

## TASMANIAN BRYOPHYTA.

By L. Rodway.

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## Fam. 2—DICRANACEAE.

Plants erect or suberect, simple or with few branches, from robust down to minute forms. Leaves lanceolate to subulate, with a closely sheathing base, surface smooth, rarely papillose; cells oblong to linear, or in some cases shorter to quadrate or rotund, longer and colourless towards the base; in some genera there is a patch of enlarged cells, the alars at the basal angle. Capsule erect, or more or less inclined, straight or bent, furrowed or smooth; in a few genera cleistocarpic, otherwise the lid well developed with a long rostrum; peristome of 16 teeth, usually cleft halfway into two slender legs; trabeculate on the inner, striate on the outer surface; in some genera cleft to the base into long slender papillose legs.

The typical genera, with long smooth leaves and characteristic capsules, are readily recognised. From this genera recede till in *Ceratodon* the appearance and tissue approximate to the *Tortulaceae*. The lidless genera, *Pleuridium* and *Bruchia*, are placed here by most bryologists, but they do not appear to have any very pronounced affinity specially with this family.

Capsule not forming a lid; plants very small.

**PLEURIDIUM:** Capsule broadly oblong or subglobose.

**BRUCHIA:** Capsule oblong, with a large apophysis.

Capsule with a lid.

Leaves papillose.

**SCLERODONTIUM:** Leaves ovate, lanceolate, pale.

TRIDONTIUM : Leaves lanceolate, nearly black.

DISTICHIMUM : Leaves subulate, distichous.

Leaves smooth ; peristome long.

CERATODON : Leaves lanceolate.

DITRICHUM : Leaves linear or subulate.

Leaves smooth ; peristome short ; plants not robust ;  
without enlarged alars.

CYNODONTIUM : Stem short ; leaves long ; cells  
rectangular ; capsule red.

CAMPYLOPODIUM : Stem short ; leaves long ;  
cells quadrate ; capsule yellow.

ANISOTHECIUM : Stem long ; leaves shorter ;  
capsule purple.

Leaves smooth ; peristome short ; plants robust, usu-  
ally with distinct alars.

CAMPYLOPUS : Calyptra fringed at the base.

BLINDIA : Capsule erect, short, oblong.

DICRANUM : Capsule narrow, oblong, inclined,  
grooved.

### BRUCHIA, Bridel.

Minute. Leaves ovate-lanceolate, erect, imbricate ;  
nerve rather broad ; cells rectangular. Capsule relatively  
large, erect, on a short seta, elliptic with a large apophysis,  
apiculate, not forming a lid ; calyptra mitriform with  
many basal incisions.

### BRUCHIA MINUTA, Mitt.

Stem simple, about 2 m.m. Leaves patent, lanceolate ;  
nerve percurrent ; margin serrulate above ; cells rather  
large and thin walled.

Cheshunt.

## PLEURIDIUM, Brid.

Plants small, erect, simple or nearly so. Leaves lanceolate from a broad base, smooth and glossy; nerve relatively broad, excurrent; cells irregular, oblong-fusiform, rectangular below. Capsule oblong, globose, apiculate, smooth, on a very short seta, not forming a lid; calyptra small, cucullate.

## PLEURIDIUM GRACILENTUM, Mitt.

Slender, 3-6 m.m. Lower leaves erect, distant, small, upper ones long, slender from a narrow ovate base, 2-5 m.m. forming a coma; margin obscurely serrulate; nerve well developed; cells very irregular, oblong-fusiform, rectangular below. Capsule broadly oblong, bright brown, shining, 0.5 m.m.

On the ground, Macquarie Plains, Cheshunt, etc.

## PLEURIDIUM TENELLUM, Mitt.

Pale brownish yellow, 3 m.m. Lower leaves very small, upper leaves slender from a broadly ovate base, 1.4 m.m., forming a coma; margin nearly plain; nerve broad; cells regularly oblong-fusiform, incrassate, quadrate below. Capsule globose, pale red, glossy, 0.5 m.m.

Cheshunt, Domain, Hobart.

## CERATODON, Brid.

Small, in caespitose tufts. Leaves lanceolate, acute; nerve narrow, bold, lost in the apex to shortly excurrent; cells small, quadrate, smooth, larger and rectangular below. Capsule fusiform with a minute bulbous neck, slightly arcuate, sulcate when dry; lid short, conic; calyptra long, narrow, cucullate; peristome teeth cleft to the base into two long slender legs, closely articulate below, remotely so above, papillose, involute.

The genus may be considered intermediate between this family and Tortulaceae.

## CERATODON PURPUREUS (L.), Brid.

Stems erect, and generally about 5 m.m., but elongating in shady places, simple or dichotomously divided. Leaves erecto-patent, imbricate, lanceolate, acute, margin revolute, nerve lost in the apex to excurrent in a short point, 2.5 m.m. Seta very long and slender red-purple. Capsule narrow, slightly bent, erect or inclined, 2.5-3 m.m.; lid oblique; peristome teeth long, slender, incurved at the tip, assuming a fanciful resemblance to a ram's horn.

Variable and very common on ground.

## CERATODON STENOCARPUS, Mont.

Habit of the last, with similar leaves. Seta very long, slender, pale. Capsule erect or inclined, narrow, 1.5 m.m.; lid shortly conic; mouth oblique; peristome shorter than in *C. purpureus*, and less regularly curved, articulations few and distant.

Common in open pastures.

## DITRICHUM, Timm.

Small, erect, simple, forming mats; sometimes in species not Tasmanian, tall and slender. Leaves narrow, subulate, or linear, from a broad sheathing base; margin involute, smooth; nerve broad and flat, constituting all or nearly all the lamina above the sheath; cells narrow, rectangular, broader and shorter towards the base, but in some species the cells are oblong and incrassate. Seta slender, straight; capsule cylindric or fusiform, usually slightly inclined; lid conic; calyptra narrow, subulate. Peristome teeth split to the base, forming 2 slender papillose legs.

The genus is closely allied to *Ceratodon*, but the elongated cells of most of the species is an advance towards typical genera. The four species with long cells here described differ from one another only in unstable details, and could well be considered forms of one widely distributed plant.

Cells oblong.

Capsule cylindric... .. elongatum.

Capsule fusiform ... .. australe.

Cells linear. Capsule fusiform.

Sheath broad.

Apex with acute teeth.....Oldfieldii

Apex obscurely toothed or  
truncate .....flavipes

Sheath narrow.

Lid half as long as capsule.....affine

Lid short.....setosum

### DITRICHUM ELONGATUM, H.f. et W.

Syn: *Trichostomum cylindricarpum*, C.M.

Stems usually under 1 c.m. Leaves very slender, 5 m.m.; base rather short and narrow; margin irregularly dentate, especially towards the tip; cells oblong, incrassate, mostly with a convex or sub-papillate surface. Seta 2.3 c.m.; capsule erect, equal, or nearly so, cylindric, 3 m.m., pale; lid narrow, conic, nearly 1 m.m.; annulus dark.

Common. Slopes Mount Wellington.

### DITRICHUM AUSTRALE, Mitt.

Stems generally about 1 c.m. Leaves yellow-green, subulate from a long sheathing base, 4 m.m.; margin with a few bold teeth, mostly at the apex; cells oblong, incrassate, smooth, those at the base long, rectangular.

Barren specimens only in collections.

This from Hooker:—"Fruit stalk pale brown,  $\frac{1}{2}$ -inch long. Capsule ovoid, erect, brown, teeth short; lid more than half as long as the capsule."

Top of Mount Wellington.

### DITRICHUM OLDFIELDII, Mitt.

Stems 1-2 c.m., forming light green mats. Leaves tapering from a broad sheathing base, 4 m.m. apex dentate; cells long, rectangular. Seta 3-4 c.m.; capsule narrow, fusiform, brown, slightly inclined, 2.5 m.m.; lid conic, half as long.

Lower slopes of Mount Wellington.



*DITRICHUM FLAVIPES*, C.M.

Stems 1-2 c.m., forming rather dense yellow-green mats. Leaves with a short broad base and a subulate lamina, 6 m.m.; margin entire; apex subtruncate and obscurely dentate; cells long, rectangular. Seta very slender, pale yellow, 3-5 c.m.; capsule erect, oblique, fusiform, pale brown, 3-4 m.m.; lid conic, about one-third the length of the capsule.

On the ground. Forestier's Peninsula.

*DITRICHUM AFFINE*, C.M.

Stems about 1 c.m., forming mats on rocks, bright green. Leaves with a narrow sheathing base, gradually tapering to a subulate lamina, 4 m.m.; margin entire, except at the tip, where there are a few irregular teeth; cells long, rectangular. Seta slender, 2-3 c.m.; capsule erect or slightly inclined, narrow, fusiform, pale brown, 2.5 m.m.; lid slender, conic, nearly half as long as the capsule.

Slopes of Mount Wellington.

*DITRICHUM SETOSUM*, H.f. et W.

Stems short, seldom exceeding 5 m.m. Leaves yellow, filiform, tapering from a short sheathing base, 2.5 m.m.; apex rather obtuse, subdentate; cells rather opaque, linear, smooth. Seta slender, yellow, 2 c.m.; capsule fusiform, slightly oblique, 2 m.m.; lid short, conic, about a quarter as long as the capsule.

Slopes of Mount Wellington.

*CYNODONTIUM*, Schimp.

Small, tufted, with short simple stems. Leaves linear; nerve broad, continuous; cells rectangular, without inflated alars. Seta erect or bent, medium length. Capsule erect to pendulous, oblong, ribbed; lid rostrate, oblique; calyptra cucullate; peristome teeth erect, striate, split low down into two slender papillose legs.

The genus closely resembles *Campylopodium*, but differs in leaf structure, and in the equal legs of the peristome teeth.

## CYNODONTIUM TASMANICUM, Broth.

Small, bright green, stems seldom exceeding 2 m.m. Leaves narrow, linear, subacute, concave; nerve broad, continuous, dentate; margin thickened, doubly serrate; cells smooth, long, rectangular, shorter above; 2.5 m.m. Seta flexuose, 2 m.m. Capsule erect, red, oblong, 1 m.m.; lid with a slender oblique rostrum as long as the capsule; peristome teeth red below, pale above, 0.3 m.m.

On the ground in a beech forest, Blue Tier.

## CAMPYLOPODIUM, C.M.

Small. Leaves abruptly setaceous, from a narrow sheathing base; nerve bold; cells quadrate above, those of the sheath long, rectangular. Seta slender, flexuose; capsule erect, grooved; calyptra broadly cucullate; edge plain; lid rostrate; peristome of 16 bold teeth, divided half way into two slender unequal papillose legs. Distinguished from smaller species of *Campylopus* by the plain edge of the calyptra.

## CAMPYLOPODIUM FLEXIPES (Mitt.), Broth.

Syn: *Trematodon flexipes*, Mitt.

Small, tufted, dark green. Leaves suddenly subulate from the sheathing base, 3-5 m.m.; margin irregularly dentate; nerve rather broad, continuous, the wings vanishing in the upper portion. Seta 2-3 m.m.; capsule broadly elliptic, 0.6 m.m.; lid nearly flat, with a slender, oblique rostrum, nearly as long as the capsule; calyptra with a broad, plain base.

Western Mountains, King River, Slopes of Mount Wellington.

## ANISOTHECIUM, Mitt.

Stems short or longer, slender, erect, with few branches or simple. Leaves small, patent, or squarrose, lanceolate, acute or abruptly subulate from a broad base, smooth, keeled; margin plain or revolute; nerve narrow, vanishing above; cells rather large, thin walled, quadrate or nearly so above, gradually longer towards the base, no differentiated alars. Seta slender; capsule smooth, curved, rarely suberect; lid conic or rostrate; calyptra cucullate; peristome red or purple, the teeth short, irregular, entire in Tasmanian species.

## ANISOTHECIUM CRISPUM (Schreb.), Lindb.

Stems slender, erect, simple, in dense clusters, 2-3 c.m., pale green. Leaves squarrose, base broad, short, abruptly linear above, 2.5-3 m.m.; margin revolute, entire, or irregular when dry from collapse of the delicate cells; nerve vanishing above the middle; cells rather large, rectangular, becoming longer towards the base. Seta slender, dark; capsule inclined, oblong, without an annulus, 1.5 m.m.; lid large, conic, or obliquely rostrate; peristome short, dark.

Slopes of Mount Wellington.

## ANISOTHECIUM FERRUGINIUM, Mitt.

Syn: *Dicranum ferruginum*, Mitt.

Stems dark red-brown, 1-3 c.m., erect in dense dark cushions. Leaves patent, base not very broad, gradually narrowing into a subulate lamina, 2 m.m., concave; nerve thin, vanishing above the middle; cells large, quadrate above, rectangular below. Seta slender, 5 m.m.; capsule broadly oblong, dark, erect, or slightly inclined, 0.5 m.m.; lid boldly rostrate, rather longer; peristome teeth short, broad, erect, red, not split.

Mount Wellington summit, Ben Lomond.

## DISTICHIUM, Br., Schimp.

Slender, erect, dichotomously branched. Leaves distichous, base short and broad, subulate above; cells narrow, rectangular, rather broader towards the base. Capsule erect or cernuous, glossy, ovate or nearly cylindric; lid conic; calyptra cucullate; peristome teeth divided to the base or somewhat attached by a membrane which becomes torn or perforated.

## DISTICHIUM CAPILLACEUM (Sw.), Br.

Syn: *Swartzia montana*, Lindb.

Pulvinate, the stems erect, 3-6 c.m., silky, dark green, slender. Leaves distichous, the base erect, concave, and closely clasping the stem, above subulate and patent or squarrose, 3 m.m., densely irregularly papillose; margin



irregular; nerve bold, comprising all the upper portion of the leaf; cells narrow, rhomboid. Seta slender, 1.5 c.m.; capsule erect, or nearly so, oblong to cylindric, 1.5 m.m.; lid conic, short.

Mount Wellington, Gordon River.

### SCLERODONTIUM, Mitt.

Habit procumbent, with ascending simple branches. Leaves ovate to lanceolate, of rather hard texture, densely papillose externally, nerved; cells irregularly round, incrassate, those at the base abruptly brown and square, inflated, except on the rib. Seta long, on a short lateral branch; capsule small, ovoid, cernuous; lid with a long rostrum; calyptra cucullate.

### SCLERODONTIUM PALLIDUM (Hook), Mitt.

Syn: *Dicranum Sieberianum*, Horns.

Syn: *Leucoloma Sieberianum*, Par.

Dark livid to pale in younger parts, 2-4 c.m.; branches many, simple. Leaves squarrose, ovate, lanceolate, 3 m.m.; nerve slender, vanishing below the acute apex; margin entire, hyaline, but the coarse papillæ assuming the character of teeth at the extreme tip.

Trevallyn Gully, Launceston.

### TRIDONTIUM, Hook.

Suberect, or depressed, with few simple branches forming mats on wet rocks. Leaves lanceolate, rather firm, very slightly papillose, nerved; margin entire; cells irregularly round, incrassate, passing towards the base into larger, rectangular. Seta fairly long; capsule short, erect, broadly obconic with a strumous base; annulus well developed; lid rostrate, nearly as long; calyptra narrow, cucullate. Peristome well developed, teeth split above into three slender closely articulated smooth legs.

### TRIDONTIUM TASMANICUM, Hook.

Syn: *Dicranum tasmanicum*, Hook.

Dark, nearly black; branches 3-6 c.m. Leaves lanceolate, obtuse, 3 m.m.; nerve vanishing near the apex; margin entire, undulate. Seta 1.5-2 c.m.; capsule 1.7 m.m.

Wet rocks in rivulet, water-race. Hobart Reservoir.

## CAMPYLOPUS, Bridel.

Medium-sized plants, erect, simple, or with few dichotomous branches, often with slender flagellate branches with longer leaves at the apex. Leaves lanceolate to subulate, rarely nearly ovate, often tipped with a hyaline hair point; nerve very broad, flat, continuous; cells small to medium, generally oblong, sometimes rectangular or rhomboid, rarely almost linear, smooth, basal cells larger and sometimes a patch of enlarged cells, alars, at the basal angles. Seta long, tortuous, burying the capsule in the leaves when young; capsule equal, or nearly so, often arcuate, sulcate when dry, oblong; lid conico-rostrate; calyptra short, broad, cucullate, fringed at the base; peristome teeth cleft half-way into unequal slender legs.

A natural group readily recognised by the broad nerve, bent seta, and fringed calyptra. Too much trust must not be placed on colour, as plants of this genus are particularly liable to blacken when subjected to constant moisture. Also habit and condition of hair point are too variable to make them of much value in a key.

Leaves very acute.

Leaves tipped with a long hyaline  
hair bent when dry.

Leafbase ovate.....introflexus  
Leafbase lanceolate.

Cells short, rhomboid ..... pudicus

Cells fusiform ..... subappressifolius

Leaves tipped with a straight

hyaline hair.....capillatus

Hair short or none.

Cells irregularly rhomboid.

Nerve more than half breadth.....insititius

Nerve less than half breadth.....clavatus

Cells rectangular ..... torquatus

Leaves more or less obtuse.

Nerve broad, cells fusiform.....bicolor

Nerve narrow, cells linear.....Kirkii

## CAMPYLOPUS INTROFLEXUS (Hedw), Brid.

Densely tufted, erect, yellowish, 2-4 c.m. Upper leaves longest, erect, shining, oblong below, slender above, passing gradually or abruptly into a slender, bent or sometimes straight, cuspidate hyaline hair, 5 m.m.; margin entire or

subserrulate above; nerve broad, occupying about half the breadth; cells irregularly oblong, strongly incrassate, towards the base long, rectangular, thin, passing from there some distance up the margin; alars brown, in a small patch; seta 5-10 m.m.; capsule narrow, oblong, curved, 1.5 m.m.; lid short, conic.

Very common on dead wood.

### CAMPYLOPUS PUDICUS, Hornsch.

Closely resembling *C. introflexus*. Leaves 5-6 m.m., narrow, lanceolate, involute, gradually tapering to a bent cuspidate hyaline hair; nerve more than half the breadth, dentate above; cells short, rhomboid, incrassate, those of the base thin walled, longer, and not rising conspicuously up the margin; alars few, delicate, colourless. Seta 5-10 m.m.; capsule oblong, 1.5 m.m., inclined; lid half as long.

Slopes of Mount Wellington.

### CAMPYLOPUS SUBAPPRESSIFOLIUS, Broth. et Geh.

Short, robust, erect, 2-3 c.m., black, except the apex. Leaves harsh, denser, and more opaque than in the last two species, narrow, lanceolate, involute, tapering to a slender, slightly cuspidate hyaline hair, bent when dry, 4 m.m.; nerve very broad, leaving a narrow wing only at the base; cells narrow, rhomboid, almost vermiform, incrassate, with a band of linear cells on the margin continuous with large rectangular basal cells; no distinct alars. Rest not seen.

Sprent River.

### CAMPYLOPUS CAPILLATUS, H.f. et W.

Densely tufted, stems elongating, 4 c.m., pale green. Leaves narrow, lanceolate at the apex, shorter below, tapering to a long, straight, obscurely cuspidate hyaline hair, 4 m.m.; nerve shallow, but broad, occupying more than half the breadth, wings of the leaf extending as a narrow border to the hyaline hair; cells quadrate, longer, and more rhomboid towards the nerve, with a band of linears on the margin continuous with the longer pellucid cells of the base; no distinct alars. Seta 5-10 m.m.; capsule inclined, oblong, 1.5 m.m.

Common on deadwood.

## CAMPYLOPUS INSITITIUS, H.f. et W.

Densely tufted, stems commonly very slender, erect, simple, yellowish-green, 3-5 c.m. Leaves involute, lanceolate, tapering to a slender plain point, but sometimes tipped with a short cuspidate hyaline hair, 4 m.m.; nerve shallow, but two-thirds the breadth of the leaf; wings lost far below the apex; cells irregularly rhomboid, larger, less incrassate, and more opaque than those of *C. capillatus*, a narrow band of linear cells on the margin continuous with the large rectangular basal cells; alars delicate, colourless, quadrate, usually forming distinct auricles. Seta 5 m.m.; capsule cylindrical, inclined, 1.2 m.m.; lid with a rostrum nearly as long.

Kingston, Macquarie Harbour.

Variable. On sandy heaths often very short, dispersed, leaves broader, with a hyaline point. On wet button-grass, Southport, similar, but quite black. Best distinguished by the shape of the cells.

## CAMPYLOPUS CLAVATUS, R. Br.

Densely tufted, robust, 4-6 c.m., upper portion bright yellow, black below. Leaves broadly lanceolate, tapering into a slender point, usually cuspidate hyaline at the extreme tip, 5 m.m., with small auricles, wing vanishing far below the apex; nerve less than half the breadth of leaf; cells very irregularly rhomboid, those towards the base quadrate; alars brown, quadrate, incrassate. Rest not seen.

Port Arthur.

## CAMPYLOPUS TORQUATUS, Mitt.

Cæspitose, light green, usually under 1 c.m. Leaves very slender from a short sheathing base, tapering to an acute, not hyaline, point, 5 m.m.; nerve shallow but very broad, constituting nearly all the breadth of the leaf; cells rectangular, short above, longer and colourless below. Seta 7 m.m.; capsule narrow, oblong, straight, 1.2 m.m.; lid red, rostrate, as long as the capsule.

On earth and deadwood Mt. Wellington.



## CAMPYLOPUS BICOLOR, Hornsch.

Commonly very short, in dense mats, sometimes elongating to 4-6 c.m., yellowish above, black below. Leaves erect, glossy, lanceolate, obtuse, 4 m.m.; nerve very broad, and occupying the greater part of the breadth of the leaf; cells linear, rhomboid, linear on the margin, rectangular below. Rest not seen.

This plant commonly propagates by throwing off branchlets.

Common on ground about Hobart, Port Arthur, Southport.

## CAMPYLOPUS KIRKII, Mitt.

Short, densely tufted, 1-2 c.m., black, except the apex. Leaves densely crowded, lanceolate, or, in some instances, ovate-lanceolate, concave, rather obtuse, 3-4 m.m.; nerve very shallow, less than half the breadth of the leaf; cells very irregularly linear, strongly incrassate, those on the extreme margin narrow, linear, continuous, with enlarged basal cells; alars few, quadrate, in a brown patch, internal to a small hyaline auricle. Rest not seen.

Sprent River, Southport. On wet heaths.

## BLINDIA, Br. Sch.

Elongated, simple, or with few branches. Leaves very narrow, attenuated to a long subulate point, smooth; nerve rather narrow, flat, continuous; cells linear, often quadrate above, with a patch of brown quadrate alars. Seta rather stout, often short, straight; capsule erect, small subspheric or broadly oblong, with a turgid neck; lid rostrate; calyptra cucullate; peristome none, or of 16 short, lanceolate teeth.

The genus is closely allied to *Dicranum*, but has a very different capsule.

Peristome present, nerve broad.....*arcuata*

Peristome absent, nerve narrow.

Lamina narrow, one-third length of leaf...*robusta*

Lamina broader, two-thirds length  
of leaf.....*tenuifolia*

*BLINDIA ARCUATA*, Mitt.

Suberect, slender, yellowish green, usually 2-4 c.m. Leaves subulate from a broad sheathing base, 4 m.m.; margin entire; nerve broad for the genus, flat, ill-defined, occupying all the upper half of the leaf; cells linear, strongly incrassate, all the basal cells quadrate, a patch of brown cells forming a small auricle. Seta 5 m.m.; capsule ovate, 0.7 m.m.; peristome well developed, the teeth cleft nearly to the base.

Summit Mount Wellington, Mount Field.

*BLINDIA ROBUSTA*, Hampe.

Syn: *Dicranum angustifolium*, Hf. W.

Erect, slender, 5-6 c.m. Leaves shining yellow-olive, usually secund, long, slender, curved, lower third narrow, lanceolate, the rest subulate, consisting wholly of nerve 7 m.m.; nerve flat, thin, not broad, often narrow; cells linear, incrassate, those of the basal angles quadrate, inflated, coloured, forming an indistinct auricle. Seta 1 c.m.; capsule erect, 1 m.m., broadly oblong, mouth expanded; peristome none.

Mount Wellington, Cradle Mountain.

*BLINDIA TENUIFOLIA*, H.f. et W.

Habit, size, and general structure of *B. robusta*. Leaves 5 m.m., base broad, the wings tapering above, and extending to the upper third; nerve slender; cells linear, a patch of many inflated quadrate cells forming a distinct auricle. Other details as in *B. robusta*.

Mount Wellington, Western Tiers.

*DICRANUM*, Hedw.

Robust mosses, usually with strong to elongated stems, with few branches, rarely short. Leaves lanceolate, generally tapering to more or less elongated filiform tips, rarely ovate, glossy and smooth, rarely opaque or papillose; nerve from faint and vanishing above to bold and excurrent, solid or furrowed; margin spinulose to plain; cells in most instances linear, sometimes oblong, quadrate, or rotund, but always a patch of enlarged quadrate, usually brown cells at the basal angles, called for short the alars. Seta medium to

very long. Capsule suberect, arcuate, cylindric, smooth, rarely sulcate; lid with a long slender rostrum; calyptra long, cucullate; peristome orange to red, confluent below, cleft above into two unequal subulate, articulate legs. All Tasmanian forms have a narrow pale leaf border, and are often placed in the genus *Leucoloma*.

This genus may be known by its robust structure. From *Campylopus* it may be readily distinguished by its narrow nerve, straight seta, and plain base of the calyptra.

Margin spinulose. Nerve furrowed.....*polysetum*.

Margin serrate. Nerve solid.

Leaves broadly lanceolate.....*pungens*

Leaves long filiform .....*Menziesii*

Margin with few or small serrations. Nerve narrow, flat.

Leaves brittle, serrations close.....*setosum*

Serrations irregular..... *Billardieri*

Leaves narrow, serrations spinulose...*robustum*

Margin entire.

Leaves slender .....*integerrimum*

Leaves ovate.....*eucamptodontoides*

### DICRANUM POLYSETUM, Hampe.

Robust, rigid, suberect, sparsely branched, 6 c.m. Leaves squarrose, sometimes subsecund, plicate, tapering to a slender apex, lower margin plain hyaline, upper margin and nerve spinulose dentate, 9 m.m.; nerve continuous, furrowed, with two prominent ridges; cells linear, those towards the nerve nearly quadrate; alars numerous, quadrate, large; perichaetia longer, sheathing, shortly piliferous. Setae usually many in each sheath, 3 c.m.; capsule cylindric, slightly inclined and arcuate, 2.5 m.m., base slender, strumose.

Common in forests.

### DICRANUM PUNGENS, H.f. et W.

Erect or decumbent, often growing in water, and elongated, usually black, except the tip. Leaves squarrose to patent, 4 m.m.; base long and broad, then tapering to an acute apex; margin remotely serrate, except towards the base; nerve round, usually dark; cells long, linear; alars not numerous, oblong, and not in a well-defined patch.

Sprent River.

## DICRANUM MENZIESII, Tayl.

Suberect, dark green, 10-12 c.m., the stem clothed with short white fibrils. Leaves slender, filiform, 12 m.m., from a short sheathing base; margin serrate above; nerve round, continuous; alars very numerous in a broad band, brown, quadrate; perichaetials short, sheathing, piliferous; cells of the lower half of sheath rectangular, those above small and quadrate. Seta slender, often shorter than the leaves; capsule cylindric, arcuate, strumose, 2 m.m.; lid bent, nearly as long.

Mount Wellington, Tasman's Peninsula, etc.

## DICRANUM SETOSUM, H.f. et W.

Glossy, yellow, and brittle, 4-6 c.m. Leaves patent, from a broad base, tapering to an acute apex, 6-8 m.m.; margin closely serrate above, plain below; nerve narrow, flat; cells very narrow, linear, strongly incrassate; alars not numerous, quadrate, in a well-defined patch; perichaetials very long sheathing, with a piliferous brittle apex. Seta 2 c.m.; capsule slightly arcuate, cylindric, 2.3 m.m.; lid with a slender beak, rather more than half the length of the capsule.

Common in forests.

## DICRANUM BILLARDIERI, Schw.

Densely matted, suberect, yellow, glossy, 4-6 c.m. Leaves patent, concave, tapering from a broad base to a slender apex, 6-10 m.m.; margin more or less obscurely or irregularly serrate, or subspinulose towards the apex, otherwise plain; nerve narrow, thin, and flat, in some instances hardly apparent, lost towards the apex; cells linear, incrassate, alars numerous, brown quadrate; perichaetials sheathing as long as or longer than the leaves, obtuse or with a short point. Seta 2 c.m.; capsule cylindric, arcuate, strumose, 2.5 m.m.; lid with a long slender beak: peristome incurved when dry.

Very common in forests. Variable.

Var: angustinerve. Leaves long; nerve very narrow. Seta shorter, and encased in the perichaetials to or almost to the capsule. Common.

Var: rigens. Elongated. Peristome gaping when dry. In deep crevices between rocks.

Var: latifolia. Leaves livid, 4 m.m., base broad, only shortly attenuated. At a high altitude, Cradle Mountain.



## DICRANUM ROBUSTUM, H.f. et W.

Generally elongated, about 10 c.m., branching above. Leaves narrow, lanceolate, tapering to a long, slender point, often 10-15 m.m.; margin spinulose above; nerve narrow, thin, flat, vanishing above; cells linear, strongly incrassate; alars quadrate, brown, in a broad patch; perichaetials long, closely sheathing, with a filiform apex, brittle, and usually broken in specimens. Seta, 1.5-2 c.m.; capsule small, suberect, 2 m.m., with a broad mouth, and tapering base; lid rather longer. Tasmanian forms have generally broader leaf bases, longer arcuate capsules, approximating *D. Billardieri*.

Cheshunt, Mount Bischoff, Mount Faulkner.

## DICRANUM INTEGERRIMUM, Broth. et Geh.

Cæspitose, short, rigid, erect, yellow above, dark below. Leaves suberect, tapering to a filiform apex, 9 m.m.; margin entire, or with a few obtuse serrulations at the apex; nerve very narrow and obscure, vanishing above; cells incrassate; alars as in *D. Billardieri*. Rest not seen.

Apparently an extreme form of *D. Billardieri*.

On gravelly buttongrass plains, West Coast.

## DICRANUM EUCAMPTODONTOIDES, Broth. et Geh.

Cæspitose, erect, dark green, 5 c.m. Leaves ovate, erect, imbricate, shining, acute, 4-5 m.m., concave; margin entire; nerve very slender, continuous; cells rather large, linear; alars numerous, quadrate, hyaline. Rest not seen.

On gravelly buttongrass hills, Sprent River.

## Fam. 3.—GRIMMIACEAE.

Plants tufted, in small dense cushions, or in large, loose mats or in a few genera with spreading decumbent stems with short, erect, branches. Leaves ovate to linear, acute, sometimes with an extended colourless hair point, dull green, yellow or red, opaque; nerve medium; margin plain or toothed; cells small, rotund to quadrate, incrassate, sometimes papillate or nodulose, lower ones longer. Seta terminating the stem or a short branch, from very short to fairly long; capsule erect; lid from flat with a short umbo to long, rostrate; calyptra mitriform, the base broad, short or long, irregularly split at the base or entire, and enveloping the capsule, seldom cucullate; peristome double, single, or none, exostome teeth usually short, and geminate, rarely longer, endostome when present of 8 or 16 slender cilia.

A very distinct family, noticeable chiefly by the dull colour, small cells, and mitriform calyptra of the typical genera. Not easily confounded with members of Tortulaceae, but closely resembling Hedwigia amongst the Neckeraceae, but the leaves of that genus are nerveless.

Calyptra with short expanded lacerated base.

GRIMMIA: Plants small, densely tufted, or, if rather larger, with sessile capsules.

RHACOMITRIUM: Plants spreading, irregularly branched, and, except in one species, with sinuose walls to the cells.

Calyptra with a relatively long, broad base, which may be entire, lacerated, or split on one side.

GLYPHOMITRIUM: Small, tufted. Calyptra grooved. Peristome teeth lanceolate or filiform, not geminate.

ORTHOTRICHUM: Tufted. Calyptra slightly hairy. Peristome teeth geminate.

ULOTA: Tufted. Calyptra copiously hairy. Peristome teeth geminate.

**MACROMITRIUM:** Spreading or creeping, with short, erect branches, usually yellowish or reddish. Calyptra usually hairless; peristome generally absent. Calyptra often split on one side.

Calyptra cucullate with a narrow base. Plants small, tufted, or creeping.

**ZYGODON:** Capsule oblong to cylindric.

**AMPHIDIUM:** Capsule goblet-shaped, with a broad mouth.

### GRIMMIA, Ehrh.

Small, densely tufted, rarely larger and looser. Leaves minutely papillose or smooth, opaque, usually ending in a colourless, often hairlike, apex; cells rotundo-quadrato, and strongly incrassate, longer towards the base. Seta short, or, if long cygneous, as in *Campylopus*; capsule erect, oblong to subspheric, lid umbonate or rostrate; calyptra mitriform, with a short, spreading, lacerated base, rarely split only on one side; peristome of 16 short, erect teeth, rarely absent.

Sec. 1, **SCHISTIDIUM.**—Capsule nearly sessile, immersed in the terminal leaves, broad, mouth wide; lid normally falling off with the columella attached, but usually not so in Tasmanian specimens. Plants loose.

Leaves with colourless tips.....apocarpa.

Leaves without colourless tips .....mutica.

Sec. 2, **EUGRIMMIA.**—Seta developed; capsule oblong, small mouthed. Plants small in dense cushions. Leaves tipped with a long, colourless point.

Seta cygneous.

Leaves ovate-lanceolate, dark ..... cygnicollis.

Leaves lanceolate, lighter green ... trichophylla.

Seta short, straight ..... leiocarpa.

## GRIMMIA APOCARPA. (L.), Hedw.

Dark brown loose mats; stems decumbent, 1-2 c.m., usually unbranched. Leaves broadly lanceolate, patent, smooth, acute, with a short colourless, usually dentate apex, keeled, 2 m.m.; margin closely revolute; nerve dark, lost in the apex; perichaetials longer and rather more acute. Capsule subhemispheric on a very short seta, reddish, 1 m.m.; lid conic or shortly rostrate; calyptra with a very short base covering the lid only; peristome teeth lanceolate, dark red.

In many specimens the colourless leaf tip is hardly apparent, and the rostrum of the lid may be well developed or rudimentary on the same plant. The columella remains in the capsule after the fall of the lid, or sometimes falls independently.

Common on damp rocks.

## GRIMMIA MUTICA, Hpe.

Similar in habit and structure to *G. apocarpa*, only more elongated; leaves broader, less acute, apex without a colourless tip. Capsule red, often nearly exerted.

Mt. Faulkner, Mt. Field, Mt. Nelson.

## GRIMMIA CYGNICOLLIS, Tayl.

Small, forming dense dark cushions on rocks, more or less hoary from the colourless leaf tips; stems seldom exceeding 5 m.m. Leaves ovate-lanceolate, concave, smooth, patent, dark green to nearly black, 1.5 m.m., with a dentate hair point usually of the same length; margin plain; nerve slender, canaliculate, ending at the hyaline apex. Seta flexed, slender, 3 m.m.; capsule pale, broadly oblong, obscurely ribbed, 1 m.m.; lid from mamillate to shortly rostrate; calyptra a third as long as the capsule, with a short, broad, lacerated base; peristome teeth pale brown, entire. Very close to *G. pulvinata* Sm. of the northern hemisphere.

Very common on hard rocks.

## GRIMMIA TRICHOPHYLLA, Grev.

Generally in larger, looser tufts than the last, and paler green; in dry situations dwarfed, and rather simi-



lar to *G. cygnicollis*, in wet subalpine places often longer and closely tufted; stems commonly about 1 c.m. Leaves erectopatent, lanceolate, undulate, smooth, 2 m.m., tipped with a shorter, smooth, or slightly dentate, colourless apex, concave; margin plain or revolute, slightly thickened; nerve canaliculate, lost in the apex. Seta flexed, 3 m.m.; capsule pale, erect, 0.7 m.m., oblong, with 8 faint ribs; lid red conic to rostrate, half as long as the capsule; calyptra with a short, narrow base; peristome teeth erect or recurved, red, bifid.

Mt. Nelson, Ben Lomond, Esperance, etc.

### GRIMMIA LEIOCARPA, Tayl.

Syn: *G. leucophoea*, Grev.

Small, forming dense, dark tufts, or hoary with the leaf tips; stems about 1 c.m. Leaves squarrose, erect when dry, ovate, tapering to a hyaline dentate hair, 1.5 m.m., the hair point about the same length, opaque; margin plain; nerve not thick, vanishing below the apex. Seta erect, about 1-2 m.m.; capsule erect, broadly oblong, 0.8 m.m.; lid small, conic-rostrate; calyptra much exceeding the lid; peristome teeth short, bifid.

Doubtfully distinct from *G. campestris*, Burch.

Evandale, Watchorn's Hill, Huon-road.

### RHACOMITRIUM, Bridel.

Robust in loose mats, stems elongated with short, lateral branches, rarely branching dichotomously and equal. Leaves lanceolate to ovate with or without a colourless tip; nerve slender; cells short above, quadrate, narrow linear below, except in *R. crispulum*, the walls have a boldly sinuous outline. Seta slender, rather short, usually on a short lateral branch; capsule oblong, smooth; lid acutely rostrate; calyptra mitriform with a short, broad, lacerated base; peristome single, teeth short, lanceolate, more or less split into pruinose slender legs.

The genus is continuous with *Grimmia*, in which it is often included. There is no consistent mark of distinction, as the sinuous walls also occur in *G. apocarpa*.

Leaves not tipped with a colourless apex.

Cell walls not sinuous ..... crispulum.

Cell walls sinuous ..... rupestre.

Leaves tipped with a colourless hair.

Leaves closely imbricate when dry

... .. symphyodon.

Leaves loose when dry ..... heterostichum.

Plants hoary, with white leaf tips.

Leaf tip straight when dry ..... hypnoides.

Leaf tip bent when dry ..... pruinosum.

### RHACOMITRIUM CRISPULUM, H.f. et W.

Forming rather dense mats on rocks, stems 2-4 c.m., blackish, except the ends, which are olive green. Leaves patent, from an ovate base, tapering to a subulate point or only acute, 2 m.m., rather coarsely papillose; margin closely revolute; nerve narrow, continuous; cells incrassate, rectangular, the lower ones slightly longer, without sinuous walls. Seta 2 m.m., on a short lateral branch; capsule erect, broadly oblong, usually shining, 1.3 m.m.; lid convex with a slender rostrum half as long as the capsule; peristome teeth short, slender, bifid.

Mt. Faulkner, Glen Leith, Huon.

### RHACOMITRIUM RUPESTRE, H.f. et W.

Robust in dark matted tufts, the stems often 5 c.m., dichotomously branching, but in alpine forms often with short lateral branches. Leaves squarrose, ovate-lanceolate, rather acute, not tipped with a hyaline point, concave, 3.3 m.m.; margin revolute below, plain above, often irregularly serrulate; nerve canaliculate, gradually vanishing towards the apex; cells narrow linear below, shorter above, minutely nodulose, the walls sinuous. Seta 3 m.m., on a short lateral branch; capsule broadly oblong, 1.8 m.m., rather constricted at the mouth; lid with a slender rostrum nearly as long as the capsule; calyptra rather rough at the point; peristome teeth split nearly to the base into two slender closely tomentose legs.

Summit Mt. Wellington. Mt. Field.

## RHACOMITRIUM SYMPHYODON, Mitt.

Forming loose dingy tufts; stems slender, 3-6 c.m., yellowish-green, darker at the base. Leaves widely spreading when moist, closely imbricate when dry, lanceolate, acute with a short, slender, hyaline cuspidate tip, 2.5 m.m., surface very obtusely papillose; margin closely revolute; nerve slender, canaliculate, continuous; lower cells linear, with coarsely sinuous walls, upper ones short, quadrate, with one or two constrictions, more incrassate than in *R. heterostichum*. Seta on a short lateral branch, 5 m.m.; capsule erect, narrow, oblong, 1.7 m.m.; lid with a slender rostrum half as long as the capsule; calyptra short, deeply divided, with a slightly rough apex; peristome teeth split nearly to the base into two slender closely tomentose legs.

Mt. Wellington slopes, on rock.

## RHACOMITRIUM HETEROSTICHUM Hedw.

Widely spreading in loose decumbent dark mats, stems long, with many short, lateral branches, but in depauperated plants from dry, elevated situations very short, with branches all of equal length. Leaves squarrose, not much imbricate when dry, lanceolate from an ovate base, acute with a colourless cuspidate hair point; margin revolute below, usually irregularly serrulate above, 2 m.m.; nerve thick, vanishing at or below the hyaline apex; lower cells narrow, linear, with fine sinuous walls, upper ones shorter, nearly quadrate. Seta 5 m.m. on short lateral branches; capsule narrow or medium oblong, 2 m.m.; lid rostrate half as long as the capsule; calyptra short, rather rough at the apex; peristome teeth in most instances very short, sometimes longer, split half way or, when the teeth are longer, nearly to the base into two slender tomentose legs.

Very common on rocks on hills.

## RHACOMITRIUM HYPNOIDES (L.), Lindb.

Syn.: *R. lanuginosum*, Brid.

In dense mats, dark, with copious white leaf tips. Leaves patent lanceolate, base narrow, tapering to a long, straight, colourless, hair point, the coloured portion about 3 m.m., the colourless part extending some distance down

the margin; lower margin shortly revolute, serrate above; nerve extending some distance into the apex; cells all long, not very narrow, with obtuse sinuous outlines, coloured cells nearly smooth. Seta slender, rough, 5 m.m.; capsule oblong, 2 m.m.; lid rostrate rather more than half as long; calyptra short, rather rough at the apex; peristome teeth split nearly to the base.

In crevices of rock. Summit Mt. Wellington.

### RHACOMITRIUM PRUINOSUM, C. M.

Stems long, numerous, with few short branches, ascending, in dense mats, dusky yellow, darker below, whitish above from the colourless leaf tips. Leaves patent, pale, ovate-lanceolate, tapering into a long, bent, colourless apex, which is covered on back and sides with numerous rather large, acute teeth, about 3 m.m., inclusive; margin revolute below; nerve ceasing in the colourless tip, loss of colour not abrupt; cells long, linear, coarsely nodulose, all with coarse, sinuose margins. Rest not seen.

Common in crevices of rocks on mountains.

### GLYPHOMITRIUM, Bridel.

Stems short, clustered or in cushions. Leaves rather narrow, opaque; nerve strong, not excurrent; cells minute, rotund, rather larger and longer towards the base. Seta slender, not long; capsule oblong, smooth; lid with a long, slender rostrum; calyptra mitriform, the broad base well developed, nude, plicate, irregularly splitting; peristome erect, teeth entire or cleft into two slender papillose legs.

Small plants with the habit of *Grimmia*, but with larger calyptra and lid, and different peristome.

Leaves acute.

Leaves entire ..... acutifolium.

Leaves serrate ..... serratum.

Leaves obtuse ..... latifolium.



## GLYPHOMITRIUM ACUTIFOLIUM, Mitt.

Small, in loose clusters, stems seldom exceeding 5 m.m. Leaves erecto-patent, broadly lanceolate, acute, smooth, 2 m.m.; margin revolute; nerve broad, flat, lost in the apex; cells rotund, unequal, not strongly incrassate; slightly convex. Seta 3-4 m.m.; capsule oblong, 1 m.m.; lid with a slender rostrum about as long; calyptra covering half the capsule; peristome teeth short, pale, split half way.

On rocks Kempton, Risdon.

## GLYPHOMITRIUM SERRATUM, Mitt.

Syn.: *Ptychomitrium Mittenii*, Jaeq.

In rather dense spreading mats, yellowish green, nearly black below. Stems mostly 1-2 c.m. Leaves spreading, ovate lanceolate, acute, recurved, concave, 3 m.m., margin undulate below, coarsely serrate above; nerve bold, lost in the apex; cells minute, rotund, smooth, very strongly incrassate, lower ones rectangular. Seta 5 m.m.; capsule narrow oblong, 1.3 m.m., mouth constricted; lid with a slender rostrum nearly as long; calyptra with the broad lacerate base nearly enclosing the capsule; peristome teeth erect, pink, unequal, long, slender, split nearly to the base into two filiform papillose legs.

Mt. Nelson. Near Launceston.

## GLYPHOMITRIUM LATIFOLIUM, Broth.

Stems ascending, 3-5 c.m., dull olive, in mats. Leaves patent, recurved, narrow oblong, obtuse, 3 m.m.; margin plain; nerve bold, lost in or just below the apex. Rest unknown.

New Town Rivluet.

## ORTHOTRICHUM, Hedw.

Stems rather short, with few branches, ascending, forming loose mats on branches of trees. Leaves lanceolate, acute; nerve slender, lost at or near the apex; cells very small, rotund, incrassate, on the

surface obtusely furcate papillose, lower cells larger, colourless. Seta short, capsule erect, oblong, with a short, tapering base, smooth, but when dry marked at least in the upper portion with 8 grooves; lid conic to shortly rostrate; calyptra with a long campanulate base enclosing the capsule, sparsely clothed with erect hairs; peristome double, exostome of 8 geminate, short, teeth usually sharply recurved when dry; endostome of 8 erect short, obtuse cilia.

Differing from *Ulota* only in a small difference in the arrangement of the leaf cells. In Europe the seta is consistently very short, while in *Ulota* it is long, giving the plants an apparent distinction. The stomata and vaginule do not assist us, and are not referred to.

Seta much longer than capsule.

Capsule cylindric with a slender base...tasmanicum.

Capsule broader with a broad base.....laticiliatum.

Seta shorter than the capsule ..... *Lawrencii*.

#### ORTHOTRICHUM TASMANICUM, H.f. et W.

Stems about 1 c.m., yellow green, covered with purplish radicles below. Leaves lanceolate, patent, little or not at all crisped when dry, acute, undulate, 3 m.m.; margin revolute; nerve lost below the apex; cells rotund, strongly incrassate, each with a short forked papilla, lower ones irregularly broadly linear. Seta 5 m.m.; capsule oblong-cylindric, tapering at the base, deeply grooved when dry, 2 m.m.; lid conic or with a short slender rostrum; calyptra shining, bearing few hairs, very acute and dark at the apex; peristome teeth obtuse; endostome teeth shorter, broad.

Common on trees and shrubs on slopes of Mt. Wellington, etc.

#### ORTHOTRICHUM LATICILIATUM, Vent.

Very close to *O. tasmanicum*, only rather more robust. Leaves lanceolate, acute, 3.5 m.m. Capsule grooved above, the lower part smooth, broader, with a rather abrupt base. Other details as in *O. tasmanicum*.

Slopes of Mt. Wellington. Forth River Gorge.

## ORTHOTRICHUM LAWRENCII, Mitt.

In dense dark cushions, stems 2-3 c.m. Leaves erectopatent, ovate with a rather obtuse acuminate apex, 2 m.m.; margin plain, arose from collapsed cells and irregular papillae; nerve vanishing in the apex; cells rotund, incrassate, very slightly convex, rectangular below; perichaetia slightly narrower, lanceolate. Seta about 1.5 m.m.; capsule oblong, smooth but furrowed when dry; lid obtusely umbonate; exostome teeth geminate, obtuse; endostome processes very broad half as long.

One specimen in Gunn's collection; locality not recorded.

## ULOTA, Bridel.

Habit and appearance of *Orthotrichum*. Leaves lanceolate to linear, with a slight or broad expansion above the narrow base, concave, flexed, or crisped when dry, margin plain, slightly thickened, sometimes revolute in the middle; cells small, strongly incrassate, rotund to shortly oblong, those of the expanded base becoming linear with a band of rectangular or quadrate colourless cells on the margin. Seta rather short, thick and twisted when dry; capsule oblong to cylindric, rarely nearly pyriform; more or less tapering at the base, deeply furrowed when dry; lid with a short, slender rostrum; calyptra campanulate, enclosing the capsule, clothed with erect, long, hairs; peristome double, exostome teeth 8 short, geminate, minutely papillose; endostome processes very slender, shorter.

Very common on dead or living wood. Differing from *Orthotrichum* only in the leaf structure.

Leaves closely crisped when dry.

Capsule cylindric ..... lutea.

Capsule subpyriform ..... fulva.

Capsule oblong ..... Weymouthi.

Leaves slightly crisped or straight when dry.

Leaves linear, very acute ..... cochleata.

Leaves lanceolate, acute.

Cells mostly rotund ..... anceps.

Cells mostly oblong ..... viridis.

## ULOTA LUTEA, Mitt.

In small, dense, yellowish mats; stems seldom 1 c.m. Leaves erecto-patent, linear-lanceolate with a rather sudden broad expansion above the base, closely crisped when dry, 3 m.m.; margin slightly thickened, very obtusely papillate; nerve lost close below or in the apex; cells small, rotund, very strongly incrassate with simple, obtuse, short, papillæ, becoming linear towards the base, the colourless marginal band of which is formed of rectangular cells. Seta rather stout, 6 m.m.; capsule cylindric gradually tapering below, deeply furrowed when dry, 2.5 m.m., mouth broad; lid shortly rostrate; calyptra copiously hairy; exostome teeth rather short, pale.

Mt. Hartz, Mt. Wellington, Western Mts.

## ULOTA FULVA, Brid.

Yellowish-green to brown, in dense mats. Stems mostly 1-2 c.m. Leaves patent, crowded, lanceolate, very acute, with a mediumly broad expansion above the base, 2.6 m.m.; very crisped when dry; margin marked above with prominent convex papillæ, revolute in the middle, plain below; nerve brown, lost in the apex; cells irregularly rotund, small, very strongly incrassate, simply and furcately papillate, linear at the base with a narrow band of rectangular colourless cells. Seta slender 4 m.m.; capsule pyriform with a rather broad mouth and shortly tapering base about 1 m.m., deeply furrowed when dry; lid with a rostrum rather more than half as long as the capsule; calyptra brown with copious erect yellow shining hairs. Exostome teeth pale, short, triangular, connected by bars above, separating in the middle line; endostome processes slender, shorter.

Hartz Mountains, West Coast.

## ULOTA WEYMOUTHII, Vent.

Green or brown, stem 1.5-2 c.m. Leaves patent or spreading, closely crisped when dry, linear lanceolate from a rather broad expansion, acute, 2.5 m.m. margin slightly thickened, very obtusely papillate; nerve narrow, lost below the apex; cells rotund, strongly incrassate, with a very obtuse surface, towards the base linear with a marginal band of rectangular colourless cells. Seta up to 1 c.m.;



capsule oblong, tapering below, strongly ribbed, 2 m.m., mouth narrow; lid conic or shortly rostrate; calyptra very hairy; exostome teeth pale, broad, truncate, partially separating; endostome processes slender, nearly as long.

Mt. Wellington.

#### ULOTA COCHLEATA, Vent.

Stems about 1 c.m., yellow-brown to green. Leaves patent, closely imbricate, partially crisped when dry, linear, very acute, 2.5 m.m., expanded portion not very broad; margin not thickened, obtusely papillate; nerve vanishing at a distance from the apex, cells larger than in most species, oblong and rotund intermixed, basals linear, with short rectangular ones on the margin. Seta strong 5 m.m.; capsule oblong, not much tapering at the base, smooth or obscurely ribbed 1.7 m.m., mouth slightly constricted; lid nearly flat, shortly umbonate; calyptra yellow, densely hairy; exostome teeth broad at the base, slender, acute, and connected by cross-bars above, apex separating; endostome processes shorter, very slender.

Mt. Wellington.

#### ULOTA ANCEPS, Vent.

Rather small, in dense tufts; stems seldom 1 c.m., green or brownish. Leaves spreading, nearly straight when dry, lanceolate, acute, the broadish portion not well developed, gradually tapering, 1.5 m.m., smooth, margin plain, recurved in the middle; nerve rather broad, vanishing at a distance from the apex; cells mostly rotund, incrassate, slightly convex, linear towards the base with a broad band of quadrate colourless cells on the margin. Seta 5 m.m.; capsule oblong, ribbed, except at tapering base, 1.5 m.m. lid shortly rostrate; calyptra narrow, campanulate, brown, with numerous erect shining hairs; exostome teeth broad, truncate; endostome processes short, slender.

Mt. Wellington.

#### ULOTA VIRIDIS, Vent.

Small, greenish yellow or brown; stems usually under 1 c.m. Leaves erecto-patent, slightly crisped when dry, gradually linear-lanceolate from a slightly expanded base, very acute, 1.2 m.m.; margin not thickened, plain below,

undulate-papillate above; nerve narrow, vanishing at a distance from the apex; cells oblong, with an almost flat surface, strongly incrassate; basal cells linear, with a narrow band of quadrate colourless cells on the margin. Seta 4 m.m.; capsule cylindric, broadest at the mouth, from there tapering equally into the seta; linear and furrowed when dry, 1 m.m.; lid rostrate; calyptra hairy; exostome teeth short, pale, obtuse; endostome processes slender, shorter.

Mt. Wellington.

### MACROMITRIUM, Bridel.

Stems procumbent, elongating, sending up numerous erect short branches. Leaves short, from ovate to linear; nerve usually canaliculate, lost in or below the apex, rarely shortly excurrent; cells rotund, or nearly so, more or less incrassate, small, convex to coarsely papillose, broader and longer below. Seta slender, seldom long; capsule erect, oblong, usually smooth, reddish purple; lid with a slender rostrum; calyptra large bell-shaped, enclosing the whole capsule till nearly mature, plicate, smooth, rarely with erect hairs, plain or variously torn at the base, often split up one side; peristome seldom present, of 16 short lanceolate teeth; endostome when present usually a short papillose membrane, commonly absent, the mouth then small, irregularly constricted, the edge thin.

A large southern genus; to be recognised principally by its habit. Some of the species are very closely related and difficult to define. It is a matter of individual opinion where the line should be drawn. The calyptra, when splitting on one side, may be classed as cucullate.

Leaves linear, obtuse, apiculate.

Leaves erecto-patent ..... asperulum.

Leaves divaricate ..... Archeri.

Leaves ovate-lanceolate, obtuse.

Leaves much twisted when dry .... microstomum.

Leaves slightly twisted ..... Weymouthii.

Leaves ovate-lanceolate, acuminate.

Leaves narrowed from a broad base ..... pusillum.

Leaves gradually tapering ..... tasmanicum.

Leaves narrow, lanceolate ..... longirostre.

Leaves ovate, subacute.

Calyptra smooth ..... eucalyptorum.

Calyptra hairy ..... microphyllum.

## MACROMITRIUM ASPERULUM, Mitt.

Stems short to very long, with numerous short erect branches, reddish yellow. Leaves crowded, straight, erecto-patent, imbricate, closely twisted when dry, linear, obtuse, apiculate, but some leaves on the same plant lanceolate-acute, 1.5 m.m.; nerve canaliculate, vanishing below the apex; cells rotund, strongly incrassate, large for the genus, coarsely papillate, those of the lower part of base linear, smooth. Seta seldom exceeding 3 m.m.; capsule narrow, oblong, furrowed when dry, narrowing into the neck, 1 m.m.; lid conic; calyptra glabrous; peristome, none.

On wood, Mt. Wellington, Southport.

## MACROMITRIUM ARCHERI, Mitt.

Creeping, with numerous short, erect, branches, red or green. Leaves divaricate, twisted when dry, linear, obtuse, with a short apiculus, rarely more acute, 1.5 m.m.; nerve narrow, keeled, lost in the apex; cells rotund, not strongly incrassate, smaller than in *M. asperulum*, papillose to convex, those at the lower base linear. Seta 1 c.m.; capsule oblong, about 1 m.m., smooth, mouth constricted, plicate, deep red; lid half as long; calyptra glabrous; peristome, none.

Mt. Wellington, Mt. Nelson, Kermadie River.

## MACROMITRIUM MICROSTOMUM, Schw.

Stems short, crowded with short, erect branches, reddish-yellow. Leaves erecto-patent, ovate-lanceolate, rather obtuse-apiculate, or sometimes subacute, twisted when dry 1.5 m.m.; nerve canaliculate, lost in the extreme apex; cells rotund, not very small, papillose, linear towards the base. Seta, 5 m.m.; capsule pale red, broadly oblong, smooth, 1.5 m.m., tapering below, mouth red, narrow, plicate; lid rostrate, half as long; calyptra glabrous; peristome, none.

Mt. Wellington, Tasman's Peninsula.

## MACROMITRIUM WEYMOUTHII, Broth.

Stems shortly spreading, branches usually rather long, erect, yellowish-green. Leaves crowded, patent, brittle,

ovate-lanceolate, sub-obtuse, apiculate 1 m.m.; not much twisted when dry; nerve bold dark yellow, continuous or lost in the apex; cells rotund, not very small, coarsely papillose, linear at the base. Seta usually exceeding 1 c.m.; capsule narrow, oblong, red, smooth, 1.5-2 m.m., narrowing below and at the mouth; lid half as long; calyptra glabrous; peristome, none.

Very close to *M. microstomum*.

Near Strahan, Zeehan.

### MACROMITRIUM PUSILLUM, Mitt.

Stems short, branches crowded, very short, erect, dark, nearly black, except the apex. Leaves patent, linear lanceolate, constricted above a broad base, concave, rather acute, 1.2 m.m., twisting when dry, smooth, or nearly so; nerve rather flat below, furrowed above, lost in the apex; cells rotund, incrassate, broadly rectangular below. Seta, 3-5 m.m.; capsule, 1.2 m.m., oblong, narrow below, furrowed; lid, rostrate; calyptra glabrous; peristome, none.

Near Launceston, Circular Head.

### MACROMITRIUM TASMANICUM, Broth.

Stems long, widely spreading, branches short, numerous, erect, livid green. Leaves patent, imbricate, ovate, acute, 1.7 m.m., nearly smooth; nerve not very strong, vanishing below the apex; cells small, rotund, incrassate, with small, simple papillæ, cells of the lower third of the leaf narrow linear. Seta 1 c.m.; capsule red, smooth, broadly oblong 1 m.m., mouth narrow, plicate; lid with a slender rostrum as long as the capsule; calyptra glabrous; peristome, none.

Mt. Wellington, Circular Head.

### MACROMITRIUM LONGIROSTRE, Schw.

Stems long and spreading, branches rather robust, erect, 1-2 c.m. Leaves erecto-patent, crowded, imbricate, not twisting when dry, nearly smooth, lanceolate, very acute, 2 m.m.; nerve narrow, keeled, lost below the apex; cells very small, strongly incrassate, quadrate-rotund, convex, becoming linear at the base. Seta 1 c.m., dark; cap-



sule dark red, furrowed, narrow, oblong, 1.5 m.m.; lid slender, rostrate, half as long; calyptra glabrous; peristome teeth red, short, recurved, connected at the base.

On dead wood, Henty River.

### MACROMITRIUM EUCALYPTORUM, Hpe. et C.M.

Slender, creeping, with numerous short, erect, slender branches, olive green, darker below. Leaves narrow-ovate, acute, squarrose, erect, and not twisting when dry, 1.1 m.m.; margin plain; nerve bold canaliculate, vanishing below the apex; cells rotund, convex, not very small, those of the base not differing. Rest not seen.

On trees, Carnarvon.

### MACROMITRIUM MICROPHYLLUM, H. et G.

Widely spreading, with numerous erect, slender branches, reddish-yellow. Leaves broadly ovate-lanceolate, patent, erect, and not twisting when dry, 1 m.m.; margin slightly erose; nerve canaliculate, lost below the apex; cells small, oblong, strongly incrassate, rather longer below. Seta 1 c.m.; capsule oblong, 2 m.m.; lid slender, less than half as long; calyptra copiously hairy; exostome wanting; endostome, a narrow, papillose membrane.

Ovens Creek.

### ZYGODON, H.f. et T.

Small, forming tufts, or, when conditions favour it, spreading on bark and sending up short, erect branches, as in *Macromitrium*. Leaves spathulate or lanceolate, opaque, minutely papillose; margin plain; nerve round, canaliculate on the upper surface, vanishing in or below the apex (except in *Z. minutus*); cells rotund or oblong, small, slightly incrassate, each with 4-5 nodules, rather longer towards the base. Seta long; capsule erect, oblong, or nearly cylindric; lid usually with a long oblique rostrum; calyptra with a narrow base, cucullate, smooth; exostome, when present, of eight geminate, short, recurved teeth or rudimentary; endostome of eight or sixteen erect, slender cilia, sometimes also absent.

The genus is easily recognised, but the species are very close, and some of them of doubtful weight.

Peristome of eight cilia or none.

Margin plain.

Leaves ovate, sub-acute ..... *intermedius*.

Leaves lanceolate, acute ..... *Reinwardtii*.

Margin with a few teeth ..... *anomalous*.

Exostome present, but rudimentary ..... *Brownii*.

Peristome of both series.

Leaves obtuse ..... *obtusifolius*.

Leaves acute, nerve vanishing ... *Menziesii*.

Leaves acute, nerve excurrent ..... *minutus*.

### ZYGODON INTERMEDIUS, Br. et Schw.

Stems slender, yellow-green, sub-erect, usually in a dense mat, 2-3 c.m. Leaves patent, ovate, sub-acute, not crisped when dry, about 1.1 m.m.; margin plain; cells rotund, rather incrassate, nodules prominent; nerve vanishing at a distance from the apex. Seta at the base of innovations slender, 5-10 m.m.; capsule oblong, cylindric, with six prominent ribs when dry, tapering below, 1.4 m.m.; lid with an oblique rostrum half as long; peristome of eight incurved cilia.

On wood, Mt. Wellington, Mt. Faulkner.

### ZYGODON REINWARDTII, Schw.

Yellowish green, in dense tufts, 1-2 c.m. Leaves pale, ovate-lanceolate, very acute, concave, patent, undulate, 1.2 m.m.; margin plain; nerve bold, lost a little distance below the apex; cells rotund, less incrassate than in *Z. intermedius*, nodules minute. Seta left low down the stem by the growth of innovations, slender, 1.5 m.m.; capsule narrow, oblong, obscurely ribbed, 1.7 m.m.; lid slender, half as long; peristome of 8-16 irregular cilia.

Slopes of Mount Wellington.

### ZYGODON ANOMALOUS, D. et M.

Stems slender, often 2-3 c.m., freely branched. Leaves divaricate, narrow, ovate-lanceolate, wavy when dry, acute, 1.2 m.m.; margin often with a few spinous teeth above; nerve narrow, vanishing in the apex; cells rotund, with very

short obtuse nodules. Seta slender, 1.5 c.m. ; capsule narrow, oblong, or cylindric, with rather prominent ribs when dry, tapering below, 2 m.m. ; lid nearly as long ; calyptra narrow, brown ; peristome of 8 irregular cilia.

Sometimes considered not distinct from the last.

On wood, Mount Wellington.

### ZYGODON BROWNII, Schw.

Stems green or yellowish, decumbent, 1.5 c.m. Leaves patent, ovate-lanceolate, acute, undulate, concave, 2 m.m. ; margin often with a few spinous teeth above ; nerve strong, vanishing just below the apex ; cells rotund, strongly incrassate, with very short, obtuse nodules. Seta from below the new shoots, about 1 c.m. ; capsule oblong, cylindric, very tapering below, obscurely ribbed, 1.4 m.m. ; lid half the length of capsule. Exostome a short membrane, seldom bearing irregular teeth ; endostome of 8 erect irregular cilia.

Very common on rocks and bark.

### ZYGODON OBTUSIFOLIUS, Hook.

Stems slender, with few irregular branches, in dense clusters, seldom 1 c.m. long. Leaves erect, imbricate, ovate-lanceolate, concave, obtuse, 0.5 m.m. ; margin plain ; nerve broad, vanishing below the apex ; cells small, rotund, coarsely nodulose, papillate, lower ones smooth, rectangular, intermediate ones quadrate, and ascending some distance within the margin. Seta 6 m.m. ; capsule oblong, deeply furrowed when dry, dark red, 1.1 m.m. ; lid shorter than the capsule ; calyptra short, dark ; peristome double, the exostome of 8 recurved, short, broad, geminate teeth ; endostome of 8-16 incurved cilia.

On wood, Macquarie Harbour.

### ZYGODON MENZIESII, Mitt.

Syn : *Z. Drummondii*, Tayl.

*Condonblepharum Menziesii*, Schw.

Densely tufted, stems short, 5-8 m.m. Leaves erecto-patent, imbricate, oblong, shortly apiculate, 1-1.5 m.m. ; margin revolute in the middle, otherwise plain ; nerve bold,

reddish, lost below the apex; cells rotund, not strongly incrassate, smooth, or slightly convex. Seta, about 1 c.m.; capsule pyriform, with a narrow mouth, smooth, furrowed when dry, 1.8 m.m.; lid conic, red at the base, less than one-third the length of the capsule; peristome double; exostome of eight short teeth, geminate, dividing above; endostome of 16 incurved cilia.

George Bay, Forth River, Near Kingston.

### ZYGODON MINUTUS, C.M. et Hpe.

Similar in habit and general structure to *Z. Menziesii*, but the leaf acuminate with a shortly excurrent nerve. The exostome is described as formed of 16 geminate, short, closely-joined teeth, and the endostome of eight cilia inserted on a tender reticulate membrane.

Not present in any available collection.

### AMPHIDIUM, Schimp.

Rather small, decumbent or sub-erect, in dense clusters, simple, or with few, irregular branches. Leaves linear-lanceolate, nerved, keeled, opaque, cells irregularly rotund, quadrate below, large and rectangular at the base; papillæ irregular, numerous, obtuse; perichaetials longer. Seta thrown to one side, short; capsule goblet-shaped or obconic, mouth very broad, thin-edged; lid shortly rostrate, oblique; calyptra short, cucullate; peristome, none.

### AMPHIDIUM CYATHICARPUM (Mont.), Broth.

Syn: *Zygodon cyathicarpum*, Mont.

Stems usually under 1 c.m., simple, dark below, livid green above. Leaves spreading, linear, acute, 2 m.m.; margin thickened, revolute below, remotely toothed above; nerve slender, lost in the apex; perichaetials longer, slender, usually exceeding the seta. Seta, 1.6 m.m.; capsule, 0.8 m.m., furrowed.

On ground, Mt. Faulkner, Mt. Dromedary; on tree, Forth River.

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## Fam. 4—LEUCOBRYACEAE.

Habit, tufted; stems ascending with few dichotomous or lateral branches, pale and spongy, brittle and harsh when dry. Leaves in many rows, lanceolate, thick, except on the margin, the greater part, generally considered to be a very broad nerve, three cells thick, the superficial layers large and colourless, empty, the intermediate layer interrupted, small and green. Fruit terminal; capsule on a long seta, oblong; lid rostrate; calyptra cucullate; peristome single of 8 or 16 strong teeth, cleft above into two subulate legs.

A small family, with peculiar leaf structure, remotely resembling that of *Sphagnum*. The structure of the capsule and peristome are very similar to *Dicranum*.

## LEUCOBRYUM, Hampe.

Capsule on a long seta, cernuous or erect, arcuate, plicate when dry; peristome of 16 teeth, cleft half way.

## LEUCOBRYUM CANDIDUM, Hpe.

Robust, in dense mats, yellowish green; stems 2-5 c.m. Leaves crowded, imbricate, patent, lanceolate, acute, 6 m.m. Capsule curved, strumous, 2.5 m.m.; lid nearly as long.

Common at the foot of trees in forests.

This appears in Gunn's collection as *Dicranum Sphagni* Wahleht.

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## Fam. 5—MNIACEAE.

Branches erect, simple or fascicled, from a creeping radiculose stolon. Leaves from delicate to rather firm, lanceolate to oblong, the cells rotundo-quadrate, medium sized, thin or slightly incrassate, rarely large rhomboid, nerve from lost above to excurrent. Normally the fruit is terminal, but in three of the Tasmanian genera it arises low down on the branch, or beneath a fascicle; seta long, slender; lid various; calyptra cucullate; peristome from small, single, and irregular to perfect (that is of two series), the exostome of 16 strong, lanceolate teeth, the endostome of 16 transparent processes. The family is not a very natural one, but it would not further matters to split it into many small, partially allied groups. *Gonobryum*, with the habit of *Rhizogonium*, has almost the tissue of a *Bryum*, and in both these the peristome is very like that of *Bryum*. *Mittenia* is an aberrant genus, and is sometimes placed in a family by itself, a proceeding warranted by its peculiar peristome and leaf insertion. Some bryologists have placed it in *Fissidentaceae*, but beyond superficial resemblance, there appears little to warrant it.

**LEPTOSTOMUM**: Leaves rather blunt, with a terminal, long, dentate hair. Peristome an irregular membrane.

**LEPTOTHECA**: Leaves acute, with an excurrent nerve. Peristome double, but teeth very short and slender.

**HYMENODON**: Leaves small, oblong, in one plane, with a terminal, long, simple hair. Peristome of one series of thin, lanceolate teeth.

**RHIZOGONIUM**: Leaves various. Peristome perfect. Outer series of bold, lanceolate teeth; inner of delicate, slender processes.

**GONOBRYUM**: Leaves translucent, cells large, rhomboid. Peristome perfect.

**MITTENIA**: Leaves in two rows; vertically inserted, dorsal margin decurrent. Peristome of two series, the outer of very long, slender bristles, the inner of 16 short, brown cilia.

## LEPTOSTOMUM, R. Br.

Robust and soft, sparsely branched, covered, except the apex, with close, purplish-brown tomentum, binding the stems into a dense cushion. Leaves rather rigid, broad, ovate, or oblong, usually obtuse, with a long, hair point; nerve slender, excurrent, cells small, rotund or subquadrate, strongly incrassate. Capsule on a tall, terminal seta, clavate, pyriform, with a tapering neck, and constricted mouth; lid small, hemispheric. Peristome single, a short, irregular membrane.

*L. macrocarpum*, R. Br., which differs from *L. inclinans* principally by the terminal hair being branched, has been recorded as Tasmanian, but probably erroneously.

Leaves obtuse or shortly acuminate.....*inclinans*

Leaves very obtuse or emarginate.....*gracile*.

## LEPTOSTOMUM INCLINANS, R. Br.

Pale green, robust, in dense cushions, stems 2-5 c.m. Leaves erect, imbricate, ovate, oblong 2.5-3.5 m.m.; apex usually obtuse, sometimes shortly acuminate, usually with a few irregular teeth in the upper portion; nerve slender, excurrent in a slender, jointed hair. Seta, 2-4 c.m.; capsule inclined, narrow pyriform, with a tapering neck, 5-7 m.m., mouth contracted.

Forms with an acuminate apex and dentate margin have been referred to *L. Menziesii* Hook, an African species, which probably does not occur in Australia.

Common on wood in forests.

## LEPTOSTOMUM GRACILE, R. Br.

Bright green, in small, loose mats; stems seldom exceeding 2 c.m. Leaves patent, ovate, 1.5 m.m., very obtuse, emarginate; margin plain, recurved; nerve slender, excurrent, in a short, jointed hair. Seta 2 c.m.; capsule inclined, narrow pyriform, with a tapering neck, 4 m.m., constricted below the narrow mouth.

Mt. Wellington. Near Circular Head.

## LEPTOTHECA, Schw.

Stems numerous, erect, simple, in dense tufts. Inflorescence, terminal on short stems, with longer leaves, often becoming lateral by elongation of a sterile innovation. Leaves rather short, imbricate, plurifarious, rather narrow, of rather firm texture, cells small, irregular, quadrate or rotund, incrassate; nerve bold, excurrent. Seta long, slender; capsule cylindric, smooth, erect, or slightly inclined; lid, short pyramidal; calyptra narrow, cucullate; peristome double, exostome of 16 short, pale, erect, lanceolate, minutely papillose teeth; endostome a short, irregular membrane, bearing 16 irregular, very delicate, slender processes, often perforate with a few irregular cilia intervening.

## LEPTOTHECA GAUDICHAUDII, Schw.

Pale green, stems usually about 2 c.m. Leaves patent, narrow, ovate, acuminate, with a bold nerve point, 3 m.m.; margin plain, or with a few irregular teeth towards the apex; nerve bold, excurrent. Leaves on fertile shoots longer lanceolate. Seta 2-4 c.m.; capsule reddish-brown, 2-4 m.m.; irregularly furrowed when dry, tapering at the base.

Mt. Wellington, Mt. Field, East Coast.

## HYMENODON, Hf. et W.

Delicate, creeping, piliferous stolons, sending up erect, simple, delicate, leafy branches. Leaves small, delicate, oblong, terminated by a delicate hair point. Seta arising from the base of a leafy branch, long and slender; capsule oblong, smooth, with a rather broad mouth; lid convex, with a slender, oblique rostrum, as long as the capsule, but in some cases shorter and conic; calyptra short, very narrow, cucullate; peristome single, of 16 linear-lanceolate, membranous teeth, truncate above, and inserted into a short basal membrane; externally covered with closely-appressed short bristles, giving the teeth a striate appearance; the teeth tend to divide in the middle line into two slender legs.



## HYMENODON PILIFIR, Hf. et. W.

Pale, delicate stems, seldom exceeding 1 c.m. Leaves oblong, with a fairly long, delicate, straight, apical hair, usually distichous, and flattened in one plane, 1 m.m.; margin marked with the cell papillae, otherwise plain; nerve vanishing above the middle; cells rotund, rather small, thin walled, surface with a strong, simple, papilla. Seta 8 m.m.; capsule inclined rather broadly oblong, 0.6-1 m.m., peristome pink, relatively long, and overarching as a dome when dry.

Slopes of Mt. Wellington. Huon River, and on trunks of Tree Ferns.

## RHIZOGONIUM, Bridel.

Stems erect, from a creeping base, simple, or with a fascicle of branches above. Leaves various, from linear acute to broadly oblong, from distichous and flattened in one plane to plurifarious; margin toothed, thickened, or plain; nerve slender, from vanishing above to excurrent, cells quadrate or rotund, medium sized, seldom incrassate. Fruit from low down the simple, leafy stem, or from beneath a fascicle. Seta long; capsule inclined; lid conic or rostrate; calyptra cucullate; peristome double, exostome of 16 lanceolate, closely articulated teeth, barred on the inner surface; endostome  $\frac{1}{3}$ , membranous, with 16 slender processes, with a few intervening cilia.

Leaves distichous, in one plane.

Nerve lost .....distichum.

Nerve continuous or excurrent.

Stem simple.

Leaf-margin not thick.....*Novae-hollandiae*.

Leaf-margin thickened ..... *aristatum*.

Stem fascicled above ..... *bifarium*.

Leaves plurifarious, very narrow.

Wings and nerve continuous.....*Mnioides*.

Nerve long, excurrent.....*spiniforme*.

**RHIZOGONIUM DISTICHUM, Brid.**

Stems simple, 1-2 c.m. Leaves distichous, in one plane, asymmetric, broadly elliptic trapezoid, slightly acuminate, 1.7 m.m.; margin plain, with few irregular, bold serrations above; nerve narrow, lost below the apex; cells very irregular, quadrate, thin walled, mostly 12-16 u. Seta inserted at the base about 2-3 c.m.; capsule inclined, cylindric, 2.5 m.m., mouth broad, constricted just below it; lid conic-rostrate, short, oblique.

Slopes of Mt. Wellington.

**RHIZOGONIUM NOVAE-HOLLANDIAE, Brid.**

Stems simple, 2-3 c.m. Leaves distichous, in one plane or secund, patent ovate, 1-1.5 m.m., margin usually serrate above, otherwise plain, and slightly or not at all thickened; nerve bold, shortly excurrent. Cells as in *R. distichum*. Seta from the base 2-3 c.m.; capsule inclined, cylindric, 2.5 m.m.; lid rostrate, oblique, half as long.

Mt. Wellington, Mt. Hartz, etc.

**RHIZOGONIUM ARISTATUM, Hpe.**

Stems simple, 3-4 c.m. Leaves patent, close together, distichous in one plane, ovate to ovate-lanceolate, acute, 1.5-2 m.m., margin with a strongly thickened border, generally obtusely and irregularly serrate above, nerve bold excurrent; cells rather large, irregular, quadrate, averaging 17 u., scarcely incrassate. Rest not seen.

Near Frenchman's Cap, Florentine Valley.

**RHIZOGONIUM BIFARIUM, Schimp.**

Stems with a fascicle of branches above 1-2 c.m. Leaves distichous, arranged in one plane, narrow elliptic, acute 1.5 m.m.; margin bordered and spinulose, some of which at least are double; nerve rather thick, often spinulose, percurrent; cells hexagonal, irregular, thin walled, mostly 12-16 u. Seta 2 c.m., arising from just below the branches; capsule inclined, oblique, broadly oblong, 1.5 m.m.; lid broadly conic, with an acute black tip.

Slopes of Mt. Wellington. Common in damp gullies on dead wood.

## RHIZOGONIUM MNIOIDES, Brid.

Syn: R. Hookeri, C.M.

Stems numerous, erect, simple, or nearly so, 5 c.m. Leaves plurifarious, patent, or spreading, crisped when dry, 4-5 m.m., linear lanceolate; margin slightly thickened, armed with double spinose serrations; nerve percurrent; cells roughly quadrate, 7-12 u., the walls not much thickened. Seta arising rather low down the stem, 5 c.m. Capsule cernuous, slightly oblique, broadly oblong, 2.7 m.m.; lid rostrate, half as long.

Mt. Wellington, Forth Gorge, Western Mounts.

## RHIZOGONIUM SPINIFORME, Bruch.

Stems erect, simple, rigid, brownish, 5 c.m. Leaves not crisped, when dry, tough, linear, lanceolate, attenuated above to a filiform point, 8-10 m.m.; margin thickened, closely armed with double spinose serrations; nerve excurrent; cells rotund, 8-12 u., strongly incrassate. Rest not seen.

Tasman's Peninsula.

## GONIOBRYUM, Lindb.

Medium size, stems suberect, from a creeping rhizome, branching only at the base. Leaves lanceolate, base narrow, apex acute; margin spinulose; nerve slender, vanishing below the apex; cells large, rhomboid or fusiform, thin walled, 13-20 x 60-90 u. Fruit on a short branch, inserted low down below the branches; seta long, slender; capsule oblong, cernuous, or pendulous, base with a short, tapering apophysis; lid shortly rostrate, calyptra narrow, cucullate; peristome double; exostome teeth, 16, lanceolate tapering to a slender, colourless, minutely papillose apex, base of one series of short, broad cells; endostome a delicate membrane, half as long as the teeth, and 16 lanceolate processes, with 4 slender cilia between each pair.

Marginal teeth single.....subbasilare.

Marginal teeth in pairs.....pellucidum.

## GONIOBRYUM SUBBASILARE (Hook), Lindb.

Syn: *Rhizogonium subbasilare*, Hook.

Stems erect, pale sage-green, usually with few irregular branches, 2-3 c.m. Leaves lanceolate, subacute, 2.5 m.m.; margin sharply serrate, sometimes slightly thickened; nerve slender, vanishing in the upper third. Seta 3.4 c.m.; capsule 3 m.m., mouth wide when dry, peristome pale.

On rotten wood, slopes of Mt. Wellington, Cradle Mountain, Mt. Bischoff, etc.

## GONIOBRYUM PELLUCIDUM (Hfw.), Lindb.

Syn: *Rhizogonium pellucidum* Mitt.

A similar plant in every detail to *G. subbasilare*, only the leaf slightly more thickened on the margin, and the marginal teeth are in pairs, also the nerve approaching the apex more.

Not present in Tasmanian collections.

## MITTENIA, Lindb.

Branches erect, simple, from a creeping rhizome. Leaves distichous, complanate, except below the fertile apex, vertically or obliquely inserted, the lower wing broadly decurrent; cells rather large, quadrate, thin-walled. Seta terminal; capsule oblong, erect; lid rostrate; calyptra mitriform, narrow, or shortly split on one side; peristome double, exostome of 16 filiform, dark brown, closely articulated teeth, nearly as long as the capsule; endostome of 16 very short, filiform, brown, cilia.

## MITTENIA PLUMULA (Mitt.), Lindb.

Syn: *Mniopsis plumula*, Mitt.

Delicate pale bluish-green, 2-3 c.m. Leaves ovate to oblong, subacute to very obtuse, 1-1.5 m.m.; margin plain; nerve vanishing above the middle. Seta, 3-4 m.m. long; capsule, 1.2 m.m., smooth, pale brown; lid dark, nearly as long; peristome teeth very slender, dark, nearly as long as the capsule.

Mt. Wellington, Mt. Bischoff, George River.



## Fam. 6.—FISSIDENTACEAE.

Plants from minute to medium sized, erect or inclined, the stems simple, or rarely with few branches, generally in caespitose masses. Leaves alternate in two opposite rows, the lower ones usually short and more or less conduplicate, in the upper ones a dorsal blade is developed carrying the nerve with it (when a nerve is present), the leaf then appears flat in the same plane as the stem, with an equitant base or sheath, cells irregularly hexagonal, quadrate or rotund, small, rarely larger, smooth or papillose. Seta long, slender, terminal, rarely lateral; capsule oblong, small; lid conic or rostrate; calyptra rather small, mitriform, or split on one side at the base; peristome of one series, well developed, teeth 16, split half way or more into two slender trabeculate legs.

The family with the peristome of *Dicranum* has a very distinct leaf structure. The inclination of the capsule is unreliable for purposes of identification; the position of the antheridium sometimes uncertain; general habit and leaf structure is more trustworthy.

## FISSIDENS, Hedw.

Character indicated in the description of the family.

Nerveless, dwarf, cells large ... .. *dealbatus*.

Tall, leaves nerved, with a serrate margin...*adiantoides*.

Nerved, margin entire, or nearly so.

Margin nowhere bordered.

Under 5 m.m.

Cells prominently papillose.....*tenellus*.

Cells smooth, upper leaves longest,  
lanceolate ..... *pallidus*.

Stems usually 1 c.m. or more.

Leaves rather obtuse.

Leaves linear, rigid ..... *strictus*.

Leaves ligulate, cells papillose...*oblongifolius*.

Leaves acute, cells incrassate.

Cells small, convex ..... *pallidus*.

Cells rather large, smooth ..... *Whiteleggi*.

Margin of sheath alone bordered.

Leaves lanceolate, straight ..... *integerrimus*.

Leaves oblong, incurved ... .. *elamellosus*.

Leaves oblong, straight ..... *brevifolius*.

Leaves oblong, recurved, papillose... .. *vittatus*.

Margin of lamina with a very narrow border; plants small,

Leaves short, recurved, papillose ... .. *vittatus*.

Leaves straight, oblong, cells irregularly quadrate, 8-10 u. .... *brevifolius*.

Leaves narrow, oblong, cells rotund, 5-6 u. .... *leptocladus*.

Margin of lamina, with strong border.

Nerve not excurrent. Plant tall.

Apex revolute when dry ..... *leptocladus*.

Tall rigid water plant ..... *rigidulus*.

Plants small, leaves of fertile stems, lanceolate, bordered on the sheath, with an excurrent nerve. Leaves of male plant short, broad, little or not at all bordered ..... *semilimbatus*

Plants small, all leaves lanceolate, with a broad border, usually blending with the excurrent nerve ..... *pungens*.

## FISSIDENS DEALBATUS, Hf. et W.

Small, pale bluish-green, delicate, seldom exceeding 5 m.m. Leaves about five pairs, oblong-lanceolate, 1.5 m.m., with a very narrow hyaline border, sheath very short; margin plain; nerve none; cells large, subrectangular, or rhomboid, smooth, wall very thin. Seta, 4-5 m.m.; capsule erect, oblong, nearly 1 m.m.; lid conic, as long as the capsule.

In damp, shaded places, lower slopes of Mt. Wellington, Forth River, etc.

## FISSIDENS ADIANTOIDES (L.), Hedw.

Tall, simple, often 3 c.m., dark green to nearly black, paler in dry places. Leaves numerous, ovate-oblong, subacute, the sheath rather swollen, and rather more than half the length, the middle leaves longest, 1.7 m.m., margin not bordered, irregularly serrate; nerve narrow, vanishing in the apex; cells rotund, not strongly incrassate, convex, 10-12 u. Seta arising half way down the stem, long; capsule oval or oblong, erect to cernuous, when dry strongly contracted below the mouth; lid with a rostrum about as long as the capsule; calyptra cucullate.

Nile River, near Evandale.

## FISSIDENS TENELLUS, Hf. et W.

Stem seldom exceeding 2 m.m. Leaves usually 5-7 pairs, oblong-lanceolate to linear-lanceolate, the narrower ones on the female plants, seldom exceeding 1 m.m., not bordered, surface and margin rather strongly papillose; nerve strong, vanishing in the apex; sheath about half the length; cells hexagonal, 7.5 u. Seta slender, variable in length; mostly 5 m.m.; capsule oblong, erect or inclined, 0.5-0.7 m.m., mouth large, and constricted below it, when dry; lid with a long acute rostrum; calyptra short, cylindric, hardly covering the rostrum; peristome red.

Mt. Nelson, Mt. Wellington, Forth River, Huon. Common in shaded places.

*FISSIDENS STRICTUS*, Hfw.

Medium sized, rigid, erect generally, 1-2 c.m. high. Leaves numerous, erecto-patent, imbricate, rigid, linear, rather obtuse, lower ones very small, dark; upper ones yellowish, nearly 2 m.m long; margin not bordered, often minutely crenulate at the apex; nerve yellow, fairly strong, vanishing below the apex; cells strongly incrassate, round, but very irregular, smooth, or slightly convex, 6-12 u. Seta rather strong, mostly under 3 m.m.; capsule very broadly oblong, erect, with a broad mouth, slightly constricted below the mouth when dry, 0.7 m.m., lid conic, oblique.

York Town Rivulet. .

*FISSIDENS OBLONGIFOLIUS*, Hf. et W.

Suberect, closely caespitose, in bright green masses, stems 1-2 c.m. Leaves numerous, imbricate, narrow, oblong, very obtuse, or with a short, apiculus, rarely with an acuminate subacute apex, revolute when dry, 2 m.m., sheath about  $\frac{3}{4}$  leaf length, surface and margin from slightly to rather prominently papillose, not bordered; nerve undulate, vanishing in or below the apex; cells irregularly rotund, slightly incrassate, averaging 9 u. Seta slender; capsule oblong, inclined 0.8 m.m.; lid with a slender rostrum nearly as long; calyptra very narrow. Very seldom found in fruit.

Very common in damp gullies.

*FISSIDENS PALLIDUS*, Hf. et W.

Pale green, brown below, 1-2 c.m., sometimes very short. Leaves numerous, imbricate, lanceolate, or ligulate, acute, more or less revolute when dry, 2 m.m. Sheath half leaf length; nerve narrow, vanishing below the apex; margin not limbate, very minutely serrate from cell protuberances; cells rather irregular, rotund, incrassate, nearly smooth, averaging 9 u. Seta 8 m.m.; capsule arcuate, oblong, with a strumous base, and a wide, rather oblique mouth, 0.8 m.m.; lid with a sharp rostrum, as long, or longer; calyptra slender, as long as the capsule, irregularly torn at the base. The type plant was small and pale.



In Tasmania it is often large. In shaded places it is slender, and darker, closely approaching *F. oblongifolius*, and was described by Hooker and Wilson as *F. ligulatus*.

Slopes of Mt. Wellington, Ida Bay, Macquarie Harbour.

### FISSIDENS WHITELEGGII, C.M.

Slender, pale green, or yellow, 2-4 c.m. Leaves numerous, nearly erect, imbricate, narrow lanceolate, suddenly narrowing above the sheath, acute, 3 m.m., sheath  $\frac{3}{4}$  leaf length; nerve bold, vanishing in the apex; margin non-limbate, very slightly crenulate, minutely serrate towards the apex; cells irregular, rotund, strongly incrassate, smooth, mostly 10-15 u. Seta slender, 8 m.m.

Mt. Bischoff.

### FISSIDENS INTEGERRIMUS, Mitt.

Stems about 1 c.m., densely caespitose. Leaves erecto-patent, imbricate, livid, lanceolate, rather obtuse, 1.7 m.m., sheath half the length; margin of the lower half of the sheath with a broad border of linear cells, otherwise non-limbate; nerve rather narrow, lost in the apex. Cells irregularly hexagonal-rotund, incrassate, 10-12 u., nearly smooth. Rest not seen.

Locality not recorded.

### FISSIDENS ELAMELLOSUS, Hpe. et C.M.

Small, slender, yellowish, mostly 2-5 m.m. Leaves small, broadly oblong, remote, erecto-patent, incurved, sub-acute, in many pairs, 0.7 m.m., dorsal lamina narrow, lost at a distance from the base; border well developed on the sheath, absent elsewhere; nerve bold, lost in, or just below, the apex; margin irregular; cells irregularly hexagonal, mostly 8-15 u. Seta very slender, 3-4 m.m.; capsule erect, very broadly oblong, 0.5 m.m., mouth broad, constricted below the mouth when dry; lid conic-rostrate, 0.4 m.m.

On dry sandstone near Bellerive.

## FISSIDENS BREVIFOLIUS, Hf. et W.

Small, green, seldom exceeding 5 m.m. Leaves generally 7-10 pairs, erecto-patent, oblong, straight, apiculate, with a narrow border from only on the lower part of the sheath to extending partly up the lamina, 0.7 m.m. long, the sheath usually  $\frac{3}{4}$  the length; nerve bold, vanishing abruptly in the apex; margin rather crenate; cells irregular in size and shape, roughly quadrate, rather thin walled, 6-10 u. Seta very slender; capsule oblong, erect to much curved, 0.7 m.m.; lid broadly conic; calyptra short, broad, split on one side.

Forms with the border excessively developed may be distinguished from small forms of *F. leptocladus* by the larger, less incrassate cells.

Slopes of Mt. Wellington.

## FISSIDENS VITTATUS, Hf. et W.

Small, slender, usually about 5 m.m., yellowish, apex recurved. Leaves about 10 pairs, rigid, opaque, generally imbricate, ovate, oblong, apiculate, recurved, 1.3 m.m., the surface papillose; margin limbate, on the sheath the limb is broad, and within the margin below, elsewhere narrow, hyaline, or absent; margin obscurely serrate; nerve lost in the apex, to shortly excurrent; cells regular, rotund, very convex, 7 u. Seta slender, 1 c.m., capsule erect, narrow-oblong, 0.7 m.m.; lid with a slender rostrum about half as long.

Slopes of Mt. Wellington, Strickland, Circular Head, etc.

## FISSIDENS LEPTOCLADUS, C.M.

Stems slender, mostly 1-1.5 c.m. Leaves smooth, numerous, straight, revolute when dry, ligulate to oblong, with an acuminate, rather acute, apex, 1.3 m.m., limbate, the border narrow, lost in the apex, and at the dorsal base, very broad at the base of the sheath, but variable, sometimes broader and coalescing, with the nerve in the apex; nerve rather broad, usually lost in the apex; cells irregularly quadrate, not incrassate, 5-6 u., sometimes nearly ro-

tund, more or less convex. Seta 5-6 m.m.; capsule oblong, arcuate, sometimes nearly straight, 1 m.m.; lid red conic-rostrate, shorter; calyptra short, broad, torn on one side; peristome bright red.

The size of plant and shape of leaf varies in response to local conditions. In exposed situations, it is stunted, and the leaf much shorter and broadly oblong, but the small, nearly rotund cells are characteristic. This is the *F. incurvus*, Hook, non Starke, of the Floras of Tasmania and New Zealand.

Slopes of Mt. Wellington

### FISSIDENS RIGIDULUS, Hf. et W.

Simple, or with few equal branches, rather rigid, dark green when submerged, lighter when growing out of water, 3-5 c.m. Leaves numerous, close set, erecto-patent, straight, lanceolate, acute, 2.7 m.m.; margin strongly limbate, entire, with a more or less sinuous edge, border and nerve usually vanishing in the extreme apex, rarely just continuous, with the apical cells more elongated and incrassate; nerve bold, attenuating above; cells irregular in shape and size, quadrato-hexagonal, mostly 6-8 u. Seta terminal, slender, 8 m.m., capsule erect or inclined, narrow, oblong, with a tapering base to very broad, mouth large, 1 m.m. long; lid usually with a rostrum half as long, but sometimes short.

Very common on rocks in running water.

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### FISSIDENS SEMILIMBATUS, C.M., et Hpe.

Small, yellowish, dioecious, usually 2-4 m.m., but the sterile stems often elongating. Leaves on sterile female or neuter stems lanceolate, acute, erecto-patent, straight, 0.6-1.2 m.m., many, nerve lost in the apex, border narrow on the sheath only; fertile stems declinate, very short, with few longer, narrower leaves, the nerve generally excurrent; on male stems the leaves are many, broadly oblong, nerve vanishing in the apex, and the border is obsolete, or none; cells irregular in size and shape, roughly hexagonal, thin

walled, 10-14 u. Seta slender, capsule erect to much bent, oblong, mouth broad, 0.7 m.m., lid conico-rostrate, calyptra short, usually narrow.

The plant grows in a great variety of places. On tenacious ground in exposed places it is very stunted, with small, erect, broad capsules (F. Taylor, C.M.). In permanently moist places, it is much infested with algae, and obscured by growth of filaments from leaves and stems (F. sarcophyllus, C.M.).

Very common.

#### FISSIDENS PUNGENS, Hpe. et C.M.

Small, pale, slender, of similar habit and leaf structure to *F. semilimbatus*, only the leaves of the males are longer and narrower, also all leaves are strongly limbate, the limb coalescing at the apex with the nerve, to form a strongly excurrent point; cells smooth, very irregular, not incrassate, mostly 10-15 u. Seta 5-6 m.m., capsule oblong, usually strongly arcuate, 0.7 m.m.; lid conic to rostrate, usually much shorter than the capsule; calyptra short, with a broad base; peristome bright red.

Very common.

This and *F. semilimbatus* form two extremes of one group, and intervening forms are widely dispersed and varied.

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