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STUDIES IN THE FAMILY THELYPTERIDACEAE VIII.

The genera Mesophlebion and Plesioneuron

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SUMMARY

Plesioneuron, originally published as a subgenus of *Mesophlebion*, is here raised to generic rank. New descriptions of both genera are provided, keys to all known species, and synonymy and description for each. Synonymy is reduced to basionyms except where other synonyms refer to important literature; in all cases published combinations in *Thelypteris* are recorded. Type material of all basionyms has been examined. An index of new names and of all basionyms cited is provided.

Mesophlebion, as here arranged, is confined to Malesia (with a short extension northwards from Malaya) with Borneo as centre of distribution. It comprises 18 species, of which the following are new: *M. caroli*, *M. dulitense*, *M. rufescens*, and *M. arenicola*. The following basionyms are reduced to synonymy: *Dryopteris paleata* Copel., *D. divergens* Rosenst., *D. subdimorpha* Copel., *Aspidium latum* Mett., *Syngramma angusta* Copel. *Mesophlebion* is perhaps most nearly related to *Cyclosorus sensu* Holttum 1971.

Plesioneuron is distributed mainly in New Guinea and the Pacific, with one species in North Borneo, two in the Moluccas, and two in the Philippines. It comprises 39 species, of which the following are here described as new: *P. ctenolobum*, *P. doctersii*, *P. dryas*, *P. fuchsii*, *P. kundipense*, *P. platylobum*, *P. pullei*, *P. rigidilobum*, *P. royenii*, *P. subglabrum*, *P. subterminale*, *P. tahitense*, *P. translucens*; also a new variety *P. hopeanum* (Bak.) Holttum var. *acutilobum*. The following basionyms are reduced to synonymy: *Lastrea varievestita* Copel., *Dryopteris hunsteiniana* Brause, *D. ensipinna* Brause, *D. quadriaurita* Copel., *D. schlechteri* Brause, *D. schizophylla* v.A.v.R., *Aspidium brackenridgei* Mett., *Nephrodium inaequilaterale* Baker. *Plesioneuron* appears to be most nearly related to *Chingia* Holttum.

MESOPHLEBION

Mesophlebion Holttum, Blumea 19 (1971) 29 (new name for *Mesoneuron* Ching, *non* Desf. *nec* Solms), excl. subgenus *Plesioneuron*.

Caudex creeping, sometimes elongate; scales narrow, rather rigid but never spine-like, bearing short acicular hairs; similar scales at least at base of stipe, in a few species throughout stipe and basal part of abaxial surface of rachis. Fronds simply pinnate (in *M. oligodictyon* simple, in *M. endertii* partly bipinnate); basal pinnae not reduced but narrowed towards their asymmetric bases; aerophores not swollen; all pinnae lobed, in some cases deeply; veins all simple and free (except casually in *M. oligodictyon*), basal basiscopic vein arising from costa near base of costule of lobe to which it belongs; basal veins from adjacent costules usually both passing to base of sinus between their lobes, touching sides of a sinus-membrane which may be slightly decurrent between them as a hairy ridge; lower surface of costae, costules, and veins always bearing small scales in various degrees of reduction (smallest of 2 or 3 cells) in addition to a varied complement of acicular unicellular hairs; upper surface hairy on costae only; sori in almost all cases indusiate, indusia always thin and sometimes small; large spherical red glands attached directly or by a hair to stalks of sporangia, sometimes also sessile on lower surface of costules; no glands nor

hairs on body of sporangium; spores with a continuous wing and a few cross-wings, or sometimes without a wing.

Type species: *Aspidium crassifolium* Bl.

This group of species was first recognized by Christensen in 1929 (Gard. Bull. Str. Settl. 4: 381—388) who provided a key to species known to him and compared them with *Dryopteris* subgenus *Steiropteris* C. Chr. of tropical America. Ching referred to these briefly in 1936 (Bull. Fan Mem. Inst. Biol. Bot. 6: 287) and in 1963 based his new genus *Mesoneuron* on *Aspidium crassifolium* Bl. In 1971 I re-named and re-described Ching's genus, adding a new subgenus *Plesioneuron* to accomodate species of eastern Malesia and the Pacific unknown to Ching. I had previously noted the resemblance of some of these species to *Mesophlebion*, and had transferred one of them (*Dryopteris wantotensis* Copel.) to *Mesoneuron*. When I came to examine these species in detail, I discovered constant differences from the type of *Mesophlebion* and noted resemblances to *Chingia*. The similarity of my two subgenera of 1971 now seems to me superficial, and I do not think that they are closely related. Therefore, in the present treatment I recognize *Plesioneuron* as a distinct genus.

Mesophlebion shows a rather close resemblance to two species of tropical America included with doubt by Christensen in *Dryopteris* subg. *Steiropteris* (Monogr. Dryopt. 1, 1913, 170—173); the typical members of subg. *Steiropteris* show a closer resemblance to *Plesioneuron* (see below). The two species in question are *Dryopteris glandulosa* (Desv.) C. Chr. (with its variety *brachyodus*) and *D. fendleri* (Eaton) Kuntze. Baker identified specimens of *Mesophlebion motleyanum* from Malaya with *Nephrodium brachyodon* Hook. (*D. glandulosa* var. *brachyodus*) and in this was followed by Beddome and Ridley, but the American plants differ in lacking glands on sporangium-stalks, in showing either true anastomosis of veins or very long-decurrent sinus-membranes, and in the presence of aerophores. Subgenus *Steiropteris* and these two aberrant species appear to be groups which have originated in tropical America independently of *Mesophlebion* and *Plesioneuron*.

Mesophlebion is confined to the forests of the Malayan region, never in open places (except perhaps *M. teuscheri* and *M. arenicola*). Plants are easy to recognize generically, but distinctions between species are not easy to state with precision. Cytotaxonomic investigation might throw much light on this question, but it would have to be undertaken, in conjunction with much field work, in Borneo.

There are a few decidedly aberrant species, as follows. *M. oligodictyon* has simple fronds and exindusiate sori spreading along the veins, giving an acrostichoid appearance; it has been placed successively in *Acrostichum*, *Leptochilus*, *Dryopteris*, *Syngramma*, and *Cyclosorus*. Its assignment to *Mesophlebion* is due to the red glands on the stalks of sporangia, spore-form, and the basiscopic vein of each group springing separately from the costa; the casual slight anastomosis of its veins is ascribed to reduction of the lamina to a simple entire frond adapted to its river-bed habitat. *M. teuscheri* and *M. arenicola* are also reduced, but to quite small pinnate fronds; two collections of *M. arenicola* were found on sandstone rocks with dripping water; their reduction is thus probably an adaptation to a mineral-deficient soil-water (*Taenitis marginata* Holttum grows in a similar situation; also probably other much-reduced species of *Taenitis*; see Holttum, Blumea 16, 1968, 89, 92). *M. endertii*, on the other hand, has large fronds with very long pinnae the basal segments of which are borne as separate pinnules.

Mesophlebion agrees with *Cyclosorus* (as restricted in Holttum 1971: 27) in the large spherical red glands on sporangium-stalks (also sometimes on lower surface of costules); I know of no other members of *Thelypteridaceae* which have such glands (as they are always present, they are not mentioned in specific descriptions). Other similarities with

Cyclosorus are the creeping rhizome and unreduced basal pinnae. The spores of the two genera are, however, very different. Wood has published a scanning electron microscope photograph of a spore of *M. trichopodum* (under the name *Thelypteris paleata*, in Jermy *et al.*, The Phylogeny and Classification of the Ferns; Academic Press, London, p. 202, pl. 1C); he also has a spore of *M. chlamydophorum* in Pl. 4F, wrongly named *Thelypteris calcarata*.

Species 1—5, which have stipes and lower part of rachis covered with large scales, show a condition parallel to that of species 1—7 of *Plesioneuron*, but the scales of *Mesophlebion* are never spine-like; they more resemble those of *Nephrodium crinipes* Hook. which belongs to the genus *Christella*.

KEY TO THE SPECIES OF MESOPHLEBION

1a. Stipe and lower part of rachis bearing numerous stiff, spreading scales 8—15 mm long 2
b. Upper part of stipe and rachis lacking large scales. 6
2a. Pinnae to 12 cm long 3
b. Pinnae of well-grown plants much longer 4
3a. Stipe-scales dark, to 1 mm wide; veins 7—9 pairs . . . . . **1. M. echinatum**
b. Stipe-scales medium-brown, to 2 mm wide; veins 12—17 pairs **2. M. persquamiferum**
4a. Costae, costules, and veins beneath bearing short hairs only; stipe-scales *c.* 6 mm long 5
b. Costae, costules, and veins beneath bearing hairs 1 mm or more long (copious on sterile fronds); stipe-scales 10 mm or more long . . . . . **3. M. trichopodum**
5a. Lower pinnae not auricled; no glands on lower surface of costules **4. M. hallieri**
b. Lower pinnae strongly auricled; copious glands on lower surface of costules **5. M. caroli**
6a. Fronds simple . . . . . **6. M. oligodictyon**
b. Fronds pinnate or partly bipinnate 7
7a. Pinnae not more than 3 cm long 8
b. Pinnae much longer 9
8a. Pinnae lobed less than halfway to costa; acroscopic bases of pinnae auricled **7. M. teuscheri**
b. Pinnae lobed more than halfway to costa, not auricled . . . . **8. M. arenicola**
9a. Largest pinnae with several pairs of free pinnules . . . . . **9. M. endertii**
b. Largest pinnae with at most one pair of small free basal segments 10
10a. Sterile pinnae lobed not more than halfway to costa, except sometimes basal pinnae 11
b. Sterile pinnae lobed more than halfway to costa 12
11a. Sterile pinnae commonly 13 × 3.5 cm (to 17 × 4 cm), not coriaceous; lowland plants **10. M. motleyanum**
b. Sterile pinnae to 10 × 2.7 cm, coriaceous; plants of mid-mountain forest **11. M. vinosicarpum**
12a. Pinnae to 6.5 cm wide, lower ones with stalks 3—4 cm . . . . **12. M. dulitense**
b. Pinnae much narrower, with shorter stalks. 13
13a. Indusia rather large, glabrous; sori close to costules 14
b. Indusia usually smaller, ± hairy; at least some sori medial 15
14a. Lower surface of costae hairless, with few persistent scales; lower pinnae stalked 10 mm or more . . . . . **13. M. beccarianum**

b. Lower surface of costae copiously short-hairy, with many small scales; stalks of lower pinnae to 5 mm . . . . . **14. M. pallescens**

15a. Basal veins well-separated at their tips; basiscopic vein arising from costa near costule 16

b. Basal veins usually almost touching below sinus; basiscopic vein in most cases arising some distance from costule 17

16a. Indusium small, glabrous, caducous; pinnae to 3 cm wide (*New Guinea*) **15. M. rufescens**

b. Indusium hairy; pinnae to 2 cm wide (*Lingga*) . . . . . **16. M. auriculiferum**

17a. Lowland plants; lamina rather thin; pinnae to 2.5 cm wide; costa beneath rather sparsely hairy; indusia fairly large. . . . . **17. M. chlamydophorum**

b. Mountain plants; lamina very firm; pinnae to 3 cm or more wide; costa closely hairy beneath; indusia small . . . . . **18. M. crassifolium**

1. **Mesophlebion echinatum** (Mett.) Holttum, *comb. nov.*

Aspidium echinatum Mett., Ann. Mus. Bot. Lugd.-Bat. 1 (1864) 230; Miquel, ibid. 4 (1868) 157. — *Dryopteris echinata* Kuntze, Rev. Gen. Pl. 2 (1891) 812; v.A.v.R., Handb. (1908) 182; C. Chr., Gard. Bull. Str. Settl. 4 (1929) 386. — *Thelypteris echinata* Reed, Phytologia 7 (1968) 274. — T y p e: *Korthals 498*, G. Prarawin, near Bandjermasin, SE. Borneo (L, sheet no. *908,335—575*).

Rhizome short-creeping; stipe to 30 cm, bearing throughout (also lower part of rachis) spreading dark scales to 10 mm long, nearly 1 mm wide at base. Lamina of type 30 cm long (of another specimen 70 cm); basal pinnae slightly narrowed at base with stalks 2 mm long; largest pinnae 11—15 × 1.5—2 cm, acuminate with sub-entire cauda 10—15 mm long, lobed to less than 2 mm from costa; costules 3.5 mm apart; veins 7—9 pairs, basal basiscopic vein from costa near base of costule; rachis and costae densely short-hairy on lower surface, hairs sparse on costules and veins. Sori inframedial; indusia small, caducous, with a few hairs.

D i s t r i b u t i o n: Kalimantan, Sarawak.

2. **Mesophlebion persquamiferum** (v.A.v.R.) Holttum, *comb. nov.*

Dryopteris persquamifera v.A.v.R., Bull. Jard. Bot. Btzg II, 16 (1914) 10; Handb. Suppl. (1917) 149. — T y p e: *Rachmat 489*, Somalilah, Celebes (BO; L).

Aspidium echinatum auct. non Mett.: Chr., Ann. Jard. Bot. Btzg 15 (1898) 128.

Stipe 35—40 cm long, densely scaly, scales medium brown, to 8 × 2 mm, similar scales on rachis. Lamina 50 cm long; basal pinnae slightly narrowed at base, short-stalked; largest pinnae 12.5 × 2—2.5 cm, short-acuminate, lobed to 2 mm from costa, lobes falcate; costules to 4 mm apart; veins 12—17 pairs, basal basiscopic vein from costa distant from costule; rachis scaly beneath almost throughout; costae and costules almost hairless beneath with many narrow scales and sessile glands. Sori inframedial; indusia small, short-hairy.

D i s t r i b u t i o n: Central Celebes, 2 collections (*Sarasin* 952, Takale Kadjo, 900 m).

3. **Mesophlebion trichopodum** (C. Chr.) Holttum, *comb. nov.*

Dryopteris trichopoda C. Chr., Ind. Fil. (1905) 298; Gard. Bull. Str. Settl. 4 (1929) 387. — *Nephrodium polytrichum* Bak., J. Bot. 29 (1891) 107, *non* Schrad. 1824. — *Dryopteris polytricha* v. A. v. R., Handb. (1908) 187. — T y p e: *G. F. Hose s.n.*, Lingga Mts, Sarawak (K).

Dryopteris paleata Copel., Philip. J. Sc. 9C (1914) 228; C. Chr., Gard. Bull. Str. Settl. 4 (1929) 383, 387. — *Thelypteris paleata* Holttum, Rev. Fl. Malaya 2 (1955) 249, fig. 141. — T y p e: *Brooks 136*, Lebong Tandai, Benkoelen, Sumatra (MICH).

Nephrodium crinipes auct. non Hook.: Ridl., J. Mal. Br. R. Asiat. Soc. 4 (1926) 74.

Caudex thick, short-creeping, bearing tufted fronds; stipe 60 cm long, densely scaly, scales 10—15 mm long, 1—1.5 mm wide above base which is sometimes dilated. Lamina to 100 cm long, pinnae *c.* 20 pairs; basal pinnae narrowed a little near base, to 30×4.5 cm (sterile); suprabasal pinnae to 3.5 cm wide (sterile wider than fertile), caudate-acuminate, lobed to 3—4 mm from costa, lobes falcate, basal basiscopic much longer than acroscopic and curved; costules 4.5—5 mm apart (fertile) or 6—7.5 mm (sterile); veins to 23 on basiscopic side of largest sterile lobe, to 18 on fertile lobes (to 15 on acroscopic side), basal basiscopic vein from costa far from costule, ends of basal veins closely parallel to each other on each side of a narrow sinus-membrane; lower surface of rachis densely scaly in basal part, throughout with close short hairs, costae also; veins on sterile pinnae with copious slender hairs 1 mm long (shorter on fertile pinnae). Sori inframedial; indusia with many short hairs.

Distribution: Borneo, Malaya, Sumatra; near streams in forest, low country. Malay Peninsula specimens are smaller than those of the Borneo type, but otherwise there is no clear distinction.

4. **Mesophlebion hallieri** (Chr.) Holttum, *comb. nov.*

Aspidium hallieri Chr., Ann. Jard. Bot. Btzg 20 (1905) 106. — *Dryopteris hallieri* C. Chr., Ind. Fil. (1905) 269; Gard. Bull. Str. Settl. 4 (1929) 387; v.A.v.R., Handb. (1908) 184. — *Thelypteris hallieri* Reed, Phytologia 17 (1968) 281. — Type: *Hallier 3204*, Amai Ambit, W. Borneo (P; BO, L).

Stipe densely scaly throughout, scales to 6×1 mm. Lamina slightly dimorphous, to 100 cm long, pinnae to 25 pairs; lowest pinnae not seen; largest pinnae 23 cm long, sterile to 3 cm wide, fertile narrower; base of middle pinnae truncate, somewhat dilated both sides, apex caudate-acuminate (cauda to 2 cm), lobed to 3 mm from costa, lobes falcate at tips; costules 4.5—5 mm apart; veins 12—15 pairs, pale and very prominent beneath, basal basiscopic vein far from its costule; rachis densely short-hairy on lower surface with scales as stipe, costae short-hairy with smaller scales, some short hairs on veins and surface. Sori inframedial; indusia small, thin, hairy.

Only known from type collection.

5. **Mesophlebion caroli** Holttum, *sp. nov.*

Rhizoma ignotum; stipes omnino paleatus, paleis brunneis, rigidis, usque 6×1 mm; rhachis (saltem basin versus) similiter paleata. Pinnae infimae prope basin angustatae praeter lobum infimum acroscopicum 9 mm longum fere liberum; lobus infimus acroscopicus pinnarum suprabasalium usque 1.8 cm longus. Pinnae maximae 25×2.5 cm, sessiles, caudato-acuminatae (cauda 3.0×0.5 cm), ¾ costam versus lobatae, lobis falcatis apice rotundatis; costulae 5—5.5 mm inter se distantes; venae usque 13-jugatae, vena infima basiscopica a basi costulae valde dissita; rachis costaeque subtus pilis brevibus dispersis paleisque rigidis angustis vestitae; costulae glandulis sphaericis rubris multis paleisque parvis praeditae. Sori inframediales; indusia parva, glabra.

Type: *Charles Hose 712*, Baram District, Sarawak (K, holo; BM).

6. **Mesophlebion oligodictyon** (Baker) Holttum, *comb. nov.*

Acrostichum oligodictyon Baker, J. Linn. Soc. Bot. 24 (1887) 261. — *Dryopteris oligodictya* C. Chr., Mitt. Inst. Allgem. Bot. Hamburg 7 (1928) 148. — *Cyclosorus oligodictyus* Holttum, Blumea 11 (1962) 530. — *Thelypteris oligodictya* Reed, Phytologia 17 (1968) 298. — Type: *C. Hose 210*, Niah, Sarawak (K).

Syngramma angusta Copel., Philip. J. Sc. 3C (1909) 348. — Type: *Brooks s.n.*, Bidi, Sarawak (MICH; BM, K).

Rhizome short-creeping, 2.5—3 mm diameter; scales 2 mm long; stipes of sterile fronds to 7 cm, of fertile 14—18 cm long. Lamina simple, dimorphous, gradually attenuate to both ends, entire or with slightly sinuate edges which are strongly cartilaginous. Sterile lamina 20—28 × 1.5—1.9 cm, veins usually 3 pairs in each group, basal basiscopic vein arising from midrib 1 mm below the rest, basal veins of adjacent groups anastomosing near margin; lower surface quite glabrous apart from small narrow scales at base of each vein-group; upper surface minutely hairy on grooved midrib and near edge. Fertile lamina 20—24 cm long, 5—6 mm wide; sporangia borne all along the veins, no indusia; a large gland at end of hair on stalk of sporangium.

Distribution: Sarawak, Brunei, W. Kalimantan; in rocky stream-beds.

7. Mesophlebion teuscheri (v.A.v.R.) Holttum, *comb. nov.*

Dryopteris teuscheri v.A.v.R., Bull. Dep. Agr. Ind. Néerl. 18 (1908) 6; Handb. (1908) 183; C. Chr., Gard. Bull. Str. Settl. 4 (1929) 383, *p.p.* — *Thelypteris teuscheri* Reed, Phytologia 17 (1968) 319. — Type: *Teuscher s.n.*, W. Borneo (BO).

Rhizome suberect; stipes 5—10 cm long, densely short-hairy, basal scales narrow. Lamina 15—20 cm long, pinnae 20 pairs; 2—3 pairs lower pinnae gradually a little reduced, narrowed towards bases, basal acroscopic segment of lowest pinnae free, entire, obovate; largest pinnae 2.2 cm long, 8 mm wide above auricled base, apex obtuse, lobed ⅓—½ towards costa; costules to 2.5 mm apart; veins to 3 pairs, basal veins not quite meeting at sinus; lower surfaces short-hairy throughout, with some large glands. Sori medial; indusium densely hairy; sporangia with a sessile gland on stalk.

Distribution: only known with certainty from type collection; Christensen (l.c. 1929) included also specimens of *M. beccarianum* and *M. arenicola.*

8. Mesophlebion arenicola Holttum, *sp. nov.*

M. teuscheri affinis, differt: pinnis basi non auriculatis, profunde lobatis.

Stipe 5—6 cm long; frond to 25 cm long (type 12 cm), pinnae 10—15 pairs, basal ones not or little reduced with stalks 1 mm long; largest pinnae 2.8 × 0.8 cm (of type 2.4 cm long), not auricled, lobed to 1 mm from costa or more deeply; costules 2.5 mm apart; veins to 4 pairs, near base of pinnae both basal ones to sides of sinus-membrane, those distal on pinnae both to edge above base of sinus; lower surface of rachis and costae densely short-hairy with scattered long hairs, whole lower surface covered with short hairs, many glands also present. Sori medial, indusia densely hairy; gland on hair attached to sporangium-stalk.

Type: *Meijer 4478*, Pajakumbuh-Taram, 500 m, Sumatra, on sandstone rocks with dripping water (L). Also *Meijer 5249*, Pajakumbuh, Harau-canyon (L).

Meijer 5249 has a lamina 25 cm long with 15 pairs of pinnae, but otherwise does not differ from the type.

9. Mesophlebion endertii (C. Chr.) Holttum, *comb. nov.*

Dryopteris endertii C. Chr., Dansk Bot. Ark. 9, no. 3 (1937) 60, pl. V, fig. 7—10. — Type: *Endert 4433*, W. Kutai, Kemul, Borneo (BO).

Stipe 80 cm long, glabrous above base; lamina more than 100 cm long; pinnae 12—14 pairs, lower ones 9 cm apart; basal pinnae 43 cm long, with stalks 4 cm and 15 pairs of free pinnules *c.* 15 mm apart, then some separately adnate lobes, distal part of pinna deeply pinnatifid; basal pinnules very unequal (basiscopic 2 cm, acroscopic 4 cm long); largest

pinnules 5 × 1 cm, in basal half lobed ⅓ towards costule; veins to 25 pairs, lower ones pinnate in the pinnule-lobes, thick and prominent; short hairs on lower surface of costa; upper pinnae normal for genus *Mesophlebion*. Sori small: indusium very small, with a few hairs.

Only known from type collection.

10. **Mesophlebion motleyanum** (Hook.) Holttum.

Nephrodium motleyanum Hook., Syn. Fil. (1867) 266. — *Dryopteris motleyana* C. Chr., Ind. Fil. (1905) 276; Gard. Bull. Str. Settl. 4 (1929) 385. — *Thelypteris motleyana* Holttum, Rev. Fl. Malaya 2 (1955) 247, fig. 140. — *M. motleyanum* Holttum in Nayar & Kaur, Comp. to Bedd., Handb. (1974) 209. — T y p e: *Motley s.n.*, Labuan (K).

Nephrodium brachyodon auct. non Hook.: Bedd., Ferns Brit. India Suppl. (1876) pl. 379; Handb. (1883) 281; Ridl., J. Mal. Br. R. Asiat. Soc. 4 (1926) 74.

Rhizome thick, creeping; stipe of sterile frond to 35 cm, of fertile to *c.* 70 cm long; lamina to 70 cm long with 8—12 pairs pinnae; basal pinnae narrowed near base, basal segments decurrent to form a cuneate base to pinna, stalk 3—10 mm long. Largest sterile pinnae to 20 × 4 cm, acuminate, lobed about halfway to costa, lobes falcate; costules 8—10 mm apart; veins to 10 on acroscopic side, to 14 on basiscopic, basal veins of adjacent costules closely parallel for some distance below sinus, basiscopic vein attached far from costule, rarely anastomosing with the next vein above it from its own costule; lower surface short-hairy on rachis and costae, sparsely elsewhere, narrow scales present on costae and costules. Fertile pinnae to 12.5 × 2.5 cm (in some intermediate cases to 3 cm wide), edges sometimes lobed more than halfway to costa, costules closer and veins fewer than in sterile pinnae; sori medial, lower ones divergent; indusia small, short-hairy.

D i s t r i b u t i o n: Borneo, Malaya.

This species is very similar to *Polypodium brachyodon* Kunze of South America (which Christensen doubtfully placed in *Dryopteris* subgenus *Steiropteris*). The latter appears to be variable in venation, sometimes with true anastomosis of the basal veins, sometimes with a long sinus-membrane prominent on the lower surface and decurrent between them almost to the costa (I have never seen this in *Mesophlebion*).

11. **Mesophlebion vinosicarpum** (v.A.v.R.) Holttum, *comb. nov.*

Dryopteris vinosicarpa v.A.v.R., Bull. Jard. Bot. Btzg III, 5 (1922) 198. — *Thelypteris vinosicarpa* Ching, Bull. Fan Mem. Inst. Biol. Bot 10 (1941) 255. — T y p e: cult. Hort. Bot. Bog., leg. *Brooks*, origin Lebong Tandai, Sumatra (BO, holo; L).

Thelypteris crassifolia sensu Holttum, Rev. Fl. Malaya 2 (1955) 247, *quoad plantae minores fertiles.*

Stipe of sterile fronds 15 cm long, of fertile to 30 cm; fronds subdimorphic, 20—25 cm long with 6—7 pairs pinnae, basal pinnae narrowed to base, stalks 2—3 mm. Largest pinnae to 4.5 × 1.5 cm (fertile), 10 × 2.7 cm (sterile), lobed *c.* halfway to costa; costules 5—6 mm part (sterile); veins 6—7 pairs (fertile), 8—10 pairs (sterile), lowest from costa far from costule; rachis and costae short-hairy beneath, costae and costules with small scales and red glands. Sori medial, lower ones diverging; indusia with a few short hairs.

D i s t r i b u t i o n: Sumatra, Malaya; in mid-mountain forest.

12. **Mesophlebion dulitense** Holttum, *sp. nov.*

Stipes ultra 75 cm longus, glabrescens, basi paleis tenuibus angustis usque 15 mm longis vestitus. Pinnae maximae verisimiliter 40—50 cm longae, 6.5 cm latae, stipitulis 3—5 cm suffultae, usque 3 mm a costa lobatae, lobo infimo libero et ab aliis remoto; costulae 10 mm inter se distantes; venae usque 25-jugatae, pallidae, crassae, utrinque

prominentes, infimae ad sinum (non infra sinum) conniventes, vena infima basiscopica e costa prope costulam ejus exoriens; pagina inferior rhachidis costarumque pilis brevissimis paucis, paleisque parvis multis praedita. Sori distales inframediales, inferiores a costula divergentes; indusia parva, glabra.

Type: *C.Hose s.n.*, 1894, Mt Dulit, Sarawak (K).

In 1972 I found a smaller specimen very similar to the above on Mt Kinabalu (*Holttum 20*) at 1500 m; this has basal pinnae 20 × 5 cm, with stalks 2.5—3.5 cm long. The large deeply lobed pinnae and almost hairless lower surfaces appear to be the distinguishing characters.

13. **Mesophlebion beccarianum** (Cesati) Holttum, *comb. nov.*

Nephrodium beccarianum Cesati, Atti Acad. Napoli 7, no. 8 (1876) 23. — *Dryopteris beccariana* C. Chr., Ind. Fil. (1905) 254; Gard. Bull. Str. Settl. 4 (1929) 384. — *Thelypteris beccariana* Reed, Phytologia 17 (1968) 263. — Type: *Beccari s.n.*, Sarawak (FI; fragment at K).

Rhizome 5 mm diameter; stipe 50 cm or more, flushed dull-red, glabrescent, basal scales to 7 mm long, less than 1 mm wide, rigid with stiff marginal hairs; lamina 50 cm long, pinnae 20 pairs or more; lowest pinnae with stalks 10—12 mm long, their basal lobes much reduced. Largest pinnae 12—18 × 1.6—2.5 cm (sterile often widest), caudate-acuminate, lobed to 1.5 mm from costa, texture firm; costules 4—4.5 mm apart (to 5 mm sterile); veins 10—12 pairs, slender, basal basiscopic vein from costa near base of costule to edge just above base of sinus; lower surface almost hairless, some very small scales present on costae. Sori inframedial, at full development touching costules; indusia rather large, firm, red-brown, glabrous.

Distribution: Sarawak, Malaya; in hill-side forest at 300—450 m.

14. **Mesophlebion pallescens** (Brause) Holttum, *comb. nov.*

Dryopteris pallescens Brause, Bot. Jahrb. 56 (1920) 88. — *Thelypteris pallescens* Ching, Bull. Fan. Mem. Inst. Biol. Bot. 10 (1941) 253. — Type: *Ledermann 9146*, Sepik, NE. New Guinea, 850 m (B; BM).

Rhizome creeping, 8 mm diameter; stipe 50—70 cm long, dark and scaly at base, scales 6 × 1.2 mm. Frond 50 cm or more long, pinnae 14—16 pairs, lowest more widely spaced and narrowed at base with stalks to 5 mm long. Largest pinnae 13 × 3 cm (on another frond 9 × 1.5 cm), caudate-acuminate, lobed to 1 mm from costa or more deeply, basal acroscopic lobe free or nearly so; costules 3—4 mm apart; veins 11—15 pairs, basal ones to sides of short sinus-membrane, basal basiscopic vein from costa near costule; lower surface of rachis and costae short-hairy with narrow scales, costules bearing sparse hairs and smaller scales. Sori inframedial, indusia large, glabrous.

Distribution: Eastern New Guinea.

15. **Mesophlebion rufescens** Holttum, *sp. nov.*

Rhizoma crassa, repens; stipes 50—60 cm longus stramineus vel rufescens, basi paleis rigidis 4 × 1 mm vestitus, sursum more rhachidis dense brevipilosus et paleis parvis praeditus. Lamina 42 cm longa, in sicco rufo-brunnea, pinnis 12-jugatis constructa; pinnae infimae stipitulis 1 cm longis suffultis, lobis infimis multo reductis. Pinnae maximae 12 × 2.8 cm, basi truncatae non auriculatae, brevi-acuminatae, usque 2.5—3 mm a costa lobatae; costulae 5 mm (pinnarum fertilium) vel 6 mm (sterilium) inter se distantes; venae 12—14-jugatae, infimae infra sinum non conniventes (membrana sinus brevis, lata), vena infima basiscopica e costa prope basin costulae exoriens; rhachis costaeque subtus pilis

brevibus paleisque multis angustis fuscis vestitae, costulae pilis sparsis, glandulis rubris et paleis minutis praeditae. Sori inferiores mediales, superiores inframediales; indusia parva glabra caduca; stipites sporangiorum glandulis margnis rubris ornati.

T y p e: *Brass 27957*, Sudest I., Papua, in forest, 300 m (K, holo; BO, L, LAE).

Brass 5155, Mafulu, Papua (BM) is a smaller specimen; it was named *Dryopteris crassifolium* var. *purpureo-lilacinum* C. Chr. forma *minor* (for this variety, see *M. crassifolium*, no. 18).

16. **Mesophlebion auriculiferum** (v.A.v.R.) Holttum, *comb. nov.*

Dryopteris auriculifera v.A.v.R., Bull. Jard. Bot. Btzg III, 5 (1922) 197. — *Thelypteris auriculifera* Ching, Bull. Fan. Mem. Inst. Biol. Bot. 10 (1941) 250. — T y p e: *Bünnemeijer 6905*, Lingga Is., Mt Tanda, 600 m (BO; L).

Rhizome short, densely scaly; stipe 50—60 cm, basal scales rigid, to 7 × 1 mm. Lamina 50 cm long, pinnae 17—20 pairs; basal pinnae stalked to 7 mm, basal acroscopic lobe 1—2 mm long, free, texture coriaceous. Largest pinnae 15 × 2 cm, middle ones with stalks 3 mm long, caudate-acuminate, lobed to 2 mm from costa; costules 4—4.5 mm apart; veins 10—11 pairs, basal basiscopic vein from costa near base of costule to edge above base of sinus; lower surface of rachis with close short hairs, of costae with dense longer pale hairs; costules and veins with hairs as costa but more sparse, lamina between veins bearing many short erect hairs and sessile yellow glands. Sori inframedial; indusium thin, pale, with many short hairs and a few glands as lamina.

Only known from type collection.

17. **Mesophlebion chlamydophorum** (Rosenst. *ex* C. Chr.) Holttum, *comb. nov.*

Dryopteris chlamydophora Rosenst. *ex* C. Chr., Gard. Bull. Str. Settl. 4 (1929) 384. — *Thelypteris chlamydophora* Ching, Bull. Fan Mem. Inst. Bio. Bot. 6 (1936) 287; Holttum, Rev. Fl. Malaya 2 (1955) 246, fig. 139. — L e c t o t y p e: *Korthals s.n.*, Borneo (L, sheet no. *908, 342—57*).

Lastrea nephrodioides Bedd., Ferns Brit. India (1866) t. 199, *non* Moore 1858; Handb. (1883) 238. — T y p e: *Parish s.n.*, Burma (K).

Aspidium calcaratum auct. non Bl.: Chr., Ann Jard. Bot. Btzg 15 (1898) 128.

Differs from *M. beccarianum* as follows: fronds not dimorphous, texture thinner; lowest pinnae stalked 3—5 mm, base usually less narrowed; pinnae somewhat narrower, less deeply lobed (to 2—3 mm from costa); lower surface of rachis, costae, costules, and veins bearing short spreading acicular hairs and many reduced scales; basal basiscopic vein meeting the sinus-membrane very close to acroscopic vein from next costule; sori more nearly medial; indusia usually smaller, with short hairs.

D i s t r i b u t i o n: Western Malesia (also Peninsular Thailand and Burma), frequent in freshwater swamp forest; also known from Celebes (Christ l.c. 1898). *Brass 3806* from Papua appears also referable here, but more collections from New Guinea are needed to verify this. A distinction from *M. beccarianum* is not always clear.

Rosenstock published the name *Dryopteris chlamydophora*, but provided no description, in Meded. Rijksherb. 31 (1917) 5; he referred to "*Aspidium crassifolium* Mett. (*non* Bl.)", but Mettenius also published no description with this name in 1864. In 1868 Miquel (Ann. Mus. Bot. Lugd.-Bat. 4: 157) referred to Mettenius and provided a description which is not very distinctive, citing specimens not all identical with those cited by Mettenius (they are all unnumbered). Christensen noticed a specimen bearing Rosenstock's name in the Rijksherbarium and based his description on it but did not label it. I have therefore selected one of the specimens named by Rosenstock as lectotype.

18. Mesophlebion crassifolium (Bl.) Holttum

M. crassifolium (Bl.) Holttum, Blumea 19 (1971) 30. — *Aspidium crassifolium* Bl., Enum. Pl. Jav. (1828) 158; Miquel, Ann. Mus. Bot. Lugd.-Bat. 4 (1868) 157, *p.p.* — *Lastrea crassifolia* Moore, Ind. Fil. (1858) 89; Copel., Fern Fl. Philip. (1960) 325. — *Dryopteris crassifolia* Kuntze, Rev. Gen. Pl. 2 (1891) 812; C. Chr., Gard. Bull. Str. Settl. 4 (1929) 381, 385; ibid. 7 (1934) 242, including var. *purpureolitacina*. — *Thelypteris crassifolia* Ching, Bull. Fan Mem. Inst. Biol. Bot. 6 (1936) 285; Holttum, Rev. Fl. Malaya 2 (1955) 246. — T y p e: *Blume s.n.*, Java (L, sheet no. *908*, 342—*64*).

Aspidium latum Mett., Farngatt. IV (1858) 95. — T y p e: *Cuming 266*, Luzon (B; K, BM, G).

Dryopteris divergens Rosenst., Fed. Repert. 13 (1914) 218. — *Thelypteris divergens* Reed, Phytologia 17 (1968) 273. — T y p e: *J. Winkler 36a*, Sumatra (not seen).

Dryopteris subdimorpha Copel., Univ. Cal. Publ. Bot. 18 (1942) 220. — *Lastrea subdimorpha* Copel., Gen. Fil. (1947) 140; Philip. J. Sc. 78 (1951) 432, pl. 20. — *Thelypteris subdimorpha* Reed, Phytologia 17 (1968) 317. — T y p e: *Brass 13666*, Idenburg River, New Guinea, 700 m (MICH).

Rhizome creeping, 8 mm or more diameter, fronds to 2 cm or more apart; stipe to 80 cm long, shorter on sterile fronds, basal scales rigid, 100 mm long, 1.5 mm wide at base; lamina to 70 cm long, pinnae to 20 pairs, subopposite, usually fewer and more widely spaced on sterile fronds; basal pinnae with stalks 3—15 mm long, basal 1—3 pairs of pinna-lobes reduced. Largest fertile pinnae 15×3 cm, sterile to 25×4.5 cm, lobed to 3—4(—5) mm from costa; costules 4—6 mm apart (to 8 mm in largest sterile fronds); veins 12—15 pairs, pale and prominent both sides, basal veins touching sides of sinus-membrane which may be decurrent between them as a short hairy ridge; lower surface of rachis and costa copiously short-hairy with narrow brown scales, smaller scales and sometimes glands on costules. Sori inframedial; indusia small, firm, short-hairy or rarely glabrous.

D i s t r i b u t i o n: Western Malesia, Philippines, Moluccas (Batjan), New Guinea; in forest at 900—1500 m.

This is a variable species, and may represent a complex of forms distinguishable cytologically; a Malayan specimen was found to be tetraploid. The specimens here named *M. dulitense* might represent an extreme form of the complex. I have not seen the type of *D. divergens* Rosenst., but I have seen another specimen so named by the author (*J. Winkler s.n.*, Pea Radja 1912), no. 142 in Rosenst. Fil. Sumatr. Exsicc. The fronds of *M. crassifolium* are always much harsher than those of *M. chlamydophorum* and less deeply lobed than those of *M. motleyanum*.

The type of Blume's species above cited is one so named by him. Another sheet in the Rijksherbarium (one of those cited by Miquel in 1868) has also been labelled as type.

The type of *Dryopteris subdimorpha* Copel. falls within the range of variation of *M. crassifolium* as here recognized; a possible distinction is the medial position of sori. Specimens have been collected from several widely separated places in New Guinea.

PLESIONEURON, *gen. nov.*

Mesophlebion subgenus *Plesioneuron* Holttum, Blumea 19 (1971) 30.

Caudex erect or suberect, rarely prostrate. Stipe always scaly at base, sometimes throughout, bases of scales usually thickened, in some species spine-like and persistent. Fronds bipinnatifid; lowest pinnae not reduced, variously narrowed at their bases, sometimes with a free basal lobe; pinnae of firm texture, deeply lobed, usually with somewhat swollen or elongate basal aerophores, lower surface often verrucose when dry; veins all free, tips of lowest from adjacent costules usually touching sides of a sinus-membrane which may be decurrent between them as a hairy ridge almost to the costa, in the most

deeply lobed pinnae both basal veins to edge above base of sinus, basal basiscopic vein arising from costa near its costule, or from base of costule; unicellular acicular hairs on lower surface of costae and costules various, usually short and stiff, thick brown hairs also sometimes present, rarely short capitate hairs, reduced scales few in most species; short acicular or capitate hairs sometimes present between veins on upper surface. Sori usually medial or inframedial, in a few cases supramedial; indusium, when present, usually firm and dark; sporangia often bearing small red or yellow glands, or setae, near annulus; hairs on sporangium-stalks sometimes acicular, never bearing red glands; spores dark, spinulose, in most observed cases (winged in four species), in about 15 species not yet observed.

Type species: *Nephrodium tuberculatum* Cesati.

Distribution: N.Borneo (1 sp.), Moluccas (2 spp.), Philippines (2 spp.), New Guinea (28 spp.), Pacific, to Tahiti (9 spp.).

The fronds of this genus are closely similar in form to those of *Mesophlebion* but differ as follows: basal basiscopic vein never arising far from its costule; sporangia in a majority of species bearing small glands or setae (or both) near the annulus and many with an acicular hair on the stalk, large spherical red glands never present on sporangium-stalks; stipe-scales sometimes spine-like (and then very like those of *Cyathea* subgenus *Sphaeropteris*; see Flora Malesiana II, 1: 127, fig. 23) or thick like those of *Cyathea* subgenus *Sphaeropteris* sect. *Schizocaena* subsect. *Sarcopholis* (ibid. p. 154, fig. 30); spores dark and spinulose in most cases. In all these characters *Plesioneuron* is nearer to *Chingia* (Holttum 1971, p. 31) than to *Mesophlebion*. It differs from *Chingia* is the invariable deep lobing of pinnae and free veins, in sori often not very close to costules, the very firm indusia of many species, the usually pustular surface of dried fronds, and in more or less swollen aerophores. As in *Chingia*, a few species have short capitate hairs on the lower surface. *Chingia* is distributed throughout Malesia, with greatest diversity in the Philippines and one species extending to Tahiti.

The name *Plesioneuron* refers to the basal basiscopic vein which always arises close to its costule.

The sinus-membrane in *Plesioneuron* is in all cases distinctly decurrent from the base of the sinus as a ± hairy ridge on the lower surface, sometimes almost reaching the costa. This condition is closely similar to that of *Dryopteris* subg. *Steiropteris* C.Chr. (Monogr. Dryopt. 1, 1913, 161), a group of species in the American tropics. These species differ from *Plesioneuron* as follows: rhizome wide-creeping; septate hairs on lower surface of rachis and costae; neither glands nor acicular hairs on sporangia; spores with translucent wing and a few cross-wings (this type of spores occurs in a few species of *Plesioneuron*). Two aberrant species included with doubt by Christensen in subg. *Steiropteris* are more similar to *Mesophlebion* and are mentioned under that genus.

Collections of recent years have shown how greatly this genus is diversified in New Guinea, with the result that 10 new species are here described. But, though the existence of many species in New Guinea cannot be doubted, I have found it difficult to state their differences clearly, and it has not been possible to have all relevant specimens from all the many herbaria assembled in one place for a final scrutiny. In some cases it is not certain how large plants of a particular species may grow, and it is possible that some type specimens represent immature plants. Several species show some degree of difference between lobes on acroscopic and basiscopic sides of a pinna, but there is no sharp distinction between these and those with no clear difference. I believe that characters of stipe-scales, pubescence of lower surface, position of sori, indusia, glands or setae on sporangia and hairs on receptacles are significant, also the shape of the bases of pinnae, both basal pinnae

(which always differ from the rest) and upper pinnae. Some specimens do not show the shape of basal pinnae clearly, and basal pinnae are sometimes lacking, also scales at the bases of stipes. The present account is to be regarded as tentative; it is the best I can make at present.

KEY TO THE SPECIES OF PLESIONEURON

1a. Stipe and rachis bearing copious dark spines 2
b. Stipe (except base) and rachis smooth; scales, if present, lacking spine-like bases 8
2a. Pinnae not over 4.5 cm wide; costules not over 5 mm apart 3
b. Largest pinnae 7—12 cm wide; costules to 10—12 mm apart 6
3a. Pinnae to 4.5 × 1.3 cm; veins not over 6—7 pairs; edges of pinna-lobes much reflexed . . . . . **1. P. pullei**
b. Pinnae much longer; veins more numerous; edges not much reflexed 4
4a. Sporangia not setiferous 5
b. Sporangia bearing long setae . . . . . **2. P. fuchsii**
5a. Veins 20—30 pairs; basal scales 0.5 mm wide, thick, setiferous; hairs on lower surfaces of costae and costules 1 mm long . . . . . **3. P. woodlarkense**
b. Veins to 20 pairs; basal scales castaneous, flat, to 2 mm wide; hairs on lower surface of costae to 0.25 mm long . . . . . **4. P. dryopteroideum**
6a. All pinna-lobes or pinnules auricled on basiscopic side, veins forked or pinnate in auricles . . . . . **5. P. notabile**
b. Pinna-lobes not thus auricled 7
7a. Pinnae lobed almost to costa, lobes not separately adnate . . **6. P. septempedale**
b. Pinna-lobes on basal half of pinnae separately adnate to costa **7. P. marattioides**
8a. Pinnae 1—5 pairs, apical lamina as pinnae; costules 6—7 mm apart **8. P. fulgens**
b. Pinnae commonly to at least 10 pairs, or if fewer costules 3—4 mm apart . . 9
9a. Pinnae lobed to 3 mm from costa; basal veins meeting sinus-membrane some distance below base of sinus . . . . . **9. P. irayense**
b. Pinnae lobed more deeply; basal veins meeting at base of sinus, or not meeting 10
10a. No indusia; no setae on sporangia 11
b. Indusia present, or if absent sporangia setose 12
11a. Aerophores elongate to 1 mm; no glands on sporangia . . . . . **10. P. belense**
b. Aerophores not elongate; glands present on sporangia . . . . . **11. P. wariense**
12a. Sporangia all setose; no glands present 13
b. Sporangia usually with glands; setae, if present, short and not on all sporangia, sometimes alternating with glands 18
13a. Sori supramedial; sporangia with 1—3 short setae . . . . . **12. P. royenii**
b. Sori medial or inframedial; sporangia with several long setae 14
14a. Short capitate hairs on lower surface of costae and costules; acicular hairs on margin only . . . . . **13. P. translucens**
b. Short acicular hairs present on lower surface of costae and costules 15
15a. Veins 10—12 pairs; largest pinnae not over 12 × 2.5 cm . . . . **14. P. savaiense**
b. Veins 14—16 pairs; largest pinnae 12—30 × 3 cm 16
16a. Only basal pinnae narrowed at their bases 17
b. All pinnae with lowest lobes reduced . . . . . **15. P. tahitense**
17a. Basal pinnae, 4 pairs, with stalks 3—4 mm long . . . . . **16. P. altum**
b. Basal pinnae sessile . . . . . **17. P. ponapeanum**
18a. Sori supramedial 19
b. Sori medial or inframedial 24

19a. Pinnae to 20×3 cm; veins 15—18 pairs . . . . . **18. P. subterminale**
b. Pinnae smaller; veins not over 12 pairs 20
20a. Basal lobes on basal pinnae free and short-stalked . . . . . **19. P. bipinnatum**
b. Basal lobes on basal pinnae not free 21
21a. Slender hairs nearly 1 mm long scattered on lower surface of costae 22
b. All hairs on lower surface much shorter 23
22a. Pinnae 7—8 pairs; veins 10—12 pairs; costules 4 mm apart, at 60° to costa **20. P. quadriquetrum**
b. Pinnae to 17 pairs; veins 7—8 pairs; costules 5 mm apart, at 45° to costa **21. P. archboldiae**
23a. Several pairs of lower pinnae narrowed towards their bases; lower surface of costae and costules very sparsely hairy . . . . . **22. P. subglabrum**
b. Lower pinnae not narrowed towards their bases; costae and costules densely hairy on lower surface . . . . . **23. P. phanerophlebium**
24a. Lower surface of costa and indusium glabrous; aerophores 1 mm long **24. P. crassum**
b. Lower surface of costa hairy (in most cases densely); aerophores swollen to elongate 25
25a. All pinna-lobes, both sides of costa, either very oblique or strongly falcate. . . 26
b. Pinna-lobes neither very oblique nor strongly falcate on both sides, but often ± unequal on the two sides 27
26a. Pinna-lobes on both sides very oblique, hardly falcate . . . . . **25. P. prenticei**
b. Pinna-lobes both sides equally strongly falcate . . . . . **26. P. falcatipinnulum**
27a. Pinna-lobes on basiscopic side of costa conspicuously more falcate and shorter than those on acroscopic side 28
b. Pinna-lobes on basiscopic side sometimes more falcate than on acroscopic side but not or little shorter 31
28a. Veins to 30 pairs; lower sori divergent from costule. . . . **27. P. myriosorum**
b. Veins usually not over 20 pairs; lower sori close to costules 29
29a. Basal lobes on middle and upper pinnae short on both sides; appressed hairs on lower surface of costules and between veins . . . . . **28. P. hopeanum**
b. Basal basiscopic lobes of middle and upper pinnae very short; basal acroscopic lobes little reduced; no appressed hairs on lower surface 30
30a. Pinnae *c.* 10 pairs, to 7×1.7 cm . . . . . **29. P. wantotense**
b. Pinnae to 25—30 pairs, to 22×2.5 cm. . . . . **30. P. attenuatum**
31a. Sori close to costules 32
b. Sori medial, or little inframedial 35
32a. No acicular hairs on receptacles; appressed hairs on lower surface between veins; both basal lobes of upper pinnae much reduced. . . . . **28. P. hopeanum**
b. Acicular hairs present on receptacles; no appressed hairs between veins; basal lobes of upper pinnae little reduced 33
33a. Pinnae to 12 cm long; costules to 5 mm apart . . . . . **31. P. doctersii**
b. Pinnae commonly 20 cm or more long, or if shorter costules 3—4 mm apart 34
34a. Indusia small, soon caducous; pinnae to 5 cm wide; lower surface of costae bearing few hairs . . . . . **32. P. tuberculatum**
b. Indusia firm, persistent; pinnae *c.* 3 cm wide; lower surface of costae copiously hairy . . . . . **33. P. costulisorum**
35a. Basal acroscopic lobe of lower pinnae longer and wider than next lobe, with veins forked or pinnate. 36
b. Basal acroscopic lobe of lower pinnae not larger than next, entire, all veins simple 37

36a. Lower surface of rachis and costae sparsely hairy; basal acroscopic lobe crenate **34. P. platylobum**
b. Lower surface of rachis and costae densely short-hairy; some basal acroscopic lobes pinnatifid . . . . . **35. P. ctenolobum**
37a. Scales at base of stipe thin . . . . . **36. P. kundipense**
b. Scales at base of stipe thick and narrow 38
38a. Basal pinnae stalked *c.* 2 mm. 39
b. Basal pinnae sessile . . . . . **37. P. dryas**
39a. Pinnae lobed to 0.5 mm from costa; apex of pinnae not caudate **38. P. rigidilobum**
b. Pinnae lobed to 1—2 mm from costa, apex narrowly caudate . . **39. P. ophiura**

1. Plesioneuron pullei Holttum, *sp. nov.*

Caudex erectus; stipes usque 25 cm longus, rufo-brunneus, nitidus, paleis multis patentibus spiniformibus nigris praeditus; lamina usque 30 cm longa; pinnae 30-jugatae, inferiores 2—3-jugatae leviter reductae, coriaceae; lobi pinnarum in sicco valde concavi (marginibus multo reflexis). Pinnae maximae 4.5 × 1.0 cm, sessiles, inferiores leviter auriculatae, mediales basi aequaliter truncatae, apice obtusae, profunde lobatae; costulae 2.5 mm inter se distantes; venae 4—5-jugatae, subtus crassae prominentes supra haud manifestae; rachis subtus paleis tenuibus nigris spiniformibus 1.5 mm longis pilisque patentibus rigidis 0.7 mm longis praedita; costae infra more rachidis pilosae, lamina inter venas pilis tenuibus erectis vestita; costa supra profunde sulcata pilis brevibus praedita; lamina supra (saltem in juventute) pilis brevibus capitatis vestita. Sori mediales; indusia nulla (vel minuta setifera?); sporangia nec glandulis nec setis praeditae.

Type: *Pulle 905*, Mt Hellwig, W. New Guinea, 2600 m (L, holo; BM).

A collection from NE. New Guinea, Western Highlands (*Pullen 5117*), is very similar, differing in fewer pinnae (18—20 pairs) on fronds of the same length as type, pinnae a little wider and veins 6—7 pairs, a distinct very small indusium present. This collection was made at 3500 m "on steep bank near rock-face in moss-forest, pendulous, in deep shade". Both collections have young sori only.

2. Plesioneuron fuchsii Holttum, *sp. nov.*

Caudex ignotus; stipes 60 cm longus, omnino dense atrospinosus, basi paleis 10—15 × 0.5 mm rigidis atrobrunneis vestitus. Lamina 75 cm longa, pinnis 35-jugatis. Pinnae maximae 21 × 1.8 cm, basi truncatae, caudato-acuminatae (cauda 2—2.5 cm longa), usque 2.5—3 mm a costa lobatae; lobi ciliati; costulae 4—4.5 mm inter se distantes; venae 10—11-jugatae, subtus prominentes supra leviter sulcatae, basales ambae membranam sinus tegentes; rachis subtus omnino spinis nigris brevibus, interdum paleisque teretibus 7—8 mm longis praedita; costae subtus paleis teretibus paucis pilisque minutis praeditae; costulae venae et lamina inter venas pilis tenuibus erectis sparsim vestitae. Sori mediales, exindusiati; sporangia setifera.

Type: *H. P. Fuchs 21477*, Sabah, Mt Kinabalu, North face, Goking's valley at 2715 m, overhanging river in moss forest (L, holo; K). *Clemens 33719*, Mt Kinabalu 2300 m, sterile (BO, SING). The type at Leiden bears only a few sori; the Kew specimen is sterile.

3. Plesioneuron woodlarkense (Copel.) Holttum, *comb. nov.*

Cyathea woodlarkensis Copel., Philip. J. Sc. 9C (1914) 1; Holttum, Fl. Males. II, 1, pt. 2 (1963) 158. — Type: *C. King 384*, Woodlark Island, Papua (MICH; NSW).

Caudex erect; stipe bearing dark slender spines to 5 mm long; base of frond lacking; largest pinna 42 × 4.5 cm, base truncate, acuminate, lobed to 1 mm from costa; costules 5 mm apart; veins to over 30 pairs, slender, dark on both sides, basal veins touching sides of short sinus-membrane; lower surface of rachis bearing slender terete spine-line scales as stipe, costae and costules with sparse slender erect hairs to 1 mm long. Sori inframedial, exindusiate; no acicular hairs on sporangium-stalks nor appendages near annulus; spores dark.

Distribution: Woodlark I. and New Britain, 0—900 m.

The isotype at Sydney, which agrees well with the original description, bears the number *384*, but Copeland cited *284*; *King 384* at Leiden is *Dryopteris logavensis* Rosenst. *Floyd 6529*, from New Britain (Central Nakanai, 900 m) is a better specimen but smaller, as follows: caudex 23 cm tall, stipe 85 cm long, basal scales thick in middle, very narrow; largest pinnae 33 × 3 cm; veins to 22 pairs. The long hairs on lower surface of costae and costules appear to be characteristic.

4. **Plesioneuron dryopteroideum** (Brause) Holttum, *comb. nov.*

Alsophila dryopteroidea Brause, Bot. Jahrb. 56 (1920) 70. — *Cyathea atrispora* Domin, Acta Bot. Bohem. 9 (1930) 95. — *Dryopteris atrispora* C. Chr., Brittonia 2 (1937) 296. — *Thelypteris dryopteroidea* Reed, Phytologia 17 (1968) 273. — Type: *Ledermann 11897*, NE. New Guinea, Sepik Dist., 2070 m (B).

Dryopteris atrispora var. *varievestita* C. Chr., Brittonia 2 (1937) 296. — *Lastrea varievestita* Copel., Gen. Fil. (1947) 140; Philip. J. Sc. 78 (1951) 429. — *Thelypteris varievestita* Reed, Phytologia 17 (1968) 323. — Type: *Brass 4996*, Papua, Mt Tafa, 2400 m (BM).

Caudex erect, to 100 cm tall; stipe to 75 cm long, basal part covered with glossy rigid castaneous scales to 10 × 2 mm, whole of stipe and rachis bearing scattered dark spines (decreasing distally) which when young bear scales at their tips. Lamina to at least 110 cm long, pinnae to 35 pairs, rigid when dry. Largest pinnae to 35 × 2.7 cm (on some plants much smaller), caudate-acuminate, lobed to 1—2 mm from costa; costules 3—4.5 mm apart; veins 10—15 pairs, basal pair meeting below sinus in large pinnae, both to edge on smaller more deeply lobed pinnae; lower surface of rachis and costae bearing short erect acicular hairs with dark warts and some narrow dark scales; costules, veins, and surface of lamina variable in pubescence (in some cases slender erect hairs all over), usually with some very small glandular hairs on costules and veins; upper surface sometimes with scattered small glands between veins. Sori near costules; indusia lacking or very small with a few short hairs or glands; sporangia sometimes bearing short capitate hairs, rarely short setae; spores black, minutely spinulose.

Distribution: NE. New Guinea, at 2000—2700 m; Moluccas (Buru).

The type of var. *varievestita* appears to be only an unusually hairy specimen; it also bears many small glands. Size of fronds, and depth of lobing of pinnae seem to vary with size and height of caudex; the smallest fronds seen are from the top of a slender caudex said to be 100 cm tall.

5. **Plesioneuron notabile** (Brause) Holttum, *comb. nov.*

Dryopteris notabilis Brause, Bot. Jahrb. 56 (1920) 91. — *Thelypteris notabilis* Ching, Bull. Fan Mem. Inst. Biol. Bot. 10 (1941) 253. — Type: *Ledermann 11663*, NE. New Guinea, Sepik Dist., Schraderberg 2070 m (B).

Frond with stipe 3—4 m long; stipe more than 75 cm long, spiny throughout, basal spines to 2 cm long, terete to tips, bearing short acicular hairs. Basal pinnae somewhat shortened, basal acroscopic lobe to 7 × 1.4 cm, pinnatifid. Suprabasal pinnae subcoriaceous,

4—10 cm apart, to 38 × 11.5 cm, basal part bearing separately adnate pinnules, lobes on apical part connected by a very narrow wing along costa; largest pinnules 6 × 0.7 cm, 1.7 cm apart, auricled at base on basiscopic side, basal vein forked or pinnate in the auricle; veins to 30 pairs, fine and prominent on both sides; lower surface glabrous apart from a few hairs on costules. Sori large, near costules, exindusiate; spores dark, irregularly verrucose.

Only known from type and one other collection from same locality (*Ledermann 11991*).

The shape of pinnules is unique. Spores are somewhat like those of *Amphineuron*.

6. Plesioneuron septempedale (Alston) Holttum, *comb. nov.*

Dryopteris septempedalis Alston, J. Bot. 78 (1940) 227; Nova Guinea NS. 4 (1940) 111, t. 8 fig. 11. — T y p e: *L. E. Cheesman 1383*, Japan I., W. New Guinea, 150 m, river bank near Menai-wende (BM; LAE).

Frond with stipe 7 feet long; stipe-base bearing many spine-like setiferous scales; lower pinnae deflexed and slightly reduced. Largest pinnae 40 × 12 cm, rigid when dry, lobed to less than 1 mm from costa, lobes at right angles (or basal ones deflexed), acuminate; costules to 12 mm apart; veins to more than 50 pairs, immersed and only just visible both sides; lower surface quite glabrous. Sori near costules, basal ones divergent, exindusiate; no glands nor setae on sporangia; spores very dark.

Only known from type collection.

7. Plesioneuron marattioides (Alston) Holttum, *comb. nov.*

Dryopteris marattioides Alston, Journ. Bot. 78 (1940) 227; Nova Guinea NS. 4 (1940) 110, pl. 7 fig. 7, 8. — T y p e: *Clemens 4809*, NE. New Guinea, Morobe Dist., Sambanga, 1800 m (BM).

Caudex to 30 cm tall; stipe 100 cm or more long, base covered with firm brown hair-pointed scales 2 cm long, to 2 mm wide, above base of stipe many spreading dark spines to 8 mm long; basal pinnae somewhat reduced; texture thick and rigid when dry. Largest pinnae 35 × 8—11 cm, basal part bearing separately adnate pinnules which are strongly deflexed, distal part lobed nearly to costa; largest pinnules 5.5 × 0.9 cm, acuminate; costules to 10 mm apart; veins to 40 pairs, thick and distinct both sides; lower surface glabrous. Sori near costules, exindusiate; no hairs nor glands on sporangia; spores dark, spinulose.

D i s t r i b u t i o n: known from 6 collections from widely-separated places in eastern New Guinea, at *c.* 2000 m. Young plants grown from spores at Kew had short capitate hairs on stipes and on their spines; these plants did not grow to maturity.

8. Plesioneuron fulgens (Brause) Holttum, *comb. nov.*

Dryopteris fulgens Brause, Bot. Jahrb. 56 (1920) 89. — *Thelypteris fulgens* Ching, Bull. Fan Mem. Inst. Biol. Bot. 10 (1941) 251. — T y p e: *Ledermann 11004*, NE. New Guinea, Sepik Dist., 1300 m, in water seepage on rock wall (B).

D. hunsteiniana Brause, Bot. Jahrb. 56 (1920) 79. — *Thelypteris hunsteiniana* Reed, Phytologia 17 (1968) 284. — T y p e: *Ledermann 11058*, loc. as *D. fulgens* (B).

Mesoneuron wantotense sensu Holttum, Blumea 13 (1965) 134 (not *Dryopteris wantotensis* Copel.)

Rhizome creeping, 4—5 mm diam., stipes 1 cm apart; stipe to 26 cm, smooth except base, basal scales 11 × 1.5 mm, stiff, hairy. Lamina to 30 cm long, apex pinna-like, pinnae 1—5 pairs, lowest pinnae a little narrowed at acroscopic base, stalk 1 mm. Largest pinnae 16 × 4.2 cm, slightly narrowed near base, caudate-acuminate, lobed to 2 mm from costa, aerophores swollen; costules 7 mm apart; veins 16—18 pairs; lower surface pustular, hairy only on sinus-membranes and edges. Sori inframedial, lowest not divergent; indusia firm,

dark, with a few hairs; acicular hairs on receptacle; sporangia bearing either glands or short setae near annulus and an acicular hair on stalk; spores dark, spinulose.

Distribution: eastern New Guinea, at 1300—2000 m.

The type of *D. hunsteiniana* has only one pair of small pinnae and is fertile on the large apical lamina only; it looks like a young plant. Holttum & Roy reported n=36 from examination of a plant cultivated at Kew and erroneously named *M. wantotense*; this plant was found growing on a steep stream-bank.

9. Plesioneuron irayense (Copel.) Holttum, *comb. nov.*

Cyclosorus irayensis Copel., Philip. J. Sc. 81 (1952) 28; Fern Fl. Philip. (1960) 340. — *Thelypteris irayensis* Reed, Phytologia 17 (1968) 285. — Type: *Ramos BS. 80344*, Mt Iraya, Batan Is (MICH).

Rhizome short-creeping; stipe 35—70 cm long, basal scales 3—4 mm long, narrow, setose. Lamina 35 cm long, pinnae 12 pairs, lowest much narrowed towards its base, almost sessile. Largest pinnae 11×2.2 cm (fertile), aerophores not swollen, acuminate, lobed to 3 mm from costa, lobes oblique, slightly falcate; costules 5 mm apart; veins 10—12 pairs, lowest both to sides of sinus-membrane; lower surface of rachis densely short-hairy, less so on costae, hairs longer on sterile than on fertile fronds. Sori medial; indusium small, thin, with short hairs; sporangia with 2 or 3 small yellow glands near annulus; spores with a narrow translucent wing and cross-wings.

Only known from type collection.

10. Plesioneuron belense (Copel.) Holttum, *comb. nov.*

Dryopteris belensis Copel., Univ. Cal. Publ. Bot. 18 (1942) 220. — *Lastrea belensis* Copel., Gen. Fil. (1947) 138; Philip. J. Sc. 78 (1951) 433, pl. 21. — *Thelypteris belensis* Reed, Phytologia 17 (1968) 263. — Type: *Brass 11509*, W. New Guinea, Bele River, 2200 m, on limestone cliff in forest (MICH; L).

Caudex thick, suberect; stipe 40 cm long, scaly throughout, basal scales thin, 4×1.5 mm, upper smaller. Lamina 45 cm long, subcoriaceous, pinnae 12—15 pairs; basal pinnae not narrowed to base. Largest pinnae 10—15×2—3 cm, sessile, with aerophores 1 mm long, caudate-acuminate, lobed to 2 mm from costa, lobes falcate, basiscopic lobes more curved than acroscopic; costules 5 mm apart; veins to 18 pairs, basal veins to sides of sinus-membrane which is decurrent between them; lower surface of rachis and costae bearing stiff brown hairs and small brown setose scales. Sori near costules, exindusiate; acicular hairs present on receptacle; no glands nor setae on sporangia; spores dark, spinulose.

Only known from type and *Brass 11327*, at 2200 m, on shaded rocky bank of forest stream.

11. Plesioneuron wariense (Copel.) Holttum, *comb. nov.*

Dryopteris wariensis Copel., Philip. J. Sc. 6C (1911) 73. — *Lastrea wariensis* Copel., Gen. Fil. (1947) 140. — *Thelypteris wariensisis* Reed, Phytologia 17 (1968) 324. — Type: *C. King 101 (p.p.)*, Papua, Wari River (MICH; NSW. — *King* 101 at BO is *P. tuberculatum*).

Stipe at least 23 cm long, basal scales unknown. Lamina to 60 cm long, pinnae 7—8 pairs, lowest pinnae with stalks 4 mm long and basal 4 pairs lobes gradually reduced, lowest free. Largest pinnae 18—30×3.5 cm, acuminate, lobed to 0.5 mm from costa, lobes slightly falcate, alike on both sides; costules to 5 mm apart; veins 17—20 pairs, prominent on lower surface; sparse short hairs and some longer ones on lower surface of rachis and costae. Sori medial, lower ones divergent; no indusia; yellow glands on sporangia; no acicular hairs on receptacle.

Only known from type collection; perhaps a young plant of *P. tuberculatum*.

12. Plesioneuron royenii Holttum, *sp. nov.*

Rhizoma breve, repens; stipes 40 cm longus, praeter basin laevis, basi paleis 6×1 mm setiferis vestitus. Lamina usque 27 cm longa; pinnae 6-jugatae; pinnae infimae stipitulis usque 2 mm longis suffultae, lobis inferioribus 2—3-jugatis sensim reductis, lobo infimo acroscopico libero, integro, 5 mm longo. Pinnae maximae 10 cm longae, fertiles 2.0—2.3 cm latae, sterile 2.8 cm; lobi acroscopici et basiscopici aequales, bases sinuum inter lobos 1.5 mm a costa distantes; costulae 3.5 mm (fertiles) vel 4.5 mm (steriles) inter se distantes; venae 11—12-jugatae, venae infimae infra sinum non conniventes; rachis costaeque subtus pilis brevissimis multis vestitae, pilis versus apices pinnarum longioribus. Sori supramediales, exindusiati; sporangia setifera; sporae non visae.

T y p e: *van Royen 5469*, W. New Guinea, Waigeo I., alt. 3 m, in forest (L).

13. Plesioneuron translucens Holttum, *sp. nov.*

Caudex suberectus; stipes 32 cm longus, basi paleis 10×1 mm setiferis vestitus. Lamina 38 cm longa; pinnae 10-jugatae suboppositae, in juventute translucentes; pinnarum infimarum lobi basales 2-jugati reductae, lobo infimo basiscopico 5 mm longo, acroscopico 10—12 mm longo fere libero. Pinnae maximae steriles 12.5×3 cm, fertiles 11×2.5 cm, basi subtruncatae, abrupte caudato-acuminatae (cauda 15—20 mm longa); lobi leviter falcati sinubus angustis separati, bases sinuum a costa 2 mm distantes; costulae 5.5—6 mm inter se distantes; venae usque 15-jugatae, tenues; rhachis costae costulaeque subtus omnino pilis capitatis brevibus vestitae. Sori prope costulas siti; indusia parva, firma, pilosa; sporangia setis prope annulum praedita; sporae non visae.

T y p e: *C. J. Brooks 17760*, Amboina, Telaga Radja, 600 m (BO, holo; BM). The Bogor specimen is a young frond, thin and translucent, with immature sori; the BM isotype is an old frond on which few sporangia remain.

14. Plesioneuron savaiense (Baker) Holttum, *comb. nov.*

Nephrodium savaiense Baker, Ann. Bot. 5 (1891) 318. — *Dryopteris savaiensis* C. Chr., Ind. Fil. (1905) 291; Bishop Mus. Bull. 177 (1943) 82. — *Thelypteris savaiensis* Reed, Phytologia 17 (1968) 312. — T y p e: *Powell 183*, Samoa (K).

Dryopteris quadriaurita Chr., Philip. J. Sc. 2C (1907) 209. — *Lastrea quadriaurita* Copel., Gen. Fil. (1947) 139; Philip. J. Sc. 78 (1951) 430; Fern Fl. Philip. (1960) 326. — *Thelypteris quadriaurita* Reed, Phytologia 17 (1968) 307. — T y p e: *Copeland 1714*, Minadano, San Ramon, 850 m (US; B, P).

Dryopteris ensipinna Brause, Bot. Jahrb. 56 (1920) 84. — *Thelypteris ensipinna* Ching, Bull. Fan Mem. Inst. Biol. Bot. 10 (1941) 251. — T y p e: *Ledermann 12773*, NE. New Guinea, Sepik Dist., with *Sphagnum* on rock-wall, 1400—1500 m (B).

Rhizome short-creeping; stipe 30—50 cm long, basal scales to 12×1.5 mm, rigid, hairy. Lamina 40—50 cm long, pinnae to 15 pairs; basal pinnae narrowed a little at base with basal acroscopic lobe free or nearly so. Largest pinnae 12×2.5 cm, sessile, short-acuminate, lobed to 1—1.5 mm from costa, lobes on both sides about equal; costules 3.5—5 mm apart, at 60° or more to costa; veins 10—12 pairs, slender and prominent both sides, basal veins not meeting at sinus; rachis and costae densely short-hairy on lower surface. Sori medial to inframedial; indusium very small with stiff hairs or absent; sporangia bearing long setae; spores dark, spinulose.

D i s t r i b u t i o n: Samoa, NE. New Guinea at 850—1500 m, Mindanao, Negros, Moluccas (Batjan, Tidore, Amboina).

Christ stated that the type of *D. quadriaurita* was exindusiate, but a small indusium is present. The differences between Christ's type from Mindanao and Baker's from Samoa are very slight. The type of *D. ensipinna* Brause appears to be exindusiate and is rather less deeply lobed than some other specimens.

15. Plesioneuron tahitense Holttum, *sp. nov.*

Caudex brevis, erectus; stipes 30 cm vel ultra longus, basi paleis nitidis 10×1.5 mm vestitus. Lamina usque 60 cm longa; pinnae 12—15-jugatae, omnes subopppositae; pinnae infimae stipitulis 3—7 mm longis suffultae, lobis inferioribus 1—2-jugatis valde reductis. Pinnae maximae 16×3 cm, omnes basi angustatae, pleraeque stipitulatae, apice caudato-acuminatae, profunde lobatae, lobis basiscopicis valde obliquis et falcatis, lobis acroscopicis fere rectis et paulo longioribus, omnibus apice angustatis; costulae usque 5 mm inter se distantes; venae usque 20-jugatae; pagina inferior omnino pilis brevibus erectis sparsim vestita. Sori inframediales; indusia parva pilis rigidis vestita; sporangia setis pluribus ornata; stipitibus sporangiorum pilis acicularibus praeditis.

Type: *Savatier 752*, Tahiti, Grottes de Mara (K).

The type was labelled *Dryopteris brackenridgei* (=*Plesioneuron attenuatum*) by Christensen, but differs in its setose sporangia, stalked pinnae, and erect hairs on lower surface. A second specimen, *Setchell & Parks 173*, is labelled "in profusion, on arched front of cave; dripping rocks". At BM is a specimen collected at Tahiti by Banks and Solander in 1769.

16. Plesioneuron altum (Brause) Holttum *comb. nov*,.

Dryopteris alta Brause, Bot. Jahrb. 56 (1920) 86. — *Thelypteris alta* Reed, Phytologia 17 (1968) 259. — Type: *Ledermann 11497*, NE. New Guinea, Sepik, 1300 m (B).

Rhizome short-creeping, apex covered with rigid setiferous scales 10×1.5 mm; stipe 70 cm long. Lamina 70 cm long; pinnae 14 pairs; lower 4 pairs stalked 3—4 mm, basal pinnae with basiscopic lobe only reduced and further from rachis than acroscopic. Largest pinnae 21×3.3 cm, caudate-acuminate (cauda to 2.5 cm), lobed to less than 1 mm from costa, lobes on basiscopic side more falcate than on acroscopic but not shorter; costules to 6.5 mm apart; veins to 16 pairs; lower surface sparsely hairy on costa, costules and sinus-membrane; upper surface with very short hairs between veins. Sori near costules except basal ones; indusia very small, hairy; sporangia bearing short setae near annulus and an acicular hair on stalk; spores dark finely spinulose.

Only known from type collection.

17. Plesioneuron ponapeanum (Hosokawa) Holttum, *comb. nov.*

Phegopteris ponapeana Hosokawa, Trans. Nat. Hist. Soc. Formosa 26 (1936) 233. — *Thelypteris ponapeana* Reed, Phytologia 17 (1968) 305. — Type: *Hosokawa 5623*, Caroline Is., Ponape (TAI).

Stipe 70 cm long, basal scales thin, 8×2 mm. Lamina 50 cm long, pinnae 13 pairs; basal pinnae sessile, lower 4 pairs lobes gradually shorter, basal acroscopic lobe 10 mm, basiscopic 5—6 mm long. Largest pinnae 18×3 cm, acuminate, lobed to less than 1 mm from costa; costules to 5.5 mm apart; veins 12—14 pairs; lower surface of rachis, costae, and costules bearing stiff short brown hairs; upper surface hairy on costae and costules only. Sori inframedial; indusia very small, short-hairy; sporangia bearing 5—7 setae 0.5 mm long.

Distribution: Ponape.

Hosokawa described the lower surface as glandular but I see no glands on the type specimen; perhaps he referred to the pustular surface common in this genus. He also stated that indusia were lacking.

18. Plesioneuron subterminale Holttum, *sp. nov.*

Caudex brevis, erectus; stipes 70 cm longus, praeter basin laevis, basi paleis crassis fuscis setiferis 10×1 mm vestitus. Lamina 80 cm longa; pinnae 25-jugatae, infimae prope basin

angustatae, stipitulis 2 mm longis suffultae. Pinnae maximae 20 × 3 cm, sessiles, acuminatae; lobi acroscopici omnes fere recti, basiscopici leviter breviores, valde falcati; bases sinuum inter lobos a costa 1 mm distantes; costulae usque 5 mm inter se distantes; venae usque 18-jugatae, utrinque prominentes, basales non conniventes; rhachis costae costulaeque subtus dense brevi-pilosae, pagina inter venas pustulosa; pagina inter venas supra interdum pilis brevibus rigidis praedita. Sori supramediales; indusia fusca, rigida, brevi-pilosa; sporangia glandulis ornata; sporae non visae.

T y p e: *Brass 32049*, NE. New Guinea, Eastern Highlands, 1400 m, in *Castanopsis*-oak forest (K, holo; L, LAE). Three other collections, from Morobe District (*Kairo NGF 47699, 44080*; *B. S. Croxall 4341*) are similar except that the lowest pinnae are sessile; these specimens are also much darker in colour than the type, perhaps due to a different method of drying.

19. **Plesioneuron bipinnatum** (Copel.) Holttum, *comb. nov.*

Dryopteris bipinnata Copel., Philip. J. Sc. 9C (1914) 2. — *Thelypteris bipinnata* Reed, Phytologia 17 (1968) 264. — T y p e: *C. King 407*, Papua, Loane (MICH; NSW).

Stipe 32 cm, scaly at base, scales narrow, hairy, to 5 mm long. Lamina 28 cm long; pinnae 10 pairs, several pairs lower pinnae with basal lobes reduced and free, these lobes on lowest pinnae short-stalked. Largest pinnae 11 × 1.6 cm, acuminate, lobed to 0.5 mm from costa; costules 3 mm apart; veins to 11 pairs; lower surface of costae and costules with very short and longer stiff hairs; scattered similar long hairs on upper surface of costules. Sori supramedial; indusia small with many short stiff hairs; no glands nor setae on sporangia; spores not seen.

Only known from type and one other collection by *C. King (no. 221)*.

20. **Plesioneuron quadriquetrum** (v.A.v.R.) Holttum, *comb. nov.*

Dryopteris quadriquetra v.A.v.R., Nova Guinea 14 (1924) 16. — *Thelypteris quadriquetra* Ching, Bull. Fan Mem. Inst. Biol. Bot. 10 (1941) 254. — T y p e: *Lam 542*, W. New Guinea, Mamberamo River, 10 m (L).

Caudex suberect, fronds tufted; stipe 20—40 cm, basal scales narrow, hairy, 6 mm long. Lamina subdimorphous, sterile with 7—8 pairs pinnae to 10 × 2 cm, fertile with 10 pairs to 8 × 1.2 cm; basal sterile pinnae with 2—3 pairs of basal lobes reduced. Middle sterile pinnae with subtruncate base, caudate-acuminate, lobed to 1 mm from costa; costules 4 mm apart; veins 10—12 pairs; lower surface of costae with rather sparse stiff spreading hairs 1 mm long, shorter hairs on costules and edges. Fertile pinnae with costules 3—3.5 mm apart, sinuses between lobes wider than sterile; sori supramedial; indusia hairy; sporangia with small glands near annulus; no acicular hairs on receptacle; spores with complete wing and cross wings.

Only known from type collection, which Lam recorded as an epiphyte, a condition not otherwise known in the genus and rare in *Thelypteridaceae*.

21. **Plesioneuron archboldiae** (Copel.) Holttum, *comb. nov.*

Lastrea archboldiae Copel., J. Arn. Arb. 30 (1949) 436. — *Thelypteris archboldiae* Reed, Phytologia 17 (1968) 260. — T y p e: *Degener 14273*, Fiji, 750—900 m, in open forest (MICH).

Rhizome short-creeping; stipe 30 cm long, scales at base narrow, thin, 5 mm long. Lamina *c.* 25 cm long, pinnae to 17 pairs, lowest pinnae stalked 3 mm with 3 pairs basal lobes gradually reduced. Largest pinnae to 12 × 2.0 cm, base a little asymmetric, acuminate, lobed to 1 mm from costa; lobes oblique, equal on both sides of costa; costules 4.5—5 mm

apart, at about 45° to costa; veins 7—8 pairs, lowest both ending above base of sinus; scattered stiff white hairs 0.8 mm long on lower surface of rachis and costae, shorter hairs on costules, veins, and between veins, an oblique ridge below sinus-membrane distinct but glabrous; upper surface of costae bearing short antrorse hairs, scattered longer stiff hairs on costae, costules, veins, and between veins. Sori supramedial; indusia small, rather thin, setose; sporangia bearing capitate hairs near annulus; spores with a continuous wing and cross-wings.

Distribution: Fiji (Viti Levu and Vanua Levu) in lowland forest.

22. Plesioneuron subglabrum Holttum, *sp. nov.*

Rhizome breve, 8 mm diametro, stipitibus 1 cm inter se distantibus; stipes 75 cm longus, basi paleis 6×1 mm tenuibus vestitus. Lamina 50 cm longa; pinnae 22-jugatae; pinnae infimae stipitulis 2 mm longis suffultae, in tertia parte basin versus sensim angustatae, lobis infimis 3—4 mm longis. Pinnae maximae 15×2.5 cm, basi late cuneatae, caudato-acuminatae (cauda 2 cm); lobi falcati, basiscopici et acroscopici conformes; bases sinuum inter lobos a costa 1.5 mm distantes; costulae 5—5.5 mm inter se distantes; venae 10—11-jugatae, basales infra sinum non conniventes; costae, costulae venaeque subtus pilis minutis sparsis, margines et membranae sinuum pilis longioribus praeditae. Sori supramediales; indusia rigida fusca parva interdum pilis paucis praedita; sporangia nec glandulis nec setis praedita; sporae non visae.

Type: *Braithwaite RSS 4512*, Solomon Is, Santa Ysabel, by stream (K).

23. Plesioneuron phanerophlebium (Baker) Holttum, *comb. nov.*

Nephrodium phanerophlebium Baker, Syn. Fil. ed. 2 (1874) 494. — Type: *Richards s.n.*, Solomon Is (K).

Type consists of upper part of lamina 37 cm long with 16 pairs pinnae, base missing; aerophores swollen. Largest pinnae 11×2 cm, basal lobes not reduced; basal acroscopic lobe attached 1.5 mm from rachis, a little longer than next, straight and at right angles to costa, basal basiscopic lobe falcate and attached very close to rachis, other lobes about equal both sides; apex caudate 2 cm; edges lobed to 1—1.5 mm from costa; costules 4 mm apart; veins 11 pairs; lower surface of rachis, costae, and costules bearing very short stiff hairs, somewhat antrorse distally. Sori submarginal; indusia firm with short hairs; 1 or 2 capitate hairs on sporangia; spores dark with rather broad wing and cross-wing. Only known from type.

24. Plesioneuron crassum (Copel.) Holttum, *comb. nov.*

Dryopteris crassa Copel., Univ. Cal. Publ. Bot. 18 (1942) 220. — *Lastrea crassa* Copel., Gen. Fil. (1947) 138; Philip. J. Sc. 78 (1951) 435, pl. 23. — *Thelypteris crassa* Reed, Phytologia 17 (1968) 269. — Type: *Brass 10878*, N. New Guinea, Lake Habbema, 2650 m, by stream in forest (MICH; L).

Rhizome short-creeping; stipe 60 cm long, basal scales 5×1.5 mm. Lamina to 30 cm long, pinnae 9 pairs; basal lobes only of lowest pinnae reduced; aerophores 1 mm long. Largest pinnae 11×2 cm with stalk 2 mm, caudate-acuminate, lobed to 0.5 mm from costa, lobes rigid with reflexed edges when dry, those on basiscopic side falcate; costules 4—4.5 mm apart; veins thick, 12 pairs; lower surface glabrous apart from a few hairs on margins. Sori near costules; indusia small, dark, thick, glabrous; no glands nor setae on sporangia.

Distribution: middle-northern part of New Guinea, 1000—2800 m.

A specimen from Mafulu, in the central mountain-mass of Papua (*L. E. Cheesman 152*,

K) agrees with the type of *P. crassum* in elongate aerophores and quite hairless lower surface, also in basal lobes of all pinnae little reduced, but differs: pinnae to 21 × 3 cm, long-caudate (3 cm); sporangia bearing many red glands; many acicular hairs on receptacle. The base of the frond is lacking. This may represent a distinct new species.

25. Plesioneuron prenticei (Carr.) Holttum, *comb. nov.*

Lastrea prenticei Carr. in Seem. Fl. Vit. (1873) 359. — *Dryopteris prenticei* Kuntze, Rev. Gen. Pl. 2 (1891) 813. Copel., Bishop Mus. Bull. 59 (1929) 40. — *Thelypteris prenticei* Alston, Amer. Fern J. 45 (1955) 120. — T y p e: *Milne 247*, Fiji, margins of streams (K).

Caudex suberect; stipe to 50 cm long, basal scales 12 mm long, very narrow, setose. Lamina to 50 cm long, pinnae to 20 pairs, lowest with stalks 5 mm, apex of frond pinna-like. Largest pinnae 15—18 × 1.0—1.5 cm, basal 5—6 pairs of lobes gradually reduced (on all pinnae), acuminate, lobed to 1—1.5 mm from costa; lobes very oblique, similar on both sides of costa, narrowed to their tips; costules 4—6.5 mm apart; veins 8—10 pairs, acroscopic basal vein to side of sinus-membrane; short stiff hairs on lower surface of rachis, costae, costules, and sinus-membrane. Sori near costules; indusia firm, glabrous or with some short hairs; acicular hairs present on receptacle; small yellow glands on sporangia near annulus.

D i s t r i b u t i o n: Fiji, 250—1000 m, stream-banks; Solomon Is (New Georgia, one specimen).

26. Plesioneuron falcatipinnulum (Copel.) Holttum, *comb. nov.*

Dryopteris falcatipinnula Copel., Philip. J. Sc. 6C (1911) 74. — *Thelypteris falcatipinnula* Reed, Phytologia 17 (1968) 276. — T y p e: *C. King 114*, Papua (MICH; BO).

Stipe 30 cm, basal scales 4 mm long, narrow, rather thin. Lamina 30 cm long; pinnae 8 pairs, opposite, several pairs lower pinnae with 1—2 pairs basal lobes reduced, lowest 4—5 mm long. Largest pinnae 12 × 1.5 cm, acuminate, lobed to less than 0.5 mm from costa, lobes equally falcate both sides; costules 3.5 mm apart; veins 12 pairs; copious stiff short hairs on lower surface of costae and rachis, sparse on costules. Sori inframedial; indusia firm, short-hairy; sporangia with orange glands near annulus.

Only known from type collection.

27. Plesioneuron myriosorum (Copel.) Holttum, *comb. nov.*

Dryopteris myriosora Copel., Philip. J. Sc. 60 (1936) 108, pl. 14. — *Thelypteris myriosora* Reed, Phytologia 17 (1968) 295. — T y p e: *Kajewski 1769*, Bougainville, 1000 m (A; BRI).

Differs from *P. attenuatum* (no. 30) as follows: basal pinnae with stalks 3—4 mm long; largest pinnae 30 × 3.5 cm, apex gradually attenuate, not caudate; veins to 30 pairs; sparse and longer hairs on lower surface of costae; basal sori diverging from costules.

D i s t r i b u t i o n: Bougainville, Treasury I. (*Guppy s.n.*, BM).

28. Plesioneuron hopeanum (Baker) Holttum, *comb. nov.*

Nephrodium hopeanum Baker, Syn. Fil. Ed. 2 (1874) 494. — T y p e: *Hope s.n.*, 1866, Fiji, Ovalau (K).

Caudex short, suberect; stipe of type 37 cm long, of large plants 50 cm, basal scales 2 mm long, thin. Lamina of type 32 cm long with 9 pairs pinnae, of others 65 cm with 22 pairs pinnae, all pinnae with basal 2—3 pairs of lobes gradually reduced, lowest lobes 2—4 mm long, basal lobe on basal pinnae quite free. Largest pinnae of type 10 × 1.8 cm, of others to 20 × 2.5 cm, caudate-acuminate, lobed to 1.5 mm from costa, lobes on basis-

copic side usually a little shorter and more falcate than on acroscopic; costules of type 4 mm apart, of largest 5—6 mm; veins 12 pairs on type, to 20 pairs on others; stiff short hairs on lower surface of rachis and costae, sparse appressed hairs on veins and between veins. Sori near costules; indusia firm with few short hairs; red glands on sporangia; no acicular hairs on receptacle.

Distribution: Fiji, 100—600 m, in forest; plants in open smaller than those in shade (G. Brownlie, in lit.). The appressed hairs on lower surface appear to be distinctive but may be sparse on old specimens.

var. acutilobum *var. nov.*

Nephrodium inaequilaterale Bak., Syn. Fil. (1868) 454, *p.p.*, excl. type.

A varietate typica differt: lobis pinnarum omnibus anguste acutis; pinnis usque 4 cm latis.

Type: *Milne 190*, Fiji, Sept. 1854 "woods, high ground, abundant" (K).

Baker cited two specimens under *N. inaequilaterale*; I select as type the specimen from Samoa (on which alone Baker wrote a name) and place it in *Plesioneuron attenuatum* (no. 30).

29. Plesioneuron wantotense (Copel.) Holttum, *comb. nov.*

Dryopteris wantotensis Copel., Univ. Cal. Publ. Bot. 18 (1942) 220. — *Lastrea wantotensis* Copel., Gen. Fil. (1947) 140; Philip. J. Sc. 78 (1951) 436, pl. 24. — *Thelypteris wantotensis* Reed, Phytologia 17 (1968) 324 (not *Mesoneuron wantotense sensu* Holttum, Blumea 13 (1965) 134). — Type: *Clemens 11013 bis*, NE. New Guinea, Morobe Dist. (MICH).

Caudex short, erect; stipe to 28 cm long, basal scales narrow, thick, setiferous. Lamina to at least 20 cm long; pinnae 10 pairs, apex pinna-like but broad; basal pinnae with 2 pairs basal lobes reduced, lowest very small. Largest pinnae 7—8 cm long (broken), 1.7 cm wide, short-acuminate, lobed to 1.5 mm from costa, lobes falcate on basiscopic side, not on acroscopic; costules to 4 mm apart; veins 10—12 pairs, basiscopic vein passing to edge above base of sinus; lower surface of rachis, costae, sinus-membranes, and edges bearing short stiff hairs. Sori near costules; indusia dark, thick, glabrous; sporangia bearing red glands; spores not seen.

Only known with certainty from type collection. It seems possible that this specimen represents a small plant of *P. attenuatum*.

30. Plesioneuron attenuatum (Brack.) Holttum, *comb. nov.*

Lastrea attenuata Brack. in Wilkes, U.S. Expl. Exp. 16 (1854) 193, t. 26, fig. 2. — *Aspidium brackenridgei* Mett., Ann. Sci. Nat. IV, 15 (1861) 75, *nom. nov.*, not *A. attenuatum* Sw. 1801. — *Thelypteris brackenridgei* Reed, Phytologia 17 (1968) 265. — Type: *Brackenridge s.n.*, Tahiti (US).

Nephrodium inaequilaterale Baker, Syn. Fil. (1868) 454. — Lectotype: *Powell 114*, Samoa (K).

Mesoneuron brackenridgei Holttum, Dansk Bot. Ark. 25, 2 (1967) 44, *nomen tantum.*

Caudex short, erect or suberect; stipe to 70 cm long; basal scales thin, to 15 × 1.5 mm. Lamina to 100 cm long; pinnae 25—30 pairs; basal pinnae stalked 1—2 mm, several pairs basal basiscopic lobes gradually much reduced, basal acroscopic lobe free and less reduced; aerophores to about 1 mm long. Largest pinnae 20 × 2.5 cm; basal basiscopic lobe 2—3 mm long, successive ones larger; basal acroscopic lobes less reduced; apex caudate-acuminate (cauda 2—2.5 cm); edges lobed to 1 mm from costa; lobes on acroscopic side straight, to 2 cm long, on basiscopic side much shorter and strongly falcate; costules 4—4.5 mm apart; veins to 20 pairs on acroscopic lobes, 12—15 pairs on basiscopic; lower surface of costae and costules bearing short stiff hairs, small scales also on costa. Sori near costules, lower ones not divergent; indusia dark, firm, with short hairs; acicular hairs on receptacle and stalks of sporangia; glands on sporangia near annulus; spores very dark.

Distribution: Bismarck Archipelago to Tahiti.

31. Plesioneuron doctersii Holttum, *sp. nov.*

Rhizoma breve, repens; stipes 25—40 cm longus, basi paleis 3 × 1 mm vestitus. Lamina 40—50 cm longa, in sicco crassa; pinnae 18-jugatae, confertae; pinnae infimae stipitulis 2—3 mm suffultis, lobis infimis solum abbreviatis. Pinnae maximae 9—11 × 2.2 cm, brevi-acuminatae; sinus inter lobos angusti, bases sinuum a costa 2 mm distantes; costulae usque 5 mm inter se distantes; venae usque 15-jugatae, parum prominentes, basales ambae membranam sinus tegentes; rachis subtus dense brevissime pilosa, costae costulaeque sparsim pilosae. Sori mediales; indusia crassa, pilis brevibus paucis praedita; receptaculum setas unicellulares gerens; sporangia interdum glandulis vel setis paucis ornata; sporae non visae.

T y p e: *Docters van Leeuwen 10357*, W. New Guinea, Rouffaer River, 300 m (BO, holo; L). Also no. *10359*, same locality and *L. E. Cheesman 1430*, Japan I., 1070 m (BM).

32. Plesioneuron tuberculatum (Cesati) Holttum, *comb. nov.*

Nephrodium tuberculatum Cesati, Atti Acad. Napoli 7 (1877) 29. — *Dryopteris tuberculata* C. Chr., Ind. Fil. Suppl. III (1934) 100; Dansk Bot. Ark. 9, 3 (1937) 48, pl. V fig. 6. — *Thelypteris tuberculata* Ching, Bull. Fan Mem. Inst. Biol. Bot. 10 (1941) 255. — T y p e: *Beccari*, Monte Arfak a Putat, W. New Guinea (FI, Herb. Becc. *12539*).

Dryopteris schlechteri Brause, Bot. Jahrb. 49 (1912) 16, fig. 1E, incl. var. *djamuensis*. — T y p e: *Schlechter 16188*, NE. New Guinea, near Ketel, 200 m (B; K, L, NSW).

Dryopteris schizophylla v.A.v.R., Nova Guinea 14 (1924) 19. — T y p e: *Lam 772*, W. New Guinea (BO; L).

Caudex massive, erect, short; stipe 75 cm long, basal scales 7 mm or more long, narrow, thick. Lamina 100 cm long; pinnae *c.* 20 pairs with aerophores to 1 mm long; basal pinnae with stalks 3—5 mm long, basal acroscopic lobe not reduced, sometimes free, basal basiscopic lobe missing or very small. Largest pinnae 25 × 5 cm, caudate-acuminate (cauda 2.5—5 cm), lobed to 1—1.5 mm from costa; lobes on both sides slightly falcate (sometimes more so on basiscopic side), basal lobe on each side slightly reduced; costules 6—7 mm apart; veins to 23 pairs; rachis glabrous beneath, sparse reddish stiff hairs on costae and costules, those on costules appressed. Sori near costules; indusia small, glabrous, soon caducous; sporangia bearing small red glands; acicular hairs on stalks of sporangia; spores minutely spinulose.

D i s t r i b u t i o n: New Guinea, in forest, to 1200 m; specimens from 2000—2500 m in New Guinea, and Batjan (*Alston 16997*) are smaller but otherwise little different. The Batjan specimen has sori further from costules and no glands on sporangia.

33. Plesioneuron costulisorum (Copel.) Holttum, *comb. nov.*

Dryopteris basisora Copel., Philip. J. Sc. 6C (1911) 73, *non* Christ 1909. — *Lastrea costulisora* Copel., Gen. Fil. (1947) 138. — *Thelypteris costulisora* Reed, Phytologia 17 (1968) 269. — T y p e: *C. King 304*, Papua (MICH; BO, BRI).

Differs from *P. tuberculatum*: smaller; basal pinnae with stalks 2 mm; aerophores short; largest pinnae 22 × 3 cm; costules 4—5 mm apart; lobes on basiscopic side of pinnae more falcate than on acroscopic side; veins 18—20 pairs; lower surface of rachis, costae and costules bearing copious stiff hairs, hairs also on and between veins; sori with larger persistent indusia.

D i s t r i b u t i o n: New Guinea, altitudes to 2000 m.

34. Plesioneuron platylobum Holttum, *sp. nov.*

Rhizoma repens, diametro 1 cm, frondes usque 2 cm inter se distantes gerens; stipes 40—50 cm longus, basi paleis crassis, usque 6 × 1.5 mm vestitus. Lamina 60 cm longa;

pinnae 20-jugatae; pinnae infimae subsessiles, lobo infimo acroscopico libero, quam ceteris latiore, crenulato, venis plurimis eius semel vel bis furcatis. Pinnae maximae 18 × 3.5 cm, acuminatae; lobi basiscopici omnes falcati, quam acroscopici leviter breviores; bases sinuum inter lobos a costa 2 mm distantes; costulae 5—6 mm inter se distantes; venae 16—18-jugatae, vena infima acroscopica membranam sinus contingens; rachis costaeque subtus pilis sparsis 0.2 mm longis praeditae, pilis costularum brevioribus. Sori mediales; indusia magna, firma, pilis brevibus paucis praedita; sporangia glandulis vel interdum setis brevibus ornata; sporae nigrae, spinulosae.

T y p e: *Jermy 3610*, NE. New Guinea, Morobe Dist., 1050 m, in *Castanopsis-Lithocarpus*-forest (BM).

35. **Plesioneuron ctenolobum** Holttum, *sp. nov.*

Rhizoma ignotum, etiam basis stipitis. Lamina 85 cm longa, in sicco rigida; pinnae 30-jugatae; pinnae inferiores stipitulis 1—1.5 mm suffultae; lobus infimus acroscopicus pinnarum plurimum inferiorum liber, elongatus, usque 3.5 cm longus, 0.7—1.5 cm latus, irregulariter (interdum profunde) pinnatifidus; lobus infimus basiscopicus 1.5 cm longus, non dilatatus; lobi infimi pinnarum mediarum nec reducti nec elongati. Pinnae maximae 21 × 4 cm; lobi acroscopici fere recti, basiscopici falcati sed quam acroscopici non breviores; bases sinuum inter lobos a costa 0.5—1 mm distantes; costulae 5 mm inter se distantes; venae usque 22-jugatae, infimae ad marginem desinentes; rachis costae costulaeque subtus dense breviter pilosae; pagina superior ad venas et inter venas pilis conspersis praedita. Sori mediales; indusia magna, firma, pilis brevibus multis vestita; sporangia glandulis paucis interdum praedita; sporae nigrae, minute spinulosae.

T y p e: *Jermy 3604*, locality as species no. 34 (BM).

36. **Plesioneuron kundipense** Holttum, *sp. nov.*

Rhizoma breve, repens; stipes 26 cm longus, basi paleis 5 × 1.5 mm non incrassatis vestitus. Lamina 30 cm longa; pinnae 14-jugatae, confertae; pinnae infimae breviter stipitatae, lobo infimo acroscopico nec reducto nec libero, lobo infimo basiscopico multo reducto. Pinnae maximae 8.5 × 2.0 cm, breviter caudato-acuminatae; lobi leviter falcati; bases sinuum inter lobos a costa 1 mm distantes; costulae 3.5—4 mm inter se distantes; venae 12-jugatae; rachis, costae costulaeque subtus pilis brevibus rigidis copiose vestitae; pagina superior inter venas pilis rigidis brevibus praeditae. Sori mediales; indusia magna, firma, pilis paucis brevibus instructa; sporangia interdum setis 1 vel 2 prope annulum ornata; sporae non visae.

T y p e: *Millar & Holttum NGF 18593*, NE. New Guinea, Western Highlands, Kundip, 2150 m (LAE, holo; K, BRI).

37. **Plesioneuron dryas** Holttum, *sp. nov.*

Caudex breve, repens (teste Brass); stipes usque 60 cm longus, basi paleis crassis 10 × 1 mm vestitus. Lamina 50 cm longa; pinnae usque 18-jugatae; pinnae infimae sessiles, basi acroscopice leviter angustatae lobo infimo 8—10 mm longo libero, basi basiscopice lobis inferioribus 5 vel 6 gradatim reductis, infimo 2—6 mm longo; pinnae mediales basi non angustatae. Pinnae maximae 12 × 2 cm, sessiles, breviter caudato-acuminatae; lobi utrinque leviter falcati; bases sinuum inter lobos a costa 1 mm distantes; costulae 3.5—4 mm inter se distantes; venae 10—11-jugatae, infimae ambae ad marginem desinentes; rachis costaeque subtus pilis brevissimis rigidis multis vestitae, pilis costularum sparsis. Sori leviter

inframediales; indusia firma fusca pilis paucis brevibus praedita; sporangia glandulis multis ornata.

T y p e: *Brass 23447*, Papua, Mt Dayman 800 m, in oak forest (BM, holo; L, LAE). Also *Brass 28451*, Rossel I., 700 m (K).

38. Plesioneuron rigidilobum Holttum, *sp. nov.*

Caudex brevis, suberectus; stipes usque 75 cm longus, basi paleis crassis angustis 5—6 mm longis vestitus. Lamina 60 cm longa; pinnae 18-jugatae, omnes stipitulatae, in sicco rigides marginibus decurvatis; pinnae infimae stipitulis 2 mm longis suffultae, lobo infimo acroscopico 8 mm longo, libero, lobo infimo basiscopico minore; lobi infimi pinnarum mediarum non reducti. Pinnae maximae 14×2.5 cm, acuminatae; lobi basiscopici omnes leviter falcati, quam acroscopici leviter breviores; bases sinuum inter lobos a costa 0.5 mm distantes; costulae 4.5—5 mm inter se distantes; venae usque 15-jugatae; rachis costaeque subtus pilis pallidis vel brunneis vix 0.5 mm longis vestitae, pilis costularum venarumque brevioribus. Sori leviter inframediales; indusia magna, firma, breviter pilosa; sporangia glandulis vel setis brevibus interdum praedita; sporae nigrae, minute spinulosae.

T y p e: *T. G. Walker 7741*, NE. New Guinea, Morobe Dist., Edie Creek, Wau, on gold-mining rubble in undergrowth (BM).

Other specimens: *Womersley & van Royen NGF 5904*, Edie Creek Road, 2000 m (LAE); *Womersley & Millar NGF 8301*, Wau-Salamaua Road, 1800 m (LAE); *Flenley ANU 2458*, Western Highlands, 2000 m; *Pullen 498*, Eastern Highlands, Goroka subdist., 2500 m (LAE, BM).

39. Plesioneuron ophiura (Copel.) Holttum, *comb. nov.*

Dryopteris ophiura Copel., Univ. Cal. Publ. Bot. 18 (1942) 220. — *Lastrea ophiura* Copel., Gen. Fil. (1947) 139; Philip. J. Sc. 78 (1951) 434, pl. 22. — *Thelypteris ophiura* Reed, Phytologia 17 (1968) 298. — T y p e: *Brass 12471*, W. New Guinea, Idenburg River, 2150 m, on open rock-slide (MICH; L, BO).

Caudex erect; stipe 16 cm, basal scales 5×1.5 mm, thick, setiferous. Lamina 20 cm long; pinnae 7—9 pairs; basal pinnae with stalks 2 mm long; basal lobes of all pinnae reduced, basiscopic one 1—3 mm long, acroscopic longer. Largest pinnae 8×1.4 cm, caudate-acuminate, lobed to less than 1 mm from costa, basiscopic lobes somewhat more falcate than acroscopic; costules 3.5—4 mm apart; veins 10 pairs; short stiff hairs on lower surface of rachis and costae, very narrow scales also on costae. Sori inframedial; indusia dark, thick, glabrous; no glands nor hairs on body of sporangia.

Two specimens from NE. New Guinea, Western Highlands, at 2300 m (*B. S. Croxall 4336, 4338*) differ in larger fronds, indusia with a few hairs, sporangia bearing glands; pinnae to 12×2.5 cm, with caudate apex 3 cm long; costules 4—5 mm apart.

INDEX

New names are in **bold** type. Numbers refer to the species under which the names are mentioned.
M = *Mesophlebion*; P = *Plesioneuron*.