Taxonomic Studies of Pteridophytes of Ambon and Seram (Moluccas) Collected by Indonesian-Japanese Botanical Expeditions V*. Dipteridaceae and Polypodiaceae

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加藤雅啓**・M. G. プライス***：アンボン島・セラム島（モルッカ諸島）のシダ植物の分類学的研究 V*. ヤブレガサウラボシ科とウラボシ科

Abstract Based on recent collections, *Dipteris conjugata* (Dipteridaceae) and the following 13 genera and 41 species of Polypodiaceae are recorded, mostly from Seram Island, with several from Ambon Island, the Moluccas (E Indonesia): *Drynaria* (3 spp.), *Aglaomorpha* (3 spp.; Drynarioideae), *Pyrosoa* (4 spp.; Platycerioideae), *Microsorum* (7 spp.), *Lecanopteris* (2 spp.), *Colysis* (2 spp.), *Cryptsima* (4 spp.), *Seligusea* (3 spp.; Microsorioidae), *Belosis* (2 spp.), *Lemmaphyllum* (1 sp.; Pleopeltioidae), *Gonioplectis* (4 spp.), *Thylaopteris* (1 sp.; Polypodioidae), and *Loxogramme* (5 spp.; Loxogrammoideae). Several published fern names from Central and East Malesia are here first reduced to synonymy and one new combination, *Seliguea albicaula*, is made.

Key words: Ambon, *Dipteris*, fern, flora, Polypodiaceae, Seram, taxonomy.

During 1983, 1984–1985 and 1986, Indonesian-Japanese botanical expeditions to Ambon (Amboina) Island and Seram (Ceram) Island, the Moluccas, east Indonesia, collected about 700 species of pteridophytes, mostly from Seram Island. This paper reports on Dipteridaceae (1 genus, 1 species) and Polypodiaceae (13 genera, 41 species). Seram Polypodiaceae show three main distribution patterns: six species are East Malesian, of which two extend east to the Pacific islands and/or Australia; 12 species are East and West Malesian, of which three range west to continental Asia; and 23 species occur throughout Malesia, mostly also beyond Malesia. The polypodioid species are relatively widely distributed, as might be expected of plants with specialization for xerophytism, compared to other families (93 species in East Malesia, 66 species in East and West Malesia, 8 species in East and South Malesia, and 89 species throughout Malesia; Kato (in press, Fern Flora of Seram, in P. Baas et al. (eds.) Diversity of Malesian Plants. Proceedings of Flora Malesiana Symposium). All species we collected...
that are distributed in both East and South Malesia are also present in West Malesia, and so the overall distribution pattern of the Polypodiaceae is similar to that of other families.

**Dipteridaceae**

**Dipteris** REINWARDT


   W Seram: Honitetu, 280–460 m, C-13938; Kamarian—G. Totaniwel, 0–870 m, C-13695; Tihulale—T. Totaniwel, 20–980 m, C-12890F, 980–1190 m, C-13616. Central Seram: G. Eseli—Wae Mamahala, 1000–1360 m, C-1717; Hatumete—G. Hoale Besar, 1300–1820 m, C-13565, C-13809; Hatumete—Maraina, 810–1770 m, C-1323.

   Habitat. Hill and mountain ridges in light shade in lowland and montane forests.


   **Note.** Dipteris lobbiana (HOOK.) MOORE was reported from Ambon by ALDERWERELT (Philip. J. Sci. 11C: 107, 1916), and Price (Brit. Fern Gaz. 10: 253, 1973).

**Polypodiaceae**

**Drynarioidae**

**Drynaria** (BORY) J. SMITH

**Key to the species**

1. Foliage leaves pinnate, pinnae sessile or short-stalked, articulate, more than 20 pairs ......1. **D. rigidula**

1. Foliage leaves pinnatifid, lobes adnate, up to 20 pairs.

2. Scales orbicular at base, abruptly contracted into a deciduous bristle-like apex, up to 8 mm long, dark brown with pale margin; lobes up to 8 pairs; sori in more than two irregular rows between main lateral veins...........................................2. **D. sparsiflora**

2. Scales lanceolate at base, gradually tapering to a persistent bristle-like apex, up to 20 mm long, concolorous, orange-brown; lobes up to 20 pairs; sori in two rows between veins ......3. **D. quaeritfolia**


   W Seram: Uweth—G. Nakaela, 700 m, C-6263; Batu Sori—Buria, 280–500 m, C-5984. Central Seram: G. Musisi—Goa Pohon Damar, 1020–1340 m, C-5617; Wae Niniyoa—Wae Puo, 210–1120 m, C-5098, C-5302; Batudinding near Sawai; 10–320 m, C-4783; Kanikeh—Wae Ansela, 600–1290 m, C-3241; Wae Eseli, 780–1000 m, C-1640; Hatumete—Hoale Pass, 810–1770 m, C-1329; Maraina—Hoale Pass, 810–1350 m, C-1985.

   Habitat. Epiphytic in lowland or lower montane forest.

   Distribution. Burma, throughout Malesia, to Australia and Samoa.

   **Note.** Drynaria pleuridioides var. amboinensis ALDERW. (Mal. Ferns Handb. 697, 1908) was based on a collection of BOERLAGE said to have originated in Ambon, and was
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reduced to the straight species, *D. pleuridioides* (METT.) DIELS by ROOS. Except for that single collection the species has not been reported from the Moluccas.


W Seram: Wae Ani near Tanahgoyang, 0–80 m, C-13280; Honitetu, 280–460 m, C-13999; Kamarian—G. Totaniwel, 0–870 m, C-13682; Titulale—G. Totaniwel, 0–120 m, C-13134. Central Seram: Sawai—Wae Niniyoa, 0–210 m, C-5029; Wae—Roho, 60 m, C-2665; Selumena—Maraina, 750–880 m, C-1626; Hatumete—Hoale Pass, 200–650 m, C-1233; G. Kakhari, 100–300 m, C-4471, C-4480. E Seram: Sungai Bula Air—G. Sentoten, 20–100 m, C-8013; Luman—G. Iilitubi, 20–100 m, C-7779.

Habitat. Epiphytic or rarely terrestrial in lowland or sometimes lower montane forests.

Distribution. Bangladesh to China, Malesia, Polynesia, and Australia.


W Seram: Taniwel, sea level, C-6251; Taniwel—Buria, 0–500 m, C-5951; Uweth—G. Nakaela, 20–580 m, C-6270.

Habitat. Epiphytic in secondary lowland forests.

Distribution. Sri Lanka to S China, throughout Malesia, to tropical Australia.

**Aglaoomorpha Schott**

Key to the species

1. Leaves huge, base scariosus and humus-collecting; fertile lobes 4–7 cm broad, monomorphic; sori numerous in irregular rows between main lateral veins ........................................ 1. **A. heraclea**

1. Leaves medium-sized, base stipitate; fertile lobes up to 2 cm broad, subdimorphic.

2. Lamina lobes subdimorphic, upper fertile lobes narrower, leaves densely hairy throughout, sori elliptic, 5 mm long, in one row along either side of costa ........................................ 2. **A. pilosa**

2. Leaves dimorphic, fertile leaves longer with narrower lobes, veins minutely hairy, sori oblong, 3 mm long, 3–4 rows on each side of costa ........................................ 3. **A. parkinsonii**


Central Seram: Wae Niniyoa—Wae Puo, 210–1020 m, C-5095; Wae Ansla—Kanikeh, 620–1290 m, C-3891; Wae Nua—G. Mapahuwe, 880–1010 m, C-11703; Wae Makariki Kecil, 500–750 m, C-719, C-820; Piliana—G. Ohae, 400–990 m, C-12031; Piliana—G. Sinaunia, 350–1000 m, C-12874; Hatumete—Hoale Pass, 550–1200 m, C-7430; Hunisi—Musellein Pass, 550–1280 m, C-14084.

Habitat. Epiphytic in lowland and montane forests.

Distribution. Throughout Malesia, Solomons.


Central Seram: Kanikeh—Selumena, 620–820 m, C-4107; Kali Ili—Goa Pohon Damar, 830–1090 m,
C-5397.

Habitat. Epiphytic in lower montane forests.
Distribution. Philippines, Seram.

Note. These are the first collections from outside the Philippines.


W Seram: Uweth—G. Nakaela, 700 m, C-6266.

Habitat. Lithophytic on mossy limestone on mountain ridge in lower montane forest.

**Platycerioideae**

**Pyrrosia** **MIRBEL**

Key to the species

1. Sterile leaves round-elliptic, coenosori linear along margin and apex of leaf .......... 1. *P. piloselloides*
2. Rhizome scales linear, concolorous, brown; stellate hairs persistent as a mat; leaves oblancolate, up to 9 cm broad ......................................................... 2. *P. princeps*
3. Scales lanceolate to ovate-lanceolate, ciliate at edge; leaves (including stipes) up to 20(-23) × 1.5 cm, thick ........................................ 3. *P. lanceolata*
4. Scales round or ovate, entire; leaves up to 60 × 2.5 cm, very thick .................... 4. *P. longifolia*


E Seram: Bula—Sungai Lora Besar, 20–150 m, C-8054.

Habitat. Epiphytic in light shade in disturbed lowland forest.
Distribution. NE India east to Hainan, throughout Malesia.

Note. The similar *P. fallax* (**ALDERW.**) **PRICE** was described from Ambon as *Drynoglossum fallax* ALDERW. (Philip. J. Sci. 11C: 111, pl. 6, 1916; see **RAVENSBERG & HENNIPMAN**, Leiden Bot. Series 9: 298, 1986). That species is also responsible for the report of *Drynoglossum carnosum* from Ambon by **HARR.** (J. Linn. Soc. Bot. 16: 33, 1877) based on *J. B. Steere s.n.*, June 1875 (**MIC**).


W Seram: Tihulale—G. Totaniwel, 0–120 m, C-13301; Uweth—G. Nakaela, 20–580 m, C-6275; Buria—Wae Mala, 140–500 m, C-5972. Central Seram: Trans-Seram Road 37 km NE of Masohi, 100–150 m, C-311; G. Batudinding, 10–320 m, C-4792; Kali Ilis—Goa Pohon Damar, 830–1090 m, C-5602; Batu Kapal near Saunulu, 0–80 m, C-12892; Roho, 60 m, C-2698; Selumena—Maraina, 750–880 m, C-1627; Maraina—Hatulolo, 620–700 m, C-4148; Hunisi—Muselleinan Pass, 360–550 m, C-14016.
Ambon: Batugong, 0–180 m, A-11244; Wae Palai, 10–70 m, A-420.

Habitat. Epiphytic or lithophytic in lowland or lower montane forests.


Note. This is the species reported from Ambon as Cyclophorus beddomeanus by Alderwerelt (Philip. J. Sci. 11: 114, 1916).


W Seram: Taniwel—Buria, 0–500 m, C-5962; Tihulale—G. Totaniwel, 0–980 m, C-13389, C-13644; Taniwel, sea level, C-6252. Central Seram: Makariki N of Masohi, sea level, C-50; Sawai—Wae Niniyoa, 0–210 m, C-5021; Wae Niniyoa—Wae Puo, 210–1020 m, C-5303; Goa Pohon Damar—Sawai, 0–1230 m, C-5911; Manerotu—G. Nusamutuwa, 0–970 m, C-14440; Hunisi—G. Salela, 180–740 m, C-14438. Ambon: Batugong, 0–180 m, A-11250.

Habitat. Epiphytic in secondary lowland forest.

Distribution. Paleotropics from Africa to the Pacific.

Note. The nearby Kai Is. was the source of the synonym Polypodium pachydermum Bak.


W Seram: Wae Ani near Tanahtqoyang, 0–80 m, C-13249; Kairatu, sea level, C-2126; Hunitetu, 350–400 m, C-2133, 400–580 m, C-2188; Tihulale—G. Totaniwel, 0–120 m, C-13318. Central Seram: Makariki N of Masohi, sea level, C-202; Wae Salunc—Wae Nua, 140–550 m, C-11356; Saunulu, sea level, C-611; Hatunete—G. Hoale Besar, 0–480 m, C-14247. E Seram: Liang Air Panas—Sungai Nief, 20–70 m, C-8035, C-8040. Ambon: Batugong, 0–180 m, A-11246; Liang, 0–400 m, A-11238.

Habitat. Epiphytic in seconday lowland forests or on village trees.

Distribution. China and Burma, throughout Malesia, to Micronesia, Melanesia and Australia.

Note. The synonym Polypodium macropodum Bak. was described from the Aru Is.

Microsorioideae

Microsorium Link

Key to the species

1. Sori numerous, irregularly scattered; leaves simple, entire.
2. Scales dark brown, veins indistinct, main lateral veins not much thicker than veinlets, sori numerous, small, often covering lamina .................................................. 1. M. punctatum
3. Scales thin brown or light brown, veins visible, main lateral veins thicker than veinlets, sori at maturity up to 2 mm or more in diameter, scattered.
4. Leaves (particularly sterile leaves) cordate or gradually narrowed at the scarious base, abruptly narrowed to an acuminate apex, scales thin, brown, main lateral veins straight 1/2–2/3 from midrib; epiphyte ................................................................. 2. M. linguiforme
5. Leaves always gradually narrowed to both ends, main lateral veins straight to near lamina edge; terrestrial ................................................................. 3. M. heterocarpum

1. Sori in one or two rows or rarely in three irregular rows along each side of midrib; leaves usually lobed.
2. Leaves simple or with up to 5 pairs of lobes ........................................4. M. scolopendria
2. Leaves lobed with many more pairs.
3. Sori in one row along each side of midrib.
4. Leaves lobed almost to narrowly winged rachis, lobes clearly narrowed to base, up to 2 cm broad, main lateral veins not distinct, sori not sunken ................................................5. M. rubidum
4. Leaves lobed to conspicuous rachis wing, lobes not or only slightly narrowed to base, in larger leaves up to 2.4-5 cm broad, main lateral veins distinct, straight 2/3 from midrib, sori sunken in deep cavities .................................................6. M. nigrescens
3. Sori in two or three irregular rows along each side of midrib, not sunken, leaves deeply lobed, lobes up to 15 pairs, not or slightly narrowed to base, veins visible, forming three or four large areoles between costa and margin ............................7. M. commutatum


W Seram: Tihulale—G. Totaniwelo, 0–120 m, C-13312; Uweth—G. Nakaela, 20–580 m, C-6277. Central Seram: Makariki N of Masohi, sea level, C-201; Trans-Seram Road 37 km NE of Masohi, 100–150 m, C-317; Wae Ninjioa—Wae Puo, 210–1020 m, C-5090; G. Batudining, 10–320 m, C-5009; Wae Nua, 0–20 m, C-11270; Saunulu, sea level, C-527, C-624; Piliana—G. Ohae, 400–990 m, m, C-11789; G. Ese—Wae Mamahala, 1000–1360 m, C-1725; Wahai—Wasa, 0–160 m, C-2642; Elema-Makualaina, 100 m, C-4458; G. Kakihari, 100–300 m, C-4475; Hatumete—G. Hoale Besar, 480–1300 m, C-14304; Hatumete—Hoale Pass, 550–1200 m, C-7450; Wolu—Batu Kokan, 380–1030 m, C-6832; Maneoratu—G. Nusamutuwa, 0–970 m, C-14486. E Seram: Luana—G. Illitubi, 20–100 m, C-7782. Ambon: Air Besar, 10–30 m, A-348, A-605; Wae Palai, 10–70 m, A-428.

Habitat. Epiphytic in lowland and lower montane forests.
Distribution. W tropical Africa to Tahiti, north to S China.

Note. Referrable to this species is Polypodium millisorum Bak. (J. Linn. Soc. Bot. 15: 109, 1876), syn. nov., described from the Kai Is.


Central Seram: Wae Nua, 150–260 m, C-11507; Air Makariki near Piliana, 350–400 m, C-526, C-627; Piliana—G. Ohae, 400–990 m, C-12032, 500–750 m, C-803; G. Hausane, 100–650 m, C-4743; Hatumete—G. Hoale Besar, 0–480 m, C-14257; Hatumete—Hoale Pass, 0–610 m, C-7169; Wolu—Batu Kokan, 0–450 m, C-6594, 380–1030 m, C-6854; Hunisi—Muselleinan Pass, 0–490 m, C-13746.

Habitat. Epiphytic or rarely lithophytic in lowland or lower montane forests.
Distribution. Sumatra, Moluccas, New Guinea, to Fiji.


Central Seram: Kanikelo—Wae Anela, 620–1350 m, C-1413, C-3261; Maraina—Wae Ese, 780–1000 m, C-1673; Hatumete—G. Hoale Besar, 480–1300 m, C-13600, C-14313; Hatumete—Maraina, 810–
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1770 m, C-1255, C-1324; Hatumete—Hoale Pass, 500–1200 m, C-1122, C-7428; Wolu—Batu Kokan, 980–1300 m, C-6841, 1030–1200 m, C-7102; Muselleinan Pass, 700 m, C-14167.

Habitat. Terrestrial or rarely epipetric in deep shade in montane forests.

Distribution. Malesia.

Note. The Seram plants have a relatively slender long-creeping rhizome, and costae abaxially very sharply carinate. ALDERWERELT (Mal. Ferns Handb. 641, 1908) reported Polypodium myriocarpum Mett. from Ambon; that name is a synonym of Microsorium longissimum Fée, a species with a superficial resemblance to M. heterocarpum.


W Seram: Wae Ani near Tanahgoyang, 0–80 m, C-13279; Taniwel—Buria, 0–500 m, C-5963; Sawai—Wae Nininya, 0–210 m, C-5017; Hatumete—Piliana, 0–400 m, C-6520. Ambon: Batugong—G. Hutumuri, 10–155 m, A-26.

“Polypodium papuanum” form. Central Seram: Goa Pohon Damar—Sawai, 0–1230 m, C-5917; Wae Nininya—Wae Puo, 210–1020 m, C-5057, C-5072; Kanikeh—Wae Ansla, 600–1290 m, C-3280; G. Hausane, 100–650 m, C-4722; Wae Kawa—Wae Salune, 0–140 m, C-11312; Piliana—G. Ohae, 400–990 m, C-11589, 500–750 m, C-805; Air Makariki near Piliana, 350–400 m, C-632; Piliana—G. Sinaunia, 350–1000 m, C-12860; Hatumete—Hoale Pass, 550–1200 m, C-7451; Wolu—Batu Kokan, 380–1030 m, C-6860; Mancoratu—G. Nusamutuwa, 0–970 m, C-14462; Muselleinan Pass, 380–550 m, C-13787.

“Polypodium cromwellii” form. Central Seram: Wae Puo—Kalì Ilì, 830–1230 m, C-5352; Kanikeh—Wae Ansla, 620–1350 m, C-1376; Wae Ansla—Wae Hulhu, 1290–2000 m, C-3358; Piliana—G. Ohae, 900–1600 m, C-12058, 1000–2030 m, C-12836 bis, C-12837, 2030–2190 m, C-12546, C-12817; Hatumete—G. Hoale Besar, 480–1300 m, C-14278; Hatumete—Marina, 810–1770 m, C-1347; Hatumete—Hoale Pass, 1200–1770 m, C-7476; Wolu—Batu Kokan, 1030–1250 m, C-7106.

Habitat. Epiphytic in light shade in lowland forests, or in light or deep shade in montane, often mossy forests.

Distribution. Old World tropics.

Note. We are treating this species in a broad sense, as to give names to the variations is not practical on a local basis in the absence of a revision. One of our lowland forms with a very slender rhizome and mostly simple fronds seems to fit the description of Polypodium papuanum BAK. (Malesia 3: 48, 1886) from NW New Guinea. Similar plants from Sulawesi (Celebes), beautifully illustrated and elaborately described as Microsorium sulawesiense H. OHBA (J. Jap. Bot. 49: 173, f. 1–3, 1974; isotype TT), syn. nov., are exactly matched by the Seram collections C-3280, C-4722, and C-5917. Another name based on nearly identical plants is the New Guinean Microsorium subgeminatum (CHRIST) COPEL., basionym Polypodium subgeminatum CHRIST in SCHUMANN & LAUT. (Nachr. Fl. Deutsch. Südsee 47, 1905), syn. nov. The Seram high elevation form has very conspicuous lateral veins and apparently matches his description of Polypodium cromwellii ROSENST. (Fedde Repert. 10: 340, 1912). ROSENSTOCK’s name and three others, all from New Guinea, were reduced by PARRIS (Kew Bull. 41: 70, 1986) to Microsorium papuanum (BAK.) PARRIS. Pleopeltis markeleana ALDERW. (Bull. Jard. Bot. Buitenz. 3, 2: 166, 1920) from high elevation in Seram, is an additional synonym of M. papuanum, according to Dr. B. S. PARRIS (pers. comm.).


Central Seram: Kanikeh—Wae Ansela, 600–1290 m, C-3214; Piliana—G. Ohae, 650–1200 m, C-1040, 900–1600 m, C-12909; Hatumete—G. Hoale Besar, 480–1300 m, C-14298; Hatumete—Hoale Pass, 550–1200 m, C-7402; Hatumete—Maraina, 810–1770 m, C-1263; Hunisi—Musellein Pass, 550–1280 m, C-14044.

Habitat. Epiphytic in montane forests.


Note. Scales on rhizomes are persistent, brown, clathrate, lanceolate, up to 12 mm long; lateral pinnae up to 20 pairs or more, linear, up to $20 \times 2$ cm.


*Microsorium alternifolium* sensu COPEL., Fern Fl. Philip. 3: 478, 1961, non (WILLD.) COPEL.

W Seram: Wae Ani near Tanahgoyang, 0–80 m, C-12866F, C-13264; Honitetu, 350–400 m, C-2141bis; Uweth—G. Nakaela, 20–580 m, C-6288; G. Batudinding, 0–320 m, C-4791; Wasa—Roho, 60 m, C-2665, C-2694; Wae Ansela—Kanikeh, 620–1290 m, C-3889; Selumena—Maraina, 700–800 m, C-4122; G. Kakhiri, 100–300 m, C-4484; Elemenata—Malualaina, 100 m, C-4450; Wae Nua, 150–260 m, C-11399; Wolu—Batu Kokan, 0–450 m, C-6533; Maneoratu—G. Komwac, 0–590 m, C-14206. Ambon: Wae Palai, 10–70 m, A-412; Wae Schwe, 20–40 m, A-7; Air Besar, 10–40 m, A-606; Liang, 0–400 m, A-11233.

Habitat. Epiphytic, lithophytic or rarely terrestrial in lowland or lower montane forest.

Distribution. S India and Sri Lanka, through Malesia, to Tahiti.


W Seram: Tihulale—G. Totaniwel, 0–120 m, C-13310; Uweth—G. Nakaela, 20–580 m, C-6272. Central Seram: Rumah Sokat Batu, 0–250 m, C-5940; Roho—Kanikeh, 60–600 m, C-2943; Kanikeh—Wae Ansela, 620–1290 m, C-3275, C-3887; Selumena—Maraina, 750–880 m, C-1630; Wae Nua, 150–260 m, C-11373; Wae Nua—Saunulu, 0–150 m, C-11744; Saunulu, sea level, C-616; Wae Makariki Kecil, 500–750 m, C-810; Hatumete—Piliana, 0–409 m, C-5514; Hatumete—G. Hoale Besar, 0–480 m, C-14258; Hatumete—Hoale Pass, 550–1200 m, C-7411. Ambon: Batugong, 0–180 m, A-11248; Batugong—G. Hutumuri, 10–155 m, A-38; Air Besar, 10–40 m, A-2611; Wae Palai, 10–70 m, A-329.

Habitat. Epiphytic, terrestrial or rarely epipetric in lowland or lower montane forests.

Distribution. Sumatra to New Guinea.

**Lecanopteris** REINWARDT

Key to the species

1. Leaves pinnatifid, rhizome 4 cm thick .........................................................1. **L. mirabilis**
2. Leaves simple, rhizome 1 cm thick .................................................................2. **L. sinuosa**


Central Seram: Maneoratu—G. Nusamutuwa, 0–970 m, C-14469.
Habitat. Epiphytic in lower montane forest.

Distribution. Moluccas (Ambon, Seram).

Note. Our small sterile plant was kindly determined by B. VERDUYN of Utrecht. *Lecanopteris carnosa* (REINW.) BL. was also originally described from the Moluccas.


W Seram: Tanahgoyang—G. Tiang Bendera, 0–350 m, C-12911; Wae Ani near Tanahgoyang, 0–80 m, C-13284; Uweth—G. Nakaela, 700 m, G-6262; Mt. Batu Putih—Batu Sori, 280–400 m, G-6203. Central Seram: Rumah Sokat Batu, 0–250 m, C-5919; Sawai—Wae Niniyoa, 0–210 m, G-3013; Selumena—Kanikhe, 620–750 m, C-1367, C-1615. E Seram: Liang Air Panas—Sungai Nief, 20–70 m, C-8041; Sungai Bolifar—S. Sinfakan, 20–150 m, C-8044.

Habitat. Epiphytic in lowland or lower montane forests.

Distribution. From S Burma, through Malesia, to the Solomons.

Note. In Index Filicum Suppl. 5: 100, 1985, the citation for the combination *L. sinuosa* is incorrectly listed as Gen. Fil. 205, 1947.

**Colysis Presl**

Key to the species

1. Leaves oblanceolate, gradually narrowed to base, stipe very short or absent, veins hardly visible, sori continuous, scales ovate-lanceolate, pale brownish-grey .......................... 1. *C. loxogrammoides*

1. Leaves oblong, stalked, veins raised beneath, sori often interrupted, scales lanceolate, dark brown........

2. *C. macrophylla*


Central Seram: Wae Nua—G. Mapahuwe, 150–880 m, C-11641; Wae Makariki Kecil, 500–750 m, C-648; Piliana—G. Ohae, 400–990 m, G-11768, C-12027, 900–1600 m, C-12103; Piliana—G. Sinaunia, 400–1390 m, C-11983, C-12444, 1000–2030 m, C-12857; Kanikhe—Wae Ansel, 620–1350 m, C-1420, C-3892; Wae Ansel—Wae Huhu, 1290–2000 m, C-3511; Maraina—Wae Eseli, 780–1000 m, C-1667; Maraina—Hatuolo, 620–700 m, C-4168; Hatumete—G. Hoale Besar, 480–1300 m, C-14341; Hatumete—Hoale Pass, 200–650 m, C-941, 550–1200 m, C-7464; Wohu—Batu Kanok, 380–1250 m, C-6897; Hunisi—Muselleinan Pass, 550–1280 m, C-13167, C-14067.

Habitat. Epiphytic on slender, often mossy tree branches in deep shade in montane forests.


Note. The synonym *Pleopeltis pseudoxogramma* ALDERW. (Bull. Jard. Bot. Buitenz. III, 5: 218, f. b, c, 1922) was described from Seram.


W Seram: Wae Ani near Tanahgoyang, 0–80 m, C-13251; Batu Sori—Buria, 280–500 m, C-5989. Central Seram: Wae Salune—Wae Nua, 140–550 m, C-11237; G. Kakihari near Elemata-Makualaina, 100–300 m, C-4467; G. Hausane near Elemata-Mualalaina, 100–650 m, C-4746; Maneoratu—G. Nusamutuwa, 0–970 m, C-14202; Hunisi—Muselleinan Pass, 0–490 m, C-13729.
Habitat. Epiphytic on branches and trunks, or lithophytic on wet rocks along streams in deep shade in lowland forests.


Note. *Colytis macrophylla* is a most variable species. Seram plants are closest to the form named *Colytis spuria* (Mett.) Ching based on *Polypodium spuriun* Mett. (Ann. Lugd. Batav. 2: 226, 1866; syn. nov.) described from Sulawesi.

**Crysinus** Presl

Key to the species

1. Leaves pinnate, lobed or compound.
2. Scales linear, red brown with pale, hairy margin, lower pinnae stalked, upper sessile, white deposits present on adaxial surface at vein endings, lamina margin not notched ..........1. *C. albidosquamatus*
3. Scales ovate-lanceolate, pale brown, entire, lower pinnae sessile or adnate, upper adnate, white points absent, lamina margin notched .................................................2. *C. taenius*

1. Leaves simple, entire.
2. Leaves short-stalked, obtuse at apex, sori sunken in cavities in one row along each side of midrib......
3. Leaves stalked, usually acuminate at apex, sori in two rows between main lateral veins, not sunken....

4. *C. enervis*


W Seram: Tanahgoyang—G. Tiang Bendera, 350–980 m, C-13204. Central Seram: Wae Nua—G. Mapahuwe, 880–1010 m, C-11711bis; Piliana—G. Ohae, 400–990 m, C-12017; Piliana—G. Sinaunia, 350–1000 m, C-12883, 1000–2030 m, C-12833; Goa Pohon Damar—G. Musisi, 1040–1340 m, C-5650; Wae Puo—Kali IlI, 830–1230 m, C-5346; Kanikhe, 600 m, C-2991; Kanikhe—Wae Anse/C, 600–1290 m, C-3254 bis; Marainna—Wae Eseh, 780–1000 m, C-1652; Wae Mamahala—G. Kobipoto, 1300–1490 m, C-1785bis; Hatumete—Hoale Pass, 550–1200 m, C-1117; Wolu—Batu Kokan, 380–1250 m, C-6880; Muselleinan Pass, 700 m, C-14126.

Habitat. Epiphytic on often mossy tree trunks in montane forests.


Central Seram: Wae Puo—Kali IlI, 830–1230 m, C-5339; Goa Pohon Damar—G. Roihelu, 1080–1350 m, C-5658; Wae Nua—G. Mapahuwe, 880–1010 m, C-11566, C-11711; Kanikhe—Wae Anse/C, 620–1350 m, C-1402bis, C-1404, C-3225, C-3254; Wae Anse/C—Wae Huhu, 1290–2000 m, C-1437, C-1485, C-3542; Wae Huhu—Wae Puck, 2000–2860 m, C-3840; G. Owae Puck—G. Binaya, 2620–2930 m, C-1520; Piliana—G. Ohae, 650–1200 m, C-1023; Piliana—G. Sinaunia, 900–1600 m, C-12080, 1390–2030 m, C-12489; Hatumete—G. Hoale Besar, 480–1300 m, C-14312, 1300–1820 m, C-13583; Hatumete—Hoale Pass, 550–1200 m, C-7424; Wae Mamahala—G. Kobipoto, 1300–1490 m, C-1785; Wolu—Batu Kokan, 380–1030 m, C-6821; Maneoratu—G. Nusamutuwa, 0–970 m, C-14447; Hunisi—Muselleinan Pass, 550–1280 m, C-14082.

Habitat. Epiphytic on mossy tree trunks in deep shade in montane forests.

Distribution. Malaya, Sumatra to Taiwan and the Moluccas.

Note. The Seram plants are fully pinnate with slender pinnae. Very similar forms.


   Central Seram: Wae Nua—G. Mapahuwe, 150–880 m, C-11621; Wae Mamahala—G. Kobipoto, 1300–1490 m, C-1792.
   Habitat. Epiphytic on mossy tree trunks in montane forests.
   Distribution. Sumatra to Vietnam, to the Moluccas.


   Central Seram: Wae Puo—Kali Ili, 830–1230 m, C-5320; Kali Ili—Goa Pohon Damar, 830–1090 m, C-5391; Goa Pohon Damar—G. Roihelu, 1080–1350 m, C-5665; Kanikeh—Wae Ansela, 620–1350 m, C-1426; Wae Ansela—Owae Huku, 1350–2050 m, C-1510, C-3572; Wae Huku—Owae Puku, 2000–2860 m, C-3808, C-3808bis, C-3839; G. Owae Puku—G. Binaya, 2620–2930 m, C-1517, C-1517bis; Wae Nua—G. Mapahuwe, 150–880 m, C-11611; Piliiana—G. Ohac, 400–990 m, C-12014; Piliiana—G. Sinaunia, 1930–2090 m, C-12507, 2030–2190 m, C-12538, C-12818; Maraina—Wae Eseli, 780–1000 m, C-165bis; Hatumete—G. Hoale Besar, 480–1300 m, C-14319; 1300–1820 m, C-13578, C-13805; Hatumete—Hoale Pass, 550–1770 m, C-1997, C-7748, 810–1770 m, C-1281, C-1317; Wae Mamahala—G. Kobipoto, 1300–1490 m, C-1783; Wolu—Batu Kolan, 380–1030 m, C-6854.
   Habitat. Epiphytic in montane forests.
   Distribution. Malesia.

Note. Plants from exposed situations at higher elevations have narrower fronds and paraphysate sori, the paraphyses being paleiform, linear, longer than sporangia, gland-tipped, ochraceous; it is possible that they may merit recognition as a variety and conceivable that the New Guinean name *Polypodium rupestris* var. *leucolpis* Rosenst. (Fedde Repert. 5: 43, 1908) may apply to them. Another possible name for them is *Polypodium petiolatum* Ridl. (Trans. Linn. Soc. II Bot. 9: 260, 1916, non Dav. 1894; *P. canaliculatum* Alderw., Mal. Ferns Suppl. 522, 1917), also from New Guinea. Neither Rosenstock nor Ridley mentioned any paraphyses.

*Cmpsinus enervis* was transferred to *Selliguea* by Ching (Bull. Fan Mem. Inst. Biol. Bot. 10: 239, 1941), a disposition that is undoubtedly correct.

**Selliguea Bory**

Key to the species

1. Leaves not distinctly dimorphic.
2. Rhizome scales ovate-lanceolate, brown with pale margin, sori superficial .................. 1. **S. feeli**
2. Rhizome scales acicular, concolorous, red brown, sori impressed .................. 2. **S. heterocarpa**
1. Leaves distinctly dimorphic, fertile leaves linear .................. 3. **S. costulata**


W Seram: Tihulale—G. Totaniwel, 980–1190 m, C-13108, C-13605. Central Seram: Goa Pohon Damar—G. Roihelu, 1080–1530 m, C-5673; Wae Huku—Owae Puku, 2000–2860 m, C-3805, 2050–2890 m,
C-1526; Wae Anseia—Owae Huhu, 1350-2050 m, C-1466; Wae Mamahala—G. Kobipoto, 1300-1490 m, C-1904; Piliana—G. Sinaunia, 1000-2030 m, C-12852; Hatumete—G. Hoale Barat, 480-1300 m, C-14282, C-14311, 1300-1820 m, C-13816, 1820 m, C-14383; Maraina—Hatumete, 1500-1770 m, C-1399, C-2110; Muscellinan Pass, 1280-1320 m, C-14158.

Habitat. Epiphytic on mossy tree trunks in light shade or in deep shade in montane forests.

Distribution. Malaysia.

Note. Plants with discrete sori and those with elongate coenosori seem to be distinct in Seram but blend elsewhere in the range of the species. *Polypodium phlebiscopum* Bak., described from Ternate, is probably this species and included both forms with discrete and confluent sori.


W Seram: Honitetus, 280-460 m, C-13985.

Habitat. Terrestrial on dry slope in lowland forest.

Distribution. Vietnam, Malay Peninsula, Sumatra, Java, Borneo, Philippines, Moluccas.


W Seram: Tanahgoyang—G. Tiang Bendera, 0-350 m, C-12931. Central Seram: Wae Puo—Kali Ilu, 850-1230 m, C-5321; Kali Ilu—Goa Pohon Damar, 830-1090 m, C-5389; G. Musisi—Goa Pohon Damar, 1020-1340 m, C-5623.

Habitat. Epiphytic on tree trunks in lowland and lower montane forests.


*Grammatopteridium* ALDERW. differs from *Selligua* by only the single character of extreme dimorphism but even this one feature, inadequate as it might be, cannot be used for generic distinction, as perfectly intermediate “species” exist. Two such that have received names are *Polypodium calophlebium* COPEL., Philip. J. Sci. 2c: 140, pl. 3A, 1907, from Philippines (Mindoro) and *Polypodium valstonianum* ALDERW., Bull. Dépt. Agric. Ind. Néerland. 18: 23, t. 5, 1908, from Java.

Also intermediate between *Grammatopteridium* as defined, and *Selligua* as typified by *S. feii* BORY, by being subdimorphic, is the New Guinean species *Polypodium albicaulitum* COPEL., Philip. J. Sci. 6c: 90, 1911 (Holotype: MICH); *Selligua albicaula* (COPEL.) KATO & PRICE, comb. nov., most easily characterized by the elongate bristle-like apices of its paleae.
Pleopeltidoideae

**Belvisia Mirbel**

### Key to the species

1. Rhizome long-creeping, scales clathrate ........................................... 1. *B. validinervis*
2. Rhizome short-creeping, scales thick cell-walled, not clathrate ................. 2. *B. mucronata*


Central Seram: Owae Huhu—G. Owae Puku, 2600–2800 m, C-1524, C-3593, C-3809, C-3842; C-3844; Kanikeh—Wae Ansehla, 620–1350 m, G-1384; Piliana—G. Sinaunia, 2030–2190 m, G-12570; Hatumete—G. Hoale Bear, 480–1300 m, C-14294, 1300–1820 m, C-14384; Hatumete—Hoale Pass, 810–1770 m, C-1272, 550–1770 m, C-7711, 1200–1770 m, C-7479.

Habitat. Epiphytic in montane forests or epipetric on mossy tree trunks on exposed high mountain ridges.

Distribution. Java, Philippines, and New Guinea, reported from Sumatra.

**2. B. mucronata** (Fée) Copel., Gen. Fil. 192, 1947; Fern Fl. Philip. 3: 468, 1961;


W Seram: Buria—Wae Mala, 140–500 m, G-5975. Central Seram: G. Musisi—Goa Pohon Damar, 1020–1340 m, C-5614, C-5615; Kanikeh—Wae Ansehla, 600–1290 m, C-3274; Selumena—Kanikeh, 620–750 m, C-1368, C-1612; Wae Nua, 150–260 m, C-11392; Hatumete—Piliana, 0–400 m, C-6521; Maraina—Hoale Pass, 810–1350 m, C-1988; Elemata-Makualaina, 100 m, C-4451.

Habitat. Epiphytic in secondary lowland forest or in montane forest.

Distribution. Sri Lanka to Polynesia, north to Annam, throughout Malesia.

**Lemmaphyllum Presl**


Central Seram: Kanikeh—Wae Ansehla, 600–1290 m, C-3273; Wae Nua—G. Mapahuwe, 150–880 m, G-11634; Wae Nua, 150–260 m, C-11385; Air Makariki, 350–400 m, C-522; Piliana, 520–670 m, C-12200; Piliana—G. Sinaunia, 400–1390 m, C-11982; Maraina—Hatulo, 620–700 m, C-4174; G. Hausane, 100–650 m, C-4707; Hatumete—G. Hoale Bear, 480–1300 m, C-14336; Maraina—Hatumete, 550–1770 m, C-2000; Hunisi—Muscleinian Pass, 0–490 m, C-13715.

Habitat. Epiphytic on slender branches and twigs or rarely lithophytic in lowland or lower montane forests.

Distribution. Malesia, Polynesia, Queensland.

Note. *Weatherbya damunensis* (Rosenst.) Copel. from New Guinea is merely a small form, well within the normal range of variation of *L. accedens*.

**Polypodioideae**

**Goniophlebium (BL.) Presl**

### Key to the species

1. Base of pinna cuneate, usually short-stalked.
2. Base of pinna round-cuneate, sori sunken in deep cavities, surrounded by dark scale-like paraphyses.

1. G. percussum

2. Base of pinna narrowly cuneate, sori in shallow cavities, paraphyses lacking.

1. Base of pinna cordate, truncate or sometimes broadly cuneate, sessile.

2. Base of pinna truncate or broadly cuneate, pinnae hairy beneath; rhizome not glaucous.

3. Base of pinna cordate, subauricled, pinnae glabrous; rhizome white-glaucous beneath palesae.

4. G. subauriculatum


W Seram: Honitetu, 350-400 m, C-2132; 280-460 m, C-14000; Tihulale—G. To taniwel, 0-120 m, C-1292. Central Seram: Rumah Sokat Batu, 0-250 m, C-5924; G. Batudinding, 10-320 m, C-5010; Roho—Kanikeh, 60-600 m, C-2962.

Habitat. Epiphytic in light shade in lowland forests.

Distribution. Malesia.


Central Seram: Wae Puo—Kali Ili, 830-1230 m, C-5315; Goa Pohon Damar—G. Roihelu, 1080-1530 m, C-5698; Wae Nua—G. Mapahuwe, 880-1010 m, C-11710bis, 700 m, C-11727; Piliana—G. Ohae, 400-990 m, C-11775, 500-750 m, C-726, C-726bis; Kanikeh—Wae Ansela, 620-1350 m, C-1402, C-1419, 600-1290 m, C-3253; Maraina—Hatuolo, 620-700 m, C-4179; Hatumete—G. Hoale Besar, 480-1300 m, C-14354; Wolu—Batu Kokan, 380-1030 m, C-6948; Hunisi—Muselleinan Pass, 550-1280 m, C-14080.

Habitat. Epiphytic or rarely terrestrial in montane forests.

Distribution. Indo-China, throughout Malesia.


Central Seram: Wae Ninioya—Wae Puo, 210-1020 m, C-5060; Wae Puo—Kali Ili, 830-1230 m, C-5335; Kanikeh, 600 m, C-2980; Kanikeh—Wae Ansela, 620-1350 m, C-1417, C-3279; Wae Ansela—Wae Huhu, 1290-2000 m, C-3540; Wae Nua—G. Mapahuwe, 150-880 m, C-11672; 880-1010 m, C-11710; Piliana—G. Ohae, 400-990 m, C-11592, C-12006, 500-750 m, C-708, C-728ter, 900-1600 m, C-11916; Piliana—G. Sinaunia, 350-1000 m, C-12882; Hatumete—G. Hoale Besar, 480-1300 m, C-14305; Hatumete—Hoale Pass, 200-650 m, C-1204, 550-1200 m, C-1121, C-7416; Wolu—Batu Kokan, 380-1030 m, C-6822; Hunisi—Muselleinan Pass, 550-1280 m, C-14112.

Habitat. Epiphytic on mossy tree trunks in montane forests or rarely in light shade in lower montane forests.

Distribution. Luzon, Mindanao, Seram.

Note. The distal portion of the rachis is hairy, and the lower surface of the pinnae is variously hairy. C.11672 is larger and much more densely hairy than other specimens. This is the first report of G. benguetense from outside the Philippines; most Philippine specimens are relatively much smaller than those of Seram but Ramos & Edaño BS 48567 (NY, UC) from Luzon, Mt. Irid, is fully as large as any.
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Central Seram: Maraina-Wae Eseli, 780-1000 m, C-1640bis; Piliana—G. Sinaunia, 1390-2030 m, C-12505; Hatumete—Hoale Pass, 1500-1770 m, C-7710; Hunisi—Muselleinan Pass, 0-490 m, C-13768.

Habitat. Epiphytic in lowland and montane forests.

Distribution. NE India and SW China, Malesia to Australia.

Note. Scales at stipe base linear, red brown, clathrate, finely toothed basally. The specimens we have grouped under this name show considerable variation.

**Thylacopteris** Kunze ex J. SM.


Central Seram: Wae Niniyoa—Wae Puo, 210-1020 m, C-5041; Kanikeh—Wae Ansla, 600-1290 m, C-3259; Wae Wasan Hotun—Kanikeh, 620-970 m, C-1601; Wae Nua—G. Mapahuwe, 150-880 m, C-11517; Wae Salunc—Wae Nua, 140-550 m, C-11393; Piliana—G. Ohae, 400-990 m, C-11904, C-12023, 500-750 m, C-649; Piliana—G. Sinaunia, 400-1390 m, C-12445; Hatumete—G. Hoale Besar, 480-1300 m, C-14351; Hatumete—Hoale Pass, 200-650 m, C-1225, 700 m, C-7471; Maraina—Hatuo, 620-700 m, C-4156; G. Hausane, 100-650 m, C-4730; Wolo—Batu Kanok, 0-450 m, C-6552; Hunisi—Muselleinan Pass, 0-490 m, C-13744.

Habitat. Epiphytic or rarely lithophytic in lowland or lower montane forests.

Distribution. W Malesia east to Philippines and Moluccas.

Loxogrammoideae

**Loxogramme** (Bl.) PRESL

Key to the species

1. Sori parallel to costa, interrupted or continuous .................................................. 1. **L. paltonioides**
2. Sori oblique, separate.
3. Leaves dimorphic, the fertile up to 1 cm broad .................................................. 2. **L. antrophoides**
4. Leaves not distinctly dimorphic.
5. Leaves 3-8 cm broad, midrib not raised above .................................................. 3. **L. scolopendriodes**
6. Leaves up to 2.5 cm broad, midrib raised above.
7. Leaves 3-8 cm broad, midrib raised above.
8. Leaves up to 2.5 cm broad, scales up to 1 mm broad, dark brown, sori medial to supramedial...
9. Leaves up to 1.5 cm broad, scales up to 1.8 mm broad, light brown, sori inframedial ....


Central Seram: Kanikeh—Wae Ansla, 600-1290 m, C-3227; Wae Ansla—Wae Huhu, 1290-2000 m, C-1436, C-3525, C-3561bis, C-3562bis; Piliana—G. Ohae, 1600-1890 m, C-12137; Piliana—G. Sinaunia, 1390-2030 m, C-12476, 2030-2190 m, C-12562, 12820; Hatumete—G. Hoale Besar, 1300-1820 m, C-14391; Hatumete—Hoale Pass, 1200 m, C-7701, 810-1770 m, C-1335, 550-1770 m, C-2101.

Habitat. Epiphytic or occasionally lithophytic on mossy limestone in often mossy, montane forests.


Note. The type of **L. vittiariifolia** ALDERW. was from Seram.

   Central Seram: Roho—Kanikheh, 60–600 m, C-2938; Maraina—Wae Eseli, 780–1000 m, G-1691; G. Kakkihari, 100–300 m, G-4466.
   Habitat. Epiphytic in lowland forests.
   Distribution. Sumatra, Java, Borneo, Sulawesi, Seram.


   W Seram: Wae Ani near Tanahglyay, 0–80 m, C-13269; Sokowati, 90–150 m, C-2062; Wae Mala N of Buria, 140–180 m, C-5981; Uweth—G. Nakela, 20–580 m, C-6276. Central Seram: G. Batudinding near Sawai, 10–320 m, C-4790; Roho, 60 m, C-2902. Ambon: Wae Palai, 10–70 m, A-322.
   Habitat. Epiphytic or rarely lithophytic in lowland forests.
   Distribution. S Burma to the Solomons.


   Central Seram: Wae Niniyo—Wae Puo, 210–1020 m, C-5070; Goa Pohon Damar—G. Rohelu, 1060–1530 m, C-5685; Wae Puo—Kali Ili, 830–1230 m, C-5348; Wae Ansla—Wae Hulu, 1290–2000 m, G-3562; Kanikheh—Wae Ansla, 600–1290 m, C-1400, C-3264, C-3284, C-3286, C-3894; Wae Wasan Hotun, 970–1100 m, C-1587; Kanikheh, 600 m, C-2990; Maraina—Wae Eseli, 780–1000 m, C-1690; Maraina—Hatumete, 620–700 m, C-4162; G. Uwelehu, 630–1000 m, C-4411; Wae Nua—G. Mapahuwe, 880–1010 m, C-11706; Piliana—G. Ohae, 650–1200 m, C-1030, 520–670 m, C-12179; Piliana—G. Sinaunia, 350–1000 m, C-12864, C-12868; Hatumete—G. Hoale Besar, 480–1300 m, C-13865, C-14286; Hatumete—Hoale Pass, 60–610 m, C-7155, 200–650 m, C-950, 550–1200 m, C-1125, 810–1770 m, C-1258, 550–1770 m, C-1993; Humisi—Muselleinan Pass, 380–550 m, C-13141, C-13795, C-14019.
   Habitat. Epiphytic or lithophytic on limestone in lowland or montane forests.
   Distribution. E malesia to Polynesia.

Note. Not previously reported from the Moluccas.


   Central Seram: Wae Hulu—Owae Puku, 2000–2860 m, C-3836, C-3847; Owae Puku, 2800–2900 m, C-3857.
   Habitat. Epiphytic in upper montane forest or lithophytic on mossy limestone in *Cyathus-Vaccinium*-mixed forest.
   Distribution. Sri Lanka to Seram.

Note. This species is similar to the preceding in its linear or narrowly elliptic leaves with oblique sori, but differs in its upper montane habitat as well as the morphological characters noted in the key. It is very closely related to the earlier *L. parallela* Copel. described from the Philippines.

Acknowledgment—This study was partly supported by Grant-in-Aid 62043018 for the Monbusho International Scientific Research Program.