

BOTANY.—*Additional Fijian mosses, III.* EDWIN B. BARTRAM, Bushkill, Pa.

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The mosses collected by Dr. A. C. Smith on his latest expedition to Fiji, April to December 1953, under the auspices of the Smithsonian Institution and the National Science Foundation, are represented by 136 numbers, many of which are in generous quantity for wide distribution. For the most part the collections duplicate previous gatherings but are of interest from the standpoint of local distribution. Three new species, *Syrrhopodon vitiensis*, *Thyridium parvifolium*, and *Chaetomitrium smithii*, together with a new variety of *Chaetomitrium orthorrhynchum*, a species new to the local flora, and *Thamnium ellipticum*, not previously known from Fiji, are the outstanding features of the series. The list of Fijian mosses now numbers about 288 species of which 75, or approximately 25 per cent, are endemic. Further explorations may expand the list to some extent, but it seems likely that the flora as now known is reasonably complete.

A representative series from this collection is in my herbarium and a complete set in the United States National Herbarium.

FISSIDENTACEAE

Fissidens vitiensis Dix.

Ovalau: Hills east of Lovoni Valley, alt. 300–500 m, dense forest, on rich humus, no. 7361.

Fissidens mangarevensis Mont.

Viti Levu: Namosi: Valley of Wainambua Creek, south of Mount Naitarandamu, alt. 250–300 m, dense forest, on rocks along stream, no. 8842. Taveuni: Summit of adjacent slopes of Mount Manuka, east of Wairiki, alt. 700–850 m, dense forest, on caudex of tree-fern, no. 8226. Ovalau: Summit and adjacent slopes of Mount Korotolutolu, west of Thawathi, alt. 500–589 m, dense forest, on caudex of tree-fern, no. 8040.

Fissidens filicinus Doz. & Molk.

Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–600 m, dense forest, on rocks in dry stream bed, no. 8346.

DICRANACEAE

Trematodon longicollis Mx.

Viti Levu: Namosi: Northern base of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 250–400 m, dense forest, on clay banks along stream, no. 8673b.

Campylopodium integrum (C.M.) Par.

Viti Levu: Namosi: Northern base of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 250–400 m, dense forest, on clay banks along stream, no. 8673a.

Campylopus samoanus Broth.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Ndakuivuna, alt. 100–200 m, dense forest, on wet rocks along stream, no. 7122. Ovalu: Summit of Mount Ndelaiovalu and adjacent ridge, alt. 575–626 m, dense bush and thickets of crest, on wet humus-covered rocks, no. 7573.

Leucoloma tenuifolium Mitt.

Viti Levu: Namosi: Hills north of Wainavindrau Creek, between Korombasambasanga Range and Mount Naitarandamu, alt. 250–450 m, dense forest, on tree trunks, no. 8452.

LEUCOBRYACEAE

Octoblepharum albidum Hedw.

Ngau: Hills east of Herald Bay, inland from Sawaieke, alt. 300–450 m, dense forest, in masses of humus on trees, no. 7842. Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–400 m, dense forest, on tree trunks, no. 8204.

Leucobryum pentastichum Bry. jav.

Viti levu: Namosi: Hills bordering Wainavindrau Creek, in vicinity of Wainimakutu, alt. 150–250 m, dense forest, in dense mats on decayed wood, no. 8857. Ngau: Hills east of Herald Bay, inland from Sawaieke, on slopes of Mount Vonda (Lion Peak) and toward Waikama, alt. 30–200 m, on humus at roots of trees in open forest, no. 7994.

Leucobryum sanctum Hpe.

Viti Levu: Serua: Hills between Waininggere and Waisese Creeks, between Ngaloa and

Wainiyambia, alt. 50–100 m, dry forest, in dense mats on humus-covered logs, no. 9514. Viti Levu: Namosi: Hills north of Wainavindrau Creek, between Korombasambasanga Range and Mount Naitarandamu, alt. 250–450 m, dense forest, in dense masses on humus, no. 8461.

Leucobryum scalare C. M.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Ndakuivuna, alt. 100–200 m, on wet banks along road, no. 7013.

Exodictyon dentatum (Mitt.) Card. ? poor condition.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Ndakuivuna, alt. 100–200 m, dense forest, on bark, no. 7148.

CALYMPERACEAE

Syrrhopodon mamillatus C. M.

Twelve collections from Viti Levu, Ngau, and Ovalau showing a broad distribution in the local area.

Syrrhopodon smithii Bartr.

Viti Levu: Serua: Hills between Waininggere and Waisese Creeks between Ngaloa and Wainiyambia, alt. 50–100 m, dry forest, on tree trunks, mixed with hepatics and lichens, no. 9538.

Syrrhopodon (Calymperidium) vitiensis Bartr., sp. nov.

Laxe caespitosus, caespitibus fusciscenti-viridibus, opacis. Caulis brevissimus. Folia sicca crispatula, humida erecto-patentia, ad 12 mm longa, e basi ovata sensim anguste lineari-subulata; marginibus remote denticulatis, in parte superior vaginae sat dense serrulatis; costa valida, excurrente; cellulis laminalibus minutis, rotundatis, diam. circa 5μ , vix incrassatis, marginibus versus 2–3 seriebus bistratosis, cancellinis male definitis. Fructus ignotus.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Ndakuivuna, alt. 100–200 m, dense forest, on tree trunks, no. 7103.

This species evidently has some affinity with *S. subulatus* Lac., but the much smaller lamina cells and the leaf margins closely and sharply serrate at the shoulders and distantly denticulate above are good diagnostic characters.

Thyridium parvifolium Bartr., sp. nov.

Caespitosum, caespitibus laxis, lutescentibus. Caulis repens, ramis vix 1 cm altis. Folia sicca

erecta, incurva, humida erecto-patentia, valde undulata, ad 2 mm longa, e basi amplexicaule, oblonga, obtusa, limbata. Limbus folii inferne 8–10 seriatius, fere ad apicem folii productus, superne tenuiter denticulatus vel integrus. Cellulis laminalibus rotundatis, diam. $8-10\mu$, chlorophyllosis, papillosis, cancellina superne rotundata; costa infra apicem folii evanida. Seta 5–6 mm. longa, tenuis, rubra; theca erecta, oblongo-cylindrica, deoperculata 1.8 mm. longa.

Ovalau: Hills east of Lovoni Valley, alt. 100–300 m, dense forest, on tree trunks, no. 7312.

Slightly more robust than *T. flavum* (C.M.) Fleisch. and obviously distinct in the bluntly obtuse leaves with the hyaline border more pronounced and extending nearly to the apex.

Thyridium luteum Mitt.

Five collections from Viti Levu, Ovalau, and Taveuni. Frequent on most of the larger islands.

Calymperes serratum A. Br.

Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–600 m, dense forest, on tree trunks, no. 8198. Ovalau: Hills west of Lovoni Valley, on ridge south of Mount Korolevu, alt. 400–500 m, dense forest on decayed wood, no. 7660.

Calymperes tahitense (Sull.) Mitt.

Viti Levu: Serua: Hills between Navua River and Wainiyavu Creek near Namuamua, alt. 100–200 m, no. 9007. Viti Levu: Serua: Hills east of Navua River, near Nukusere, alt. 100–200 m, dense forest on tree trunks, no. 9142.

Calymperes tahitense var. **truncatum** Ther & Dix.

Viti Levu: Serua: Hills between Waininggere and Waisese Creeks, between Ngaloa and Wainiyambia, alt. 50–100 m, dry forest, on boulders, no. 9390.

POTTIACEAE

Rhamphidium veitchii Dix.

Viti Levu: Namosi: Northern base of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 250–400 m, dense forest on clay banks along stream, nos. 8681, 8673.

Barbula inflexa (Duby) C. M.

Viti Levu: Namosi: Valley of Wainambua Creek, south of Mount Naitarandamu, alt. 250–350 m, dense forest on rocks along stream, no. 8840a.

BRYACEAE

Brachymerium indicum (D. & M.) Bry. jav.

Viti Levu: Serua: Flat coastal strip in vicinity of Ngaloa, alt. near sea level, on humus-covered rocks in village, no. 9502. Ngau: Hills east of Herald Bay, inland from Sawaicke, on slopes of Mount Vonda (Lion Peak) and toward Waikama, in pockets of humus on bare rocks of open hillside, alt. 30–200 m, no. 7957.

Bryum nitens Hook.

Viti Levu: Namosi: Valley of Wainambua Creek, south of Mount Naitarandamu, alt. 250–350 m, on rocks along stream, no. 8840.

Bryum greenwoodii Dix.

Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–600 m, on humus-covered rocks in dry stream bed, no. 8338.

RHIZOGONIACEAE

Rhizogonium spiniforme (Hedw.) Bruch forma **samoana** Mitt.

Two collections. Frequent throughout the islands.

Rhizogonium setosum Mitt.

Eight collections from Viti Levu, Ovalau, and Ngau. A common species in the local flora.

BARTRAMIACEAE

Philonotis pilifer Dix.

Viti Levu: Namosi: Northern base of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 250–400 m, on clay banks along stream, no. 8680.

HYPNODENDRACEAE

Hypnodendron subspininervium (C. M.) Jaeg.

Ovalau: Summit of Mount Tana Lailai and adjacent ridge, alt. 500–550 m, dense bush and thickets of crest, on trees, no. 7722. Ovalau: Summit of Mount Ndelaiovalau and adjacent ridge, alt. 575–626 m, dense bush and thickets of crest, on tree trunks, no. 7612. Taveuni: Hills east of Somosomo, west of old crater occupied by small swamp and lake, alt. 660–900 m, dense forest, on tree trunks, no. 8382.

Hypnodendron vitiense Mitt.

Taveuni: Hills east of Somosomo, west of old crater occupied by small swamp and lake, alt. 660–900 m, on rocks along stream, no. 8371.

SPIRIDENTACEAE

Spiridens balfourianus Grev.

Ngau: Slopes of Mount Ndelaitho, on northern spur, toward Navukailangi, alt. 350–500 m, dense forest, on trees trunks, no. 7884.

Spiridens aristifolius Mitt.

Ovalau: Summit of Mount Tana Lailai and adjacent ridge, alt. 500–550 m, dense bush and thickets of crest, dependent from tree trunks and branches, no. 7726. Ovalau: Summit of Mount Ndelaiovalau and adjacent ridge, alt. 575–626 m, dense bush and thickets of crest, epiphyte, no. 7371.

Spiridens flagellosus Schp.

Ovalau: Summit of Mount Tana Lailai and adjacent ridge, alt. 500–550 m, dense bush and thickets of crest, on tree trunks, no. 7725. Taveuni: Valley between Mount Manuka and Mount Koroturanga (Des Voeux Peak), east of Wairiki, alt. 600–700 m, dense forest, in masses on trees, no. 8278.

ORTHOTRICHACEAE

Macromitrium subtile Schwaegr.

Ovalau: Summit and adjacent slopes of Mount Korotolutolu, west of Thawathi, alt. 500–589 m, dense forest on tree trunks, no. 8052.

RHACOPILACEAE

Rhacopilum spectabile R. & H.

Viti Levu: Namosi: Valley of Wainambua Creek, south of Mount Naitarandamu, alt. 250–350 m, on decayed wood, no. 8841.

PTEROBRYACEAE

Garovaglia smithii Bartr.

Ngau: Hills east of Herald Bay, inland from Sawaieke, alt. 300–450 m, dense forest, on tree trunks, nos. 7742, 7827.

Endotrichella graeffeana C. M.

Viti Levu: Namosi: Hills bordering Wainavindrau Creek, in vicinity of Wainimakutu, alt. 150–250 m, dense forest, on tree trunks and branches, no. 8884.

Euptchium setigerum (Sull.) Broth.

Ovalau: Summit of Mount Tana Lailai and adjacent ridge, alt. 500–550 m, dense bush and thickets of crest, on tree trunks, no. 7724.

Symphysodon vitianus (Sull.) Broth.

Five collections from Viti Levu, Ngau, and Ovalau. A frequent species on tree trunks and branches on the larger islands.

METEORACEAE

Floribundaria seruginosa (Mitt.) Fleisch.

Viti Zevu: Tailevu: Hills east of Wainimbuka River, in vicinity of Wailotua, alt. 100–150 m, on damp rocks at mouth of cave in dense forest, no. 7236.

NECKERACEAE

Calyptothecium urvilleanum (C. M.) Broth.

Viti Levu: Namosi: Northern slopes of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 450–600 m, dense forest, on decayed wood, no. 8740.

Himantocladium implanum (Mitt.) Fleisch.

Ngau: Hills east of Herald Bay, inland from Sawieke, alt. 300–450 m, dense forest on tree trunks, no. 7753.

Homaliodendron flabellatum (Dicks.) Fleisch.

Taveuni: Summit and adjacent slopes of Mount Manuka, east of Wairiki, alt. 700–830 m, dense forest, in masses on tree trunks, no. 8233.

Thamnium ellipticum (Bry. jav.) Kindb.

Ngau: Hills east of Herald Bay, inland from Sawaeke, alt. 300–450 m, dense forest, on wet rocks along stream, no. 7862.

New to Fiji. Area: Sumatra, Java, Borneo, Philippines.

HOOKERIACEAE

Distichophyllum vitianum (Sull.) Besch.

Three collections from Ovalau and Taveuni. A frequent local species on dead wood.

Cyclodictyon blumeianum (C. M.) Broth.

Vitu Levu: Namosi: Hills bordering Wainavindrau Creek, in vicinity of Wainimakutu, alt. 150–250 m, dense forest, on rocky banks along stream, no. 8889.

Callicostella vesiculata C. M.

Ovalau: Valley of Mbureta and Lovoni Rivers, alt. 20–50 m, on roots of *Inocarpus* trees along trail, no. 7673.

Callicostella papillata (Mont.) Jaeg.

Seven collections from Viti Levu, Taveuni, and Ovalau. A common species on decayed wood.

Callicostella papillata var. *brevifolia* Fleisch.

Taveuni: Valley between Mount Manuka and Mount Koroturanga (Des Vocux Peak), east of Wairiki, alt. 600–700 m, dense forest, on wet rocks along stream, no. 8256a.

Chaetomitrium orthorrhynchum (D. & M.) Bry. jav. var. *vitiense* Bartr., var. nov.

A typo foliorum marginibus superne minute denticulatis differt.

Species new to Fiji. Quite distinct from the typical form in the upper leaf margins minutely denticulate instead of sharply serrate. Otherwise, the agreement seems to be complete.

Ovalau: Summit and adjacent slopes of Mount Korotolutolu, west of Thawathi, alt. 500–589 m, dense forest, on tree trunks, no. 8048.

Chaetomitrium (Leiocarpus) smithii Bartr., sp. nov.

Caespitosus, caespitibus laxis, depressis, viridibus. Caulis procumbens, irregulariter pinnatim ramosus, ramis late patentibus, 5–8 mm. longis, parce ramulosis, valde complanatis. Folia ramea patentia, ovato-lanceolata, concava, acuminata, 1.5–2 mm. longa; marginibus erectis, fere ad basin serrulatis; costis binis, bene notatis; cellulis anguste linearibus, laevissimis. Seta 12–15 mm. longa, inferne laevis, superne papillosa; calyptra ubique dense hispida, ad basem longe ciliata.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Ndakuivuna, alt. 100–200 m, dense forest, on bark, no. 7172.

The seta smooth below and weakly papillose above will at once separate this species from either *C. depressum* Mitt. or *C. rugifolium* Sull. The habit is more irregular and less dense than in *C. densum* Dix., the leaves more slenderly pointed and the leaf cells essentially smooth.

LEUCOMIACEAE

Leucomium aneurodictyon (C. M.) Jaeg.

Ovalau: Summit of Mount Ndelaiovalau and adjacent ridge, alt. 575–626 m, dense bush and thickets of crest, on bark, no. 7592; Hills west of Lovoni Valley, on ridge south of Mount Korolevu, alt. 400–500 m, dense forest, on decayed wood, no. 7624.

THUIDIACEAE

Thuidium samoanum Mitt.

Ovalau: Summit of Mount Ndelaiovalau and adjacent ridge, alt. 575–626 m, dense bush and thickets of crest, on decayed wood, no. 7598.

Thuidium cymbifolium (D. & M.) Bry. jav.

Taveuni: Valley between Mount Manuka and Mount Koroturanga (Des Vocux Peak), east of Wairiki, alt. 600–700 m, dense forest, on wet rocks along stream, no. 8258.

ENTODONTACEAE

Campyloodontium flavescens (Hook.) Bry. jav.

Viti Levu: Namosi: Valley of Wainavindrau Creek, in vicinity of Wainimakutu, alt. about 150 m, on tree trunks in thickets along stream, no. 8817.

SEMATOPHYLLACEAE

Trichosteleum hamatum (D. & M.) Jaeg.

Eleven collections from Viti Levu and Ngau. Frequent locally and widely distributed in the southwest Pacific.

Trichosteleum boschii (D. & M.) Jaeg.

Four collections from Viti Levu. Not uncommon on decayed wood.

Trichosteleum fissum Mitt.

Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–600 m, dense forest, on tree trunks, no. 8206.

Taxithelium lindbergii (Bry. jav.) R. & C.

Viti Levu: Namosi: Hills east of Wainikoroiluva River, near Namaumau, alt. 50–200 m, dense forest, on decayed wood, no. 8913a. Ovalau: Hills east of Lovoni Valley, alt. 100–300 m, dense forest, on tree trunks, no. 7311.

Taxithelium kerianum (Broth.) Fleisch.

Three collections from Viti Levu, Ovalau, and Taveuni. Rather frequent on tree trunks and decayed wood.

HYPNACEAE

Vesicularia reticulata (D. & M.) Broth.

Viti Levu: Namosi: Hills bordering Wainavindrau Creek, in vicinity of Wainimakutu, alt.

150–250 m, dense forest, on rocky banks along stream, no. 8889a.

Vesicularia calodictyon (C.M.) Broth.

Ovalau: Hills east of Lovoni Valley, alt. 100–300 m, dense forest, on wet rocks along stream, no. 7299.

Isopterygium minutirameum (C.M.) Jaeg.

Viti Levu: Namosi: Hills east of Wainikoroiluva, near Namaumau, alt. 50–200 m, dense forest, on bark, no. 9050.

Ectropothecium molle Dix.

Viti Levu: Namosi: Valley of Wainambua Creek, south of Mount Naitarandamu, alt. 250–350 m, dense forest, on wet stones along stream, no. 8792.

Ectropothecium adnatum Broth.

Taveuni: Valley between Mount Manuka and Mount Koroturanga (Des Vocux Peak), east of Wairiki, alt. 600–700 m, dense forest, on wet rocks along stream, no. 8256.

Ectropothecium percomplanatum Broth.

Viti Levu: Tailevu: Hills east of Wainimbuka River, in vicinity of Wailotua, alt. 100–150 m, on damp rocks at mouth of cave in dense forest, no. 7237.

Ectropothecium longicaule Bartr.

Taveuni: Slopes of Mount Manuka, east of Wairiki, alt. 300–600 m, dense forest, in masses on tree trunks, no. 8188.

Ectropothecium cyathothecium (C.M.) Jaeg.

Viti Levu: Namosi: Northern base of Korombasambasanga Range, in drainage of Wainavindrau Creek, alt. 250–400 m, dense forest, on tree trunks, no. 8638. Viti Levu: Serua: Hills between Wainingere and Waisese Creeks, between Ngaloa and Wainiyambia, alt. 50–100 m, dry forest, on decayed wood, no. 9639. Ovalau: Slopes of Mount Korotolutolu, west of Thawathi, alt. 300–500 m, dense forest, on decayed wood, no. 8006.

POLYTRICHACEAE

Pogonatum graeffeanum (C.M.) Jaeg.

Four collections from Viti Levu. A frequent local species.



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