

## MUSCI.

By WILLIAM MITTEN, A.L.S.

The number of the mosses as yet known to occur in the island of Rodriguez is thirty-three, of these ten were gathered in a fertile state, the remaining twenty-three being barren. With one exception all the genera are the same as those known from Africa or the Mascarene Islands, and thirteen of the species are identical with those found in those countries. Three species are found also in India and the Indian Archipelago, and seventeen are considered to be new, of these eleven are without fruit, and six fertile.

The most interesting moss is the *Orthotrichum plicatum*, Beauv., before known only from the specimens gathered in Bourbon by Du Petit Thouars, described and well figured by Schwægrichen; it is undoubtedly a member of the family of the *Orthotricha*, but its characters as a genus are intermediate, and its position in that family unique. A few species correspond with those from the western coast of tropical Africa, and it appears from what little is yet known of the mosses of the eastern coast that some species have an enormous range in the African continent.

Cosmopolite mosses are represented solely by *Weisia controversa*.

*Octoblepharum albidum*, Lin. (Bryum).

Not a common species. Found on decayed branches of trees and vegetable humus.

*Calymperes (Hyophilina) lævifolium*, Mitt.

*Caulis* ascendens ramosus. *Folia* dense inserta e basi erecta dilatata late obovata margine minute crenulata intus cellulis hyalinis areolata exinde patentia lineali ligulata apice lato acuta subapiculatave margine incurvo canaliculata integerrima cellulis minutis sublævibus obscuris et ad margines folii basis erectioris limbum formantibus descendentibus areolata, vitta intramarginalis nulla. *Folia* anomala longiora erecta attenuata apice propagulis glomerulatis coronata.

*Stems* about half an inch high, with the leaves a line and a half wide. The uppermost leaves green, the lower all brown, about a line long, when dry, curved and loosely contorted.

Not uncommon.

In its leaves this moss comes nearest the South American *C. Richardi*, C. Mull. and *C. parasiticum*, Sw., and differs from the African *C. Afzelii*, Sw. in the absence of the marginal vitta.

*Calymperes pallidum*, Mitt.

*Caulis* brevis subsimplex. *Folia* a basi parum latiore erecta cellulis hyalinis areolata margine superiore crenulata exinde patentia oblongo-lanceolata, cellulis rotundatis vix obscuris papillis brevibus aspera, nervo crassiusculo concolori intus

extusque scabro percursa, vitta angusta sub-intra-marginali lutescente circumdata. Folia anomala angustiora ex apice nervi glomerula corpuscularum viridium fusiformium ferentia.

Stems about two lines high. Leaves a line long, pale glaucous green when dry, loosely incurved and contorted.

Frequent.

In the structure of the leaf nearest to *C. varium* from Ceylon and Moulmein, in the glaucous appearance of the upper cells like *C. Dozyanum*, Mitt. (*C. Moluccense*, Bryol. Jav. t. 37; but not of Schwægrichen), so widely spread in the Indian Archipelago and Pacific Islands.

*Weisia* (*Euweisia*) *controversa*, Hedw. *Fund. Musc. Frond.* iii. 12 t. 5.

Everywhere on the banks of streams.

*Weisia* (*Hyophila*) *Roscheri*, Lorentz.

Found with other species of *Weisia*.

Small barren stems, which agree pretty well with others from Zanzibar. The species is very similar to *W. (H.) involuta*, so common in India.

*Weisia* (*Tortularia*) *incerta*, Mitt.

*Caulis* brevis ramosus. *Folia* patentia patenti-recurvaque lineali ligulata apice obtusa, nervo crasso rufescente in mucronem brevem excurrente, marginibus superioribus inflexis integerrimis, cellulis superioribus rotundatis obscuris basalibus paucis oblongis parvis rectangulatis hyalinis.

*Stem* a quarter of an inch high. *Leaves* one line long, dark green, when old of a rusty brown colour.

Common on banks of streams.

This appears to be a moss very nearly resembling *W. navicularis*, Mitt. *Musc. Austr. Amer.* 139, but it is a species of which too little is known to render its position here well ascertained.

*Tortula* (*Planbelia*) *mutica*, Mitt.

Humilis, subsimplex. *Folia* erecto-patentia ovato-oblonga obtusissima, nervo valido concolori sub apice abrupto dorso superne aspero inferne lævi carinata, integerrima, cellulis superioribus parvis fere obscuris inferioribus basin versus rotundo-quadratis parvis pellucidis.

*Stems* two lines high, red. *Leaves* one third of a line long, glaucous green, when dry contorted.

Along with species of *Weisia*, but more scarce.

Very near to *T. orientalis*, Willd., and to *Pottia (Hyophila) papillinervis*, Lorentz, from Zanzibar, which is doubtless a species of this group, being very similar to *T. orientalis* in size, habit, and in the structure of its leaves.

**Leiomitrium**, genus nov.

*Caulis* repens ramis fertilibus erectis. *Theca* exserta. *Peristomium* duplex externum octodentatum (dentibus bigeminatis) internum octociliatum. *Calyptra* campanulata plicis nullis.

**L. plicatum**, Beauv. *Prodr.* 81; Schwægr. t. 52 (Orthotrichum).

Not uncommon.

This curious and interesting species has been well figured and described by Schwægrichen, its habit is that of a *Macromitrium*, its leaves like those of the species of *Zygodon* which are allied to *Z. viridissimus*, and its capsule and peristome as in *Ulota*; there is, however, no species of *Orthotrichum* or *Ulota* to which it has any resemblance, except in its capsule. In the non-plicate calyptra this genus agrees with *Schlotheimia*, without, however, having any other near affinity or resemblance.

**Macromitrium astroideum**, Mitt.

*Caulis* repens prostratus, foliis e basi patente divergentibus apice incurvis hastato-lanceolatis acuminatis apice angustis cellulis inferne oblongis nonnullis curvulis superioribus rotundatis obscuris areolata, rami dense dispositi breves erecti densifolii, foliis linealibus e basi suboblonga erecta cellulis pellucidis angustis oblongis paucis curvatis papillis elevatis intus asperis, exinde patentibus apice obtuse acutis incurvis cellulis rotundis densis obscuris vix papillosis areolatis costa superne concolori inferne flavescente percursa carinatis.

*Stems* creeping in a centrifugal manner with closely set branches about a line high. *Leaves* one line long, when dry curled and contorted, forming globular tufts.

Rare. Only at the top of Oyster River valley, trailing over boulders.

This appears to be near *M. fimbriatum*, Schw., but has narrower leaves.

**Macromitrium aciculare**, Brid.; Schwægr. t. 111.

Occurs more commonly than the foregoing.

Stems all barren, but agree with Mauritian specimens. It appears to be one of the most abundant amongst a group of very closely allied species found in Mauritius.

**Bartramia (Philonotis) pungens**, Mitt.

Dioica. *Caulis* erectus ascendensve late cæspitosus gracilis rufus infra perichetium ramis plerumque ad unam lateram decurvis ramosus. *Folia* laxè imbricata erecto-patentia lanceolata sensim angustata acutissima costa angusta dorso denticulata percursa margine parum recurva serrulata e cellulis oblongis laxis pellucide areolata, perichætialia e basi dilatata ovata subulata nervis lævioribus. *Theca* in pedunculo rubro sæpe sinuoso parva globoso-pyriformis inclinata sicca plicata operculo convexo breviter mamillata peristomio normali. *Flos masculus* gemmiformis rufus foliis perigonalibus e basi dilatata excavata vaginante sensim angustatis elongatis remotius serrulatis.

*Stems* half an inch or more high, with the leaves half a line wide. *Leaves* when dry appressed, rather soft in substance, the upper of a pale sub-glaucous green, the lower pellucid, with the nerves and margin pale brown. *Seta* three-quarters of an inch high, shining. *Capsule* when dry and deoperculate curved and plicate, of a red brown colour.

On moist rocks near the sources of all streams.

Very nearly resembling the Ceylon *B. imbricatula*, Mitt. Musc. Ind. Or., but with narrower and more lax areolation. The male flower is like that of *B. rufiflora*, Hornsch. in Mart. Flor. Brasil.

Plate 37 A. 1. Plants of the natural size. 2. Leaves. 3. Portion of perichæcium. 4. Capsule mature with operculum. 5. Older collapsed capsule. 6. Male flower: all magnified.

*Bartramia* (*Philonotis*) *flaccidifolia*, Mitt.

Gracilis, subsimplex. *Folia* caulina laxè inserta apicalia subsecunda planiuscula late lanceolata acuta nervo dorso lævi in acumen pungentem dissoluto margine parum recurva serrulata, cellulis oblongis laxis pellucidis areolata. *Folia* in ramulorum inferiorum nonnulla parva obtusa.

Found with the foregoing.

Larger than *B. pungens*, with leaves twice as wide, but in their substance less different, although more flaccid. It is possible that this may be only an altered state of *B. pungens* by some peculiarity of locality, but its appearance is different.

*Brachymenium pulchrum*, Hook. Bot. Miscell. i. t. 38.

On the stems of many trees.

A small quantity of plants which appear to be a young state of this or some nearly allied species. When dry the foliage is much twisted, but the form of the leaf is as in the S. African moss.

*Bryum erythrocaulon*, Schwægr. t. lxxx.

Widely spread on the island.

The specimens agree well with barren examples from Mauritius and Natal. The species appears to have softer and narrower leaves than is usual in *B. leptothecium*, Tayl., which in other respects is very closely allied.

*Bryum megalacrion*, Schwægr. t. 71.

Common on trees.

Specimens barren.

*Bryum pachypoma*, Mont. in Ann. Sc. Nat. 3d ser. iv. 104.

Rare. Only in a few places on rotten wood.

Stems mostly barren, all without fruit. They agree with specimens from Ceylon and Java.

**Rhacopilum Africanum**, *Mitt. in Journ. Linn. Soc.* vii. 162.

Found intermingled with species of *Ectropothecium* on moist rocks in the bed of streams.

Specimens barren, but they appear to be in no way different from those from the western coast of tropical Africa. The species differs from *R. mucronatum*, Beauv. Prodr. 66, in the cells of its leaves being larger and easily defined with a lens that leaves those of *R. mucronatum* obscure.

**Callicostella læviuscula**, *Mitt.*

Synoica. *Caulis* procumbens. *Folia* compressa, media late ovali; oblonga apice obtusa late sub-apiculata, intermedia longiora apice truncato obtusa, lateralia apice late acuta, omnia costis divergentibus sub apice abruptis dorso parum erosio marginibus versus apicem crenulatis cellulis parvis rotundis lævibus areolata; perichætialia erecta vaginulam vix tegentia. *Theca* in pedunculo rubro lævi horizontalis decurvave ovalis operculo longe subulato calyptra ad medium thecæ descendente apice scabra, peristomii dentibus crassiusculis solidis cæterum normalibus.

Abundant.

One of a large genus, most of the species of which to the naked eye present scarcely any obvious differences; on a close examination, however, of the areolation of the leaves considerable differences are apparent in the form of the cells, in the presence or absence of the papillæ, also in the position of the papillæ on the cells; due consideration being given to this, *C. læviuscula* is allied in structure to *C. papillata*, Mont., so widely distributed in the Pacific islands, to *C. Africana*, Mitt. in Linn. Trans. xxiii. 53. t. 5, f. ix., from tropical Africa, to *C. depressa*, Swartz, from the West Indies, and to *C. Martiana* and *C. Merkeli* and *C. microcarpa*, Hornsch., all from S. America, but appears to differ from all in its shorter leaves which are not evidently papillose.

Plate 37 B.—1, stem of the natural size; 2, a leaf from the middle series of the upper side of the stem; 3, a leaf of the intermediate series on the same side; 4, a lateral leaf; 5, perichætium; 6, capsule with calyptra: all magnified.

**Meteorium involutifolium**, *Mitt. in Journ. Linn. Soc.* vii. 156.

Not common. At the top of Oyster River Valley.

Specimens showing the moss in a young or incomplete state, with simple stems about an inch long, arising from a creeping rhizoma-like stem denuded of leaves. On the ascending branches the leaves are imbricated, and at their points are congested into a cuspidate bud, they are inserted in five twisted rows. This species is found also in Madagascar as well as on the Western Coast. Fertile stems are frond-like, and show the species to be nearly related to *M. Mawineuse*, Sull., and *Cryptotheca cochlearifolia*, Hornsch.

**Pterogonium curvifolium**, *Mitt.*

Monoicum. *Caulis* primarius repens radicellis purpureis apice ascendens arcuatus. Rami laxè dispositi ascendentes simplici vel interdum ramosi. *Folia* ramea

patentia incurva parum compressa sicca tereti imbricata, late ovato acuminata concava margine recto ob prominentia cellularum parietum minute crenulata nervo furcato brevi subobsoleto, cellulis superioribus anguste elongate oblongis apicibus in papillas elevatis basin versus ad lateras densis minutis transverse oblongo-rotundis obscurioribus, perichætialia duplo majora patentia ovato-lanceolata læviora. *Flos masculus* exilissimus.

*Stems* about an inch long. *Branches* three to four lines long, when wet straight, when dry curved, with the leaves one fourth of a line wide.

Found sparingly on trees in Oyster Bay Valley.

This pretty moss forms extensive rather loosely interwoven patches. In miniature it has the habit of *P. gracile*; it differs from *Clasmatodon*, *Habrodon*, and *Anisodon* in the almost obsolete nerve and papillose leaves.

Plate 37 C.—1, stem of the natural size; 2, a portion with leaves; 3 and 4, leaves detached: all magnified.

*Anomodon exilis*, *Mitt. in Journ. Linn. Soc.* xiii. 309.

Rare.

A single stem amongst *Pterogonium curvifolium* agrees well with the South African specimen. The species is allied to *A. triste*, Cesati, but has the foliage of its branches compressed.

*Neckera Lepineana*, *Mont. in Ann. Sc. Nat.* 3<sup>a</sup> ser. x. 107.

Only in Valley Rivière des Huitres, trailing over the boulders.

Agrees with specimens from Madagascar and from Johanna, where it was gathered by Speke. The species is found in Ceylon, the Indian Archipelago, and the Pacific islands. Its fruit is rare.

*Sematophyllum fulvifolium*, *Mitt.*

Monoicum. *Caulis* decumbens ramosus. *Folia* compressa interdum secunda laxè imbricata ovata ovaliaque parum acuminata acuta concava, margine late subplana integerrima breviter obsoleteque binervia cellulis oblongis distinctis obscuriusculis alaribus utrinque tribus majoribus pellucidis areolata, perichætialia erecta longiora acuminata. *Theca* in pedunculo gracili rubro ovalis suberecta inclinatave basi callosa, operculo convexo tenui curvirostro, peristomii dentibus luteis inferne latis crassis.

*Stems* an inch long, with the leaves scarcely a line wide. *Leaves* green, almost glossy. *Seta* four lines long. *Capsule* greenish brown, after the fall of the red operculum, much contracted below the mouth and urceolate, at its base where contracted into the seta is a callous ring.

Not uncommon.

The specimens appear to be specifically identical with a moss gathered in Mauritius by Telfair, Bewsher, and Pike, in which the leaves are usually fulvous. *S. brachycarpum*, Hampe Ic. xi., has narrower leaves with a different areolation.

In the obscure cells of the leaf *S. fulvifolium* agrees with the South American *S. Kegegianum*, C. Muller.

Plate 37 D.—1, stem of the natural size; 2, leaves from the same; 3, perichæ-tium and male flower; 4, capsule with operculum: all magnified.

*Sematophyllum incurvum*, *Mitt.*

Monoicum. *Caulis* repens pinnatus ramis assurgentibus incurvis. *Folia* caulina ovato-lanceolata acuminata concava nervis binis brevibus uno validiore vel obsolete serrulata ramea undique patentia sicca sursum secunda elliptico-lanceolata concava margine recurva integerrima enervia e cellulis elongatis angustis basi ad angulos rotundatis incrassatis alaribus oblongis hyalinis: perichæ-tialia erecta caulinis similia duplo longiora. *Theca* in pedunculo breviusculo rubro ovalis horizontalis pendulave, basi apophyse calloso, operculo convexo longe oblique rostrato.

The prostrate *stems* are about an inch long, the branches from two to three lines long, and with the leaves about two-thirds of a line wide. The *leaves* glossy green and straw coloured. *Seta* three lines long.

Common.

This differs greatly in the substance of its leaves from *S. fulvifolium*, and agrees more nearly with *S. brachycarpum*, from which it may be distinguished by the form of its leaves, which are all directed upwards on the incurved branches.

Plate 38 A.—1, stem of the natural size; 2, leaves detached; 3, perichætium and male flower; 4 and 5, capsules, one with calyptra.

*Ectropothecium scaturagineum*, *Brid.* ii. 418 (Hypnum).

Perhaps the commonest species on the island.

Specimens all without fruit, varying greatly in appearance, but not much in the form of the leaves.

*Ectropothecium subenerve*, *Mitt.*

*Caulis* procumbens pinnatus ramis assurgentibus in cæspitem intertextus. *Folia* caulina compressa subsecunda ovata acuminata integerrima, nervis obsolete serrulatis, caviuscula ad margines vix implana, e cellulis elongatis angustis firmis areolata.

*Branches* from three to six lines long, with the leaves three-fourths of a line wide.

Along with the foregoing.

*Ectropothecium doliare*, *Mitt.*

Monoicum. *Caulis* procumbens intricatus foliis a symmetricis ovato-lanceolatis. *Rami* ascendentes in cæspitem laxum congesti foliis distichaceis compressis apicibus decurvis subfalcatibus fulcatisve anguste lanceolatis omnibus margine apicem versus minute serrulatis, nervis binis brevibus subobsolete serrulatis, cellulis elongatis angustis lævibus areolatis; perichætialibus longioribus subulato-angustatis. *Theca* in pedunculo gracili breviter ovalis pendula operculo convexo brevirostro, peristomio e dentibus

latis crassis interno processibus et ciliis in uno coalitis in membranam alte exsertam insidentibus.

*Branches* with the leaves about two-thirds of a line wide. *Leaves* pale green, glossy. *Seta* half an inch long. *Capsule* small and short.

Very common on clay rocks on the banks of streams. Forming extensive soft loose patches, in which the ramification, so frequently elegantly pinnate in allied species, is in the present scarcely perceptible.

Plate 38 B.—1, a stem of the natural size; 2, a leaf from the middle series on the upper side of the stem; 3, a leaf from the intermediate series of the same side; 4, a lateral leaf; 5, perichæcium and male flower; 6, capsule.

*Ectropothecium subulosum*, *Mitt.*

*Caulis* procumbens radicans ramis brevibus pinnatim ramosus. *Folia* subcompressa lateralia patentia apicalia subfalcata, omnia lanceolato-subulata, caulina integerrima, ramea apicem versus sub-serrulata, costis binis brevibus inconspicuis, subobsoletis, cellulis angustis firmis areolata.

*Branches* about two lines long ascending, with the leaves two-thirds of a line wide. *Leaves* green, shining, scarcely altering when dry.

Frequent along with the preceding.

This moss nearly resembles a Mauritian species in its narrow leaves, but seems a little larger and of a firmer substance.

*Hypnum* (*Rhynchostegium*) *pectinatum*, *Mitt.*

*Caulis* procumbens ramis assurgentibus. *Folia* laxè inserta patula compressa, sicca pectinatim patula, ovata acuta vel breviter acuminata argute serrulata, costa tenui ultra medium evanida, cellulis ubique elongatis teneris mollibus areolata.

*Stems* with branches an inch long, slender, with leaves one line long, subpellucid, thin and glossy.

Not common: on dry places.

Nearly resembling a species from Natal, and also the S. African *H. raphidorrhynchum*, C. Muller, but not exactly agreeing with any.

*Fissidens procumbens*, *Mitt.*

*Caulis* elongatus inferne procumbens crassiusculus simplex. *Folia* alterna patentia lineari-lanceolata acuta, costa vix pellucida in apice evanida, lamina vera ultra medium producta acuta, dorsali angusta haud decurrente, ubique integerrima e cellulis minutis obscuris densis areolata.

*Stems* an inch or more long with the leaves a line wide.

Occurs in tufts occasionally.

A species to all appearance different from any of the large group to which it belongs by its immarginate obscure leaves, which are not crenulate from the promi-



ment marginal cells, as is so frequently observable among the species destitute of the hyaline limb.

*Fissidens brevifrons*, *Mitt.*

*Caulis* brevis oblique ascendens. *Folia* circiter sex juga longitudine increscentia frondem sub-flabelliformem sistencia, superiora anguste linealia apice latiuscule acuta nervo valido pallidior percursa, lamina vera vix mediam folii attingente apice acuta parum inæquale, dorsali ad nervi basin anguste continuata, e cellulis minutis fere opacis areolata integerrima.

*Stem* a line long. The upper *leaves* one and a half line long, of a glaucous olive green, becoming brown.

On clay rocks. Rare.

Allied to the S. African *F. plumosus*, Hornsch., but with leaves narrower at the points and more opaque.

*Fissidens flaccidus*, *Mitt. in Trans. Linn. Soc.* xxiii. 56. t. 6, f. xviii.

Sparingly on clay rocks.

The specimens, all of a dark brown colour, agree with those from Western Africa. In this species the nerve vanishes some distance below the point of the leaf, an uncommon circumstance in the genus.

*Fissidens Vogelianus*, *Mitt. in Trans. Linn. Soc.* xxiii. 54. t. 5, f. x.

With *Anthoceros fuciformis*.

The specimens have the leaves a little wider than in those from the Western Coast of Africa. In other respects they agree closely.

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## HEPATICÆ.

By WILLIAM MITTEN, A.L.S.

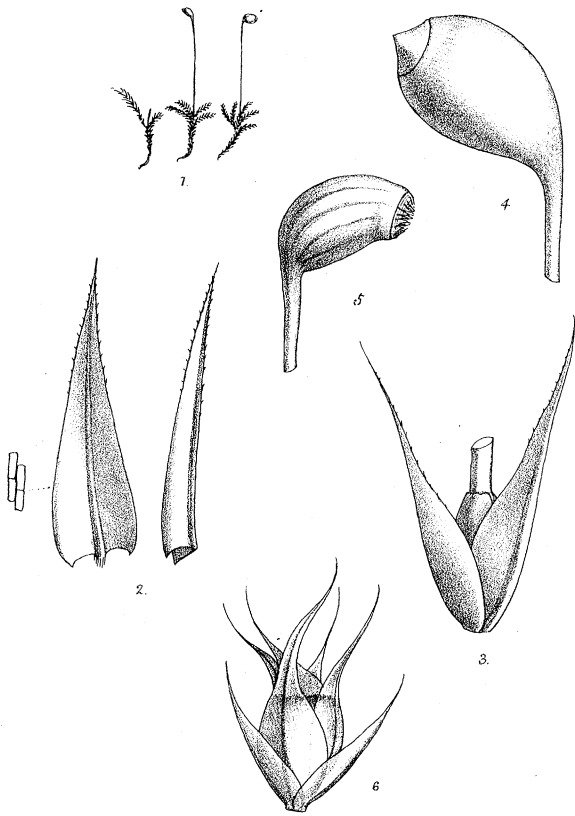
The entire number of the Hepaticæ is eighteen, of which thirteen were obtained with more or less complete fructification and five only were barren. As in the Mosses the genera are all African, but only three of the species are identical with African or Mascarene forms; one only is also found in the Eastern Archipelago, and one *Anthoceros lævis* may be said to be cosmopolitan.

Thirteen of the species appear to be new, of these nine are fertile and four barren.

*Lophocolea subrotunda*, *Mitt.*

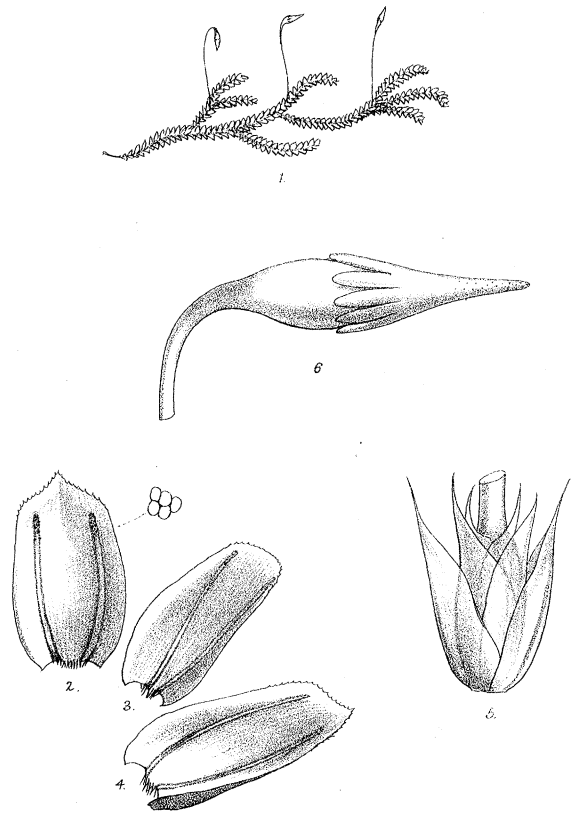
*Caulis* repens pallidus. *Folia* imbricata alterna explanata marginibus recurvis convexa vel sursum secunda apicibus recurvis ovato-rotunda, apice rotundata subretusave, integerrima; amphigastria parva caulem vix latitudine superantia quadrifida, basi uno latere cum folio subjacente anguste connexa, cellulis parvis rotundatis pellucidis areolata, perianthium triquetrum superne latiore, labiis longis spinosis;

A.



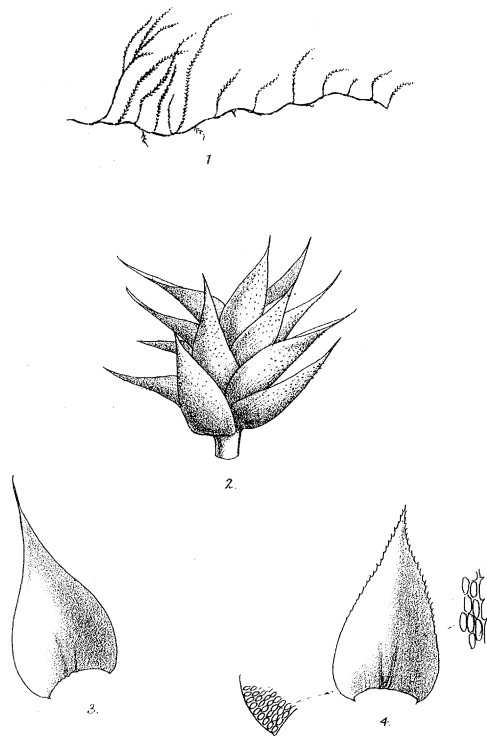
BARTRAMIA PUNGENS, *Mitt.*

B.



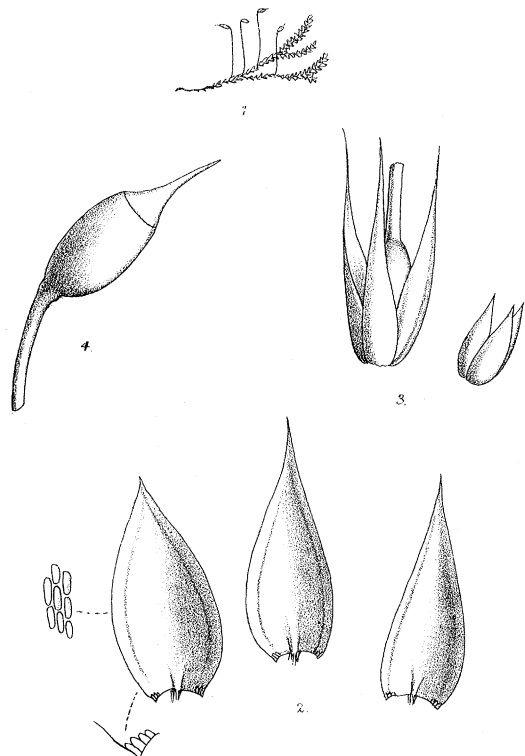
CALICOSTELLA LAEVIUSCULA, *Mitt.*

C.



PTEROGONIUM CURVIFOLIUM, *Mitt.*

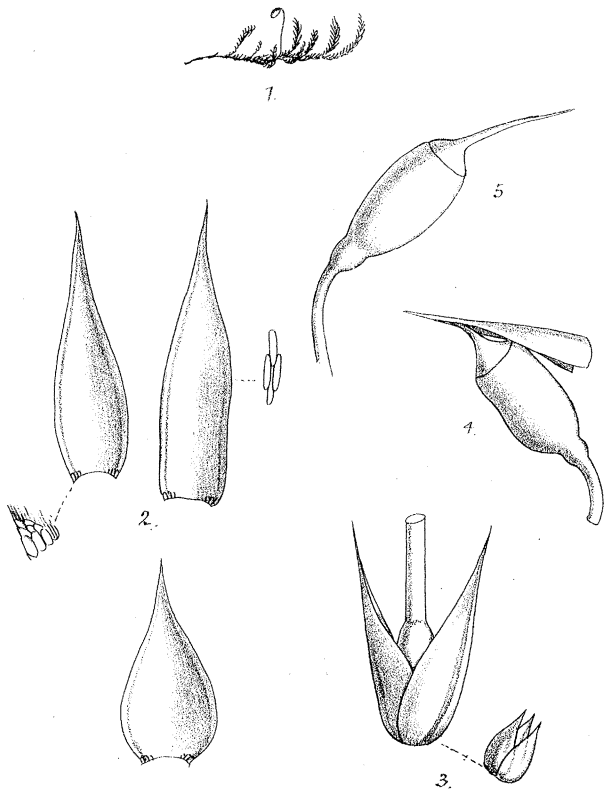
D.



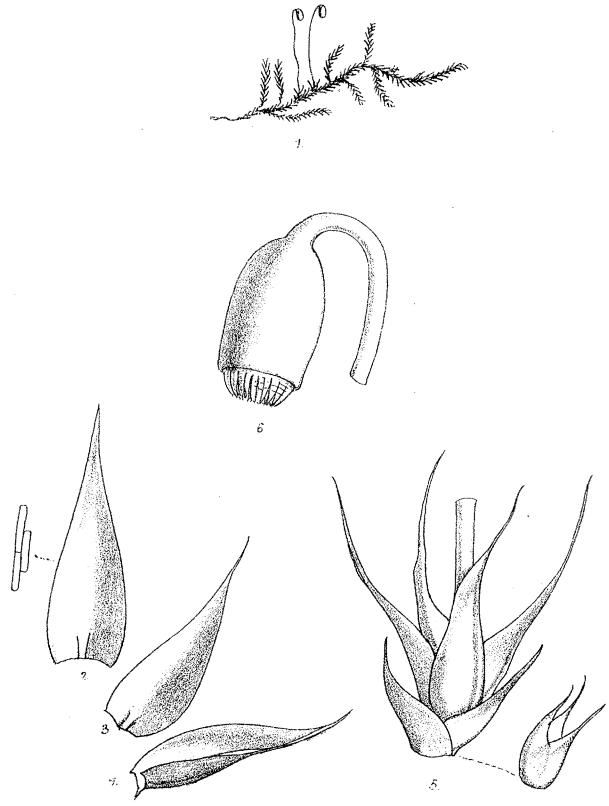
SEMATOPHYLLUM FULVIFOLIUM, *Mitt.*

A.

B.



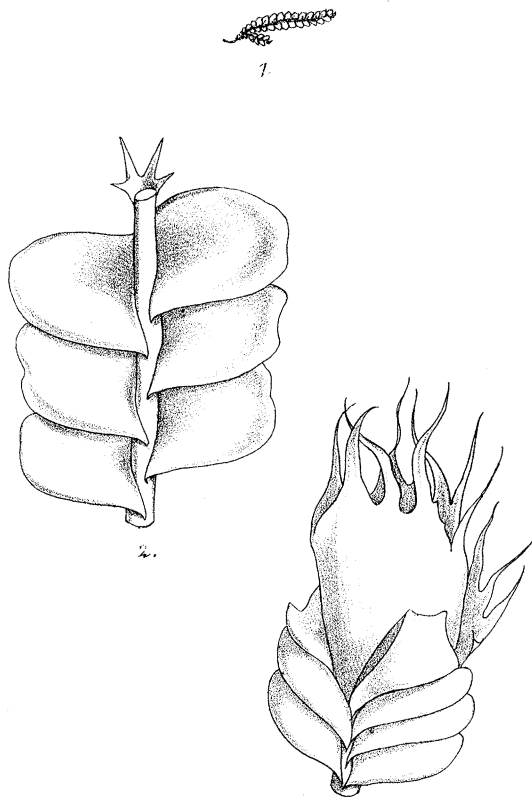
SEMATOPHYLLUM INCURVUM, *Mitt.*



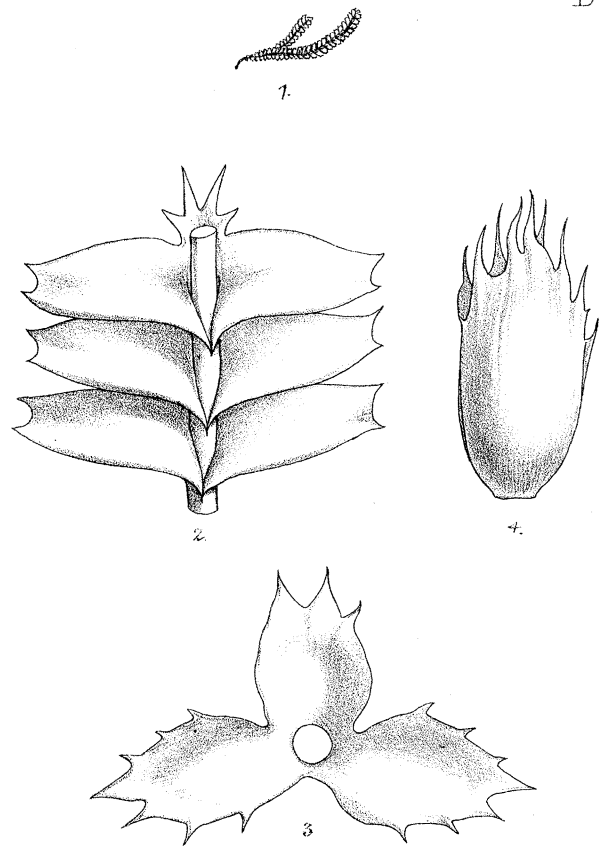
ECTROPOTHECIUM DOLIARE, *Mitt.*

C.

D.



LOPHOCOLEA SUBROTUNDA, *Mitt.*



LOPHOCOLEA OPPOSITA, *Mitt.*