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THE MACHRIS BRAZILIAN EXPEDITION

BOTANY: Musci

By Howard Crum

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CONTRIBUTIONS IN SCIENCE is a series of miscellaneous technical papers in the fields of Biology, Geology and Anthropology, published at irregular intervals by the Los Angeles County Museum. Issues are numbered separately and numbers run consecutively regardless of subject matter. Number 1 was issued January 23, 1957. The series is available to scientists and scientific institutions on an exchange basis. Copies may also be purchased at a nominal price.

The MACHRIS BRAZILIAN EXPEDITION from the Los Angeles County Museum was sponsored by Mr. and Mrs. Maurice A. Machris and Mrs. Maybell Machris Low. It was conducted under the auspices of the Museu Nacional do Brasil. Botanical and zoological collections were made from April through June, 1956, in the region of the headwaters of the Rio Tocantins in the state of Goiás. General accounts and itineraries are given in papers 1 and 2 of this series. Technical type specimens of new entities are deposited in the Museu Nacional in Rio de Janeiro.

THE MACHRIS BRAZILIAN EXPEDITION

BOTANY: Musci

By Howard Crum[1]

In the spring of 1956 Dr. E. Yale Dawson collected 31 species of mosses in the State of Goiás, central Brazil, in three general localities, as follows: 1. The region of the Chapada dos Veadeiros, in grassland (with gallery forests along the streams) at an altitude of about 3500 ft.; collections were made 19-20 km. north of São João da Aliança and also 14 km. south and 4 km. north of Veadeiros (April 13 to May 7). 2. The southern Serra Dourada, a region of dense forest interspersed with open scrub forest and scant grassland, 17-25 km. east of Formoso, at an elevation of about 3000 ft. (May 12 to June 15). 3. A gallery forest along a stream 143½ km. south-southwest of Peixe, on the road to Porangatú. Species are grouped together by localities in the following list. Information on each numbered collection, as well as general ecological information, can be found in the second paper in the series on "The Machris Brazilian Expedition."

A full set of specimens, including a duplicate type of the one new species, is deposited in the Los Angeles County Museum, with a representative set of duplicates in the National Museum of Canada.

1. Region of the Chapada dos Veadeiros

Sphagnum erythrocalyx Hampe. 14669

Fissidens garberi Lesq. & James. 14311; 14341a; 14346 *p. p.* (with *Sematophyllum caespitosum)*

Ochrobryum gardnerianum (C. M.) Mitt. 14344 These plants resemble a slender *Leucobryum* with leaves bearing propagula near their tips. Dr. A. LeRoy Andrews recently sent me a very similar specimen from Mexico, as a first record for that country and a northern range extension for the genus. The apparently wide disjunction of the species makes one wonder whether specimens from Guatemala, Costa Rica and Colombia which have been referred in the literature to *O. obtusifolium* (C. M.) Mitt. are specifically distinct from *O. gardnerianum.*

Octoblepharum albidum Hedw. 14308

Syrrhopodon incompletus Schwaegr. 14513

Syrrhopodon prolifer Schwaegr. 14315

[1] National Museum of Canada, Ottawa.

Calymperes richardii C. M. 14352 *p. p.* (with *Erythrodontium squarrosum)*

Trichostomum weisioides C. M. *(det. ex char.)* 14349 *p. p.* (with *Mittenothamnium diminutivum);* 14416; 14421 (All were found to be dioicous.)

Funaria calvescens Schwaegr. 14324; 14461

Bryum truncorum Brid. 14409

Macromitrium punctatum (Hook. & Grev.) Brid. 14743c

Macromitrium stellulatum (Hook. & Grev.) Brid. 14806

Schlotheimia rugifolia (Hook.) Schwaegr. 14408

Rhacopilum tomentosum (Hedw.) Brid. 14326; 14459 *p. p.* (with *Helicodontium tenuirostre);* 14462 *p. p.* (with *H. tenuirostre)*

Leucodontopsis geniculata (Mitt.) Crum & Steere. 14318

Jaegerina scariosa (Lor.) Arzeni. 14310; 14319; 14326 *p. p.* (with *Rhacopilum tomentosum);* 14341 *p. p.* (with *Sematophyllum caespitosum)* These plants have markedly squarrose leaves, with the costa exceedingly variable even on the same stems, always slender, frequently extending ½ - ¾ the length of the leaf, but sometimes short and double. The leaves may vary on a single stem from entire to very finely serrulate nearly all around. The leaf cells are porose throughout, and filiform propagula of the typical sort are frequent in leaf axils. The meager specimen of *Jaegerinopsis ulei* (C. M.) Broth. (presumably part of the Brazilian type) at the New York Botanical Garden is completely similar to these plants except that the leaves are erect-spreading. A sizable series of specimens, mostly from Mitten's herbarium at New York, has proved to my satisfaction that the angle of leaf divergence is highly variable and not a character of genetic significance. Mitten's concept of *Pterobryum brasiliense* obviously included *Jaegerinopsis ulei* and *Jaegerina scariosa.* Although generally credited as the basionyn for *Jaegerinopsis brasiliensis* (Mitt.) Broth., *Pterobryum brasiliense* was intended by Mitten only as a generic transfer for *Antitrichia brasiliensis* Hornsch. Brotherus (in *Die natürlichen Pflanzenfamilien)* called Mitten's concept of *A. brasiliensis* into question and pointed out that a specimen named by Hampe *(Glaziou* 6397) is a *Squamidium.* I have confirmed Brotherus' statement; I find Glaziou's specimen to be a species related to *S. nigricans* (Hook.) Broth. There is, of course, no apparent reason to favor Hampe's concept over Mitten's. The doubt should be resolved by study of Hornschuh's original specimen, which I have been unable to find; the original description is singularly uninformative.

Helicodontium tenuirostre Schwaegr. 14346 *p. p.* (with *Semato-*

phyllum caespitosum); 14347; 14459; 14461 *p. p.* (with *Funaria calvescens);* 14462 The type collections of this species and also of *H. chlarazii* (Duby) Par. were recently studied. The latter has been characterized in the literature as having a smooth seta and, questionably, a monoicous inflorescence. I found the seta often somewhat roughened and the inflorescence autoicous.

Isopterygium brachyneuron (C. M.) Mitt. 14327 These plants (which are autoicous) compare reasonably well with the original collections by Pabst and Gardiner.

Isopterygium lonchopelmatum (C. M.) Broth. *(det. ex char.)* 14745

Taxiphyllum machrisianum sp. nov. Fig. 1-4

Planta tenella, luteo-virens, nitida, depressa. Caulis repens, irreg-

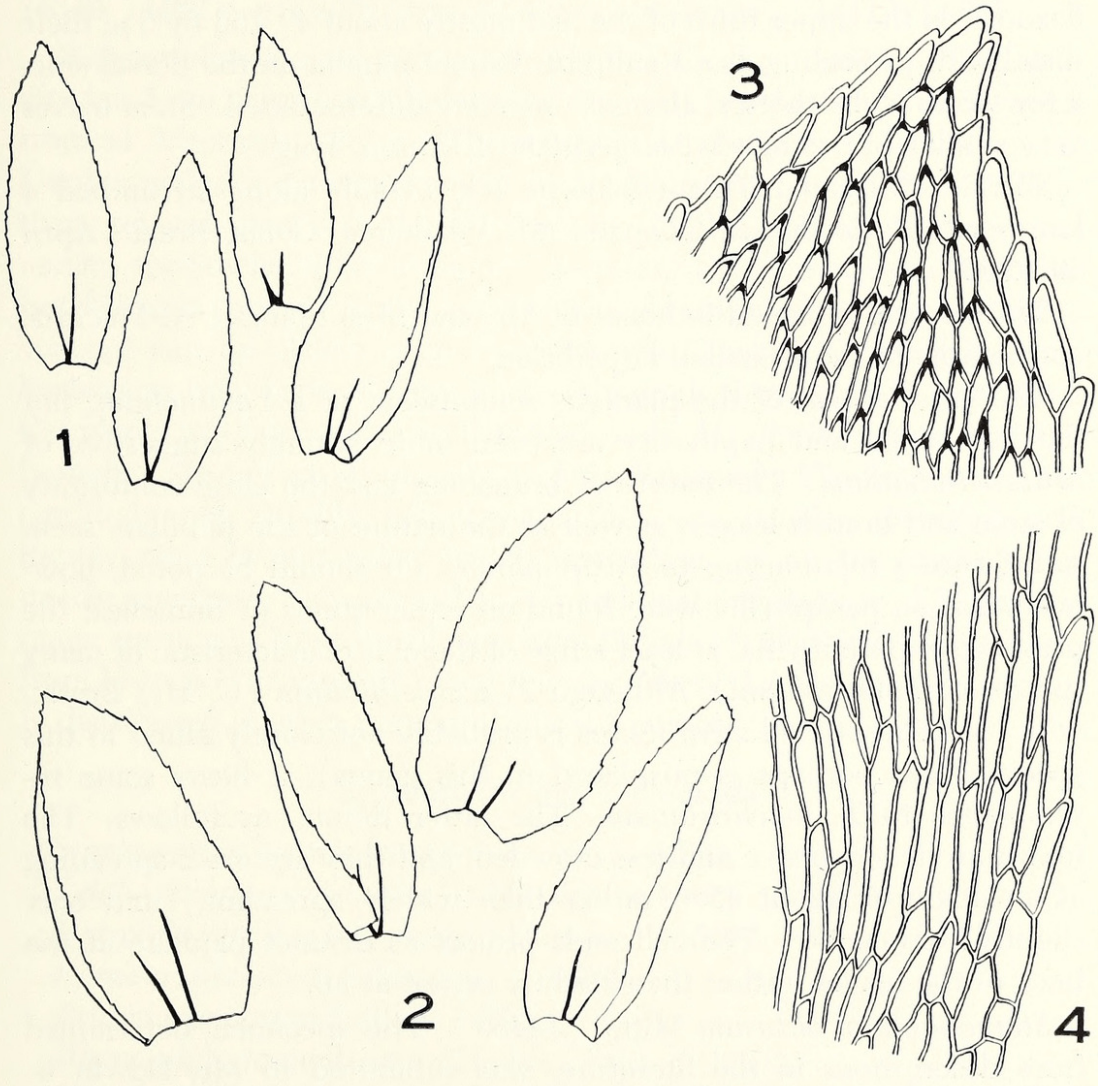

Fig. 1-4. *Taxiphyllum machrisianum* sp. nov. 1. Branch leaves, x 44. 2. Stem leaves, x 44. 3. Cells near apex of branch leaf, x 385. 4. Cells at basal margin of branch leaf, x 385.

ulariter ramosus; rami prostrati, breves, inaequali, plus minus plani. Folia ramulina erecto-patens, subcomplanata, 0.59-0.86 mm. longa, ovata vel oblongo-ovata, acuta, marginibus erectis, serrulatis, nervis duobus, inaequalis, cellulis flexuoso-linearibus, dorso papillis parvis sed distinctis prominentibus. Folia caulis similis sed major, 0.86-1.12 mm. longa. Caetera ignota.

Plants slender, yellow-green, glossy, in low, flat, intricate mats. Stems creeping, freely but irregularly branched; branches unequal, up to 6 mm. long, 1-1.5 mm. wide (with leaves), spreading horizontally, slightly flattened. Branch leaves erect-spreading, somewhat complanate, 0.59-0.86 mm. long, moderately concave, ovate or oblong-ovate, acute; margins erect, serrulate nearly to the base; costae two, one somewhat the longer and extending 1/5 - 1/4 up the leaf; cells linear-flexuose, in the upper third of the leaf mostly about 40 - 56 by 5 μ, their distal ends projecting as a small but distinct papilla on the dorsal side, a few apical cells shorter, alar cells scarcely differentiated. Stem leaves very similar but somewhat larger, 0.86-1.12 mm. long.

TYPE: *Dawson* 14743a (holotype R), 14743b, along streambed 4 km. north of Veadeiros, Chapada dos Veadeiros, Goiás, Brazil, April 30, 1956.

This species is named in honor of Mr. and Mrs. Maurice A. Machris, co-sponsors of the Brazilian Expedition.

The gross aspect of the plants is reminiscent of a *Taxithelium*, but the leaf shape and papillosity are even more strongly suggestive of *Mittenothamnium*. The nature of branching and the close conformity of stem and branch leaves, as well as the nature of the papillae, seem to indicate a relationship to *Taxiphyllum*. (It should be noted, however, that no paraphyllia were found on either stems or branches; the presence of paraphyllia, at least a few of them, is characteristic of many species of *Taxiphyllum*.) Although *T. scalpellifolium* (C. M.) Broth., with its differentiated stem leaves is probably not closely allied to this species (and perhaps is misplaced in this genus), it bears some resemblance to *T. machrisianum*. The latter differs, as follows: The leaves are less concave and less crowded, and they are erect-spreading at an angle of about 45° (rather than widely spreading) and only slightly complanate. The cell ends project as distinct papillae at the back of the leaves, rather than slightly or not at all.

Stereophyllum obtusum Mitt. 14460 This specimen, determined from descriptions in the literature, was submitted to Mr. Edwin B. Bartram, who wrote: "This agrees well with material I have from Brazil. In referring to this species Grout [in his revision in *The*

Bryologist 48: 60-70. 1945] mentions an occasional tooth on the apical margins. Your material, and mine too, show the apical margins quite strongly toothed."

Erythrodontium squarrosum (C. M.) Par. 14339a; 14346 *p. p.* (with *Sematophyllum caespitosum);* 14352; 14805

Sematophyllum caespitosum (Hedw.) Mitt. 14314; 14325 *p. p.* (with *Isopterygium* sp.); 14327 *p. p.* (with *I. brachyneuron);* 14341; 14342; 14351; 14357; 14410.

Sematophyllum galipense (C. M.) Mitt. 14309; 14312

Potamium vulpinum (Mont.) Mitt. 14339

Mittenothamnium diminutivum (Hampe) Britt. 14316 *p. p.* (with *Trichostomum weisioides);* 14421 *p. p.* (with *T. weisioides);* 14348; 14349; 14460 *p. p.* (with *Stereophyllum obtusum);* 14417; 14419

Mittenothamnium elegantulum (Hook.) Card. 14514 This species has been greatly misunderstood by most bryologists working with tropical American mosses. The material at the New York Botanical Garden includes many specimens of *M. diminutivum* and its near relatives, several species in the *M. reptans* complex and even a few misnamed specimens of *Ctenidium malacodes.* I have not seen the type, but Mitten's concept of the species was almost surely correct, and his concept can be clearly seen from the abundance of material in his herbarium now kept at New York. Although they grow in low mats, the plants are not so clearly flattened as in *M. diminutivum,* and the branches are not at all or only slightly flattened. The leaves are accordingly not notably complanate; they are usually crowded and loosely erect or somewhat widely spreading, or on the stems often nearly squarrose; they are rather soft and ovate-acuminate. I have seen many specimens from Brazil, one from Bolivia *(Williams* 2055) and one from Mexico *(Purpus* 4274), and it is very likely that the species is widely distributed in other parts of tropical America.

2. Southern Serra Dourada

Syrrhopodon incompletus Schwaegr. 14965
Trichostomum weisioides C. M. *(det. ex char.)* 14852a
Hyophila tortula (Schwaegr.) Hampe. 15201
Funaria calvescens Schwaegr. 14969
Bryum truncorum Brid. 14855
Rhacopilum tomentosum (Hedw.) Brid. 14942
Pireella pohlii (Schwaegr.) Card. 14966
Sematophyllum galipense (C. M.) Mitt. 14851; 14854

Isopterygium lonchopelmatum (C. M.) Broth. *(det. ex char.)* 14888

3. On road to Porangatú, SSW. of Peixe

Syrrhopodon ligulatus Mont. 15194 *p. p.* (with *Callicostella apophysata)*

Callicostella apophysata (Hampe) Jaeg. *(det. ex char.)* 15194

The plants are autoicous, and the setae are subscabrous.