

MOSSES OF THE EASTERN HIGHLANDS, NEW GUINEA, FROM THE 6th ARCHBOLD EXPEDITION, 1959

By EDWIN B. BARTRAM¹

The moss collections, represented by 375–400 numbers, made by L. J. Brass, H. M. van Deusen, and J. D. Collins in the Eastern Highlands of northeastern New Guinea have been acquired by the Smithsonian Institution. These were entrusted to me for determination. They are a welcome and important supplement to the collection made by Ross G. Robbins in the Western Highlands. The results bring into sharp focus a number of significant aspects of the New Guinea moss flora.

As a result of active field work by Mr. Brass and Mr. Robbins this insular moss flora has been expanded in recent years to about 850 species. This is a large number for an area the size of New Guinea and it emphasizes the astonishing richness of this tropical flora. Every new collection adds new records and new species to a total which may eventually reach or exceed 1,000 species. The rugged terrain of the interior, with some peaks reaching altitudes of 14,000 to 16,500 ft., provides a wide variety of habitats which increase the interest and complexity of the flora. While far from complete, our present knowledge is broad enough to form the basis for some general conclusions. The percentage of endemism is abnormally high. Between 350 and 400 species, or nearly half of the known flora, have been described as new from New Guinea. Critical studies may reduce the figure to some extent, but the ratio of endemic species is likely to remain disproportionately high. Of the remaining 400 to 500 species by far the greater part is broadly representative of the Indo-Malayan areas to the west from where the bulk of the present flora has been derived. A limited number of species are common to the New Zealand-Australian area, but the affiliation in this direction is rather limited. A few species from the alpine crests of the higher peaks such as *Calliergon sarmentosum*, *Calliergon wilhelmense* (near

¹ Edwin B. Bartram, 1878–1964. Shortly before his death the author transferred his personal herbarium to the Farlow Herbarium at Harvard University where he had long been honorary curator of mosses.

C. turgescens), and *Meesea triquetra* show such disjunct geographical distribution as to preclude any logical explanation. If the North Pole was located in the south central Pacific ages ago, as has been suggested, these relicts may represent waifs of circumpolar distribution that have survived in sanctuary niches, but this is of course only a random guess. The implications are too complex and extensive for my modest attainments. The fact remains that the New Guinea moss flora is predominantly Malaysian in character and probably represents the southeastern front of a broad pattern of geographical distribution extending east to Fiji and Samoa.

In the following list, species not previously recorded from New Guinea are preceded by an asterisk. A complete series of specimens is deposited in the herbarium of the United States National Museum, Washington, D.C., and in the Farlow Herbarium at Harvard University.

Andreaeaceae

Andreaea rupestris Hedw.

Mt. Wilhelm, east slopes: on stones on alpine grassland, 13,500 ft., *Van Deusen* 29896; cushioned in crevices near summit, 14,500–14,700 ft., *Collins* 29958, 29959; cushioned on a rock near summit, 14,700 ft., *Van Deusen & Collins* 30027.

Andreaea (Enervia) novo-guinensis Bartr. sp. nov.

Robusta, caespitosa, caespitibus densis, fuscescentibus, nitidiusculis. Caulis 5–7 cm. altus, parce ramosus, ramis obtusis. Folia erecta, imbricata, late ovata, profunde concava, obtusa, 1.5–2.5 mm. longa, 1.2 mm. lata, ecostata; marginibus integris, erectis, superne inflexis; cellulis superioribus parvis, rotundatis, incrassatis, laevissimis, diam. 5–6 μ , basilaribus internis linearibus, incrassatis, porosis, externis parvis, rotundatis. Folia perichaetialia parva caulina similia; theca in pseudopodio crasso, ovalis folia perichaetialia vix superans.

Type in the U.S. National Herbarium, collected on moist ground near summit, at 14,700 ft. altitude, east slopes, Mt. Wilhelm, New Guinea, June 18, 1959, by Van Deusen and Collins (no. 30029).

This remarkable species in an unusual habitat is characterized by the robust habit, the turgid stems, and the broad, concave, bluntly pointed leaves.

Fissidentaceae

Fissidens filicinus D. & M.

Kassam: wet, shady bank of a small stream in *Castanopsis*-oak forest, 1370 m., 32414.

Ditrichaceae

Ditrichum sericeum Bartr.

Mt. Wilhelm, east slopes, 14,700 ft.: on ground near summit, *Collins* 29964; in a moist crevice near summit, *Van Deusen & Collins* 30032.

Dicranaceae

Trematodon longicollis Mx.

Mt. Otto, south slopes, 7,300 ft., 29122.

Campylopodium euphorocladum (C. M.) Besch.

Purosa, Okapa area: terrestrial on roadside in rain forest, 1950 m., 31610.

Dicranella setifera (Mitt.) Jaeg.

Arau: on a clay roadbank in forest, 1400 m., 32069.

Campylopus (Eucampylopus) crispifolius Bartr. sp. nov.

Dense caespitosus, caespitibus fuscescentibus. Caulis brevis, vix 1 cm. longus, dense foliosus; folia sicca arcte flexuosa vel crispata, humida erecto-patentia, e basi oblonga sensim acuminata, 4 mm. longa, 0.5 mm. lata; marginibus erectis, integris, apice solum denticulatis; costa inferne 375μ lata; cellulis basilaribus hyalinis, parietibus teneris, rectangularibus, 12–18 μ latis, superioribus parvis, rhomboideis; alaribus nullis. Caetera ignota.

Type in the U.S. National Herbarium, collected on a seepage slope in alpine grassland, at 3560 m. elevation, east slopes, Mt. Wilhelm, New Guinea, June 14, 1959, by L. J. Brass (no. 29894).

The absence of alar cells suggests some affinity with *C. robbinsii* Bartr., but the flexuose-crispate leaves less slenderly acuminate are quite distinctive.

Campylopus (Palinocraspis) wilhelmensis Bartr. sp. nov.

Caespitosus, caespitibus lutescentibus intus fuscescentibus. Caulis erectus, 4–5 cm. altus, simplex vel sparse ramosus, rubro-tomentosus. Folia sicca erecta, humida flexuoso-patentia, e basi breviter oblonga sensim subulato-acuminata, 5 mm. longa, ad 0.7 mm. lata; marginibus erectis, inferne integris, superne remote et minute denticulatis; costa inferne 300μ lata; cellulis basilaribus breviter oblongis, 14–18 μ latis, parietibus firmis, marginalibus e seriebus 4–5 abrupte angustioribus, alaribus distinctis, fuscis vel hyalinis, sat auriculatis; superioribus parvis, subquadratis. Caetera ignota.

Type in the U.S. National Herbarium, collected on a tree stump in moist forest, at 2740 m. elevation, east slopes, Mt. Wilhelm, New Guinea, July 1, 1959, by L. J. Brass (no. 30237).

The costal structure is similar to that of *C. morobensis* Bartr., but the stems are evenly foliate, tomentose and the leaves shorter.

Campylopus comosus Bosch & Lac. (?)

Sterile. Morobe District, Botanic Gardens, Lae: on tree-fern stem supports of epiphytic orchids, 200 ft., 29111.

Campylopus caudatus (C. M.) Mont.

Mt. Wilhelm, east slopes: on deadwood on alpine grassland, 3560 m., 29891.

Campylopus (Palinocraspis) atro-fuscescens Bartr. sp. nov.

Dense caespitosus, caespitibus inferne nigricentibus superne lutescentibus. Caulis erectus, dense foliosus. Folia erecta, flexuosa, humida erecto-patentia, e basi ovata sensim subulato-acuminata, 6 mm. longa, 0.6 mm. lata; marginibus erectis, integris, apice solum parcissime denticulatis; costa breviter excurrente, inferne circa 0.3 mm. lata; cellulis superioribus parvis, rotundatis, basilaribus linearibus, porosis margines versus angustioribus, alaribus subquadratis, vix distinctis, fugacissimis. Caetera ignota.

Type in the U.S. National Herbarium, forming cushions on alpine grassland, at 13,100 ft. elevation, east slopes, Mt. Wilhelm, New Guinea, June 15, 1959, by J. D. Collins (no. 29941).

Suggestive of *C. clemensiae* Bartr. in some respects but distinct in the darker color, the evenly foliate stems, and the differentiated alar cells which while present are not well defined.

Campylopus exasperatus Brid.

Mt. Wilhelm, east slopes: on wet ground in alpine grassland, 13,100 ft., *Collins* 29939.

Campylopus archboldii Bartr.

Mt. Wilhelm, east slopes: on exposed rock in alpine grassland, 3560 m., 29821a; on rocks of a shady stream in forest, 2770 m., 30450.

Campylopus umbellatus (Arn.) Par.

Morobe District, Wau-Edie Creek road: 5,800 ft., 29162. Kaindi: on clayey moist roadbank, 2060 m., 29548. Mt. Wilhelm, east slopes: on alpine grassland, 13,100 ft., 29942, 30090a. Mt. Otto: on rocks of a creek bank in forest, 2200 m., 30839. Mt. Michael, northeast slopes: on exposed rock in forest, 2000 m., 31533.

Atractylocarpus dicranoides Dix.

Mt. Wilhelm, east slopes: on deadwood in subalpine forest, 3560 m., 30045.

***Amphidium cyathicarpum** (Mont.) Broth.

Mt. Wilhelm, east slopes: on dry ground under a rock overhang on alpine grassland, probably fertilized by owl pellets and droppings, 3650 m., *Van Deusen* 30151.

Distribution: Guatemala, western South America, Australia, New Zealand, Africa.

***Symblepharis reinwardtii** (D. & M.) Bosch & Lac.

Mt. Michael: on rocks of summit, 3650 m., *Brass & Collins* 31259.

Distribution: Sikkim, Burma, Java, Borneo, Philippine Islands.

Dicranoweisia macrocarpa Bartr.

Mt. Wilhelm, east slopes: cushioned high on a tree in forest, 2770 m., 30470.

Holomitrium stenobasis Dix.

Mt. Wilhelm, east slopes: on a tree in edge of subalpine forest, 3700 m., 30119.

Holomitrium austro-alpinum Bartr.

Mt. Otto: on alpine grassland of the summit, 3540 m., 31038.

Cryptodicranum armittii (C. M.) Bartr.

Arau: on tree trunks, 1400 m., 31960a, 31961.

Dicranoloma perarmatum Broth.

Morobe District, Mt. Kaindi: on decayed wood in forest, 7,200 ft., 29165; on edge of a path in *Castanopsis* forest, 2000 m., 29526. Mt. Wilhelm, east slopes: on tree trunk in subalpine forest, 3650 m., 29868.

Dicranoloma laevifolium (Broth. & Geh.) Par.

Mt. Wilhelm, east slopes: in small cushions on tree trunks in subalpine forest, 3650 m., 29869; on wet ground in long-grass community of alpine grassland, 3800 m., 30121.

Dicranoloma dicarpum Hornsch.

Mt. Michael, northeast slopes: on lower trunks of big trees in *Castanopsis-Nothofagus* forest, 2000 m., 31504. Purosa, Okapa area: on leaf littered ground in *Castanopsis* forest, 2050 m., 31844.

Dicranoloma braunii (C. M.) Par.

Mt. Wilhelm, east slopes: on tree trunks in forest, 2740 m., 30234. Purosa, Okapa area: on undergrowth in rain forest, 1950 m., 31667; on tree trunks in *Castanopsis* forest, 2050 m., 31843. Arau: on tree in *Castanopsis* forest, 1400 m., 31976.

Dicranoloma blumii (Nees) Par.

Mt. Michael: on trees in subalpine forest, 3500 m., *Brass & Collins* 31318.

Braunfelsia enervis (D. & M.) Par.

Mt. Wilhelm, east slopes: on a tree in moist, mossy forest, 2600 m., 30490.

Leucobryaceae

***Leucobryum chlorophyllum** C. M.

Morobe District, Oomsis: on buttress roots of a great *Anisoptera* tree, 200 m., 29268a.

Distribution: Ceylon, Java, Philippine Islands, Celebes, Sumbawa, Timor.

Leucobryum sanctum Hpe.

Purosa, Okapa area: on tree trunks in rain forest, 1950 m., 31693. Kassam: on logs and bases of trees in *Castanopsis*-oak forest, 1370 m., 32433.

Leucobryum candidum (Brid.) H. f. & W.

Mt. Otto, south slopes, 2000 m.: low on trees in *Castanopsis* forest, 31111.

Leucobryum pentastichum D. & M.

Morobe District, Oomsis: on buttress roots of a great *Anisoptera* tree, 200 m., 29266, 29267a.

Octoblepharum albidum Hedw.

Morobe District: Botanic Gardens, Lae: on tree-fern stem supports of epiphytic orchids, 29105.

Leucophanes glaucescens C. M.

Morobe District, Umi River, Markham Valley: low on a tree in rain forest, 480 m., 32584; Botanic Gardens, Lae: on tree-fern stem supports of orchids, 200 ft., 29107b.

Leucophanes octoblepharioides Brid. var. *korthelsii* (D. & M.) Fleisch.

Morobe District, Botanic Gardens, Lae: 200 ft., 29106a.

Calymperaceae

Syrrhopodon ciliatus (Hook.) Schwaegr.

Morobe District, Botanic Gardens, Lae: on tree-fern stem supports of epiphytic orchids, 200 ft., 29107.

***Syrrhopodon philippinensis** Bartr.

Morobe District, Oomsis: on buttress roots of a great *Anisoptera* tree, 200 m., 29268.

Distribution: Philippine Islands.

Calymperes hyophylaceum C. M.

Morobe District, Botanic Gardens, Lae: on tree-fern stem supports of epiphytic orchids, 200 ft., 29109.

Calymperes moluccense Schwaegr.

Morobe District, Botanic Gardens, Lae: on tree-fern supports of epiphytic orchids, 29107a, 29110.

Calymperes tahitense (Sull.) Mitt.

Morobe District, Kelly Bros. place on Bulolo Road, about 3 miles west of Lae: ca. 20 m., between buttress roots of tree, 29104a.

Pottiaceae

Hyophila involuta (Hook.) Jaeg.

Mt. Michael, northeast slopes: on rocks in *Castanopsis-Nothofagus* forest, 2000 m., 31535, 31537a, 31544. Morobe District, Umi River, Markham Valley: on moist rock face in rain forest, 480 m., 32627.

Trichostomum angustatum (Mitt.) Fleisch.

Mt. Otto, south slopes: underside of a rock overhang, 2200 m., 30923.

Trichostomum subulifolium Bartr.

Mt. Wilhelm, east slopes: on a tree trunk in subalpine forest, 3560 m., 29847. Mt. Michael, northeast slopes: on rock in *Castanopsis-Nothofagus* forest, 2000 m., 31543.

***Leptodontium warnstorffii** Fleisch.

Mt. Wilhelm, east slopes: alpine grassland, 13,500 ft., *Van Deusen* 29895.

Distribution: Java.

***Streptopogon erythrodontus** (Tayl.) Wils.

Mt. Wilhelm, east slopes: tufted on exposed branches of a tree in subalpine forest 3560 m., 30068.

Distribution: Guatemala, Colombia, Ecuador, Peru, Bolivia, Hawaii, Madagascar, Africa.

The occurrence of this species in New Guinea presents a problem in geographical distribution that is hard to explain with any satisfaction. The species is fairly well distributed along the American Cordillera from Bolivia to Guatemala. It is also known from the crater of Haleakala, Maui, Hawaii, and the variety *rutenbergii* (C. M.) Salm. from Madagascar and the African continent. This is the only known record from the southwest Pacific area. The species appears to be of austral origin and has fanned up through South America and Africa.

Grimmiaceae

Grimmia affinis Hornsch.

Mt. Wilhelm, east slopes: cushioned on rocky slopes, 14,700 ft., *Van Deusen & Collins* 30026.

This species has been recorded from the Himalayas and Ceylon at high altitudes under the name of *G. ovalis* (Hedw.) Lindb., but according to the studies by Dr. Sayre (*Bryologist* 55:258, 1952), Hornschuch's name will take precedence. Here the setae are distinctly curved when dry but strictly erect when moist.

Rhacomitrium crispulum (H. f. & W.) H. f. & W.

Mt. Wilhelm, east slopes: exposed rock in alpine grassland, 3650 m., 29874; in crevices near summit, 14,500–14,700 ft., J. D. Collins 29961, 29962; on a rock in alpine grassland, 3560 m., 30086, 30091; terrestrial in alpine grassland, 3800 m., 30122; on rocks of a shady stream in forest, 2770 m., 30448.

Rhacomitrium lanuginosum (Hedw.) Brid. var. **pruinatum** H. f. & W.

Mt. Wilhelm, east slopes: alpine grassland, 13,100 ft., *Collins* 29940; 3700 m., *Brass* 29996.

Funariaceae

Entosthodon subulatus Bartr.

Mt. Wilhelm, east slopes: on wet ground in alpine grassland, 13,100 ft., *Collins* 29938.

Entosthodon contortus Bartr.

Mt. Michael: wet ground edging small pools on alpine grassland, 3560 m., 31432 bis.

Funaria hygrometrica Hedw.

Morobe District, Mt. Kaindi: roadbank, 2200 m., 29593. Mt. Wilhelm, east slopes: burnt ground, 2770 m., 30673. Purosa, Okapa area: burnt ground, 31841.

Splachnaceae

Tayloria octoblepharis (Hook.) Mitt.

Mt. Wilhelm, east slopes: terrestrial in an open place in long-grass community of alpine grassland, 3850 m., 30118; on log, 2740 m., 30241a.

Bryaceae

Mielichhoferia (Eumielichhoferia) novo-guinensis Bartr. sp. nov.

Paroica: caespitosa, caespitibus densis, superne pallide viridibus, inferne fuscescentibus, nitidiusculis. Caulis erectus, usque ad 2 cm. altus, inferne denudatus, dein dense foliosus. Folia imbricata, ovato-lanceolata, tenuiter acuminata, 2 mm. longa, 0.45 mm. lata; marginibus erectis, superne minute denticulatis; costa inferne 0.75 μ lata, valde excurrente; cellulis anguste linearibus, infimis brevioribus. Seta 2 cm. longa; theca erecta vel leniter inclinata, oblongo-cylindrica, deoperculata ad 4 mm. longa; operculum obtuse conicum; endostomium hyalinum, laevissimum, corona basilaris ad 50 μ alta, processus anguste lineari, 375 μ longi, medio c 17 μ lati; spori ferruginei, papilloso, diam. 20 μ .

Type in the U.S. National Herbarium, collected in a crevice near summit, at 14,500-14,700 feet elevation, east slopes, Mt. Wilhelm, New Guinea, June 16, 1959, by J. D. Collins (no. 29966).

This species resembles *M. javanica* Broth. in some respects, but the larger, finely acuminate leaves 2 mm. long with the costa excurrent in a short arista are good diagnostic characters.

***Pohlia elongata* Hedw.**

Mt. Wilhelm, east slopes: on base of tree in edge of subalpine forest, 3650 m., 29866.

****Pohlia flexuosa* Hook.**

Morobe District, Wau-Edie Creek road: on moist, clayey roadbank, 5,800 ft., 29159.

Distribution: Apparently widely distributed in tropical regions. Himalayas, West Indies, Central & South America.

***Brachymerium nepalense* Hook.**

Mt. Wilhelm, east slopes: on tree trunk in forest, 2740 m., 30231.

****Anomobryum cymbifolium* (Lindb.) Broth.**

Mt. Wilhelm, east slopes: on rocks in an alpine grassland stream, 3560 m., 30089.

Distribution: Himalayas, Khasia, South India, Java, Amboina, Philippine Islands.

***Bryum argenteum* Hedw.**

Morobe District, Mt. Kaindi: open ground, 2250 m., 29680. Mt. Wilhelm, east slopes: on a stump in alpine grassland, 3560 m., 30085; on open ground in alpine grassland, 4080 m., 30172; on bare ground in forest 2600 m., 30718.

***Bryum porphyroneuron* C. M.**

Morobe District, Botanic Gardens, Lae: limestone of a rockery, 200 ft., 29114; Kaindi: on wet rock, 29551; on log, 29552; Gurakor: on log in forest, 640 m., 29414. Mt. Wilhelm, east slopes: open flood banks of Pengagl Creek, 2770 m., 30269.

****Bryum australe* Hampe.**

Morobe District, Kaindi: roadbank in forest, 2060 m., 29681.

Distribution: Australia.

***Bryum nitens* Hook.**

Morobe District: Umi River, Markham Valley, 480 m., 32627a.

***Bryum* (*Doliolidium*) *wilhelmense* Bartr. sp. nov.**

Gracile, dense caespitosum, caespitibus pallide fuscescentibus, intus dense intertextis. Caulis ad 5 cm. altus, ramosus. Folia erecta, imbricata; folia caulina ovata breviter aristata, ad 0.8 mm. longa, comalia longiora; marginibus integris, erectis; costa breviter excurrente; cellulis superioribus rhomboideis, 35-40 μ longis, 10 μ latis, basilaribus infimis subquadratis. Seta gracilis ad 2.5 cm. longa; theca horizontalis, deoperculata 2 mm. longa.

Type in the U.S. National Herbarium, collected on exposed rock in alpine grassland, at 3560 m. elevation, east slopes, Mt. Wilhelm, New Guinea, June 11, 1959, by L. J. Brass (no. 29821). Paratype at same locality, on rocks in a stream in alpine grassland, Brass 30093.

In some respects this species resembles *B. junghuhnianum* Hpe. of Java, but the elongated stems and shorter-pointed longer leaves are quite distinctive.

Bryum novo-guinense Bartr.

Mt. Wilhelm, east slopes: on rocks in an alpine grassland stream, 3560 m., 30090b.

Bryum truncorum Brid.

Mt. Wilhelm, east slopes: on a tree in subalpine forest, 3560 m., 30150; on a tree stump in forest, 2740 m., 30233; lower trunk of tree in mossy forest, 2770 m., 30349. Mt. Otto, south slopes: on a log in forest, 2480 m., 30902.

Bryum crassulum Bartr.

Morobe District, Kaindi: on a log in forest, 2150 m., 29703.

Rhodobryum giganteum (Hook.) Schp.

Mt. Wilhelm, east slopes: terrestrial in moist forest, 2900 m., 30388.

Leptostomaceae

Leptostomum intermedium Broth.

Mt. Wilhelm, east slopes: on tree in subalpine forest, 3560 m., 29892. Mt. Otto, south slopes: on dead small tree in forest, 2480 m., 30903.

Mniaceae

Orthomniopsis elimbata Noguchi.

Morobe District, Wau-Edie Creek road: 5,800 ft., on moist, rocky roadbanks, 29161. Mt. Wilhelm, east slopes: on thick terminal branches of a *Ternstroemia* tree in forest, 2770 m., 30352.

As no. 30352 is in good fruit, the sporophyte of this species may be described. Dr. Noguchi was correct in assuming that this species was an *Orthomniopsis*. *Mnium rotundifolium* Bartr., which is exactly the same thing, will therefore be reduced to synonymy.

Perichaetial leaves spatulate, rounded, unbordered, 7-8 mm. long. Seta solitary or two from one perichaetium, 5 mm. long, 0.5 mm. thick, slightly curved; capsule nodding, oblong-cylindric, abruptly contracted to the seta, 4 mm. long, 2 mm. thick; peristome double, teeth brown, papillose, linear-lanceolate, 0.8 mm. long, endostome papillose, pale, basal membrane about half the height of the teeth, segments about equaling the teeth. Operculum, calyptra, and spores not seen.

Rhizogoniaceae

Hymenodon parvulus Bartr.

Mt. Wilhelm, east slopes: on trees in forest, 2770 m., 30348, 30351.

No. 30348 contains many fruiting plants. The sporophyte may be

described as follows: Perichaetium small, leaves about 1 mm. long, broadly ovate, laxly areolate, unbordered, costa excurrent. Seta 12 mm. long, pale brown; capsule erect, relatively large, oblong-cylindric, urn 2.5 mm. long, operculum conic-rostrate, 1 mm. long, oblique; outer peristome lacking, endostome pale, segments 0.3 mm. long from a rather high basal membrane projecting about 50 μ above the rim; spores pale, smooth, diameter 10 μ ; calyptra cucullate, small, barely covering the operculum.

Rhizogonium spiniforme (Hedw.) Bruch.

Morobe District, Oomsis: on buttress roots of a great *Anisoptera* tree, 200 m., 29267; Gurakor: base of tree, 640 m., 29505. Arau: on tree roots, 1400 m., 31926. Kassam: on tree trunks and rotting wood, 1370 m., 32339.

Hypnodendraceae

Hypnodendron diversifolium Broth.

Purosa, Okapa area: on logs in rain forest, 1950 m., 31697. Arau: on surface roots in oak-*Castanopsis* forest, 1400 m., 31926a.

Hypnodendron auricomum Broth. & Geh.

Morobe District, Kaindi: on stem of a dead tree fern in forest, 2060 m., 29789. Mt. Wilhelm, east slopes: terrestrial in deep shade in subalpine forest, 3560 m., 29849. Mt. Otto, south slopes: terrestrial on edge of a stream in *Castanopsis* forest, 2000 m., 31112.

Hypnodendron (Euhypnodendron) brassii Bartr. sp. nov.

Robustum, pallide viride, nitidum. Caulis usque ad 10 cm. altus, erectus, rigidus, alte stipitatus, dense rufo-tomentosus, stipite foliis pallidis, adpressis, acuminatis, superne dense ramosus, ramis bipinnatis, ca. 3 cm. longis, densissime congestis; folia ramea complanata, ovato-lanceolata, breviter acuminata; marginibus erectis, superne grosse et irregulariter serratis; costa tenuis, infra apicem folii evanida, dorso superne serrata; cellulis linearibus, basilaribus infimis laxioribus. Setae numerosi, ad 10, rubri, 2.5 cm. longi; theca cum collo cylindrica, valde plicata, 5 mm. longa.

Type in the U.S. National Herbarium, collected on ground in *Castanopsis*-oak forest, at 1400 m. elevation, Arau, New Guinea, Oct. 12, 1959, by L. J. Brass (no. 32042).

This unusual and attractive species is immediately distinguished by the tomentose stipes and the branches densely crowded in a compact, globular head up to 6 cm. in diameter, suggestive in a way of *H. junghuhnii* but much denser and more pronounced.

Mniodendron humile Lindb.

Mt. Wilhelm, east slopes: on dead tree in forest 2740 m., 30243; on a log in forest, 2770 m., 30451. Mt. Otto, south slopes: terrestrial in stunted forest, 3300 m., 31039. Arau: on logs in forest, 1400 m., 31978.

Bartramiaceae

***Conostomum australe** Sw.

Mt. Wilhelm, east slopes: on moist ground near summit, 14,700 ft., *Van Deusen & Collins* 30030.

Distribution: Colombia to Fuegia, Falkland Islands, Auckland Islands, Campbell Islands, Australia, New Zealand.

Bartramia sp.

The leaves up to 4 mm. long differ from those of either *B. cubica* Dix. or *B. conica* Bartr. where they are 7–8 mm. long. In the absence of fruit it seems unwise to propose a new species.

Mt. Wilhelm, east slopes: cushioned in crevices near summit, 14,500–14,700 ft., *Collins* 29963.

Philonotis secunda (D. & M.) Bosch & Lac.

Mt. Wilhelm, east slopes: wet, boggy ground in long-grass community in alpine grassland, 3560 m., 30070; on rocks in stream, 2770 m., 30450a. Mt. Otto, south slopes: wet stream bank, 2200 m., 30841. Morobe District, Umi River, Markham Valley: 480 m., 32529.

Philonotis novoguineensis Reim.?

Mt. Wilhelm, east slopes: in shallow seepage water on open flood terraces of Pengagl Creek, 2770 m., 30407.

The broader leaf cells (to 10 μ wide) suggest that these plants may be referred to Reimer's species, but in the absence of fruit the determination is questionable.

Breutelia romeri Fleisch.

Mt. Wilhelm, east slopes: on moist ground in long-grass community of alpine grassland, 3560–3850 m., 29819, 30117.

Spiridentaceae

Spiridens reinwardtii Nees.

Mt. Wilhelm, east slopes: on stem of a tree fern in subalpine forest, 3560 m., 30149.

Spiridens aristifolius Mitt.

Purosa, Okapa area: in rain forest, forming large clumps often on stems of tree ferns, 1950 m., 31682.

Spiridens perichaetialis Bartr. & Willis.

Morobe District, Wau-Edie Creek road: on dead tree fern, 1850 m., 29777. Mt. Wilhelm, east slopes: on trees, 2770 m., 30292. Mt. Otto, south slopes: on small trees in forest, numerous plants radiating from their supports, 2480 m., 30892. Mt. Michael: on trees in forest, 3100–3290 m., *Brass & Collins* 31302. Purosa, Okapa area: on stems of tree ferns, 1950 m., 31682a.

Orthotrichaceae

Zygodon reinwardtii Al. Br.

Mt. Wilhelm, east slopes: on deadwood in subalpine forest, 3560 m., 29820.

Zygodon intermedius B. & S.

Mt. Wilhelm, east slopes: under a rock overhang in alpine grassland, 3650 m., *Van Deusen* 30152.

***Ulota anguste-limbata* Bartr.**

Mt. Wilhelm, east slopes: on upper branches of trees in subalpine forest, 3650 m., 29867; on dead branch in edge of subalpine forest, 3900 m., 30120.

***Ulota splendida* Bartr.**

Mt. Wilhelm, east slopes: in golden yellow masses on alpine grassland, 13,100 ft., *Collins* 29944; alpine grassland, 13,100 ft., *Collins* 29945a.

***Desmotheca apiculata* (D. & M.) Lindb.**

Morobe District, Botanic Gardens, Lac: 200 ft., on roots of epiphytic orchid, 29108; Oomsis: matted high on a dipterocarp tree in forest, 150 m., 29194; Umi River, Markham Valley, 480 m., on tree trunk, 32617.

***Macromitrium erubescens* Bartr.**

Morobe District, Kaindi: high epiphyte in *Nothofagus* forest, 2150 m., 29701. Mt. Otto, south slopes: high epiphyte in *Castanopsis* forest, 2000 m., 31116.

***Macromitrium orthostichum* Nees.**

Mt. Otto, south slopes: on tree, 2000 m., 31117a.

***Macromitrium (Goniostoma) brevirameum* Bartr. sp. nov.**

Humile, fuscescens. Caulis prostratus, ramosus, rami breves, 4-5 mm. alti, cuspidati. Folia sicca spiraliter contorta, humida patula, anguste oblongo-lanceolata, obtusa, apiculata, 1.5 mm. longa, 0.3 mm. lata; marginibus integris, superne sinuatis; costa percurrente; cellulis superioribus parvis, papillosis, sat incrassatis, basilaribus linearibus, grosse tuberculosus. Seta gracilis, 5-7 mm. longa; theca elliptica, microstoma, ore angulato; calyptra glabra, basi integra.

Type in the U.S. National Herbarium, collected as a high epiphyte in *Castanopsis* forest, at 2000 m. elevation, south slopes, Mt. Otto, New Guinea, Aug. 17, 1959, by L. J. Brass (no. 31117). Paratype on a living branch in forest undergrowth, at 2000 m. elevation, north-east slopes, Mt. Michael, *Brass* 31485.

This species has much in common with *M. speirophyllum* Bartr., but the distinctions are sharply defined. Here the branches are less than 5 mm. high, the leaves only 1.5 mm. long, the upper leaf cells 7-8 μ in diameter and minutely papillose and the color brownish green, while in *M. speirophyllum* the branches are about 1 cm. long, the leaves 2-2.5 mm. long, the upper cells 12-15 μ in diameter and highly papillose and the color deep, rich red.

***Macromitrium novo-guinense* Bartr.**

Mt. Wilhelm, east slopes: on bark of a dead tree in forest, 2750 m., 30229; on tree trunks in subalpine forest, 3560 m., 29823.

***Macromitrium sublongicaule* Bartr.**

Mt. Wilhelm, east slopes: on high branches of a tree in forest, 2770 m., 30353. Mt. Otto, south slopes: high epiphyte in *Castanopsis* forest, 2000 m., 31118, 31117b. Arau: on tree trunks in *Castanopsis* forest, 1400 m., 31943, 31977. Morobe District, Umi River, Markham Valley: on tree trunk, 480 m., 32615.

Macromitrium semipellucidum D. & M.

Morobe District: Kelly Bros. place about 3 miles west of Lae, on Bulolo road, 20 m., 29102; Botanic Gardens, Lae, 200 ft., on tree-fern stem support of an epiphytic orchid, 29112; Umi River, Markham Valley, on a dead stick, 480 m., 32548; on a tree trunk, 32614.

Macromitrium angustifolium D. & M.

Mt. Wilhelm, east slopes: on dead branch, 2740 m., 30230; on tree trunk in forest edge, 2600 m., 30789. Mt. Otto, south slopes: on tree trunk in *Castanopsis* forest, 2000 m., 31113. Kassam: on tree trunk, 1370 m., 32376. Purosa, Okapa area: on a big tree in rain forest, 1950 m., 31796. Morobe District, Kaindi: open, rocky bank of stream in forest, 2060 m., 29549; Umi River, Markham Valley, tree trunk, 480 m., 32616.

Schlotheimia emarginato-pilosa Herz.

Arau: high on trees in *Castanopsis*-oak forest, 1400 m., 31941.

Schlotheimia pilicalyx Broth. & Geh.

Mt. Wilhelm, east slopes: tree trunks in subalpine forest, 3650 m., 29873, 29993. Mt. Otto, south slopes: on alpine grassland of summit, 3540 m., *Brass & Collins* 31038a.

Schlotheimia macgregorii Broth. & Geh.

Mt. Michael: on a tree in forest, 2700 m., 31450. Morobe District, Kaindi: high epiphyte in *Nothofagus* forest, 2150 m., 29702.

Rhacopilaceae

Powellia involuta Mitt.

Mt. Michael, northeast slopes: on stem of small *Pandanus* in *Castanopsis*-*Nothofagus* forest, 2000 m., 31547. Arau: trunk of *Pandanus* in *Castanopsis*-oak forest, 1400 m., 31942; on stem of *Pandanus* tree, 1400 m., 32039.

Rhacopilum spectabile R. & H.

Purosa, Okapa area: on rotting logs, 1950 m., 31651. Kassam Gap: on log, 1460 m., 32297. Mt. Michael, northeast slopes: on twigs and branches, 2000 m., 31540, 31542, 31549. Mt. Otto, south slopes: on tree in forest, 2200 m., 30840. Morobe District, Wau-Edie Creek road: on log, 5,800 ft., 29163; Mt. Kaindi: on log, 2200 m., 29594 in part.

Hedwigiaceae

Rhacocarpus humboldtii (Hook.) Lindb.

Mt. Wilhelm, east slopes: cushioned on moist ground near summit, 14,700 ft., *Van Deusen & Collins* 30031.

Rhacocarpus alpinus (Wright) Par.

Mt. Wilhelm, east slopes: terrestrial on alpine grassland, 3700 m., 29995.

These plants correspond in all particulars with those from Mt. Kinabalu, Borneo, and also with the scrap from Mt. Wilhelmina (Bartram, E. B., *Lloydia* 5:275, 1942). The leaves show no trace of a hair-point and are constantly short apiculate. By contrast the plants in no. 30031 all show hair-pointed leaves. I have therefore referred this latter collection to *R. humboldtii* and this one to *R. alpinus* pending a critical revision of the genus.

Cyrtopodaceae

Bescherellea cyrtopus F. v. Muell.

On lower trunks of trees in *Castanopsis* forest, Kassam, 1370 m., 32281.

***Bescherellea elegantissima** Duby.

Mt. Wilhelm, east slopes: low on trees in moist forest, 2740 m., 30245; on tree trunks in forest, 2900 m., 30387; low on trees in open, swampy forest, 2770 m., 30468.

Distribution: New Caledonia, Aneityum.

Ptychomniaceae

Hampeella pallens (Lac.) Fleisch.

Morobe District, Kaindi: on dead branch in forest, 2060 m., 29663.

Prionodontaceae

Neolindbergia brassii Bartr.

Mt. Wilhelm, east slopes: masses low on tree in forest, 2770 m., 30620.

By good fortune these plants are well fruited with the capsules very young and immature, ripe and in prime condition, or old and empty. The sporophyte characters are as follows: perichaetium small, inner leaves erect, 3 mm. long, ligulate from an ovate base, serrulate near apex, costa ending below the acute apex, upper cells small, round, basal cells linear toward costa, small and round in 5-6 rows at margins. Seta 5 mm. long, erect, papillose; capsule globose, brown, glossy, 1 mm. in diam.; operculum oblique, conic-rostrate, 1 mm. long; calyptra cucullate, short, pilose, 2 mm. long; peristome teeth about 0.3 mm. long, linear, hyaline, smooth, inserted below rim; endostome none or fragmentary and rudimentary without segments or cilia; spores 16-20 μ in diam., minutely papillose, exothecial cells irregularly hexagonal, incrassate, smaller and colored in several rows around mouth, annulus none.

Pterobryaceae

Trachyloma indicum Mitt.

Mt. Wilhelm, east slopes: low on trees in subalpine forest, 3560 m., 30069.

Trachyloma tahitense Besch.

Mt. Wilhelm, east slopes: low on trees in moist, mossy forest, 2900 m., 30390.

Endotrichella apiculata Bartr. sp. nov.

Sat robusta, pallide viridis, nitida. Caulis secundarius usque ad 4 cm. longus, simplex, haud complanatus, cum foliis 7 mm. latus. Folia late patentia, rotundato-ovata, ca. 3 mm. longa, 2.2 mm. lata, apice rotundata, apiculata, plicata; marginibus superne minute denticulatis; costa duplex, brevis; cellulis lineari-rhomboideis, incrassatis, infimis fuscis, alaribus nullis. Folia perichaetialia parva, erecta, acuta; seta 1 mm. longa; theca erecta, exserta, oblonga deoperculata 2 mm. longa.

Type in the U.S. National Herbarium, collected on undergrowth in forest, at 1400 m. elevation, Arau, New Guinea, Oct. 6, 1959, by L. J. Brass (no. 31909).

Paratype: On undergrowth in *Castanopsis*-oak forest, 1370 m., Kassam, New Guinea, Brass 32439a.

The short, apiculate leaves are distinctive as compared with the other local species.

Endotrichella compressa (Mitt.) Broth.

Arau: on undergrowth in forest, 1400 m., 31910; high on trees in *Castanopsis*-oak forest, 1400 m., 31925. Kassam: tufted on underbrush, 1370 m., 32437.

Endotrichella falcifolia Bartr. sp. nov.

Robusta, superne pallide viridis inferne fuscescens. Caulis secundarius ad 5–6 cm. longus. Folia vix conferta, falcato-secunda, oblongo-lanceolata, filiformiter acuminata, plures plicata, ecostata, 6–7 mm. longa, 1.5 mm. lata; marginibus superne grosse serratis; cellulis superioribus anguste linearibus, incrassatis, basilaribus latioribus, infimis fuscis, alaribus paucis, irregularis. Caetera ignota.

Type in the U.S. National Herbarium, collected on undergrowth in rain forest, at 2000 m. elevation, Purosa, Okapa area, New Guinea, Oct. 1, 1959, by L. J. Brass (no. 31840).

The falcate-secund leaves will separate this species from *E. perplicata* Broth. to which it seems to have some affinity.

Endotrichella elegans (D. & M.) Fleisch.

Morobe District, Gurakor: on branchlets of small tree in a moist ravine in rain forest, 640 m., 29419.

Endotrichella perplicata Broth.

Purosa, Okapa area: on branches of woody undergrowth in rain forest, 1900 m., 31766a. Kassam: on undergrowth in *Castanopsis*-oak forest, 1370 m., 32436.

Endotrichella novae-hannoverae C. M.

Mt. Wilhelm, east slopes: low on tree in moist forest, 2770 m., 30284.

Garovaglia mirabilis Dix.

Kassam: on underbrush in *Castanopsis*-oak forest, 1370 m., 32438. Mt. Michael, northeast slopes: on a rock in *Castanopsis-Nothofagus* forest, 2000 m., 31546. Morobe District, Mt. Kaindi: on dead branchlets in forest undergrowth, 7,200 ft., 29166.

Garovaglia brevifolia Bartr. sp. nov.

Gracilis, fuscescens, nitida. Caulis secundarius usque ad 5 cm. longus, simplex, sat dense foliosus, cum foliis ca. 2 mm. latus. Folia late patentia, apice incurva, late ovata, abrupte apiculata, 2–2.5 mm. longa, 1.3–1.6 mm. lata, leniter plicata, ecostata; marginibus planis, superne denticulatis; cellulis anguste rhomboideis, c. 12 μ latis, 36–48 μ longis, incrassatis, alaribus sat numerosis, oblongis. Perichaetium majusculum, alte convolutum, foliis abrupte breviter acuminatis, marginibus superne denticulatis; theca immersa, oblongo-cylindrica, deoperculata 2 mm. longa, subsessilis.

Type in the U.S. National Herbarium, collected on undergrowth in a semiswampy place in *Castanopsis*-oak forest, at 1370 m. elevation, Kassam, New Guinea, Nov. 5, 1959, by L. J. Brass (no. 32439).

The short, abruptly apiculate leaves and more slender habit are thoroughly distinctive characters in comparison with *G. densifolia* Thw. & Mitt.

Garovaglia papuana Dix.

Mt. Wilhelm, east slopes: low on trees in moist forest, 2740 m., 30246.

Meteoriaceae

Meteorium miquelianum (C. M.) Fleisch.

Mt. Wilhelm, east slopes: on twigs in subalpine forest, 3560 m., 29846; on woody undergrowth in moist forest, 2770 m., 30368. Morobe District, Umi River, Markham Valley: on tree in rain forest, 480 m., 32585.

Floribundaria floribunda (D. & M.) Fleisch.

Arau: on leaf of a Zingiberaceous herb, 1400 m., 32185. Kassam: on woody undergrowth, 1370 m., 32279. Morobe District, Umi River, Markham Valley: on trees, underbrush and leaves in rain forest, 480 m., 32550, 32551.

Floribundaria aurea (Griff.) Broth.

Mt. Wilhelm, east slopes: pendant from underbrush in moist, mossy forest, 2770 m., 30409.

Meteoropsis reclinata (C. M.) Fleisch.

Morobe District, Gurakor: on leaves, rotten wood and branchlets, 640 m., 29417, 29420a, 29423.

Lembophyllaceae

Camptochaete subporotrichoides (Broth. & Geh.) Broth.

Mt. Wilhelm, east slopes: low on trees in forest, 2900 m., 30391.

Phyllogoniaceae

Orthorrhynchium elegans (H. f. & W.) Reh'dt.

Kassam: on lower trunk of tree in *Castanopsis*-oak forest, 1370 m., 32377.

Neckeraceae

Calyptothecium crispulum (Lac.) Broth.

Mt. Otto, south slopes: on a tree on forest edge, 7,300 ft., 29124.

Calyptothecium extensum Fleisch.

Morobe District, Umi River, Markham Valley: 480 m., 32587.

Calyptothecium urvilleanum (C.M.) Broth.

Kassam: on stilt roots of *Pandanus*, 1370 m., 32413. Morobe District: Umi River, Markham Valley, 480 m., on trees in rain forest, 32586.

Neckeropsis gracilentia (Lac.) Fleisch.

Morobe District, Gurakor: on leaves and trees in moist rain forest, 640 m., 29420, in part, 29421.

Neckeropsis lepinea (Mont.) Fleisch.

Purosa, Okapa area: on tree trunk, 1900 m., 31767. Arau: on tree trunks, 1400 m., 31907. Kassam: on tree trunks, 1370 m., 32334. Morobe District: Umi River, Markham Valley, on underbrush in rain forest, 480 m., 32549.

Homaliodendron flabellatum (Sm.) Fleisch.

Kassam: on tree trunks, 1370 m., 32280.

Pinnatella mucronata (Lac.) Fleisch.

Morobe District, Umi River, Markham Valley: on dead branches, 480 m., 32531a.

Nemataceae

Ephemeropsis tjlbodensis Goeb.

Mt. Michael, northeast slopes: on twigs and leaves of an undergrowth small tree in *Castanopsis-Nothofagus* forest, 2000 m., 31531 in mixture.

Hookeriaceae

Daltonia angustifolia D. & M.

Mt. Wilhelm, east slopes: on deadwood in subalpine forest, 3560 m., 30044; on twigs in forest undergrowth, 2740–2800 m., 30248, 30472, 30740.

Daltonia angustifolia D. & M. var *revoluta* (Broth.) Bartr.

Mt. Wilhelm, east slopes: on a log in moist forest, 2740 m., 30242.

Daltonia contorta C. M.

Mt. Wilhelm, east slopes: on a log, 2740 m., 30242a.

Daltonia aristifolia R. & C.

Mt. Wilhelm, east slopes: on deadwood in subalpine forest, 3650 m., 29875.

Distichophyllum brevicuspidatum Bartr.

Mt. Michael, northeast slopes: on twigs and leaves, 2000 m., 31531a.

Actinodontium raphidostegum (C.M.) Bosch & Lac.

Arau: on a rotting log, 1400 m., 31980a.

Callicostella papillata (Mont.) Mitt.

Purosa, Okapa area: on rotting wood in rain forest, 1950 m., 31696.

Chaetomitriopsis glaucocarpa (Reinw.) Fleisch.

Purosa, Okapa area: on branches of an undergrowth tree in rain forest, capsules a pale, glaucous blue 1950 m., 31797. Kassam: low on woody undergrowth in forest, 1370 m., 32278.

Chaetomitrium nano-hystrix C. M.

Morobe District, Gurakor: on living twigs in rain forest undergrowth, 640 m., 29424.

Chaetomitrium papillifolium Bosch & Lac.

Morobe District, Umi River, Markham Valley; on dead branches and bark in rain forest, 480 m., 32531, 32583.

Chaetomitrium papuanum Bartr.

Arau: on twigs of undergrowth trees, 1400 m., 31929. Kassam: on branches of woody undergrowth, 1370 m., 32435.

Chaetomitrium crispifolium Bartr.

Mt. Wilhelm, east slopes: on a tree trunk, 3560 m., 29850a; on a log in moist forest, 2740 m., 30241.

Chaetomitrium integrifolium Bartr.

Arau: on leaf of an undergrowth tree in *Castanopsis*-oak forest, 1400 m., 31928.

Chaetomitrium pseudopapillifolium Bartr.

Morobe District, Oomsis: on bark and branchlets in rain forest, 100 m., 29243, 29244, 29292, 29293; Umi River, Markham Valley: on a tree trunk, 480 m., 32656.

Thuidiaceae

Pelekium velatum Mitt.

Morobe District, Oomsis: logs in rain forest, 100 m., 29210, 29211; Umi River, Markham Valley, on a log, 480 m., 32613.

Thuidium furfurosum (H. f. & W.) Jaeg.

Morobe District, Oomsis: on rocks on bank of stream in rain forest, 100 m., 29230.

Thuidium investe (Mitt.) Jaeg.

Morobe District, Kaindi: on bark and rotting wood in forest, 2060 m., 29550, 29555.

Thuidium cymbifolium (D. & M.) Bosch & Lac.

Mt. Michael, northeast slopes: on trees and rocks in *Castanopsis-Nothofagus* forest, 31539, 31536. Kassam: on rocks, 1370 m., 32349, 32434, in part.

Amblystegiaceae

***Calliergon sarmentosum** (Wahlenb.) Kindb.

Mt. Wilhelm, east slopes: on wet ground in alpine grassland, 13,100 ft., *Collins* 29943a.

The occurrence of this widely distributed species in the alpine region of New Guinea is noteworthy and significant. It is evidently a waif from the south where it occurs sparingly in New Zealand.

Distribution: Europe, Asia, Fuegia, South Georgia, New Zealand, East Africa.

Calliergon wilhelmense Bartr. sp. nov.

Dense caespitosum, caespitibus fuscescentibus, nitidis. Caules prostrati, parce ramosi, valde tumidi. Folia laxè imbricata, oblongo-ovata, breviter acuminata, profunde concava, usque ad 2 mm. longa, 0.8 mm. lata; marginibus erectis, integris superne inflexis; costa duplex, brevissima; cellulis superioribus, anguste linearibus, 4–5 μ latis, 40–50 μ longis, basilaribus longioribus, incrassatis alaribus sat numerosis, irregulariter quadratis, incrassatis. Caetera ignota.

Mt. Wilhelm, east slopes: forming loose cushions on wet ground on alpine grassland, 13,100 ft., *J. D. Collins* 29943. June 15, 1959.

This species in appearance and detail shows a very close affinity to *C. turgescens* (Th. Jens.) Kindb., but the uniformly short, double costa and the narrower lamina cells seem to be distinguishing characters.

Brachytheciaceae

Pleuropus luzonensis Broth.

Mt. Wilhelm, east slopes: low on a dead tree in forest, 2740 m., 30240; on bark of a big *Podocarpus papuanus* tree, 2770 m., 30469.

Brachythecium plumosum (Hedw.) B. S. & G.

Mt. Wilhelm, east slopes: on rocks of a stream in forest, 2600–2800 m., 30447, 30449, 30600, 30738, 30739.

Brachythecium integerrimum Bartr.

Mt. Wilhelm, east slopes: on rocks in an alpine grassland stream, 3560 m., 30090.

Eurhynchium celebicum (Bosch & Lac.) Bartr.

Arau: on a bracket fungus in *Castanopsis*-oak forest, 1400 m., 32194 in mixture.

Rhynchostegiella stellata Bartr.

Morobe District, Kaindi: on a tree in forest, 2060 m., 29554, with hepatics.

Entodontaceae

Erythrodonium julaceum (Hook.) Par.

Morobe District. Wau: in front of District Office on a tree, 3,500 ft., 29156; Umi River, Markham Valley, on a tree in rain forest, 480 m., 32657.

Campylodontium flavescens (Hook.) Bosch & Lac.

Arau: on rotting wood in *Castanopsis*-oak forest, 1400 m., 32062.

Sematophyllaceae

Clastobryella cuculligera (Lac.) Fleisch.

Mt. Wilhelm, east slopes: on branch in forest undergrowth, 2770 m., 30471.

Acanthocladium clarkii Dix.

Mt. Wilhelm, east slopes: pendant from twigs in subalpine forest, 3700 m., 29990.

Acanthocladium gracile Bartr.

Mt. Wilhelm, east slopes: on a tree trunk in subalpine forest, 3560 m., 29850. Morobe District, Kaindi: on moist, clayey roadbanks, 2060 m., 29615.

The falcate-secund leaves suggest that this species may be an *Ectropothecium*. The inflated alar cells of the stem leaves are hard to demonstrate and seem to be large hyaline cells confined to the extreme basal angles as in other species of *Ectropothecium*.

Trismegistia panduriformis (C. H. Wright) Broth.

Purosa, Okapa area: on surface roots in rain forest, 1950 m., 31666.

Trismegistia rigida (H. & R.) Broth.

Arau: on a log in *Castanopsis*-oak forest, 1400 m., 32196.

***Meiothecium attenuatum** Broth.

Morobe District, Wau: on a tree trunk in front of District Office, 3,500 ft., 29157.

Distribution: Philippine Islands.

Meiothecium longisetum Bartr.

Mt. Wilhelm, east slopes: on deadwood in moist, mossy forest, 2900 m., 30389.

Meiothecium microcarpum (Harv.) Mitt.

Morobe District, Botanic Gardens, Lae: 200 ft., on bark of frangipani tree, 29115; Lae: 10 m., on bark of garden Hibiscus tree, 29116.

Brotherella falcata (D. & M.) Fleisch.

Arau: on a rotting log in *Castanopsis*-oak forest, 1400 m., 31979.

Sematophyllum subhumile (C. M.) Fleisch.

Morobe District, Oomsis: tree trunk in rain forest, 200 m., 29265.

Acroporium diminutum (Brid.) Fleisch.

Kassam: on tree trunks, 1370 m., 32432.

Acroporium sigmatodontium (D. & M.) Fleisch.

Arau: on a tree trunk, 1400 m., 31960.

Acroporium secundum (R. & H.) Fleisch.

Purosa, Okapa area: on trees, 1950 m., 31734.

Warburgiella subleptorrhynchoides Fleisch.

Mt. Wilhelm, east slopes: log in forest, 2740 m., 30239, 30249, 30250; on trees in subalpine forest, 3560-3650 m., 29848, 29871, 29893. Mt. Otto: on trees and rotting wood, 2000 m., 31114, 31115. Mt. Michael, northeast slopes: on rotting wood and a bracket fungus, 2000 m., 31550, 31391. Purosa, Okapa area: on rotting logs, 1950 m., 31647, 31649. Arau: on rotting wood, 1400 m., 31940a. Kassam: on a rotting log, 1370 m., 32336. Morobe District, Mt. Kaindi: on deadwood, 2060-2200 m., 29642, 29764.

Trichosteleum laevi-hamatum Dix.

Arau: on rotting wood, 1400 m., 32197.

Trichosteleum novae-guineae Bartr.

Arau: on rotting wood, 1400 m., 31940.

Acanthorrhynchium papillatum (Harv.) Fleisch.

Kassam: on tree trunks, 1370 m., 32337.

Taxithelium nepalense (Schwaegr.) Broth.

Morobe District, Oomsis: on deadwood in rain forest, 150 m., 29193, 29212.

Taxithelium kerrianum (Broth.) Fleisch.

Morobe District, Umi River, Markham Valley: on dead branches, 480 m., 32531b.

Taxithelium isocladum (Lac.) R. & C.

Arau: on leaves of a ground fern, 1400 m., 31975. Morobe District, Gurakor: on leaves of undergrowth shrub, 640 m., 29481.

Glossadelphus zollingeri (C. M.) Fleisch.

Morobe District, Gurakor: on a rock in a stream bed in rain forest, 640 m., 29413.

Glossadelphus prostratus (D. & M.) Fleisch.

Mt. Wilhelm, east slopes: on moist granitic rocks of a stream in forest, 2600 m., 30601.

These plants are less slender than the plants from Mt. Dayman with leaves up to 1 mm. long and 0.45 mm. wide. It is apparently a robust form.

Macrohymenium mitratum (D. & M.) Fleisch.

Arau: on a tree, 1400 m., 31976a.

Macrohymenium novo-guineense Reim.

Mt. Wilhelm, east slopes: on deadwood in edge of subalpine forest, 3700 m., 29994; on exposed trunk of tree in forest, 3150 m., 30705; exposed trunk of tree in subalpine forest, 3600 m., 30148.

These collections differ from *M. mitratum* in the more robust habit, ruddy color, and longer setae. Here as in the material from Mt.

Wilhelmina and Mt. Hagen the setae are from 12–17 mm. long and weakly scabrous above. The leaves vary from 2–2.4 mm. long and from 0.4–0.7 mm. wide. While the leaves are slightly larger than originally described, the robust habit, coloring, and long setae indicate that they should be referred here.

Hypnaceae

Ectropothecium ichnotocladum (C. M.) Jaeg.

Mt. Michael, northeast slopes: on dead bark, 2000 m., 31548. Arau: on deadwood, 1400 m., 31980, 32195. Morobe District, Umi River, Markham Valley: on log, 32530, in part.

Ectropothecium percomplanatum Broth.

Mt. Michael, northeast slopes: on wet rocks in stream, 2000 m., 31534.

Ectropothecium falciforme (D. & M.) Jaeg.

Mt. Wilhelm, east slopes: among tall grasses in alpine grassland, 3560 m., 29822; on a rotting log, 2740 m., 30235. Mt. Michael, northeast slopes: on logs, 2000 m., 31486, 31545.

Ectropothecium circinatum Ther.

Morobe District, Kaindi: on bank of stream, 2060 m., 29557.

Ectropothecium arfakense Broth. & Geh.

Purosa, Okapa area: on a log, 1950 m., 31650. Arau: on a log, 1400 m., 31927. Morobe District: Umi River, Markham Valley: on a log, 480 m., 32720.

Ectropothecium longipedunculatum Dix.

Purosa, Okapa area: on leaf-littered ground, 2000 m., 31839.

Ectropothecium buitenzorgii (Bel.) Jaeg.

Mt. Michael, northeast slopes: on a log, 31348. Kassam: on logs and rocks in a stream bed, 1370 m., 32335, 32434, in part. Arau: on a log, 1400 m., 31927a. Morobe District, Mt. Kaindi: on log, 2200 m., 29594, in part.

Ectropothecium dealbatum (H. & R.) Jaeg.

Morobe District, Botanic Gardens, Lae: on orchid roots, 200 ft., 29113.

Trachythecium verrucosum (Hpe.) Fleisch.

Purosa, Okapa area: on a branch in rain forest undergrowth, 1950 m., 31648; on rotting wood, 1950 m., 31798. Arau: on a log, 1400 m., 31908. Morobe District, Umi River, Markham Valley: on logs and rocks, 480 m., 32530, in part, 32682, in part.

Isopterygium albescens (Schwaegr.) Jaegr.

Morobe District, Botanic Gardens, Lae: on a tree-fern stem, 200 ft., 29106.

Ctenidium luzonense Broth.

Mt. Wilhelm, east slopes: on leaves of an epiphytic fern in subalpine forest, 3700 m., 29992; on a tree trunk, 2740 m., 30236.

Hylocomiaceae

Macrothamnium hylocomioides Fleisch.

Mt. Wilhelm, east slopes: on lower trunks of trees in moist forest, 2850 m., 30556.

Polytrichaceae

Pogonatum junghuhnianum (D. & M.) Bosch & Lac.

Mt. Otto, south slopes: on clayey roadbanks, 7,300 ft., Kotuni, 29123.

Pogonatum humile Bartr.

Mt. Wilhelm, east slopes: in a crevice near summit, 14,500–14,700 ft., *Collins* 29967; on ground near summit, 14,700 ft., *Collins* 29964a.

Pogonatum klossii Dix.

Mt. Otto, south slopes: on claybanks, 29122a. Morobe District, Kaindi: on clayey ground, 2060 m., 29578.

Pogonatum spurio-cirratum Broth.

Purosa, Okapa area: in small colonies in rain forest, 1950 m., 31736. Mt. Elandora, Kratke Mts.: terrestrial in forest, 2130 m., *Brass & Collins* 32166.

Polytrichum juniperinum Hedw.

Mt. Michael: alpine grasslands, 3650 m., *Brass & Collins* 31260, 31432.

Polytrichadelphus archboldii Bartr.

Mt. Wilhelm, east slopes: on open eroding banks of Pengagl Creek, 2770 m., 30408.

Dawsoniaceae

Dawsonia grandis Schleip. & Geh.

Mt. Wilhelm, east slopes: a small colony in moist, mossy forest, 2600 m., 30487. Purosa, Okapa area: in rain forest, 1950 m., 31719.

Dawsonia pullei Fleisch.

Mt. Michael: on a path in low, mossy, myrtaceous forest, 3290 m., 31419. Morobe District, Kaindi: on mossy ground in *Nothofagus* forest, 2150 m., 29633.

Dawsonia lativaginata v. d. Wijk.

Mt. Otto, south slopes: on rocks and ground in rain forest of a ravine, leaves somewhat bluish green, 2200 m., 30828.

Dawsonia beccarii Broth. & Geh.

Morobe District, Wau-Edie Creek road: on open, clayey ground, 5,800 ft., 29164; Kaindi: on open, clayey banks of a stream, 2060 m., 29625.

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