

MOSSES OF RAIATEA

By

EDWIN B. BARTRAM

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The Raiatean mosses collected by Mr. John W. Moore between October 5, 1926 and May 31, 1927 consist of 92 numbers, some mixed, representing 51 species as shown in detail in the accompanying list. Many of these are fairly well-known Tahitian types, as might naturally be expected, but the list is by no means lacking in items of unusual interest.

The species not previously reported from the Society Islands comprise: *Syrrhopodon ciliatus*, *Syrrhopodon mamillatus*, *Syrrhopodon aristifolius*, *Calymperes tenerum*, *Philonotis laxissima*, *Meiothecium serrulatum*, *Acroporium sigmatodontium* and *Isopterygium albescens*. The species described as new are: *Fissidens raiatensis*, *Calymperes moorei*, *Garovaglia tahitense* var. *brevicuspidata* and *Sematophyllum moorei*, the type collections of which have been deposited in the herbarium of Bernice P. Bishop Museum and in the herbarium of the writer.

FISSIDENTACEAE

Fissidens raiatensis Bartram, new species (fig. 1, *a-g*).

Plantae gregariae. Folia plurijuga, infima minuta, sicca flexuosa, anguste lanceolata, lamina dorsalis ad basin folii enata. Costa infra summum apicem folii evanida. Limbus bi-triseriatus, bistratosus, infra apicem folii desinente; margines sinuato-denticulati. Cellulae hexagonae, parietibus tenuibus, papillosae, circa 8-10 μ . Seta saepe geniculata, ad 2.75 mm. alta, theca inclinata, circa 0.7 mm. longa, operculo rostrato. Caetera ignota.

Dioicous: male flower terminal on a smaller plant. Small, rather closely gregarious plants, pale or sordid green. Stems erect or decumbent, the fertile up to 2 mm. long with 4 or 5 pairs of leaves, the sterile up to 5 mm. long with more numerous leaves. Leaves linear-lanceolate, short acuminate, the lowermost minute, rapidly larger upward, the upper leaves about 1.5 mm. long; dorsal lamina slightly narrowed below, rounded at the base, ending abruptly just below the insertion of the duplicate blades; costa pale, ending just below the apex; margin sinuate-denticulate all around; apical and dorsal blades bordered with 2-3 rows of rather short rectangular or rhomboidal cells in two layers ending a little way below the apex; duplicate blades bordered below with 2-3 rows of long narrow cells gradually becoming shorter and rhomboidal upward; leaf cells hexagonal, thin-walled, papillose, 8-10 μ in diameter. Perichaetial leaves slightly larger than the upper stem leaves; seta erect from a geniculate base, about 2.75 mm. long, pale when young becoming reddish with age; capsule inclined, ovoid-cylindric, urn 0.7 mm. long; lid conic-rostrate, 0.5 mm. long (capsule immature).

Type: on wet rocks on floor of *mape* grove, Faaroa Valley, Raiatea, Society Islands, Jan. 7, 1927, John W. Moore No. 8.

A species with some of the characteristics of *F. rigidulus* Hooker, filius, and Wilson but much smaller in every way. The narrow inconspicuous leaf border fades out entirely some distance below the apex of the leaf.

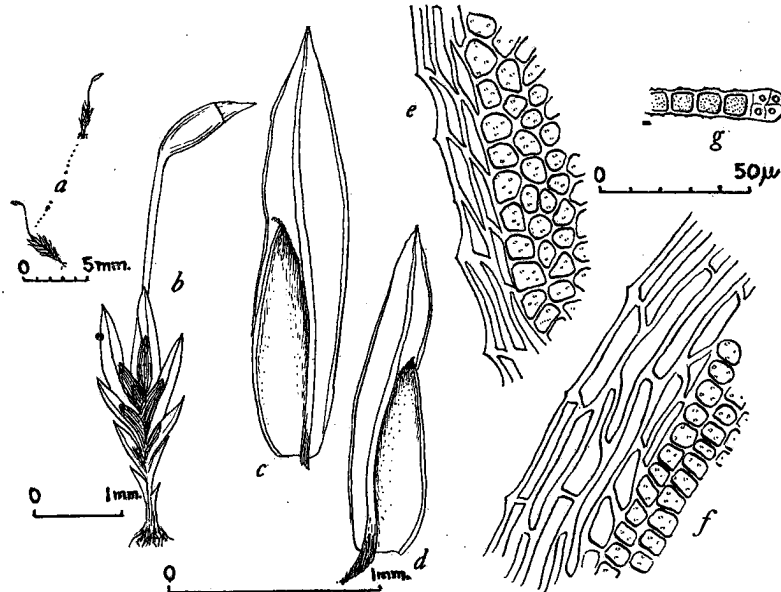


FIGURE 1.—*Fissidens raiatensis* Bartram, new species: *a*, two plants; *b*, moist plant; *c*, perichaetial leaf; *d*, stem leaf; *e*, cells and margin of apical blade; *f*, cells and margin of duplicate blade; *g*, cross section of leaf margin.

DICRANACEAE

Campylopodium euphorocladum (C. Müller) Bescherville.

Highest mountain, west side, on wet rock, no. 41.

Campylopus sulphureus Bescherville.

Faaroa Bay, on moist red clay soil, elevation 100 meters, no. 70.

Thysanomitrium umbellatum Arnott.

Mt. Temehani, on wet rocks near the "Hole," elevation 450 meters, no. 22.

A slender form with the hyaline hair-points of the leaves nearly obsolete.

Leucoloma limbatulum Bescherele.

Temehani range, south end, on soil in shade of shrubs, elevation 500 meters, no. 50; also, intermixed with liverworts on branches of shrubs, no. 47.

LEUCOBRYACEAE

Leucobryum tahitense Aongstrom.

West side of highest mountain, on wet branches of trees, elevation 500 meters, no. 25; Faaroa Bay, north side, on top of mountain among other mosses, elevation 500 meters, no. 54.

Leucophanes prasiophyllum Bescherele.

Faaroa Valley, on decaying base of fern (*nehe*), elevation 100 meters, no. 71.

In this species the median band of stereid cells is exposed on the dorsal side of the leaf while in *L. tahiticum* it is covered with a row of large thin-walled cells.

Leucophanes tahiticum Bescherele.

Third valley south of Uturoa, on coconut tree, elevation 50 meters, no. 6.

Octoblepharum longifolium Lindberg.

With the preceding species, no. 6a.

Arthrocormus schimperi Dozy and Molkenboer.

Faaroa Bay, on dead *purau* branch, elevation 200 meters, no. 53.

Exodictyon dentatum (Mitten) Cardot

Averaiti Valley, upper end, on dead branch of tree over stream bed, elevation 300 meters, nos. 76 and 83a.

CALYMPERACEAE

Syrrhopodon banksii C. Müller, cum fructibus.

Tioo, on coconut tree near the beach, elevation 1 meter, no. 51.

Syrrhopodon tristichellus Bescherele.

West side of highest mountain, on moist branches of trees, elevation 400 meters, no. 36a.

Syrrhopodon mamillatus C. Müller.

Faaroa Valley, on decaying base of fern (*nehe*), elevation 100 meters, no. 71a.

Known from Samoa and Fiji but new to the Society Islands.

Syrrhopodon ciliatus (Hooker) Schwaegrichen.

With the preceding species, mixed with *Leucophanes prasiophyllum*, no. 71b.

The occurrence of this species in Raiatea extends its range widely to the eastward.

Syrrhopodon aristifolius Mitten.

Averaiti Valley, upper end, on dead branch of tree over stream bed, elevation 300 meters, no. 76b; also, on shrub, elevation 500 meters, no. 92.

Previously known only from Samoa.

Syrrhopodon nadeaudianus Bescherelle.

Faaroa Bay, on dead *purau* branch, elevation 200 meters, no. 53a; highest mountain on tree branches, elevation 800 meters, no. 91.

Thyridium constrictum (Sullivant) Mitten.

North side of Faaroa Bay, mountain, on wet branches of tree, elevation 400 meters, no. 65; Faaroa Valley, on decaying wood in moist soil, elevation 100 meters, no. 67.

Thyridium obtusifolium (Lindberg) Fleischer.

Averaiti Valley, upper end, on wet branch of tree, elevation 300 meters, nos. 78, 83, 86

Calymperes tenerum C. Müller.

Island of Nao Nao, on lichens, on bark of *hatu* tree, elevation 1 meter, no. 88.

Calymperes aongstroemii Bescherelle.

Faaroa Valley, on base of *mape* tree, elevation 150 meters, no. 9; Tioo, on bark of *mape* tree in shade, no. 84.

Calymperes moorei Bartram, new species, (figure 2, *a-h*).

A *C. chamaeleontum* C. Müller affine sed foliis latioribus; marginibus basilaribus et laminalibus integris; cellulis laevibus haud papillosis.

Plants 3-4 mm. high, yellowish-green at the tips, brown below. Leaves erect with incurved points when dry, spreading when moist, the normal leaves

slightly contracted above the short base to an oblong-ovate blade, obtuse, about 1.5 mm. long by 0.5 mm. wide; margin plane, entire; costa smooth, percurrent or ending just below the apex, in cross section with stereid bands on both sides of the median row of guide cells; leaf cells rounded hexagonal, thin-walled, turgid on the free surfaces but not papillose, cancellinae shorter than the leaf base, truncate above or higher toward the margins than near the costa; teniolae narrow but distinct, ending a short distance above the shoulders of

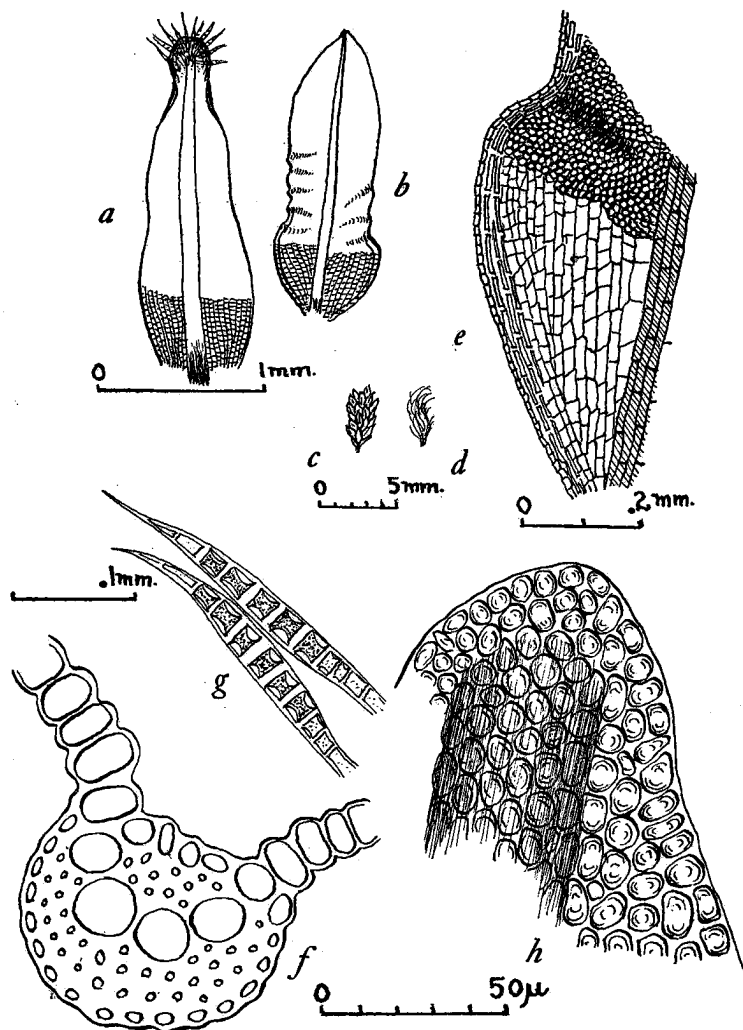


FIGURE 2.—*Calymperes moorei* Bartram, new species: *a*, abnormal leaf; *b*, normal leaf; *c*, moist plant; *d*, dry plant; *e*, one side of leaf base; *f*, cross section of costa; *g*, two propagulae; *h*, apex of normal leaf.

the leaf base; abnormal leaves constricted just below the rounded apex and bearing numerous septate, spindle-shaped propagulae on the inner side of the flaring throat. Sporophyte unknown.

Type: 1 kilometer south of Fatuna, on bark of coconut tree, elevation 1 meter, Raiatea, Society Islands, May 23, 1923, John W. Moore, no. 85.

***Calymperes tahitense* (Sullivant) Mitten.**

Mount Temehani, on bare wet rocks, elevation 400 meters, no. 19; Averaiti Valley, on rotten log along stream, elevation 300 meters, no. 73.

BRYACEAE

***Bryum weberaceum* Bescherelle?**

Tioo, on soil in coconut grove, elevation 1 meter, no. 90.

A sterile collection with the costa excurrent in a longer point than in typical plants from Tahiti. It may be a distinct species.

***Bryum leptothecium* Taylor.**

Temehani range, south end, among other mosses on branches of shrubs, elevation 500 meters, no. 46e.

HYPNODENDRACEAE

***Hypnodendron vescoanum* Bescherelle.**

Averaiti Valley, upper end, on *Pandanus* tree, elevation 300 meters, no. 74.

***Mniodendron tahiticum* Bescherelle.**

Highest mountain, west side, on wet branches of trees, elevation 800 meters, no. 45; Temehani range, south end, among other mosses on branches of shrubs, elevation 500 meters, no. 46a; Averaiti Valley, upper end, on wet branches of trees in deep shade, elevation 400 meters, no. 57; north side of Faaroa Bay, mountain, on wet branches of tree in shade, elevation 400 meters, nos. 61 and 62; Averaiti Valley, on dead branch of tree above stream bed, elevation 300 meters, no. 77.

BARTRAMIACEAE

Philonotis laxissima (C. Müller) van den Bosch and Lacoste:
Bryologica Javanica, 1855-1861.

Averaiti Valley, upper end, on rock of small waterfall, elevation 300 meters, no. 75.

I have not seen the type of *P. jardini* (Bescherelle) Brotherus, from Tahiti, but there is little or nothing in the description to distinguish it from *P. laxissima* which apparently ranges from Java to Hawaii.

SPIRIDENTACEAE

Spiridens balfourianus Greville.

Small valley below Mt. Temehani, on wet branches of *Pandanus* trees, elevation 250 meters, no. 18.

ORTHOTRICHACEAE

Macromitrium subtile Schwaegrichen.

Faaroa Valley, on branches of *purau* tree, on ridge, elevation 100 meters, no. 17; Mount Temehani, on dry branches of shrub, on ridge, east of mountain, elevation 250 meters, no. 20; Tioo, on coconut tree, elevation 1 meter, no. 52; north side of Faaroa Bay, on ridge of mountain, on branch of tree, elevation 150 meters, no. 89.

PTYCHOMNIACEAE

Ptychomnium aciculare (Bridel) Mitten.

Mount Temehani, on wet *Pandanus* branches, in valley east of mountain, elevation 300 meters, no. 24; highest mountain, west side on branches of shrubs in shade, elevation 700 meters, no. 56; ditto, on branch of shrub, elevation 500 meters, no. 59.

PTEROBRYACEAE

Garovaglia tahitense Bescherelle var. **brevicuspidata** Bartram,
new variety (fig. 3).

Apex foliorum saepe raptim brevius acuminatus.

The leaves of the Raiatean plants are consistently more abruptly contracted to a shorter point than those of typical plants from Tahiti.

Highest mountain, in shade on tree branches, small valley, west side of mountain, elevation 600 meters, no. 27 (type); highest mountain, west side, on wet tree branches, elevation 800 meters, no. 44; Temehani range, south end, among other mosses on branches of shrubs, elevation 500 meters, no. 46.

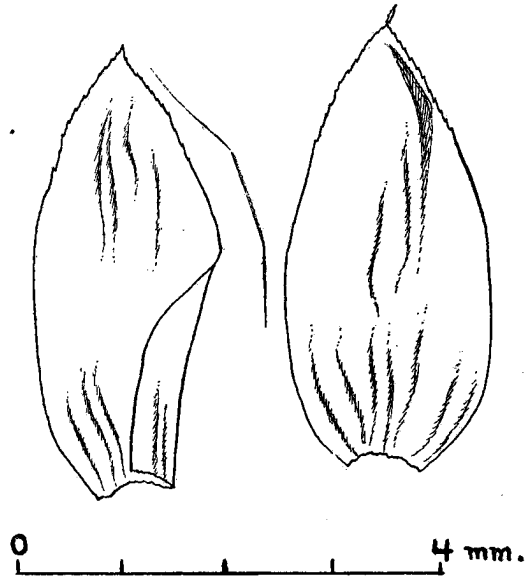


FIGURE 3.—*Garovaglia tahitense* Bescherelle var. *brevicuspidata* Bartram, new variety: two leaves.

METEORIACEAE

Papillaria helictophylla (Montagne) Brotherus.

Highest mountain, west side, on tree branch in shade, elevation 800 meters, no. 43; Temehani range, south end, among other mosses on branches of shrubs, elevation 500 meters, no. 46f.

Floribundaria aeruginosa (Mitten) Fleischer.

North side of Faaroa Bay, mountain, on old *farapepe*, elevation 400 meters, no. 68.

NECKERACEAE

Neckeropsis lepineana (Montagne) Fleischer.

Temehani range, south end, among other mosses, on branches of shrubs, elevation 500 meters, no. 46g.

HYPOPTERYGIACEAE

Hypopterygium arbusculosum Beschereille.

Temehani range, south end, among other mosses, on branches of shrubs, elevation 500 meters, no 46d.

SEMATOPHYLLACEAE

Meiothecium serrulatum Dixon.

Temehani range, south end, on branch of shrub, elevation 500 meters, no. 49.

Sematophyllum moorei Bartram, new species (fig. 4, *a-g*).

Autoicum? robustiusculum, caespites aureo-lutescentes, nitidi. Caulis repens, dense ramosus, ramis sub-erectis, dense foliosus. Folia erecta, concava, saepe spiraliter imbricata, oblongo-ovata, acuminata; marginibus recurvis, superne reflexis; cellulis linearibus, incrassatis, porosis, laevibus. Folia perichaetialia erecta, superne serrulata; seta ad 14 mm. longa, rubra; theca erecta vel inclinata, oblongo-cylindrica, sub ore constricta, cellulae exothecii collenchymaticae; operculum conico-rosratum; sporae papilloso, ad 30 μ .

Autoicum? male flowers not seen. Robust plants in deep, dense tufts or mats, bright golden yellow, very glossy. Stems creeping, radiculose, nearly or quite denuded of leaves, very densely and compactly branched, branches erect or ascending, up to 3.5 cm. long, simple below, fasciculately branched above the middle, branchlets short and erect. Leaves closely imbricated, erect, \pm distinctly seriate in spiral rows below, oblong-ovate, short acuminate, very concave, up to 1.7 mm. long by 0.5 mm. wide; margin broadly reflexed from just below the apex in the upper half, narrowly recurved on one or both sides below, minutely denticulate at the apex, entire below; costa none; leaf cells linear, 5-6 μ wide by 12-18 times as long, incrassate, strongly pitted, several rows across the width of the insertion shorter and broader, golden-yellow, 3 or 4 cells at the basal angles greatly enlarged, oval-oblong, yellow or golden-brown. Perichaetial leaves erect, oblong-lanceolate, gradually acuminate, sharply serrate in the upper half, up to 1.5 mm. long; seta red, smooth, about 14 mm. long; capsule erect or slightly inclined, oblong-cylindric, contracted under the mouth when dry, urn 1 mm. long, brown, exothecal cells rounded, very collenchymatous; peristome teeth yellowish, cross-striate, with a fine zigzag median line, not furrowed, strongly trabeculate on the inner surface, inner peristome pale, papillose, basal membrane less than half as long as the teeth; lid conic-rostrate, as long as the urn; spores papillose, up to 30 μ .

Type: Mount Temehani, on wet *Pandanus* branches, in valley east of mountain, elevation 300 meters, Raiatea, Society Islands, Jan. 15, 1927, John W. Moore, no. 23.

A beautiful species comparable to no other with which I am familiar. The plants are unusually robust for the genus, rather rigid, densely and compactly matted together and of a brilliant golden-yellow color. The small, short pointed leaves are closely imbricated in a neat trim manner and frequently, but not always, in distinct spiral rows.

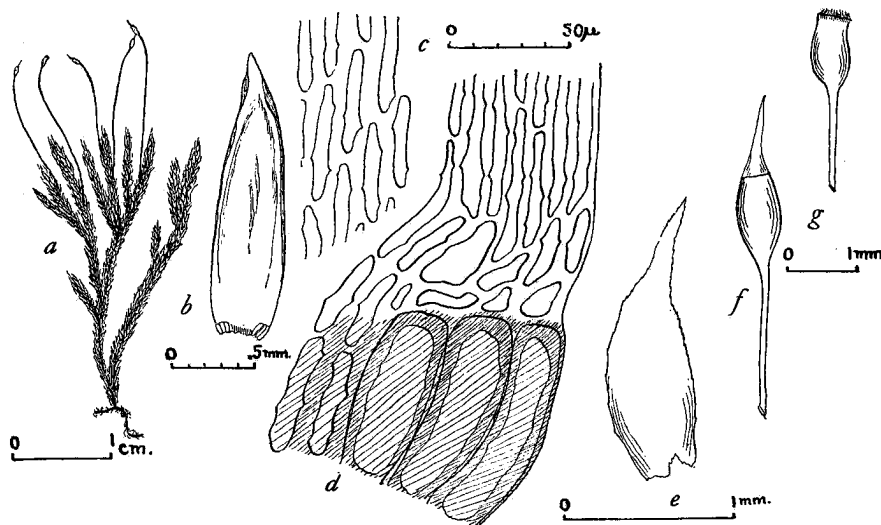


FIGURE 4.—*Sematophyllum moorei* Bartram, new species: a, plant; b, stem leaf; c, upper leaf cells; d, basal angle of leaf; e, inner perichaetial leaf; f, moist operculate capsule; g, dry deoperculate capsule.

***Acroporium sigmatodontium* (C. Müller) Fleischer.**

Mount Temehani, on wet *Pandanus* branches in deep shade, elevation 450 meters, no. 7; west side of highest mountain, on wet branches of trees, elevation 400 meters, no. 37.

***Acroporium lepinei* (Bescherelle) Fleischer.**

Mount Temehani, on wet *Pandanus* branches in deep shade, elevation 450 meters, no. 7a; Mount Temehani, on wet *Pandanus* branches, east of mountain, elevation 300 meters, no. 21; highest mountain, on wet branches of trees in small valley, west side of mountain, eleva-

tion 500 meters, no. 26; Mount Temehani, on wet *Pandanus* branches, east of "Hole," elevation 300 meters, no. 29; small valley, west side of highest mountain, on wet branches of trees, elevation 700 meters, nos. 30 and 31; Faaroa Bay, north side, on top of mountain, among other mosses, elevation 500 meters, nos. 54a, 60, 62a, 63, 64a, 69; Averaiti Valley, upper end, on wet branches of trees in shade, elevation 400 meters, nos. 55, 58, 81.

Judging from the number and abundance of the collections, this must be one of the commonest species on the island. The leaf points vary considerably as far as the degree of acumination is concerned but average is decidedly shorter than in the preceding species.

Trichosteleum hamatum (Dozy and Molkenboer) Jaeger.

Small valley, west side of mountain, on branches of trees, elevation 500 meters, no. 32; highest mountain, west side of ridge, on branches of trees, elevation 800 meters, nos. 34, 36, 38; Averaiti Valley upper end, on *Pandanus* tree in river bed, elevation 300 meters, no. 79; ditto on branch of tree in shade, nos. 82, 87.

Trichosteleum orthophyllum (Bescherelle) Brotherus.

West side of highest mountain on wet branches of trees, elevation 600 meters, no. 35.

These plants compare very closely with those from Tahiti, distributed under this name by Bescherelle. The species is far from convincing and should, in all probability, be considered as a form of *T. hamatum*.

Trichosteleum patens Bescherelle.

Highest mountain, west side, on wet clay soil, elevation 500 meters, no. 39.

Taxithelium trachaelocarpum (Aongstrom) Brotherus.

West side of highest mountain, on wet branches of trees, elevation 600 meters, no. 35a.

Taxithelium vernieri (Duby) Bescherelle.

Third valley south of Faaroa, on moist rocks in shade, elevation 80 meters, no. 4.

HYPNACEAE

Ectropothecium sodale (Sullivant) Mitten.

Faaroa Valley, on moist branches of trees in shade, elevation 100 meters, nos. 10, 12, 13, 15, 16; west side of highest mountain, small valley, in shade of shrubs, elevation 800 meters no. 28; Temehani range, on branches of shrubs in shade, elevation 400 meters, No. 48.

Ectropothecium sandwichense (Hooker and Walker Arnott) Mitten.

Third valley south of Faaroa Bay, on moist rocks in moist shady *mape* grove, elevation 100 meters, no. 3.

Isopterygium albescens (Schwaegrichen) Jaeger.

North side of Faaroa Bay, mountain, on branch of tree in shade, elevation 400 meters, no. 64. Averaiti Valley, upper end, on moist rock in stream bed, elevation 300 meters, no. 72.

As far as I can see there is nothing to distinguish *Isopterygium argyrocladum* Beschereille from the above species which is widely distributed from the Indo-Malayan regions to Hawaii.

Isopterygium albescens (Schwaegrichen) Jaeger var. **applanata** Fleischer.

Averaiti Valley, on tree branches in shade, elevation 300 meters, no. 80.

Vesicularia inflectens (Bridel) C. Müller.

Uturoa, on wet wood in stream bed, elevation 50 meters, no. 1; Third valley south of Faaroa Bay, on moist rocks in damp shady *mape* grove, elevation 100 meters, no. 2; Third valley south of Faaroa Bay, on dripping rocks, elevation 80 meters, no. 5; Faaroa Valley, on moist rocks in deep shade, elevation 100 meters, nos. 11, 14.

POLYTRICHACEAE

Pogonatum tahitense Beschereille.

Highest mountain, west side, on wet rock, elevation 600 meters, no. 40.