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MEXICAN MOSSES COLLECTED BY
BROTHER ARSÈNE BROUARD—III

BY

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MEXICAN MOSSES COLLECTED BY BROTHER
ARSÈNE BROUARD—III

BY I. THÉRIOT

FONTAINE LA MALLET, FRANCE

With the present paper the study of Brother Arsène's mosses comes to an end. In addition to this collection a rather large number of species collected by Brother Amable in 1926-27 are included. These last are from the Valley of Mexico and adjacent regions. Together the two collections comprise about 300 species, among which 18 had not been found previously in Mexico, and 44 are entirely new. Brother Arsène's and Brother Amable's explorations have thus enriched the bryological flora of Mexico by more than 60 species. These valiant botanists are deserving of great praise and also of thanks from all those who are interested in bryology. Referring to the figures given by Cardot¹ the Mexican flora now includes, with the Arsène and Amable contributions, about 700 species of mosses. We are therefore well above the 400 species enumerated in the Prodrôme of Bescherelle.

It remains now for me to fulfill the very agreeable duty of expressing my gratitude to Brother Arsène and Edwin B. Bartram, who have assumed with such kindness the task of translating my French text into English, and to the Smithsonian Institution for publishing my studies.

The two previous parts were published in the Smithsonian Miscellaneous Collections as follows: Vol. 78, no. 2, pp. 1-29, June 15, 1926; vol. 81, no. 1, pp. 1-26, August 15, 1928. In the introduction to the first of these there will be found a list of localities in the states of Michoacán and Puebla from which specimens are cited; this will prove useful also for the present and final contribution.

DITRICHACEAE (continued)

DISTICHUM CAPILLACEUM (Sw.) Bry. Eur.

Valle de México: Desierto (*Bro. Amable* 1500).

Very probably new to Mexico.

¹ Rev. Bryol. 38: 97. 1911; 40: 33. 1913.

BRYOXIPHIACEAE

BRYOXIPHIMUM MEXICANUM Besch. Journ. de Bot. 6: 180. 1892

Eustichium norvegicum Schimp. in Besch. Prodr. Bryol. Mex. 29. 1871.

Valle de México: Desierto (*Bro. Amable* 1629).

DICRANACEAE (continued)

CAMPYLOPUS (Eucampylopus) ANGUSTI-ALATUS Thér., sp. nov.

Distr. Federal: Río Frío, alt. 3,000 meters (*Bro. Amable* 1724).

Habitu, colore, rete foliorum *C. Pittieri* R. S. W. sat similis, sed differt: caulibus elongatis usque 6 cm., foliis magis concavis, angustis (basi 0.5 mm.), acumine angustiore, cellulis laminae minus incrassatis, costa angustiore (0.36 mm.).

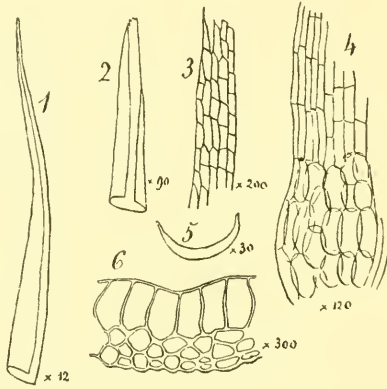


FIG. 1.—*Campylopus angusti-alatus* Thér. 1, leaf; 2, acumen; 3, lamina cells in the upper third; 4, alar and suprabasal cells; 5, cross-section of a leaf near the base; 6, cross-section of costa.

In size this species suggests *C. Apollinairei* Thér.,¹ from Colombia, but may be distinguished from it by the leaves, which are erect-appressed when dry, little or not flexuous, shorter and only half as wide, very narrow toward the base (8 to 10 rows of cells), and by the non-incrassate cells of the lamina.

CAMPYLOPUS DESTRUCTILIS (C. M.) Jaeg.

Dicranum destructile C. M. Bot. Zeit. 17: 220. 1859.

Campylopus Arsenei Thér. Smithsonian Misc. Coll. 78²: 5. 1926.

Having seen from the Berlin Museum the types of *C. Chrismari* (C. M.) and *C. destructilis* (C. M.), both Mexican species, I have

¹ Archiv. Bot. 2: 187. 1928.

come to the conclusion that they are distinct, the first belonging to the subgenus *Eucampylopus*, the second to the subgenus *Pseudocampylopus*; furthermore, that *C. Arsenei* Thér. does not differ from the latter.

CAMPYLOPUS (*Eucampylopus*) **SAINT-PIERREI** Thér., sp. nov.

Hidalgo: El Chieo, on rocks, alt. 2,600 meters, leg. Marius Saint-Pierre (*Bro. Amable* 1589).

Sterilis. Caespites densi. Caulis 2-3 cm. altus, simplex vel parce ramosus, inferne radiculosus, basi terra obrutus, dense foliosus. Folia sicca erecta, parum flexuosa, humida erecto-patula, lanceolata, longissime subulata, canaliculata, marginibus integris, apice denticulatis,

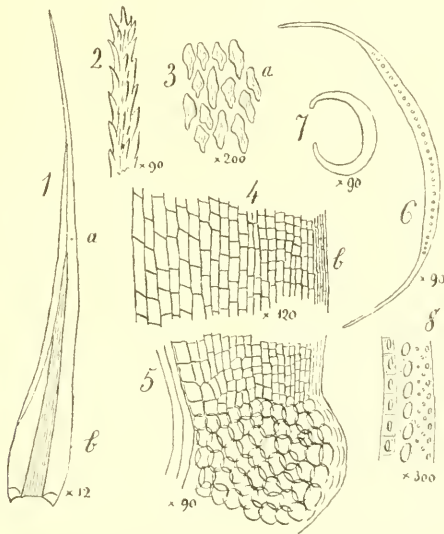


FIG. 2.—*Campylopus Saint-Pierrei* Thér. 1, leaf; 2, acumen; 3, upper cells at *a*; 4, suprabasal cells toward *b*; 5, alar cells; 6, cross-section of leaf near the base; 7, section from the acumen; 8, cross-section of costa near the base.

5-6 mm. longa, 0.7 mm. lata; costa basi 0.3 mm., breviter excurrente, dorso superne sulcata, haud lamellosa; auriculis distinctis, valde excavatis, cellulis alaribus numerosis, minutis, vesiculosus, rete suprabasilaris chlorophylloso, cellulis marginalibus (3-4) linearibus, hyalinis, sequentibus quadratis, internis rectangularibus, parietibus incrassatis, sinuatis; cellulis laminae rhomboidalibus valde incrassatis, juxtamarginalibus minutis, juxtacostalibus sensim majoribus.

At first sight a cross-section of the costa seems to indicate the subgenus *Palinocraspis*. Under a moderate magnification this section

appears as a thin opaque slice, in which is seen only the median arc of eurocysts covered on both sides by cells with a small lumen.

But, using a higher magnification for the same section, one notices that the ventral surface is formed of a unique layer of cells with very thick walls showing a lumen like a "cat-eye" (not punctiform). These cells, which are not stereids, remind one exactly of those found in *C. matarensis* Besch., from La Réunion Island. Like the last named species, *C. Saint-Pierrei* belongs to the group "C.b."¹

Another peculiarity is that the comal leaves often end in a rather long hair point, which is discolored or subhyaline, recalling to mind that of the group *Trichophylli*.

POTTIACEAE

MOLENDOA OBTUSIFOLIA Broth. & Par. in Card. Rev. Bryol. 40: 36. 1913

Puebla: Hacienda Alamos (4631, 4697); Río Alseseca (574). Vera Cruz; Córdoba (10978). Distr. Federal: Mixcoac (9432, 9434, 9462, 9465, 9466, 9468). Valle de México (*Bro. Amable*): Desierto (1244); San Juanico (1261).

The leaves of this species show a peculiarity which has not yet been pointed out: the margins of the acumen are a little thickened by the bistratose marginal cells, such as may be seen in some other species of the family Pottiaceae.

MOLENDOA OBTUSIFOLIA Broth. & Par. var. **INCRASSATA** Thér., var. nov.

Puebla: Hacienda Batán (5007 p. p.), associated with *Trichostomopsis crispifolia* Card.

Caulis 1 cm. altus. Folia breviora latioraque, 1 mm. × 0.25 mm.; rete opaco, cellulis incrassatis, costa 50 μ.

Here the thickening of the cell walls is more accentuated than in the type form: toward the apex the lamina is composed of 2 layers of cells throughout, while in the middle the thickening is confined to 2 or 3 rows of marginal cells.

ANOECTANGIUM LIEBMANNI Schimp. in Besch. Prodr. Bryol. Mex. 15. 1871

Morelia: Jesús del Monte (7965).

ANOECTANGIUM COMPACTUM Schwaegr. Suppl. 1: 36, pl. 11. 1811

Puebla: (4800).

¹E. & P. Nat. Pflanzenfam. ed. 2, 10: 187. 1924.

ANOECTANGIUM APICULATUM Schimp. in Besch. Prodr. Bryol. Mex. 16.
1871

Puebla: Hacienda Alamos (4770). Morelia: Cerro San Miguel (5042). Valle de México: Puente de la Venta (*Bro. Amable* 1388).

ANOECTANGIUM EUCHLORON (Schwaegr.) Mitt. Musc. Austr. Amer. 176.
1869

Morelia: Loma del Zapote (7508).

ANOECTANGIUM CONDENSATUM Schimp. in Besch. Prodr. Bryol. Mex. 16.
1871

Valle de México (*Bro. Amable*): Contreras (1483); Desierto (1627).

HYMENOSTOMUM (Kleioweisia) SEMIDIAPHANUM Thér., sp. nov.

Morelia: Cerro San Miguel, on earth (5040).

Dioicum? fl. masc. haud vidi. Tenellum; caulis 1 mm. altus, paucifoliatus. Folia sicca crispula, madida patula, inferiora minuta, caetera sensim majora, oblonga-lanceolata, breviter acuminata, acuta, concava,

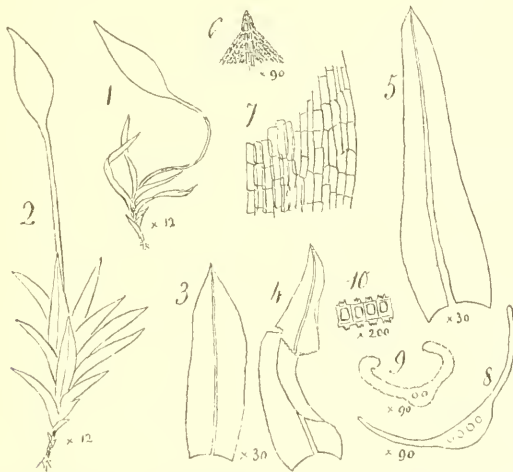


FIG. 3.—*Hymenostomum semidiaphanum* Thér. 1, entire plant, dry; 2, moist plant; 3, 4, 5, leaves; 6, acumen; 7, basal cells; 8, cross-section of leaf toward the base; 9, cross-section of acumen; 10, fragment of cross-section from acumen.

superne canaliculata, marginibus integerrimis, valde involutis, folia media 1 mm. longa, 0.3 mm. lata; costa basi $40\ \mu$, percurrente vel breviter excurrente; rete basilari in dimidio inferiore hyalino, cellulis rectangularibus, parietibus tenuibus, cellulis laminae opacis, densissime

papillosis, papillis elatis, diam. 6 μ . Pedicellus 3 mm. longus, pallidus, siccus valde arcuatus, humidus erectus; calyptra cucullata, dimidium partem capsulae obtegens; capsula oblonga, clausa; operculum haud secedens, e basi conicum oblique rostratum; sporae papillosae, 18-20 μ .

Easily distinguished from the other species of the subgenus *Klcioweisia* by the length of the pedicels.

HYMENOSTOMUM MEXICANUM Card. Rev. Bryol. 36: 70. 1909

Puebla: Road to Cholula. (4849). Valle de México: Tenayuca (*Bro. Amable* 1380).

These plants conform closely to Cardot's type except in the inflorescence. The type specimen has a paroicous inflorescence (teste Cardot); here it is autoicous (male flower on a short pedicel under the female flower). However, I do not think it is wise to base a new species on this difference alone; it seems more logical, in my opinion, to conclude that in *H. mexicanum* the inflorescence is variable, occasionally paroicous but more often autoicous, as is normal among the species of the genus *Hymenostomum*.

GYMNOSTOMUM CALCAREUM Bryol. Germ. 1: 153, pl. 10, f. 15. 1823

Valle de México: Morales (*Bro. Amable* 1595), c. fr.

This species is new to Mexico.

GYROWEISIA OBTUSIFOLIA (Hampe) Broth. in E. & P., Nat. Pflanzenfam. 1³: 389. 1902

Puebla: Cerro Guadalupe (666); Hacienda Alamos (4634). Morelia: Loma del Zapote (7507).

The leaves of this species are identical as to form and areolation with those of *Husnotiella revoluta*. But this is the only likeness, the leaves of *G. obtusifolia* being exactly plane on the margin and having the costa half as narrow, not dilated at the apex.

GYROWEISIA PAPILLOSA Thér., sp. nov.

Morelia: (4927); Loma Santa María (7887).

Pusilla, caulis vix 1 mm. Folia erecto-appressa, parum crispula, difficile emollita, oblonga vel oblongo-lanceolata, summo late obtusa, valde concava, integerrima, marginibus planis, costa basi 30 μ , superne dilatata, sub apicem evanescente, cellulis basilaribus hyalinis, rectangularibus, cellulis mediis et superioribus quadrato-hexagonis, chlorophyllosis, papillosis, 8-10 μ , parietibus tenuibus. Pedicellus pallidus,

erectus, 8-10 mm. longus; capsula oblonga, erecta, basi attenuata; operculum conico-rostratum; annulus latus, peristomium sub orificio insertum, dentes papillosi.

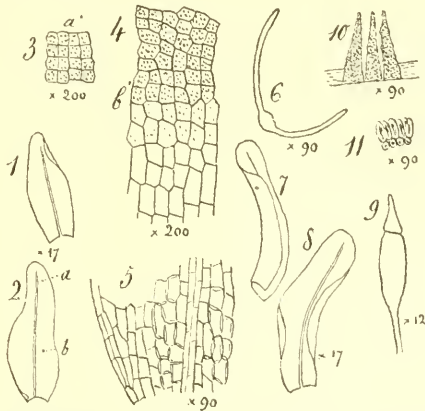


FIG. 4.—*Gyroweisia papillosa* Thér. 1, 2, leaves; 3, cells in upper part at *a*; 4, middle cells near *b*; 5, basal cells; 6, cross-section of a leaf; 7, 8, perichaetial leaves; 9, capsule; 10, fragment of peristome; 11, annulus.

Differs from *G. obtusifolia* by the very unequal, narrower leaves, whose cells are more chlorophyllose and papillose, also by the capsule with a broader annulus.

HUSNOTIELLA REVOLUTA Card. Rev. Bryol. 36: 71. 1909

Puebla: Guadalupe (662, 671, 800); Hacienda Santa Bárbara (4519, 4520, 4595 p. p.). Morelia: (4922, 7653); Andameo (4829, 4841, 4842, 4845). Distr. Federal: Mixcoac (9441, 9447, 9475 p. p., 9483). Valle de México (*Bro. Amable*): Desierto (1249); San Juanico (1227); Penon (1255); San Borja (1259).

Forma **ELATA** Thér., form. nov.—Stems longer, up to 10 to 15 mm., green above, discolored below. Leaves dimorphous, the lower short, oval as in the type, those of the young shoots elongated, almost twice as long as the lower stem leaves. Valle de México: Contreras (*Bro. Amable* 1333).

HUSNOTIELLA REVOLUTA Card. var. **PALMERI** (Card.) Thér., comb. nov.

Husnotiella Palmeri Card. Rev. Bryol. 37: 121. 1910.

Puebla: (698); Rancho Santa Bárbara (4594b). Morelia: Loma Santa María (7880, 4902). Distr. Federal: Mixcoac (9471, 9475 p. p., 9490).

In reducing *H. Palmeri* Card. to a mere variety, following my own observations, I feel in perfect agreement with Mr. R. S. Williams and also with Cardot himself.¹

HUSNOTIELLA TORQUESCENS (Card.) Bartr. *Bryologist* 29: 45. 1926

Didymodon torquescens Card. *Rev. Bryol.* 36: 83. 1909.

Morelia: (7652); Bosque San Pedro (4577, 4583); La Huerta (7967); Loma Santa María (4913, 7882, 7886).

These specimens differ slightly from the type in being green, not glaucous, above; but the agreement is complete in so far as the fruit and the form and structure of the leaves are concerned.

HYMENOSTYLIUM CURVIROSTRE (Ehrh.) Lindb.

Puebla: Boca del Monte (4737); Hacienda Batán, with var. *scabrum* Lindb. (4960); Esperanza (7976).

HYMENOSTYLIUM INCURVANS (Schimp.) Broth. in *E. & P. Nat. Pflanzenfam.* 1²: 389. 1902

Gymnostomum incurvans Schimp. in *Besch. Prodr. Bryol. Mex.* 15. 1871.

Puebla: Esperanza (4740). Valle de México: Desierto (*Bro. Amable* 1500 p. p.).

For want of good capsules the determination remains uncertain. The male and female flowers are lateral, an abnormal character for the genus *Hymenostylium*. This fact is, however, not unique; I have previously mentioned a similar case in connection with *H. curvirostre*.²

TRICHOSTOMUM CLINTONI C. M. *Linnaea* 38: 636. 1874

Morelia: Jesús del Monte (7613 p. p.); Loma Santa María (7860, 7874); Campanario (7643).

TRICHOSTOMUM INVOLVENS Card. *Rev. Bryol.* 40: 34. 1913

Puebla: Cerro Guadalupe (674, 802); Rancho Guadalupe (4612). E. G. Paris distributed as *T. lamprothecium* C. M. a moss collected by Bro. Arsène at Puebla which is very different from this species and should be referred to *T. involvens*.

TRICHOSTOMUM CHLOROPHYLLUM C. M. var. **BREVIFOLIUM** Thér., var. nov.

Puebla: (4994, 4995).
Folia breviora latioraque.

¹ *Rev. Bryol.* 40: 34. 1913.

² *Bull. Acad. Internat. Geogr. Bot.* 11: 319. 1902.

TIMMIELLA SUBANOMALA (Besch.) Broth. in E. & P. Nat. Pflanzenfam. 1³: 392. 1902

Trichostomum subanomalum Besch. Prod. Bryol. Mex. 33. 1871.

Puebla: Hacienda Alamos (582, 4513, 4635, 4769); Finca Guadalupe (730). Morelia: Campanario (4773, 7523); Loma Santa María (4907). Distr. Federal: Mixcoac (9448). Valle de México (*Bro. Amable*): Desierto (1215, 1251, 1271); Río Frío (1711). Hidalgo: El Chico (1579).

TIMMIELLA ANOMALA (Bry. Eur.) Limpr. Laubm. Deutschl. 1: 590. 1888

Valle de México: Tenango (*Bro. Amable* 1686).

This species, which grows also in California, Arizona, Louisiana, and Florida, has not previously been recorded from Mexico. The specimens are identical with the European moss.

T. subanomala is very close to *T. anomala*, and to my mind seems to be only a subspecies or a species of secondary rank. It differs from *T. anomala* by the position of the male flowers, the form of the acumen (which is more gradually narrowed and more acute), and by the much broader costa, up to two and a half times as wide.

TRICHOSTOMOPSIS CRISPIFOLIA Card. Rev. Bryol. 36: 74. 1909

Puebla: Rancho Santa Bárbara (4593, 4594a, 4595, 4599); Rancho Posadas (4807). Morelia: Cerro Azul (4934, 4936). Valle de México (*Bro. Amable*): San Jerónimo (1593); Tenango (1688).

Forma **CRASSIRETIS** Thér., form. nov.—Cellulae laminae valde incrassatae.—Puebla: Hacienda Batán (5007 p. p.).

TRIQUETRELLA FERRUGINEA (Schimp.) Thér., comb. nov.

Barbula ferruginca Schimp. in Besch. Prodr. Bryol. Mex. 37. 1871.

San Cristóbal (*F. Müller*), original specimen. Puebla: Boca del Monte (*Purpus*, in hb. Cardot), (*Arsène* 4726); Esperanza (4742). Valle de México: Desierto (*Bro. Amable* 1419).

The leaves are triquetrous, squarrose-spreading when moist; the areolation and papillae suggest the genus *Leptodontium*. I found in no. 4726 a single capsule. The fruit of this species not being known, I describe it:

Folia perichaetialia erecta, vaginantia; pedicellus flavidus, 1 cm. altus; capsula parum inclinata, oblongo-cylindrica; operculum oblique rostratum.

LEPTODONTIUM ANGUSTINERVE Thér., sp. nov.

Puebla: Esperanza (4741; 4743).

Sterile. Caespites sat densi, intense virides. Caulis 4-5 cm. longus, simplex vel parce ramosus, laxe foliosus. Folia sicca erecta, parum patula, flexuosa, madida patula, oblongo-lanceolata, sensim acuminata, acuta, carinata, decurrentia, marginibus integerrimis, in medio reflexis, 1.2 mm. longa, 0.3 mm. lata; costa basi 45 μ , percurrente, dorso papil-

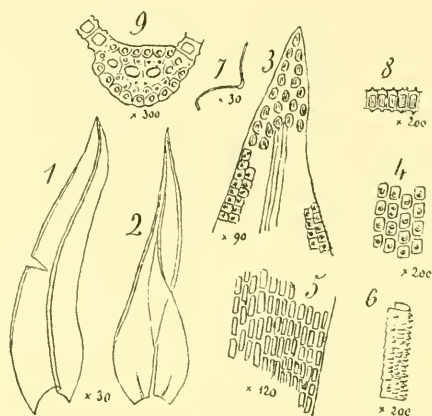


FIG. 5.—*Leptodontium angustinerve* Thér. 1, 2, cauline leaves; 3, acumen; 4, middle cells; 5, basal cells; 6, papillae from the dorsal side; 7, cross-section near the lower third of leaf; 8, 9, fragments of 7.

losa; cellulis laminae quadrato-hexagonis, incrassatis, $12 \times 10 \mu$, papillosis, papillis 1-2, elatis, obtusis, cellulis apicalibus laevibus, cellulis basilaribus rectangularibus, incrassatis, laevibus.

This species is rather close to *L. filscens* Hampe, but is distinguished by the narrow acute leaves, the narrow costa, the incrassate cells with only 1 or 2 large papillae, the smooth apical cells, and the more compact basal areolation.

LEPTODONTIUM ARSENEI Thér., sp. nov.

Morelia: Cerro San Miguel (5073).

Sterile. Caespites sat densi, compacti, fusco-virides. Caulis 4-5 cm. altus, dense radiculosus, regulariter foliosus. Folia sicca crispula, humida patulo-squarrosa, vaginantia, e basi erecta, breviter oblonga, superne dilatata, sat abrupte in acumen angustum, canaliculatum, sub-obtusum contracta, marginibus integris, in medio folii revolutis, 1.3 mm. longa, 0.5 mm. lata; costa basi 70 μ , percurrente, dorso pa-

pillosa, cellulis laminae opacis, vix distinctis, quadratis, 7-8 μ , dense et tenuiter papillosis, cellulis basilaribus juxtamarginalibus linearibus, laevibus, hyalinis, internis rectangularibus, papillosis, paulum chlorophyllosis.

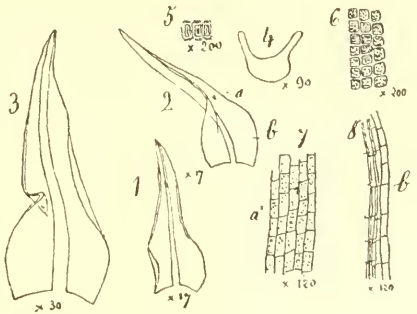


FIG. 6.—*Leptodontium Arsenei* Thér. 1, 2, 3, cauline leaves; 4, cross-section in the acumen; 5, fragment of 4; 6, upper cells; 7, cells in the upper part of leaf base toward *a*; 8, marginal cells of leaf base at *b*.

This species also belongs to the group of *L. filescens*. It may be separated from it by the more elongated stems, by the leaves with a short sheathing base, by the narrower acumen (subobtuse and not apiculate), and the smaller median cells.

LEPTODONTIUM FILESCENS (Hampe) Mitt. *Musc. Austr. Amer.* 50. 1869

Valle de México; Desierto, upon bark associated with *Rozea stricta* Besch. (*Bro. Amable* 1444).

A Colombian species, new to Mexico.

LEPTODONTIUM SQUARROSUM (Hook.) Par. *Ind. Bryol.* 732. 1896

Holomitrium serratum (Schimp.) C. M. *Syn.* 2: 587. 1851.

Valle de México (*Bro. Amable*): Desierto (1431); Río Frio (1306).

The last plant is a form with strongly undulate leaves.

LEPTODONTIUM EXASPERATUM Card. *Rev. Bryol.* 36: 74. 1909

Valle de México: Río Frio (*Bro. Amable* 1690).

LEPTODONTIUM sp.

Valle de México (*Bro. Amable*): Puerta de la Venta (1391); Desierto (1439 p. p.).

The present species, which unquestionably is new, was recognized as such independently by my friend Edwin B. Bartram, who will shortly publish a description.

TORTULA SUBNIGRA Mitt. *Musc. Austr. Amer.* 164. 1869

The position of this moss has remained uncertain until now. Jaeger classified it as a *Barbula*. Brotherus¹ thought that perhaps it was a *Didymodon*. Lastly, J. Cardot, who saw its capsules in good condition, verified the absence of a peristome and asked² if it might not be convenient to separate Mitten's species from true *Tortula* to constitute the type of a new subgenus.

Mr. Bartram and myself think that we must go further. Transverse sections of the leaves show that the costa possesses the structure of the Trichostomoideae and not of the Pottioidae. Another peculiar fact is that the lamina is composed of two layers of cells, except at the margin. These noteworthy characters, in addition to that presented by the sporophyte, justify the creation of a new genus. We are happy to dedicate this Mexican genus to our eminent friend J. Cardot, whose last and precious works contributed so much to a better understanding of the bryological flora of Mexico, and who has enriched it with such a large number of new species.

NEOCARDOTIA Thér. & Bartr., gen. nov.

Caulis erectus. Folia sicca crispata, humore patulo-squarrosa, carinata, acuta, marginibus inferne revolutis, superne serratis; rete opaco, bistratoso; cellulis basilaribus linearibus, laevibus, hyalinis, caeteris minutis, dense papillosis; costa breviter excurrente, in sectione transversali e strato medio cellulis eurycystis et stereidis ventralibus et dorsalibus composita. Folia perichaetalia perlonga, erecta, vaginantia; capsula erecta, cylindrica, symmetrica, gymnostoma, annulata; operculum breviter conicum, cellulis recte seriatis; sporae laeves.

The affinities of the genus *Neocardotia* are with the genus *Leptodontium*, as much through the habit of the plant as by its serrated cauline leaves and strongly sheathing perichaetial leaves, 2 to 3 times larger than the stem leaves.

A single species:

NEOCARDOTIA SUBNIGRA (Mitt.) Thér. & Bartr., comb. nov.

Tortula subnigra Mitt. *Musc. Austr. Amer.* 164. 1869.

Caespites nigrescenti-virides; caulis 2-4 cm. altus. Folia 3.5-4 mm. longa, 1 mm. lata; costa basi 60-80 μ , dorso rugulosa; cellulis laminae 6-7 μ , paulum incrassatis, papillis minutis, obtusis; pedicellus 1 cm.

¹ E. & P. Nat. Pflanzenfam. 1³: 405. 1902; ed. 2, 10: 273. 1924.

² Rev. Bryol. 38: 101. 1911.

longus, sporae diam. 12-18 μ .—Often mixed with other mosses, and almost always with *Braunia secunda*.

Mexico: Loc. class. (*Humboldt*); La Cima (*Barnes & Land* 373 p. p.). Valle de México (*Bro. Amable*): Salazar (1294, 1716); Contreras (1470). Hidalgo: Mineral del Chico (*Orcutt* 6841). Arizona: Santa Rita Mts. (*Bartram* 813).

The plant from Arizona shows some differences as compared with the Mexican plant, slight differences it is true, but worthy of mention; it is a little more slender, the leaves are more shortly acuminate, and their cells less regularly bistratose.

HYOPHILA DENTATA Card. Rev. Bryol. 40: 36. 1913

Morelia: (7896).

HYOPHILA MEXICANA Thér., sp. nov.

Valle de México: Tizapán, on earth (*Bro. Amable* 1613 p. p.).

Sterilis. Caulis perbrevis; folia 2 mm. longa, 0.6 mm. lata, marginibus integerrimis, planis, superne paulum involutis; cellulis laminae hexagonis, papillosis, parietibus tenuibus, diam. 6-7 μ , costa latissima, 90-100 μ , in mucronem brevem acutum excurrente.

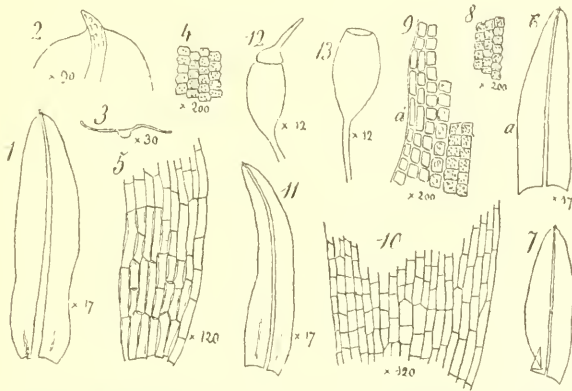


FIG. 7.—*Hyophila mexicana* Thér. 1, leaf; 2, acumen; 3, cross-section toward the middle; 4, median cells; 5, basal cells. *Hyophila subangustifolia* Thér. 6, 7, cauline leaves; 8, median cells; 9, marginal cells toward *a*; 10, basal cells; 11, perichaetial leaf; 12, 13, capsules.

In form, size, and areolation of the leaves this species may be compared with *H. Beschertlei* C. M. It differs in the very short stems and perfectly entire leaves, and in the hyaline basal cells, with thin, soft walls. These last characters distinguish our species from *H. fragilis* Card.

HYOPHILA SUBANGUSTIFOLIA Thér., sp. nov.

Valle de México: Tizapán, on earth, associated with the preceding species and other mosses (*Bro. Amable* 1613 p. p.).

Dioica. Caespites incohaerentes laxiusculi, virides. Caulis perbrevis, 2-3 mm. altus. Folia sicca crispula, humida erecto-patentia, 1.3-1.6 mm. longa, 0.40—0.45 mm. lata, oblongo-lanceolata, obtusa, breviter mucronata, marginibus planis, integris, superne parum involutis; costa 60 μ lata, breviter excedente, dorso laevi; cellulis basilaribus hyalinis, ad costam elongate rectangularis, ad marginem brevioribus, superioribus minutis, quadratis vel hexagonis, papillosis, obscuris, diam. 7-8 μ . Pedicellus erectus, 4 mm. longus; capsula oblonga, gymnostoma, annulata; operculum oblique et longe rostratum, capsulam subaequans; sporae papillosae, diam. 18 μ . Flos masculus ignotus.

I can find no better comparison for this than *H. angustifolia* Par. & Ren., from Madagascar. It differs from the latter in its shorter stems, oblong-lanceolate leaves (wider, scarcely involute above, and not cucullate at the apex), more compact areolation, and longer operculum.

WEISIOPSIS STENOCARPA Thér., sp. nov.

Valle de México: Desierto (*Bro. Amable* 1205 p. p.). Growing as isolated stems among other mosses, such as *Didymodon ocnus* and *Campylium hispidulum* var. *Sommerfeltii*.

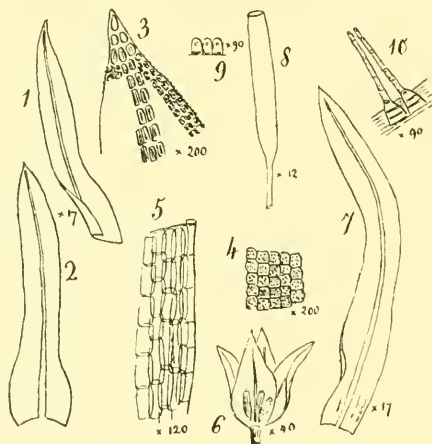


FIG. 8.—*Weisiopsis stenocarpa* Thér. 1, 2, cauline leaves; 3, acumen; 4, median cells; 5, basal cells; 6, antheridial bud; 7, perichaetial leaf; 8, capsule; 9, annulus; 10, fragment of peristome.

Autoica, pusilla. Caulis ascendens, 2-5 mm. altus. Folia sicca crispula, humore patula, lanceolato-acuminata, acuta, basi plicatula, marginibus planis, integris, 2-2.2 mm. longa, 0.3-0.4 mm. lata, costa

basi $60\ \mu$, percurrente vel breviter excedente; rete opaco, papilloso, papillis densis, minutis, cellulis quadrato-hexagonis, $8-9\ \mu$, cellulis basilaribus laxioribus, hyalinis, rectangularibus. Folia perichaetialia longiora (3 mm.); pedicellus erectus, pallidus, 5-6 mm. longus; capsula angustissime cylindrica 1.5 mm. longa, 0.26 mm. crassa, annulata, peristomium sub ore insertum, dentes lineares, integri, tenuiter papilloso; spora laeves, $12\ \mu$ crassae. Calyptra? Operculum?

Comparable to *W. stomatodonta* (Card.) Broth. in form and size of capsule, but very different in its autoicous inflorescence, longer, more narrowly acuminate leaves (with margins not involute), looser basal areolation, and entire peristome teeth.

Furthermore, does Cardot's species, which has the peristome teeth divided into two branches, really belong to the genus *Wcisioopsis*?

DIDYMODON (Erythrophyllum) PATENTIFOLIUS Thér., sp. nov.

Valle de México: Xoquiapán (*Bro. Amable* 1676); Mixcoac (*Arsène* 9442).

Diocious, tenellus, obscure viridis. Caulis erectus, simplex, vix 2 mm. altus. Folia sicca crispula-patula, humida patentia, carinato-

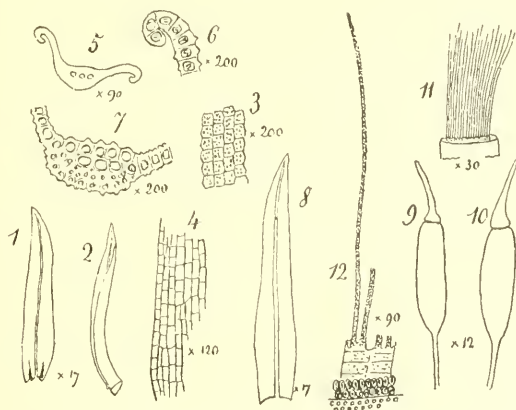


FIG. 9.—*Didymodon patentifolius* Thér. 1, 2, cauline leaves; 3, median cells; 4, basal cells; 5, 6, cross-sections in acumen; 7, cross-section of costa near base; 8, perichaetial leaf; 9, dry capsule; 10, moist capsule; 11, peristome; 12, fragment of peristome.

concava, lanceolato-ligulata, acuta, marginibus anguste revolutis, integris, 1.5-1.6 mm. longa, 0.3 mm. lata; costa papillosa, basi $60\ \mu$ crassa, percurrente; cellulis laminae hexagonis, chlorophyllosis, obscuris, papilloso, $8-9\ \mu$, basilaribus laxis, hyalinis, teneris, oblongo-hexagonis, vel rectangularibus. Folia perichaetialia similia sed majora,

haud vaginata; pedicellus purpureus, erectus, 10-12 mm. longus; capsula oblonga (2 mm. longa c. operculo), annulata, peristomii dentes e membrana basilari humillima erecti (0.6 mm. alti), fere usque ad basin in 2 crura filiformia papillosa divisi; sporae laeves, 12-15 μ ; operculum conico-rostratum.

Distinguished at a glance from *D. oeneus* by its small size. The leaf margin is so closely revolute that at first sight the border seems to be thickened and formed of two layers of cells.

DIDYMODON OENEUS (C. M.) Schimp. in Besch. Prodr. Bryol. Mex. 28. 1871

Trichostomum Oeneum C. M. Syn. 2: 628. 1851.

Puebla: Esperanza (4802). Valle de México: Desierto (*Bro. Amable* 1205 p. p., 1417).

DIDYMODON CAMPYLOCARPUS (C. M.) Broth. in E. & P. Nat. Pflanzenfam.

1³: 405. 1902

Trichostomum campylocarpum C. M. Syn. 2: 628. 1851.

Valle de México: Desierto (*Bro. Amable* 1248).

DIDYMODON INCRASSATO-LIMBATUS Card. Rev. Bryol. 36: 81. 1909

Morelia: (7914); Rincón (4567); Loma Santa María (4886); Cerro San Miguel (5085). Valle de México: Tlalpan (*Bro. Amable* 1348, 1349).

According to these specimens the peristome teeth are a little twisted, and not exactly straight. Furthermore, the cells of the operculum are arranged in oblique rows, a character which is also found in Pringle's no. 10588. No. 4567, from Rincón, is a form with acute leaves whose margins are less strongly thickened.

DIDYMODON FUSCO-VIRIDIS Card. Rev. Bryol. 36: 83. 1909

Valle de México: San Juanico (*Bro. Amable* 1264).

DIDYMODON PUSILLUS Card. Rev. Bryol. 36: 82. 1909

Valle de México (*Bro. Amable*): Desierto (1207 p. p., 1331, 1615); Río Frío (1746); Xoquiapán (1752).

A robust form, the stems tall, up to 2 cm., leaves wider at the base, margins plane or slightly reflexed. These plants seem to mark a transition toward the last preceding species.

DIDYMODON DIAPHANOBASIS Card. Rev. Bryol. 37: 125. 1910

Valle de México (*Bro. Amable*): Contadero (1363); Río Frío (1704).

DIDYMODON MEXICANUS Besch. Prodr. Bryol. Mex. 28. 1871

Puebla: Hacienda Alamos (4764). Valle de México: San Juanico (*Bro. Amable* 1322, 1332).

DACTYLHYMENIUM PRINGLEI (E. G. Britt.) Card. Rev. Bryol. 36: 72. 1909

Puebla: (9493); Rancho Santa Bárbara (4598, 4811).

These specimens represent a form with less papillose leaves and a nearly smooth costa.

BARBULA BESCHERELLEI Sauerb.

Puebla: Cerro Guadalupe (686a, 799). Morelia: Punguato (5048); Campanario (7564); Cerro San Miguel (5087). Tlaxcala: (613). Valle de México: Desierto, Contadero (*Bro. Amable*).

BARBULA BESCHERELLEI Sauerb. var. **CRASSINERVIA** Thér., var. nov.

Distr. Federal: Mixcoac (9470, 9473).

Folia basi cordata, sat abrupte contracta, costa lata, 90 μ ; folia perichaetialia late ovata vel oblonga, breviter acuminata; capsula anguste cylindrica.

BARBULA BESCHERELLEI Sauerb. var. **STENOCARPA** Card.

Valle de México: Xoquiapán (*Bro. Amable* 1749).

BARBULA ALTISETA Card. Rev. Bryol. 36: 83. 1909

Tlaxcala: (621, 720).

A robust form, the stems longer and the leaves less strongly revolute than usual.

BARBULA GRACILIFORMIS Schimp. in Besch. Prodr. Bryol. Mex. 35. 1871

Puebla: Cerro Guadalupe (668, 669, 680, 801). Distr. Federal: Mixcoac (9460, 9461). Tlaxcala: Acuitlapilco (725).

Nos. 680 and 801 are more robust forms.

BARBULA GRACILESCENS Schimp. in Besch. Prodr. Bryol. Mex. 34. 1871

Puebla: (600). Morelia: (7946, 7948); Bosque San Pedro (4577 p. p., 4578, 4581, 4925, 4926); Loma Santa María (4888, 4904); Jesús del Monte (7622). Distr. Federal: Mixcoac (9431, 9435, 9454, 9456, 9458, 9469, 9480).

Barbula altiseta Card., *B. graciliformis* Schimp., and *B. gracilescens* Schimp. are very closely allied species, especially the last two.

According to authentic specimens *B. gracilescens* is distinguished from *B. graciliformis* by its flexuose leaves when dry (not stiff and subimbricated), often narrower, with the acumen a little longer and thinner. I have not detected any differences in areolation, costa, or recurvature of the leaf margins. And inasmuch as I have found forms that could not be definitely connected with either species, I am much inclined to believe that these so-called species are in reality but forms of a single one.

BARBULA TERETIUSCULA Schimp. in C. M. Syn. 1: 614. 1849

Puebla: (907); Fort de Lorette (4622). Morelia: Loma Santa María (7864 p. p.).

BARBULA SUBTERETIUSCULA Card. Rev. Bryol. 36: 85. 1909

Puebla: Rancho Posadas (4808).

BARBULA BOURGEANA Besch. Rev. Bryol. 36: 35. 1909

Puebla: (4996); Río San Francisco (4999); Hacienda Alamos (4637).

BARBULA ORIZABENSIS C. M. Linnaea 40: 638. 1876

Puebla: Hacienda Alamos (578); Cerro Guadalupe (4616); Rancho Guadalupe (4590 p. p.). Distr. Federal: Mixcoac (9464, 9467).

All of these plants are sterile but are identical with the type, which I have been able to examine.

The author compares this species with *B. spiralis* Schimp. It is distinguished, he says, by its less twisted leaves and its cylindrical capsule. These characters are rather intangible and valueless to one who has seen a series of specimens of *B. spiralis*. Happily other important and obvious characters are available: In *B. orizabensis* the margins of the leaves are merely reflexed and not revolute; they are plane at the apex, the costa is thinner and not widened in the acumen, and finally the areolation is chlorophyllose and papillose almost to the base. These characters establish the true position of *B. orizabensis* by the side of *B. unguiculata* and not of *B. spiralis*.

I have noticed in all my specimens, as well as in Pringle's no. 10574, the presence of abundant moniliform propagula in the leaf axils.

BARBULA SPIRALIS Schimp. in C. M. Syn. 1: 622. 1849

Puebla: (892); Mayorazgo (4673, 5975); Cerro Guadalupe (655, 663, 675, 681, 690, 691, 692, 693, 4619, 4620); Rancho Guadalupe (728, 4591, 4602 p. p., 4604 p. p., 4607, 4609 p. p.); Río Alseseca (701); Malinche (6003). Distr. Federal: Tlaquecomeca (9478); Mixcoac (9446, 9447, 9449, 9482). Tlaxcala: Acuitlapilco (741, 742). Morelia: Campanario (7922); Andameo (4830, 4843, 4844); Cuincho (5082); Cerro Azul (5053); Loma del Zapote (7509). Valle de México (*Bro. Amable*): San Juanico (1231, 1262); Texcoco (1287); Guadalupe (1228); Peñon de los Baños (1256).

Of all the mosses known to Mexico this species seems to be the most common.

BARBULA EHRENBERGII (Lor.) Fleisch. var. **MEXICANA** Thér., var. nov.

Nuevo Leon: Monterrey (*Bro. Abbon* 10969).

A forma typica differt foliis valde revolutis.

BARBULA (*Hydrogonium*) **RUBRICAULIS** Thér., sp. nov.

Nuevo Leon: Monterrey (*Bro. Abbon* 10968).

Sterilis. Caespites densi, glauco-virides. Caulis erectus, simplex, ruber, 1.5-2 cm. altus, basi terra obrutus, laxe foliosus. Folia sicca

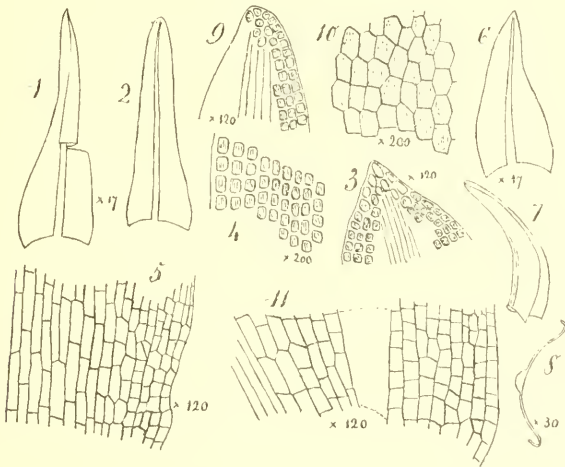


FIG. 10.—*Barbula rubricaulis* Thér. 1, 2, leaves; 3, acumen; 4, median and marginal cells; 5, basal cells. *Barbula Abbonii* Thér. 6, 7, leaves; 8, cross-section of leaf; 9, acumen; 10, median cells; 11, basal cells.

erecto-flexuosa, madida erecta, paulum patula, oblongo-ligulata, sub-obtusa, concava, decurrentia, marginibus integris, planis vel uno latere parce reflexis; costa basi 60-70 μ , apicem attingente, rete chlo

rophyllous, cellulis subquadratis, $10 \times 8 \mu$, laevibus, parietibus incrassatis, rete basilari laxiore, cellulis juxtacostalibus rectangularibus, hyalinis, margines versus quadratis vel breviter rectangularibus. Caetera desunt.

In color of the stems and in form, size, and areolation of the leaves *B. rubricaulis* is very close to *B. dialytrichoides* Thér., from China, differing only in its nearly smooth areolation. I have not seen the fruit.

BARBULA (Hydrogonium) ABBONII Thér., sp. nov.

Nuevo Leon: Monterrey (*Bro. Abbon* 10970).

A *B. rubricaulis* proximo differt: caule viride, foliis siccis valde patulis, humidis subsquarrosis, brevioribus, 1.4 mm. longis, 0.60-0.65 mm. latis, costa latoria, 90-100 μ crassa, cellulis mediis majoribus, 15-20 $\mu \times 10-15 \mu$.

The leaves show the median areolation of *B. Ehrenbergiana* var. *mexicana* and the basal areolation of *B. rubricaulis*; the leaf margins are narrowly revolute three-fourths of the way up from the base.

BARBULA (Streblotrichum) CALCAREA Thér., sp. nov.

Morelia: Loma Santa María, on calcareous rocks (4891). Valle de México: Desierto (*Bro. Amable* 1620).

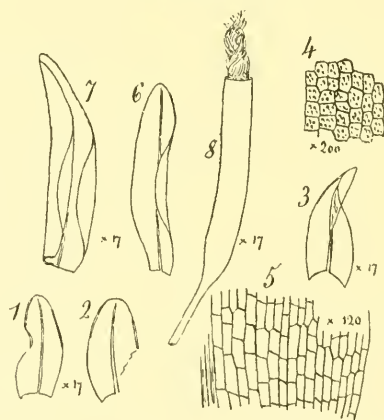


FIG. 11.—*Barbula calcarea* Thér. 1, 2, 3, cauline leaves; 4, median cells; 5, basal cells; 6, 7, perichaetial leaves; 8, deoperculate capsule.

Pusilla. Caulis gracilis, simplex, 3-5 cm. altus, laxe foliosus. Folia mollia, sicca appressa, humida patula, elliptica vel oblonga, late rotundata, decurrentia, marginibus integerrimis, inferne planis, superne

valde revolutis, 0.9 mm. longa, 0.4 mm. lata; costa basi 60 μ , continua, dorso papillosa; cellulis mediis opacis, indistinctis, dense papillosis, diam. 10-12 μ , superioribus minoribus, rete basilari laxiore, pellucido, cellulis rectangularibus, chlorophyllosis, plus minus papillosis, iufimis laevibus. Folia perichaetialia pauca, intima 2 duplo longiora, convoluta, longe vaginantia, apice lingulata, obtusa; pedicellus tenuis, pallido-luteus, 7-8 mm. longus; capsula (immatura) minuta, anguste-cylindrica; operculum rostratum. Caetera ignota.

By its slender habit, its loosely foliate stems, and leaves revolute in the upper two-thirds, the present species is immediately distinguished from *B. hypselostegia* Card. and *B. Muenchii* Card., both of which also have obtuse leaves.

BARBULA (Streblotrichum) STENOTHECA Thér., sp. nov.

Valle de México; Río Frío, on earth (*Bro. Amable* 1726).

Dioica. Caespites sat densi, obscuro-virides. Caulis erectus, flexuosus, gracilis, remote foliosus, 10-15 mm. altus. Folia sicca incurvato-

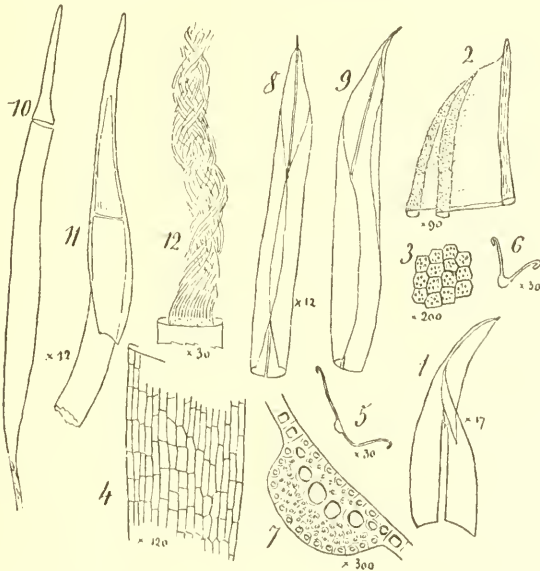


FIG. 12.—*Barbula stenotheca* Thér. 1, cauline leaf; 2, acumen; 3, median leaf cells; 4, basal cells; 5, 6, cross-sections of leaf; 7, cross-section of costa near base; 8, 9, perichaetial leaves; 10, dry capsule; 11, calyptra; 12, peristome.

crispata, madida patula, oblongo-lanceolata, subobtusa, breviter apiculata, marginibus integris, usque ad apicem revolutis, 2 mm. longa, 0.6 mm. lata, costa valida, basi 60 μ crassa, dorso laevi, breviter ex-

currente; rete opaco, cellulis hexagonis, 10 μ , parietibus tenuibus, dense et minute papillois, cellulis inferioribus rectangularibus, pellucidis, laevibus, parietibus firmis. Folia perichaetalia numerosa, externa patulo-subsquarrosa, intima convoluta, longe vaginantia, decolorata, longissima, 4 mm. longa, obtusiuscula, apiculata; pedicellus ruber, 15 mm. longus; capsula erecta, angustissime cylindrica vel arcuato-cylindrica, 4 mm. longa, 0.4 mm. crassa; calyptra $\frac{1}{4}$ partem capsulae obtegens; operculum longe conicum, 1.3 mm. longum; annulus simplex; peristomium elatum, 1 mm. altum, dentibus valde contortis, membrana basilari brevi; sporae laeves, 8-9 μ .

Differs widely from the other Mexican species of the section *Streblotrichum* in size and habit, and especially in the dimensions of the capsule.

MORINIA EHRENBERGIANA (C. M.) Thér., comb. nov.

Barbula Ehrenbergiana C. M. Syn. 1: 636. 1849.

Barbula trichostomoides Besch. Prodr. Bryol. Mex. 38. 1871.

Morinia trichostomoides Card. Rev. Bryol. 37: 124. 1910.

Valle de México: Desierto, on earth (*Bro. Amable* 1240).

While studying this specimen I recognized, by a happy chance, its identity with *Barbula Ehrenbergiana* C. M. and with *Morinia trichostomoides* (Besch.) Card. The name established by Müller has priority, hence the above new combination.

ALOINA CALCEOLIFOLIA (Spruce) Broth. in E. & P. Nat. Pflanzenfam.
1³: 428. 1902

Puebla: (704); Mayorazgo (4672).

ALOINELLA CATENULA Card. Rev. Bryol. 36: 76. 1909

Valle de México (*Bro. Amable*): Desierto (1207 p. p., 1217 p. p.); Salazar (1296 p. p.).

Terrestrial, in isolated bits, always associated with other mosses.

TORTULA PARVA Card. var. LATIFOLIA Thér., var. nov.

Puebla: (4509); Rancho Santa Bárbara (4593, 4600); Hacienda Alamos (4720). Morelia: Cerro Azul (4933). Valle de México: Cartridge Factory (*Bro. Amable* 1459 p. p.).

A forma typica differt statura robustiore, foliis longioribus et duplo latioribus, 1.2-1.8 mm. \times 0.6-0.8 mm.

TORTULA AMPHIDIACEA (C. M.) Broth. in E. & P. Nat. Pflanzenfam.
I^a: 424. 1902

Barbula? *amphidiacea* C. M. Linnaea 38: 639. 1874.

Puebla: Rancho Santa Bárbara (4810 p. p.). Morelia: Parc San Pedro, c. fr. (4587); Cerro Azul (4932). Valle de México: Contadero (*Bro. Amable* 1300, 1308 p. p., 1360).

The plant from San Pedro bears capsules. The fruit being unknown, I describe it: Pedicel short, 6-7 mm., almost hidden by the

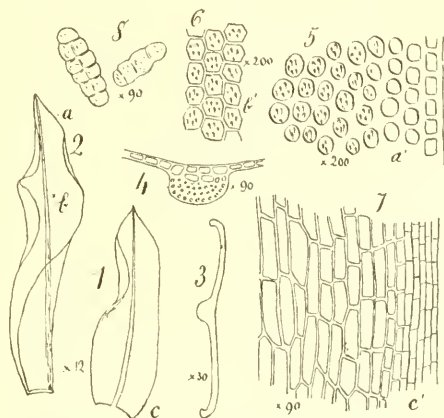


FIG. 13.—*Tortula amphidiacea*. 1, 2, stem leaves; 3, cross-section of a leaf; 4, the same, costa; 5, upper marginal cells toward *a*; 6, median cells; 7, basal cells; 8, propagulae.

long and numerous innovations; capsule oblong-cylindrical. All the capsules are old and have neither operculum nor peristome.

The species is well characterized in other particulars: The leaf is acute and entire, more or less marginate at the base with several rows of narrow cells, the lamina with differentiated, incrassate and smooth cells; the costa is percurrent or short-excurrent; the stems bear oblong propagula.

TORTULA RIPICOLA Thér., sp. nov.

Valle de México: Morales, on earth, bank of a small stream, associated with *Fissidens tortilis* Hampe & C. M. (*Bro. Amable* 1596 p. p.).

Sterilis, pusilla. Caulis inferne denudatus, superne rosulato-foliosus, 0.5-1 cm. altus, in axillis foliorum propagula numerosa, fusca, sphaerica gerens. Folia sicca paulum crispula, humore patula, ovato-lanceolata, obtusa vel raro subacuta, breviter mucronata, marginibus

integerrimis, toto ambitu revolutis, 1.5 mm. longa, 0.6-0.7 mm. lata; rete opaco, dense et minute papilloso; cellulis quadrato-hexagonis, chlorophyllosis, haud incrassatis, diam. $6\ \mu$, basilaribus paucis, hyalinis, laevibus, breviter rectangularibus, costa basi $60\ \mu$, dorso minute pa-

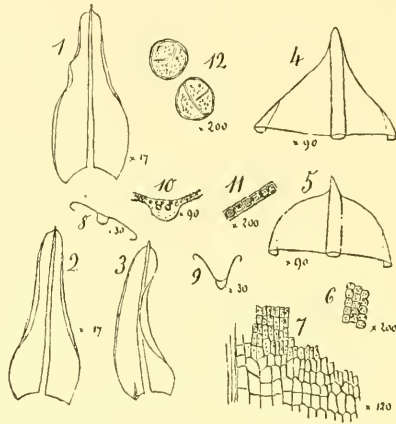


FIG. 14.—*Tortula ripicola* Thér. 1, 2, 3, leaves; 4, 5, acumens; 6, median leaf cells; 7, basal cells; 8, 9, 10, 11, cross-sections of a leaf; 12, propagulae.

pilosa, in mucronem brevem excedente, structura in sectione transversali ut in genere.

Group of *T. papillosa* Wils. Well characterized by its small size, its leaves broadened at base, revolute all around and short-mucronate, and its very compact areolation.

TORTULA FRAGILIS (Tayl.) Mitt. Musc. Austr. Amer. 172. 1869

Tortula confusa Card. Rev. Bryol. 36: 87. 1909.

Tortula Pringlei Card. Rev. Bryol. 36: 87. 1909.

Puebla: (4510); Esperanza (4940). Distr. Federal: Tlalpam (9494).

For the synonymy of this species the reader is referred to a recent note by Mr. E. B. Bartram.¹ While studying Bro. Arsène's collection I also formed a clear idea that Cardot's two species could not be maintained, as the author himself apparently suspected.

TORTULA OBTUSISSIMA (C. M.) Mitt. Musc. Austr. Amer. 174. 1869

Puebla: Cerro Guadalupe (667, 673). Tlaxcala: (606). Valle de México (Bro. Amable): San Juanico (1232); Tenayuca (1376); Xoquiapán (1675).

¹ Bryologist 29: 53. 1926.

TORTULA OBTUSISSIMA (C. M.) Mitt. var. **CONNECTENS** (Card.) Thér.,
comb. nov.

Tortula connectens Card. Rev. Bryol. 36: 87. 1909.

Puebla: Fort Guadalupe (4621). Morelia: Cerro Azul (4531).
Distr. Federal: Mixcoac (9485).

The characters indicated to separate *T. connectens* from *T. obtusissima* do not appear constant, and I combine the two species.

GRIMMIACEAE (continued)

GRIMMIA INVOLUCRATA Card. Rev. Bryol. 36: 105. 1909

Valle de México (*Bro. Amable*): Tlalpam, c. fr. (1448); Zacatenco, ster. (1352).

GRIMMIA PRAETERMISSA Card. Rev. Bryol. 36: 105. 1909

Valle de México (*Bro. Amable*): Río Frío, on rocks (1401 p. p., 1681).

The capsule is sometimes pale and scarcely exerted, sometimes brown, longer-pedicellate, and well exerted.

GRIMMIA CALIFORNICA Sull. in U. S. Rep. Expl. Miss. Pacif. 4: 187, pl. 4.
1856

Valle de México (*Bro. Amable*): Río Frío, intimately mixed with the preceding species (1401 p. p.); Llano Grande, alt. 3,700 meters (1724, 1734).

GRIMMIA PULLA Card. Rev. Bryol. 36: 106. 1909

Valle de México: Contreras, on rocks (*Bro. Amable*).

The plants are fruited, but the over-ripe capsules have lost their peristomes. Sporophyte pseudo-lateral, because of the 1-3 rather elongated innovations borne under the male flower; pedicel 2-2.5 mm. long, suberect when dry, arcuate when moist; capsule oblong, strongly furrowed.

SPLACHNACEAE

TAYLORIA (*Eutayloria*) **TORTELLOIDES** Thér., sp. nov.

Hidalgo: El Chico, 2,600 meters (*Bro. Amable* 1587 p. p.). Growing as isolated stems among other mosses, especially with *Bryum Ehrenbergianum*.

Dioica? Flos masculus ignotus. Caulis brevis, vix 1 cm. altus, simplex vel parce ramosus, inferne denudatus, radiculosus, paucifoliatus, apice rosulato-foliosus. Folia sicca valde crispata, nitida, humore patentia, oblongo-spathulata, e basi contracta, decurrentia, apice rotundata, apiculata, apiculo brevi, obliquo, marginibus planis, inferne paulum reflexis, integris vel remote et obtuse denticulatis, 3 mm. longa, 2 mm. lata; costa basi $120\ \mu$, raptim attenuata, sub apicem evanescente, in sectione transversali ut in genere; cellulis mediis hexagonis, chlorophyllosis, parietibus tenuibus, $60 \times 30\ \mu$, marginalibus

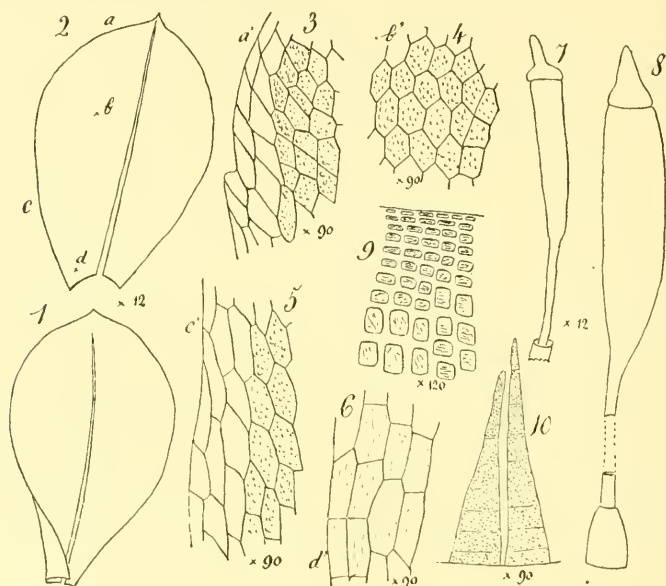


FIG. 15.—*Tayloria tortelloides* Thér. 1, lower leaf; 2, comal leaf; 3, upper cells at *a*; 4, median cells at *b*; 5, marginal cells toward *c*; 6, basal cells; 7, young dry capsule; 8, moist capsule; 9, wall of capsule orifice; 10, fragment of peristome.

(2-3 ser.) elongatis, inanis, cellulis basilaribus rectangularibus, parce chlorophyllosis. Folia perichaetialia similia, intima minora; pedicellus erectus, perbrevis, 1.5 mm. longus, laevis, pallidus; capsula subcylindrica, brevicollis, 2 mm. longa; operculum obtuse conicum, columella inclusa, peristomii 16 dentes liberi, opaci, dense papilloso, 0.4 mm. longi; sporae laeves, $15-18\ \mu$ crassae. Calyptra?

The extremely short pedicel and the entire leaves, rounded apiculate, broadly spatulate, and shrivelled when dry (like some *Tortula*), readily distinguish this plant from the other species of the subgenus *Eutayloria*.

BRYACEAE (continued)

MIELICHHOFERIA SAINT-PIERREI Thér., sp. nov.

Valle de México: Lerma; leg. *Marius Saint Pierre* (*Bro. Amable* 1685).

Paroica, laxiuscula caespitosa, tenella, viridis. Caulis julaceus, 2-3 mm. altus, ramis erectis, vix 5 mm. longis. Folia caulina conferta, imbricata, ovato vel oblongo-lanceolata, acuminata, acuta, 0.8-1.2 mm. longa, 0.4-0.5 mm. lata, marginibus parce et anguste reflexis, superne remote denticulatis vel sinuolatis, costa basi 30-36 μ crassa, subpercur-

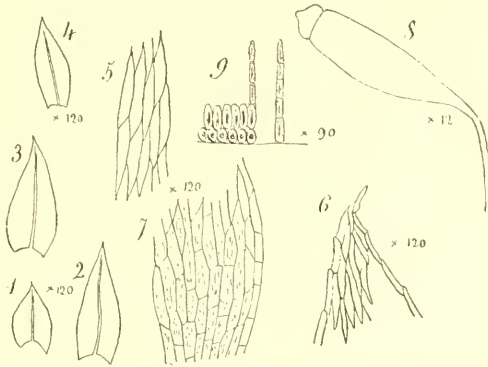


FIG. 16.—*Mielichhoferia Saint-Pierrei* Thér. 1, 2, 3, stem leaves; 4, leaf from an innovation; 5, median cells; 6, apical cells; 7, basal cells; 8, moist capsule; 9, fragment of peristome and annulus.

rente, rete membranaceo, cellulis elongate rhomboideis, 60-70 $\mu \times 12 \mu$, marginibus angustioribus, basilaribus rectangularibus; folia ramea angustiora, marginibus erectis. Folia perichaetialia caulinis similia; pedicellus erectus, 8-12 mm. longus; capsula inclinata vel subhorizontalis, symmetrica, oblongo-cylindrica, collo attenuato instructa; annulus latus; peristomium simplex, membrana basilari subnulla, processus angusti, 10 μ lati, granulosi haud appendiculati; sporae sublaeves, 12-15 μ ; operculum convexum, mamillatum.

LEPTOBRYUM PYRIFORME (L.) Wils.

Valle de México: Tlalpam (*Bro. Amable* 1246 p. p.).

EPIPTERYGIUM MEXICANUM (Besch.) Broth.

Valle de México (*Bro. Amable*): Puente de la Venta (1400); Santa Rosa (1513); Desierto (1642).

EPIPTERYGIUM MEXICANUM (Besch.) Broth. var. ANGUSTIRETE Thér.,
var. nov.

Valle de México: Contreras (*Bro. Amable* 1659).

Folia angustiora, cellulis chlorophyllosis, angustioribus.

MNIOBRYUM INTEGRUM (Card.) Broth. in E. & P. Nat. Pflanzenfam.
ed. 2, 10: 363. 1924

Webera integra Card. Rev. Bryol. 40: 11. 1913.

Valle de México: Contreras (*Bro. Amable* 1478).

WEBERA SPECTABILIS (C. M.) Jaeg.

Webera cylindrica (Mont.) Schimp. in Besch. Prodr. Bryol. Mex. 52. 1871.

I have received from Bro. Amable rather numerous collections of *Webera* of the present relationship, but frankly, I have not succeeded in distinguishing *W. cylindrica* from *W. spectabilis*. The characters I had considered distinctive are rarely combined on the same plant and all of them show a rather wide variability, as, for instance, in the width of the leaf, the recurvature of the margin, the width of the costa and of the cells, and the length of the capsule. My conclusion is that we must unite the two species. *Webera spectabilis* has priority.

WEBERA PSEUDO-BARBULA Thér., sp. nov.

Valle de México (*Bro. Amable*): Desierto (1630, 1643); Contreras (1658); Lerma (1684).—In all these localities the plants grow in company with *Anomobryum filiforme* var. *mexicanum*, a remarkable fact of association.

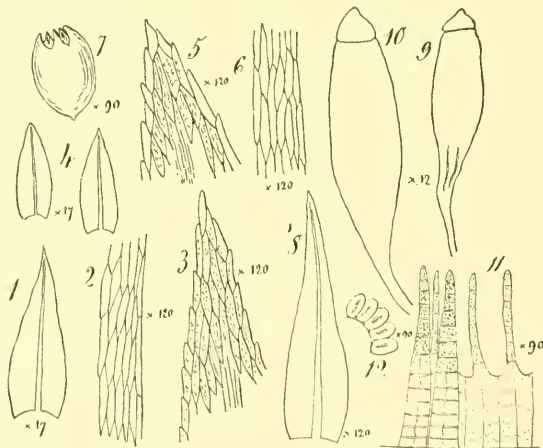


FIG. 17.—*Webera pseudo-Barbula* Thér. 1, stem leaf; 2, marginal and median cells; 3, apical cells; 4, leaves of innovations; 5, apical cells of 4; 6, marginal and median cells of 4; 7, propagula; 8, perichaetial leaf; 9, dry capsule; 10, moist capsule; 11, peristome (fragment); 12, fragment of annulus.

Dioica. Caespites laxi, virides. Caulis brevis, 5 mm. longus, superne innovationibus elongatis, 10-15 mm. longis, in axillis foliorum superiorum propagula fusca, numerosa, subglobosa gerens. Folia sicca erecta, parum flexuosa, humore erecto-patula, ovato-acuminata, 1.2-1.5 mm. longa, 0.5 mm. lata, marginibus planis, interdum anguste revolutis, elimbatis, integerrimis, apice denticulatis; costa basi $60\ \mu$, sensim attenuata, ante apicem evanescente; cellulis anguste rhomboideis, chlorophyllosis, $70-90\ \mu \times 8-9\ \mu$, ad marginem angustioribus; folia innovationis similia sed minora. Folia perichaetialia longiora, ovato-lanceolata, acuminata, intima anguste lanceolata, tenui-acuminata, marginibus revolutis, costa percurrente; pedicellus flexuosus, 20-25 mm. altus; capsula suberecta vel inclinata, oblonga collo brevior attenuata; operculum convexum, mamillatum; annulus latus; exostomii dentes pallidi, haud marginati, dorso inferne laeves, superne papilloso, 0.27 mm. alti, membrana ad $\frac{1}{3}$ dentium producta, processus lineares, fugaces, cilia rudimentaria; spora diam. 12-15 μ .

Very close to *W. didymodontia* (Mitt.) Broth., which is distinguished at a glance by its globular capsule.

BRACHYMENIUM (*Dicranobryum*) **SAINT-PIERREI** Thér., sp. nov.

Valle de México: Contreras, on earth; leg. *Marius Saint-Pierre* (*Bro. Amable* 1338 p. p.).

Dioicum. Caulis brevis, 2-3 mm. altus, inferne denudatus, innovationibus numerosis, clavatis. Folia sicca appressa, oblonga, breviter

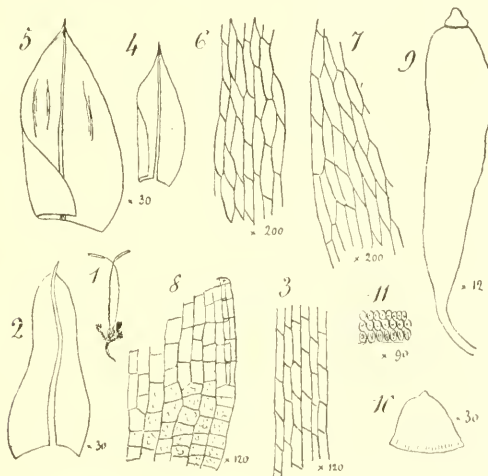


FIG. 18.—*Brachymenium Saint-Pierrei* Thér. 1, plant at natural size; 2, stem leaf; 3, median cells; 4, lower leaf of innovation; 5, upper leaf of innovation; 6, median cells; 7, marginal cells; 8, basal cells; 9, moist capsule; 10, operculum; 11, fragment of annulus.

acuminata, mucronata, elimbata, marginibus integris, planis; costa flexuosa, basi $40\ \mu$, breviter excurrente, cellulis longe hexagonis, $36-60\ \mu \times 10\ \mu$, basilaribus quadratis; folia innovationis inferiora minuta, caetera sensim majora, valde concava, apice congesta. Folia perichaetialia majora, deltoidea; pedicellus pertenuis, flexuosus, 12-15 mm. longus; capsula suberecta vel horizontalis, microstoma, oblongo-cylindrica, collo longo attenuata; annulus latus; operculum conico-convexum, mamillatum; peristomium externum normale, 0.32 mm. altum, internum? (capsulae immaturae); sporaes laeves, $18\ \mu$ crassae.

In the size and form of its capsule this species recalls *B. rubricarpum* (Besch.). It differs in its leaves, which are of another form, short-mucronate, with the hair-point not spreading when dry, in its areolation, the median cells of which are a little shorter and the marginal cells not differentiated, and in its paler capsule.

BRYUM BOTTERII C. M. *Linnaea* 38: 622. 1874

Valle de México (*Bro. Amable*): Desierto (1619, 1633, 1637); Río Frío (1709); Salazar (1714); Llano Grande, 3,700 meters (1736).

BARTRAMIACEAE (continued)

BARTRAMIA ITHYPHYLLA (Hall.) Brid.

Valle de México: Río Frío (*Bro. Amable* 1405, 1407 p. p.).
This species is new to Mexico.

BARTRAMIA THRAUSTA Schimp.; C. M., *Nuov. Giorn. Bot. Ital.* 4: 41. 1897

Valle de México: On rocks (*Bro. Amable* 1502 p. p., 1503 p. p.).
An interesting discovery. This species belongs to the South American flora and was known previously only from Bolivia and Argentina. Unfortunately I found only two specimens, these among tufts of *Anacolia intertexta*.

BARTRAMIDULA MEXICANA Schimp. in *Besch. Prodr. Bryol. Mex.* 58. 1871

Valle de México: Desierto (*Bro. Amable* 1624).

PTYCHOMITRIACEAE

PTYCHOMITRIUM LEPIDOMITRIUM Schimp. in *Besch. Prodr. Bryol. Mex.* 41. 1871

Valle de México (*Bro. Amable*): Contreras (1443, 1469); Salazar (1719).

HEDWIGIACEAE (continued)

HEDWIGIDIUM IMBERBE (Sm.) Bry. Eur.

Valle de México: Salazar, on trunks of trees (*Bro. Amable* 1294 p. p.).

A new genus for Mexico, also, I believe, for all of North America. This number (1294) was made up of a close intermixture of four species, two of them predominant: *Hedwigidium imberbe* and *Neocardotia subnigra*; the two others, *Hedwigia albicans* var. *viridis* and *Braunia secunda*, were represented by a few plants only.

It was an easy matter to separate *Neocardotia subnigra* and *Hedwigia albicans*, but quite another thing with regard to *Braunia secunda*, whose presence I did not even suspect. If some fruiting plants had not been present this species would have been overlooked, its size and appearance being so similar to those of *Hedwigidium imberbe*.

It is rather unusual to find, associated in such a manner, two species that are indistinguishable either to the naked eye or by the use of a hand lens except by their fruit; and it is even more unusual to be unable to find morphological and anatomical characters by which to separate them. The form and size of the leaves, recurvature of the borders, plication of the lamina, and areolation, all are identical. I do not know of another example of such an association and such a similarity.

AMBLYSTEGIACEAE

CAMPYLIUM CHRYSOPHYLLUM (Brid.) Bryhn, Explor. 61. 1893

Hypnum chrysophyllum Brid. Musc. Rec. 2²: 84. pl. 2. 1801.

Morelia: Loma Santa María (7870).

CAMPYLIUM HISPIDULUM (Brid.) Mitt. var. SOMMERFELTII (Myrin)
Lindb. Musc. Scand. 38. 1879

Puebla: Rancho Guadalupe (4602). Morelia: Cerro Azul (4561); Loma Santa María (5103, 5105, 7859 p. p.); Campanario (7462 p. p.). Valle de México (*Bro. Amable*): Desierto (1222 p. p., 1238, 1432); Contreras (1462, 1490).

AMBLYSTEGIUM SERPENS (L.) Bry. Eur.

Distr. Federal: Tlalpam (9493).

This species seems to be new to Mexico.

AMBLYSTEGIUM VARIUM (Hedw.) Lindb. var. **ARSENEI** (Par. & Broth.)
Thér., var. nov.

Amblystegium Arseni Par. & Broth., Ms.

Puebla: Río San Francisco (5004). Valle de México: Tlalpam (*Bro. Amable* 1453).

I had previously received this plant from E. G. Paris under the name *A. Arseni* Par. & Broth., sp. nov., likewise from Río San Francisco. Indeed, at first sight it would appear different from *A. varium* in several respects: (1) Its narrower leaves; (2) its greatly developed perichaetium, the perichaetial leaves being almost 4 times longer than the cauline leaves; (3) the capsule not arcuate when dry.

These characters, however, fade out to some extent upon close examination: (1) In *A. varium* the form of the leaves is very variable; (2) if specimens of *A. varium* are found with an inconspicuous perichaetium and short perichaetial leaves, there are others whose perichaetium is as well developed as in *A. Arseni*; (3) there remains only the character afforded by the form of the capsule. This last is not sufficient to justify the recognition of a species.

AMBLYSTEGIUM ORTHOCLADUM (Beauv.) Jaeg.

Puebla: Finca Guadalupe (737); Hacienda Alamos (4723, 4725).
Morelia: Bosque San Pedro (4569).

The last plant, probably half submerged, is a form with greatly elongated stems and branches and a thicker nerve (60 μ).

AMBLYSTEGIUM RADICALE (Beauv.) Mitt. *Musc. Austr. Amer.* 569. 1869

Puebla: Hacienda Batán (934); Río San Francisco (5000).

Plants sterile, the determination only probable. The plant from Río San Francisco has the stems and branches laxly foliate and the larger leaves widely spreading, either dry or moist.

AMBLYSTEGIUM JURATZKANUM Schimp.

Valle de México: Tlalpam (*Bro. Amable* 1346 p. p.).

The nerve extends well into the apex of the leaf. This is almost the only difference I could find, as compared with the preceding plants identified as *A. radiale*.

AMBLYSTEGIUM HYGROPHILUM (Jur.) Schimp.

Puebla: Hacienda Batán (5008).

A new species for Mexico.

HYGROHYPNUM PALUSTRE (Huds.) Loesk.

Puebla: San Felipe (4504, 4505).

This species was not known previously from Mexico.

DREPANOCLADUS EXANNULATUS (Gümb.) Warnst. var. **MEXICANUS** (Mitt.) Card. Rev. Bryol. 37: 54. 1910

Puebla: Hacienda Batán (4961). Querétaro: Cienaga de la Cañada (11002).

The var. *mexicanus* seems close to var. *pinnatus* (Boul.), from which it may be distinguished by its almost entire leaves, with thinner costae. The most conspicuous character of this variety consists in the very marked apical prominence of the cells. It is, perhaps, the first time this peculiarity has been noted in connection with *D. exannulatus*.

PLATYHYPNIDIUM SUBRUSCIFORME (C. M.) Fleisch. Laubm. Fl. Jav. 4: 1537. 1922

Hypnum subruscifforme C. M. Linnæa 38: 658. 1874.

Rhynchostegium malacocladum Card. Rev. Bryol. 37: 71. 1910.

Puebla: (699); banks of Alseseca (700); Cerro Guadalupe (676); Hacienda Alamos (4626, 4629, 4761). Valle de México (*Bro. Amable*): Morales (1597); Tenango (1687).

I have noticed the variability of this species with regard to the form of the acumen and of the capsule.

PLATYHYPNIDIUM PRINGLEI (Card.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 347. 1925

Rhynchostegium Pringlei Card. Rev. Bryol. 37: 70. 1910.

Puebla: Hacienda Alamos (4628, 4769 p. p.); Hacienda Batán (5006). Morelia: Parc San Pedro (4589); Andameo (4822); Campanario (7534); Loma Santa María (4908, 4910).

PLATYHYPNIDIUM OBTUSIFOLIUM (Besch.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 347. 1925.

Rhynchostegium obtusifolium Besch. in Card. Rev. Bryol. 37: 71. 1910.

Morelia: Cerro San Miguel (4870, 5041, 5071); Campanario (7631); Loma Santa María (4890, 4917). Distr. Federal: Tlalpam (9492).

PLATYHYPNIDIUM OBTUSIFOLIUM (Besch.) Broth. var. **SUBACUTUM** Thér., var. nov.

Leaves subacute and contracted at the apex.

Valle de México: Tlalpam, in water (*Bro. Amable* 1450, 1452).

BRACHYTHECIACEAE

PLEUROPUS BONPLANDII (Hook.) Broth. in E. & P. Nat. Pflanzenfam. 1^a:
1136. 1908

Leskea Bonplandii Hook. in Kunth Syn. Pl. Aequin. 1: 61. 1822-28.

Puebla: Esperanza (4745, 4754). Valle de México (*Bro. Amable*): Desierto (1438); Santa Rosa (1504). Hidalgo: El Chico (1580).

BRACHYTHECIUM

I must confess that the study of the Mexican specimens belonging to the genus *Brachythecium* has been an extremely laborious task: The sterility of many of them on the one hand and, on the other, the difficulty if not the impossibility of obtaining, for the sake of comparison, good and complete specimens of the types, are among the more important contributory causes.

I studied nearly 60 numbered specimens and drew almost all of them. They belong, excepting five or six, to the sections *Acuminata* and *Salebrosa*. Now except for *B. salebrosum* (Hoffm.) and *B. laxi-reticulatum* Card., the Mexican species of this group are very difficult to identify. For one specimen that agrees with the type there are many others which combine characters common to several species and which one hesitates to attribute to one rather than the other. Hence I gave three different names in succession to the same specimen without being entirely satisfied with any of them. My conclusions are as follows:

(1) Several of my determinations remain uncertain; they are merely probable.

(2) Some of the Mexican species are very polymorphous, like our *B. rutabulum*, and their forms have been taken for new species. Therefore one must not be surprised to find indeterminable specimens which in turn seem like new species.

It will be a task for future bryologists, those who will have the privilege of studying the flora *in situ*, to weigh these variable species and to make, with a thorough knowledge of the facts, whatever reductions are necessary.

BRACHYTHECIUM TENUINERVE Card. Rev. Bryol. 37: 65. 1910

Puebla: Xuehitl, near Esperanza (7988). A form which by its laxer areolation marks a tendency toward *B. lanceolifolium* Card.

Valle de México (*Bro. Amable*): Contreras (1221, 1483); Desierto (1618); Salazar (1717); Llano Grande (1738). This is a form with very elongate branches.

BRACHYTHECIUM ALBULUM Besch. in Card. Rev. Bryol. 37: 66. 1910

Morelia: Bosque San Pedro (4582).

I have seen only a very incomplete specimen of the type. The present specimen seems to differ from it by the longer and more slender acumen of the leaves.

BRACHYTHECIUM LANCEOLIFOLIUM Card. Rev. Bryol. 37: 66. 1910

Puebla: Cerro Guadalupe (796); Hacienda Alamos (4760); Río San Francisco (5003). Morelia: Loma Santa María (5089). Distr. Federal: Mixcoac (9453). Valle de México (*Bro. Amable*): Santa Teresa (1339); Contadero (1364); Tizapán (1612).

BRACHYTHECIUM LANCEOLIFOLIUM Card. var. **GRACILE** Card. Rev. Bryol. 37: 66. 1910

Puebla: Hacienda Batán (935); Hacienda Alamos (4799). Morelia: Campanario (7452).

BRACHYTHECIUM CLADONEURON (C. M.) Par. Ind. Bryol. 132. 1894

Hypnum cladoneuron C. M. Linnaea 38: 652. 1874.

Puebla: Hacienda Alamos (4696).

BRACHYTHECIUM COMTIFOLIUM (C. M.) Jaeg.

Hypnum comtifolium C. M. Linnaea 38: 653. 1874.

Valle de México: Desierto (*Bro. Amable* 1238).

BRACHYTHECIUM TROCHALOBASIS C. M. Bull. Herb. Boiss. 5: 238. 1897

Puebla: Esperanza (4729). Morelia: Cascade de Coincho (4713); Carindapaz (7951); Santa Clara (4886).

BRACHYTHECIUM FLEXIVENTROSUM (C. M.) Jaeg.

Hypnum flexiventrosum C. M. Linnaea 38: 653. 1874.

Morelia: Cerro San Miguel (7546); Campanario (7940); Cerro Azul (4532, 4541, 4554, 4788). Distr. Federal: Tlalpan (9498). Valle de México (*Bro. Amable*): Desierto (1222 p. p.); San Juanico (1261).

Several of these specimens oscillate between this species and the preceding one. In their long and slender acumen and flexuose costa they tend toward *B. flexiventrosum*; but the habit, the short nerve, and the short pedicel (1 cm. or less) bring them nearer to *B. trochalobasis*. I am not far from believing that these two species should be united into one.

BRACHYTHECIUM SERICEOLUM Card. Rev. Bryol. 37: 66. 1910

Puebla: (4997); Hacienda Batán (4975).

BRACHYTHECIUM FLEXINERVE Card. Rev. Bryol. 37: 67. 1910

Puebla: (4862); Hacienda Santa Bárbara (740). Tlaxcala: (4855).

BRACHYTHECIUM ALBO-FLAVENS Card. Rev. Bryol. 37: 68. 1910

Puebla: Rancho Guadalupe (4614); Esperanza (4666). Morelia: Campanario (7537, 7566); Cerro Azul (4530).

BRACHYTHECIUM ALBO-VIRIDE Besch. in Card. Rev. Bryol. 37: 69. 1910

Puebla: Boca del Monte (4674). Morelia: Campanario (7539).

I recognize in these specimens most of the characters attributed to *B. albo-viride*: the green color of the tufts, the laxly foliate branches, the lanceolate leaves strongly excavate at the base, long-acuminate, with a costa reaching to two-thirds and even three-fourths of the leaf; but I have not noticed that the stems are more slender and the branches more tenuous than in *B. albo-flavens*.

BRACHYTHECIUM LAXIRETICULATUM Card. Rev. Bryol. 37: 67. 1910

Valle de México: Desierto (*Bro. Amable* 1412).

BRACHYTHECIUM ACUTUM (Mitt.) Sull. Icon. Musc. Suppl. 99. pl. 75. 1874

Pueblo: Río San Francisco (5001 p. p.); sterile plant.

BRACHYTHECIUM SALEBROSUM (Hoffm.) Bry. Eur.

Puebla: Esperanza (4515, 4664, 4690).

BRACHYTHECIUM SALEBROSUM var. **POLYOICUM** Thér., var. nov.

Synicous and unisexual flowers, male and female, on the same stem.

Puebla: Hacienda Batán (4937).

I combine this curious form with *B. salebrosus* on account of its characters as a whole. It is much nearer to it than to the known synicous or polyoicous species *B. acutum*, *B. conostomum*, and *B. Mildeanum*.

BRACHYTHECIUM INTEGRIFOLIUM Thér., sp. nov.

Distr. Federal: Tlalpam (9499).

Sterile. Caulis repens, radiculosus, sat regulariter pinnatus, ramis inaequalibus, 3-4 mm., usque 10 mm. longis, patulis, attenuatis. Folia caulina sicca et humida erecto-appressa, e basi decurrente latissime cordato-ovalia in acumen longiusculum, patulum, acutum sat subito constricta, haud plicata, marginibus planis, integerrimis, 1.6-1.7 mm.

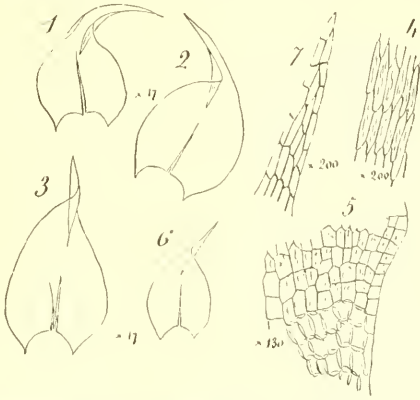


FIG. 19.—*Brachythecium integrifolium* Thér. 1, 2, 3, stem leaves; 4, median cells; 5, basal and alar cells; 6, branch leaves; 7, acumen.

longa, 0.8-0.9 mm. lata, costa ad $\frac{2}{3}$ evanida; rete pellucido, chlorophylloso, cellulis linearibus, parietibus tenuibus, $35-45 \mu \times 5-6 \mu$, cellulis basilaribus et alaribus laxioribus, breviter rectangularibus. Folia ramea minora, secunda, subfalcata, 1 mm. \times 0.5 mm. Caetera ignota.

In size and habit like *B. hylacomioides* Card., but that species has denticulate non-falciform leaves and looser areolation. It suggests also *B. reflexum* Starke, but is easily distinguished by its entire leaves, with the nerve reaching only to the base of the acumen.

BRACHYTHECIUM CORBIEREI Card. Rev. Bryol. 38: 42. 1911

Valle de México (*Bro. Amable*): Desierto (1222 p. p., 1441); Río Frío (1692, 1703, 1706); Contadero (1307).

The last number (1307) represents a form with long, flexuose stems, irregularly ramose, with long, slender, almost flagelliform branches.

BRACHYTHECIUM PLUMOSUM (Sw.) Bry. Eur.

Puebla: Huejotzingo (4856). Morelia: Loma Santa María (4896). Valle de México (*Bro. Amable*): Desierto (1245, 1616, 1640); Contreras (1668). Hidalgo: El Chico (1586).

Of the material listed no. 1668 may be classified as var. *sublaevipes* Card.,¹ because the pedicel is scarcely papillose at the top; under a strong magnification one can see only separated, depressed, low papillae. In this specimen a single costa is the exception; most of the leaves have a double nerve of very variable length, sometimes very short. The *Bryologia Europaea* indicates that this case is not of rare occurrence.

BRACHYTHECIUM HASTIFOLIUM Card. Rev. Bryol. 37: 69. 1910

This species is not mentioned by Brotherus in his treatment of *Brachythecium* in the second edition of *Die natürlichen Pflanzenfamilien*, but I am inclined to think that it is the one cited in the genus *Heterophyllum* under the combination *H. hastifolium* (Card.) Fleisch.

Cardot says, "Costa ad $\frac{2}{3}$ evanida." How can this character agree with the genus *Heterophyllum*, which has "Rippe sehr kurz oder fehlend?" How could a moss which a bryologist of the standing of Cardot affirms to belong to the genus *Brachythecium* have at the same time the characters of the family Brachytheciaceae and those common to the genus *Heterophyllum* of the family Sematophyllaceae?

I have endeavored to solve this puzzle. An examination of no. 10474 of Pringle's exsiccata brought the answer to me. The specimen in my collection labelled *Brachythecium hastifolium* Card. is not this species, but *Heterophyllum affine* (Hook.) Fleisch. Now if one turns to the original description, where Cardot discusses Pringle's no. 10474, which he considers as a form of his *Brachythecium hastifolium*, the inference is clear that Pringle distributed under this same number (10474) two different species—the form just mentioned and *Heterophyllum affine*. I take no pride in this discovery, but I cannot understand why such an expert and conscientious bryologist as Fleischer failed to find the clue and thus allowed himself to be misled into giving full confidence to a specimen which did not agree with the original description and was distributed by a collector who was not a bryologist.

My conclusions are: First, that *Heterophyllum hastifolium* (Card.) Fleisch. is a myth, and that this combination must disappear from nomenclature; secondly, that the binomial, *Brachythecium hastifolium* Card., which applies to one of the best characterized species of the subgenus *Salebrosium*, ought to take again its place.

¹ Rev. Bryol. 37: 70. 1910.

RHYNCHOSTEGIUM SAINT-PIERREI Thér., sp. nov.

Valle de México: Contadero, on bark; leg. *Marius Saint-Pierre* (*Bro. Amable* 1298).

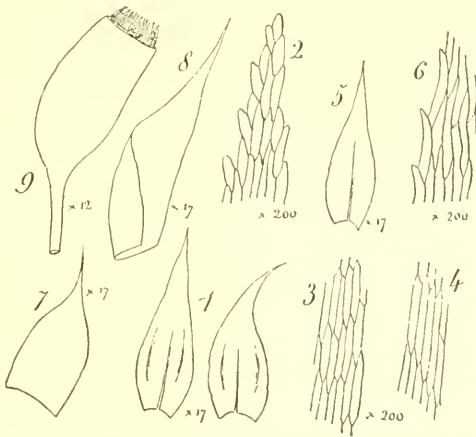


FIG. 20.—*Rhynchostegium Saint-Pierrei* Thér. 1, stem leaves; 2, apical cells; 3, upper cells; 4, median cells; 5, branch leaf; 6, marginal cells; 7, 8, perichaetial leaves; 9, moist capsule.

Rh. leptomero-carpo (C. M.) sat simile, sed differt colore smaragdo-viridi, caulibus gracilibus, laxe foliosis, foliis siccis valde patulis, duplo angustioribus (1.7 mm. \times 0.5 mm.), tenuiter acuminatis, paulum decurrentibus, rete densiore (cellulis mediis 90-120 μ \times 6 μ), foliis perichaetialibus duplo majoribus, pedicellis longioribus (2 cm. longis).

RHYNCHOSTEGIUM HUITOMALCONUM (C. M.) Besch. Prodr. Bryol. Mex. 107. 1871

Hypnum huitomalconum C. M. Syn. 2: 248. 1850.

Morelia: Cascade de Coincho (4712a); Andameo (4827). Valle de México: Tlalpam (*Bro. Amable*).

RHYNCHOSTEGIUM LEPTOMEROCARPUM (C. M.) Besch. Prodr. Bryol. Mex. 107. 1871

Hypnum leptomero-carpum C. M. Syn. 2: 354. 1850.

Puebla: Hacienda Alamos (586). Morelia: Loma Santa María (4868, 4894, 5062). Distr. Federal: Tlalpam (9430a); Cuajimalpa (9487, 9489). Valle de México (*Bro. Amable*): Santa Rosa (1515); Contadero (1315).

RHYNCHOSTEGIELLA ARSENEI Thér., sp. nov.

Puebla: Hacienda Santa Bárbara, on sandy ground (739).

Sterile. Caespites lutescenti-virides, nitidi. Caulis repens, gracilis, laxe foliosus, ramosus, parce radiculosus, paraphyllis raris; ramis erectis, brevibus, 2-3 mm. longis, sat confertis, sat dense foliosis. Folia caulina et ramea sicca erecto-patula, humida patentia, anguste lanceolata-acuminata, acuta, decurrentia, marginibus planis, toto am-

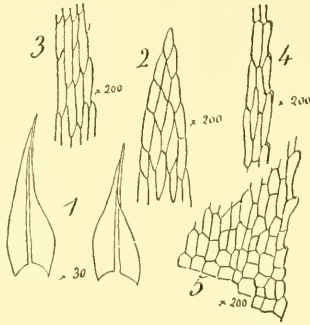


FIG. 21.—*Rhynchostegiella Arseni* Thér. 1, stem leaves; 2, apical cells; 3, median cells; 4, marginal cells; 5, basal cells.

bitu minute denticulatis, 0.6-0.7 mm. \times 0.2 mm.; costa basi 30 μ percurrente; rete opaco, cellulis linearibus, 36-40 μ \times 6 μ , basilaribus sat distinctis, marginalibus subquadratis (2-3 ser.), subhyalinis.

This species can be compared only with *R. Jacquini* (Garov.) Limpr. and *R. Teesdalii* (Sm.) Limpr. It is distinct from both by its leaves denticulate all around and from the first species also by its larger branch leaves, differentiated basal areolation, and more densely foliate branches; from the second species by its acute, decurrent leaves.

EURHYNCHIUM SUBSTRIATUM Thér., sp. nov.

Valle de México: Llano Grande, alt. 3,700 meters, on rocks (*Bro. Amable* 1735).

E. striato (Schreb.) simillimum differt: statura graciliore, ramis brevioribus, foliis minus profunde sulcatis, caulinis angustius decurrentibus, rete basilaris praecipue ad angulos densiore, foliis rameis margine dentibus brevioribus.

I segregate this plant from *E. striatum*, because, in addition to the characters enumerated above, the European species is absolutely un-

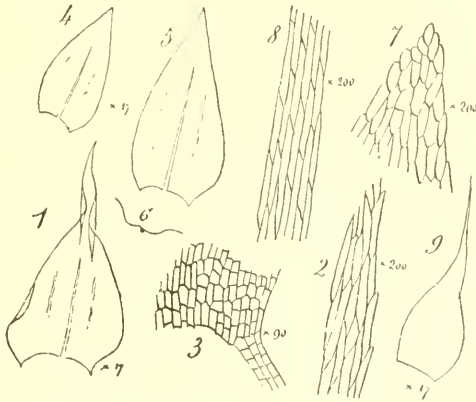


FIG. 22.—*Eurhynchium substriatum* Thér. 1, stem leaf; 2, median and marginal cells; 3, basal cells; 4, 5, branch leaves; 6, cross-section of branch leaf; 7, apical cells; 8, median cells; 9, perichaetial leaf.

known throughout the American continent and it is therefore hardly possible to consider the moss from Llano Grande as a local form.

EURHYNCHIUM STOKESII (Turn.) Bry. Eur.

Puebla: Boca del Monte (4738); a form with stems less densely branched, elongate, and laxly foliate. Valle de México: Contreras (*Bro. Amable* 1518).

ENTODONTACEAE (continued)

PTERIGYNANDRUM FILIFORME (Timm.) Hedw. var. **MEXICANUM** Thér., var. nov.

Folia valde secunda, latiora (0.5 mm.), cellulis apice parum prominulis, costa gemella usque ad $\frac{1}{3}$ folii producta.

Valle de México: Santa Rosa (*Bro. Amable* 1503). Hidalgo: Mineral del Chico (*Orcutt* 6649).

The typical form of this species has not yet been found in Mexico.

ROZEA STRICTA

Besch. Prodr. Bryol. Mex. 100. 1871

Valle de México (*Bro. Amable*): Desierto (1418, 1425, 1444); Llano Grande (1731).

ENTODON JAMESONII (Tayl.) Mitt. Musc. Austr. Amer. 525. 1869

Morelia: Cerro Azul (4779). Valle de México (*Bro. Amable*): Desierto (1245); Contadero (1311).

ENTODON ABBREVIATUS (Bry. Eur.) Jaeg.

Valle de México (*Bro. Amable*): Contadero (1302, 1305); San Rafael (1280).

The pedicel is very variable in length. In the same tuft I have seen pedicels 3 mm. long and others up to 9 mm. long.

ENTODON ABBREVIATUS (Bry. Eur.) Jaeg. var. **TURGESCENS** Thér., var. nov.

Caules et rami turgidi, folia 2.2 mm. \times 1.3 mm., valde concava, cochleariformia, rete laxiore, cellulis mediis 70-90 μ \times 9 μ .

Valle de México: Contadero (*Bro. Amable* 1362).

The facies of this variety is very different from the usual forms of *E. abbreviatus*. In its leaves and their areolation it comes close to Pringle's no. 15226, identified by Cardot as *E. brevipes* (Schimp.).

SEMATOPHYLLACEAE

RHAPHIDORRHYNCHIUM OBLIQUEROSTRATUM (Mitt.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 428. 1925

Sematophyllum obliquostratum Mitt. Musc. Austr. Amer. 472. 1869.

Morelia: Campanario (7926, 7941).

RHAPHIDORRHYNCHIUM DECUMBENS (Wils.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 427. 1925

Hypnum decumbens Wils. (Ms.); *Sematophyllum decumbens* Mitt. Musc. Austr. Amer. 488. 1869.

Valle de México: Desierto (*Bro. Amable* 1439).

SEMATOPHYLLUM CAESPITOSUM (Sw.) Mitt. Musc. Austr. Amer. 479. 1869

Morelia: (7893, 7909, 7912); Cerro Azul (4784); Campanario (7515, 7516, 7520, 7537, 7550, 7552, 7557, 7935).

SEMATOPHYLLUM CAESPITOSUM (Sw.) Mitt. var. **LATICUSPIDATUM** (Card.) Thér., comb. nov.

Rhaphidostegium caespitosum var. *laticuspidatum* Card. Rev. Bryol. 40: 39. 1913.

Morelia: (7890, 7916); Campanario (7642).

SEMATOPHYLLUM HAMPEI (Besch.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 433. 1925

Rhynchostegium Hampei Besch. Prodr. Bryol. Mex. 105. 1871.

Morelia: Campanario (7518).

HYPNACEAE (continued)

STEREODON FALCATUS (Schimp.) Fleisch. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 452. 1925

Stereodon subfalcatus (Schimp.) Fleisch. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 452. 1925.

Further observations have convinced me that in these two species of Schimper's there is only a single specific type.¹

New localities: Valle de México (*Bro. Amable*): Desierto (1219, 1221); Acopilco (1201); Salazar (1236).

HYPNUM AMABILE (Mitt.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 454. 1925

Ectropothecium amabile Mitt. Musc. Austr. Amer. 513. 1869.

Puebla: (4945, 4947, 4948, 4949, 4951, 4953, 4956, 4959). Distr. Federal: San Angel (9479).

ISOPTERYGIUM CYLINDRICARPUM Card. Rev. Bryol. 37: 56. 1910

Valle de México: Desierto (*Bro. Amable* 1247, 1623).

TAXIPHYLLUM PLANISSIMUM (Mitt.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 462. 1925

Isopterygium planissimum Mitt. Musc. Austr. Amer. 498. 1869.

Puebla: Hacienda Alamos (584). Distr. Federal: Tlalpam (10999).

ISOPTERYGIUM PLANISSIMUM Mitt. var. **LAXIRETE** Thér., var. nov.

A forma typica differt: rete laxiore, cellulis diam. 8-9 μ .

Morelia: Loma Santa María (4877).

VESICULARIA VESICULARIS (Schwaegr.) Broth. in E. & P. Nat. Pflanzenfam. 1³: 1094. 1908

Hypnum vesiculare Schwaegr. Suppl. 2²: pl. 199. 1827.

Nuevo León: Monterrey (*Bro. Abbon* 10969).

MICROTHAMNIUM THELISTEGUM (C. M.) Mitt. Musc. Austr. Amer. 504. 1869

Hypnum thelistegum C. M. Syn. 2: 269. 1850.

Morelia: Campanario (7924).

Sterile, the determination uncertain. The cauline leaves are sharply dentate and the branch leaves secund.

¹ See, Smithsonian Misc. Coll. 78²: 28. 1926.

MICROTHAMNIUM SUBTHELISTEGUM (Card.) Broth. in E. & P. Nat. Pflanzenfam. ed. 2, 11: 471. 1925

Mittenothamnium subthelistegum Card. Rev. Bryol. 37: 55. 1910.

Morelia: Jesús del Monte (7608a).

HYLOCOMIACEAE

LEPTOHYMENIUM EHRENBERGIANUM (C. M.) Fleisch. in sched.

Hypnum Ehrenbergianum C. M. Bot. Zeit. 14: 408. 1856.

Hylacomium Ehrenbergianum Besch. Prodr. Bryol. Mex. 111. 1871.

Vera Cruz: Jalapa (7998).

POLYTRICHACEAE (continued)

POGONATUM BESCHERELLEI Hampe in Besch. Prodr. Bryol. Mex. 63. 1871

Valle de México: Salazar, alt. 3,100 meters (*Bro. Amable* 1715).

POLYTRICHUM ALPINIFORME Card. Rev. Bryol. 37: 6. 1910

Valle de México (*Bro. Amable*): Contreras (1667); Xoquiapán (1750).

The last plant, which is in fruit, affords an opportunity to complete the description:

Folia perichaetia numerosa (12-15), remota, longe et late vaginantia (vagina 4-5 mm. longa, 0.2 mm. lata), in acumen angustum abrupte contracta, humida patulo-squarrosa. Pedicellus 20 mm. altus; capsula minuta, oblonga, laevis; calyptra angusta, elongata, 6-7 mm., parce pilosa. Caetera ignota (capsulae immaturae).

SMITHSONIAN MISCELLANEOUS COLLECTIONS

VOLUME 85, NUMBER 4 (ADDENDUM)

INDEX TO PAPERS BY I. THÉRIOT ON MEXICAN MOSSES COLLECTED BY BROTHER ARSÈNE BROUARD PUBLISHED BY THE SMITHSONIAN INSTITUTION¹

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¹ Part I, Smithsonian Misc. Coll., vol. 78, no. 2, June 15, 1926.

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ERRATUM.

Part III, page 43 (Smiths. Misc. Coll. 85, no. 4)—For *Isopterygium planissimum* Mitt. var. *laxirete* Thér., var. nov., substitute *Taxiphyllum planissimum* (Mitt.) Broth. var. *laxirete* Thér., var. nov.