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**Additional Fijian Mosses II**

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The extensive moss collection made by Dr. A. C. Smith during his latest visit to Fiji between April 1947 and January 1948 is comprised of 225 numbers distributed among 100 species and 26 genera. It was collected under the auspices of the Arnold Arboretum of Harvard University and the John Simon Guggenheim Memorial Foundation, with the aid of grants from the Penrose Fund of the American Philosophical Society and the Bache Fund of the National Academy of Sciences. This important collection appreciably broadens our knowledge of the Fiji moss flora and is especially instructive as coming largely from the higher rain forests of northern and central Viti Levu, probably the richest bryological area in the entire group.

While the individual collections are all important from the standpoint of local distribution, I have listed only those representing species previously unknown from Fiji, including the descriptions of three species new to science. From a phytogeographical point of view it is rather significant that about half of the species mentioned below stem from the west through the Philippines, Malaysia, and New Guinea, with Fiji as the eastern limit of their known range.

As Dr. Smith's collections are ample and are beautifully prepared, they will be a welcome addition to the herbaria of various institutions to which sets will eventually be distributed.

DICRANACEAE

***Dicranoloma Blumii*** (Nees) Paris.

Viti Levu: Mba (formerly Tholo North), summit of Mt. Tomaniivi (also Mt. Victoria), alt. 1,290-1,323 m., dense mossy forest on tree trunks, Sept. 6, 1947, no. 5907.

Although sterile, there is little doubt about the identification of this species previously unknown from Fiji. The long, finely setaceous pointed leaves are thoroughly characteristic and quite distinct from the more abundant *D. Braunii*.

## RHIZOGONIACEAE

**Hymenodon piliferus** Hooker f. and Wilson.

Viti Levu: Mba (formerly Tholo North), summit of Mt. Tomani-nivi (also Mt. Victoria), alt. 1,290-1,323 m., dense mossy forest on trees, July 10, 1947, no. 5166b.

These plants, segregated from a tuft of *Spiridens aristifolius*, show the leaves with the hair points very fragile and mostly broken off, but here and there a typical leaf with the hair point intact indicates that this is merely an abnormal feature. I think the plants can safely be referred to *H. piliferus*, previously known only from Australia, Tasmania, and New Zealand.

## RHACOPIACEAE

**Powellia involutifolia** Mitten.

Viti Levu: Mba (formerly Nandi), upper slopes of Mt. Koromba (formerly Pickering Peak), alt. 800-1,075 m., dense forest, on bark, June 3, 1947, no. 4682.

As the original collection of this species is from Samoa, it is interesting but not unexpected to find it in Fiji. It is a rare species with a limited and very local distribution.

## CYRTOPODACEAE

**Bescherellea cryphaeoides** (C. Müller) Fleischer.

Viti Levu: Mba (formerly Tholo North), hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850-970 m., dense forest on tree trunks, Sept. 9, 1947, nos. 5939, 5947.

The sporophyte of this species has never been described. A few fruiting plants from these collections show the following characters. Seta 18-19 mm. long, pale yellow, slender, flexuous; capsule erect, cylindric, 2-2.5 mm. long; peristome single, endostome none or very rudimentary. Dixon has questioned the propriety of referring this species to *Bescherellea*, but the sporophyte shows that Fleischer's

intuition was justified. Furthermore, the Fiji plants are uncomfortably close to *B. elegantissima* Duby of New Caledonia and ultimately may have to be reduced to a synonym of that species. The only distinction seems to be in the leaf acumen which in the Fiji plants is shorter and not quite as slender.

## PTEROBRYACEAE

**Garovaglia Powellii** Mitten.

Viti Levu: Nandronga and Navosa, northern portion of Rairaimatuku Plateau between Nandrau and Rewasau (formerly in Tholo North), alt. 725-825 m., dense forest on branches, Aug. 11, 1947, no. 5660a.

Previously known only from Samoa and Nukuhiva in the Marquesas Islands. The Fiji plants are more robust than Powell's original collection from Samoa, but the foliage characters are identical in detail.

**Garovaglia Smithii**, new species.

Robusta, lutescens, nitida. Caulis secundarius usque ad 6 cm. altus, dense foliosus, simplex. Folia compressa, erecto-patentia, 4 mm. longa, 2.4 mm. lata, late ovalia, breviter acuminata, plicata, plicis dorso superne denticulatis; marginibus planis, superne argute serratis; cellulis rhomboideo-ovalis, incrassatis, inferioribus longioribus, alaribus numerosis, breviter oblongis.

Vanua Levu: Mathuata, southern base of Mathuata Range, north of Natua, alt. 100-250 m., dense forest on branches, Dec. 4, 1947, nos. 6830 (type), 6853.

As compared with *G. Powellii* Mitten, the leaves of *G. Smithii* are shorter, broader and more abruptly pointed, the upper leaf margins are more coarsely serrate and the alar cells more numerous and conspicuous.

The supplementary collection number 6853 of a few fruiting stems shows the following sporophyte characters: perichaetium exerted, inner perichaetial leaves cuspidate from a broad or emarginate, erose apex, capsule oblong, deep brown around the mouth; peristome teeth brown.

## NECKERACEAE

**Pinnatella (Urocladium) vitiensis**, new species.

Sat robusta, fusciscenti-viridis. Caulis primarius repens, caules secundarii ad 6 cm. alti, stipitati dein densissime pinnatim ramosi, ramis patulis, circa 1 cm.

longis, apicem versus decrescentibus, dense foliosis. Folia caulina e basi lata cordata-ovata raptim lanceolata, acuta, plures plicata, limbo intralimbali nullo, 2-2.1 mm. longa, 1 mm. lata; marginibus minute serrulatis; costa longe infra apicem evanida; cellulis ellipticis, incrassatis, minutis, ad  $12\mu$  longis, infima basi longioribus, alaribus numerosis, brevioribus et latioribus. Folia ramulina minora, ovalia, caulinus similia.

Viti Levu: Mba (formerly Tholo North), hills east of Nandala Creek, about 3 miles south of Nandarivatu, alt. 850-970 m., dense forest on tree trunks, Sept. 9, 1947, no. 5933.

Sharply distinct from *P. luzonensis* Brotherus, of the Philippines, in the plicate leaves abruptly lanceolate from a broad, subcordate base, the smaller lamina cells and the large area of small subquadrate alar cells.

#### HOOKERIAACEAE

##### *Daltonia contorta* C. Müller.

Viti Levu: Naitasiri, northern portion of Rairaimatuku Plateau, between Mt. Tomanivi (also Mt. Victoria) and Nasonggo (formerly in Tholo North), alt. 870-970 m., dense forest on branchlets, Sept. 18, 1947, no. 6138a.

New to Fiji. A few plants segregated from a tuft of *Clastobryella cuculligera* (Lacoste) Fleischer definitely give this species a place in the local flora. Previously known from Ceylon, Java, the Philippines, and the Hawaiian Islands.

#### HYPOPTERYGIACEAE

##### *Hypopterygium Vriesii* Bryologia Javanica.

Vanua Levu: Mathuata, southern base of Mathuata Range, north of Natua, alt. 100-250 m., dense forest on rocks and logs along stream, Dec. 4, 1947, no. 6845.

The conspicuous axillary tufts of brown brood filaments on the branches will easily separate this species from any of its local congeners. It is a significant addition to the Fiji flora from the west. Distribution: Sumatra, Java, Amboina, New Guinea, Ceram, the Philippines.

#### BRACHYTHECIACEAE

##### *Rhynchostegiella Smithii*, new species.

Autoica; corticola; plantae gregariae, minutae, virides. Caules prostrati, laxe et irregulariter ramosi. Folia complanata, 0.6-0.7 mm. longa, ovata, obtusa,

superne minute denticulata, inferne integra; costa brevis, tenuissima, infra medium folii evanida; cellulis linearibus, alaribus paucis, subquadratis. Seta perbrevis, 1.5-2 mm. longa, minute scaberula; theca minuta, erecta, 0.5 mm. longa; dentes peristomii brevis, triangulari, papilloso, endostomium hyalinum, processus lineares ut videtur; sporii 16-20 $\mu$  minute granulosi.

Viti Levu: Mba, northern portion of Mt. Evans Range, between Mt. Vatuyanitu and Mt. Natondra, alt. 700-900 m., on tree trunks, in dense forest, May 9, 1947, no. 4281.

This is a very diminutive species that cannot be compared with anything I know. Unfortunately, the capsules are mostly too old to show the peristome details clearly. A careful examination of all I dare remove indicates a double peristome with the segments of the endostome very slender and widely spaced, but I have not seen the complete peristome on any one capsule.

**Eurhynchium asperisetum** (C. Müller) Bartram.

Viti Levu: Nandronga and Navosa, northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau (formerly in Tholo North), alt. 725-825 m., dense forest on humus, Aug. 11, 1947, no. 5650a.

A few plants growing with *Mnium longirostrum* may be definitely referred to *E. asperisetum* here through a single sporophyte showing the characteristic scabrous seta. Previously known from Java and the Philippines.

SEMATOPHYLLACEAE

**Clastobryella cuculligera** (Lacoste) Fleischer.

Viti Levu: Mba (formerly Tholo North), summit of Mt. Tomanivi (also Mt. Victoria), alt. 1,290-1,323 m., dense mossy forest, on branches, July 10, 1947, no. 5187; Naitasiri, northern portion of Rairaimatuku Plateau, between Mt. Tomanivi and Nasonggo (formerly in Tholo North), alt. 870-970 m., dense forest on branchlets, Sept. 18, 1947, no. 6138.

These two collections are not identical, but I have referred them both to this species, which is credited to Fiji by Dixon through Greenwood's collection number 207b. The typical form is represented by number 6138 with narrow, slenderly pointed leaves. On the other hand number 5187 shows the leaves with shorter, broader points and the margins less coarsely toothed above, suggestive of

*C. epiphylla* (Renauld and Cardot) Fleischer, from Java and New Caledonia; but I am not familiar enough with the latter species to hazard a distinction.

**Acroporium Lepinei** (Bescherelle) Fleischer.

Viti Levu: Mba (formerly Tholo North), summit of Mt. Tomanivi (also Mt. Victoria), alt. 1,290-1,323 m., dense mossy forest, in masses on trees, July 10, 1947, nos. 5170, 5192, 5193, Sept. 6, 1947, nos. 5902, 5906, 5908, 5909; Ra, ridge from Mt. Namama, east of Nandarivatu, toward Mt. Tomanivi (formerly in Tholo North), alt. 1,050-1,120 m., dense forest, associated with roots of an epiphytic orchid, Aug. 18, 1947, no. 5704.

Until now, *Acroporium* in Fiji has been without any particular complications, but these collections throw a new light on the subject. The ovate-lanceolate, slenderly pointed leaves differ sharply from the broadly ovate, short-pointed leaves of *A. brevicuspidatum* Mitten and suggest that the plants in question may represent various forms of *A. Lepinei*. Numbers 5192 and 5193 with the leaves plainly falcate-secund on most of the plants approach *A. falcifolium* Fleischer very closely. To carry the analogy still farther, it is a question whether all three species are not forms of *A. stramineum* (Reinwardt and Hornschuch) Fleischer. In a broad sense the dioicous inflorescence is shared by all of them.

HYPNACEAE

**Isopterygium planifolium** Fleischer.

Viti Levu: Nandronga and Navosa, northern portion of Rairaimatuku Plateau, between Nandrau and Rewasau (formerly in Tholo North), alt. 725-825 m., dense forest, on branches, Aug. 11, 1947, no. 5652; Mba (formerly Tholo North), western and southern slopes of Mt. Tomanivi (also Mt. Victoria), alt. 850-1,150 m., dense forest on bark, July 14, 1947, no. 5263.

I have not had access to the type collection of this species for critical comparison, but the Fiji plants agree well with the original description. The short setae, rarely over 5 mm. high, erect capsules, and symmetrical leaves denticulate toward the apex are characters which in the aggregate suggest no other specific concept. Previously known only from Java.

**Ectropotheciella distichophylla** (Hampe) Fleischer.

Viti Levu: Mba (formerly Tholo North), immediate vicinity of Nandarivatu, alt. 800-900 m., in dense forest on wet banks along stream, July 2, 1947, no. 5039.

New to Fiji. Superficially these plants resemble *Ctenidiadelphus spinulosus* (Brotherus) Fleischer; but under a microscope, the shorter, pointed leaves and wider, shorter leaf cells are very distinctive. Distribution: Siam, Java, Celebes, Amboina, and the Philippines.

## POLYTRICHAECEAE

**Pogonatum Junghuhnianum** (Dozy and Molkenboer), *Bryologica Javanica*.

Viti Levu: Mba (formerly Tholo North), western slopes of Mt. Nanggaranambuluta (formerly Lomalangi), east of Nandarivatu, alt. 1,000-1,100 m., dense forest on soil of trail bank, June 23, 1947, no. 4826; southern slopes of Mt. Ndelainathovu, on the escarpment west of Nandarivatu, alt. 870-970 m., dense forest on clay banks, June 26, 1947, no. 4950; western and southern slopes of Mt. Tomani (also Mt. Victoria), alt. 850-1,150 m., dense forest on clay bank, July 7, 1947, no. 5126; valley of Nggaliwana Creek, north of the sawmill at Navai, alt. 725-850 m., dense forest on clay banks, July 21, 1947, no. 5377; Nandronga and Navosa, northern portion of Rairaimatuku Plateau, between Nandrau and Nanga (formerly in Tholo North), alt. 725-825 m., dense forest on clay banks, Aug. 7, 1947, no. 5568.

From these collections it may be assumed that this species is not uncommon on Viti Levu, though, strangely enough, it has never before been recorded from Fiji. *P. Graeffeanum* (C. Müller) Jaeger, as I understand it, shows the lamellae 2-4 cells high with the end cell rounded in cross section, whereas in *P. Junghuhnianum* the lamellae are 4-7 cells high with the end cell flat or notched. Distribution: Sikkim, Siam, Java, Celebes, Borneo, and the Philippines.

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