THE MOSSES OF YUCATÁN[1]

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The name Yucatán is customarily limited to the northern and Mexican part of the Peninsula, comprising the states of Yucatán and Campeche, and the territory of Quintana Roo. British Honduras and the Petén region of Guatemala are thus excluded. The second expedition of the biological survey of the Maya area (cf. Bartlett, 1932) spent the summer months of 1932 in this region, using the Carnegie Institution's headquarters at Chichen Itzá as a center of operations. The writer, as botanist, paid especial attention to the collecting of bryophytes, so that this group is well represented in his collections.

Although a considerable amount of floristic work has been done in Yucatán (Standley, 1930; Bartlett, 1932), our knowledge concerning the bryophytes of the region still remains very fragmentary. The only collections made in this group, as in the other groups of cryptogams, have apparently been casual and haphazard. Nearly all the existing records of Yucatecan mosses are the result of the work of Dr. G. F. Gaumer, who collected for many years for the Field Museum. From Gaumer's and his own collections, Millspaugh (1895, 1896, 1898), in the course of three papers on the Yucatán flora, listed a total of eight species of mosses, as follows: *Barbula agraria* Hedw., *Didymodon aeneus* Sch., *Stercophyllum leucostegium* (Brid.) Mitt., *Cryphaea filiformis* (Sw.) Brid., *Octoblepharum albidum* (L.) Hedw., *Thuidium involvens* (Hedw.) Mitt., *Leucobryum incurvifolium* C. Müll., and *Stereophyllum perpusillum* C. Müll., the last two being described as new. Standley (1930) has collected these references in his "Flora of Yucatan," with the following appropriate changes in nomenclature: *Barbula agraria* Hedw. becomes *Tortula agraria* Sw. and Müller's new *Leucobryum* is properly reduced to synonymy under *L. albidum* (Brid.) Lindb. In the present paper it will be shown that Müller's other new species, *Stereophyllum perpusillum,* really represents *S. leucostegium* (Brid.) Mitt., and that the "*Hypnum* sp." listed by both Millspaugh and Standley likewise belongs here. Widely scattered through the literature are other references to Yucatecan mosses. Gaumer's rediscovery of an almost forgotten West Indian species of Swartz, *Syrrhopodon parasiticus* (Sw.) Besch., aroused a widespread in-

[1] This paper is based on collections made by an expedition of the Herbarium and Museum of Zoology of the University of Michigan collaborating with the Department of Historical Research of the Carnegie Institution of Washington in a biological survey of the Maya region. Papers of the Herbarium and Department of Botany of the University of Michigan, No. 450.

terest in this species. Two species, *Hyophila fragilis* Card. and *Erpodium diversifolium* (C. Müll.) Paris, originally described from the Yucatán area have been reduced respectively to *Desmatodon Garberi* Lesq. and James and *Erpodium domingense* (Brid.) C. Müll. Apparently the only species so far described from material collected in Yucatán which is still accepted is *Pireella pachyclada* (Ren. et Card.) Card., which has since been found in Guatemala by Professor Bartlett. This lack of endemic moss species is quite significant in view of the fact that, according to Standley, 17 per cent of the species of flowering plants from the same region are endemic.

When the large number of botanical collections that have been made in Yucatán during the past forty years is taken into consideration, eleven species seem surprisingly small for the total known moss flora. This small number will appear less remarkable if the nature of the country is realized. Almost all of Yucatán is an undulating plain, consisting of low hills of exposed limestone alternating with depressions filled with red clay. There are no streams or rivers in the whole northern part, the only water supply being found in occasional deep sinkholes or "cenotes." The entire region is covered with a short, dense, scrub forest. The long dry season, lasting at least six months, combined with the unvaried lowland or "*tierra caliente*" habitat, very evidently discourages the development of bryophytes, which consequently form an extremely inconspicuous part of the vegetation. Toward the extreme south and southeast, where the rainy season is longer and the amount of precipitation therefore greater, the scrub forest gradually develops into a rain forest in which bryophytes find a more favorable environment.

The mosses of the following list were collected during the most favorable part of the year, the rainy season, which occurs during the summer months. As especial attention was given to the collecting of bryophytes, the writer believes that the list is reasonably representative. In the interest of completeness, the list is supplemented with records of material from other sources. The Yucatán mosses of the Field Museum Herbarium yielded not only a number of additional localities, but also several species not hitherto reported. A collection made in southern Campeche by Mr. C. L. Lundell, although containing few numbers, presents some interesting extensions of range. A small collection made by Mr. J. R. Swallen at Tizimín, in the state of Yucatán, is also cited.

Of the forty species here listed for Yucatán, the greater part are unreported for the region, and two are described as new. The majority of the Yucatán mosses are the cosmopolitan species characteristic of the West Indian and Central American lowlands or tierra caliente, many of them extending into the southern part of the United States and the northern part of South America. The mosses falling into this category are *Fissidens Garberi, Fissidens Kegelianus, Leucobryum albidum, Octoblepharum albidum, Calymperes Richardi, Syrrhopodon incompletus, Desmatodon Garberi, Hyophila Tortula, Tortula agraria, Funaria calvescens, Bryum coronatum, Philonotis*

gracillima, Macromitrium mucronifolium, Rhacopilum tomentosum, Cryphaea filiformis, Leucodontopsis floridana, Pseudocryphaea flagellifera, Pireella cymbifolia, Papillaria nigrescens, Thuidium involvens, Stereophyllum leucostegium, Sematophyllum adnatum, Taxithelium planum, Vesicularia amphibola, Vesicularia vesicularis, and *Microthamnium thelistegium.* Excluding these wide-spread species, the affinity of the Yucatán moss flora seems clearly to be with that of Central America, particularly the Petén region of Guatemala, and of the West Indies, rather than with the moss flora of the Mexican mainland to the west. Of the species listed below, *Didymodon aeneus* is apparently the only one which is strictly Mexican, whereas *Schlotheimia Mohriana, Acrocryphaea mexicana,* and *Sematophyllum chrysocladum,* although originally described from Mexico, are just as much at home in Central America. *Splachnobryum Bernoullii,* further, is known only from Central America. *Syrrhopodon parasiticus, Erpodium domingense,* and *Taxithelium portoricense* are characteristic of the West Indies and widely distributed there. Two South American species, *Fissidens radicans* and *Stereophyllum radiculosum,* are recorded here apparently for the first time from Central America.

With few exceptions, the nomenclature followed is that of Brotherus in the second edition of the Pflanzenfamilien, by Engler and Prantl.

Unless it is otherwise indicated, the collection numbers are those of the writer.

FISSIDENTACEAE

FISSIDENS GARBERI Lesq. and James, Proc. Amer. Acad. **14**: 137. 1884.

Yucatán: Peto, *2215.* On base of tree.
Distribution: Southern part of the U. S.; Central America.

FISSIDENS KEGELIANUS C. Müll., Linn. **1848**: 81.

Yucatán: Chichen Itzá, *1358, 1557*; Peto, *2257.* Quintana Roo: Tancah, *2616.* On soil, usually clay.
Distribution: Louisiana; West Indies; Honduras; northern South America.

FISSIDENS RADICANS Mont. Ann. Sc. Nat. II. **14**: 345. 1840.

Yucatán: Chichen Itzá, *1514.* Quintana Roo: Cozumel Island, *2685b, 2736, 2878.* On the bark of trees.
Distribution: Guiana; Brazil.
This is apparently the first record from Central America.

Fissidens (Bryoidium) yucatanensis sp. nov.

Dioicus; antheridiis et archegoniis terminalibus fasciculatis; plantae parvae, 4–8 mm. altae, pallide virides, simplices subcaespitosae, flaccidae, erectae; folia 4–12-juga, oblanceolata vel lingulata, apice obtusa vel acutiuscula, anguste marginata; majora superiora imbricata costis flexuosis cum margine confluentibus praedita interdum in apiculum unicellulum excurrentibus, minora inferiora distantia prope apicem haud marginata et costis rectis haud apicem attingentibus; cellulis superioribus irregulariter polygonis vel hexagonis 24–32 μ diamentientibus nec elongatis, papillam singulam magnam me-

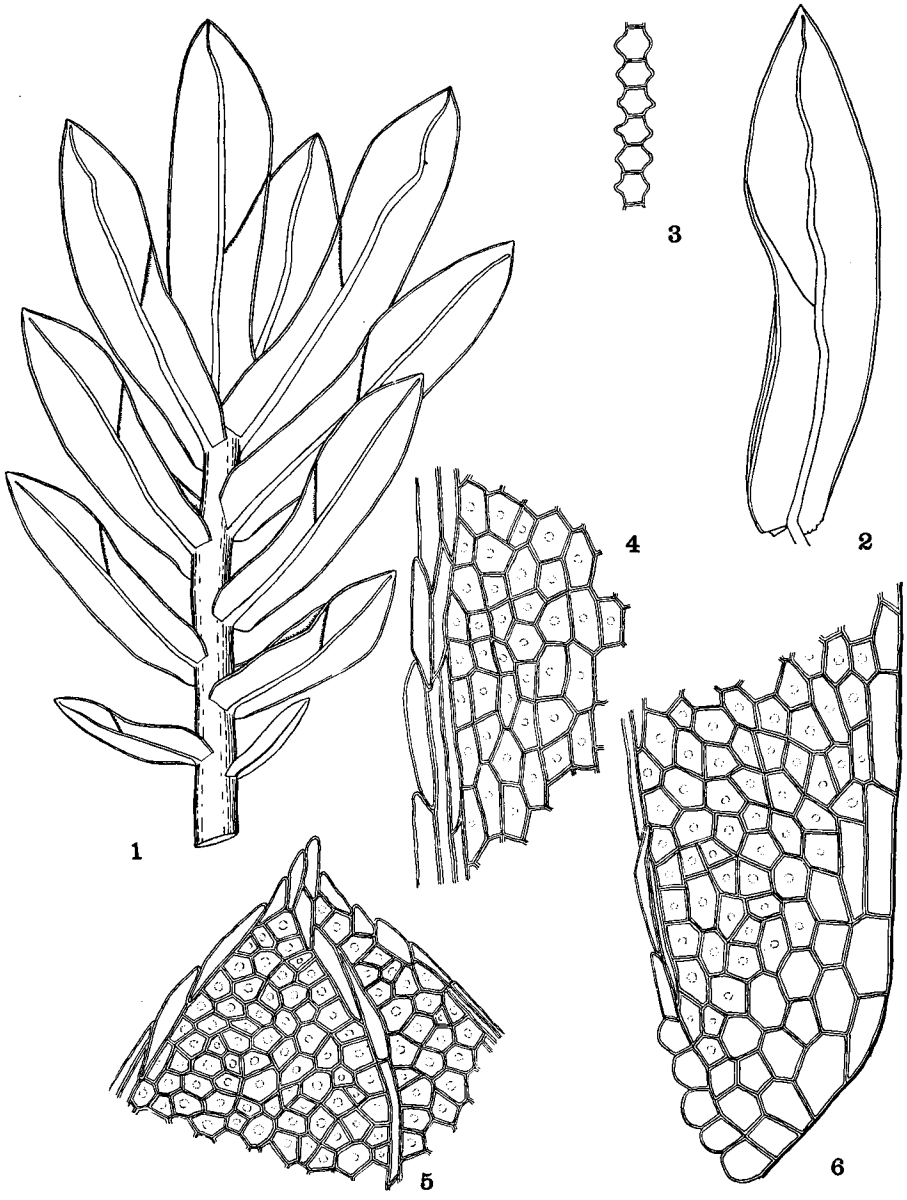

Fig. 1–6. *Fissidens yucatanensis* sp. nov. Fig. 1. Entire plant. × 32. Fig. 2. A single leaf. × 41. Fig. 3. A small part of a cross section of the apical half of a leaf, showing the structure of the cells of the lamina. Fig. 4. Marginal cells of the sheathing lamina. Fig. 5. Apex of leaf. Fig. 6. Extreme base of the inferior lamina; costa at right, margin at left. Fig. 3–6. × 330.

diam utrinque ferentibus; cellularum serie prope costam saepe constante ex cellulis majoribus subhyalinis; cellulis inferioribus quam superioribus majoribus, ca. 48 μ longis, rectangulis, infimis laevibus; vagina ultra medium desinenti intus laevi non papillosa; lamina inferiore basi abrupte terminanti nec decurrenti, angulo inferiore de causa cellularum marginalium productarum crenata. Sporogonium ignotum. Yucatán, Uxmal, *no. 2034*; Muna, *no. 2129* (specimen typicum, in Herb. Univ. Mich. conservatum). *F. angustifolia* Sull. affinis sed differt foliis latioribus et obtusis; etiamque cellulis folii superioribus majoribus distinctioribusque.

Dioicous, antheridia and archegonia in terminal clusters; plants small. 4–8 mm. high, light green, unbranched, somewhat caespitose, flaccid, erect; leaves in 4–12 pairs, oblanceolate to ligulate with a wide, obtuse or somewhat acute apex, narrowly bordered, the sheath reaching slightly more than halfway to the apex; the upper leaves larger, crowded and imbricated, with a stout flexuous costa confluent with the border, and occasionally excurrent into a small apiculus; the lower leaves smaller, distant, the borders and the straight costa not reaching the apex; upper leaf cells irregularly polygonal to hexagonal, 24–32 μ in diameter, not elongated, bearing a single large distinct papilla on the middle of each exposed surface, except on the sheathing laminae, where the inner face is smooth; the single row of cells adjacent to the costa often larger and nearly hyaline; those of the basal region larger, about 48 μ long, rectangular, those at the extreme base, smooth; inferior lamina ceasing abruptly at the base, not at all decurrent, crenate at the lower angle by the projecting marginal cells. Sporophyte unknown.

Yucatán: Uxmal, *2034*; Muna, *2129* (type).

This species appears to be related to *F. angustifolius* Sull. but differs in the much broader and more obtusely pointed leaves. The upper leaf cells are also larger and more distinct.

LEUCOBRYACEAE

LEUCOBRYUM ALBIDUM (Brid.) Lindb., Öfv. Svensk. Vet. Akad. Förh. **20**: 403. 1863. (*L. incurvifolium* C. Müll., Publ. Field Mus. Bot. Ser. **1**: 347. 1898.)

Yucatán: Buena Vista Xbac, *Gaumer 1117*. Campeche: Tuxpeña, *Lundell 1109*. Quintana Roo: Cozumel Island, *2706, 2781*. On rotten logs.

Distribution: Eastern North America; West Indies; Mexico; Central America.

OCTOBLEPHARUM ALBIDUM (L.) Hedw. Descrip. Musc. Frond. **3**: 15. 1791.

Yucatán: Chichen Itzá, *1461, 1556, 1706*; Silam, *Gaumer 665*. Campeche: Champotón, *1847, 1873*. Quintana Roo: Cozumel Island, *2659*. On tree trunks, especially those of palms.

Distribution: Very common in all tropical regions.

CALYMPERACEAE

CALYMPERES RICHARDI C. Müll., Syn. I. 524. 1849.

Campeche: Champotón, *1861*. Quintana Roo: Chichankanab, *2491*; Tancah, *2597*; Cozumel Island, *2656, 2737*. On bark of trees.

Distribution: Florida; West Indies; Panama south to Brazil.

SYRRHOPODON INCOMPLETUS Schwaegr., Suppl. 2(1): 119. 1824.

Yucatán: Chichen Itzá, *1556a.* Campeche: Champotón, *1848.* Quintana Roo: Chichankanab, *2419, 2457, 2467.* On the trunks of trees; often on palms.

Distribution: Florida; Mexico; West Indies; Guatemala; northern South America

SYRRHOPODON PARASITICUS (Sw.) Besch. Ann. Sc. Nat. VIII. 1: 298. 1895.

Yucatán: Chichen Itzá, *1156, 1186, 1644.* Quintana Roo: Chichankanab, *2492, Gaumer 1278.* On the trunks and twigs of trees.

This interesting and long forgotten species of Swartz was first rediscovered by Gaumer in Yucatán, and has since been found in Florida, Trinidad, and the West Indies. Some of Gaumer's material has been illustrated by Williams (1923). Unfortunately, fertile specimens have never been collected in Yucatán.

Distribution: Florida; West Indies; Yucatán.

POTTIACEAE

DESMATODON GARBERI Lesq. et James, Manual, 112. 1884. (*Hyophila fragilis* Card., Rev. Bryol. 36: 75. 1909.)

In his description of *Hyophila fragilis,* Cardot does not mention either the collection number or the locality from which the type specimen came. He says, very briefly: "Yucatan, Barbulae agrariae consociatam leg. prof. Millspaugh." As the only collection of *Tortula agraria* Sw. made by Millspaugh is his no. 80 from Izamal, it is probable that the present species was likewise collected at Izamal.

Distribution: Key West, Florida; Bahama Islands; Guatemala; Yucatán.

DIDYMODON AENEUS (C. Müll.) Sch., in Bescherelle, Prod. Bryol. Mex. **28.** 1871.

Yucatán: Izamal, *Millspaugh 80, in part.* On limestone.

Distribution: Mexico; Yucatán.

Hyophila Bartramiana sp. nov.

Paroeca; plantae parvae simplices; folia superiora viventia squarrosa, siccata crispata, ovata vel spathulata basi angustata, lamina 1.5–2.5 mm. longa, apice acuta; costa valida in mucronem brevem excurrente; cellulis superioribus obscuris, mamillosis et papillosis, 4–6-gonis, non elongatis, basalibus majoribus hyalinis; seta erecta, 4–5 mm. longa; capsula erecta, 1.0–1.3 mm. longa; operculo quam capsula dimidio breviore; peristomate nullo; annulo nullo; sporis 22–26 μ diametro. Yucatán: Muna, *no. 2143* (specimen typicum, in Herb. Univ. Mich. conservatum), *no. 2146.* Species magnitudine *H. subcucullatae* R. S. Williams similis sed inflorescentiis paroecis differt; a *H. microcarpa* (Besch.) Broth. differt magnitudine etiamque foliorum forma. Folia *H. microcarpae* lingulata ex basi late ovato sunt.

Paroicous, the antheridia in clusters of 4–5, in the axils of the outer perichaetial leaves; fertile plants small, unbranched, rather loosely caespitose,

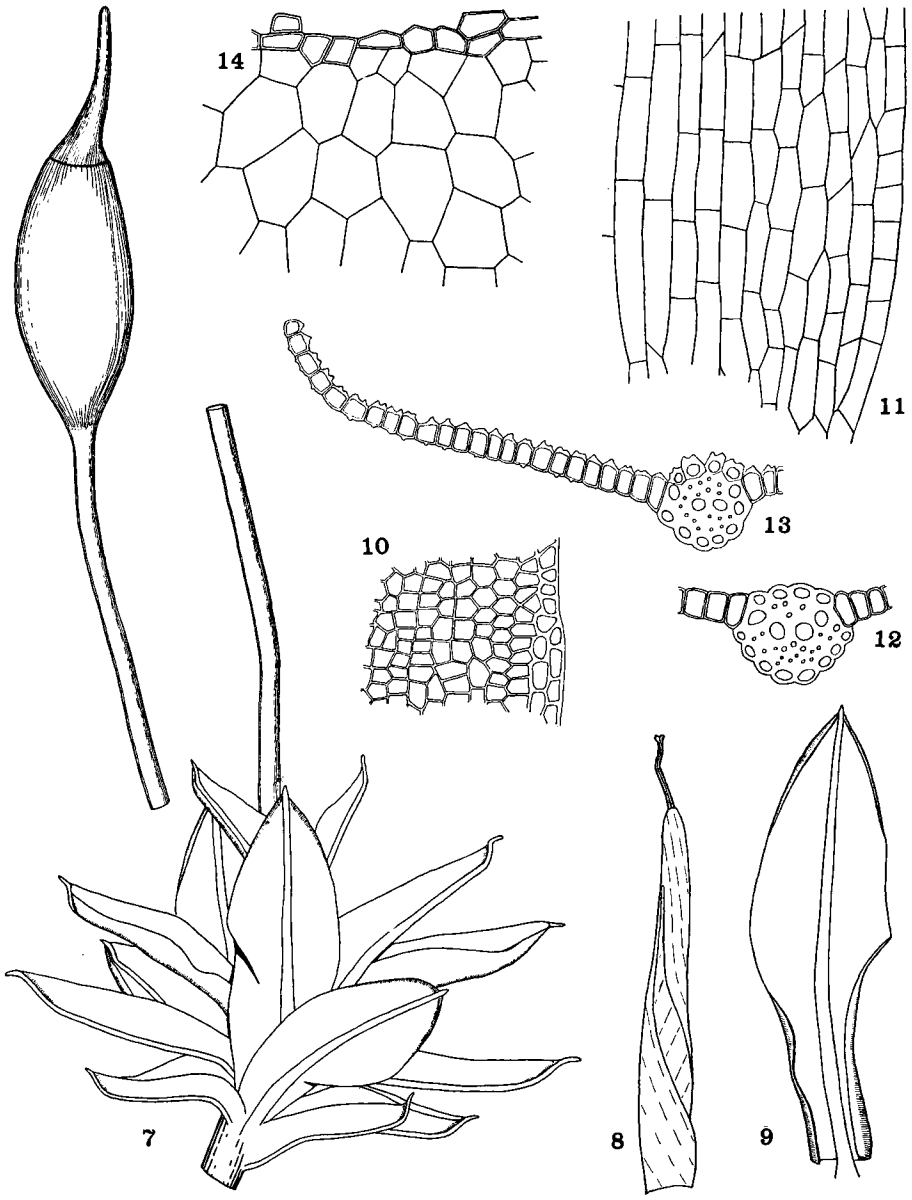

Fig. 7–14. *Hyophila Bartramiana* sp. nov. Fig. 7. Habit of entire plant bearing sporophyte. × 32. Fig. 8. Calyptra from a young capsule. × 41. Fig. 9. A single leaf, seen from the ventral surface. × 41. Fig. 10. Cells from the upper part of a leaf; the margin at the right. Fig. 11. Cells from the extreme base of a leaf; the margin at the right. Fig. 12. A cross section of the costa from the lower part of a leaf, showing the arrangement of the stereids and guide cells. Fig. 13. Cross section of a leaf, made through the apical half. Fig. 14. The uppermost cells of the capsule, showing the differentiated rim cells around the naked mouth. Fig. 10–14, × 330.

0.5–3.0 mm. high; lower leaves small, the upper larger, squarrose-spreading when moist, flexuous to crisped with strongly inrolled margins when dry, ovate to somewhat spatulate from a narrow, sheathing base, very concave; blade 1.5–2.5 mm. long, 0.4–0.7 mm. wide at the broadest part, the apex acute, the margins entire and involute in the upper third; costa stout, nearly or quite smooth on the back, papillose on the ventral side above, excurrent into a short mucro, in cross section showing mostly four guide cells, with a stereid band above and below, and a row of four or five cells on the ventral side, nearly as large as the guide cells, the outer cells on the dorsal side also strongly differentiated; leaf cells rather obscure, mamillose and papillose in the upper part of the leaf, more or less four- to six-angled, not at all elongated, 6–8 μ in diameter, their arrangement into parallel rows very apparent, the marginal row or so distinctly incrassate, those of the basal part smooth, pale to hyaline, much larger, ranging from more or less rectangular to considerably elongated at the extreme base, not at all decurrent, outer perichaetial leaves not differentiated, the inner smaller and narrower; seta erect, 4–5 mm. long, capsule erect, 1.0–1.3 mm. long without the lid, with the stomata in 1 row near the base; exothecial cells large, thin-walled; uppermost row of cells much smaller, thick-walled, red; annulus and peristome lacking, the mouth of the capsule being completely naked; operculum long conic, about half the length of the capsule; spores minutely reticulate-roughened to nearly smooth, sometimes remaining associated in groups of four, 22–26 μ in diameter; calyptra cucullate, spiral, fugacious.

Yucatán: Muna, *2143* (type), *2146*. On red clay soil.

This species is of about the same size as *Hyophila subcucullata* R. S. Williams (Bryologist **24**: 22, 1921) from Cuba, but differs mainly in the paroicous inflorescence, as well as in several minor characters. From *H. microcarpa* (Besch.) Broth. it differs in size and in leaf shape, the leaves of *H. microcarpa* being lingulate from a broadly ovate base.

It is a pleasure to associate with this species the name of Mr. Edwin B. Bartram, who has contributed greatly to our knowledge of the mosses of Central America. Without his help and advice, the writer would have found it almost impossible to solve many of the puzzles and difficulties met with in the study of the material presented here.

HYOPHILA TORTULA (Schwaegr.) Hampe. Bot. Zeit. **4**: 267. 1846.

Yucatán: Chichen Itzá, *1615*.
More common than indicated, but always sterile. On limestone.
Distribution: Arizona; Mexico; West Indies; Brazil.

TORTULA AGRARIA Sw., Fl. Ind. Occid. **3**: 1763. 1799.

Yucatán: Chichen Itzá, *1268*; Izamal, *Millspaugh 80, in part*; Muna, *2144*. Campeche: Tuxpeña, *Lundell 915*. Quintana Roo: Chichankanab, *Gaumer 2257*; Cozumel Island, *2682*. On limestone.
Distribution: West Indies; Florida; Mexico.

FUNARIACEAE

FUNARIA CALVESCENS Schwaegr., Suppl. 1(2): 77. 1826.

Yucatán: Chichen Itzá, *Millspaugh 1637*. Campeche: Villahermosa, *Lundell 1174 in part*. On calcareous soil.

Distribution: In all tropical and subtropical regions.

SPLACHNACEAE

SPLACHNOBRYUM BERNOULLII C. Müll., Verh. K. K. Zool.-Bot. Ges. Wien, 1869: 505.

Yucatán: Uxmal, *2083*. On red clay soil.

Distribution: Guatemala, Honduras.

BRYACEAE

BRYUM CORONATUM Schwaegr. Suppl. 1(2): 103. 1816.

Yucatán: Chichen Itzá, *1358, 1535*. Campeche: Villahermosa, *Lundell, 1174, in part*. Determined by Dr. A. L. Andrews. On calcareous earth.

Distribution: In all tropical regions.

BARTRAMIACEAE

PHILONOTIS GRACILLIMA Ångstr. Prim. lin. 17. 1876.

Yucatán: Chichen Itzá, *1538, 1614*. Quintana Roo: Chichankanab, *Gaumer 1491*. On calcareous earth or limestone.

Distribution: American tropics.

ERPODIACEAE

ERPODIUM DOMINGENSE (Brid.) C. Müll. Bot. Zeit. 1: 773. 1843. [*E. diversifolium* (C. Müll.) Paris.]

Yucatán: Peto, *2356*, on citrus trees; Tizimín, *Swallen 2577*, on dead wood; Valladolid, *1694*, on stone walls.

E. diversifolium was first described from material collected by Dr. S. Hogberg at Laguna de Terminos in the extreme southern part of Campeche. Fleischer has since reduced the species to synonymy under *E. domingense*, thus extending the range of the latter species considerably.

Distribution: West Indies; Mexico.

ORTHOTRICHACEAE

MACROMITRIUM MUCRONIFOLIUM (Hook. et Grev.) Schwaegr. Suppl. 2(2): 61. 1826.

Yucatán: Chichen Itzá, *1470, 1534*. Campeche: Champotón, *1777*; Tuxpeña, *Lundell 1304, in part*. Quintana Roo: Cozumel Island, *2760, 2681*. On the trunks of trees.

Distribution: Florida; Antilles; northern South America.

SCHLOTHEIMIA MOHRIANA C. Müll. Linn. 1876: 642.

Campeche: Tuxpeña, *Lundell 916, in part*; *Lundell 1304, in part*. On the trunks of trees.

Distribution: Mexico; Guatemala.

RHACOPILACEAE

RHACOPILUM TOMENTOSUM (Sw.) Brid. Bryol. Univ. 2: 719. 1827.

Yucatán: Chichen Itzá, *1263*, on limestone; *1269*, on decaying wood.

This material corresponds almost exactly to the description of *R. angustatum* Sch. As a whole series of intermediate and transitional forms exists

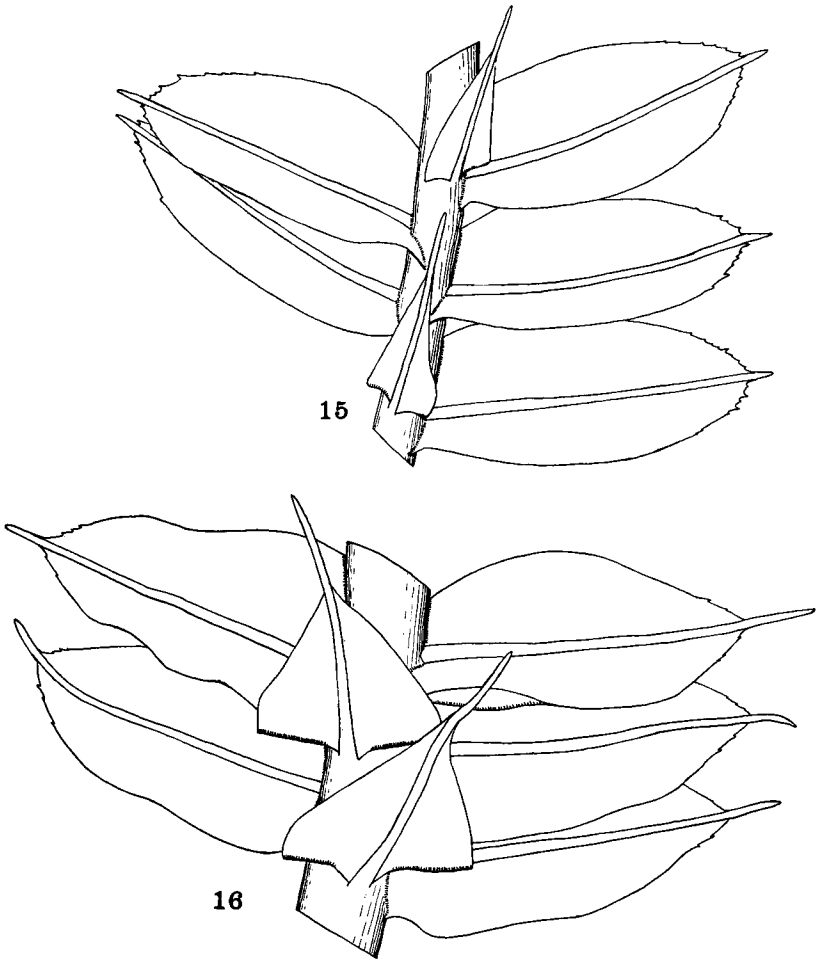

Fig. 15 and 16. *Rhacopilum tomentosum* (Sw.) Brid. × 32. Fig. 15. A lax form with narrow dorsal leaves, from Chichen Itzá (*Steere 1269*). Fig. 16. A more robust form from Mexico (*Orcutt, Mosses of Mexico*, no. *827*).

connecting *R. angustatum* and *R. tomentosum*, it must be considered as an extreme form of the latter species. Some idea of the great variation presented by different specimens of this species may be gained from figures 15 and 16. There is a bewildering variability in length and width of dorsal and

lateral leaves, in the amount and manner of serration, in the development of papillae by the leaf cells, and in the manner of growth, whether compact or lax.

Distribution: Tropic and subtropic America.

CRYPHAEACEAE

CRYPHAEA FILIFORMIS (Sw.) Brid. Bryol. Univ. **2**: 252. 1827.

Yucatán: Chichen Itzá, *1050, 1176, 1187, 1513, 1523, 1533*; Izamal, *Gaumer 320, Gaumer 1669*. Quintana Roo: Chichankanab, *Gaumer 2258, in part*. On the branches and twigs of trees.

Distribution: Widespread in the American tropics.

ACROCRYPHAEA MEXICANA Schimp. Bryol. eur. V. Mon. Cryphaeae ined.

Yucatán: Chichen Itzá, *1050a*; Peto, *2255*. On small branches of trees.

Distribution: Mexico; Honduras.

LEUCODONTACEAE

LEUCODONTOPSIS FLORIDANA (Aust.) E. G. Britton, Bryol. **15**: 28. 1912.

Cozumel Island, *2879*. On trees.

Distribution: Florida; West Indies; Central America; northern part of South America.

PSEUDOCRYPHAEA FLAGELLIFERA (Brid.) E. G. Britton, Bull. Torrey Club, **32**: 261. 1905. (*Leucodon domingense* Mitt., Journ. Linn. Soc. **12**: 409. 1869.)

Yucatán: Tekax, *Gaumer 1213*. Quintana Roo: Chichankanab, *Gaumer 2258, in part*. On trees.

Distribution: Florida; Antilles; Central and South America.

PTEROBRYACEAE

PIREELLA CYMBIFOLIA (Sull.) Card. Rev. Bryol. **40**: 17. 1913.

Yucatán: Chichen Itzá, *1403, 1574*. Quintana Roo: Tancah, *2582*; Chichankanab, *2458*; Cozumel Island, *2766*. On the trunks of trees.

An interesting feature of a number of these specimens is the marked development of papillae by the leaf cells. According to the description, *P. papillosula* (Ren. et Card.) Card. differs essentially from the present species only by the papillose leaf cells. Consequently it is strongly suspected that *P. papillosula* is merely a form of *P. cymbifolia* with well developed papillae on the leaves.

Distribution: Louisiana, Florida; Cuba; Mexico; Guatemala.

PIREELLA PACHYCLADA (Ren. et Card.) Card. Rev. Bryol. **40**: 18. 1913.

Campeche: Tuxpeña, *Lundell 1175*. On the trunk of a tree.

Although this species was first described from material collected in Yucatán, it is apparently more characteristic of a region farther south. This fact is indicated by the sterility of the type material, and by the collection of fruiting material in Guatemala by Prof. Bartlett (Bartram, 1932). The present collection from southern Campeche also bears abundant fruit.

Distribution: Yucatán; Guatemala.

METEORIACEAE

PAPILLARIA NIGRESCENS (Sw.) Jaeg., Ber. St. Gall. Nat. Ges. **1875–1876**: 265. 1877.

Yucatán: Chichen Itzá, *1427, 1575*. On the bark of trees.

Distribution: Louisiana, Florida; Mexico; West Indies; Central and South America; China.

THUIDIACEAE

THUIDIUM INVOLVENS (Hedw.) Mitt. Journ. Linn. Soc. **12**: 575. 1869.

Yucatán: Chichen Itzá, *1264, 1270*; Xcholac, *Gaumer 560*; Muna, *2128*. On limestone.

Distribution: West Indies; Central and South America.

PLAGIOTHECIACEAE

STEREOPHYLLUM LEUCOSTEGIUM (Brid.) Mitt. Journ. Linn. Soc. **12**: 543. 1869. (*S. perpusillum* C. Müll., Field Mus. Publ. Bot. **1**: 348. 1898.)

Yucatán: Chichen Itzá, *1639, 1703*; Izamal, *Gaumer 340*; Peto, *2214, 2300*; Tizimín, *Swallen 2543, Swallen 2544*. Campeche: Champotón, *1939, 1940*. Quintana Roo: Chichankanab, *2360, 2375, 2460, 2476*; Cozumel Island, *Millspaugh 33, Millspaugh 47*. On the bark of trees and on decaying wood.

Gaumer's collection no. 340 has had a varied history. One portion sent to Mrs. Britton for determination was at first called "*Hypnum* sp." This is the name under which the number is cited by both Millspaugh (1896) and Standley (1930). Later, however, the material was assigned to the present species, according to the specimens in the herbaria of both the New York Botanical Garden and the Field Museum.

Another portion was sent to Dr. Müller, who described it as a new species, *Stereophyllum perpusillum*. Examination of the type material shows, however, that it in no way differs from typical *S. leucostegium*, and so must be reduced to synonymy under the latter species.

Distribution: West Indies; Central and South America.

STEREOPHYLLUM RADICULOSUM (Hook.) Mitt., Journ. Linn. Soc. **12**: 542. 1869.

Campeche: Tuxpeña, *Lundell 1036a.* Quintana Roo: Chichankanab, *2368, 2459, 2468, 2469*; Cozumel Island, *Millspaugh 1523.* On decayed wood, and on limestone.

Mitten (1869) and Brotherus (1925, following Mitten) use the presence or absence of papillae upon the leaves as a character for the identification and separation of the species of *Stereophyllum,* and group the present species among those with smooth cells. The material cited here agrees in all details with the descriptions, except for the fact that the backs of the leaves are clearly papillose above. It was found upon examination that all of the specimens labelled *S. radiculosum* in the Herbarium of the New York Botanical Garden likewise showed the papillose condition.

Apparently our conception of this species must be amplified somewhat, in order that plants with papillose leaf cells may be admitted.

Distribution: Jamaica; South America. This is, so far as the author is aware, the first record from Central America.

SEMATOPHYLLACEAE

SEMATOPHYLLUM ADNATUM (Mx.) E. G. Britton, Bryol. **5**: 65. 1902.

Yucatán: Chichen Itzá, *1555*; Peto, *2258, 2341*; Tizimín, *Swallen 2571.* Campeche: Champotón, *1783*; Tuxpeña, *Lundell 1036, in part.* Quintana Roo: Chichankanab, *2478, Gaumer 1524.* On bark of trees and on decaying wood.

Distribution: Southern part of the U. S.; Central and South America.

SEMATOPHYLLUM CHRYSOCLADUM (Card.) Broth., in Engler und Prantl, Pflanzenfam. Ed. II. **11**: 431. 1925.

Cozumel Island, *2658, 2671, 2710, 2728, 2753, 2768, 2796.* On bark of trees and on decaying wood.

Distribution: Mexico; Honduras.

TAXITHELIUM PLANUM (Brid.) Mitt. Journ. Linn. Soc. **12**: 496. 1869.

Yucatán: Chichen Itzá, *1572a, 1576.* Campeche: Champotón, *1849.* Quintana Roo: Cozumel Island, *2684, 2712, 2727, 2850.* On trees and on decayed wood.

Distribution: Florida; Mexico; Central and South America.

TAXITHELIUM PORTORICENSE R. S. Williams, Bryol. **30**: 37. 1927.

Cozumel Island, *2767.* On bark of tree.

Distribution: Puerto Rico; Isle of Pines, Cuba.

This is apparently the first record since the original collections.

HYPNACEAE

VESICULARIA AMPHIBOLA (Spruce) Broth., in Engl. und Prantl, Pflanzenfam. **1(3)**: 1094. 1909.

Yucatán: Chichen Itzá, *1524, 1573a.* On base of tree and on limestone.

Distribution: Florida; West Indies; Central and South America.

VESICULARIA VESICULARIS (Schwaegr.) Broth., in Engl. und Prantl, Pflanzenfam. 1(3): 1094. 1909.

Yucatán: Chichen Itzá, *1266, 1537, 1572.* On calcareous soil and on limestone.
Distribution: Florida; West Indies; Central and South America.

MICROTHAMNIUM THELISTEGIUM (C. Müll.) Mitt., Journ. Linn. Soc. **12**: 504. 1869.

Cozumel Island, *2711.* On dead wood.
Distribution: Florida; Mexico; West Indies; Central and South America.

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