

ing done at the School, since the adoption of an elective policy by the University has enabled undergraduates to make more use of the School of Botany.

Of the four assistants and instructors who have been connected with the School of Botany since its organization, besides the two who are still identified with its work, one was called to a college professorship of botany, one was engaged by the United States Department of Agriculture for the performance of physiological work, etc., in its sub-tropical laboratory, and the other two, after leaving the School of Botany, acted as botanical assistants at the Garden, from which they have been advanced to more responsible positions, — the plan at the University, as at the Garden, having been to consider these positions as transient, enabling incumbents to improve themselves during a limited connection with the School of Botany.

Very respectfully,

WILLIAM TRELEASE,  
Director.

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in: Rept. Missouri Bot. garden. 2 (1897)

SCIENTIFIC PAPERS.

THE MOSSES OF THE AZORES.

BY J. CARDOT.

In 1870, in Godman's Natural History of the Azores, Mr. Mitten published a catalogue of the Muscineae observed in those islands as well as at Madeira and in the Canaries. That list contains, for the Azores, 44 mosses and 3 sphagna, gathered by Hunt, Watson and Godman. Since that time, at least to my knowledge, no new indication had been added to the stock of information we possessed about the bryological flora of this group of islands. Mr. William Trelease, Director of the Missouri Botanical Garden, having intrusted to me the study of mosses gathered in the Azores by himself and by Mr. C. S. Brown, Dr. Bruno Carreiro and Sr. C. Machado, in 1894 and 1896, I have found in these collections 52 species, of which 30 are not mentioned in Mr. Mitten's Catalogue; and among these 30, eight species and three varieties are entirely new. I have received also, through my excellent friend M. F. Renauld, some species, collected in 1895 and 1896, in the crater of Graciosa and on the peak of Pico, by MM. Blanchy, Richard and Minelle, during the last scientific cruises of H. II. the Prince of Monaco's yacht.

These several contributions raise to 80 the total number of species of mosses (not counting the Sphagna) thus far observed in the Azores. They are distributed in the

following manner amongst the different islands of the group:—

San Miguel, 49.	Pico, 8.
Sta. Maria, 36.	Terceira, 6.
Flores, 16.	Corvo, 3.
Fayal, 14.	San Jorge, 1.*
Graciosa, 9.	

The mere fact that several of the most important islands, like San Jorge, Terceira and Pico, do not, as yet, muster together more than 14 species, shows how much there is still to be done to arrive at a satisfactory knowledge of the bryological vegetation of this small cluster of islands, and I feel assured that careful investigation might easily double the number of species now known.

As could easily be concluded from the geographical situation of the islands, their bryological vegetation is in close relationship on the one hand with the vegetation of Madeira and the Canaries, and on the other with that of the Spanish peninsula and the shores of the Mediterranean. Out of the 80 species found in the Azores, about fifty are to be met with at Madeira and in the Canary islands, and sixty-one in Europe, especially in the Mediterranean region, and in Algeria. About forty are found also in North America.

A few species show some relationship between the bryological vegetation of the Azores and that of more distant regions. Thus, *Fissidens asplenoides* Hedw., widely distributed in the tropical parts of America, exists or is, at least, represented by very similar forms in the Azores, Madeira, the Canaries, Tristan d'Acunha, New Zealand and Tasmania. A small *Philonotis*, gathered by Mr. Trelease at Flores, is, to my mind, not different from *P. obtusata* C. Müll., from Madagascar. The genus *Sciaromium*, which counts three species at the Azores, has nearly all its

\* Eight species are mentioned in a general way, as occurring in the Azores, without any more particular indication.

other representatives in New Zealand and in the temperate regions of South America. *Hylophila Treleasei* Card. and *Lepidopilum fontanum* Mitt. represent at the Azores two genera almost exclusively tropical.

Among the mosses most worthy of notice, we shall mention in the first line some species and varieties quite endemic or which, at least, have not as yet been found elsewhere than at the Azores: *Campylopus flexuosus* var. *fayalensis* Card., *C. setaceus* Card., *Hylophila Treleasei* Card., *Trichostomum mucronatum* Card. and *T. azoricum* Card., *Glyphomitrium azoricum* Card., *Bryum pachyloma* Card., *Breutelia azorica* (Mitt.), *Fontinalis antipyretica* var. *azorica* Card., and *Sciaromium Renauldi* Card. Then, another series of species which are found also at Madeira and in the Canaries, but nowhere else: *Ramphidium purpuratum* Mitt., *Campylopus azoricus* Mitt., *Bryum caespiticium* var. *atlanticum* Card., *Astrodonium canariense* Schw. and *A. Treleasei* Card., *Lepidopilum fontanum* Mitt., *Sciaromium prolixum* (Mitt.) and *S. spinosum* (Mitt.), and *Hylocomium Berthelotianum* (Mont.). These species may be called truly Atlantic. Finally, we shall note still, as interesting and also Atlantic species: *Glyphomitrium nigricans* Mitt., common enough at the Azores, Madeira and in the Canaries, but very rare in Europe, where it has been recorded only from a few Portuguese localities; and *Myurium hebridarum* Sch., and *Hypnum canariense* (Mitt.), both of which exist in the three clusters of islands, and of which the first is also found in the Hebrides and the second in Ireland.

## CATALOGUE.

### GYMNOSTOMUM Hedw.

1. G. CALCAREUM Nees et Hornsch. Bryol. Germ. i. p. 153.—San Miguel (Godman).—*Distrib.*: the five parts of the world.

## WEISIA Hedw.

2. *W. VIRIDULA* (Linn.) Hedw. Fund. II. p. 90.—Azores (Godman). San Miguel (Trelease, Pl. Az. no. 1351).—*Distrib.*: throughout the world.

## RAMPHIDIUM Mitt.

3. *R. PURPURATUM* Mitt. apud Godman, Nat. Hist. of the Azores, p. 291.—San Miguel (Godman).—*Distrib.*: Madeira.

## DICRANUM Hedw.

4. *D. SCOTTIANUM* Turn. Musc. Hib. p. 75, t. 6, f. 1.—Azores (Godman).—*Distrib.*: Europe.  
This moss very likely does not belong to the true *D. Scottianum* Turn., but to *D. canariense* Hpe. in Bot. Zeit., 1862, p. 11.

## CAMPYLOPUS Brid.

5. *C. flexuosus* (Linn.) Brid. Mant. p. 71, var. *fayalensis* Card. var. *nova*.—Fayal (Brown, Pl. Az. no. 383).

A forma typica europaea differt foliis basi latioribus, acumine breviori cellulisque alaribus minus inflatis, auriculas vix efformantibus. Cespites densi, 6-8 centim. alti, superne lutescentes, intus rufo-tomentosi. Sterilis.—Pl. I.—*a*, entire plant, nat. size; *b, b, b*, leaves  $\times 14$ ; *c*, basal areolation of a leaf  $\times 130$ ; *d*, marginal areolation in the middle of a leaf  $\times 200$ ; *e*, leaf point  $\times 130$ ; *f*, transverse section of a leaf  $\times 130$ ; *g*, portion of the same  $\times 260$ .

6. *C. setaceus* Card. *sp. nova*.—Fayal (Brown, Pl. Az. no. 380 in part). San Miguel (Machado).

Lutescenti-viridis, sericeus, inferne fuscus, tomento destitutus. Caulis erectus vel ascendens, dichotome ramosus, apice attenuatus, 3-4 centim. longus. Folia remotiuscula, madida erecto-patentia, sicca erecto-flexuosa, 4-6 millim. longa, e basi lanceolata sensim et longissime subulata et subtubulosa, setacea, solo summo apice subhyalino denticulis paucissimis, cellulis alaribus magnis, inflatis, partim fuscis, partim hyalinis, auriculas distinctas efformantibus, sequentibus rectangulis, caeteris oblongis linearibusque, obtusis, incrassatis; costa circa tertiam partem basis vel ultra et totam fere subulam occupante, dorso laevi, in sectione transversali e cellularum stratis 3 composita, quorum interno e cellulis

laxis magnis, quadrangulis, inanibus, caeteris e cellulis parvis, incrassatis, stercidis intermixtis formatis. Caetera ignota.—Pl. 2.—*a*, entire plant, nat. size; *b, b, b*, leaves  $\times 14$ ; *c*, basal areolation of a leaf  $\times 130$ ; *d*, marginal areolation in the middle of a leaf  $\times 260$ ; *e, e*, leaf point  $\times 130$ ; *f*, portion of a transverse section of a leaf  $\times 260$ .

Closely allied to *C. Boryanus* Besch. from Reunion Island, which has exactly the same structure of the costa; but *C. setaceus* has the stems and branches more slender and the leaves less crowded, with a much longer and thinner subula.

7. *C. AZORICUS* Mitt. apud Godman, Nat. Hist. of the Azores, p. 292.—San Miguel (Godman).—*Distrib.*: Madeira.
8. *C. POLYTRICHOIDES* DeNot. Syll. Musc. p. 222 et Epil. p. 654.—San Jorge (Brown, Pl. Az. no. 378). San Miguel (Carreiro, Pl. Az. no. 16). Sta. Maria (Trelease, Pl. Az. nos. 1348, *b* and 1348, *c*). Graciosa (Blanchy). Pico (Richard and Minelle).—*Distrib.*: Europe, Algeria, Canaries, Madeira, and nearly all the tropical and subtropical zone if, according to Mr. Mitten's views, we consider this as a synonym of *C. introflexus* Brid.

The moss from San Miguel is a very peculiar form, with long, slender innovations, suddenly clavate at apex. Several female flowers are found in the terminal bunch of the comal leaves, which are rather abruptly constricted to the point and with rather well defined and often excavate auricles.

## LEUCOBRYUM Hpe.

9. *L. GLAUCUM* (Linn.) Sch. Coroll. p. 19.—Pico, Fayal (Brown, Pl. Az. nos. 375 and 384).—*Distrib.*: Europe, North America, Canaries.  
—var. *ALBIDUM* (Brid.) Card. (*Dicranum albidum* Brid. Musc. Recent. II. part 1, p. 167).—San Miguel, Sta. Maria (Trelease, Pl. Az. nos. 1348 and 1348, *a*).—*Distrib.*: Europe, North America.

The plant from Sta. Maria is a small form, with very narrow leaves, much resembling *L. molle* C. Müll., from Madagascar.

10. *L. JUNIPEROIDEUM* (Brid.) C. Müll. in Linnaea, XVIII. p. 689. (*Dicranum juniperoideum* Brid. Bryol. Univ.

i. p. 409).—Azores (Watson).—*Distrib.*: Canaries, Madeira.

This moss, of which I have been able, thanks to the generosity of M. F. Camus, to study an original specimen (Canaries, leg. Riedle, ex herb. Richard), seems to me not sufficiently distinct from the small forms of *L. glaucum*. The broadness of the hyaline border of the leaf, which is quoted by Bridel as distinctive for his *Dicranum juniperoides*, proves to be variable in the Azorean specimens I have examined.

#### FISSIDENS Hedw.

11. *F. SERRULATUS* Brid. Mant. p. 190 et Bryol. Univ. II. p. 704.—Sta. Maria (Godman). San Miguel (Machado).—*Distrib.*: Canaries, Madeira, Algeria, South Europe, England.
12. *F. ASPLENIODES* (Sw.) Hedw. Musc. Frond. III. p. 65, t. 28. (*F. flabellatus* Hornsch. Fl. Bras. fasc. I. p. 91, t. II. f. II?).—San Miguel (Godman). Sta. Maria (Trelease, Pl. Az. no. 1383, c).—*Distrib.*: Canaries, Madeira, tropical America, New Zealand, Tasmania, Tristan d'Acunha.

Mr. Mitten refers the Brazilian *F. flabellatus* Hornsch. to *F. asplenioides* Hedw., and quotes this last as pertaining to the Azores, Madeira and the Canaries. According to a recent communication of M. Bescherelle, Swartz's type of *Dicranum asplenioides* from Jamaica has the leaves narrowed, then broadly acuminate, and thereby differs from the South American specimens, which themselves are not identical with each other, but have generally more obtuse leaves than the type from Jamaica. The moss gathered by Mr. Trelease at Sta. Maria, in sterile state, has short stems, leaves in 10-12 pairs, obtuse, shorter and less obscurely areolate than in the South American specimens. I do not venture, however, to separate it from *F. asplenioides* Hedw., being at present unable to decide whether this species constitutes a polymorphous, widely distributed type, or whether there is, under this name, confusion of several distinct species.

#### CERATODON Brid.

13. *C. PURPUREUS* (Linn.) Brid. Bryol. Univ. I. p. 480.—Sta. Maria (Trelease, Pl. Az. no. 1383, b in part). Graciosa (Blanchy).—*Distrib.*: throughout the world.

#### HYOPHILA Hpe.

14. *H. Treleasei* Card. *sp. nova*.—Sta. Maria (Trelease, Pl. Az. no. 1383, a).

Dioica? Dense caespitosa vel pulvinata, inferne fuscescens, superne lutescens vel lurido-viridis. Caulis erectus, 5-7 millim. longus, simplex furcatusve. Folia conferta, madida erecto-patentia, sicca contorta, lineari-lanceolata, late acuminata, costa lutescente excurrente mucronata, marginibus planis integerrimis, cellulis minutissimis, obscuris, rotundatis, vel rotundato-quadratis, parietibus crassiusculis, sublaevibus, inferioribus laxis, teneris, oblongis, hyalinis. Folia perichaetialia erecta, e basi subvaginante anguste lineari-reticulata, sensim et longe acuminata, costa excurrente cuspidata, in quorum axillis paraphyses tenerrimae filiformes reperiuntur. Capsula in pedicello pallide lutescente, 5-7 millim. longo, oblonga, pallide badia, microstoma, gymnostoma, sicca plicatula, operculo longe oblique rostrato. Sporae minute verrucosae, 0 mm. .012 - 0 mm. .015.—Pl. 3.—a, entire plant, nat. size, in moist and dry state; b, b, b, leaves  $\times 16$ ; c, basal areolation of a leaf  $\times 130$ ; d, point of a leaf  $\times 130$ ; e, e, perichaetial leaves  $\times 16$ ; f, capsule in dry state  $\times 16$ ; g, the same in moist state  $\times 16$ ; h, spores  $\times 260$ .

Quite distinct from *H. contorta* (Kze.) Jaeg., from Madeira, by the form of the leaves and the total lack of peristome.

#### TRICHOSTOMUM Hedw.

15. *T. MUTABILE* Bruch n. sp.; De Not. Syll., p. 192.—San Miguel (Brown, Pl. Az. no. 388).—*Distrib.*: Europe, Algeria, Canaries, Madeira, South America, New Zealand.
16. *T. FLAVOVIRENS* Bruch in Flora, 1829, part II. p. 404, t. 2, f. 7.—San Miguel (Godman).—*Distrib.*: South and West Europe, Algeria, Florida.
17. *T. mucronatulum* Card. *sp. nova*.—San Miguel (Machado).

Humile, viride, 5-7 millim. altum. Caulis erectus, simplex. Folia irregulariter conferta, madida arcuato-patula, sicca incurvato-crispatula, oblongo-lingulata, apice plano obtuso vel subobtusulo costa excurrente minute et breviter mucronato, marginibus planis subundulatis, supra basin plerumque minute denticulatis, deinde integerrimis; cellulis superioribus minutis, rotundatis, dense papillois, unde valde obscuris, inferioribus pellucidis laevibus, elongate rectangulis, costam et margines versus majoribus, laxioribus. Caetera ignota.—Pl. 4.—a, entire plant,

nat. size, in moist and dry state; *b, b, b, b, b*, leaves  $\times 30$ ; *c*, basal areolation of a leaf  $\times 260$ ; *d*, point of the same  $\times 260$ .

Resembling the small forms of *T. crispulum* Bruch, but quite distinct by the leaves not being cucullate at apex.—I have found only some sterile stems of this little moss amongst a tuft of *Hypnum cupressiforme*.

18. *T. azoricum* Card. *sp. nova*.—Terceira (Trelease, Pl. Az. no. 1383).

Monoicum vel subsynoicum, humile, pusillum. Caulis erectus, brevis (2-3 millim.), basi minute et remote, superne congeste foliosus. Folia inferiora brevia, appressa, superiora majora in rosulam congesta, madida patentia, sicca flexuosa, 2.50-3 millim. longa, lineali-lanceolata, acuta, apice saepe incurvo cucullata, marginibus plerumque inflexis, integerrimis, costa tereti percurrente vel infra summum apicem evanida; cellulae in parte superiore obscurae, parvae, rotundatae, minutissime papillosae, inferiores laxiores, rectangulae, pellucidae. Flos masculus sub femineo situs, vel antheridia in axillis foliorum perichaetialium nascentia, paraphysibus intermixtae. Folia perichaetialia caulinis paulo majora, costa latiore applanata instructa, superne subserrulata vel crosula. Capsula in pedicello pallide rubello, 8-15 millim. longo, erecta, oblonga, operculo conico recte rostrato, annulo duplici. Peristomii dentes pallide purpurei, elongati, ad basin usque bifidi, cruribus longis omnino liberis vel inferne hic illic cohaerentibus et interdum uno alterove ad basin fisso, dense papillois, filiformibus, subnodulosis.—Pl. 5.—*a*, entire plant, nat. size; *b, b, b*, leaves  $\times 30$ ; *c*, basal areolation, near the costa  $\times 260$ ; *d*, basal areolation on the margin  $\times 260$ ; *e*, leaf point  $\times 260$ ; *f*, capsule  $\times 14$ ; *g*, two teeth of the peristome with portion of the annulus  $\times 130$ .

Allied to the European *T. triumphans* De Not. and *T. pallidisetum* H. Müll., but distinguishable at first sight by its larger leaves and red pale pedicel.

#### DESMATODON Brid.

19. *D. NERVOSUS* (Hook. et Tayl.) Br. Sch. Bryol. Eur. fasc. 18-20, Mon. p. 6, t. 3. (*Tortula atrovirens* (Sm.) Lindb. De Tort., p. 236).—Terceira (Trelease, Pl. Az. no. 1382).—*Distrib.*: Europe, Asia, Algeria, Cape, Chile, New Zealand, Tasmania.

#### BARBULA Hedw.

20. *B. MARGINATA* Br. Sch. Bryol. Eur. fasc. 13-15, Mon. p. 33, t. 19. (*Tortula acuminata* Mitt. apud Godman, Nat. Hist. of the Azores, p. 297).—San Miguel

(Hunt; Godman; Trellease, Pl. Az. nos. 1384, 1386 and 1387). Sta. Maria (Trellease, Pl. Az. no. 1387, *a*).—*Distrib.*: Europe, chiefly in the Mediterranean region, Asia, Algeria, Madeira, North America.

21. *B. CONVOLUTA* Hedw. Stirp. Crypt. i. p. 86, t. 32.—San Miguel (Trellease, Pl. Az. no. 1385).—*Distrib.*: Europe, Asia, Algeria, North America.
22. *B. SQUARROSA* Brid. Bryol. Univ. i. p. 833.—Sta. Maria (Trellease, Pl. Az. no. 1393, *d*).—*Distrib.*: Europe, Asia, Algeria, Canaries (?), North America.
23. *B. LAEVIPILO* (Brid.) Br. Sch. Bryol. Eur. fasc. 13-15, Mon. p. 40, t. 25.—San Miguel (Godman).—*Distrib.*: Europe, Algeria, Canaries, North America.

#### GRIMMIA Hedw.

24. *G. PULVINATA* (Linn.) Sm. Engl. Bot. t. 1728.—San Miguel (Godman).—*Distrib.*: the five parts of the world.
25. *G.* — *sp. nova?* — Graciosa (Blanchy; Brown, Pl. Az. no. 380 in part). Sta. Maria (Trellease, Pl. Az. no. 1393, *c*).

This species seems to be allied to *G. trichophylla* Grev., but distinct. Unfortunately, all the specimens hitherto obtained are perfectly sterile.

#### RACOMITRIUM Brid.

26. *R. FASCICULARE* (Schrad.) Brid. Mant. p. 80.—Pico (Richard and Minelle).—*Distrib.*: Europe, North America.
27. *R. HETEROSTICHUM* (Hedw.) Brid. Mant. p. 79.—Pico (Richard and Minelle).—*Distrib.*: Europe, North America.
28. *R. LANUGINOSUM* (Ehrh.) Brid. Mant. p. 79.—San Miguel (Godman). Fayal (Brown, Pl. Az. no. 379,

and 380 in part. — Richard and Minello.  
*Distrib.*: the five parts of the world.

## GLYPHOMITRIUM Brid.

29. *G. POLYPHYLLUM* (Dicks.) Mitt., Lindb. Musci Scand. p. 29.— San Miguel (Godman).— *Distrib.*: Europe, Canaries, Madeira.
30. *G. azoricum* Card. *sp. nova*.— Corvo, Terceira, Flores, Sta. Maria (Trelease, Pl. Az. nos. 1373, 1374, 1375, 1376, 1377 and 1377, a).

Monoicum, pulvinatum, fulvescens aut luteo-viride. Caulis simplex vel e basi divisus, 5-15 millim. longus. Folia dense conferta, madida erecto-patentia, sicca cirrato-crispata, 3.25-4 millim. longa, e basi anguste oblonga plicata, longe lineali-lanceolata, acuta subacutave, carinata, marginibus planis vel reflexis apicem versus remote sinuoso-dentatis aut integris, costa tereti percurrente, cellulis inferioribus laxis, subrectangulis, fusciscentibus, suprabasalibus flavidis, linearibus, mediis quadratis vel oblongis, superioribus subrotundato-quadratis, omnibus incrassatis laevibus. Folia perichaetialia vix diversa. Pedicelli nunc solitarii, nunc geminati, pallidi, siccitate infra capsulam haud vel vix dextrorsum torti, 3-5 millim. longi. Capsula oblonga, leptoderma, laevis, pallida, ore rubro, operculo conico recte vel oblique aciculari-rostrato. Peristomii dentes pallide rubelli, apice saepe decolorati, basin versus usque in crura duo subulata filiformia papillosa soluti. Flores masculi sub femineo siti.— Pl. 6.— *a*, entire plant, in moist state, nat. size; *b*, the same, in dry state, nat. size; *c*, *c*, leaves  $\times 14$ ; *d*, *d*, leaf point  $\times 30$ ; *e*, basal areolation of a leaf  $\times 130$ ; *f*, areolation in the middle of a leaf, near the costa  $\times 260$ ; *g*, marginal areolation of a leaf, in the upper part  $\times 260$ ; *h*, leaf point  $\times 130$ ; *i*, *i*, capsules and perichaetial leaves  $\times 14$ ; *j*, capsule  $\times 14$ ; *k*, two teeth of the peristome  $\times 130$ .

May be considered as a subspecies of *G. polyphyllum* Mitt., from which it differs in the smaller sizes, the shorter and less aggregated pedicels, the smaller capsules and the narrower, entire or less denticulate leaves.

31. *G. NIGRICANS* (Br. Sch.) Mitt. apud Godman, Nat. Hist. of the Azores, p. 294.— San Miguel (Godman). Graciosa (Trelease, Pl. Az. no. 1393).— *Distrib.*: Canaries, Madeira, Portugal.
- var. *PULVINARE* (Mitt.) Card. (*G. pulvinare* Mitt. in

Journ. Linn. Soc. Bot. 22. 2.— Sta. Maria (Trelease, nos. 1391, 1392, 1393, b).— *Distrib.*: Madeira.

I cannot consider *G. pulvinare* Mitt. as specifically distinct from *G. nigricans*; the longer pedicels and generally less obscure areolation of the leaves, composed of smaller and more distinct cells, are characters of insufficient value to allow a specific distinction for this form.

## PHYSCOMITRIUM Brid.

32. *P. PYRIFORME* (Linn.) Brid. Bryol. Univ. II. p. 815.— Sta. Maria (Godman).— *Distrib.*: Europe, Algeria, Canaries, North America, New Zealand.

## ENTOSTHODON Schw.

33. *E. TEMPLETONI* (Sm.) Schw. Suppl. II. II. fasc. 1, p. 44, t. CXIII.— Sta. Maria (Godman). Fayal (Watson). San Miguel (Machado).— *Distrib.*: Europe, Algeria, Egypt, Sinai, Canaries, Madeira, California.

## FUNARIA Schreb.

34. *F. HYGROMETRICA* (Linn.) Sibth. Fl. Oxon. p. 288.— San Miguel (Godman).— *Distrib.*: throughout the world.

## BRYUM Dill.

35. *B. ARGENTEUM* Linn. Sp. Plant. p. 1120.— San Miguel (Godman). Sta. Maria (Trelease, no. 1380, e).— *Distrib.*: the five parts of the world.
36. *B. ALPINUM* Huds. Fl. Angl. p. 415, var. *MERIDIONALE* Sch. Syn. Musc. Eur. ed. 2, p. 441.— Sta. Maria (Trelease, Pl. Az. no. 1380, d).— *Distrib.*: Madeira, Portugal, England.

This variety belongs to the group of the southern forms of *B. alpinum* including *B. mediterraneum* and *gemmiparum* De Not. From these it differs by its leaves being narrower, more acuminate and shortly mucronate by the excurrent costa; from *B. alpinum*, type, it is distinct in the smaller sizes, the leaves narrower, not tinged with red below, plane or

scarcely revolute on the . . . . . more narrowly areolate.—The *B. alpinum* var. *angustifolium* . . . . . Muscol. Gall., p. 247 (*B. atlanticum* Solms), seems to be the same plant.

*B. Notarisii* Mitt. (*Melichhoferia* . . . . .) much resembles *B. alpinum* var. *meridionale* Sch. as to the vegetative system; but its peristome is far less evolute, the teeth of the exostome being narrower, less trabeculate and the endostome entirely wanting.

37. *B. caespiticium* Linn. Sp. Plant. p. 1121, var. *atlanticum* Card. var. *nova*.—Sta. Maria (Trelease, Pl. Az. nos. 1380, *a*, 1380, *b*, 1380, *c*).—*Distrib.*: Madeira.

A forma typica differt foliis costa excurrente brevius cuspidatis, in comam densam glomeratis capsulaque minus abrupte pendula, subhorizontalis vel inclinata, pro more angustiore.

A striking form.

38. *B. CAPILLARE* Linn. Sp. Plant. p. 1121.—San Miguel (Godman). Flores (Trelease, Pl. Az. nos. 1378 and 1380).—*Distrib.*: the five parts of the world.

39. *B. CANARIENSE* Brid. Mant. p. 118, et Bryol. Univ. i. p. 672.—Graciosa (Brown, Pl. Az. no. 380, in part).—*Distrib.*: Canaries, Portugal, Corsica, France.

40. *B. pachyloma* Card. sp. *nova*.—Terceira (Trelease, Pl. Az. no. 1381). San Miguel (Machado).

Caulis brevis, sub perichaetio innovans, 5-7 millim. altus. Folia in comam congesta, obovato-oblonga vel subspathulata, madida erecto-patentia, sicca erecto-imbricata, vix flexuosa, circa 2 millim. longa, brevissime acuminata, toto ambitu limbo crassissimo 3-4-stratoso, superne remote et plerumque obsolete denticulato circumducta, costa viridi basi rubescente valida, apice cum limbo confluenta in cuspidem crassam obsolete denticulatam breviter excedente; cellulis ovato- et oblongo-hexagonis, inferioribus elongatis subrectangulis laxioribus, infimis, in-anibus rubescentibus. Folia perichaetialia externa lineari-oblonga, laxius reticulata, intima minora, lanceolata, longius acuminata, limbo angustiore. Capsula in pedicello rubente flexuoso 12-15 millim. longo, inclinata vel subhorizontalis, oblongo-subcylindrica, basi attenuata, operculo convexo apiculato. Annulus? Peristomium *B. capillaris*. Dioicum videtur.—Pl. 7.—*a*, entire plant, nat. size; *b*, *b*, *b*, leaves  $\times 14$ ; *c*, leaf point  $\times 120$ ; *d*, transverse section of a leaf in the lower part  $\times 60$ ; *e*, transverse section of the border of the leaf  $\times 260$ ; *f*, capsule  $\times 14$ .

This species is very peculiar by the strongly thickened margin of

the leaves, which constitutes two true marginal nerves, showing the same structure and, in the upper part of the leaf, the same broadness and thickness as the median costa. In *B. platyloma* Schw. from Madeira, of which I have been able to study the original specimen, preserved in the herbarium Hedwig-Schwaegrichen at the Musée Boissier, the leaves also show a very broad margin, composed of linear, yellowish, thickened cells, but disposed in a single layer, a character which alone would be sufficient to separate the two species; besides, in *B. pachyloma* Card., the costa is much stouter and forms a much shorter and thicker point than in *B. platyloma* Schw.—The margin of *B. Donianum* Grev., although thickened, cannot be compared with that of *B. pachyloma*, which is, at least, thrice stouter.

In his contributions to the Cryptogamic Flora of the Atlantic Islands (Journ. Linn. Soc., 1863, p. 4), Mr. Mitten too briefly describes a *B. obovatum* Mitt. from Madeira, which seems to approach *B. pachyloma* by the thickness of the terete margin, but according to the description, the leaves of Mr. Mitten's species are twice as wide as those of *B. Donianum*, and almost uniformly reticulate, the lower cells being neither elongated nor rectangular,—features which do not agree with *B. pachyloma*, which has the leaves rather smaller than those of *B. Donianum* and with a distinct basal areolation of elongated, subrectangular cells, much larger and looser than the upper ones.

#### ANOMOBRYUM Sch.

41. *A. JULACEUM* (Sm.) Sch. Syn. Musc. Eur. ed. 1, p. 382.—San Miguel (Godman).—*Distrib.*: Europe, Algeria, Cameroon, Canaries, Madeira, Central and South America.

#### WEBERA Hedw.

42. *W. TOZERI* (Grev.) Sch. Coroll. p. 67.—San Miguel (Godman).—*Distrib.*: Europe, Algeria, Canaries, Madeira, North America.

#### MNIUM Dill.

43. *M. UNDULATUM* (Linn.) Weis. Pl. Crypt. Fl. Gott. p. 158.—Flores (Godman). San Miguel (Trelease, Pl. Az. no. 1349).—*Distrib.*: Europe, Algeria, Madeira, Canaries.

#### PHILONOTIS Brid.

44. *P. RIGIDA* Brid. Bryol. Univ. ii. p. 17.—San Miguel (Hunt; Watson; Machado; Trelease, Pl. Az. no.

1347). Sta. Maria, Flores, Pl. Az. no. 1347, *a*).  
Fayal (Godman).—*Distrib.*: South Europe, Algeria,  
Canaries, Madeira.

45. *P. FONTANA* (Linn.) Brid. Bryol. Univ. II. p. 18.—  
San Miguel (Brown, Pl. Az. no. 393).—*Distrib.*: the  
five parts of the world.

46. *P. OBTUSATA* C. Müll. apud Ren. et Card. Musci Exot.  
novi vel min. cogn., fasc. VII. p. 169 (Bull. de la Soc.  
royale de Bot. de Belg. t. xxxiv. part 2, p. 61).—  
Flores (Trelease, Pl. Az. no. 1350).—*Distrib.*:  
Madagascar.

Tenella, 1-2 centim. alta. Caulis simplex vel parce divisus. Folia  
parva, vix 1 millim. longa, erecto-patentia, saepe curvatula, oblongo-  
lanceolata, late et breviter acuminata, inferiora obtusa, superiora  
obtusiuscula, subacuta acutave, marginibus planis in parte superiore  
obtusè serratis, costa valida infra apicem evanida, dorso denticulata,  
rete laxo pellucido laevi. Cactera desunt.—Pl. s.—*a*, entire plant, nat.  
size; *b*, *b*, *b*, leaves  $\times 30$ ; *c*, basal areolation of a leaf  $\times 130$ ; *d*, mar-  
ginal areolation, in the middle of a leaf  $\times 130$ ; *e*, *e*, *e*, upper areolation  
 $\times 130$ .

Although it is very astonishing to find in the Azores a species hitherto  
known only from Madagascar, it seems impossible not to refer the  
moss from Flores to *P. obtusata* C. Müll.; it differs only in the green  
glaucous tint, not dirty reddish, and the less distant leaves; but as to  
the shape and areolation of the leaves, it agrees exactly with the moss  
from Madagascar.

#### BREUTELIA Sch.

47. *B. AZORICA* (Mitt.) Card. (*Bartramia azorica* Mitt.  
apud Godman, Nat. Hist. of the Azores, p. 300).—  
San Miguel (Hunt, ex Watson; Machado; Trelease, Pl.  
Az. no. 1368). Fayal (Godman).

#### ATRICHUM Pal. Beauv.

48. *A. UNDULATUM* (Linn.) Pal. Beauv. Prodr. p. 42.—  
Flores (Godman). San Miguel (Machado).—*Dis-  
trib.*: Europe, Asia, Algeria, Madeira, North America.

#### *Pogonatum* A. Beauv.

49. *P. ALOIDES* (Hedw.) Pal. Beauv. Prodr. p. 84.—  
Flores (Trelease, Pl. Az. no. 1364). San Miguel  
(Machado; Trelease, Pl. Az. no. 1365; Carreiro, no.  
18).—*Distrib.*: Europe, Algeria, Canaries, Madeira.

#### POLYTRICHUM Dill.

1895  
50. *P. COMMUNE* Linn. Sp. Plant. II. p. 1109.—Azores  
(Godman). San Miguel (Machado; Brown, Pl. Az.  
no. 387; Trelease, Pl. Az. nos. 1357, 1358, 1359, 1360,  
1361; Carreiro, no. 19). Terceira (Trelease, Pl. Az.  
no. 1363). Fayal (Brown, Pl. Az. nos. 381 and 382).  
Corvo (Prince of Monaco).—*Distrib.*: Europe, Asia,  
America, Canaries, Madeira.

— var. *MINUS* Weis. Pl. Crypt. Fl. Gott. p. 171.—Flores  
(Trelease, Pl. Az. no. 1355).—*Distrib.*: Europe,  
Madeira.

— var. *PERIGONIALE* (Mich.) Br. Sch. Bryol. Eur. fasc.  
21-22, Mon. p. 13, t. 17, f.  $\beta$ .—San Miguel, Sta.  
Maria (Trelease, Pl. Az. no. 1353, *a*; Carreiro, no.  
19, *a*).—*Distrib.*: Europe, North America.

— var. ? — Corvo (Trelease, Pl. Az. no. 1356).

51. *P. FORMOSUM* Hedw. Sp. Musc. p. 92, t. 19, fig. 1 et  
*a*.—Flores (Trelease, Pl. Az. nos. 1354 and 1362).—  
*Distrib.*: Europe, Asia, Algeria, Madeira, North  
America.

— forma *BREVISETA*.—San Miguel (Trelease, Pl. Az. no.  
1355).

52. *P. JUNIPERINUM* Willd. Fl. Berol. Prodr. p. 305.—  
Graciosa (Blanchy).—*Distrib.*: the five parts of the  
world.

53. *P. PILIFERUM* Schreb. Spic. Fl. Lips. p. 74.—Graciosa  
(Blanchy).—*Distrib.*: the five parts of the world.



*Fontinalis* Dill.

54. *F. ANTIPYRETICA* Linn. <sup>ex Hedw</sup> ~~ex~~ <sup>ant.</sup> p. 1571.— Flores (Godman).— *Distrib.*: Europe, Asia, Algeria, Madeira, North America.

— var. *azorica* Card. *var. nova.*— Flores (Trelease, Pl. Az. no. 1367).

A forma typica differt foliis dorso haud curvatis, minus acute carinatis, nonnullis tantum plicatis, cellulis parietibus angustissimis, alaribus numerosioribus, auriculis distinctiores efformantibus. Sterilis. Habitu formis robustioribus *F. Duriaei* Sch. sat similis.

## ASTRODONTIUM Schw.

55. *A. CANARIENSE* Schw. Suppl. II. I. 2, p. 128, t. cxxxiv.— San Miguel (Godman).— *Distrib.*: Canaries, Madeira.

56. *A. Treleasei*, Card. *sp. nova.*— Terceira, Sta. Maria (Trelease, Pl. Az. nos. 1352 and 1352, a). Graciosa (Brown, Pl. Az. no. 386).— *Distrib.*: I have received from M. F. Renauld, a sterile and rather stunted specimen, collected in Madeira by R. Fritze in 1880 and labeled by M. Geheeb *A. canariense*, but which seems to belong to *A. Treleasei* Card.

Verisimiliter dioicum, caespitosum, sordide vel lutescenti-viride. Caulis repens, stoloniformis, ramis numerosis fasciculatis, crassis, erectis vel ascendentibus, simplicibus, siccitate rigidulis, teretibus, 1-2 centim. longis. Folia 2-2.50 millim. longa, dense conferta, madida patentia, sicca arcuissime imbricata, ovato-lanceolata, acuminata, acuta, valde plicata, enervia, marginibus late reflexis ubique integerrimis, cellulis omnibus incrassatis, mediis linearibus, flexuosis, margines versus oblongis ovatisve, alaribus permultis, obscurioribus, interdum fusciscentibus recte seriatis, subrotundatis, marginalibus transverse dilatatis. Folia perichaetialia externa abrupte cuspidata, intima longe convoluta, acuminata, integerrima. Capsula in pedicello rubello, 8-10 millim. longo, superne dextrorsum torto, erecta inclinatave, ovato-subglobosa, badia, operculo ignoto. Peristomii externi dentes albi, spongiosi, fragiles, intus trabeculati, papilloso, integri, linea divisurali superne valde conspicua, siccitate reflexi; interni membrana annulari albida, 16-plicata. Planta mascula ignota.— Pl. 9.— *a*, entire plant, nat. size; *b, b, b*, leaves  $\times 14$ ; *c*, basal areolation of a leaf  $\times 260$ ; *d*, marginal areolation

in the middle of a leaf  $\times 260$ ; *e*, peristome  $\times 260$ ; *f*, perichaetium  $\times 14$ ; *g*, capsule  $\times 14$ ; *h*, peristome of the capsule  $\times 60$ ; *i*, a tooth of the exostome with peristome membrane of the endostome  $\times 260$ .

Easily known from *A. canariense* Schw. by the much smaller sizes, the shorter and more sharply acuminate leaves, and the more numerous, less thickened and colored alar cells, extending higher along the margins of the leaf. As far as concerns the vegetative system, *A. Treleasei* very much resembles *Leucodon sciuroides* Schw., but it is readily distinguished from that species by the shape of the perichaetial leaves and especially by the structure of the peristome, which agrees exactly with that of *A. canariense*.

## PTEROGONIUM Sw.

57. *P. GRACILE* (Dill.) Sw. Musc. Suec. p. 26.— Graciosa (Blanchy).— *Distrib.*: Europe, Algeria, Canaries, Madeira, California.

## LEPIDOPILUM Brid.

58. *L. (TETRASTICHUM) FONTANUM* Mitt. in Journ. Linn. Soc. 1863, p. 4.— Flores (Godman).— *Distrib.*: Madeira.

## THUIDIUM Br. Sch.

59. *T. TAMARISCINUM* (Hedw.) Br. Sch. Bryol. Eur. fasc. 49-51, Mon. p. 7, t. 2 et 3.— San Miguel (Godman; Machado; Brown, Pl. Az. no. 395).— *Distrib.*: Europe, Madeira.

## BRACHYTHECIUM Br. Sch.

60. *B. SALEBROSUM* (Hoffm.) Br. Sch. Bryol. Eur. fasc. 52-54, Mon. p. 16, t. 15 et 16.— San Miguel (Brown, Pl. Az. no. 396). Sta. Maria (Trelease, Pl. Az. no. 1369, c, in part).— *Distrib.*: Europe, Asia, Algeria, Canaries, North America.

## MYURIUM Sch.

61. *M. HEBRIDARUM* Sch. Syn. Musc. Eur. ed. 2, p. 808.— Azores (Hunt). Flores (Trelease, Pl. Az. nos. 1370, 1371 and 1372). Fayal (Brown, Pl. Az. no. 397 in

part). Sta. Maria (Trelease, Pl. Az. nos. 1372, *a* and 1372, *b*). San Miguel (Machado).—*Distrib.*: Madeira, Canaries, Hebrides.

SCLEROPodium Br. Sch.

62. *S. ILLECEBRUM* (Schw.) Br. Sch. Bryol. Eur. fasc. 45–46, Mon. p. 3, t. 2.—Azores (Godman).—*Distrib.*: Europe, Algeria, Canaries, Madeira, North America.

EURHYNCHIUM Br. Sch.

63. *E. CIRCINATUM* (Brid.) Br. Sch. Bryol. Eur. fasc. 57–61, Mon. p. 5, t. 3.—Flores (Trelease, Pl. Az. no. 1390).—*Distrib.*: South and West Europe, Algeria.

64. *E. MERIDIONALE* (Sch.) DeNot. in Piccon. Elenco Muschi Ligur. no. 32. (*E. longirostre* var. *meridionale* Br. Sch. Bryol. Eur. fasc. 57–61, Mon. p. 7, t. 5, fig. B. *Hypnum striatum* var. *Duriaeanum* Mont. apud Dur. Pl. Astur. no. 139).—Azores (Godman).—*Distrib.*: South Europe, Algeria, Madeira.

65. *E. PRAELONGUM* (Linn., Hedw.) Br. Sch. Bryol. Eur. fasc. 57–61, Mon. p. 8, t. 6.—Pico (Brown, Pl. Az. no. 385). San Miguel, Sta. Maria (Trelease, Pl. Az. nos. 1369 and 1369, *a*).—*Distrib.*: Europe, Asia, Algeria, North and South America.

—var. *ATROVIRENS* (Sw.) Br. Sch. Bryol. Eur. fasc. 57–61, Mon. p. 8, t. 7, fig. 1, 1b, 2 et 3. (*Hypnum atrovirens* Sw. Disp. p. 65, non Dicks. II. *Swartzii* Turn. Muscol. Hib. p. 151, t. 14, f. 1).—Sta. Maria (Godman; Trelease, Pl. Az. no. 1369, *b*).—*Distrib.*: Europe, Asia, Algeria, Madeira.

66. *E. STOKESII* (Turn.) Br. Sch. Bryol. Eur. fasc. 57–61, Mon. p. 10, t. 8.—Sta. Maria (Godman; Trelease, Pl. Az. no. 1346, *b*).—*Distrib.*: Europe, Algeria, Madeira, Canaries, North America.

RHYNCHOSTEGIUM Br. Sch.

67. *R. CONFERTUM* (Dicks.) Br. Sch. Bryol. Eur. fasc. 49–51, Mon. p. 7, t. 4.—Sta. Maria (Godman).—*Distrib.*: Europe, Algeria, Canaries, Madeira.

68. *R. RUSCIFORME* (Neck.) Br. Sch. Bryol. Eur. fasc. 49–51, Mon. p. 11, t. 9.—San Miguel, Flores (Trelease, Pl. Az. nos. 1345, 1395, and 1395, *a*).—*Distrib.*: Europe, Asia, Algeria, Canaries, North America.—*forma.*—San Miguel (Trelease, Pl. Az. no. 1346, *a*.)

THAMNIUM Br. Sch.

69. *T. ALOPECURUM* (Linn.) Br. Sch. Bryol. Eur. fasc. 49–51, Mon. p. 4, t. 1.—San Miguel (Machado; Brown, Pl. Az. nos. 389 and 390; Trelease, Pl. Az. no. 1346; Carreiro, no. 17).—*Distrib.*: Europe, Asia, Algeria, Madeira, Canaries.

PLAGIOTHECIUM Br. Sch.

70. *P. SYLVATICUM* (Linn.) Br. Sch. Bryol. Eur. fasc. 48, Mon. p. 14, t. 11.—San Miguel (Machado).—*Distrib.*: Europe, Asia, Algeria, North America.

SCIAROMIUM Mitt.

71. *S. PROLIXUM* (Mitt.) Jaeg. et Sauerb. Adumbr. Fl. Musc. (*Leskea, Sciaromium, prolixa* Mitt. in Journ. Linn. Soc. 1863, p. 7).—Fayal (Godman).—*Distrib.*: Madeira.

72. *S. (ECHINODIUM) SPINOSUM* (Mitt.) Card. (*Leskea, Sciaromium, spinosa* Mitt. l. c.).—Azores (Hunt).—*Distrib.*: Madeira.

73. *S. (Echinodium) Renauldi* Card. *sp. nova.*—Pico (Brown, Pl. Az. no. 377).

Habitu et magnitudine *S. setigero* (Mitt.) simile. Folia firma, rigida, 3.25–4.25 millim. longa, plerumque subhomomalla, e basi lauceolata

integerrima haud vel vix pilis brevissimis attenuata, margine incrassato, nervo valido compresso in apicem laminae laevem longe excedente, cellulis pachydermicis fere ubique praeter basin versus et juxta costam) bistratosi, margines versus 3-4-striatosi, inferioribus breviter linearibus, infimis lutescentibus, alaribus paucis brevibus, superioribus minutis, rotundatis ovatisve. Caetera ignota.—Pl. 10.—*a*, entire plant, nat. size; *b*, *b*, *b*, leaves  $\times 14$ ; *c*, basal areolation of a leaf  $\times 260$ ; *d*, areolation in the middle of the lamina  $\times 260$ ; *e*, areolation in the upper part of the lamina  $\times 260$ ; *f*, point of the subula of a leaf  $\times 260$ ; *g*, transverse section of a leaf, in the lower part  $\times 60$ ; *h*, portion of the same  $\times 130$ .

Differs from *S. setigerum* (Mitt.), from Madeira, by the leaves gradually narrowed and quite entire on the margins. It is more closely allied with *S. hispidum* (Hook. et Wils.), a South Pacific species, with the leaves strongly plicate and the lower cells shorter.

I name this fine moss in honor of my excellent friend M. F. Renauld.

#### HYPNUM Dill.

74. *H. CUPRESSIFORME* Linn. Sp. Plant. p. 1592.—Fayal (Godman). San Miguel (Machado; Brown, Pl. Az. nos. 392 and 394). Corvo (Trelease, Pl. Az. no. 1389). Graciosa (Blanchy).—*Distrib.*: the five parts of the world.

— var. *RESUPINATUM* (Wils.) Sch. Syn. Musc. Eur. ed. 2, p. 757. (*H. resupinatum* Wils. Bryol. Brit. p. 398).—Fayal (Brown, Pl. Az. no. 399). Flores (Trelease, Pl. Az. no. 1388). Graciosa (Blanchy).—*Distrib.*: Europe.

75. *H. CANARIENSE* (Mitt.) Jaeg. et Sauerb. Adumbr. Fl. Musc. II. p. 584. (*Stereodon canariensis* Mitt. in Journ. Linn. Soc. 1863, p. 5).—San Miguel (Godman; Brown, Pl. Az. no. 391). Pico, Fayal (Brown, Pl. Az. nos. 376 and 398).—*Distrib.*: Canaries, Madeira, Ireland.

— forma *gracilis filiformis*.—Flores (Trelease, Pl. Az. no. 1392).

76. *H. PURUM* Linn. Sp. Plant, p. 1594.—Sta. Maria (Godman; Trelease, Pl. Az. no. 1394, *a*). Flores

(Trelease, Pl. Az. no. 1392).—*Distrib.*: Europe, Algeria, Madeira, Miguelon Island.

77. *H. CUSPIDATUM* Linn. Sp. Plant. p. 1595.—Sta. Maria (Godman). San Miguel (Machado; Brown, Pl. Az. no. 393 in part).—*Distrib.*: Europe, Asia, Algeria, North America, New Zealand.

#### HYLOCOMIUM Br. Sch.

78. *H. SQUARROSUM* (Linn.) Br. Sch. Bryol. Eur. v. Mon. p. 9, t. 6.—Fayal (Godman).—*Distrib.*: Europe, Asia, North America.

79. *H. SPLENDENS* (Hedw.) Br. Sch. Bryol. Eur. v. Mon. p. 5, t. 1.—San Miguel (Trelease, Pl. Az. no. 1391).—*Distrib.*: Europe, Asia, Algeria, Canaries, North America.

80. *H. BERTHELOTIANUM* (Mont.) Geheeb, in Flora, 1886, no. 22. (*Hypnum Berthelotianum* Mont. Hist. des Iles Canaries, p. 4, t. 1, f. 2).—San Miguel (Hunt; Godman; Machado). Fayal (Brown, Pl. Az. no. 397). Sta. Maria (Trelease, Pl. Az. no. 1391, *a*).—*Distrib.*: Canaries, Madeira.

#### SPIAGNUM (Dill.) Ehrh.

(ACCORDING TO DR. C. WARNSTORF.)

1. *S. CYMBIFOLIUM* Hedw. Fund. Musc. II. p. 86 ex parte.—Fayal (Godman). San Miguel (Machado).—*Distrib.*: Europe, Asia, North America.

— var. *GLAUDESCENS* Warnst. in Bot. Gazette, xv. p. 251 (ut var. *laeve* f. *glaucescens*).—Terceira (Trelease, Pl. Az. no. 1333).

— var. *PALLESCENS* Warnst. Eur. Torfm. no. 9 (ut var. *laeve* f. *pallescens*).—Flores (Trelease, Pl. Az. no. 1332).

- var. *FUSCESCENS* Warnst. Die Europ. Torfm. p. 135 (ut *S. cymbifolium* var. *vulgare* ? *fuscescens*).—Terceira, San Miguel (Leg....? Comm. Daveau; herb. Cardot).
- var. *COMPACTUM* Schlieph. et Warnst. apud Warnst. in Flora, 1884.—Terceira (Leg....? Comm. Daveau; herb. Cardot).
2. *S. CENTRALE* Arn. et Jens. in Bihang til K. Svenska Vet. Akad. Handl. Band xxi. Afd. iii. no. 10. (*S. intermedium* Russ. Zur Kenntniss etc. p. 108, non Hoffm.).—Corvo, San Miguel (Trelease, Pl. Az. nos. 1331 and 1335).—*Distrib.*: Europe, Caucasus, North America.
3. *S. RIGIDUM* Sch. Hist. Nat. des Sph. p. 72, pl. xviii.—San Miguel (Godman).—*Distrib.*: Europe, Siberia, Madeira, North America.
4. *S. SQUARROSUM* Pers. apud Schrad. Journ. Bot. 1800, p. 398.—Azores (Teste Warnstorf, in Hedwigia, 1890, p. 181).—*Distrib.*: Europe, Siberia, North America.
5. *S. ACUTIFOLIUM* (Ehrh.) Russ. et Warnst. in Bot. Ver. Prov. Brandenb. xxx. p. 112.—Fayal (Godman). Terceira (Trelease, Pl. Az. no. 1336).—*Distrib.*: Europe, Asia, North and South America.
6. *S. SUBNITENS* Russ. et Warnst. in Bot. Ver. Prov. Brandenb. xxx. p. 115.—Flores, San Miguel (Trelease, Pl. Az. nos. 1341 and 1344; Machado).—*Distrib.*: Europe, Asia, North America.
7. *S. GODMANII* Warnst. in Hedwigia, 1890, p. 189, pl. iv. f. 1a, 1b, pl. vii. f. 19.—Azores (Godman; herb. Mitten).
- This is perhaps Mr. Mitten's *S. acutifolium* from Fayal, in Godman's Nat. Hist. of the Azores, p. 316.
8. *S. nitidulum* Warnst. in litt. ad Card. 1896; *sp. nova*.—Terceira, in thermal sulphurous springs (Leg....? Comm. Daveau; herb. Cardot).

ON SOME MOSSES COLLECTED IN MADEIRA BY WILLIAM  
TRELEASE, IN JUNE, 1896.

BY J. CARDOT.

1. *WEISIA VIRIDULA* (Linn.) Hedw. Fund. ii. p. 90.—The Mount (Trelease, no. 3000).
2. *DICRANUM CANARIENSE* Hpe. in Bot. Zeit. 1862, p. 11.—Caldeirão do Inferno (Trelease, no. 3001).
- This moss has been mistaken for *D. Scottianum* Turn., from which it differs chiefly by the distinctly serrate leaves. The true *D. Scottianum* seems not to be found either at Madeira, or in the Canaries. (Cf. Geheeb, Bryologische Fragmente, in Flora, 1886, no. 22).
3. *TRICHOSTOMUM CIRRHIFOLIUM* (Mitt.) Card. (*Tortula cirrhifolia* Mitt. apud Godman, Nat. Hist. of the Azores, p. 296).—Boa Ventura (Trelease, no. 3002). Ribeira da Vigaria (Trelease, no. 3114 in part).
4. *AMPHORIDIUM CURVIPES* (C. Müll.) Jaeg. Adumbr. Fl. Musc. p. 386. (*Zygodon curvipes* C. Müll. Syn. i. p. 681).—Ribeiro Frio (Trelease, no. 3003).
5. *HEDWIGIA CILIATA* (Dicks.) Ehrh. Hannov. Mag. 1781, p. 109.—Torrinhas (Trelease, no. 3004).
6. *GLYPHOMITRIUM POLYPHYLLUM* (Dicks.) Mitt., Lindb. Musci Scand., p. 29. (*Ptychomitrium procerum* Sch.).—Ribeiro Frio, Caldeirão do Inferno (Trelease, nos. 3005, 3006).
- Ptychomitrium procerum* Sch. is, to my mind, a mere robust form of *G. polyphyllum*.
7. *GLYPHOMITRIUM NIGRICANS* (Br. Sch.) Mitt. var. *PULVINARE* (Mitt.) Card. (*G. pulvinare* Mitt. in Journ. Linn. Soc. 1863, p. 2).—Ribeiro Frio (Trelease, no. 3007).

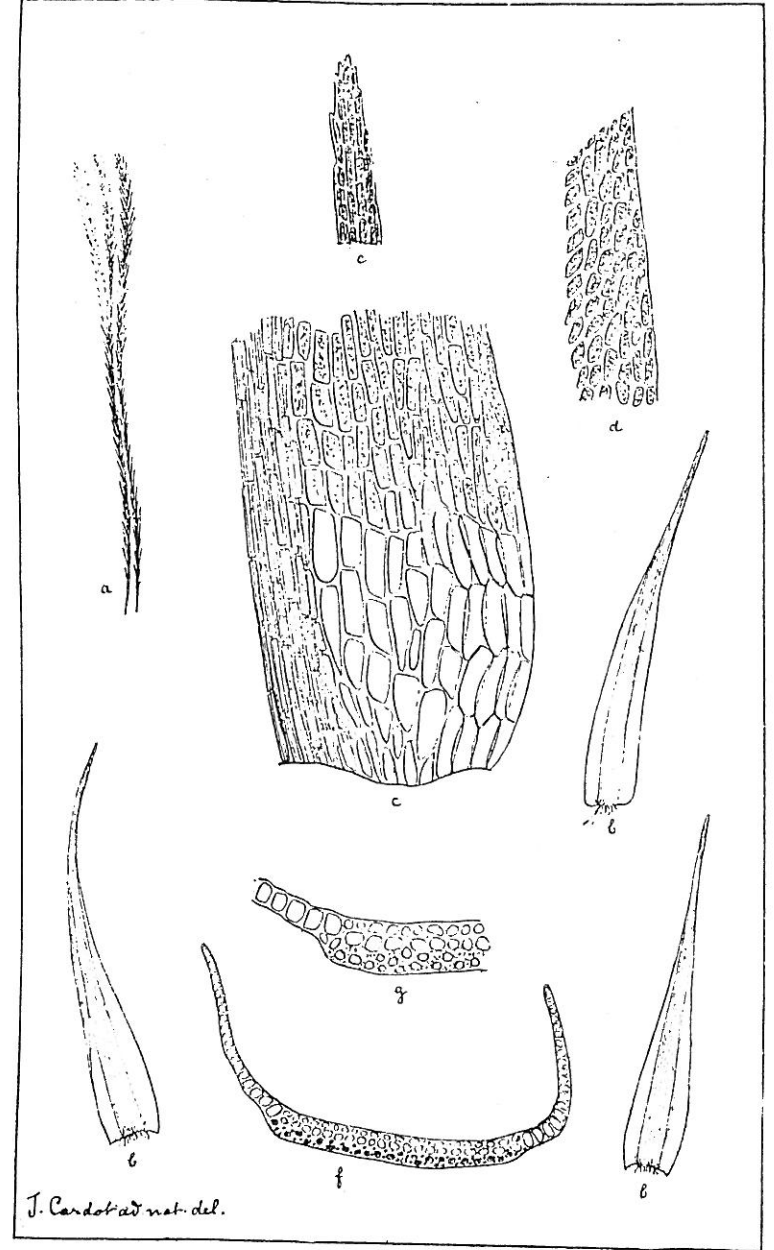
8. *PHILONOTIS RIGIDA* Brid. Bryol. Univ. II. p. 17.— Sta. Cruz, Caldeirão do Inferno, Mount (Trelease, nos. 3008, 3009, 3010).
9. *PHILONOTIS MARCHICA* (Willd.) Brid. Bryol. Univ. II. p. 23, forma.— Ribeira da Vigaria (Trelease, no. 3011).
10. *BRYUM PLATYLOMA* Schw. Suppl. I. II. p. 116, t. LXXVI.— Caldeirão do Inferno, Ribeira da Vigaria, Mount (Trelease, nos. 3012, 3013, 3014).
11. *Bryum serrulatum* Card. *sp. nova*.— Funchal (Trelease, no. 3015).

Dioicum, nitidum, lutescens. Caulis brevissimus, simplex vel subperichaetio innovans, vix 3-4 millim. altus. Folia in comam densam congesta, madida rosulatis patentia, sicca appressa, superiora oblongo-lanceolata, breviter acuminata, costa excurrente mucronata, 1.50-2 millim. longa, inferiora minora, angustiora, longius acuminata, omnia marginibus e basi usque ad apicem versus anguste revolutis, superne minute sed distincte serrulata, costa basi dilatata, breviter excurrente; cellulis oblongo-hexagonis, inferioribus rectangulis. Folia perichaetialia externa comalibus subsimilia sed integra vel subintegra, intima multo minora, longius acuminata, marginibus planis integris. Capsula in pedicello rubello, circa 15 millim. longo, inclinata vel subhorizontalis, obovato-oblonga, basi attenuata, fusca, operculo convexo apiculato. Planta mascula ignota. — Pl. 11. — *a*, entire plant, nat. size; *b*, *b*, *b*, *b*, leaves  $\times 14$ ; *c*, basal areolation of a leaf  $\times 130$ ; *d*, leaf point  $\times 130$ ; *e*, capsule  $\times 14$ .

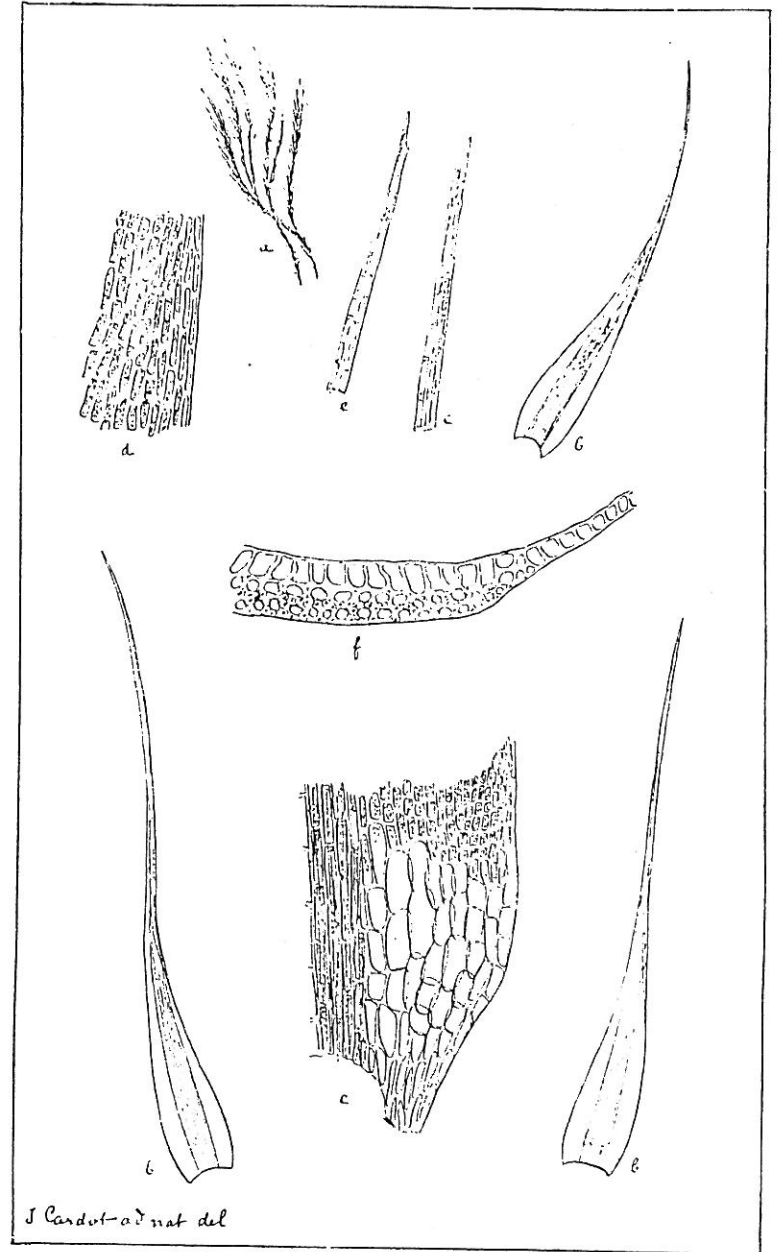
Allied to *B. canariense* Brid., but easily known from that species by the very short stems, the more abruptly constricted and shorter acuminate leaves, glomerate to an apical bunch, the thinner costa and the suberect or inclined capsule.

12. *BRYUM CAESPITICUM* Linn. var. *ATLANTICUM* Card. in Rept. Mo. Bot. Gard. VIII. p. 62. São Jorge (Trelease, no. 3016).
13. *Mnium* — *sp. nova?* Ribeiro Frio (Trelease, no. 3017).
- Very likely a new species, but unfortunately in a single fragment.
14. *POGONATUM ALOIDES* (Hedw.) Pal. Beauv. Prodr. p. 84.— Mount (Trelease, no. 3018).

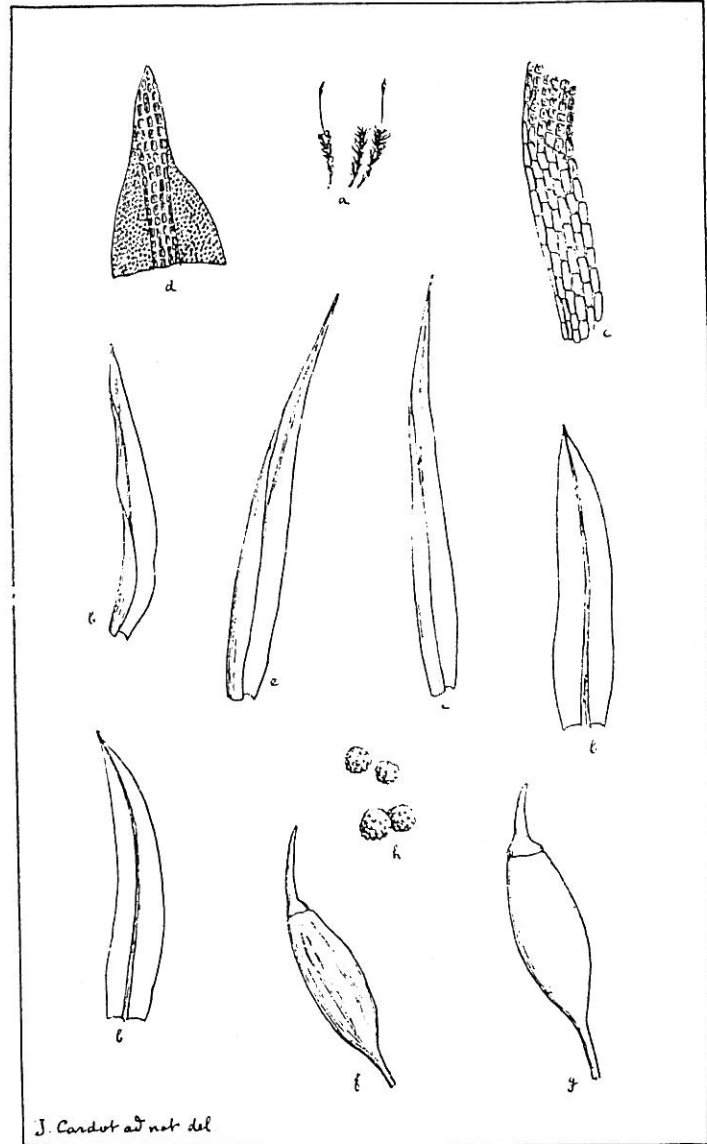
15. *POLYTRICHUM COMPLANATUM* Linn. var. *MINUS* Weis. Pl. Crypt. Fl. Gott. p. 171.— Caldeirão do Inferno (Trelease, no. 3019).
16. *POLYTRICHUM PILIFERUM* Schreb. Spic. Flor. Lips. p. 74.— Ribeiro Frio (Trelease, no. 3020).
17. *THIAMNIUM ALOPECURUM* (Linn.) Br. Sch. Bryol. Eur. fasc. 49-51, Mon. p. 4, t. 1.— Ribeiro Frio (Trelease, no. 3021.)
18. *SCIAROMIUM PROLIXUM* (Mitt.) Jaeg. et Sauerb. Adumbr. Fl. Muse.— Torrinhas, Ribeiro Frio, Ribeira Brava (Trelease, nos. 3022, 3023).
19. *HYPNUM PURUM* Linn. Sp. Plant. p. 1594.— Boa Ventura, Caldeirão do Inferno (Trelease, nos. 3024, 3025).
- Stenay, Feb. 1897.*



CAMPYLOPUS FLEXUOSUS, VAR. FAYALENSIS.



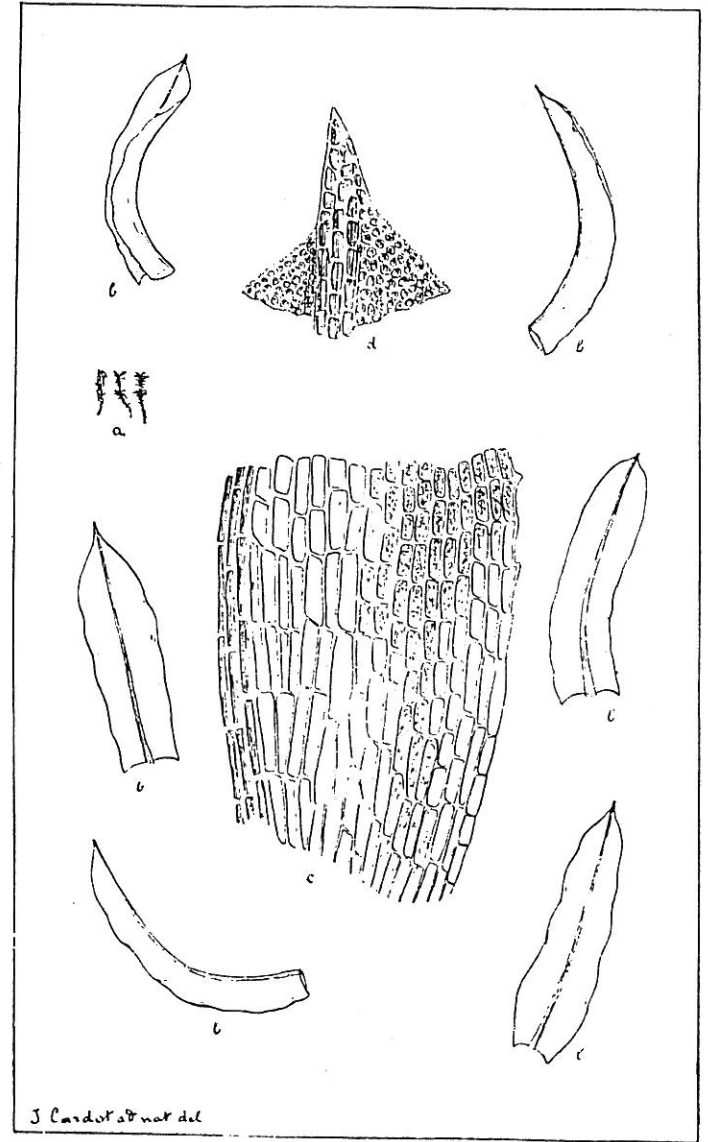
CAMPYLOPUS SETACEUS.



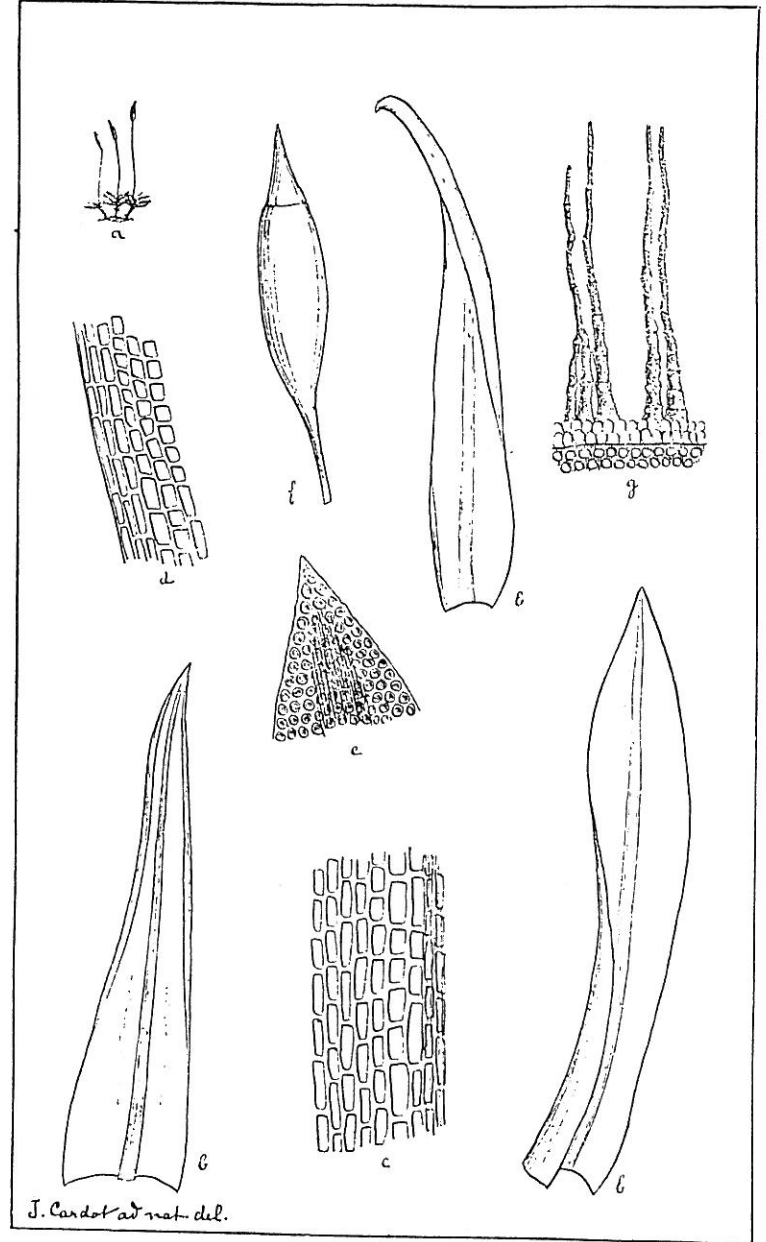
J. Cardot aut not del

HYOPHILA TRELEASEI.



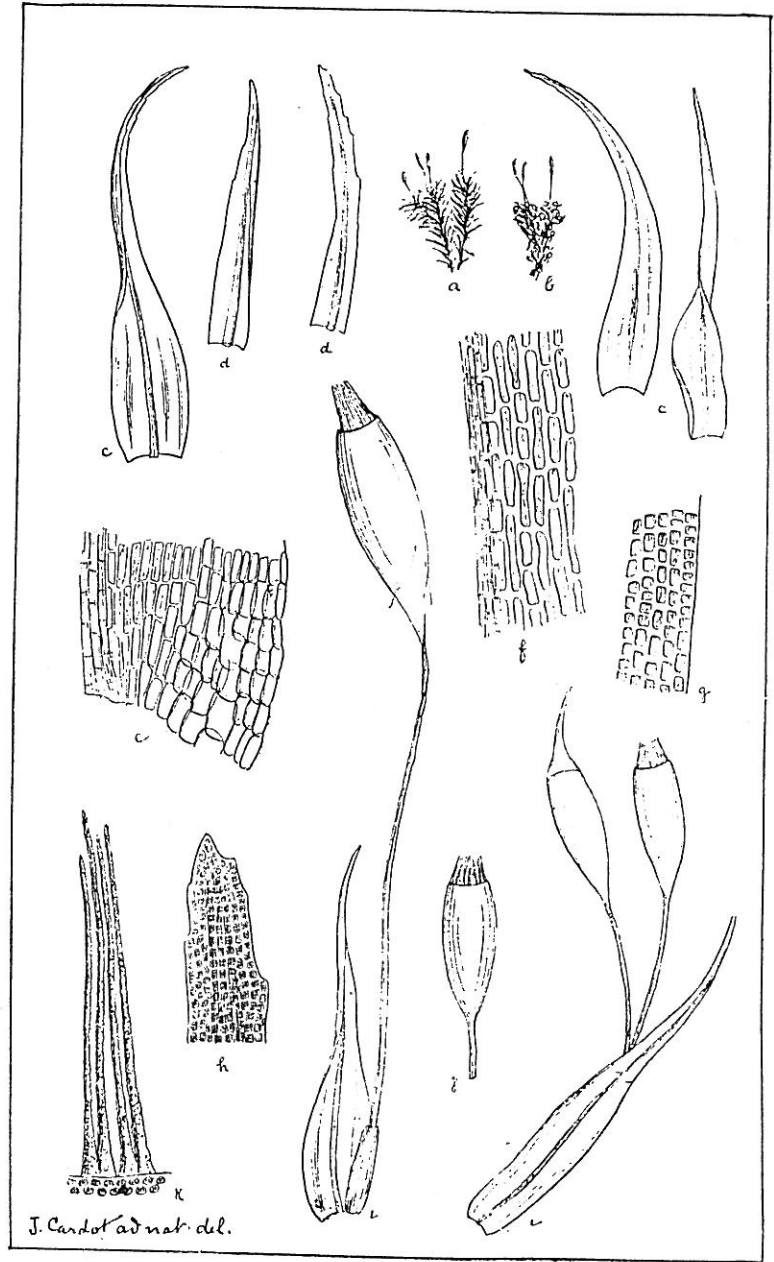


TRICHOSTOMUM MUCRONATULUM.

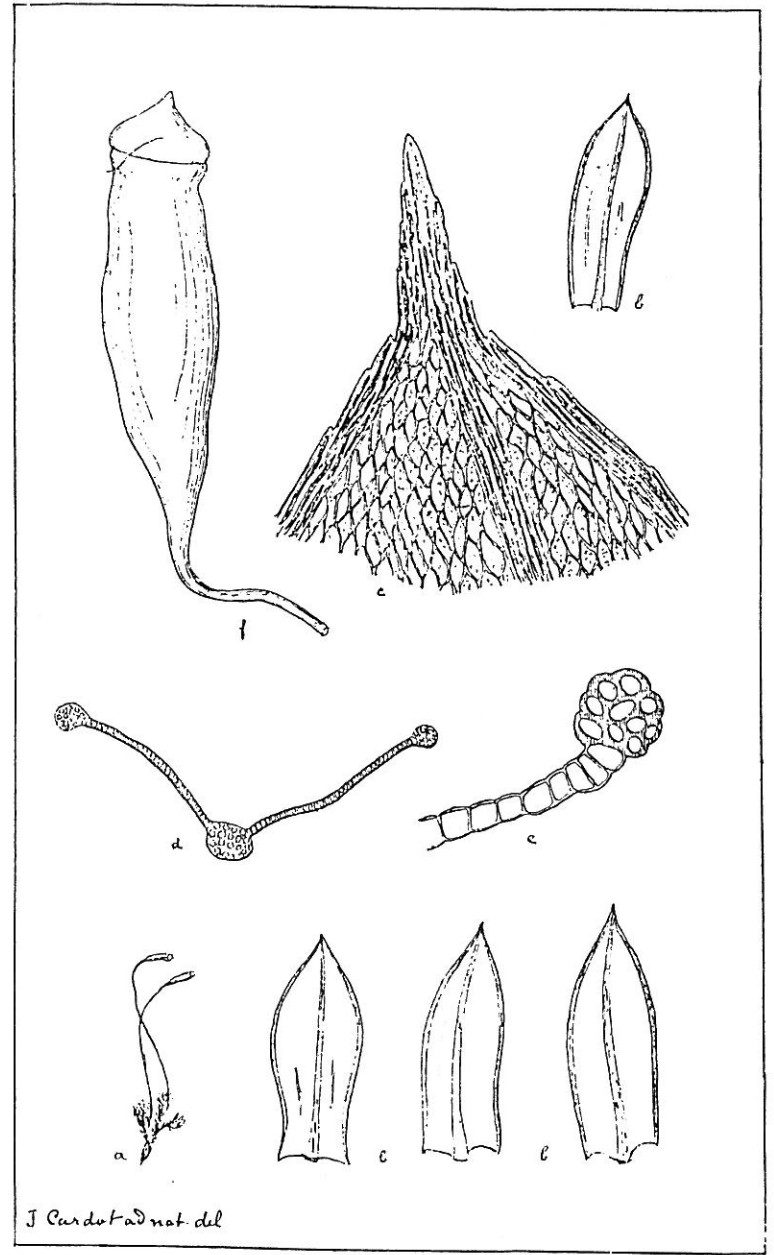


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TRICHOSTOMUM AZORICUM.

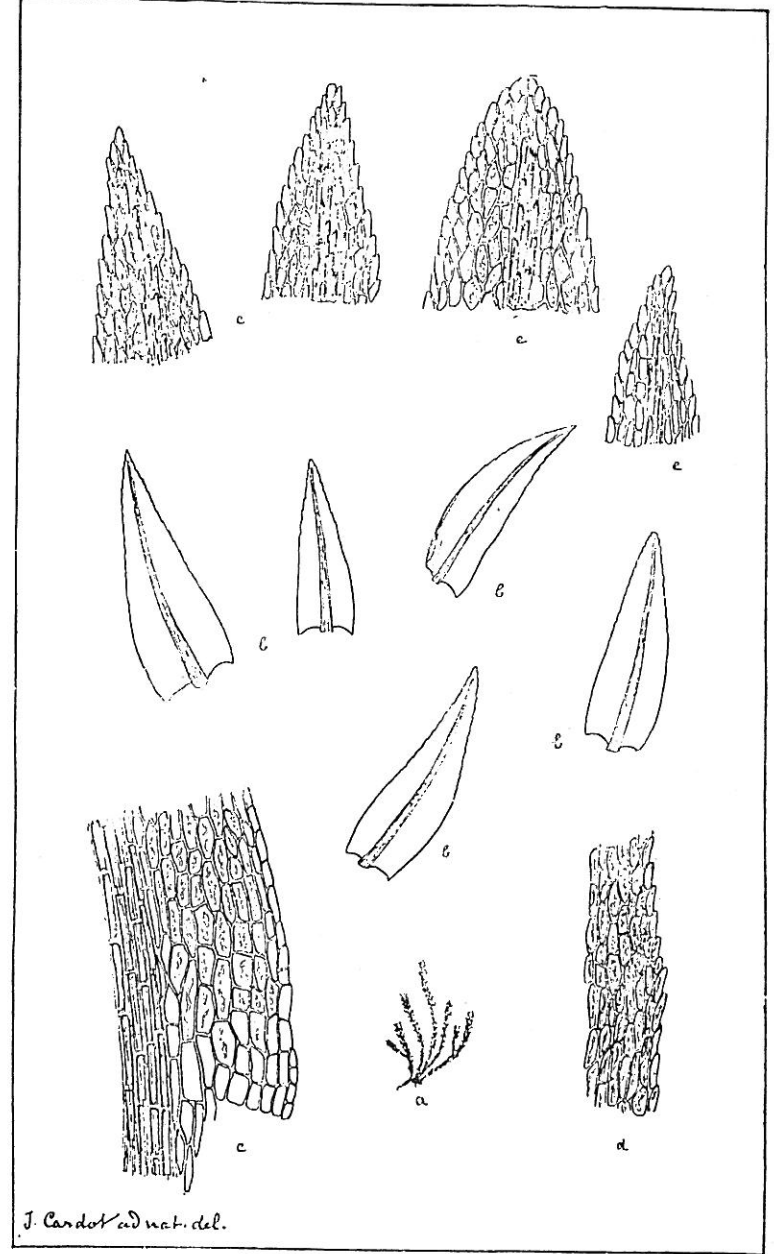


GLYPHOMITRIUM AZORICUM.

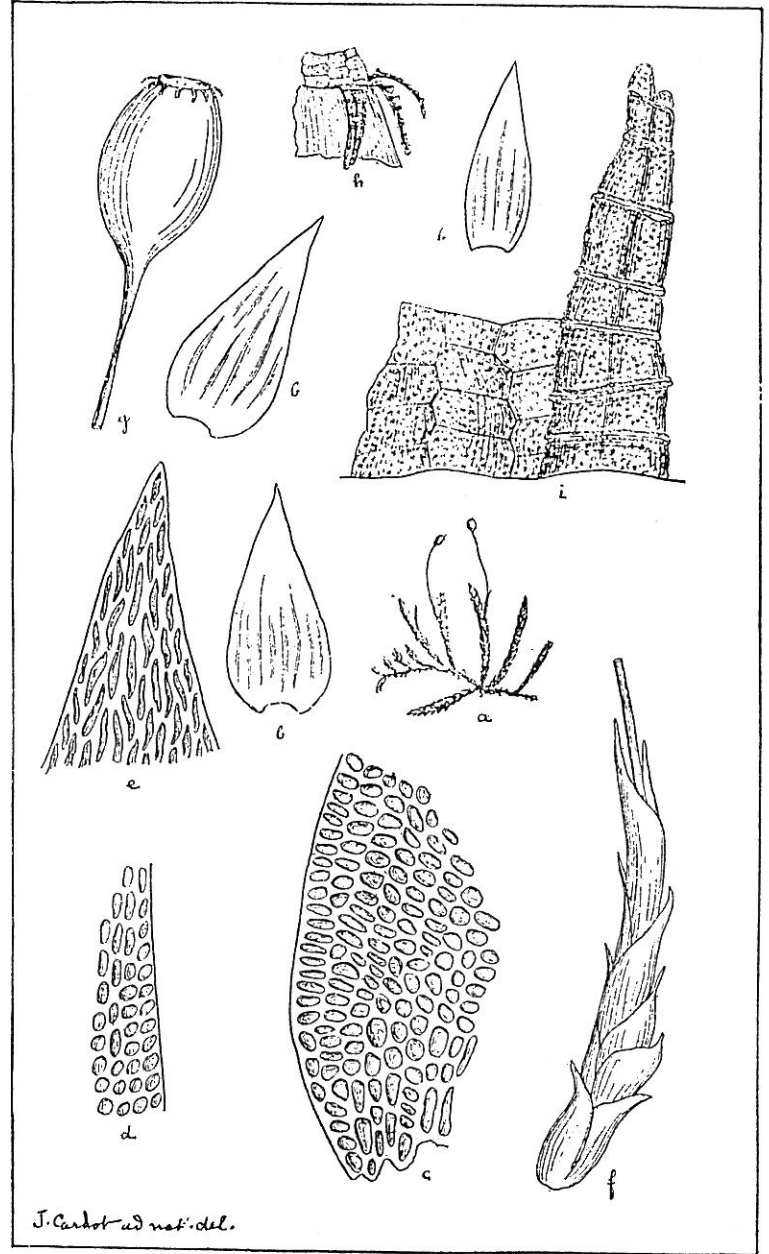


J Cardot adnot del

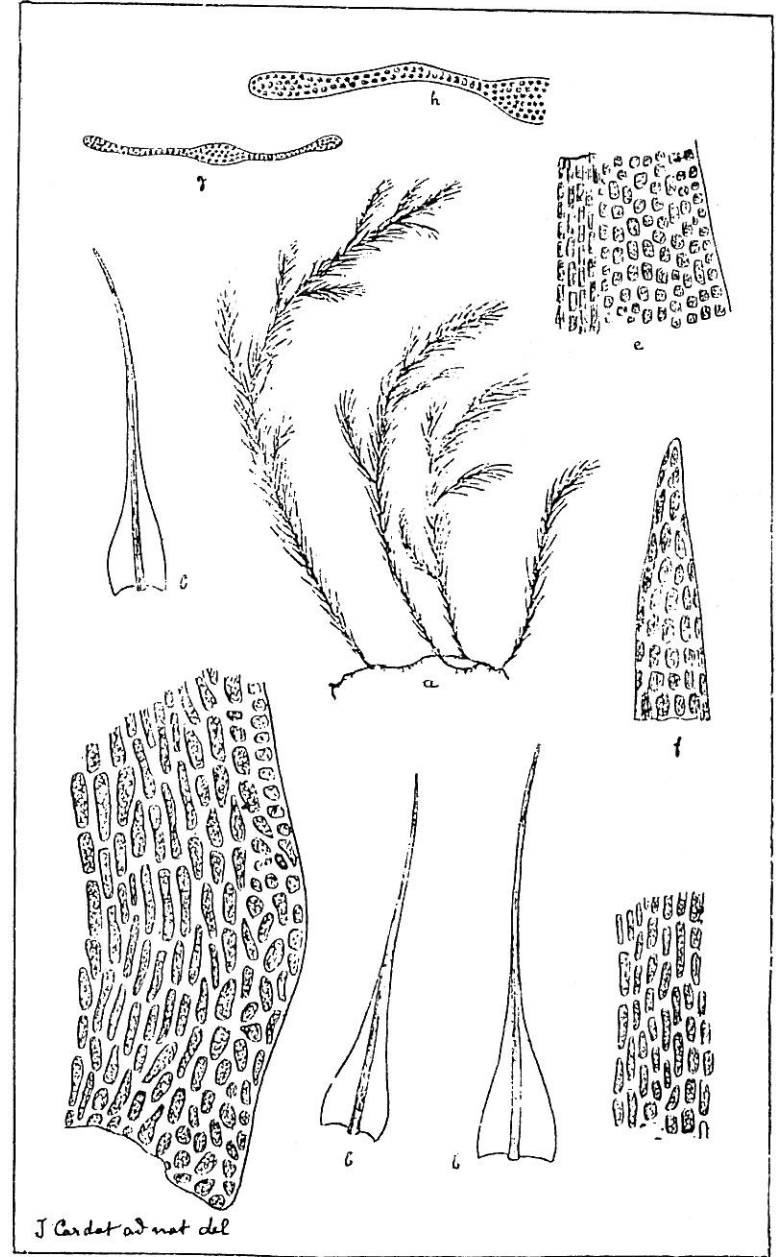
BRYUM PACHYLOMA.



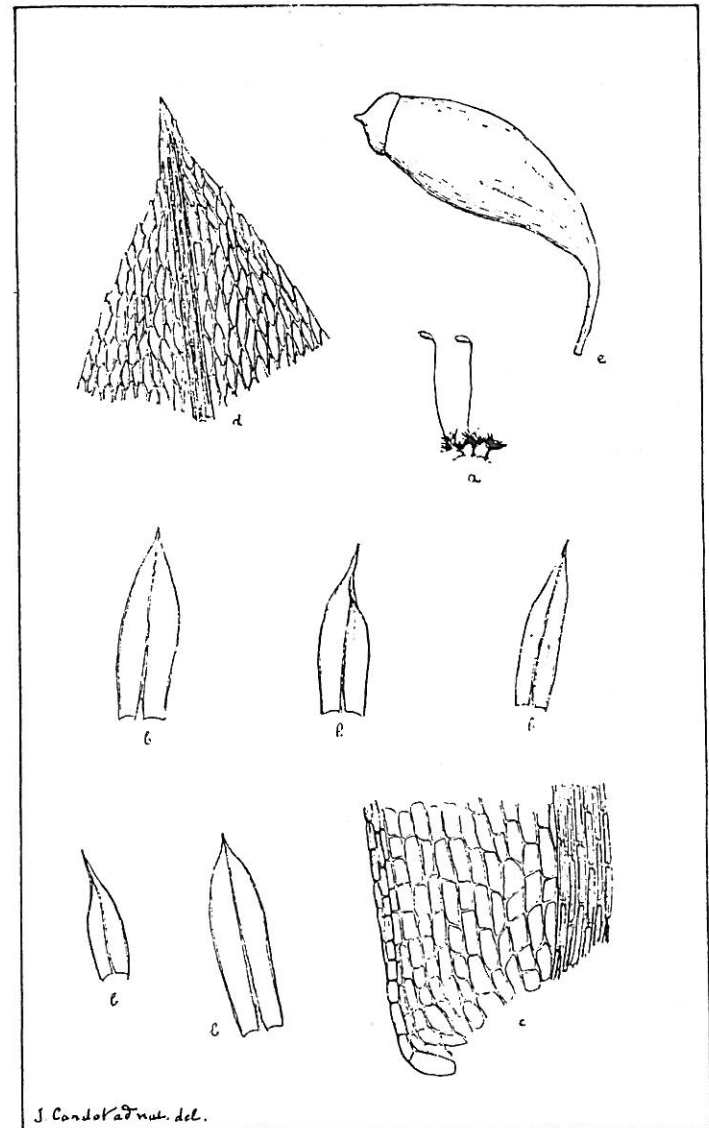
PHILONOTIS OBTUSATA.



ASTRODONTIUM TRELEASEI.



SCIAROMIUM RENAULDI.



BRYUM SERRULATUM.