

FOUR NEW SPECIES OF FERNS FROM NEW GUINEA

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Gleichenia hooglandii Holtum, *sp. nov.*

G. erecta C. Chr. affinis, differt: segmentis maximis laminae ramorum ultimorum 8—15 mm longis, costulis 3—4 mm inter se distantibus.

Rhizome to 3½ mm diameter; stipes to 50 cm long; primary rachis-branches usually forking in 3 or 4 orders, branches of all orders except the last 3—5 cm long, ultimate branches to 20 cm long; stipular leaflets, more or less lobed, present at bases of primary branches, or lacking; penultimate branches in most cases fully leafy, sometimes partially so; lamina-segments on ultimate branches 8—15 mm long, at 60—70° to costa, bases of their costules 3—4 mm apart; scales as *G. erecta*, those on costae c. 1½ × ½ mm, spreading at right angles, dark brown with slender ascending marginal hairs towards apices.

Type: Hoogland & Schodde 7692 (CANB), N.E. New Guinea, Western Highlands Distr., Laiagam Subdistr., Yobobos grassland area, 2590 m, in coniferous forest.

NEW GUINEA. *Brass* 29923, Mt Wilhelm, 3400 m; *Brass* 30074, Mt Wilhelm, 3500 m. Hoogland & Schodde 7090, Western Highlands, Mt Sugarloaf, 2900 m. Pullen 5370, W. Highlands, Kubor Range, 2745 m. Hoogland 9515, Cromwell Mts, 2290 m; 9704, Salawaket Range, 2900 m; 9919, Salawaket Range, 3570 m. Schodde 1846, 2055, Papua, S. Highlands, Mt Giluwe, 2750—3050 m.

Dr. R. D. Hoogland has called my attention to this species, which he noted as distinct when collecting in the Huon Peninsula. He writes that the new species occurs together with *G. erecta* C. Chr. and *G. bolanica* Rosenst., and is intermediate between the two. The lamina-segments are much shorter than in typical *G. erecta*, in which they are 12—27 mm long, 4—7 times the distance between adjacent costules; the angle of forking in *G. hooglandii* is also wider than in *G. erecta*, resulting in a much less erect and less compact habit.

Cyathea nothofagorum Holtum, *sp. nov.*

Caudex gracilis, diametro 2.5 cm, frondes c. 85 cm longas ferens. Stipes 7 cm longus, paleis pallidis 20 mm longis 1 mm latis marginibus fragilibus fuscis omnino vestitus; rhaches omnes subtus paleis parvis brunneis breve-ciliatis vel setiferis arcte vestitae, paleisque elongatis eis stipitis similibus vel medio nigro-striatis conspersis praeditae. Pinnae infimae 3 cm longae, maximae 20 cm; pinnulae maximae c. 22 mm longae, 7—8 mm latae, pinnatae; foliola tertiaria c. 2 mm inter se distantia, tenuia, 4 mm longa, 1½ mm lata, lobata; venulae 4—5-jugatae. Sori in quoque foliolo 2—4, prope costulam siti; indusia cuculliformia, soros tegentia sed marginem versus aperta. Costae infra paleis parvis brunneis plerisque setiferis praeditae; costulae infra nudaae.

Type: Pullen 5358, N.E. New Guinea, Western Highlands Distr., Kubor Range, side-ope in Nothofagus forest, 2775 m (K).

In aspect this species is very like *C. perpelvigera* v.A.v.R. and *C. microphyloides* Rosenst., but the indusia are hemitelioid and there are differences in scaliness in all three species.

Diplazium stipitipinnula Holttum, *sp. nov.* — *D. spinulosum* Bl. var. *novoguineense* Rosenst., Hedwigia 56 (1915) 351.

D. spinulosum Bl. affinis, differt: pinnulis majoribus, breve stipitatis, marginibus leviter crenatis; venis secundariis omnibus anastomosantibus, venulis liberis prope marginem paucis, 1—2 mm longis; soris 4—5-jugatis.

Stipe 50—75 cm long, bearing rather sparse short spines (as also rachises), otherwise glabrous; scales not seen. Lamina to 125 cm long, bipinnate; pinnae 5—6 pairs, longest c. 60 cm long, with c. 10 pairs of stalked pinnules (stalks to 3 mm long), distal pinnules increasingly adnate to rachis and merging into deeply lobed apical lamina. Largest pinnules 11 × 3 cm, base truncate, apex acuminate, edges slightly and distantly crenate in basal $\frac{2}{3}$; texture thin; main lateral veins 5—7 mm apart, each with 5—6 pairs of secondary veins, the latter anastomosing with those of adjacent main veins in a somewhat irregular manner; free veins near margin only, very short (1—2 mm). Sori along almost the whole length of 4 or 5 pairs of secondary veins, sometimes also on the excurrent vein formed by union of two secondary veins.

Type: Hoogland 9090, N.E. New Guinea, Huon Peninsula, Mt Rawlinson, common in low forest on stony creek-bank, 1370 m (K).

NEW GUINEA. Bamler 66, N.E. New Guinea, Sattelberg, 800 m (type of *D. spinulosum* var. *novoguineense* Rosenst., dupl. at K). Brass 28610, Woodlark Isl., occasional in rain forest, 100 m. Carr 14926, Papua, Boridi, 1220 m (K); 15688, Lala River, 1525 m (K).

This species differs from *D. spinulosum* Bl. (type from Celebes) in the characters mentioned in the latin diagnosis. It differs also similarly from *D. paradoxum* Fée [syn. *D. smithianum* (Bak.) Diels] of Ceylon. In size and venation of pinnules it is nearest to *D. insigne* Holttum of Malaya, but in the latter all pinnae are adnate. It seems to me probable that all these species are local derivatives of *D. proliferum* (Lam.) Kaulf., which, broadly construed, is distributed from the islands of the Indian Ocean to Fiji. Prof. I. Manton has shown that *D. insigne* (plant from type locality cultivated at Kew) is a sterile triploid, which must be a hybrid between the local form of *D. proliferum* and a bipinnate species with free veins. The spores of *D. stipitipinnula*, however, are abundant and good. It might have originated as a mutant form *D. proliferum*, or as a hybrid which has subsequently become stabilized.

Belvisia longissima Holttum, *sp. nov.*

Rhizoma repens, 6 mm diametro, frondes pendulas inter se 1—2 cm distantes ferens; paleae rhizomatis rotundatae vel ovato-acutae, 2—4 mm longae, 2 mm latae, parietibus cellularum prope umbilicum incrassatis, margines versus tenuibus. Stipes ad 30 cm longus. Lamina sterilis c. 125 cm longa, 4 cm lata, basin versus longe angustata, apice sensim in laminam angustam fertilem transgrediens; venulae in sicco ± evidentes, apices venularum hydathodii praeditae et interdum squamulis albidis ornatae. Lamina fertilis c. 40 cm longa, coenosoris tota occulta, in maturitate 6—8 mm lata; coenosori basi c. 5 cm in laminam sterile descendentes; sporangia in juventute squamulis minutis omnino tecta.

Type: Pullen 5356, N. E. New Guinea, Western Highlands, Kubor Range, 2775 m, epiphyte on *Pandanus* in *Nothofagus* forest (K).

NEW GUINEA. Hoogland & Schodde 6841, Western Highlands, Wabag subdistr., 2290 m, epiphyte on *Pandanus* in native garden. Brass 30362, Eastern Highlands, Mt Wilhelm, 2770 m, epiphyte on large *Pandanus* and apparently confined thereto, leaves 2—3 m long. Womersley 4805, Eastern Highlands, near Nondugl, on bank of stream. Brass 10647, W. New Guinea, 9 km NE. of Lake Habbema, 2800 m, confined to upper stems of large *Pandanus* planted in forest by natives.

This species agrees in scales of rhizome with *B. validinervis* (Kze) Copel. and also in the gradual narrowing of lamina at junction of sterile and fertile parts. *B. longissima* has, however, much longer fronds, and the narrow sporangia-bearing bands (coenosori) are much decurrent on to the apex of the sterile lamina and are covered with smaller scales than those figured for *B. validinervis* by Kunze (Ann. Mus. Bot. Lugd.-Bat. 4, 1869, pl. 7). The fact that this species occurs mainly (if not entirely) on *Pandanus* is also notable. Philippine specimens (from Mindanao) referred to *B. validinervis* by Christensen and Copeland are probably not conspecific with the Java type; they are nearer to *B. longissima* but smaller, with much shorter stipe and the junction between sterile and fertile parts of the frond more sharply defined.