves loosely imbricated, alternate, patent at an angle of  $55^\circ$ , insertion slightly oblique, sometimes transverse, subsecund, roundish, oval, or subquadrate, subconduplicate, scarcely carinate, divided to about the middle into two equal lobes, sinus and segments acute, patulous; cells quadrate, nucleate, small, papillose, without trigones. Underleaves none. Involucrume on short lateral branches, outer bracts larger than the leaves, similar in shape with an additional postical tooth at the base; bracteole oblong-oval. Perianth (?) only a single, imperfect one observed. This had a slightly irregular margin at mouth. Pistillidia clustered, oblong, 5 or 6. Androecium on chief stem or forming short lateral spikelets, 4 to 6 pairs of leaves, perigonial leaves gibbous at base, monandrous; antheridia shortly stipitate, spherical.

Measurements: Stems, from  $\frac{1}{2}$  in. to 1 in. long, 15 mm to 175 mm diam., with leaves 5 mm to 6 mm diam.; leaves, 45 mm long  $\times$  4 mm broad; seg., 2 mm long, 4  $\times$  3; seg., 2, 325  $\times$  275; seg., 15; cells, 1-50 mm, 0125  $\times$  02 mm, 02  $\times$  0175, 02  $\times$  02, 0225  $\times$  02, 0225  $\times$  02, 025 ×

·02; outer bracts, ·55 mm long  $\times$  ·5 mm broad; seg., ·3 mm long; marginal notch, ·05 mm deep, ·7  $\times$  ·6; seg., ·4; marginal notch, ·125; bracteole, ·3 mm long  $\times$  ·1 mm broad.

Hab., "Ploughed Fields," Mount Wellington, January 1st, 1886. 261.

Obs.—Unfortunately no perfect perianths have been found, so we hesitate as to what genus it should be assigned.

To none of the already described species can *J. Bastovii* be referred so far as we are able to say.

The discoverer, Mr. R. A. Bastow, of Hobart, Tasmania, in whose honour the name is given, and who has already considerably added to the list of Tasmanian Cryptogams, sent it as *Gymnomitrium physocaulum*, Tayl., but with that species it has nothing in common.

This is in many respects the most interesting of Mr. Bastow's discoveries; the short lateral axillary involucre and absence of underleaves distinguish it from any known species. The insertion of the leaves is nearly transverse, but undoubtedly succubous.

Description of Plate V.—Fig. 1, plants nat. size; 2, plant  $\times$  16; 3, apex of ♂ stem  $\times$  16; 4, portion of stem  $\times$  51; 5, 6, 7, leaves  $\times$  85, flattened out; 8, portion of leaf  $\times$  290; 9, 10, outer bracts  $\times$  57; 11, bracteole  $\times$  85; 12, pistillidia  $\times$  85; 13, antheridium  $\times$  85.

[*CESIA EROSA* n. sp.]

Monoicous; loosely cæspitose, pale olive green, rhizomatous, creeping, sparingly branched filiform, fertile stems erect, clavate, leaves very closely imbricate, appressed, erect, ovate or roundish-ovate, entire, retuse or slightly notched, margin hyaline, irregularly erose, crenulate; cells minute, guttulate; bracts broadly ovate to cordate-ovate, bidentate, sinus acute, inner bracts 3-lobate, dentate.

Monoicous. Tufts intricately entangled, of a pale olive green colour. Stems on a cross section about 30 cells in circumference, 10 in diameter, 3 outer rows darker, inner hyaline, rhizomatous, simple or slightly branched, rigid, somewhat flexuose, filiform, flagelliferous; flagella with or without minute leaves, rooting; rootlets frequent, short, whitish. Leaves closely imbricated, appressed, erect, ovate, or broadly ovate, retuse, slightly notched or entire, sinus extremely shallow, segments slightly acute or rounded, margin of leaves hyaline, irregularly crenulate or erose; cells minute, guttulate, quadrate, or 5-6 sided, marginal cells long and narrow, conical or irregular in form. Perigynium on short club-shaped branches; outer bracts rather larger than

leaves, broadly ovate to cordate-ovate, bidentate, sinus from 1-10 to 1-5 deep, acute, margin as in leaves; inner bracts 3-lobate, irregularly dentate. On the margins of these inner bracts were numerous *cellulæ clavulæ*, which Leitgeb states to be peculiar to *Cesia* as distinct from *Marsupella*. Pistillidia 10, long, capsule not seen. Androecia terminal on lateral branches, 4 to 6 pairs of leaves, ovate-quadrate, emarginate sinus and segments obtuse, antheridia 2 in each leaf, oval, stipitate.

Measurements: Stems, with branches,  $\frac{1}{2}$  in. to 1 in. diam., ·2 mm, with leaves ·3 to ·4 mm; leaves, ·7 mm long  $\times$  ·6 mm broad, ·6  $\times$  ·5, ·4  $\times$  ·35; cells 1-70 mm, ·015 mm  $\times$  ·015, ·0125  $\times$  ·0125, ·02  $\times$  ·0125; marginal cells, ·05 mm  $\times$  ·01 mm, ·04  $\times$  ·01, ·03  $\times$  ·01, ·025  $\times$  ·0125; bracts, outer, ·7 mm  $\times$  ·7 mm, ·6  $\times$  ·7, ·5  $\times$  ·5; seg., ·05; bracts, middle, ·55 mm  $\times$  ·55 mm; seg., ·1 mm; bracts, inner, ·45 mm high; *cellulæ clavulæ*, ·01 mm  $\times$  ·02 mm, ·01  $\times$  ·0175; pistillidia, ·275 mm long  $\times$  ·05 mm broad; perigonial leaf, 4 mm  $\times$  ·325 mm; antheridia, ·175 mm  $\times$  ·125 mm.

Obs.—In habit resembling *Cesia coralliooides*. Differs from it in its monoicous inflorescence, margin of leaves being irregularly crenulate, with long narrow cells, although in *Cesia coralliooides* the margins of the leaves are so diaphanous and scariose that the cell structure can scarcely be defined, yet the cells always retain their quadrate shape.

*Cesia crenulata*, which it resembles in size, is also dioicous, margin of leaves more regularly and deeply crenulate, with the marginal cells shorter and more conical, leaves always bidentate.

Hab., top of Mount Wellington, Tasmania, January 1st, 1886. 284.

Description of Pl. VI.—Fig. 1, plants nat. size; 2, plant  $\times$  16; 3-7, leaves  $\times$  24; 8, leaf  $\times$  85; 9, portion of leaf  $\times$  290; 10, margin of leaf  $\times$  290; 11, 12, outer bracts  $\times$  16; 13, ditto  $\times$  85; 14, middle bract  $\times$  85; 15, inner bract  $\times$  85; 16, *cellulæ clavulæ*  $\times$  290; 17, pistillidium  $\times$  85; 18, perigonial leaf  $\times$  85; 19, antheridium  $\times$  85.

[*JUNGERMANIA (JAMESONIELLA) TERES* n. sp.]

Dioicous, densely cæspitose, flagelliferous; reddish-brown colour; stems subramose, terete, wiry, rigid, filiform, flexuose, branches postical, leaves closely appressed, imbricate, sub-amplexicaule, erect, broadly ovate, obtuse, margin hyaline, entire; underleaves, none; involucral bracts much larger, laciniate-

dentate, bracteole ovate-acute, slightly dentate; perianth ovate-cylindric, deeply, 4-6 plicate, mouth incurved, denticulate; ♂ branches postical, perigonial leaves 6-8 pairs cordate, cucullate.

Dioicous; ♂ and ♀ entangled in the same tufts, but on separate stems, loosely intricately cæspitose, prostrate, flagelliferous; flagella rooting at the end, clothed with minute leaves. Stems filiform, julaceous, about  $\frac{1}{2}$  in. long, of a reddish-brown colour, slightly branched, rigid, serpentine, about the thickness of horsehair, a cross section showing it to be composed of small, thick, opaque cells, branches postical. Leaves very closely appressed to stem, imbricate or approximate, obliquely erect; alternate or subopposite, succubous, entire, ovate, broadly ovate or cordate-obtuse, reddish-brown, with a paler hyaline border; cells smallish, quadrate or oblong-quadrata, 4-5 sided, trigones none, marginal cells 3 rows deep, smaller, and with thinner walls. Fertile stems suddenly bent upwards. Bracts accrescent, 2nd pair irregularly dentate, innermost larger, broader than long, acutely and deeply 6-10 lacinate-dentate. Bracteole ovate-lanceolate, slightly dentate on one side. Perianth projecting half beyond bracts, oval, 4-6 plicate, composed of one layer of cells, about 100 cells round near the middle upon a cross section, mouth wide, slightly incurved, faintly denticulate. Pistillidia 12-15 long. Plant ♀ on postical branches, perigonial leaves larger, 6 to 8 pairs, hooded, unidentate near base on one side, monandrous, antheridia oblong-orbicular.

Measurements: Stems, from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, .2 mm to .3 mm diam.; leaves, .35 mm long  $\times$  .45 mm broad, .45  $\times$  .35, .4  $\times$  .3, .375  $\times$  .35, .35  $\times$  .3; cells, 1-40 mm, .03 mm  $\times$  .025 mm, .03  $\times$  .02, .025  $\times$  .02; second bract, .4 mm broad  $\times$  .4 mm high; innermost bract, .75 mm  $\times$  .65 mm, .65  $\times$  .55; bracteole, .6 mm high  $\times$  .4 mm broad near base; perianth, 1.5 mm long  $\times$  .6 mm broad; perigonial leaf, .4 mm long  $\times$  .5 mm broad; pistillidia, .3 mm long  $\times$  .06 mm broad; antheridia, .2 mm  $\times$  .15 mm.

Hab., near top of Mount Wellington, December 25th, 1885. 275.

Obs.—This minute and very beautiful species resembles a microscopic form of *Jung. (Jamesoniella) rubella*, Spruce, but is abundantly distinct from that or any known species.

Description of Pl. VII.—Fig. 1, plants nat. size; 2, fertile stem  $\times$  24; 3-6, leaves  $\times$  85; 7, portion of leaf  $\times$  290; 8, second bract  $\times$  85; 9, 10, innermost bracts  $\times$  64; 11, bracteole  $\times$  64; 12, perianth  $\times$  51; 13, cross section of perianth; 14, pistillidia  $\times$  85; 15, perigonial leaf  $\times$  85; 16, antheridium  $\times$  85.

61. *ANTHOCEROS LONGISPIRUS* n. sp.

Monoicous; fronds large, dark green, older portion yellowish, irregularly oblong-quadrate or flabelliform, broadly nerved, lobate, lobes cuneate, flabelliform, concave, laciniate-crenate, gemmiparous, slightly glandular; involucre very long, cylindrical, remarkably thick and fleshy, mouth contracted and thinner, irregularly notched, capsule long, pale brown, slender, splitting into 2 valves; spores greenish, minutely verruculose, elaters very long, unispiral.

Plant growing in large patches of a dark green colour, the older imbricated portion discoloured, yellowish beneath. Frond large, very irregular in shape, usually oblong-quadrate or flabelliform, irregularly lobed; texture somewhat fleshy, broadly nerved, *i.e.*, thicker at the middle, gradually becoming thinner towards the margin (8 to 12 cells thick near the middle, cells small and closely packed, 1 to 2 cells thick, near the margin laxer); lobes short, cuneate, margin ascending, laciniate-crenate, much malformed and crisped by the gemmiparous growths.

Within the margin of the fronds scattered, sessile, glandular cells are met with, surface of frond otherwise smooth.

Inflorescence monocious. Involucres numerous, usually arising in two's or four's from the thickened portion of frond near the end, narrow and very long, fleshy, 8 to 12 cells thick near the middle, 1 to 2 near the mouth.

When old and dry, mouth contracted, smooth, plicate, irregularly notched. Capsule pale brown, long, slender, splitting into 2 valves; columella filiform.

Spores greenish, minutely verruculose. Elaters remarkably long, enclosing a single, broad, loosely coiled, brown spiral band.

Measurements: Fronds about 1 in. long,  $1\frac{1}{2}$  to 2 cm broad; lobes, 5 mm broad; fronds, .04 mm to .05 mm thick in the middle, .01 mm to .02 mm thick near the margin; cells of upper layer, .025 mm; involucre, 1 cm to 1 cm 5 mm long, 1 mm to 1.5 mm broad; capsule,  $1\frac{1}{2}$  in. long.

Habitat, St. Crispin's Well, Mount Wellington.

Obs.—The remarkably fleshy involucre and the length and perfection of the elaters distinguish this species from *A. laevis*. The presence of glands associates it with *A. glandulosa*, Lehm., but that species is covered with glands, giving the plant a very peculiar character.

Dr. Spruce mentions Amazonian species having long elaters, but no species known to us possesses the characters given in the diagnosis.

Description of Pl. VIII.—Fig. 1, 2, plants nat. size ; 3, portion of frond  $\times 11$  ; 4, cross section of frond  $\times 16$  ; 5, portion of frond showing outer layer of cells  $\times 290$  ; 6, portion of involucre showing mouth  $\times 16$  ; 7, cross section of involucre near middle  $\times 16$  ; 8, cross section of involucre near mouth  $\times 16$  ; 9-12, spores  $\times 290$  ; 13, elater  $\times 280$ .