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ORCID

DC: 0000-0001-9475-2075

Novitates Bruneienses, 11. A Checklist of the Ferns and Lycophytes of Brunei Darussalam (In continuation of studies of Brunei pteridophytes initiated by David S. Edwards)

DANIELE CICUZZA^{1*}, JOFFRE ALI AHMAD², BARBARA PARRIS³, SEBASTIAN C. WONG^{4,5*}, KHOON MENG WONG⁴

¹ *Universiti Brunei Darussalam, Faculty of Science, Jl. Tungku Link, Gadong, Bandar Seri Begawan, Brunei Darussalam*

² *Ministry of Primary Resources and Tourism, JI Menteri Besar, Bandar Seri Begawan BB3910, Brunei Darussalam*

³ *Fern Research Foundation, Bay of Islands, New Zealand*

⁴ *Singapore Botanic Gardens, National Parks Board, Singapore*

⁵ *House 42, Taman Penampang, Mile 5.5 Jalan Penampang Lama, 88300 Kota Kinabalu, Sabah, Malaysia*

*Corresponding authors. Email: dcicuzza@gmail.com; sebastian.c.wong@gmail.com

Abstract. A checklist of all species of ferns and fern allies that are known in Brunei is presented. The native, introduced, and endemic status in Borneo for all taxa are given. Ecological notes on distribution within Brunei as well as abundance or rarity are also provided. This checklist comprises 32 families, 106 genera and 364 species. We examined and re-identified all specimens of ferns and lycophytes in the National Herbarium of Brunei Darussalam (BRUN) at the Forestry Department and the University of Brunei Darussalam herbarium (UBDH) accordingly. The checklist suggests the threat status for each species, specifically, if it may be of least concern or rare in Brunei. Additionally, five new species belonging to the family Polypodiaceae are newly described here, viz., *Acrosorus pectinatus* Parris, *Calymmodon ashtonii* Parris, *Calymmodon minutus* Parris, *Calymmodon rupicola* Parris, and *Ctenopterella rivularis* Parris.

Keywords: Borneo, ferns, Lycophytes, plant diversity, Pteridophytes.

INTRODUCTION

Borneo is the third largest island in the world, located at the centre of Malesia, the vast Southeast Asian archipelago. The larger part of the island (nearly 73%) is represented in the eastern and southern portion by Indonesian Kalimantan, in the northern and north-western part by the component territories of Malaysia (Sabah, Sarawak, and the Malaysian Federal Territory of Labuan Island), and the Sultanate of Brunei Darussalam. A recent estimate of the total vascular flora of the Malesian region (the phytogeographic region from Sumatra, across Malaysia and the Philippines, eastwards to New Guin-

ea), is estimated to be around 42,000 plant species (Joyce et al. 2020). Borneo, with an up-to-date checklist, harbours an astonishing 271 families with 12,590 vascular plant species (Wong 2023).

The term *Pteridophyta* was first introduced by Ernst Haeckel in 1866 to classify a group of vascular plants that reproduce via spores rather than seeds. This group includes ferns, clubmosses, and horsetails. The name is derived from the Greek words *pteron* (“feather”) and *phyton* (“plant”), a reference to the feather-like morphology of fern fronds (Haeckel 1866).

Pteridophyte (ferns and lycophytes) research in the Malaysian region can be highlighted in several stages. The Malayan Fern Allies handbook by van Alderwerelt van Rosenburgh in 1908, with a later supplement in 1917, enumerated 1495 species for the entire Malaysian region. This was the first and most comprehensive account which covered the pteridophyte diversity of ferns in the islands of this region. Masamune (1945) also published a list of Bornean pteridophytes, enumerating a total of 963 species of ferns and fern-allies. Another insight is from the Flora of Malaya Volume II, Ferns of Malaya by Holttum (1966), wherein close to 600 species were also mentioned as being distributed in Borneo.

Since the Flora Malesiana Project began, several pteridophyte families have been treated for the whole Malaysian region. Based on this flora, Borneo’s pteridophyte richness has been documented by family as: *Lomariopsis* group (Holttum 1978), 24 species; *Tectaria* group (Holttum 1991), 54 species; *Tectaria* group: *Arthropteris* (Hovenkamp and Leonardia 2012), one species; Polypodiaceae (Hovenkamp et al. 1998), 80 species; Davalliaceae (Nootboom 1998), 20 species; Azollaceae (Saunders 1998), one species; Cheiroleuriaceae (Laferrière 1998), one species; Equisetaceae (Laferrière 1998), one species; Matoniaceae (Kato 1998), one species; Plagiogyriaceae (Zhang and Nootboom 1998), 5 species; Thelypteridaceae (Holttum 1981), 94 species; Blechnaceae (Nootboom et al. 2012), 11 species; Hypodematiaceae (Nootboom 2012), two species; Monachosoraceae (Nootboom 2012), one species; Nephrolepidaceae (Hovenkamp and Miyamoto 2012), 7 species; Oleandraceae (Hovenkamp & Ho 2012), three species; Pteridaceae subfam. Parkerioideae (Nootboom 2012), two species; and the Hymenophyllaceae (Iwatsuki and Ebihara 2023), 62 species.

Moreover, regional accounts, some including checklists, have been produced over the past years. Parris and Latiff (1997) provide a provisional checklist for Malaysia. Popelka et al. (2018) has published on the filmy ferns of Kuala Belalong in Brunei. The most recent checklist from Sabah (Andi Maryani et al. 2022) enumerated 900 species and 26 infraspecific taxa of ferns and lycophytes,

with an additional species on Kinabalu by Chen et al. (2023). The pteridological flora of the emblematic Mount Kinabalu had the first attempt in 1934 from Christensen and Holttum, enumerating 417 species. A later checklist increased the total fern and lycophyte flora of Kinabalu to 609 species and 12 infraspecific taxa (Parris et al. 1992). Other checklists or results from expeditions on the island of Borneo reported and gradually contributed to the overall fern flora knowledge. The Mulu National Park checklist (Parris et al. 1984), and those for Bario and Kelabit highlands (Razali et al. 1999), Kalimantan (Bellefroid et al. 2007, Iwatsuki and Kato 1980–1984) are examples. The most up-to-date checklist of vascular plants from Borneo enumerated a total pteridophyte flora of 39 families and 1139 species (Wong 2023).

Brunei Darussalam has a territory of 5,765 km², with a gently hilly landscape, and only c. 1% of the territory is considered mountainous, in the most inland part of Temburong district. Nearly 70% of the country’s land area is covered with forests. Despite its small land area compared with the other territories, Brunei harbours a much-forested landscape divided into seven categories: mixed dipterocarp forest, mountain forest, heath forest, beach forest, mangrove and brackish water forest, freshwater swamp forest, and peat swamp forest (Wong 1999). This diversity creates a varied forest landscape making Brunei particularly rich in plant diversity compared with its size.

HISTORICAL PERSPECTIVE, APPROACH AND METHODOLOGY

The first person who gave consistent attention to collating material of the ferns of Brunei was Dr. David S. Edwards, who joined the Universiti Brunei Darussalam (UBD) in 1986, its Head of the Biology Department (1987–1993) and subsequently Dean of Science, starting UBD’s collections in the fledgling herbarium there (Fig. 1). Dr Edwards also frequented Brunei’s main herbarium at the Forestry Department in Sungai Liang (international acronym BRUN). With the geographical coverage and collecting intensity of the Brunei-Kew Checklist project of the late 1980s and early 1990s (this addressed flowering plants and gymnosperms, although pteridophytes were also routinely taken; see Coode et al. 1996), the BRUN herbarium rapidly expanded and was subsequently designated the National Herbarium. In those early years, his attention given to identifying and naming ferns and paying heed to newly emerging revisions was the main curatorial effort on the Brunei material. However, he completed his service with UBD in 2012, and has not been able to continue working on Brunei

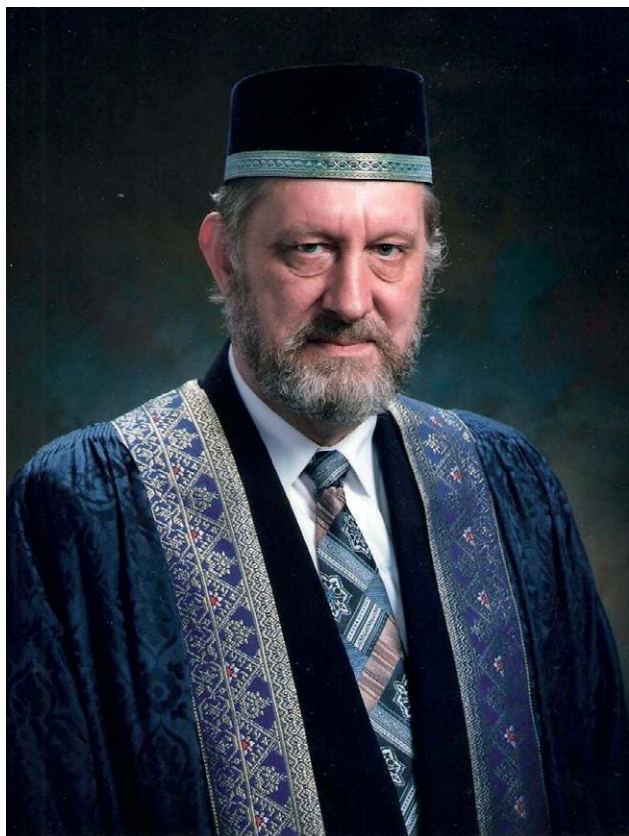


Figure 1. Dr. David S. Edwards of Universiti Brunei Darussalam, pioneer in Brunei's fern studies. (Courtesy of the Universiti Brunei Darussalam).

ferns. His imprint is nevertheless clearly present. Further to these efforts, continuing exploration of the Brunei flora in collaboration with the Brunei Forestry Department and the Singapore Botanic Gardens since 2013 and other collectors have continued to add interesting material. The most recent fern species described from Brunei was *Haplopteris palustris* in 2024 (Cheng et al. 2024). Collectors with the highest voucher contribution to the Brunei fern flora are D.S. Edwards 893, R.J. Johns 519, K.M. Wong 268, BRUN numbers 207, D. Cicuzza 142, Mohd. Ariffin 118, J. Dransfield 96, and A.D. Poulsen 78.

The present work aims to contribute to the first Fern and Lycophyte checklist of Brunei Darussalam. Although we do not attempt to assess the conservation status of Brunei fern species according to IUCN criteria (IUCN 2022), which would necessitate many more considerations outside of Brunei itself, we attempt, wherever possible, to include notes on rarity or commonness, as well as distribution, in Brunei.

The checklist, representing the first enumeration of the ferns and lycophytes of Brunei Darussalam, is entirely

based on the specimen material deposited in the herbaria of Brunei Darussalam. These are, respectively, the National Herbarium of Brunei Darussalam (BRUN), and the Universiti Brunei Darussalam Herbarium (UBDH). All international research projects conducted in Brunei over the recent years have their reference vouchers lodged with BRUN and UBDH, while duplicates are deposited overseas. Therefore, this checklist should represent the most comprehensive record of the Brunei pteridophyte flora.

For each taxon assessed in this work, we include the species name, most common synonyms, collector name(s), voucher number, and known local distribution. The circumscription of the families and genera mostly followed the PPG I (2016). The nomenclature for each species was checked with the online resources of Plants of the World Online, POWO, Tropicos.org (MBG 2024), IPNI (2024) and Ferns and Lycophytes of the World (2024). For taxa identified at the subspecies or variety levels but not recognised on the international online sources, we consider them only at the species level, leaving these to benefit from better comprehension from further studies. Specimens cited in the manuscript have been physically examined, while images have been shared with experts for name certification.

We use only two categories that attempt to indicate local conservation assessment: Least Concern and Rare. In cases with more information, each indication is augmented with further information about the species abundance. The evaluation for each species is based on the frequency of the herbarium vouchers deposited with BRUN and UBDH and on the authors' first-hand knowledge. When the species had fewer than five duplicates collected within the country, we considered it rare for Brunei. This first attempt will be the basis for future and improved evaluations. The notation 'cf.' is used in instances where very few specimens are of uncertain identity or were initially listed under a name that was subsequently regarded as a synonym of another species. We did not go beyond any attempt to provide further explanation, as this would require a level of taxonomic interpretation beyond the scope of this study.

A note on taxonomic information represented.

This checklist also includes five newly described species by Barbara Parris, and the taxonomic descriptions are presented within the enumeration of the Polypodiaceae. Otherwise, at the same time that we realise this checklist is not a work of taxonomy *per se*, we have made every attempt up to the present time to consult the latest revisions and authoritarian accounts (see references) to adopt the results of both conventional taxonomic and

molecular studies elucidating relationships. It would be well appreciated that these modern studies have recently modified very many taxonomic concepts from previous classifications before the present century. We have omitted any listing of synonymy as this is necessarily related to taxonomic interpretations by various specialists; the only exceptions are very few, pertaining to identifications of Brunei specimens where different names applied are considered by current specialists to refer to the same taxon. We mention these in the specimen listings.

BIOGEOGRAPHICAL CONSIDERATIONS: RICHNESS AND ENDEMISM

Brunei Darussalam is divided into four administrative districts: Kuala Belait (BEL), Brunei Muara (BRM), Temburong (TEM), and Tutong (TUT); these district acronyms are used in the listing of specimens seen throughout the checklist (Fig. 2). Each species reported in this checklist has information related to their distribution for each district for ease of tracing localities. The distribution of each species beyond Brunei is sum-

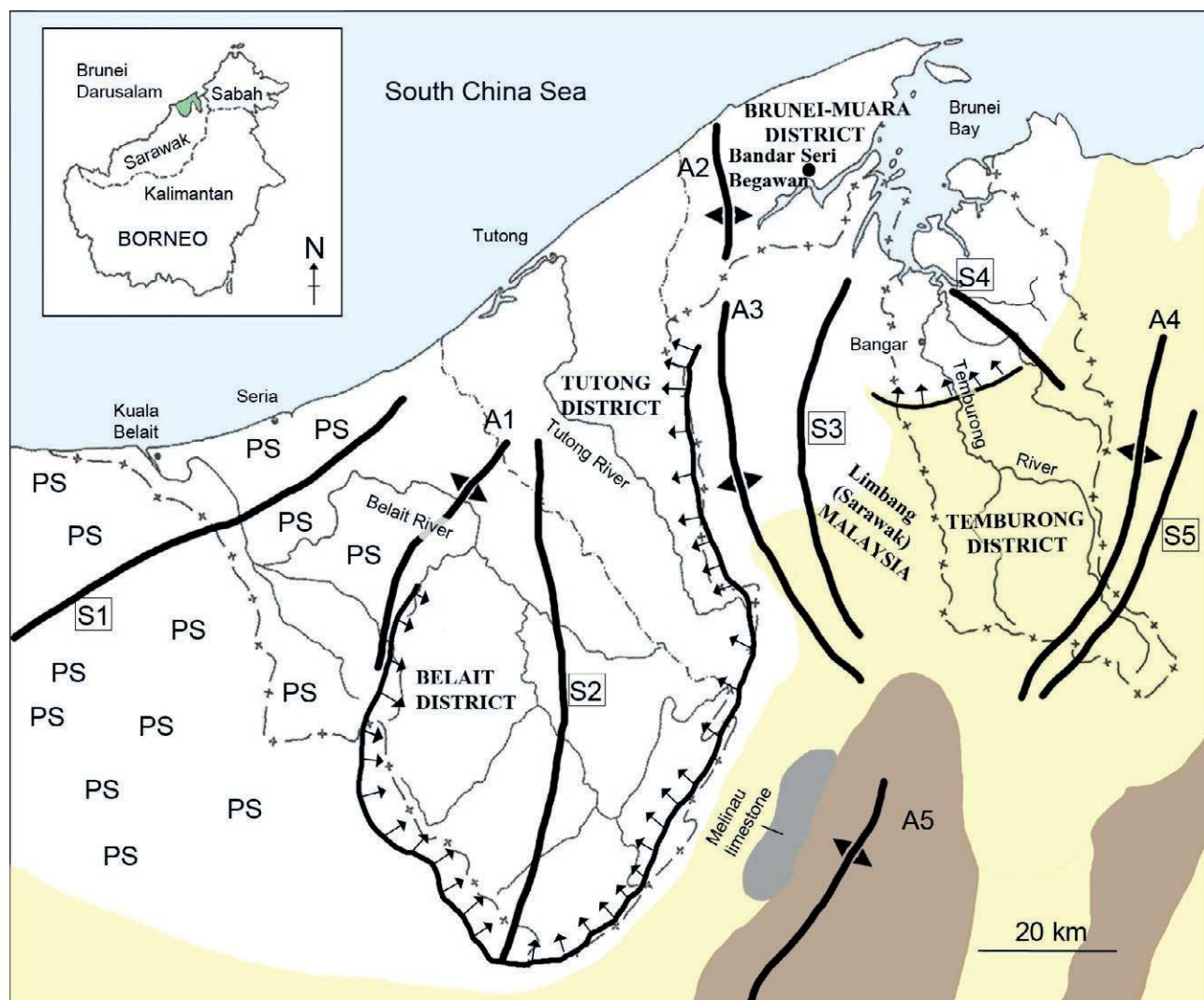


Figure 2. Distinctive geo-ecological features of the Brunei area. *Uncoloured:* Pliocene - Miocene Sediments, in places overlain by Pleistocene or more recent deposits. *Yellow:* Miocene - Oligocene Sediments. *Brown:* Rajang Group Deepwater Sediments (Late Cretaceous - Eocene). *Anticlines:* A1. Belait anticline. A2. Jerudong anticline. A3. Danau anticline. A4. Tangga anticline. A5. Mulu Uplift. *Synclines:* S1. Liku-Badas syncline. S2. Belait syncline. S3. Limbang syncline. S4. Labu syncline. S5. Tangga syncline. Simple line with arrows: Approximate boundary of synclinal basins within Brunei. PS. Peat body or peat swamp vegetation over low-lying ground. (Credit: K.M. Wong & Alsa Moo, from Joffe et al. 2015).

marised from various sources, including Hassler (2021 global), Lindsay & Middleton (2012 onwards, Cambodia, Laos and Thailand), Cámara-Leret et al. (2020, New Guinea), and the Flora Malesiana series (<https://floramalesiana.org/>).

A total of 1921 vouchers were examined, with 364 species belonging to 106 genera and 32 families (Table 1). Brunei's angiosperm and gymnosperm flora was estimated at close to 3500 species (Wong 1999). Ferns and lycophytes represent some 10% of Brunei's vascular plant flora.

The top five most species-rich families in the country are Polypodiaceae (80 spp.), Pteridaceae (35 spp.), Hymenophyllaceae (32 spp.), Thelypteridaceae (29 spp.), and Lindsaeaceae (24 spp.). With a total of 200 species, they represent 54.9% of the entire pteridophyte flora of Brunei. Polypodiaceae and Thelypteridaceae are some of the most species-rich plant families among pteridophytes in the world, and thus their predominance in the country is also expected. The most species-rich genera for Brunei are *Lindsaea* (20 taxa, Lindsaeaceae), *Selliguea* (16 taxa, Polypodiaceae), *Asplenium* and *Hymenophyllum* (with 15 taxa each, Aspleniaceae and Hymenophyllaceae, respectively), *Selaginella* and *Tectaria* (with 14 taxa each, Selaginellaceae and Tectariaceae, respectively), *Diplazium* (12 taxa, Athyriaceae), and *Haplopteris* (10 taxa, Pteridaceae). Of the 364 species presented, 47 are endemic to Borneo, representing 12.9% of Brunei's pteridophyte flora. Four species, *Calymmodon ashtonii*, *C. minutus*, *Ctenopterella rivularis* and *Tectaria jacobsonii*, are endemic to Brunei.

Plant distributions are not expected to follow man-made administrative districts, rather, more so natural attributes such as elevation, terrain, geology, and vegetation types or even drainage. But it should also be realised (Wong 1999) that bigger plants with better-dispersed propagules (e.g., seeds) have, in general, a wider distribution than smaller plants such as forest-floor herbs. On the other hand, wind dispersal, as in the case of many orchids, also generally results in a wider distribution, so within the small land area of Brunei, fewer instances of restriction of plant distribution in this dispersal category may be expected. This would appear to be the case with ferns and lycophytes. Notwithstanding, plant-geographic considerations have identified a 'Brunei area' (including Brunei and adjacent parts of southwest Sabah and northeast Sarawak) as a plant area of special interest, often with its own suite of rare and endemic plants (Ashton 2003, Henrot et al. 2013, Joffe et al. 2015, Wong and Neo 2019).

Table 1. Fern and lycophyte families, genera and the number of species enumerated for Brunei Darussalam; in parentheses, the number of species endemic to Borneo.

GROUP / Family	Genera	Species
A. LYCOPHYTA		
1 Lycopodiaceae	<i>Huperzia</i>	2
	<i>Lycopodium</i>	1
	<i>Palhinhaea</i>	1
	<i>Phlegmariurus</i>	5
2 Selaginellaceae	<i>Selaginella</i>	14 (7)
B. PTERIDOPHYTA		
3 Aspleniaceae	<i>Asplenium</i>	15 (1)
4 Athyriaceae	<i>Diplazium</i>	12 (3)
5 Blechnaceae	<i>Blechnopsis</i>	2
	<i>Parablechnum</i>	1
	<i>Stenochlaena</i>	1
	<i>Telmatoblechnum</i>	1
6 Cibotiaceae	<i>Cibotium</i>	1
7 Cyatheaceae	<i>Alsophila</i>	5 (1)
	<i>Sphaeropteris</i>	8 (2)
8 Cystodiaceae	<i>Cystodium</i>	1
9 Davalliaceae	<i>Davallia</i>	8
	<i>Davallodes</i>	1
10 Dennstaedtiaceae	<i>Histiopteris</i>	2
	<i>Microlepia</i>	3
	<i>Pteridium</i>	1
11 Didymochlaenaceae	<i>Didymochlaena</i>	1
12 Dipteridaceae	<i>Cheiropleuria</i>	1
	<i>Dipteris</i>	4 (1)
13 Dryopteridaceae	<i>Arachniodes</i>	2
	<i>Bolbitis</i>	3
	<i>Dryopteris</i>	1
	<i>Elaphoglossum</i>	3
	<i>Pleocnemia</i>	2
	<i>Teratophyllum</i>	3
14 Gleicheniaceae	<i>Dicranopteris</i>	2
	<i>Diplopterygium</i>	2 (1)
	<i>Gleichenia</i>	1
	<i>Sticherus</i>	3
15 Hymenophyllaceae	<i>Abrodictyum</i>	4
	<i>Cephalomanes</i>	2
	<i>Crepidomanes</i>	5
	<i>Didymoglossum</i>	4
	<i>Hymenophyllum</i>	15
	<i>Trichomanes</i>	1
	<i>Vandenboschia</i>	1
16 Hypodematiaceae	<i>Leucostegia</i>	1
17 Lindsaeaceae	<i>Lindsaea</i>	20 (1)
	<i>Tapeinidium</i>	4 (1)
18 Lomariopsidaceae	<i>Cyclopeltis</i>	1
	<i>Lomariopsis</i>	2
19 Lygodiaceae	<i>Lygodium</i>	4

(Continued)

Table 1. (Continued).

GROUP / Family	Genera	Species
20 Marattiaceae	<i>Angiopteris</i>	3
	<i>Christensenia</i>	1
	<i>Ptisana</i>	1
21 Matoniaceae	<i>Matonia</i>	1
22 Nephrolepidaceae	<i>Nephrolepis</i>	5
23 Oleandraceae	<i>Oleandra</i>	3 (1)
24 Ophioglossaceae	<i>Helmintostachys</i>	1
	<i>Ophioglossum</i>	4
25 Plagiogyriaceae	<i>Plagiogyria</i>	1
26 Polypodiaceae	<i>Acrosorus</i>	2 (1)
	<i>Calymmodon</i>	5 (3)
	<i>Ctenopterella</i>	2 (1)
	<i>Dasygrammitis</i>	1
	<i>Drynaria</i>	3
	<i>Glabrigrammitis</i>	1
	<i>Goniophlebium</i>	2
	<i>Lecanopteris</i>	3
	<i>Lepisorus</i>	6
	<i>Leptochilus</i>	2
	<i>Loxogramme</i>	3
	<i>Microsorium</i>	7
	<i>Oreogrammitis</i>	7 (3)
	<i>Platycerium</i>	2
	<i>Prosaptia</i>	4
	<i>Pyrrosia</i>	6 (1)
	<i>Scleroglossum</i>	4 (1)
	<i>Selliguea</i>	16 (4)
	<i>Thylacopteris</i>	1
	<i>Tomophyllum</i>	2
	<i>Xiphopterella</i>	1 (1)
27 Psilotaceae	<i>Psilotum</i>	2
28 Pteridaceae	<i>Acrostichum</i>	2
	<i>Antrophyum</i>	3
	<i>Ceratopteris</i>	1
	<i>Cheilanthes</i>	1
	<i>Haplopteris</i>	10 (1)
	<i>Mickelopteris</i>	1
	<i>Pityrogramma</i>	1
	<i>Pteris</i>	6 (1)
	<i>Syngramma</i>	5 (1)
	<i>Taenitis</i>	4 (1)
	<i>Vaginularia</i>	1
29 Saccolomataceae	<i>Saccoloma</i>	1
30 Schizaeaceae	<i>Actinostachys</i>	2
	<i>Schizaea</i>	2
31 Tectariaceae	<i>Draconopteris</i>	1
	<i>Polydictyum</i>	1 (1)
	<i>Tectaria</i>	14 (3)

(Continued)

Table 1. (Continued).

GROUP / Family	Genera	Species
32 Thelypteridaceae	<i>Abacopteris</i>	1
	<i>Amblovenatum</i>	2
	<i>Chingia</i>	1
	<i>Christella</i>	2
	<i>Coryphopteris</i>	1
	<i>Cyclosorus</i>	1
	<i>Grypothrix</i>	3
	<i>Macrothelypteris</i>	1
	<i>Mesophlebion</i>	7 (3)
	<i>Plesioneuron</i>	1 (1)
	<i>Pronephrium</i>	2
	<i>Sphaerostephanos</i>	7 (1)

ENUMERATION OF TAXA

LYCOPHYTA

Family 1. LYCOPODIACEAE

1.1. *Huperzia* Bernh., J. Bot. (Schrader) 1800(2): 16. 1801.

Huperzia ceylanica (Spring) Rothm., Feddes Repert. Spec. Nov. Regni Veg. 54: 59. 1951.

TEM: Bkt Retak, *Edwards* 820.

Distribution. From India and Sri Lanka to Java and Brunei.

Ecology. In mature forests. Threat: Least Concern.

Huperzia serrata (Thumb.) Trevis., Atti Soc. Ital. Sci. Nat. 17: 247–248. 1875.

TEM: G Pagon, *Wong WKM1900*, *Booth* P39.

Distribution. Pantropical.

Ecology. In tropical montane forests. Threat: Rare in Brunei.

1.2. *Lycopodiastrum* Holub ex R.D.Dixit, J. Bombay Nat. Hist. Soc. 77: 540. 1980.

Lycopodiastrum casuarinoides (Spring) Holub ex R.D.Dixit, J. Bombay Nat. Hist. Soc. 77: 541. 1981.

TEM: Bkt Retak, *Wong WKM428*; G Pagon, *Booth* P25.

Distribution. From India, Eastern China, and Japan, to New Guinea.

Ecology. In mature tropical forests. Threat: Least Concern.

1.3. *Palhinhaea* Franco & Carv., Bol. Soc. Brot., ser. 2, 41: 24. 1967.

Palhinhaea cernua (L.) Franco & Vasc., Bol. Soc. Brot., sér. 2, 41: 25. 1967. (Fig. 3).

BEL: Wasai Wong Kadir, *Edwards 2557*; Sg Mendaram, *Ariffin et al. BRUN22801*; Sg Mendaram, *Ariffin et al. BRUN22802*; Luagan Lalak, *Forman LLF859*. **BRM:** Tasek Lama, *Goh s.n.*; Tasek Lama, *Naqibah s.n.*; Tasek Gorge, *Edwards 408*; Serasa, *Ariffin et al. BRUN23887*. **TEM:** Bkt Belalong, *Edwards & Cantley 808*; G Pagon, *Booth P25*, *Ashton A209*, *Ashton A224*; Belalong, FSC, *Tagane B378*; Bkt Gelagas, *Simpson 2312*; Bkt Retak, *Wong WKM431*; Batu Apoi, *Poulsen ADP356*. **TUT:** Benutan Lake, *Edwards 2331*; Tasek Merimbun, *Bernstein JHB125*.

Distribution. Pantropical.

Ecology. Forest margins and areas with minimal disturbance. Threat: Least Concern.

1.4. *Phlegmariurus* (Herter) Holub, *Preslia* 36: 17, 21. 1964.

Phlegmariurus cf. *gnidioides* (L.f.) A.R.Field & Bostock, *PhytoKeys* 20: 40. 2013.

TEM: Bkt Patoi, *Edwards 2268*.

Distribution. Southern Africa, West Indian Ocean Islands, and Brunei.

Ecology. In mature forests. Threat: Least Concern.

Phlegmariurus nummulariifolius (Blume) Ching, *Acta Bot. Yunnan.* 3: 298. 1981.

TEM: Bkt Belalong, *Sands MS5554*; Sg Temburong, FSC, *Wong WKM1229*, *Boyce 393*; Sg Belalong, *Ashton A101*. **TUT:** Sg Rambai, *Ariffin et al. BRUN17588*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sabah, Sarawak), Brunei, Indonesia (Java, Kalimantan, Maluku), Philippines, New Guinea to Fiji.

Ecology. In primary and secondary forests. Threat: Least Concern.

Phlegmariurus phlegmaria (L.) T.Sen & U.Sen, *Fern Gaz.* 11(6): 421. 1978. (Fig. 4).

BEL: Lamunin, Pipeline, *Edwards 957*; Batu Melintang, Sg Ingei, *Wong WKM627*; Belait river, Melilas, *Forman LLF1144*; Badas Peat Swamp, *Wong WKM180*; Labi hill, *Cicuzza 2688*. **TEM:** Bkt Patoi, *De Vogel 8904*, *Edwards 2269*, *Poulsen ADP148*; Sg Dolhakim, *Edwards 557*; Bkt Retak, *Wong WKM784*; Belalong, FSC, *Wong WKM1237*, *Wong WKM257*, *Xia 3*; Kpg Bakok, *Cicuzza 2716*; Belalong FSC, *Tagane B378*. **TUT:** Sg Apam, Ulu Tutong, *Edwards 2404*; Sg Medit, *Simpson 2516*; Near Pipeline, *Edwards 957*.



Figure 3. Lycopodiaceae. *Palhinhaea cernua* (Photo KM. Wong).

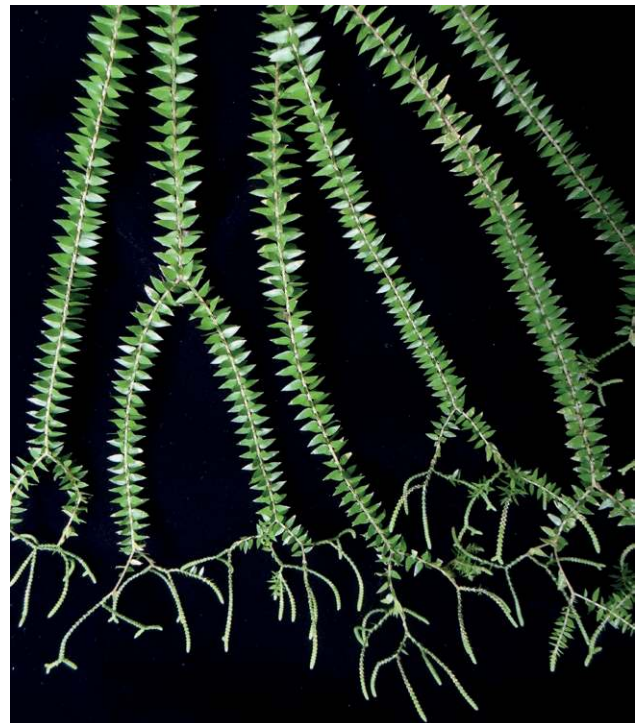


Figure 4. Lycopodiaceae. *Phlegmariurus phlegmaria* (Photo KM. Wong).

Distribution. Old World tropics from Africa and Asia to the Pacific Islands.

Ecology. In mature forests. Threat: Least Concern.

Phlegmariurus pinifolius (Trevis.) Kiew, *PhytoKeys* 96: 108. 2018.

TEM: Batu Apoi, *Simpson* 2288.

Distribution. Sri Lanka, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku), Philippines, New Guinea.

Ecology. In mature forests. Threat: Least Concern.

Phlegmariurus squarrosus (G.Forst.) Á.Löve & D.Löve, *Taxon* 26: 324. 1977.

TEM: K Belalong, FSC, *Wong WKM277*; Batu Apoi, *Poulsen ADP198*. **TUT:** Benutam dam, Ladan hill, *Edwards* 956.

Distribution. West Indian Ocean Islands, Sri Lanka, India, Nepal, Bangladesh, China, Thailand, throughout Malesia to Australia and the Pacific Islands.

Ecology. In mature forests. Threat: Least Concern.

Family 2. SELAGINELLACEAE

2.1. *Selaginella* P.Beauv., *Mag. Encycl.* 9(5): 478. 1804, *nom. cons.*

Many of the *Selaginella* recorded from Brunei have very few collections, with the exception of the commoner species. Such low records can be attributed to species rarity, or that botanists have overlooked this family when collecting specimens. As a result, many species have been assessed as Rare in Brunei; however, more studies are needed to provide better conservation status evaluations of these species.

Selaginella alopecuroides Baker, *J. Bot.* 19: 368, no. 83. 1881.

TEM: Batu Apoi, *Samhan SN10*. **TUT:** Benutan Lake, *Edwards* 2337; Ladan Hill, *Edwards* 948; Sg Apan, *Edwards* 2406.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. A forest species found in humid sites and close to water. Threat: Rare in Brunei.

Selaginella boschai Hieron., *Hedwigia* 51: 243, no. 2. 1912.

BRM: Kpg Dadap, *Edwards* 2410, *Edwards* 2414.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. A forest species found in humid sites and close to streams. Threat: Rare in Brunei, possibly overlooked in similar habitats.

Selaginella delicatula (Desv. ex Poir.) Alston, *J. Bot.* 70: 282. 1932.

TEM: Amo, Belalong, FSC, *Cicuzza* 2598.

Distribution. India to Maluku, doubtfully in tropical America.

Ecology. A forest species found in humid sites and close to water. Threat: Rare in Brunei.

Selaginella dielsii Hieron., *Hedwigia* 51: 254, no. 7. 1912.

BRM: Lumapas, Kpg Dadap, *Edwards* 2411.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. In pristine lowland forests. Threat: Rare in Brunei.

Selaginella hewittii Hieron., *Hedwigia* 51: 262, no. 12. 1912.

TEM: Belalong, FSC, Sg Baki, *Edwards* 2296.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. In pristine forests. Threat: Rare in Brunei.

Selaginella intermedia (Blume) Spring, *Bull. Acad. Roy. Sci. Bruxelles* 10: 144. 1843.

(=) *Selaginella atroviridis* (Wall. ex Hook. & Grev.) Spring, *Flora* 21: 183. 1838.

BEL: Labi, Sg Teraja, *Edwards* 2534; Melilas, Sg Ingei, *Wong WKM664*; Melilas, Ulu Ingei, *Wong WKM s.n.*; Sg Ingei, upstream, *Edwards* 2377; Sg Liang, *Edwards* 489. **BRM:** Jln Sg Akar, *Edwards* 444. **TEM:** Bkt Belalong, *Edwards* 815.

Distribution. India, Myanmar, throughout Malesia.

Ecology. In pristine forests, along streams. Threat: Least Concern.

Selaginella involvens (Sw.) Spring, *Bull. Acad. Roy. Sci. Bruxelles* 10(1): 136. 1843. (Fig. 5).

TEM: Amo, Kerangan Meritam, *Hussain et al. BRUN15676*; Amo, Sg Temburong, *Wong WKM1718*; Amo, Sg Belalong (Amo), *Wong WKM1339*; Amo, K Belalong, *Dransfield SD1002*; Amo, K Belalong, *Dransfield SD990*; Amo, Sg Temburong, *Wong WKM460*; Batu Apoi, *Samhan SN9*.

Distribution. Sri Lanka, India, China, Korea, Japan, Indochina, Malaysia (Sabah, Sarawak), Brunei, Indonesia (Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku).



Figure 5. Selaginellaceae. *Selaginella involvens* (Photo KM. Wong).

Ecology. In pristine lowland forests to 1200 m a.s.l. Threat: Least Concern.

Selaginella lobbii Veitch ex A.Braun., Index Sem. Hort. Berol. 20. 1858.

TEM: Sg Belalong, *Edwards* 938; Batu Apoi, *Edwards* 2447.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. In pristine forests. Threat: Rare in Brunei.

Selaginella longiaristata Hieron., Hedwigia 50: 16. 1910.

BRM: Lumapas, Kpg Dadap, *Edwards* 2412.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. In pristine lowland forests. Threat: Rare in Brunei.

Selaginella plana (Desv. ex Poir.) Hieron., Nat. Pflanzenfam. [Engler & Prantl] 1(4): 703. 1901.

BRM: Jln Sg Akar, *Edwards* 443.

Distribution. Malay Peninsula, Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Sulawesi, Maluku), widely naturalised in tropical and subtropical regions.

Ecology. In pristine forests. Threat: Rare in Brunei.

Selaginella subserpentina Alderw., Bull. Jard. Bot. Buitenzorg 2, 1: 17. 1911.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP98*.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. In pristine lowland forests. Threat: Rare in Brunei.

Selaginella tamariscina (P.Beauv.) Spring, Bull. Acad. Roy. Sci. Bruxelles 10(1): 136. 1843.

TEM: Sg Sitam, FSC, *Edwards* 2017.

Distribution. India, China, Japan, North and South Korea, Thailand, Malaysia (Sabah), Brunei, Indonesia (Java, Lesser Sunda Islands, Sulawesi), Philippines.

Ecology. In pristine forests. Threat: Rare in Brunei.

Selaginella wallichii (Hook. & Grev.) Spring, Fl. Bras. (Martius) 1(2): 124. 1840.

BRM: Jln Sg Akar, *Edwards* 518.

Distribution. China, Indochina, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Sumatra, Indonesian New Guinea).

Ecology. In pristine forests. Threat: Rare in Brunei.

Selaginella willdenowii (Desv. ex Poir.) Baker, Gard. Chron. 783. 1867.

TEM: Bangar, Sg Temburong, *Edwards* 496.

Distribution. India, China, Indochina, Malay Peninsula, Indonesia (Sumatra, Java), the Philippines, widely naturalised in tropical regions.

Ecology. In pristine forests. Threat: Rare in Brunei.

PTERIDOPHYTA

Family 3. ASPLENIACEAE

3.1. *Asplenium* L., Sp. Pl.: 1078. 1753.

Asplenium affine Sw., J. Bot. (Schrader) 1800(2): 56. 1801.

BEL: K Belait, Sg Belait, *Edwards* 2417. **TEM:** Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2421; Amo, Batu Apoi FR (K Belalong), *Hansen CH1619*; Amo, Sg Temburong, *Johns RJ7391*, *Edwards*

2130; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2074*; Sg Sitam, FSC, *Edwards 996*; Sg Belalong & Sg Esu, FSC, *Edwards 2198*.

Distribution. West Indian Ocean Islands, Sri Lanka, India, China, Indochina, throughout Malesia to Australia and Fiji.

Ecology. It is found in mature forests in muddy soil and humid places; abundant along slopes from the lowlands to 1500 m a.s.l. Threat: Least Concern. Notes: This species is widely distributed in the old-world tropics and displays a wide morphological variability; and is considered as a particularly complex species (Philcox 2006).

Asplenium anguineum Christ, J. Bot. (Morot), sér. 2, 1: 232, 265. 1908.

BEL: Sukang, Buau-Sindum, *Idris et al. BRUN18619*; Melilas, Ulu Ingei, *Idris et al. BRUN17318*, *Sands MS5923*; Labi, Wasai Mendaram, *Johns RJ6810*; Labi, Labi, *Johns RJ6833*, *Johns RJ6897*; K Belait, Sg Belait, *Dransfield SD1140*. **TEM:** Amo, Bkt Belalong, *Johns RJ7003*; Amo, Ulu Belalong LP382, *Idris et al. BRUN16690*; Bangar, Bkt Bangar, *Johns RJ7044*; Amo, K Belalong, *Ashton A14*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2095*, *Edwards 2040*, *Hansen CH1528*, *Poulsen ADP146*; Batu Apoi, Sg Selapon, *Wong WKM2038*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2330*, *Simpson 2325*; Amo, Sg Temburong, *Johns RJ7351*, *Johns RJ6952*, *Johns RJ7236*; Batu Apoi, Kpg Selapon, *Dransfield SD1158*; Amo, Kerangan Meritam, *Hussain et al. BRUN15675*. **TUT:** Rambai, Sg Tutong (Belabau), *Coode MC6345*; Rambai, Sg Medit, *Simpson 2588*; Rambai, Ulu Tutong, *Johns RJ7558*, *Johns RJ7644*; Lamunin, Ladan Hills FR, *Johns RJ7094*.

Distribution. From South China to New Guinea.

Ecology. In shade forest, along rivers, streams or in humid sites; lowlands to 1000 m a.s.l. Threat: Least Concern.

Asplenium borneense Hook., Sp. Fil. 3: 138 t–186. 1860.

TEM: Amo, Bkt Retak, *Johns RJ6679*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. In mature forest, from lowland to submontane forest. Threat: Rare in Brunei.

Asplenium colubrinum Christ, Bull. Herb. Boissier II(6): 999. 1906.

TEM: Labu, Peradayan FR, *Johns RJ7049*; Amo, Batu Apoi FR; *Johns RJ6932*; Amo, Bkt Retak; *Johns RJ6614*; Labu, Peradayan FR, *Johns RJ7050*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Philippines.

Ecology. Terrestrial, in mature forest; lowlands to 1000 m a.s.l. Threat: Rare in Brunei.

Asplenium longissimum Blume, Enum. Pl. Javae 2: 178. 1828. (Fig. 6).

(=) *Asplenium anisodontum* C.Presl, Epimel. Bot. 73. 1851.

TEM: Amo, Belalong, KBFSC, *Cicuzza 2722*. **TUT:** Telisai, Kpg Telamba, *Ariffin et al. BRUN20766*; Ukong, Kpg Sg Damit, *Ariffin et al. BRUN20439*; Kago dam, *Cicuzza 2646*; Labi hill, *Cicuzza 2684*.

Distribution. India, Bangladesh, the Chagos Islands, Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Java, Sulawesi, Lesser Sunda Islands), Philippines.

Ecology. In dry places; lowlands to 2000 m a.s.l. Threat: Least Concern.

Asplenium cf. *longissimum* Blume

TEM: Amo, Bkt Retak, *Johns RJ6626*.

Asplenium macrophyllum Sw., J. Bot. (Schrader) 1800(2): 52. 1801.

TEM: Sg Dolhakim, *Edwards 574*.



Figure 6. Aspleniaceae. *Asplenium longissimum* (Photo D. Cicuzza).

Distribution. Cameroon, West Indian Ocean Islands, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Lesser Sunda Islands, Kalimantan, Maluku), Philippines, New Guinea, to Polynesia.

Ecology. Along rivers in mature forest. Threat: Rare in Brunei.

Asplenium nidus L., Sp. Pl. 2: 1079. 1753. (Fig. 7).

BEL: Labi, Wasai Wong Kadir, *Johns RJ7445*. Labi, Bkt Teraja, *Johns RJ6890*. **BRM:** Serasa, Meragang Beach, *Idris et al. BRUN17363*; P Punyit, *Wong & Kamariah s.n.*; Sg Akar, *Edwards 439*. **TEM:** Bangar, Bkt Bangar, *Johns RJ7035*, *Johns RJ7046*; Bangar, Bkt Biang, *Forman LLF925*; Amo, Batu Apoi FR (K Belalong FSC), *Wong WKM1321*; Amo, Batu Apoi FR (K Belalong FSC), *Hansen CH1512*; Amo, Sg Temburong, *Johns RJ6943*; Amo, K Belalong, *Wong WKM1*. **TUT:** Rambai, Tasek Merimbun, *Suzuki K13056*. Rambai, Tasek Merimbun, *Johns RJ7468*; Lamunin, *Edwards 968*; Merimbun lake, *Cicuzza 2553*.

Distribution. Old World Tropics.

Ecology. In secondary forests, plantations, and parks; a common species in Southeast Asia. Threat: Least Concern.



Figure 7. Aspleniaceae. *Asplenium nidus* (Photo D. Cicuzza).

Asplenium nitidum Sw., Syn. Fil. (Swartz): 84, 280. 1806. (Fig. 8).

BEL: Melilas, Sg Ingei, *Wong WKM666*; Sg Teraja, *Edwards 704*; Sg Belait, *Edwards 2417*, Labi Hill, *Cicuzza 2685*. **BRM:** Mentiri, Kpg Mentiri, *Edwards 669*. **TEM:** Amo, K Belalong FSC, *Dran-sfield SD1012*; Batu Apoi, Sg Selapon, *Wong WKM2040*; Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2061*; Bkt Patoi, *Edwards 2256*. **TUT:** Benutan lake, *Edwards 2227*.

Distribution. Sri Lanka, India, Himalaya (Nepal to Assam), Indochina, Sumatra, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei.

Ecology. Epiphytic, sometimes lithophytic; in Brunei, found from coastal forest to 1000 m a.s.l. Threat: Least Concern.

Asplenium pellucidum Lam., Encycl. 2: 305. 1786.

TEM: Amo, K Belalong FSC, *Middleton DJM772*, *Edwards 2170*, *Edwards 2065*, *Edwards 995*, *Wong WKM1316*; Amo, Sg Temburong; *Johns RJ7281*, *Johns RJ7199*; Amo, Sg Belalong, *Johns RJ6997*, Amo, Sg Belalong, *Cicuzza 2608*. **TUT:** Merimbun Lake, *Cicuzza 2546*.

Distribution. Old World Tropics.



Figure 8. Aspleniaceae. *Asplenium nitidum* (Photo D. Cicuzza).

Ecology. In open forest and shrubby areas; lowlands to 1100 m a.s.l. Threat: Least Concern.

Asplenium phyllitidis D.Don, Prodr. Fl. Nepal. 7. 125. 1825.

TEM: Amo, Bkt Retak, Wong WKM916; Belalong, MDF, Cicuzza 2580. **TUT:** Lamunin, Kpg Lamunin, Edwards 968; Amo, FSC, Tagane B567; Sg Engkiang, FSC, Edwards 2095; Sg Sitam FSC, Edwards 2040; Merimbun lake, Cicuzza 2552.

Distribution. India, Nepal, China, Indochina, throughout Malaysia, West Pacific Islands.

Ecology. Epiphytic in mature tropical forests, usually in humid sites; lowlands to 1100 m a.s.l. Threat: Least concern.

Asplenium salignum Blume, Enum. Pl. Javae 2: 175. 1828. (Fig. 9).

TEM: Amo, Sg Belalong, Edwards 2134, Edwards 2126; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2181, Edwards 2002; Amo, Sg Belalong (Amo); Edwards 2126; Sg Motong, Batu Apoi, Samhan SN16; Sg Baki FSC, Edwards 2293; Sg Sitam FSC, Edwards 2039.



Figure 9. Aspleniaceae. *Asplenium salignum* (Photo KM. Wong).

Distribution. China, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku).

Ecology. In evergreen forest to 1500 m a.s.l. Threat: Least Concern.

Asplenium scolopendrioides J.Sm., J. Bot. (Hooker) 3: 408 (nomen). 1841; J.Sm. ex Hook, Hooker's Icon. Pl. t. 930. 1854.

BEL: Labi, Labi Hills FR (Compt 12), Ariffin et al. BRUN21312; Labi, Sg Teraja, Edwards 796. **TEM:** Amo, Bkt Belalong, Johns RJ7009; Sg Motong, Batu Apoi, Samhan SN13.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Kalimantan), Philippines.

Ecology. In deep shade, either in mixed dipterocarp forest or on limestone, to 1500 m a.s.l. Threat: Rare in Brunei.

Asplenium tenerum G.Forst., Fl. Ins. Austr. 80. 1786. (Fig. 10).

BEL: Melilas, Sg Ingei, Wong WKM631. Melilas, Sg Ingei, Edwards 2355; Labi, Sg Teraja, Edwards 701. **TEM:** Dransfield SD993, Dran-



Figure 10. Aspleniaceae. *Asplenium tenerum* (Photo D. Cicuzza).

sfield SD989; Amo, Bkt Retak, Wong WKM843, Johns RJ6714, Johns RJ6678; Amo, Sg Temburong, Johns RJ7200; Johns RJ7226, Idris et al. BRUN15603; Amo, Sg Belalong, Johns RJ6953; Amo, Batu Apoi FR (K Belalong FSC), Hansen CH1618; Lee 1040; Amo, Bkt Retak, Johns RJ6621; Amo, Sg Belalong, Middleton DJM747; Amo, Sg Sibut, Johns RJ6904; Batu Apoi, Sg Temburong (Headwaters), Wong WKM1961; Batu Apoi, Sg Selapon, Wong WKM2042; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2331, Simpson 2329, Simpson 2496; Amo, Batu Apoi FR (K Belalong FSC), Edwards 994, Edwards 2007, Edwards 2187; Amo, Sg Belalong, Edwards 2137; Amo, Batu Apoi FR, Poulsen ADP259, Poulsen ADP266; Amo, G Pagon Periok, Ashton A476; Amo, Bkt Belalong, Johns RJ7018; Amo, Sg Temburong, Johns RJ6931; Amo, K Belalong, Ashton A51, Ashton A34; Amo, Belalong ridge, De Vogel 8934; Amo, FSC, Tagane B495; Batu Apoi, Wong WKM278; Amo, Belalong, FSC, Cicuzza 2518; Amo, Sg Belalong, Cicuzza 2629; Amo, Sg Belalong, Cicuzza 2732. **TUT:** Rambai, Ulu Tutong, Johns RJ7548.

Distribution. Sri Lanka, India, China, Japan, Indochina throughout Malesia to the Pacific Islands.

Ecology. Epiphytic, sometimes lithophytic; lowlands to 1500 m a.s.l. Threat: Least Concern.

Asplenium trifoliatum Copel., Philipp. J. Sci., C. 5: 284. 1910.

TEM: Sg Baki FSC, Edwards 2298; Sg Baki FSC, Edwards 2146; Sibut river, Johns RJ6904; Sg Temburong, Wong WKM1961.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah).

Ecology. Lithophyte in lowland mature forests. Threat: Rare in Brunei.

Asplenium vittaeforme Cav., Descr. Pl. 255. 1802.

(=) *Asplenium squamulatum* Blume, Enum. Pl. Javae 2: 174. 1828.

TEM: Amo, Bkt Belalong, De Vogel 9020; Belalong river, Wong WKM1333; Dransfield SD988.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Indonesian New Guinea), Philippines.

Ecology. Lithophyte, in dense forests from the lowlands to lower montane forests. Threat: Least Concern.

Asplenium* cf. *vittaeforme Cav.

TEM: Amo, K Belalong, Dransfield SD979, Dransfield SD988; Amo, K Belalong, De Vogel 8929, Wong WKM281; Amo, Sg Temburong, Wong WKM1333.

Family 4. ATHYRIACEAE

4.1. *Diplazium* Sw., J. Bot (Schrader) 1800(2): 4, 61. 1801.

Diplazium cordifolium Blume, Enum. Pl. Javae 2: 190. 1828.

BEL: Labi, Kpg Labi, Ariffin ARK70; Melilas, Batu Melintang, Kessler PK389; Pipeline road, Belait, Edwards 980. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), Edwards 2054; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP203; Amo, Sg Belalong (Amo), Edwards 2099; Amo, Sg Belalong (Amo), Wong WKM1158; Amo, Batu Apoi FR (K Belalong), Poulsen ADP144; Amo, Bkt Retak, Johns RJ6741; Amo, Bkt Retak, Johns RJ6709; Amo, Sg Sibut, Johns RJ6907; Amo, Sg Belalong (Amo), Middleton DJM763; Bangar, Pekan Bangar, Ashton A85; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2443; Labu, Bkt Patoi (Peradayan FR), Edwards 925; Amo, Ulu Temburong, Ariffin et al. BRUN15747; Amo, Bkt Retak, Johns RJ6622; Sg Temburong, FSC, Hovenkamp BR001; Amo, FSC, Tagane B269; Sg Sitam FSC, Edwards 2025; Sg Sitam FSC, Edwards 991; Sg Sitam FSC, Edwards 2020; G Pagon, Booth P18; Amo, G Pagon, Liaw 45; Amo, Belalong FSC, Cicuzza 2639. **TUT:** Lamunin, Benutan dam, Edwards 930; Benutan Lake, Edwards 2335; Benutan Lake, Edwards 2243; Benutan Lake, Edwards 2225; Benutan Lake, Edwards 930; Lamunin, water tower, Edwards 745.

Distribution. Indochina, throughout Malesia to the Solomon Islands and Australia.

Ecology. In mature forest, usually in shady habitats; common but at low densities; lowlands to 1500 m a.s.l. Threat: Least Concern.

Diplazium dilatatum Blume, Enum. Pl. Javae 2: 194. 1828.

TEM: Sg Belalong, FSC, Edwards 2390; Sg Babi, FSC, Edwards 2145; Sg Enkiang, FSC, Edwards 2049; Sg Belalong, FSC, Edwards 2106; Amo, Belalong, FSC, Hovenkamp BR013.

Distribution. Sri Lanka, India, China, Japan, Indochina, throughout Malesia to the Solomon Islands and Australia.

Ecology. Lowlands, in mature tropical forest and old secondary forest. Threat: Least Concern.

Diplazium esculentum (Retz.) Sw., J. Bot. (Schrader) 1801(2): 312. 1803. (Fig. 11).

BEL: Bkt Sawat, Bkt Sawat, Azlan et al. BRUN22303; Labi, Sg Teraja, Edwards 2536. **BRM:** Qawi s.n. **TEM:** Obud dam, Edwards 2391; Batu Apoi, Belalong, Poulsen ADP144.

Distribution: India, Sri Lanka, China, Japan, Indochina, throughout Malesia to the Pacific Islands, widely naturalised.

Ecology. Common at forest margins and abundant in plantations and farms, usually cultivated; lowlands to 1000 m a.s.l. Threat: Least Concern.



Figure 11. Athyriaceae. *Diplazium esculentum* (Photo D. Cicuzza).

Notes

One of the most common edible ferns in Southeast Asia.

Diplazium fraxinifolium C.Presl, Reliq. Haenk. 1(1): 49. 1825.

Athyrium riparium (Holttum) Holttum, Rev. Fl. Malaya 2: 554 (1955 [‘1954’]).

Diplazium riparium Holttum, Gard. Bull. Straits Settlement. 11(2): 97 (1940); Holttum, Rev. Fl. Malaya, ed. 2, 2: 637 (1968).

BEL: Labi, Sg Teraja, *Edwards* 2537; Arboretum Sg Liang, *Edwards* 478; Labi, Sg Teraja, *Edwards* 762; Labi, Sg Teraja, *Edwards* 795; Labi, Labi Hills FR (Compt 12), *Ariffin et al.* BRUN21319; Labi, Labi Hills FR (Compt 12), *Ariffin et al.* BRUN21445. **TEM:** Sg Temburong FSC area, *Edwards* 2156; Sg Temburong, FSC area, *Edwards* 2190; Sg Sitam, FSC, *Edwards* 2026; Sg Babi, FSC, *Edwards* 2151; Bkt Patoi, *Edwards* 888; Sg Belalong FSC, *Edwards* 2086; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP123*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2180; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2460; Amo, Batu Apoi, *Ariffin et al.* BRUN23437; Amo, Batu Apoi, *Hovenkamp BR011*, *Hovenkamp BR004*; Amo, Belalong FSC, *Cicuzza* 2633; Kpg Bakok, *Cicuzza* 2712.

Distribution. India, Brunei, Indonesia (Java, Kalimantan), Philippines, New Guinea.

Ecology. In primary lowland forest on wet soil and close to streams. Threat: Least Concern.

Diplazium holttumii Hovenkamp, Gard. Bull. Singapore 71(1): 62. 2019.

BEL: Liang, Andulau FR (Sg Liang), *Edwards* 905. **TEM:** Amo, FSC, *Tagane B61*; Amo, Bkt Retak, *Johns RJ6618*; Batu Apoi, Belalong, *Poulsen ADP348*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Maluku).

Ecology. In lower montane forests, along trails and on well-drained soil. Threat: Least Concern, but not frequent in Brunei.

Diplazium hottae Tagawa, Acta Phytotax. Geobot. 25(2–3): 65. 1972.

BEL: Kpg Mendaram, *Ariffin et al.* BRUN23455; Kpg Rampayoh, *Ariffin et al.* BRUN23690. **TEM:** Amo, Bkt Belalong, *Dransfield SD1249*; Amo, Ulu Belalong LP382, *Kirkup DK907*; Amo, Bkt Belalong, *Edwards* 2315; Bkt Belalong, *Edwards* 810; Sg Baki, FSC, *Edwards* 2294; Amo, Belalong, FSC, *Hovenkamp BR015*; Amo, Belalong, FSC, *Hovenkamp BR017*. **TUT:** Lamunin, *Edwards* 740.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. Along rivers in mature forest where large boulders are present; lowlands below 500 m a.s.l. Threat: Least Concern.

Diplazium pallidum (Blume) T.Moore, Index Fil. 16: 333. 1861. (Fig. 12).

(=) *Diplazium crenatoserratum* (Blume) T.Moore, Index Fil. 121: 325. 1859.

BEL: Labi, Sg Mendaram, *Johns RJ6805*; Labi, Wasai Wong Kadir, *Johns RJ7435*, *Cicuzza* 2583; Sg Rampayoh, Sandstone, Labi, *Cocde MC7255*; Andulau, *Ashton A188*; Sg Liang, *Wong WKM949*. **TEM:** Amo, Bkt Belalong, *Poulsen ADP346*; Amo, Sg Belalong, *Cicuzza* 2743; Bkt Belalong, *Wong WKM1363*; Bkt Patoi, *Simpson* 2214; Sg Belalong, *Edwards* 2082; Batu Apoi, *Poulsen ADP26*; Bkt Belalong, *Sands MS5540*; FSC, *Schatz GS3306*; Amo, K Belalong, *Wong WKM1422*; Amo, Batu Apoi FR (K Belalong FSC), *Ariffin et al.* BRUN23426 (two sheets), *Poulsen ADP73*, *Poulsen ADP91*, *Nielsen* 1069; Ulu Temburong, *Ariffin et al.* BRUN24119, *Johns RJ6918*, *Said et al.* BRUN15894; Bkt Belalong, *Dransfield SD1218*; G Retak, *Johns RJ6729*, *Johns RJ6681*; Sg Belalong, FSC, *Hovenkamp BR019*; Amo, Sg Belalong FSC, *Cicuzza* 2606, *Cicuzza* 2609. **TUT:** Telisai, Telamba bridge, *Ariffin et al.* BRUN20761.

Distribution. Indochina, throughout Malesia to the Solomon Islands and Australia.

Ecology. Occurs in forests with well-drained soil, secondary forests, and disturbed forests; lowlands to 1500 m a.s.l. Threat: Least Concern.



Figure 12. Athyriaceae. *Diplazium pallidum* (Photo D. Cicuzza).

Diplazium polypodioides Blume, Enum. Pl. Javae 2: 194. 1828.

(=) *Diplazium asperuma* Blume, Enum. Pl. Javae 2: 195. 1828.

(=) *Athyrium asperum* (Blume) Milde, Bot. Zeit. 1870: 353. 1870.

TEM: Amo, Batu Apoi FR, *Poulsen ADP184*.

Distribution. India, Sri Lanka, China, Indochina, throughout Malesia to the Solomon Islands.

Ecology. Along streams with large boulders and partly-open canopies; lowlands to 1000 m a.s.l. Threat: Least Concern.

Diplazium porphyrorachis (Baker) Diels, Nat. Pflanzenfam. [Engler & Prantl] 1(4). 225. 1899.

BEL: Sg Ingei, Batu Melintang, *Edwards 2349*; Sg Mendaram, *Ariffin et al. BRUN23237*; Labi Hills, Sg Rampayoh, *Ariffin et al. BRUN22451*; Labi, Wasai Wong Kadir, *Cicuzza 2586*. **TEM:** Amo, Bkt Belalong, *Poulsen ADP91*; Amo, Bkt Retak, *Johns RJ6624*; Amo, Sg Temburong, *Johns RJ7256*; Amo, Bkt Retak, *Johns RJ6682*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP80*;

Amo, K Belalong FSC; *Edwards 2166*; Amo, Ulu Belalong; *Idris et al. BRUN16655*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2233*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2416*; Amo, Belalong, FSC, *Hovenkamp BR016*; Amo, Belalong, *Cicuzza 2612*; Amo, Sg Belalong, *Cicuzza 2636*. **TUT:** Lamunin, Ladan Hills FR, *Johns RJ7105*; Lamunin, Ladan Hills FR, *Edwards 946*; Rambai, Ulu Tutong, *Johns RJ7514*; Lamunin, water tower, *Edwards 751*; Ladan hill, Banutan, *Edwards 946*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. Shady habitats in mature forest with well-drained soil; lowlands below 500 m a.s.l. Threat: Least Concern.

Notes

Common but not abundant within the Brunei mature MDF forests. Usually solitary, often fertile. Leaves have a certain degree of morphological variability, specifically in their length and width.

Diplazium tomentosum Blume, Enum. Pl. Javae 2: 192. 1828.

BEL: Sg Mendaram, *Ariffin et al. BRUN22797*. **TEM:** Amo, Bkt Retak, *Johns 6620*; Amo, Bkt Retak, *Johns 6617*; Bkt Tudal Area, *Said et al. BRUN15810*. **TUT:** Rambai, Sg Tutong (Belabau), *Coode 6321*; Bkt Patoi, *Edwards 923*; Amo, Sg Belalong, *Cicuzza 2735*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines.

Ecology. In primary forest, in well-drained soil, in shady habitats; lowlands to 1000 m a.s.l. Threat: Least Concern.

Notes

One of the few fern species which has iridescent leaves.

Diplazium wahauense M.Kato, Darnaedi & K.Iwats., J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot. 15(1): 101. 1991.

TUT: Ladan hill, Banutan catchment, *Edwards 947*.

Distribution. Endemic to Borneo (Brunei, Kalimantan).

Ecology. In primary forest. Threat: Rare in Brunei.

Diplazium xiphophyllum (Baker) C.Ch., Index Filic. 241. 1905.

TEM: Amo, Belalong, *Hovenkamp BR012*; Batu Apoi, *Poulsen ADP114*.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Maluku), and the Philippines.

Ecology. In primary forest. Threat: Rare in Brunei.

Family 5. BLECHNACEAE

5.1. *Blechnopsis* C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 115. 1851.

Blechnopsis finlaysoniana (Wall. ex Hook. & Grev.) C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 115. 1851. (Fig. 13).

BEL: Liang, Andulau FR (Sg Liang), Ibrahim *et al.* BRUN19831, Ariffin *et al.* BRUN23246; Labi, Bkt Teraja, Johns RJ6831; Arbo-retum Sg Liang, Edwards 477; Wasai Wong Kadir, Cicuzza 2591. **TEM:** Amo, Sg Belalong (Amo); Edwards 2097; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2336; Batu Apoi, Sg Temburong, Poulsen ADP136, Wong WKM481; Amo, Batu Apoi FR, Cowley JC39; Batang Duri, Kian 4; Batang Duri, Kian 2; Amo, Belalong, FSC Cicuzza 2615; Amo, Sg Belalong, Cicuzza 2632, Amo, Sg Belalong, Cicuzza 2659. **TUT:** Lamunin, Ladan Hills FR, Johns RJ7101; Lamunin, Benutan dam, Edwards 2246; Ladan hill, Benutan dam, Edwards 950.

Distribution. From Indochina, throughout Malesia.

Ecology. In tropical mature forest on well-drained soil and close to streams; lowlands to 1500 m a.s.l. Threat: Least Concern.



Figure 13. Blechnaceae. *Blechnum finlaysoniana* (Photo D. Cicuzza).

Notes

This species can be confused with *B. orientalis*, particularly when leaves of this are large due to nutrient-rich soil. However, within Brunei, the two species can be easily separated. *B. finlaysoniana* is restricted to shady habitats and small gaps in mature forests or secondary forests, whereas *B. orientalis*, if present in forests or forest gaps, is always found on dryer sites, and the pinna are often thinner.

Blechnopsis orientalis (L.) C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 477. 1851.

BEL: Labi, Bkt Teraja, Sands MS5686; Labi, Bkt Teraja, Johns RJ6889; Sg Sagat, Lee 914. **BRM:** Kilanas, Terjun Menyusop, Sands MS5674; Kota Batu, Kpg Kota Batu, Johns RJ6794; UBD campus, Chin s.n.; Sg Akar, Kian 1; Bandar, Edwards 402. **TEM:** Bangar, Bkt Bangar, Johns RJ7040; Amo, Bkt Retak, Wong WKM829, Johns RJ 6590; Amo, Bkt Belalong, Wong WKM1481; Amo, Sg Temburong, Johns RJ6923; Amo, G Pagon, Liaw 26; Batang Duri, Kian 9; Batang Duri, Kian 5. **TUT:** Tg Maya, Kpg Bkt Udai, Voeks RV500; Telisai, Johns RJ6792; Rambai, Tasek Merimbun, Suzuki K13040; Rambai, Tasek Merimbun, Bernstein JHB224.

Distribution. Throughout the tropics of Asia, Australia, and the Pacific Islands.

Ecology. In sunny places and along hill slopes. Threat: Least Concern.

5.2. *Parablechnum* C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 109. 1851.

Parablechnum vestitum (Blume) Gasper & Salino, Phytotaxa 275(3): 217. 2016.

TEM: G Pagon, Booth P19; G Pagon, Edwards & Cantley 723; Bkt Retak, Edwards 854; Amo, G Pagon ridge, Wong WKM1849; Amo, G Pagon, Coode MC7448; Amo, Bkt Retak, Johns RJ6768.

Distribution. Throughout Malesia except New Guinea.

Ecology. In open sites with humid soil. In Brunei, only collected in the Pagon mountain chain on montane sites above 1500 m a.s.l. Threat: Least Concern.

5.3. *Stenochlaena* J.Sm., J. Bot. (Hooker) 3: 401. 1841.

Stenochlaena palustris (Burm.f.) Bedd., Ferns S. India, Suppl. (1.): 26. 1876. (Fig. 14).

BEL: Bkt Sawat, Bkt Sawat, Idris *et al.* BRUN15844; Labi, Bkt Teraja, Johns RJ6887; Labi, Wasai Wong Kadir, Johns RJ7431. **TEM:** Bkt Patoi, Edwards 2252. **TUT:** Rambai, Tasek Merimbun, Bernstein JHB290, Uchida K13618; Rambai, Bkt Tangan, Suzuki K13313; Ukong, Kpg Ukong, Johns RJ7083.

Distribution. Sri Lanka, India, Indochina, throughout Malesia to Australia and Polynesia.

Ecology. It is found in lowland areas, and is common in flooded areas, swamp forest margins, and channels. The species is collected and eaten as a vegetable throughout Southeast Asia. Threat: Least Concern.

5.4. *Telmatoblechnum* Perrie, D.J.Ohlsen & Brownsey, *Taxon* 63(4): 755. 2014.

Telmatoblechnum indicum (Burm.f.) Perrie, D.J.Ohlsen & Brownsey, *Taxon* 63(4): 755. 2014. (Fig. 15).

BRM: Kota Batu, Bandar Seri Begawan, *Edwards* 675.

Distribution. Indochina, throughout Malesia, to Australia and Western Pacific Islands.

Ecology. In degraded flooded areas. Threat: Least Concern.

Notes

Despite the sole herbarium specimen, this species is rather common, particularly at the disturbed site of peat swamp forest margin in Kuala Belait and Tutong district.

Family 6. CIBOTIACEAE

6.1 *Cibotium* Kaulf., Berlin. *Jahrb. Pharm. Verbundenen Wiss.* 21: 53. 1820.

Cibotium barometz (L.) J.Sm., London *J. Bot.* 1: 437. 1842.

TEM: Amo, Bkt Retak, *Wong WKM828*.

Distribution. India, China, Japan, Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), and New Guinea.

Ecology. Open sites in forests and forest margins; recorded at 1600 m a.s.l. Threat: rare in Brunei.

Notes

Collected only from a single site on mountain habitat, never collected from lowland sites. However, this species is famous for its medicinal uses and thus there is a need to consider the threat of overexploitation.



Figure 14. Blechnaceae. *Stenochlaena palustris* (Photo D. Cicuzza).



Figure 15. Blechnaceae. *Telmatoblechnum indicum* (Photo D. Cicuzza).

Family 7. CYATHEACEAE

7.1. *Alsophila* R.Br., Prodr. Fl. Nov. Holland.: 158. 1810.

Alsophila borneensis (Copel.) R.M.Tryon, Contr. Gray Herb. 200: 31. 1970.

(≡) *Cyathea borneensis* Copel., Philipp. J. Sci., C 6: 135. 1911.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2012, Edwards 2059, Edwards 2063, Edwards 2067, Edwards 2116, Edwards 2117, Edwards 2144, Edwards 2200, Hansen CH1536, Nielsen 1038* (3 vouchers); Amo, Sg Isu, *Edwards 2119*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1944*; Sg Baki FSC, *Edwards 2292*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), and Brunei.

Ecology. Along rivers in mature forest. Threat: Rare in Brunei.

Alsophila commutata Mett. in Ann. Mus. Bot. Lugduno-Batavi 1: 53. 1863.

(=) *Cyathea recommutata* Copel., Philipp. J. Sci., C 4: 36. 1909.

TEM: Amo, Bkt Tudal, *Idris et al. BRUN15795*; Amo, Bkt Retak, *Wong WKM786*.

Distribution. Indonesia (Sumatra, Kalimantan), Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei.

Ecology. In mature forest, c. 600 m a.s.l. Threat: Rare in Brunei.

Alsophila glabra Hook. Sp. Fil. 1: 51. 1844.

(=) *Cyathea glabra* (Blume) Copel., Philipp. J. Sci., C 4: 35. 1909.

BEL: Seria, Pekan Seria, *Edwards 910*; Lumut, *Ariffin et al. BRUN23191*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, West Java, Lesser Sunda Islands, Kalimantan).

Ecology. In peat swamp forest and lowland forest. Threat: Rare in Brunei.

Alsophila latebrosa Wall. ex Hook., Sp. Fil. 1: 37. 1844.

(≡) *Cyathea latebrosa* (Wall. ex Hook.) Copel., Philipp. J. Sci., C 4: 52. 1909.

TEM: Amo, Bkt Belalong, *Wong WKM1539*; Amo, Bkt Retak, *Johns RJ6589*; Sg Temburong near Bangar, *Edwards 631*; Bkt Belalong, ridge, *Edwards 2319*.

Distribution. China (Hainan), Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. In tropical forests. Threat: Rare in Brunei.

Alsophila ramispina Hook., Syn. Fil.: 42. 1866. (Fig. 16).

(≡) *Cyathea ramispina* (Hook.) Copel., Philipp. J. Sci., 4: 36. 1909.

TEM: Amo, Bkt Retak, *Edwards 819, Johns RJ6522, Johns RJ6769, Wong WKM443*; Amo, G Pagon, *Booth P8, Edwards & Cantley 722, Wong WKM1779*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. In primary forests; lowlands to 2500 m a.s.l. Threat: Rare in Brunei.



Figure 16. Cyatheaceae. *Alsophila ramispina* (Photo KM. Wong).

7.2. *Sphaeropteris* Bernh., J. Bot (Schrader) 1800(2): 122. 1801.

***Sphaeropteris alternans* (Hook.) R.M.Tryon, Contr. Gray Herb. 200: 21. 1970.**

($\equiv$) *Cyathea alternans* (Hook.) C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 5: 347. 1848.

BRM: Mentiri pools, *Edwards* 673.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra).

Ecology. Along rivers and lakes. Threat: Rare in Brunei.

***Sphaeropteris angustipinna* (Holttum) R.M.Tryon, Contr. Gray Herb. 200: 21. 1970.**

($\equiv$) *Cyathea angustipinna* Holttum, Kew Bull. 16: 52. 1962.

BEL: Melilas, Sg Ingei, *Wong WKM616, Edwards* 2367; Melilas, Ulu Ingei, *Dransfield* SD958.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. Along rivers and in humid sites in mature forest. Threat: Rare in Brunei.

***Sphaeropteris leucotricha* (Christ) R.M.Tryon, Contr. Gray Herb. 200: 22. 1970.**

($\equiv$) *Cyathea leucotricha* Christ, Ann. Jard. Bot. Buitenzorg 20(1): 135. 1905.

TEM: Amo, Sg Belalong, *Edwards* 2174, *Wong WKM1332*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 999, *Samhan* SN91/9.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. In proximity to rivers in mature forest, in lowland forest. Threat: Rare in Brunei.

***Sphaeropteris moluccana* (R.Br. ex Desv.) R.M.Tryon, Contr. Gray Herb. 200: 22. 1970. (Fig. 17).**

($\equiv$) *Cyathea moluccana* R.Br. ex Desv., Mém. Soc. Linn. Paris 6(3): 322. 1827.

BEL: Labi, Bkt Teraja, *Simpson* 2077; Seria, Badas SL, *Ashton* A141; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1019*; Liang, Andulau FR (Sg Liang), *Ariffin et al. BRUN22033*, Labi, Ulu Sg Mendaram, *Ariffin et al. BRUN22809*; Belait, *Kirkup* DK497. **BRM:** Kpg Dadap, recreation forest, *Edwards* 2274. **TEM:** Batu Apoi, Sg Temburong, *Poulsen* ADP69, *Edwards* 2154, *Schatz* GS3295, *Lee* 1016; Batu Apoi, Sg Temburong-Machang, *Wong WKM1924*, *Athen* PA006; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2011, *Samhan* SN91/7, *Samhan* SN91/11; Batang Duri

Mini-Zoo, *Kian* 3. **TUT:** Rambai, Ulu Tutong, *Kirkup* DK497; Ukong, Andulau FR, *Ariffin et al. BRUN21950*; Kago dam, *Cicuzza* 2648.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku).

Ecology. In primary and secondary forests, along streams with boulders along banks; lowlands to 900 m a.s.l. Threat: Least Concern.

***Sphaeropteris polypoda* (Baker) R.M.Tryon, Contr. Gray Herb. 200: 23. 1970.**

($\equiv$) *Cyathea polypoda* Baker, Trans. Linn. Soc. London, Bot 4(2): 250. 1894.

TEM: Amo, Bkt Retak, *Wong WKM783*; Bkt Retak, summit, *Edwards* 838.

Distribution. Malay Peninsula, Borneo (Brunei, Kalimantan, Sabah, Sarawak), and the Philippines.

Ecology. In mature lowland tropical forests below 500 m a.s.l. Threat: Rare in Brunei.



Figure 17. Cyatheaceae. *Sphaeropteris moluccana* (Photo D. Cicuzza).

Sphaeropteris squamulata (Blume) R.M.Tryon, Contr. Gray Herb. 200: 23. 1970.

(≡) *Cyathea squamulata* (Blume) Copel., Philipp. J. Sci., C 4: 37. 1909.

BEL: Labi, Wasai Mendaram, *Forman LLF1030*; Sg Gelugos, Wasai Wong Kadir, *Edwards 2551, Edwards 2573*; Mentiri pools, *Edwards 674*; Benutan lake, *Edwards 2234, Edwards 2244*; Wasai Wong Kadir, *Nazihah et al. BRUN24575*.

Distribution. Indonesia (Sumatra, Java, Kalimantan), Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Philippines.

Ecology. Lowland forests to 1500 m a.s.l. Threat: Least Concern.

Sphaeropteris trichodesma (Scort.) R.M.Tryon, Contr. Gray Herb. 200: 23. 1970. (Fig. 18).

(≡) *Cyathea trichodesma* (Scort.) Copel., Philipp. J. Sci., C 4: 55. 1909.

BEL: Labi, Sg Teraja, *Edwards 794, Edwards 794, Edwards 2527*; Wasai Wong Kadir, *Cicuzza 2582*. **BRM:** Kilanas, Terjun Meny-

sop, *Sands MS5680*; Mentiri, Kpg Mentiri, *Edwards 670, Edwards 671*; Sg Akar, *Edwards 512*. **TEM:** Amo, Bkt Retak, *Edwards 844, Edwards 853*; Bkt Patoi, *Edwards 877*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Kalimantan).

Ecology. Lowland primary forests, to 1500 m a.s.l. Threat: Least Concern.

Sphaeropteris tripinnata (Copel.) R.M.Tryon, Contr. Gray Herb. 200: 23. 1970.

(≡) *Cyathea tripinnata* Copel., Philipp. J. Sci. 1(Suppl. 4): 251. 1906.

TEM: Amo, G Pagon ridge, *Wong WKM1890*.

Distribution. Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Java, Kalimantan, Maluku), Philippines.

Ecology. Primary forests between 250–1700 m a.s.l. Threat: Least Concern.

Family 8. CYSTODIACEAE

8.1. *Cystodium* J.Sm. in W.J.Hooker, Gen. Fil.: t 96. 1842.

Cystodium sorbifolium (Sm.) J.Sm., Gen. Fil. [Hooker] t. 96. 1841. (Fig. 19).

BEL: Labi, Wasai Wong Kadir, *Forman LLF1054, Johns RJ7446, Edwards 2553*; Labi, Sg Mendaram, *Johns RJ6806*; Sg Teraja, *Edwards 2511*; Seria, Badas FR, *Wong WKM2*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 986, Poulsen ADP93*; Sg Babi, *Edwards 2148*; Amo, Batu Apoi FR (K Belalong FSC), *Nielsen 1028, Edwards 2449*; Amo, Sg Belalong (Amo), *Edwards 2098*; Amo, Batu Apoi, *Lee 993*; Amo, Batu Apoi FR (K Belalong FSC), *Hansen CH1522, Hussain et al. BRUN15679*; Amo, K Belalong, *Johns RJ6992*; Amo, Sg Temburong, *Johns RJ7379, Lee SL1043*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2396*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2179*. **TUT:** Rambai, Ulu Tutong, *Edwards 2403, Johns RJ7483*; Lamunin, Ladan Hills FR, *Edwards 944, Edwards 750*; Lamunin, Benutan dam, *Edwards 2237*; Lamunin, Benutan dam, *Edwards 2332*.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Sulawesi, Maluku, New Guinea.

Ecology. Along rivers in mature forests, albeit not abundant; lowlands, c. 400 m a.s.l. Threat: Least Concern.



Figure 18. Cyatheaceae. *Sphaeropteris trichodesma* (Photo D. Cicuzza).



Figure 19. Cystodiaceae. *Cystodium sorbifolium* (Photo KM. Wong).

Family 9. DAVALLIACEAE

9.1. *Davallia* Sm., Mém. Acad. Roy. Sci. (Turin) 5: 414. 1793.

Davallia angustata Wall. ex Hook. & Grev., Icon. Filic. t. 231. 1831.

BEL: Labi, Jln Labi, *Edwards* 2044; Labi, Kpg Teraja, *Wong WKM990*; Liang, Badas (Sg Liang), *Wong WKM181*. **TEM:** Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2224, *Simpson* 2318; Bkt Patoi, *Edwards* 2259. **TUT:** Rambai, Bkt Bedawan (Ulu Tutong), *Joffre et al. BRUN18279*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi), Philippines, Micronesia.

Ecology. In lowland tropical forests to 1000 m a.s.l. Threat: Least Concern.

Davallia denticulata (Burm.f.) Mett. ex Kuhn, Filic. Afr. 27. 1867.

BRM: Jln Gadong, *Edwards* 433; Muara, Coastal Kerangas, *Edwards* 790; Serasa, Meragang Beach, *Idris et al. BRUN17365*.

TEM: Amo, Sg Belalong, *Edwards* 2133; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2111; Bkt Patoi, *Edwards* 2263; Amo, Belalong, *Cicuzza* 2614; Amo, Sg Belalong, *Cicuzza* 2736. **TUT:** Tg Maya, Jln Tutong-Belait (Pasir Puteh), *Paing BRUN15554*, *Ariffin et al. BRUN21720*; Telisai, Pasir Puteh, *Johns RJ6507*.

Distribution. Tropical Africa, East and Southeast Asia, throughout Malesia, to Australia and the Pacific Islands.

Ecology. Epiphyte in secondary forest, parks, plantations, and urban areas; lowlands to 1000 m a.s.l. Threat: Least Concern.

Davallia divaricata Blume, Enum. Pl. Javae 2: 237. 1828.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP195*; Amo, K Belalong, *Dransfield SD1003*, *Wong WKM275*, *Johns RJ7421*, *Ashton A20*, *Ashton A323*, *Wong WKM1345*; Batu Apoi, Sg Selapon, *Wong WKM2091*; Amo, Sg Temburong, *Johns RJ7421*; Amo, Sg Temburong, *Wong WKM1345*.

Distribution. India, China, Indochina, throughout Malesia to the Solomon Islands.

Ecology. Epiphyte in secondary forest, plantation, and city parks; lowlands to 1000 m a.s.l. Threat: Least Concern.

Davallia heterophylla Sm., Mém. Acad. Roy. Sci. (Turin) 5: 414–415. 1793.

BRM: Mentiri, Meragang, *Edwards* 2327; Muara, kerangas forest, *Edwards* 785; Kota Batu, P Chermin, *Edwards* 621; Sg Dolhakim, *Edwards* 564.

Distribution. India, Indochina, throughout Malesia, and the Pacific Islands.

Ecology. In lowland forests, to 1000 m a.s.l. Threat: Least Concern.

Davallia parvula Wall. ex Hook. & Grev., Ic. Filic. pl. 138. 1829. (Fig. 20).

BEL: Liang, Badas (Sg Liang), *Ashton A135*; *Ariffin et al. BRUN23283*; Seria, Pekan Seria, *Edwards* 918.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan), Papua New Guinea.

Ecology. Lowland tropical forests to 1000 m a.s.l. Threat: Least Concern.

Davallia pectinata Sm., Mém. Acad. Sci. (Turin) 5: 415. 1793.

BEL: Liang, Jln Badas (Lumut), *Edwards* 586. **BRM:** Muara, Kerangas forest, *Edwards* 787; P Chermin, *Edwards* 622. **TUT:** Telisai, Pasir Puteh, *Johns RJ6504*, *Ariffin ARK3*; Telisai, Jln Tutong-Telisai, *Idris et al. BRUN15857*; Tg Maya, Jln Tutong-Belait (Pasir Puteh), *Simpson* 2185.



Figure 20. Davalliaceae. *Davallia parvula* (Photo D. Cicuzza).

Distribution. India, China, Indochina, throughout Malesia to the Pacific Islands.

Ecology. In mature and secondary forest; lowlands to 1000 m a.s.l. Threat: Least Concern.

***Davallia repens* (L.f.) Kuhn, Fil. Afr. 27. 1868. (Fig. 21).**

BEL: Melilas, Sg Ingei, *Edwards 2358, Edwards 2376, Kessler PK422; Labi Road, Edwards 2045; Melilas, Sg Topi, Joffre s.n.*
TEM: Labu, Bkt Patoi (Peradayan FR), *Ashton A130, Edwards 869; Amo, K Belalong FSC, Middleton LCL777; Amo, Sg Temburong, Coode MC6610, Johns RJ6930, Johns RJ7158, Sands MS5543, Sands MS5844; Amo, Bkt Belalong, De Vogel 9024; Amo, K Belalong, De Vogel 8948; Amo, Sg Belalong, Edwards 2084; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2230, Simpson 2298; Amo, Bkt Tudal, Idris et al. BRUN15833, Idris et al. BRUN16164; Amo, Bkt Retak, Edwards 821, Johns RJ6675, Sands MS5236, Wong WKM913, Wong s.n.; Amo, G Pagon, Wong WKM1782; Liaw 17; G Pagon, Booth P24; Amo, K Belalong, Dransfield SD1006; Sg Enkiang, Edwards 2068. TUT: Rambai, Ulu Tutong, *Johns, RJ7542; Ulu Sg Medit, Jangarun BRUN22857.**

Distribution. Africa, Madagascar, Sri Lanka, India, China, Japan, Indochina, throughout Malesia, Australia (Queensland), the Pacific Islands.



Figure 21. Davalliaceae. *Davallia repens* (Photo D. Cicuzza).

Ecology. In lowland tropical forests to 1000 m a.s.l. Threat: Least Concern.

***Davallia solida* (G.Forst) Sw., J. Bot. (Schrad.) 1800(2): 87. 1801.**

TEM: Amo, Bkt Lutut LP297, *Ariffin et al. BRUN20822. TUT:* Rambai, Sg Tutong (Belabau), *Coode MC6372.*

Distribution. Sri Lanka, India, China, Thailand, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Maluku), Philippines, New Guinea, Australia and the Pacific Islands.

Ecology. In tropical forests to 1000 m a.s.l. Threat: Least Concern.

9.2. Davallodes Copel., Philipp. J. Sci., C 3: 33. 1908.

***Davallodes hymenophylloides* (Blume) M.Kato & Tsutsumi, Acta Phytotax. Geobot. 59: 12. 2008.**

TEM: Amo, G Pagon ridge, *Wong WKM1916; Amo, Bkt Retak, Johns RJ6631, Johns RJ6685, Johns RJ6713.*

Distribution. Sri Lanka, India, Thailand, Malaysia (Malay Peninsula, Sabah, Sarawak), Brunei, Philippines, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan).

Ecology. Epiphytic in secondary forests between 500–2200 m a.s.l.
Threat: Least Concern.

Family 10. DENNSTAEDTIACEAE

10.1. *Histiopteris* (J.Agardh) J.Sm., Hist. Fil.: 294. 1875.

Histiopteris incisa (Thunb.) J.Sm., Hist. Fil. 295. 1875.

TEM: Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2307, Liaw 46*.

Distribution. Pantropical.

Ecology. Sunny and disturbed sites; lowlands to 1000 m a.s.l.
Threat: Least Concern.

Histiopteris stipulacea (Hook.) Copel. Philipp. J. Sci. C 3: 347. 1909.

TEM: Amo, Bkt Belalong, *Edwards 2309*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Maluku), Papua New Guinea.

Ecology. Forest edges on montane forests above 1000 m a.s.l.
Threat: Least Concern.

10.2. *Microlepia* C.Presl, Tent. Pterid.: 124. 1836, *nom. cons.*

Microlepia manilensis (Goldm.) C.Chr., Index Filic.: 427. 1906.

BEL: Pipeline near Wasan, *Edwards 974*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Indonesia (Java, Kalimantan, Sulawesi), Philippines.

Ecology. In open areas with humid soil. **Threat:** Rare in Brunei.

Microlepia puberula Alderw., Bull. Jard. Bot. Buitenzorg, sér. 2, 11: 17. 1913.

TEM: Bkt Patoi, *Edwards 2260*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku).

Ecology. In mature forest. **Threat:** Rare in Brunei.

Microlepia speluncae (L.) T.Moore, Index Fil. (T. Moore) 93. 1857.

BEL: Layong, pipeline, *Edwards 966*. **TEM:** Amo, K Belalong, *Dransfield SD1030*; Bkt Patoi, *Edwards 2261*. **TUT:** Lamunin, Layong-Gadong Pipeline, *Edwards 966*; Tasek Merimbun, *Edwards 588*; Benutan reservoir, *Edwards 929*.

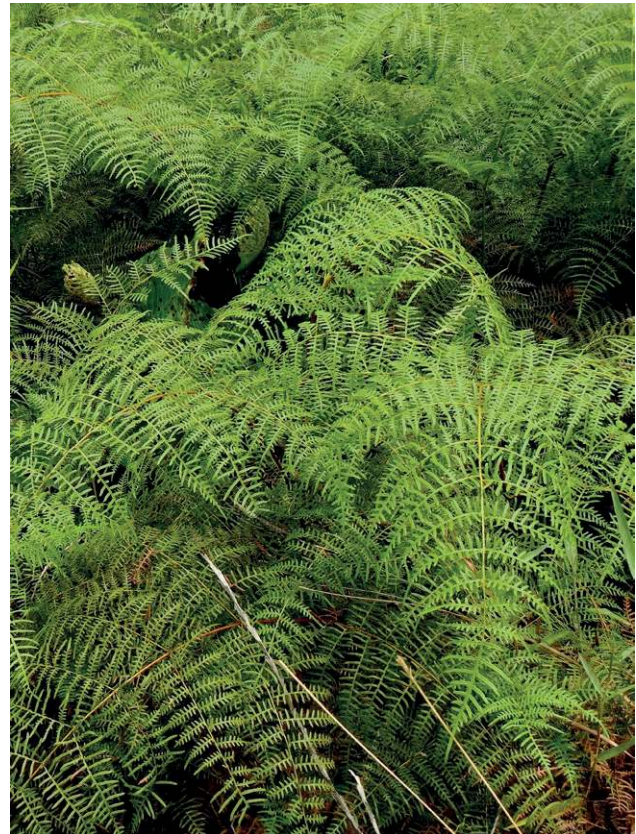


Figure 22. Dennstaedtiaceae. *Pteridium esculentum* (Photo KM. Wong).

Distribution. Pantropical.

Ecology. Shady areas in forests. **Threat:** Least Concern.

10.3. *Pteridium* Geld. ex Scop., Fl. Carniol.: 169. 1760.

Pteridium esculentum (G.Forst.) Cockayne, Rep. Bot. Surv. Tongariro Nat. Park 34. 1908. (Fig. 22).

BRM: Gadong, *Ariffin et al. BRUN22782*. **TEM:** Bangar, Bkt Bangar, *Johns RJ7039*. **TUT:** Telisai, Kpg Telisai, *Johns RJ6776*; Rambai, Tasek Merimbun, *Suzuki K13033*; Bkt Lebadak, St line, *Sinclair KEP80177*; Ukong, Kpg Ukong, *Niga NN177*.

Distribution. India, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Maluku), Philippines, Australia, New Zealand, the Pacific Islands.

Ecology. Open sites in full sun. **Threat:** Least Concern.

Family 11. DIDYMOCHLAENACEAE

11.1. *Didymochlaena* Desv., Ges. Naturf. Freunde Berlin Mag. Nauesten Entdeck. Gesamten Naturk. 5: 303. 1811.

Didymochlaena truncatula (Sw.) J.Sm., J. Bot. (Hooker) 4: 196. 1842[1841].

TEM: Amo, Bkt Retak, *Johns RJ6734*; Amo, G Pagon ridge, *Wong WKM1904*.

Distribution. Pantropical in the wide sense.

Ecology. In dense forest with rich soil. In Brunei also in lowland hilltops, otherwise at medium altitude, submontane forest. Threat: Least Concern.

Family 12. DIPTERIDACEAE

12.1. *Cheiropleuria* C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 189. 1851.

Cheiropleuria bicuspis (Blume) C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 189. 1851. (Fig. 23).

TEM: Amo, G Pagon, *Coode MC7584*, *Ariffin ARK135*; Amo, G Pagon ridge, *Ariffin ARK128*; *Wong WKM1797*; Amo, Bkt Retak,



Figure 23. Dipteridaceae. *Cheiropleuria* cf. *C. bicuspis* (Photo KM. Wong).

Booth P7, *Booth P29*, *Edwards 839*, *Johns RJ6586*, *Johns RJ6627*, *Wong WKM425*.

Distribution. China, Japan, Indochina, throughout Malesia.

Ecology. In mature tropical forests, on steep slopes with boulders; lowlands to 1500 m a.s.l. Threat: Rare in Brunei.

Notes

Booth P7 and *Wong WKM425*, with hardly lobed leaves, could be *C. parva* M.Kato, Y.Yatabe, Sahashi & N.Murak.

12.2. *Dipteris* Reinw., Syll. Pl. Nov. 2: 3. 1825.

Dipteris conjugata Reinw., Syll. Pl. Nov. 2: 3. 1828[1825]. (Fig. 24).

BEL: Labi, Ulu Sg Mendaram trail, *Ariffin et al. BRUN22793*; *Johns RJ6879*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD962*. **BRM:** Kumbang Pasang, Jln Kumbang Pasang; *Johns RJ7065*; Kpg Belimbing, *Ariffin et al. BRUN22462*; Sg Awar, *Edwards 438*. **TEM:** Amo, Bkt Retak, *Wong WKM899*; *Liaw 24*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2236*; Ridge close to FSA, *Athen PA009*; Bkt Tudal, *Said et al. BRUN15830*.

Distribution. China, Japan, Indochina, throughout Malesia, to Australia and Fiji.



Figure 24. Dipteridaceae. *Dipteris conjugata* (Photo KM. Wong).

Ecology. In forest clearings; near sea level to 1500 m a.s.l. Threat: Least Concern.

Dipteris lobbiana (Hook.) T.Moore, Index Fil. 80. 1857. (Fig. 25).

(=) *Dipteris quinquefurcata* Christ, Farnkr. Erde 123. 1897.

BEL: Melilas, Sg Ingei, *Ashton BRUN5627*; Melilas, Ulu Ingei, *Sands MS5947*; Melilas, Sg Ingei, *Edwards 2368*; Labi, Labi Hills FR, *Ashton A147*; Labi, Kpg Teraja, *Sands MS5683*, *Edwards 2535*, *Edwards 2565*; Labi, Bkt Teraja, *Johns RJ6834*, *Ariffin et al. BRUN23240*; Labi, Bkt Teraja, *Simpson 2078*; *Leong 26*; Labi, Sg Rampayoh, *Sands MS6001*; Labi Wasai Wong Kadir, *Cicuzza 2588*; Labi Wasai Wong Kadir, *Cicuzza 2669*. **BRM:** Mentiri, Mentiri pools; *Sands MS5666*. **TEM:** Amo, Sg Temburong; *Wong WKM463*, *Liaw 48*, *Hovenkamp BR003*, *Edwards 2213*; Batu Apoi, Sg Temburong (Batu Apoi), *Nielsen 976*; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards 2189*; Batu Apoi, Sg Temburong (Batu Apoi), *Poulsen ADP63*; Amo, G Pagon ridge, *Booth s.n.*, *Wong WKM1902*. **TUT:** Lamunin, Benutan dam, *Edwards 2336*; Lamunin, Benutan dam, *Ariffin et al. BRUN24292*; Nyamokning dam, *Bazilah B26*.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Kalimantan Sulawesi, Maluku), Philippines, Papua New Guinea.



Figure 25. Dipteridaceae. *Dipteris lobbiana* (Photo D. Cicuzza).

Ecology. Occurs in very specific and restricted habitats, where it anchors on rocks in stream beds; lowlands to 1500 m a.s.l. Threat: Least Concern.

Dipteris nieuwenhuisii Christ, Ann. Jard. Bot. Buitenzorg 20(1): 124, t. 3, f. 3. 1905. (Fig. 26).

BEL: Labi, Bkt Teraja, *Johns RJ6845*. **TEM:** Amo, Bkt Retak, *Johns RJ6660*; Amo, Bkt Retak, *Wong WKM456*; Amo, Bkt Retak, *Wong WKM901*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. In mature montane forest. Threat: Rare in Brunei, found only in montane areas of the country.

Dipteris novoguineensis Posth., Recueil Trav. Bot. Néerl. 25: a. 248 f. 1. 1928.

TEM: Amo, Bkt Retak, *Edwards 849*.



Figure 26. Dipteridaceae. *Dipteris nieuwenhuisii* (Photo KM. Wong).

Distribution. Malaysia (Sabah, Sarawak), Brunei, Sulawesi, Papua New Guinea.

Ecology. In mature mixed dipterocarp forest. Threat: Rare in Brunei.

Family 13. DRYOPTERIDACEAE

13.1. *Arachniodes* Blume, Enum. Pl. Javae 2: 241. 1828.

Arachniodes aristata (G.Forst.) Tindale, Contr. New South Wales Natl. Herb 3(1): 89. 1961.

TEM: Amo, Bkt Retak; *Johns RJ6690*.

Distribution. India, Nepal, China, Japan, Korea, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Java, Lesser Sunda Islands, Maluku), Philippines, Australia, the Pacific Islands.

Ecology. Forests and wet ravines between 100–1600 m a.s.l. Threat: Least Concern.

Arachniodes tripinnata (Goldm.) Sledge, Bull. Brit. Mus. (Nat. Hist.), Bot. 5: 41. 1973.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP353*.

Distribution. India, Malay Peninsula, Java, Borneo (Brunei, Kalimantan, Sabah, Sarawak), Philippines.

Ecology. Common in forests. Threat: Least Concern.

13.2. *Bolbitis* Schott, Gen. Fil. (Vindob.): t. 14. 1835.

Bolbitis heteroclita (C.Presl) Ching, Index Filic., Suppl. 3, 3: 48. 1934.

BEL: Labi, Kpg Teraja, *Sands MS5694*, *Edwards 769*; Batu Apoi, Kpg Selapon, *Dransfield SD1166*. **TEM:** Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2405*; Sg Sitam, FSC, *Edwards 2015*; Amo, Belalong, FSC, *Cicuzza 2506*; Amo, Sg Belalong, *Cicuzza 2738*.

Distribution. India, Bangladesh, Nepal, China, Japan, Indochina, throughout Malesia to the Pacific Islands.

Ecology. Along streams, on mud and humid forest. Threat: Least Concern.

Bolbitis repanda (Blume) Schott, Gen. Fil. (Vindob.): t. 14. 1835.

BRM: Pengkalan Batu, Kpg Wasan, *Edwards 973*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2029*; Labu, Bkt Patoi (Peradayan FR), *Edwards 900*; Bangar, Bkt Biang, *Forman LLF921*; Sg Baki, FSC, *Edwards 2105*, *Edwards 2297*. **TUT:** Benuatan lake, *Edwards 2235*.

Distribution. Malaysia (Sabah, Sarawak), Brunei, Indonesia (Lesser Sunda Islands, Sulawesi), Philippines, the Pacific Islands.

Ecology. In mature forests. Under good ecological conditions, the species can form large, dense communities. Threat: Least Concern.

Bolbitis sinuata (C.Presl) Hennipman, Blumea 18(1): 148–149. 1970.

BEL: Sg Teraja, *Edwards 2520*; Lamunin, *Edwards 741*. **TEM:** Labu, Peradayan FR, *Johns RJ7056*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2150*; Sg Esu, *Edwards 2303*; Sg Babi, *Edwards 2150*; Amo, Belalong, *Cicuzza 2617*; Amo, Sg Belalong, *Cicuzza 2640*, *Cicuzza 2740*, *Cicuzza 2742*.

Distribution. India, Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines, New Guinea.

Ecology. A terrestrial climber along rivers and riparian areas in mature forests; lowlands to 1000 m a.s.l. Threat: Least Concern.

13.3. *Dryopteris* Adans., Fam. Pl. 2: 20, 551. 1763, *nom. cons.*

Dryopteris sparsa (D.Don) Kuntze, Revis. Gen. Pl. 2: 813. 1891.

TEM: Amo, Bkt Retak, *Johns RJ6683*.

Distribution. Sri Lanka, India, Myanmar, Nepal, Bhutan, China, Japan, Indochina, throughout Malesia to Australia.

Ecology. common in disturbed sites; lowlands to 1000 m a.s.l. Threat: Least Concern.

13.4. *Elaphoglossum* Schott ex J.Sm., J. Bot. (Hooker) 4: 148. 1841.

Elaphoglossum annamense C.Chr. & Tardieu, Notul. Syst. (Paris) 8: 209. 1939

TEM: Amo, Bkt Retak, *Johns RJ6523*; Amo, G Pagon, *Wong WKM1840*.

Distribution. Vietnam, Malaysia (Sabah, Sarawak), Brunei, Indonesia (Kalimantan, Maluku, Indonesian New Guinea).

Ecology. In mature submontane and montane forests. Threat: Rare in Brunei.

Elaphoglossum melanostictum (Blume) T.Moore, Ind. Fil. 361. 1862.

TEM: Amo, Bkt Retak, *Edwards 858*, *Wong WKM771*.

Distribution. Thailand, Malaysia, (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan), Philippines.

Ecology. Epiphyte or lithophyte in submontane forests. Threat: Rare in Brunei.

Elaphoglossum norrisii (Hook.f.) Bedd., Ferns Brit. India 23. 1870.

BEL: Bkt Sawat, Jln Labi (km 13), *Haslani HA75*. **TEM:** Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2311*; Batu Apoi, *Samhan SN91/3*.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku, Indonesian New Guinea). **Ecology:** In mature forests to 1500 m a.s.l. **Threat:** Least Concern.

13.5. *Pleocnemia* C.Presl, Tent. Pterid.: 183. 1836.

Pleocnemia irregularis (C.Presl) Holttum, Kew Bull. 29: 347. 1974.

BEL: Bkt Sawat, Kpg Merangkang, *Ariffin et al. BRUN21987*. **TEM:** Amo, Bkt Belalong, *Sands MS5546*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP162*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2023*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2052*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2005*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP294*; Amo, K Belalong, *Wong WKM273*; Sg Babi, *Edwards 2143*. **TUT:** Lamunin, Benutan dam, *Edwards 2247*; Lamunin, Ladan Hills FR, *Ariffin et al. BRUN17607*.

Distribution. Indochina, throughout Malesia, to Fiji.

Ecology. Dry slopes in the lowlands. **Threat:** Least Concern.

Pleocnemia olivacea (Copel.) Holttum, Reinwardtia 1: 181, f.8, 10. 1951.

BEL: Melilas, Ulu Ingei, *Sands MS5917*; Labi, Sg Mendaram, *Johns RJ6808*; Sg Teraja, *Edwards 683*, *Edwards 2516*; Wasai Wong Kadir, *Edwards 2572*; Sg Teraja, *Edwards D683*; Labi, Wasai Wong Kadir, *Cicuzza 2673*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2177*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2051*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2050*; Amo, K Belalong, *Ashton A360*; Batu Apoi, *Samhan SN8*; Batu Apoi, *Edwards 2444*. **TUT:** Lamunin, Benutan dam, *Edwards 2236*; Ladan Hills, *Edwards 951*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan).

Ecology. Terrestrial; lowlands to 1600 m a.s.l. **Threat:** Least Concern.

13.6. *Teratophyllum* Mett. ex Kuhn, Ann. Mus. Bot. Lugduno-Batavi 4: 296. 1870.

Teratophyllum aculeatum (Blume) Mett. ex Kuhn, Ann. Mus. Bot. Lugduno-Batavi 4: 296. 1869.

BEL: Labi, Sg Teraja, *Edwards 804*. **TEM:** Belalong, FSC, *Edwards 2205*. **TUT:** Lamunin, Ladan Hills FR, *Wong WKM6399*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Sulawesi, Maluku), Philippines, New Guinea.

Ecology. Humid areas in lowland forests. **Threat:** Least Concern.

Teratophyllum ludens (Fée) Holttum, Gard. Bull. Straits Settlement. 5: 298, t. 10. 1932.

BEL: Seria, Pekan Seria, *Edwards 914*; Wasai Wong Kadir, *Edwards 2558*; Sg Teraja, *Edwards 2531*. **BRM:** Broken Coal Mine, *Edwards 2304*. **TUT:** Merimbun, *Cicuzza 2555*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei.

Ecology. In lowland peat swamp forest. **Threat:** Rare in Brunei.

Teratophyllum rotundifolium (Bonap.) Holttum, Gard. Bull. Straits Settlement. 5: 294, t. 7–8. 1932.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP131*; Amo, Ulu Belalong LP382, *Coo de MC7868*. **TUT:** Lamunin, Ladan Hills FR, *Idris et al. BRUN17659*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra).

Ecology: Lowlands in peat swamp forest. **Threat:** Least Concern.

Family 14. GLEICHENIACEAE

14.1. *Dicranopteris* Bernh., Neues J. Bot.(2): 38. 1806.

Dicranopteris curranii Copel., Philipp. J. Sci. 81: 4. 1952.

BRM: Berakas, Berakas FR, *Edwards 783*; Jln Subok, *Edwards 508*; Jln Berangan, *Edwards 448*. **TUT:** Rambai, Tasek Merimbun, *Suzuki K13035*.

Distribution. India, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi), Philippines.

Ecology. Forest margins. **Threat:** Least Concern.

Dicranopteris linearis (Burm.f.) Underw., Bull. Torrey Bot. Club 34(5): 250. 1907. (Fig. 27).

BEL: Bkt Sawat, Jln Labi (Bkt Sawat), *Forman LLF857*; Labi, Kpg Labi, *Johns RJ6828*; Wasai Wan Kadir, *Edwards 2563*. **BRM:** Kota Batu, Kpg Kota Batu, *Edwards 643*, *Johns RJ6795*; Kota Batu, Kpg Kota Batu, *Johns RJ6796*; Kota Batu, Kpg Kota Batu, *Edwards 643*; Gadong, Jln Gadong, *Edwards 651*; Gadong, Jln Gadong, *Edwards 654*; Jln Subok, *Edwards 507*; Kpg Dadap, *Edwards 2277*; Kiange, *Edwards 403*. **TEM:** Amo, Bkt Retak, *Wong WKM s.n.*, *Edwards*



Figure 27. Gleicheniaceae. *Dicranopteris linearis* var. *linearis* (Photo KM. Wong).

855; Amo, Batu Apoi FR (KBFSC), Poulsen ADP82; Bukok, Kpg Sibatang, *Forman LLF951*; Amo, Bkt Retak, *Wong WKM s.n.*; Amo, Bkt Retak, *Edwards 843*; Bangar, Bkt Bangar, *Johns RJ7038*; Labu, Bkt Patoi (Peradayan FR), *Edwards 867*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7623*; Rambai, Tasek Merimbun, *Bernstein JHB356*; Lamunin, Kpg Lamunin, *Edwards 966A*; Telisai, Kpg Telisai, *Johns RJ6793*; Sg Padang, *Edwards 663*; Tasek Merimbun, *Edwards 592*; Jln Tutong, *Edwards 531*.

Distribution. Old World Tropics.

Ecology. Very common species, in open places. Threat: Least Concern.

14.2. *Diplopterygium* (Diels) Nakai, Bull. Natl. Sci. Mus. Tokyo 29: 47. 1950.

Diplopterygium brevipinnulum (Holtum) Parris, Pl. Mt. Kinabalu 1: 59. 1992.

TEM: Amo, Bkt Retak, *Edwards 848*, *Wong WKM s.n.*; Amo, G Pagon LP 307, *Wong WKM1820*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. From lowland hilly sites to montane sites, at forest margins or forest gaps. Threat: Rare in Brunei.

Diplopterygium bullatum (T.Moore) Parris, Pl. Mt. Kinabalu 1: 59. 1992.

TEM: Amo, G Pagon, *Ariffin ARK139*, *Booth P13*, *Wong WKM1768*; Amo, Bkt Retak, *Edwards 837*.

Distribution. Indonesia (Java, Kalimantan), Malaysia (Sarawak, Sabah), Brunei, Papua New Guinea.

Ecology. Tropical forests from mid elevation to montane forest. Threat: Rare in Brunei.

14.3. *Gleichenia* Sm., Mém. Acad. Roy. Sci. (Turin) 5: 419. 1793.

Gleichenia peltophora Copel., Philipp. J. Sci. 40: 291, t. 1. 1929.

TEM: Amo, G Pagon Periok, *Ashton A458*.

Distribution. Philippines, Malaysia (Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Sulawesi, Maluku, Indonesian New Guinea).

Ecology. Montane sites, at forest margins and forest gaps. Threat: Rare in Brunei.

14.4. *Sticherus* C.Presl, Tent. Pterid.: 51. 1836, *nom. cons.*

Sticherus hirtus (Blume) Ching, Sunyatsenia 5: 283. 1940.

TEM: Amo, Bkt Tudal, *Idris et al. BRUN16165*; Amo, Bkt Retak, *Edwards 856*, *Wong WKM898*; Amo, G Pagon Periok, *Ashton A232*, *Booth P30*, *Booth P31*, *Booth P32*, *Wong WKM1920*.

Distribution. Malay Peninsula, Brunei, Indonesia (Sumatra, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku), Philippines, New Guinea, Solomon Islands.

Ecology. In mid-montane forest, usually forming thick thickets at forest edges. Threat: Least Concern.

Notes

The voucher was identified as *Gleichenia hirta* Blume var. *paleacea* (Baker) C.Chr. which is here considered as *Sticherus hirtus* (Blume) Ching.

Sticherus loheri (Christ) Copel., Gen. Fil. [Copeland] 27. 1947.

TEM: Amo, Bkt Retak, *Johns RJ6524*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Indonesia (Sulawesi, Maluku), Philippines.

Ecology. In montane forests at forest margins and forest gaps. Threat: Rare in Brunei.

Notes

The voucher was identified as *Gleichenia loheri* var. *major* Holttum, which is here considered as *Sticherus loheri* (Christ) Copel.

Sticherus truncatus (Willd.) Nakai, Bull. Natl. Sci. Mus. Tokyo 29: 20, 1950.

BRM: Tasek Gorge, *Edwards* 425. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP96*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP104*; Amo, Sg Temburong, *Johns RJ7157*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2192; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2062. **TUT:** Rambai, Ulu Tutong, *Johns RJ7622A*.

Distribution. Thailand, throughout Malesia.

Ecology. Forest margins and secondary forests. Threat: Least Concern.

Family 15. HYMENOPHYLLACEAE

15.1. *Abrodictyum* C.Presl, Hymenophyllaceae: 20. 1843.

Abrodictyum idoneum (C.V.Morton) Ebihara & K.Iwats., *Blumea* 51(2): 243. 2006.

TEM: Amo, Bkt Retak, *Johns RJ6527*; Amo, Bkt Retak, *Johns RJ6565*; Amo, Bkt Retak, *Johns RJ6664*; Amo, Bkt Retak, *Johns RJ6668*; Amo, Bkt Retak, *Johns RJ6531*; Amo, Bkt Retak, *Johns RJ6512*; Amo, G Pagon, *Coode MC7510*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2309; Batu Apoi, Amo, Bkt Retak, *Wong WKM912*; Amo, Bkt Retak, *Wong WKM s.n.*; Bkt Pagon, *Edwards & Cantley* 733; Bkt Retak, *Edwards* 828, *Edwards* 859; Amo, Belalong, FSC, *Cicuzza* 2576.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Maluku), Philippines, New Guinea.

Ecology. In hilly forest with good fertile soil. Threat: Least Concern.

Abrodictyum obscurum (Blume) Ebihara & K.Iwats., *Blumea* 51(2): 244, 2006.

(=) *Abrodictyum saxatile* (T.Moore) Parris, *Fern Gaz.* 20(7): 305. 2018.

BEL: Bkt Sawat, Jln Merangking, *Edwards* 2400; Melilas, Sg Ingei, *Edwards* 2361; Pipeline Road, *Edwards* 983; Sg Liang, Arboretum, *Edwards* 487; Bkt Teraja, *Cicuzza* 2681; Labi, Bkt Teraja, *Johns RJ6855*; Labi, Bkt Teraja, *Johns RJ6858*; Labi, Bkt Teraja, *Ariffin et al. BRUN23242*; Labi, Bkt Teraja, *Johns RJ6853*; Labi, Kpg Teraja, *Sands MS5691*; Labi, Bkt Teraja, *Johns RJ6860*; Labi, Sg Mendaram, *Johns RJ6815*; Melilas, Bkt Batu Patam (Ulu Ingei),

Wong WKM1128; Labi Sg Teraja, *Edwards* 2530. **BRM:** Lumas, Kpg Dadap, *Edwards* 2415; Jln Sg Akar, *Edwards* 521; Bera-kas, Kpg Tanah Jambu, *Edwards* 2422; Mentiri, Mentiri pools, *Johns RJ7077*; Mentiri, Mentiri pools, *Johns RJ7074*; Kpg Dadap, *Edwards* 2287; Jln Kota Batu, *Edwards* 650; Jln Sg Akar, *Edwards* 441, *Edwards* 523. **TEM:** Amo, K Belalong, *Ashton A55*, *Dancák* 90A; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP340*, *Lee* 1048; Amo, Bkt Retak, *Wong WKM882*; Amo, Sg Belalong (Amo), *Edwards* 942; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards* 2164; Sg Belalong, *Edwards* 2125; Amo, Sg Temburong, *Coode MC6507*; Amo, K Belalong, *Johns RJ7015*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7221*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7643*; Rambai, Ulu Tutong, *Johns RJ7486*; Rambai, Ulu Tutong, *Johns RJ7489*; Rambai, Ulu Tutong, *Johns RJ7517*.

Distribution. Sri Lanka, India, Nepal, Bhutan, China, Taiwan, Japan, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, Solomon Islands, and Australia.

Ecology. Along streams or muddy stream banks in mature forest and secondary vegetation. Threat: Least Concern.

Abrodictyum pluma (Hook.) Ebihara & K.Iwats., *Blumea* 51(2): 243. 2006.

TEM: Amo, Bkt Retak, *Johns RJ6538*; Amo, Bkt Retak, *Johns RJ6546*; Amo, Bkt Retak, *Johns RJ6569*; Amo, Bkt Retak, *Johns RJ6563*; Amo, Bkt Tudal, *Idris et al. BRUN182*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2313; Amo, Bkt Retak, *Wong WKM s.n.*; Bkt Gelagas (Bkt Suang), *Simpson* 2302a.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, and the Solomon Islands.

Ecology. In dense forest and hilly sites, with good and fertile soil. Threat: Least Concern.

Abrodictyum cf. pluma (Hook.) Ebihara & K.Iwats.

BEL: Sg Ingei, *Dransfield* SD943. **TEM:** Bkt Retak, *Edwards* 831; G Pagon, *Booth* P37; Labi hill, *Cicuzza* 2686.

Abrodictyum setaceum (Bosch) Ebihara & K.Iwats., *Blumea* 51(2): 244. 2006.

BEL: Labi, Bkt Teraja, *Ariffin et al. BRUN22804*; Labi, Bkt Teraja, *Johns RJ6869*; Labi, Bkt Teraja, *Johns RJ6866*; Melilas, Sg Ingei, *Wong WKM640*; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1015*; Sukang, Sg Paleh Bangawong, *Kirkup DK685*. **TEM:** Amo, Bkt Belalong, *Dransfield* SD1211. **TUT:** Rambai, Bkt Bahak, *Coode MC6994*; Rambai, Sg Medit, *Simpson* 2525.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Kalimantan), and Philippines.

Ecology. On hills and submontane tropical forest. Threat: Least Concern.

15.2. *Cephalomanes* C.Presl, Hymenophyllaceae: 17. 1843.

Cephalomanes javanicum (Blume) C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 5: 334. 1848.

BEL: Melilas, Sg Ingei, *Edwards* 2359; Labi, Kpg Teraja, *Sands* MS5690; Labi, Kpg Teraja, *Sands* MS5687; Melilas, Batu Melintang, *Edwards* 2345; Melilas, Sg Ingei, *Wong WKM655*; Labi, Sg Mendaram, *Johns RJ6811*; Labi, Sg Mendaram, *Johns RJ6814*; Labi, Wasai Mendaram, *Johns RJ6822*; Labi, Bkt Teraja, *Johns RJ6851*; K Belait, K Belait, *Johns RJ7121*; Labi, Wasai Wong Kadir, *Johns RJ7437*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2380. **BRM:** Kota Batu, Kpg Kota Batu, *Edwards* 649; Kilanas, Terjun Menyusop, *Sands* MS5677; Mentiri, Mentiri pools, *Johns RJ7078*; Sg Teraja, *Edwards* 2521; Sg Teraja, *Edwards* 2514. **TEM:** Amo, Sg Belalong (Amo), *Ashton* A12; Amo, Sg Belalong (Amo), *Edwards* 2140; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2081; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2031; Amo, Bkt Belalong, *Wong WKM1519*; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards* 2163; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2380; Amo, Sg Temburong, *Johns RJ7288*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7225*; Labu, Peradayan FR, *Johns RJ7059*; Amo, Batu Apoi Forest Reserve, *Lee* 978, *Lee* 905; Amo, Sg Temburong, *Johns RJ7371*; Sg Baki, *Edwards*, 2186; Sg Babi, *Edwards* 2153; Bkt Patoi, *Edwards* 893; Sg Belalong, *Dancák* 100; Amo, Sg Temburong, *Johns RJ7371*; Amo, Belalong, *Cicuzza* 2658; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2032; Amo, Ulu Temburong (Wong Nguan), *Coode MC6655*; Amo, K Belalong, *Ashton* A19; Amo, Sg Temburong, *Johns RJ7123*, *Johns RJ7125*, Sg Apan, *Edwards* 2401; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7196*; Amo, K Belalong, *Johns RJ6988*. **TUT:** Lamunin, Ladan Hills FR, *Joffre et al. BRUN18146*, *Edwards* 949; Rambai, Ulu Tutong, *Johns RJ7485*; Rambai, Ulu Tutong, *Johns RJ7642*; Rambai, Ulu Tutong, *Johns RJ7516*; Rambai, Ulu Tutong, *Johns RJ7497*; Labi, Sg Mendaram, *Johns RJ6811*; Labi, Sg Mendaram, *Johns RJ6814*; Labi, Wasai Mendaram, *Johns RJ6822*; Labi, Bkt Teraja, *Johns RJ6851*.

Distribution. India, Nepal, Bhutan, China, Japan, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Philippines, Indonesia (Sumatra, Java, Kalimantan, Maluku), New Guinea, Solomon Islands.

Ecology. Shaded and humid sites in lowland forest, also along streams. Threat: Least Concern.

Cephalomanes singaporianum Bosch, Ned. Kruidk. Arch. 4(4). 351. 1859.

BEL: Labi, Sg Mendaram, *Johns RJ6820*; Labi, Sg Mendaram, *Ariffin et al. BRUN22805*; Labi, Bkt Teraja, *Johns RJ6848*; Labi, Bkt Teraja, *Johns RJ6850*; Labi, Bkt Teraja, *Johns RJ6856*; Labi, Bkt Teraja, *Johns RJ6867*; Labi, Bkt Teraja, *Johns RJ6894*; Melilas, Sg Ingei, *Edwards* 2360; Melilas, Sg Ingei, *Wong WKM617*; Melilas, Sg Ingei, *Wong WKM629*; Melilas, Ulu Belait, *Sands* MS5888; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield* SD963; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield* SD938; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield* SD942; Sukang, Kpg Buau, *Watu et al. BRUN19143*; Sg Liang, *Edwards* 486; Wasai Wan Kadir, *Edwards* 2547; Labi, Andaulau, *Cicuzza* 2577. **TEM:** Amo, Sg Temburong, *Coode MC6535*; Amo, Sg Temburong, *Wong WKM465*; Amo, K Belalong, *Johns*

RJ7017; Amo, Sg Belalong (Amo), *Edwards* 2087, *Edwards* 941, *Edwards* 2125, *Edwards* 2341; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP204*; Amo, Sg Temburong, *Johns RJ6976*; Amo, K Belalong, *Johns RJ6999*; Amo, Sg Sibut, *Johns RJ6910*; Amo, Sg Temburong, *Johns RJ6937*; Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2049*; Belalong, FSC, *Dancák* 76; Amo, Belalong, FSC, *Cicuzza* 2519, *Cicuzza* 2604, *Cicuzza* 2613; Amo, Sg Belalong *Cicuzza* 2628, Kpg Bakok, *Cicuzza* 2709. **TUT:** Rambai, Ulu Tutong, *Johns RJ7582*; Rambai, Ulu Tutong, *Johns RJ7481*; Rambai, Ulu Tutong, *Johns RJ7499*; Rambai, Ulu Tutong, *Johns RJ7546*; Rambai, Bkt Bahak, *Coode MC6997*; Rambai, Sg Medit, *Simpson* 2533.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. Common in forests and along streams. Threat: Least Concern.

15.3. *Crepidomanes* C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 258. 1851.

Crepidomanes aphlebioides (Christ) I.M.Turner, Asian J. Trop. Biol. 1(2): 26. 1995.

TEM: Amo, Bkt Belalong, *Wong WKM1520*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Maluku, Indonesian New Guinea), Papua New Guinea, Solomon Islands, Vanuatu, Fiji, Australia.

Ecology. Epiphytic in mature hilly forests to 600 m a.s.l. Threat: Rare in Brunei.

Crepidomanes bipunctatum (Poir.) Copel., Philipp. J. Sci. 67(1): 59. 1938.

(=) *Crepidomanes bilabiatum* (Nees & Blume) Copel., Philipp. J. Sci. 67: 59. 1938.

TEM: Amo, Bkt Retak, *Johns RJ6755*; Amo, Bkt Retak, *Johns RJ6753*; Amo, Bkt Retak, *Johns RJ6746*; Amo, Sg Belalong (Amo), *Edwards* 2142; Labu, Bkt Patoi (Peradayan FR), *Edwards* 890 [these vouchers were identified as *Trichomanes bipunctatum*]; Amo, Bkt Retak, *Wong WKM876*.

Distribution. Widely distributed across the Old-World Tropics.

Ecology. Shady forest areas with well-drained and humid soil. Threat: Least Concern.

Crepidomanes christii (Copel.) Copel., Philipp. J. Sci. 67: 60. 1938.

TEM: Amo, Sg Temburong, *Coode MC6659*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2438; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP262*; Amo, K Belalong FSC, *Edwards* 2188; Amo, Sg Belalong (Amo), *Edwards* 2141; Amo, Sg Belalong (Amo), *Edwards* 2139; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2034; Batu Apoi, *Edwards* 2460; Sg Esu, FSC, *Edwards* 2202, *Edwards* 2203; Belalong, FSC, *Dancák* 75, *Dancák* 83, *Dancák* 101.

Distribution. Thailand, Malay Peninsula, Sumatra, Borneo (Brunei, Kalimantan, Sabah, Sarawak), and the Philippines.

Ecology. Epiphytic or lithophytic in lowland forests. Threat: Least Concern.

Crepidomanes grande (Copel.) Ebihara & K.Iwats., *Blumea* 51(2): 239. 2006.

TEM: Labu, Bkt Patoi (Peradayan FR), *Edwards* 883.

Distribution. Malaysia (Sabah, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Maluku), Philippines, New Guinea, Solomon Islands, and Micronesia.

Ecology. Well-drained soil in mature and slightly disturbed forests; lowlands to 1500 m a.s.l. Threat: Least Concern.

Crepidomanes parvulum (Poir.) Nivart, Senterre & Dubuisson, *Phytotaxa* 523(1): 122. 2021.

(=) *Crepidomanes minutum* (Blume) K.Iwats., *J. Fac. Sci. Univ. Tokyo, Sect. 3, Bot.* 13(5): 524. 1985.

BEL: Sg Teraja, *Edwards* 719, *Edwards* 777, *Edwards* 2542. **TEM:** Sg Belalong, *Edwards* 2091; Bkt Patoi, *Edwards* 2272.

Distribution. The Paleotropics (Africa to Polynesia), Siberia, Japan, and Australia.

Ecology. Epiphytic or lithophytic in lowland forests. Threat: Least concern.

15.4. *Didymoglossum* Desv., *Mém. Soc. Linn. Paris* 6: 330. 1827.

Didymoglossum beccarianum (Ces.) Senterre & Rouhan, *Phytotaxa* 292(3): 210. 2017.

(=) *Didymoglossum motleyi* (Bosch) Ebihara & K.Iwats., *Blumea* 51(2): 236. 2006.

TEM: Belalong, FSC, *Dancák* 119; W ridge FSC, *Edwards* 2207.

Distribution. Seychelles, Sri Lanka, India (Andaman Islands), Taiwan, Japan (Ryukyu Islands), Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Java, Kalimantan, Maluku, Indonesia New Guinea), Philippines, Papua New Guinea, to the Solomon Islands, Micronesia, and Australia.

Ecology. Mature tropical dipterocarp forest. Threat: Rare in Brunei.

Didymoglossum bimarginatum (Bosch) Ebihara & K.Iwats., *Blumea* 51(2): 236. 2006.

BEL: Seria, Pekan Seria, *Edwards* 922; Sg Teraja, *Edwards* 717, *Edwards* 806. **TEM:** Labu, Bkt Patoi (Peradayan FR), *Edwards* 881; Labu, Bkt Patoi (Peradayan FR), *Edwards* 889; Labu, Bkt Patoi (Peradayan FR), *Edwards* 891. **TUT:** Lamunin, Kpg Lamunin, *Edwards* 758.

Distribution. Sri Lanka, India, China, Japan, Indochina, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Java, Kalimantan, Maluku), Papua New Guinea, the Pacific Islands, Australia.

Ecology. Epiphytic or lithophytic in lowland and montane forests. Threat: Least Concern.

Didymoglossum mindorense (Christ) K.Iwats., *Blumea* 51(2): 236. 2006.

BEL: Pipeline road, *Edwards* 985. **BRM:** Lumapas, Kpg Dadap, *Edwards* 2416; Pengkalan Batu, Kpg Wasan, *Edwards* 984. **TEM:** Amo, Sg Belalong (Amo), *Edwards* 2041; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2470.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Philippines, Papua New Guinea, Solomon Islands, and Australia.

Ecology. Mature tropical forests. Threat: Least Concern.

Didymoglossum sublimbatum (Müll.Berol.) Ebihara & K.Iwats., *Blumea* 51(2): 236. 2006.

TEM: Batu Apoi, Sg Temburong (Batu Apoi), *Edwards* 2196; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards* 2194; Amo, Sg Belalong (Amo), *Edwards* 2138; G Retak, *Johns* 6744, *Johns* 6750.

Distribution. India, China, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan), Papua New Guinea.

Ecology. Along forest streams on muddy soil. Threat: Least Concern.

15.5. *Hymenophyllum* Sm., *Mém. Acad. Roy. Sci. (Turin)* 5: 418. 1793.

Hymenophyllum acanthoides (Bosch) Rosenst., *Bull. Jard. Bot. Buitenzorg, sér. 2, 2*: 25. 1911.

BEL: Melilas, Ulu Ingei, *Sands MS5901*; Wasai Wong Kadir, *Edwards* 2560; Sg Teraja, *Edwards* 718. **TEM:** Amo, Bkt Belalong, *De Vogel* 8996; Amo, Ulu Belalong LP382, *Dransfield JD7351*; Amo, Sg Temburong, *Johns RJ7358*; Obud dam, *Edwards* 2395; Bkt Pagon, *Edwards & Cantley* 735; Bkt Retak, *Edwards* 864; G Pagon, *Booth P28*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7584*.

Distribution. India, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines.

Ecology. Shaded humid areas in mature forests. Threat: Least Concern.

Hymenophyllum blandum Racib., *Pteridoph. Buitenzorg* 20. 1898.

TEM: Amo, Bkt Retak, *Edwards* 826.

Distribution. Taiwan, Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku), Philippines, and New Guinea.

Ecology. Lithophyte in shaded forest areas. Threat: Rare in Brunei.

Hymenophyllum cardunculus C.Ch., Mitt. Inst. Hamburg 7: 144. 1928.

TEM: Amo, Sg Temburong, *Johns RJ7409*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7512*.

Distribution. Malaysia (Sabah, Sarawak), Brunei, Indonesia (Sumatra, Kalimantan, Maluku), Philippines.

Ecology. In lowland forest. Threat: Least Concern.

Notes

The specimen was first classified as *H. acanthoides* and later as *H. cardunculus*. More research is needed to confirm this species in Brunei.

Hymenophyllum denticulatum Sw., J. Bot. (Schrader) 1800(2): 100. 1801.

TEM: Amo, Bkt Retak, *Edwards 864*; Amo, G Pagon, *Coode MC7599*; Amo, Bkt Retak, *Wong WKM914*, *Wong WKM s.n.*; Amo, Bkt Retak, *Johns RJ6584*; Batu Apoi, FSC, *Edwards 2457*; Samhan SN18; Bkt Belalong, *Edwards 2322*; Obud dam site, *Edwards 2396*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7496*.

Distribution. Sri Lanka, India, China, Taiwan, Japan, Indochina, throughout Malesia, to Fiji.

Ecology. In mossy montane forest on rocks and trunks. Threat: Least Concern.

Hymenophyllum digitatum (Sw.) Fosberg, Smithsonian Contr. Bot. 45: 1. 1980.

(=) *Trichomanes dichotomum* Kunze, Bot. Zeitung (Berlin) 5: 302 (nomen). 1847.; Bosch. Hym. Jav. 22, t. 16. 1861. 1847.

TUT: Sg Ingei, *Edwards 2394*; Rambai, Ulu Tutong, *Johns RJ7506*.

Distribution. Tanzania, West Indian Ocean Islands, Taiwan, Indochina, Malaysia (Malay Peninsula, Sabah), Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, Micronesia, Polynesia and Australia.

Ecology. Humid sites in mature dipterocarp forests. Threat: Rare in Brunei.

Hymenophyllum edentulum (Bosch) C.Ch., Index Filic.: 360. 1905.

(=) *Hymenophyllum bakeri* Copel., Sarawak Mus. J. 2. 309. 1917.

BEL: Sg Teraja, *Edwards 778*. **TEM:** Amo, Bkt Retak, *Wong s.n.*; Amo, Bkt Retak, *Edwards 830*; Amo, Bkt Retak, *Wong WKM906*; Amo, Bkt Retak, *Johns RJ7356*, Amo, Bkt Retak, *Sands MS5553*; Amo, Bkt Retak, *Johns RJ7360*; Amo, Bkt Retak, *Johns RJ7241*; Amo, Bkt Retak, *Johns RJ7350*; Bkt Pagon, *Edwards & Cantley 736*.

Distribution. India, Sumatra, Malay Peninsula, Borneo (Brunei, Sarawak), and the Philippines.

Ecology. In mature lowland forests. Threat: Rare in Brunei.

Hymenophyllum holochilum (Bosch) C.Ch., Index Filic. fasc. 6: 362. 1905.

TEM: Amo, Sg Temburong, *Johns RJ7177*; Sg Belalong, *Edwards 963*; Bkt Belalong ridge, *Edwards 2208*; Bkt Patoi, *Edwards 2271*, *Edwards 2273*.

Distribution. Taiwan, Thailand, throughout Malesia, to the Solomon Islands, Vanuatu, Fiji, New Caledonia, and Australia.

Ecology. Epiphyte in lowland to submontane forests. Threat: Rare in Brunei.

Hymenophyllum hosei Copel., Philipp. J. Sci., C 12: 46. 1917.

TEM: Amo, Sg Belalong (Amo), *Edwards 963*, *Wong WKM1331*; Amo, Sg Belalong (Amo), *Wong WKM1336*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2089*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2088*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2042*; Amo, Sg Belalong (Amo), *Edwards 963*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1937*; Amo, Sg Belalong (Amo), *Johns RJ6996*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2439*; Amo, Sg Temburong, *Johns RJ7418*; Amo, Sg Temburong, *Johns RJ7240*; Amo, Sg Temburong, *Johns RJ7420*; Amo, Sg Temburong, *Johns RJ7284*; Amo, Sg Temburong, *Johns RJ7229*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7232*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7242*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7355*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7204*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7202*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7132*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7408*; Belalong, FSC, *Dancák 88A*; Amo, Bkt Retak, *Johns RJ6604*; Sg Sitam camp FSC, *Edwards 2042*; Sg Enkiang, *Edwards 2088*, *Edwards 2089*.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Maluku (Seram).

Ecology. In lowland forest, near rocky streams. Threat: Least Concern.

Hymenophyllum lobbii T.Moore ex Bosch, Ned. Kruidk. Arch. 5(3). 176. 1863.

TEM: Amo, Bkt Belalong, *Edwards 2209, Edwards 2210*; Amo, Bkt Retak, *Johns RJ6539*; Amo, Bkt Retak, *Johns RJ6530*; Amo, Ulu Belalong, *Coode MC7835*.

Distribution. Sumatra, Borneo (Brunei, Kalimantan, Sabah, Sarawak), Australia.

Ecology. Lowland forests. Threat: Rare in Brunei.

Hymenophyllum pachydermicum Ces., Atti Accad. Sci. Fis. Mat. Napoli 7(8): 8. 1876.

TEM: Amo, Sg Temburong, *Coode MC6614*; Sg Belalong, *Edwards 2092*; Amo, Bkt Retak, *Johns RJ6532*; Amo, Bkt Belalong, *De Vogel 9018, Dransfield SD1247, Dransfield SD1248*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7232*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7242*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7355*; Batu Apoi, Sg Temburong (Headwaters), *Johns RJ7244*; Bkt Retak, *Edwards 863*; Sg Temburong, *Edwards 2216*.

Distribution. Borneo (Brunei, Sabah, Sarawak), Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Maluku), Philippines, New Guinea.

Ecology. In lowland forests, on stream boulders. Threat: Least Concern.

Hymenophyllum pallidum (Blume) Ebihara & K.Iwats., Blumea 51(2): 232. 2006.

(=) *Hymenophyllum album* (Blume) Parris, Fern Gaz. 20(7): 305. 2018.

TEM: Amo, Bkt Retak, *Johns RJ6600*; Amo, Bkt Retak, *Johns RJ6583*; Amo, Bkt Retak, *Wong WKM907, Wong WKM s.n.*; Amo, Sg Temburong, *Johns RJ7370*; Amo, Bkt Retak, *Johns RJ6570, Edwards 832* [these samples were identified as *Pleuromanetes pallidum*]; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards 2195*; Amo, G Pagon ridge, *Wong WKM1862*.

Distribution. Sri Lanka, India, China, Indochina, throughout Malesia to Polynesia and Australia.

Ecology. On tree trunks along rivers in lowland and montane forests. Threat: Least Concern.

Hymenophyllum palmatifidum (Müll.Berol.) Ebihara & K.Iwats., Taxon 53(4): 941. 2004.

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD968*. **TEM:** Bkt Retak, *Edwards 827*; Amo, Bkt Retak, *Johns RJ6669*; Amo, Bkt Retak, *Johns RJ6641*; Amo, Bkt Retak, *Johns RJ6567*; Amo, Bkt Retak, *Johns RJ6535*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2314*; Amo, Bkt Retak, *Wong WKM908*; Amo, Bkt Retak, *Wong WKM s.n.*

Distribution. Taiwan, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Maluku, Indonesian New Guinea) and Papua New Guinea.

Ecology. Epiphyte in montane areas between 1500–2500 m a.s.l. Threat: Least Concern.

Hymenophyllum penangianum Matthew & Christ., J. Linn. Soc., Bot. 39: 214. 1909.

TEM: Bkt Belalong, *FSC, Edwards 2321*.

Distribution. Malay Peninsula (Penang), Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. In mature dipterocarp forests. Threat: Rare in Brunei.

Hymenophyllum pilosissimum C.Chr., Gard. Bull. Straits Settlem. ser. 3, 7: 213. 1934.

TEM: Amo, Bkt Retak, *Johns RJ6640*.

Distribution. Taiwan, Thailand, Borneo (Brunei, Kalimantan, Sabah, Sarawak), Philippines, New Guinea.

Ecology. In lowland forests. Threat: Rare in Brunei.

Hymenophyllum polyanthos (Sw.) Sw., J. Bot. (Schrader) 1800(2): 102. 1801.

TEM: Labu, Bkt Patoi (Peradayan FR), *Edwards 882*; Amo, Sg Belalong (Amo), *Edwards 2090*. Amo, G Pagon ridge, *Wong WKM1901*; Bkt Patoi, *Edwards 2270*.

Distribution. Throughout the tropics and subtropics, and Japan.

Ecology. Near streams and in forests. A very common and morphologically-variable species. Threat: Least Concern.

15.6. Trichomanes L., Sp. Pl.: 1097. 1753.

Trichomanes superbum Backh., Nursery Cat. (Backhouse of York) 1861: 15. 1861.

TUT: Ulu Tutong, *Johns RJ7603*; Bkt Bahak, *Johns RJ7018*.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. In mature tropical forests. Threat: Rare in Brunei.

15.7. Vandenboschia Copel., Philipp. J. Sci. 67: 51. 1938.

Vandenboschia maxima (Blume) Copel., Philipp. J. Sci. 67(1): 54. 1938.

TEM: Amo, Bkt Retak, *Wong WKM879*; Amo, Bkt Retak, *Wong WKM883*; Labu, Bkt Patoi (Peradayan FR), *Edwards 892*.

Distribution. Japan, Taiwan, Indochina, throughout Malesia, and the Pacific Islands.

Ecology. Along rivers, on rocks, from lowlands to montane forests. Threat: Least Concern.

Family 16. HYPODEMATIACEAE

16.1. *Leucostegia* C.Presl, Tent. Pterid.: 94. 1836.

Leucostegia pallida (Mett.) Copel., Philipp. J. Sci. 34: 252. 1927.

TEM: Amo, Sg Temburong, *Johns RJ7133, Johns RJ7388*.

Distribution. Myanmar, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Kalimantan, Maluku), the Philippines, Papua New Guinea, Micronesia, Polynesia.

Ecology. Epiphytic in shaded areas of mature tropical forests, sometimes growing on trunks of Cyatheaceae; lowlands below 600 m a.s.l. Threat: Least Concern.

Family 17. LINDSAEACEAE

17.1. *Lindsaea* Dryand. ex Sm., Mém. Acad. Roy. Sci (Turin) 5: 413. 1793.

Lindsaea borneensis Hook. ex Baker, Syn. Fil. (Hooker & Baker) 107. 1867. (Fig. 28).

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1049*; Labi, Ulu Sg Mendaram, *Ariffin et al. BRUN22791*; Wasai Wong Kadir, *Edwards 2568*; Andulau, *Edwards 908*; Labi hills, *Edwards 791*; Sg Ingei, *Edwards 2353*; Labi, Wasai Mendaram, *Dransfield SD932*; Labi, Bkt Teraja, *Johns RJ6880, Sands MS5470*; Melilas, Sg Ingei, *Edwards 2352*; Badas forest reserve, *Wong WKM2*; Melilas, Batu Melintang, *Kessler PK390*; Bkt Teraja, *Cicuzza 2674*. **BRM:** Sg Akar, *Edwards 515*. **TEM:** Labu, Bkt Patoi (Peradayan FR), *Edwards 876*; Amo, Bkt Lutut, *Ariffin et al. BRUN20787, Wong WKM1362*; Amo, Batu Apoi FR (K Belalong FSC), *Nielsen 1068*; Bkt Belalong, *Edwards 2315*; Bkt Patoi, *Edwards 2262, Edwards 873*; Sg Sitam, *Edwards 986*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2226*; Amo, Bkt Belalong, *Edwards 2313*; Rambai, Amo, Ulu Belalong, *Idris et al. BRUN16696*; Amo, Bkt Tudal, *Idris et al. BRUN15808*; Amo, Ulu Temburong (Wong Nguan), *Coode MC6678*; Bangar, Pekan Bangar, *Ashton A79*; Amo, Bkt Belalong; *Dransfield SD1270*; Liang, Andulau FR (Sg Liang), *Edwards 908*; Bkt Belalong, *Poulsen ADP93*; Amo, Belalong KBFSC, *Cicuzza 2718*; Amo, Belalong KBFSC, *Cicuzza 2723*; Amo, Belalong KBFSC, *Cicuzza 2726*. **TUT:** Benutan Lake, *Edwards 2332*; Ulu Tutong, *Johns RJ7606*; Telisai Pasir Puti, *Cicuzza 2526*; Kago dam, *Cicuzza 2645*; Kago dam, *Cicuzza 2654*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Kalimantan).

Ecology. In mature mixed dipterocarp forest, from lowlands to mid-montane forests. Threat: Least Concern.



Figure 28. Lindsaeaceae. *Lindsaea borneensis* (Photo D. Cicuzza).

Lindsaea bouillodii Christ, Notul. Syst. (Paris) 1(2): 59. 1909.

TUT: Rambai, Sg Medit, *Simpson 2626*; Sg Padang, Jln Merimbun, *Edwards 659*.

Distribution. Indochina, Philippines, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Java, Kalimantan, Sulawesi).

Ecology. Terrestrial, in forests between 300–1400 m a.s.l. Threat: Least Concern.

Lindsaea carvifolia K.U.Kramer, Blumea 15: 569. 1968.

TEM: Amo, G Pagon, *Coode MC7541, Booth P5, Booth P6, Booth P17*; Amo, G Pagon, *Wong WKM1777*; Amo, G Pagon Periok, *Ashton A264*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Sulawesi, Maluku).

Ecology. Epiphytic, in forests between 500–1700 m a.s.l. Threat: Least Concern.

Lindsaea crispa Baker, J. Bot. 17: 39 1879.

TEM: Amo, Bkt Retak, *Edwards* 851.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. In forests between 1000–1600 m a.s.l. Threat: Rare in Brunei.

Lindsaea cultrata (Willd.) Sw., Syn. Fil. (Swartz) 119. 1806.

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield* SD941. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Poulsen* ADP128, *Poulsen* ADP343; Amo, K Belalong FSC; *Edwards* 2168, *Edwards* 2343; Amo, G Pagon, *Liaw* 18; Amo, Belalong, FSC, *Cicuzza* 2605; Amo, Belalong, FSC, *Cicuzza* 2607.

Distribution. India, Sri Lanka, China, Thailand, throughout Malesia except New Guinea, and the Solomon Islands.

Ecology. In mature forests to 1300 m a.s.l. Threat: Least Concern.

Lindsaea divergens Hook. & Grev., Icon. Filic.: t. 226. 1831.

BEL: Labi, Bkt Teraja, *Johns* RJ6838, *Simpson* 2050; *Ariffin et al.* BRUN23236; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield* SD940, *Wong* WKM1055; Melilas, Sg Ingei, *Edwards* 2373; Kargu dam, *Edwards* 2398; Bkt Teraja, *Cicuzza* 2682. **BRM:** Jln Kebangsaan, *Edwards* 587; Berakas, near coast, *Edwards* 458. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Poulsen* ADP271. **TUT:** Rambai, Bkt Bahak, *Coode* MC6999.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Sumatra, Kalimantan), Philippines.

Ecology. Terrestrial, in forests from sea level to 800 m a.s.l. Threat: Least Concern.

Lindsaea doryphora K.U.Kramer, Blumea 15: 566. 1968. (Fig. 29).

BEL: Melilas, Ulu Ingei, *Sands* MS5932; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong* WKM1026; Melilas, Sg Ingei, *Suhaili* SZ4; Labi, Labi Hills FR, *Ariffin et al.* BRUN22551; Labi, Bkt Teraja, *Johns* RJ6841, *Ariffin et al.* BRUN23234; Bkt Sawat, Jln Merangking-Buau, *Niga* NN249; Wasai Wong Kadir, *Edwards* 2549, *Cicuzza* 2584, *Cicuzza* 2667. **TEM:** Amo, Sg Temburong, *Johns* RJ7249; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen* ADP341; Amo, Ulu Belalong, *Idris et al.* BRUN16683; Amo, Ulu Temburong (Wong Nguan), *Wong* WKM1731; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2479; K Belalong, FSC, *Tagane* B568; Amo, Belalong FSC, *Cicuzza* 2627. **TUT:** Rambai, Bkt Bahak; *Coode* MC7092; Sg Apan, *Edwards* 2405; Benutan Lake, *Edwards* 2240.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Sumatra, Java, Kalimantan), Philippines.



Figure 29. Lindsaeaceae. *Lindsaea doryphora* (Photo D. Cicuzza).

Ecology. In swamp forests to 1300 m a.s.l. Threat: Least Concern.

Lindsaea ensifolia Sw., J. Bot. (Schrader) 1800(2): 77. 1801.

BEL: Labi, Bkt Teraja, *Johns* RJ6878, *Edwards* 710; Sg Mendaram, *Ariffin et al.* BRUN22799; Sg Rampayoh, *Leong* 16; Seria, Badas FR, *Wong* WKM8; Labi, Kpg Teraja, *Wong* WKM987. **BRM:** Kota Batu, Kpg Kota Batu, *Johns* RJ6798; Jerudong beach, *Edwards* 524; Crocodile beach, *Edwards* 609; Jln Tasek, *Edwards* 455; Sultan Bolkiah's tomb, Kota Batu, *Edwards* 449; Jln Tg Batu, *Edwards* 2307. **TEM:** Labu, Bkt Patoi (Peradayan FR), *Edwards* 871, *Edwards* 2248, *Edwards* 871. **TUT:** Tg Maya, Kpg Bkt Udai, *Voeks* RV495; Sg Layong, *Edwards* 473; Jln Tutong, *Edwards* 460; Tasek Merimbun, *Edwards* 596; Merimbun Lake, *Cicuzza* 2539; Rambai, Sg Medit, *Simpson* 2526.

Distribution. Old World tropics from the East African coast to Hawaii.

Ecology. Terrestrial or lithophytic, in wet or dry places; sea level to 1000 m a.s.l. Threat: Least Concern.

Lindsaea heterophylla Dryand., Trans. Linn. Soc. London 3: 41, pl. 8. 1797.

TUT: Sg Padang, *Edwards* 658.

Distribution. West Indian Ocean Islands, India, Sri Lanka, China, Japan, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Maluku), Philippines.

Ecology. Along rivers and forest streams in mature forests. Threat: Rare in Brunei.

Lindsaea integra Holttum, Gard. Bull. Straits Settlement. 5: 67. 1930.

BEL: Labi, Sg Rampayoh, *Sands MS5996*; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1014*; Jln Sg Akar, *Edwards 520*. **TEM:** Batu Apoi, Sg Temburong (Batu Apoi), *Edwards 2157*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP344*; Amo, Sg Temburong, *Coode MC6490*, *Hussain s.n.*; Amo, Bkt Belalong, *Dransfield SD1212*.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. In forests, often along streams, between 100–1200 m a.s.l. Threat: Least Concern.

Lindsaea lobata Poir., Encycl. Suppl. 3(2): 448. 1814.

TEM: Amo, Bkt Belalong, *Edwards 2316*.

Distribution. China (Hainan), Vietnam, Malaysia (Sabah, Sarawak), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku), Philippines, Papua New Guinea, Micronesia.

Ecology. Terrestrial or at the base of trees in primary forests, 50–1800 m a.s.l. Threat: Least Concern.

Lindsaea lucida Blume, Enum. Pl. Javae 2: 216–217. 1828. (Fig. 30).

BEL: Labi, Sg Teraja, *Edwards 803*, *Edwards 2540*, *Edwards 775*; Labi, Sg Rampayoh, *Sands MS6007*; Melilas, Ulu Belait, *Sands MS5887*. **TEM:** Batu Apoi, Sg Temburong (Batu Apoi), *Edwards 934*; Amo, Batu Apoi FR, *Sands MS5787*; Batu Apoi, Kpg Selapon, *Dransfield SD1161*; Amo, Sg Belalong (Amo), *Johns RJ6980*, *Johns RJ7001*, *Johns RJ7016*, *Middleton DJM752*; Amo, Bkt Retak, *Johns RJ6692*; Amo, Sg Temburong, *Johns RJ7171*, *Johns RJ7219*, *Sands MS5550*, *Wong WKM487*; Amo, Bkt Belalong, *Edwards 813*; Amo, Batang Duri, *Edwards 2393*, *Schatz GS3291*; Amo, K Belalong, *Ashton A9*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 997*, *Edwards 2018*, *Nielsen 1042*, *Poulsen ADP72*; Amo, Ulu Temburong (Wong Nguan), *Coode MC6490*; Sg Sitam, *Edwards 997*; Sg Anak Babi, *Wong WKM3437*; Amo, Batu Apoi, *Lee 1047*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7518*, *Johns RJ7550*; Rambai, Sg Tutong (Belabau), *Coode MC6370*; Ladan hills, *Edwards 955*.

Distribution. India, Bhutan, Bangladesh, China, Japan, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines, Papua New Guinea, Micronesia.

Ecology. Terrestrial or on rocks, 400–1600 m a.s.l. Threat: Least Concern.



Figure 30. Lindsaeaceae. *Lindsaea lucida* (Photo D. Cicuzza).

Lindsaea oblanceolata Alderw., Bull. Jard. Bot. Buitenzorg, sér. 2, 23: 15. 1916. (Fig. 31).

BEL: Bkt Teraja, *Cicuzza 2679*. **TEM:** Amo, Bkt Belalong, *Dransfield SD1252*, *Wong s.n.*; Amo, Bkt Retak, *Johns RJ6525*, *Johns RJ6601*, *Johns RJ6655*, *Wong WKM405*, *Wong WKM772*, *Edwards 829*, *Edwards 852*; Amo, G Pagon, *Coode MC7498*, *Coode MC7606*, *Wong WKM1791*, *Booth P10*; Amo, Bkt Tudal, *Idris et al. BRUN15811*; G Pagon, *Liaw 32*. **TUT:** Lamunin, Ladan Hills FR, *Idris et al. BRUN17663*, Kago dam, *Cicuzza 2647*, Bkt Teraja, *Cicuzza 2679*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines.

Ecology. Epiphytic, 800–1800 m a.s.l. Threat: Least Concern.

Lindsaea obtusa Hook., Sp. Fil. [W. J. Hooker] 1: 224. 1846.

TEM: Amo, Bkt Retak, *Wong WKM884*, *Liaw 42*.

Distribution. Andaman Islands, Taiwan, throughout Malesia, to Micronesia and Australia.



Figure 31. Lindsaeaceae. *Lindsaea oblanceolata* (Photo KM. Wong).

Ecology. Lowland primary forests to 2000 m a.s.l. Threat: Least Concern.

Lindsaea orbiculata (Lam.) Mett., Ann. Mus. Bot. Lugduno-Batavi 4(9): 279. 1869.

BRM: Berakas, Kpg Tanah Jambu, *Edwards 2418*.

Distribution. India, China, Japan, Indochina, and throughout Malesia except New Guinea.

Ecology. At forest margins or ravines. Threat: Least Concern.

Lindsaea ovata J.Sm., Sp. Fil. [W. J. Hooker] 1: 204, t.64A. 1846.

BEL: Labi, Labi Hills FR, *Idris et al. BRUN18755*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD955*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Sumatra), Philippines.

Ecology. Terrestrial or lithophytic, from near sea level to 1000 m a.s.l. Threat: Least Concern.

Lindsaea parallelogramma Alderw., Bull. Jard. Bot. Buitenzorg, sér. 3, 5: 212. 1922. (Fig. 32).

BEL: Melilas, Ulu Ingei, *Sands MS5921*, *Wong s.n.*; Melilas, Sg Ingei, *Edwards 2350*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD939*; Melilas, Batu Melintang, *Wong WKM670*; Labi, Sg Teraja, *Edwards 802*; Labi, Bkt Teraja, *Johns RJ6849*, *Simpson 2085*; Labi, Kpg Teraja, *Sands MS5693*; Liang, Badas (Sg Liang), *Ashton A153*; Sg Mendaram, *Ariffin et al. BRUN23241*. **TEM:** Amo, Sg Temburong, *Johns RJ7227*, *Wong WKM466*; Amo, Ulu Temburong (Wong Nguan), *Coode MC6677*, *Coode MC6678*; Amo, Bkt Belalong, *Dransfield SD1210*, *Wong WKM1354*, *Wong WKM1487*, *Edwards & Cantley 812*; Amo, Bkt Retak, *Wong WKM880*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP71*, *Poulsen ADP342*, *Edwards 2003*, *Edwards 2112*; Bangar, Pekan Bangar; *Sands MS5637*; Sg Babi, *Edwards 2155*; G Pagon, *Liaw 13*, *Liaw 8*, *Liaw 7*. **TUT:** Rambai, Ulu Tutong, *Paing s.n.*, *Kirkup DK500*; Lamunin, Ladan Hills FR, *Coode MC6428*, *Johns RJ7109*.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Sumatra, Java, Kalimantan, Maluku, Indonesian New Guinea), Papua New Guinea.

Ecology. Terrestrial; lowlands to 1200 m a.s.l. Threat: Least Concern.



Figure 32. Lindsaeaceae. *Lindsaea parallelogramma* (Photo D. Cicuzza).

Lindsaea parasitica (J.Roxb. ex Griff.) Hieron., Hedwigia 62: 14. 1920.

BEL: Bkt Sawat, Merangking-Buau, Coode MC7696; Bkt Sawat, Sg Sindum, Ariffin et al. BRUN21981, Ariffin et al. BRUN24623; Liang, Sg Liang Arboretum FR, Junaidi et al. BRUN18910; Liang, Andulau FR (Sg Liang), Azlan et al. BRUN19791; Melilas, Sg Ingei, Edwards 2378; Sg Liang, Arboretum, Edwards 479, Edwards 480, Edwards 481, Edwards 482.

TEM: Amo, G Pagon, Liaw 19, Liaw 43.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Singapore, Indonesia (Sumatra, Kalimantan, Maluku).

Ecology. Epiphytic; lowlands to 1100 m a.s.l. Threat: Least Concern.

Lindsaea repens (Bory) Thwaites, Enum. Pl. Zeyl. 388. 1864.

BEL: Kargu dam, Edwards 2399. **BRM:** Sg Dolhakim, Edwards 576; P Berembang, Edwards 581. **TEM:** Amo, Bkt Retak, Johns RJ6656.

Distribution. West Indian Ocean Islands to Hawaii.

Ecology. Epiphytic on tree trunks. Lowlands to montane forests at 1800 m a.s.l. Threat: Least Concern.

Lindsaea rigida J.Sm. ex Hooker., Sp. Fil. [W. J. Hooker] 1: 217, t. 63. 1846.

TEM: Amo, Bkt Retak, Johns RJ6602, Edwards 824, Wong WKM732; Amo, G Pagon Periok, Ashton A275; Amo, Bkt Retak, Wong WKM909.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, the Solomon Islands to Tahiti.

Ecology. Epiphytic, 1000–2000 m a.s.l. Threat: Least Concern.

17.2. *Tapeinidium* (C.Presl) C.Chr., Index Filic.: 631. 1906.

Tapeinidium gracile (Blume) Alderw., Malayan Ferns 315, 1909.

BRM: Kpg Dadap walk, Edwards 2275.

Distribution. Vietnam, Borneo (Brunei, Sarawak), Indonesia (Java, Lesser Sunda Islands, Sulawesi, Maluku), Philippines.

Ecology. On rocky, humid sites, along streams. Threat: Rare in Brunei.

Tapeinidium luzonicum (Hook.) K.U.Kramer, Blumea 15: 552. 1968.

BEL: Labi, Bkt Teraja, Sands MS5469. **TEM:** Batu Apoi, Sg Temburong (Batu Apoi), Edwards 2158, Lee 1046, Poulsen ADP70; Amo, G Pagon, Coode MC7509, Coode MC7607, Ariffin ARK138; Amo, Bkt Tudal, Idris et al. BRUN15814; Amo, Bkt Retak, Edwards 850, Johns RJ6510; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2013, Edwards 2127, Nielsen 1037, Poulsen ADP70, Poulsen ADP350; Amo, K Belalong, Ashton A104, Dransfield SD991; Amo, Sg Temburong, Johns RJ7129, Johns RJ7216, Wong WKM486; Amo, Sg Belalong (Amo), Edwards 2120, Johns RJ6922; Amo, Ulu Temburong (Wong Nguan), Coode MC6503; Amo, Bkt Belalong, Dransfield SD1250, Edwards 2311; Sg Temburong, Sg Injiing, Samhan SN15; Sg Temburong, Sg Apan, Samhan SN14. **TUT:** Rambai, Bkt Bedawan (Ulu Tutong), Idris et al. BRUN17650; Rambai, Ulu Tutong, Johns RJ7544.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Maluku), Philippines.

Ecology. Terrestrial in forests; between 600–1500 m a.s.l. Threat: Least Concern.

Tapeinidium oligophlebium (Baker) C.Chr., Index Filic. 631. 1906.

TEM: G Retak, Johns RJ6629.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. In montane forests. Threat: Rare in Brunei.

Tapeinidium pinnatum (Cav.) C.Chr., Index Filic. 213. 1905.

TEM: Amo, G Pagon, Liaw 35.

Distribution. India, Taiwan, Japan, Indochina, Singapore, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi), Philippines.

Ecology. In montane forests. Threat: Rare in Brunei.

Family 18. LOMARIOPSIDACEAE

18.1. *Cyclopeltis* J.Sm., Bot. Mag. 72(Companion): 36. 1846.

Cyclopeltis crenata (Fée) C.Chr., Index Filic., Suppl. 3, 64. 1934.

TEM: Amo, Sg Temburong, Johns RJ7373; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP178.

Distribution. China, Indochina, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi), Philippines.

Ecology. In pristine forest, usually in shady sites with mature and humid soil. Threat: Least Concern.

18.2. *Lomariopsis* Fée, Mém. Foug. 2. Hist. Acrostich: 10. 1845.

***Lomariopsis lineata* (C.Presl) Holttum, Novit. Bot. Univ. Carol. 9. 1968.**

BEL: Sg Malayan, Ariffin *et al.* BRUN23289. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP126; Sg Belalong, Edwards 2102. **TUT:** Lamunin, Ladan Hills FR, Edwards 953, Edwards 970.

Distribution. Indonesia, throughout Malesia except Papua New Guinea.

Ecology. Lowlands to 1200 m a.s.l. Threat: Least Concern.

***Lomariopsis spectabilis* (Kunze) Mett., Fil. Hort. Bot. Lips. 22. 1856.**

BEL: Labi, Labi Hills FR, Ariffin *et al.* BRUN22566. **TEM:** Amo, Ulu Belalong, Idris *et al.* BRUN16685; Amo, Kerangan Meritam, Idris *et al.* BRUN15280; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2462; Kpg Bakok, Cicuzza 2704.

Distribution. Taiwan, Japan, Malaysia (Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Maluku) and Philippines.

Ecology. In mature and old secondary forests; lowlands to 1500 m a.s.l. Threat: Least Concern.

Family 19. LYGODIACEAE

19.1. *Lygodium* Sw., J. Bot. (Schrader) 1800(2): 7, 106. 1801.

***Lygodium circinnatum* (Burm.f.) Sw., Syn. Fil. 153. 1806. (Fig. 33).**

BEL: Bkt Sawat, Jln Merangking-Buau, Wong WKM375; Labi, Bkt Teraja, Johns RJ6886. **BRM:** Mentiri, Jln Muara, Edwards 2425; Sg Teraja, Edwards 2517; Tasek Gorge, Edwards 465; Jln Tasek, Edwards 466. **TEM:** Amo, Batang Duri, Forman LLF932; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP133; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2048; Batu Apoi, Selapon (Bkt Beliton), Wong WKM2012; Labu, Bkt Patoi (Peradayan FR), Edwards 899, Edwards 2255. **TUT:** Lamunin, Benutan dam, Edwards 2224, Edwards 459; Rambai, Kpg Benutan, Ariffin ARK67; Rambai, Bkt Tangan, Suzuki K13080; Kpg Batang Mitus, Edwards 2575; Merimbun Lake, Cicuzza 2539.

Distribution. Sri Lanka, India, China, throughout Malesia to the Pacific Islands.

Ecology. A terrestrial climber. Found in open sites, gaps in primary forests, secondary forests, plantations and other disturbed sites; lowlands to 1000 m a.s.l. Threat: Least Concern.



Figure 33. Lygodiaceae. *Lygodium circinnatum* (Photo D. Cicuzza).

***Lygodium longifolium* (Willd.) Sw., J. Bot. (Schrader) 1801(2): 305. 1803.**

BEL: Labi, Jln Labi, Voeks RV385. **BRM:** Kota Batu, Kpg Kota Batu, Johns RJ6797; Jln Sg Akar, Edwards 759; Jln Kota Batu, Edwards 642. **TUT:** Tg Maya, Kpg Bkt Udal, Voeks RV498.

Distribution. India, China, Malay Peninsula, Indonesia (Sumatra, Kalimantan, Sulawesi), Philippines.

Ecology. At forest margins, forest gaps, secondary forests, or plantations below 500 m a.s.l. Threat: Least Concern.

***Lygodium microphyllum* (Cav.) R.Br., Prodr. 162. 1810.**

BEL: Bkt Sawat, Jln Labi (Bkt Sawat), Idris *et al.* BRN15843; K Belait, K Belait, Niga NN342; Sg Teraja, Edwards 2545. **BRM:** Kapok Kanan, Grindrod JG/BR6; Jln Gadong, Edwards 432. **TUT:** Tg Maya, Kpg Bkt Udal, Voeks RV483; Rambai, Tasek Merimbun, Bernstein JHB221, Edwards 591; Telisai, Pasir Puteh, Johns RJ6786; Ukong, Kpg Ukong, Johns RJ7084.

Distribution. Tropical and southern Africa, India, China, Japan, Thailand, throughout Malesia, Solomon Islands, New Caledonia and Australia. Naturalised in Southern USA.

Ecology. In secondary forests and plantations below 500 m a.s.l. Threat: Least Concern.

Lygodium salicifolium C.Presl, Tent. Pterid. 102. 1836.

BEL: Labi, Bkt Teraja, *Johns RJ6896*; Sg Teraja, *Edwards 2522*; Wasai Wong Kadir, *Edwards 2523*. **BRM:** Jln Tasek, *Edwards 454*. **TUT:** Lamunin, Benutan dam, *Edwards 2219*, *Edwards 470*; Rambai, Sg Medit, *Edwards 2219*, *Simpson 2563*, *Simpson 2621*; Rambai, Kpg Benutan, *Ariffin ARK60*; Jln Merimbun, *Edwards 661*, *Edwards 662*.

Distribution. India, China, Indochina, Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Java, Kalimantan), New Guinea, Micronesia.

Ecology. Forest margins and plantations; lowlands to 1000 m a.s.l. Threat: Least Concern.

Family 20. MARATTIACEAE

20.1. *Angiopteris* Adans., Fam. Pl. 2: 21. 1763.

Angiopteris evecta (G.Forst.) Hoffm., Commentat. Soc. Reg. Sci. Gott. 12: 29, t. 5. 1794.

BEL: Bkt Teraja, *Watu et al. BRUN19663*. **TUT:** Lamunin, Kpg Lamunin, *Edwards 739*.

Distribution. Madagascar, India, Sri Lanka, China, Japan, Indochina, throughout Malesia, Australia, Papua New Guinea, the Pacific Islands; naturalised in Hawaii and Central America.

Ecology. Along rivers and streams, in rocky habitats. Threat: Rare in Brunei.

Angiopteris palmiformis (Cav.) C.Chr., Dansk Bot. Ark. 9(3): 30, pl. 3. 1937.

TEM: Amo, G Pagon ridge, *Wong WKM1892*.

Distribution. Taiwan, Japan, Vietnam, Malaysia (Sabah), Brunei, Indonesia (Sumatra, Java, Maluku), Philippines.

Ecology. In montane forests. Threat: Rare in Brunei.

Angiopteris smithii Racib., Bull. Int. Acad. Sci. Cracovie 2: 54. 1902. (Fig. 34).

BEL: Labi, Kpg Labi, *Johns RJ6807*; Sg Teraja, *Edwards 684*; Sg Telingan waterfall, *Ariffin et al. BRUN23693*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2103*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1960*, *Edwards 2103*; Labu, Peradayan FR, *Johns RJ7047*; Bkt Patoi, *Edwards 897*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, and Indonesia (Sumatra, Kalimantan).

Ecology. Along rivers in primary forests. Threat: Endangered.

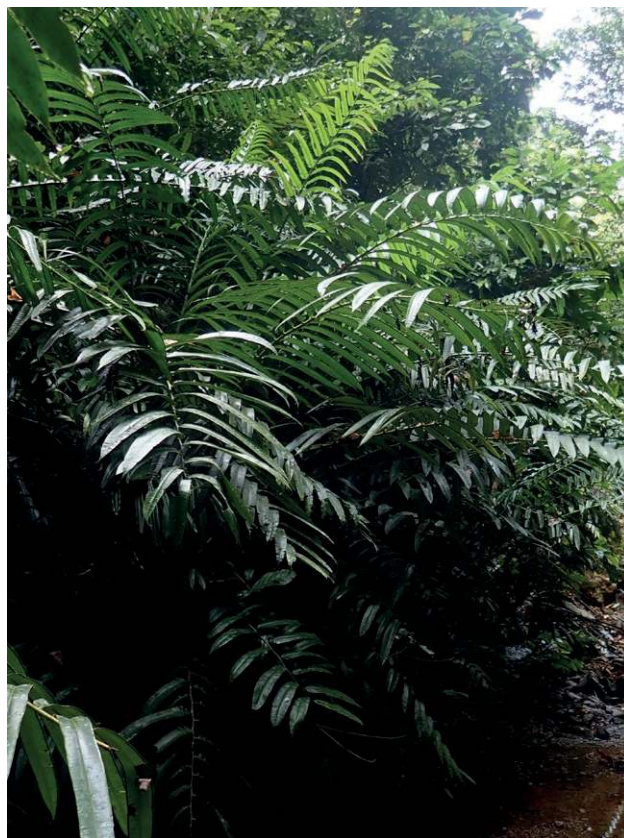


Figure 34. Marattiaceae. *Angiopteris smithii* (Photo D. Cicuzza).

20.2. *Christensenia* Maxon, Proc. Biol. Soc. Washington 18: 239. 1905.

Christensenia aesculifolia (Blume) Maxon, Proc. Biol. Soc. Washington 18(50): 240. 1905. (Fig. 35).

BEL: Labi, Wasai Wong Kadir, *Johns RJ7433*; Labi, Kpg Teraja, *Ariffin et al. BRUN21112*; Labi, Wang Tebadak, *Azizi et al. BRUN23756*; Wasai Wan Kadir, *Cicuzza 2662*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2184*, *Sands MS5847*, *Poulsen ADP113*; Amo, K Belalong, *Dransfield SD1015*; Amo, Sg Apan, *Ariffin et al. BRUN15746*; Amo, Sg Belalong (Amo), *Edwards 2101*; Amo, Sg Sibut, *Johns RJ6903*; Amo, Sg Temburong, *Johns RJ7154*, *Johns RJ7156*; Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2069*; Sg Baki, *Hovenkamp BR007*; Sg Belalong, FSC, *Cicuzza 2579*; Kpg Bakok, *Cicuzza 2714*. **TUT:** Lamunin, Kpg Lamunin, *Edwards 753*; Benutan Lake, *Edwards 2230*, *Edwards 2233*; Lamunin, Sg Beruang, *Ariffin et al. BRUN23285*.

Distribution. India, China, Indochina, throughout Malesia, Solomon Islands.

Ecology. Along rivers in pristine forest, on muddy soil; lowlands to 1000 m a.s.l. Threat: Least Concern.



Figure 35. Marattiaceae. *Christensenia aesculifolia* (Photo D. Cicuzza).

20.3. *Ptisana* Murdock, Taxon 57: 744. 2008.

Ptisana sylvatica (Blume) Murdock, Taxon 57(3): 747. 2008. (Fig. 36).

TEM: Amo, Bkt Retak, Wong WKM849.

Distribution. Borneo (Brunei, Sabah, Sarawak), Java, Philippines.

Ecology. In primary forest, on humid soil and in ravines, between 400–1300 m a.s.l. Threat: Rare in Brunei.

Family 21. MATONIACEAE

21.1. *Matonia* R.Br., N.Wallich, Pl. Asiat. Rar. 1: 16. 1829.

Matonia foxworthyi Copel., Philipp. J. Sci., Bot. 3: 343, pl. 2. 1908.

TEM: Amo, G Pagon, Wong WKM1769, Booth P23; Amo, Bkt Retak, Edwards 857; Amo, G Pagon, Ariffin ARK132; Amo, Batu Apoi, Ariffin et al. BRUN23433.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Maluku, Indonesian New Guinea), Philippines.

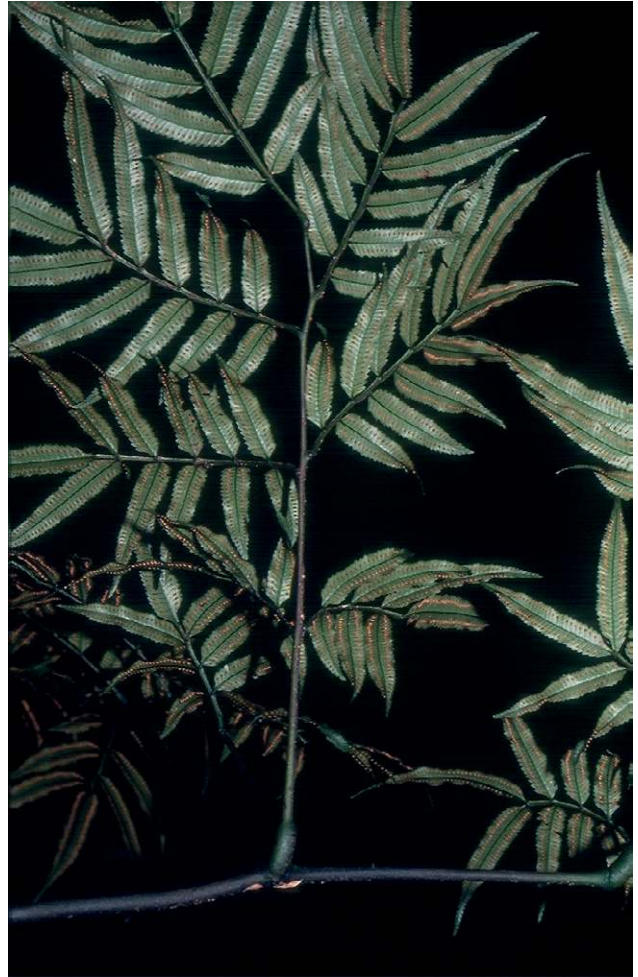


Figure 36. Marattiaceae. *Ptisana sylvatica* (Photo KM. Wong).

Ecology. On isolated mountain summits, open spaces, or forest margins. Threat: In Brunei, found only in Pagon mountain site.

Family 22. NEPHROLEPIDACEAE

22.1. *Nephrolepis* Schott, Gen. Fil. (Vindob.): t. 3. 1834.

Nephrolepis biserrata (Sw.) Schott, Gen. Fil. [Schott] ad t. 3. 1834.

BEL: K Belait, K Belait, Ashton A16; Labi, Sg Petai-Luagan Lalak, Ariffin et al. BRUN20448; Labi, Wasai Wong Kadir (= Wasai Rampayoh), Johns RJ7434; Sg Teraja, Edwards 2526; Seria, Badas, Ashton A139. BRM: Jln Residency, Edwards 407; JKR, grounds, Edwards 495. TEM: Amo, Sg Belalong (Amo), Johns RJ6941; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2232. TUT: Lamunin, Ladan Hills FR, Johns RJ7097; Tg Maya, Kpg Bkt Udal, Voeks RV494; Rambai, Sg Medit, Simpson 2631; Benutan Lake, Edwards 2223.

Distribution. Pantropical.

Ecology. Terrestrial on open or sparsely-shaded forest areas, sometimes epiphytic on trees or man-made structures; lowlands to 1000 m a.s.l. Threat: Least Concern.

Nephrolepis davallioides (Sw.) Kunze, Bot. Zeitung (Berlin) 4: 460. 1846.

TEM: Amo, Bkt Retak, *Johns RJ6749*, *Johns RJ6737*, *Wong WKM840*.

Distribution. Thailand, and throughout Malesia.

Ecology. Epiphytic on tree trunks from 300–1000 m a.s.l. Threat: Least Concern.

Nephrolepis falciformis J.Sm., Ferns Brit. For. 287. 1866.

(-) ***Nephrolepis falcata*** (Cav.) C.Chr., Dansk Bot. Ark. 9(3): 15. t. 1(5-9). 1937.

TEM: Amo, Bkt Belalong, *Johns RJ6990*; Amo, Sg Temburong, *Johns RJ7407*; Amo, Bkt Retak, *Wong WKM s.n.*, *Idris et al. BRUN15879*; Amo, Batu Apoi FR, Sg Temburong-Machang, *Wong WKM1927*, *Edwards 629*; Amo, Bkt Belalong, *Johns RJ7020*; Sg Sitam, *Edwards 987*; Sg Enkiang, FSC, *Edwards 2096*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 987*; Amo, K Belalong, *Ashton A33*, *Ashton A49*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2096*.

Distribution. Sri Lanka, China, Indochina, and throughout Malesia.

Ecology. Epiphytic on tree trunks in forests, between 600–800 m a.s.l. Threat: Least Concern.

Nephrolepis hirsutula (G.Forst.) C.Presl, Tent. Pterid. 79. 1836.

TUT: Rambai, Tasek Merimbun, *Bernstein JHB223*.

Distribution. Indochina, throughout Malesia, to the Pacific Islands and Australia; widely naturalised in the New World tropics.

Ecology. Mainly a lowland species in open areas and sparse forests. Threat: Rare in Brunei.

Nephrolepis radicans (Burm.) Kuhn, Ann. Mus. Bot. Lugduno-Batavi 4. 285. 1869.

TEM: Batu Apoi, Kpg Selapon, *Wong WKM2073*; Batu Apoi, Sg Batu Apoi, *Edwards 629*.

Distribution. India, China, Indochina and throughout Malesia to New Caledonia.

Ecology. Common in scrubby vegetation and disturbed areas. Threat: Least Concern.

Family 23. OLEANDRACEAE

23.1. *Oleandra* Cav., Anales Hist. Nat. 1: 115. 1799.

Oleandra coriacea Copel., J. Straits Branch Roy. Asiat. Soc. 63: 72. 1912.

TEM: Amo, G Pagon, *Edwards 724*; Amo, G Pagon Periok, *Ashton A424*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Amongst summit vegetation in montane areas between 1100–2200 m a.s.l. Threat: Rare in Brunei.

Oleandra musifolia (Blume) C.Presl. Abh. Königl. Böhm. Ges. Wiss., ser. 5, 6: 402. 1851.

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1122*.

Distribution. Sri Lanka, India, Indochina, Brunei, Indonesia (Java, Lesser Sunda Islands, Sulawesi), Philippines, Australia.

Ecology. Lithophytic; a montane species often found in disturbed forests; c. 2000 m a.s.l. Threat: Rare in Brunei.

Oleandra neriiformis Cav., Anales Hist. Nat. 1: 115. 1799. (Fig. 37).

TEM: Amo, Batu Apoi FR, *Joffre et al. BRUN20032*; Amo, G Pagon, *Coode MC7548*; Amo, Batu Apoi FR, *Wong WKM s.n.*; Amo, G Pagon Periok, *Ashton A242*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2306*; Labu, Peradayan FR, *Ariffin et al. BRUN19910*; Labu, Bkt Patoi (Peradayan FR), *Dransfield SD976*; Labu, Bkt Patoi (Peradayan FR), *Edwards 875*. Amo, Batu Apoi FR, *Wong WKM s.n.*; Amo, Bkt Tudal, *Davis APD464*; Amo, Bkt Retak, *Johns RJ6545*; Amo, Bkt Retak, *Wong WKM740*; Amo, Bkt Belalong, *Wong WKM1444*; Amo, Bkt Retak, *Edwards 818*; Amo, Sg Temburong, *Johns RJ7384*; Amo, Sg Temburong, *Hussain s.n.*; Amo, Sg Temburong, *Johns RJ7369*; Amo, Sg Temburong, *Wong WKM459*; Amo, Sg Temburong, *Coode MC6498*; Bkt Pagon, *Liaw 25*; Amo, Bkt Belalong, *Edwards 2308*; Bkt Patoi, *Dransfield SD976*.

Distribution. India, China, Indochina, throughout Malesia to the Pacific Islands.

Ecology. Lowlands to montane sites, in dry and sparse forest, sometimes on rocky substrate. Threat: Least Concern.

Family 24. OPHIOGLOSSACEAE

24.1. *Helminthostachys* Kaulf., Flora 5: 103. 1822.

Helminthostachys zeylanica (L.) Hook., Gen. Fil. [Hooker] t. 47. 1840. (Fig. 38).

BEL: Labi, Kpg Tenajor, *Haslani HA5*; Labi, Kpg Teraja, *Sands MS5685*; Pipeline, *Edwards 959*; Sg Teraja, *Edwards 2539*; Wasai



Figure 37. Oleandraceae. *Oleandra neriiformis* (Photo D. Cicuzza).



Figure 38. Ophioglossaceae. *Helminthostachys zeylanica* (Photo D. Cicuzza).

Beluluk, Low LYW504. **TEM:** Amo, Sg Temburong, *Edwards* 632; Amo, Sg Temburong, *Johns* RJ7327; Batu Apoi, Kpg Selapon, *Dransfield* JD7486. **TUT:** Rambai, Tasek Merimbun; *Bernstein* JHB403; Rambai, Sg Tutong, *Simpson* 2605; Ukong, Kpg Ukong, *Johns* RJ7082.

Distribution. India, Sri Lanka, China, Japan, Indochina, throughout Malesia, to New Caledonia, Australia and Micronesia.

Ecology. Lowlands to montane forests. In secondary forests, plantations, and sparse forests. Widely consumed as a vegetable in most of its distributional range. Threat: Rare in Brunei, or perhaps over-collected. This is a common edible species in Brunei; all individuals available in the market are collected (over-collected?) from the wild. Further studies are needed to understand the population size of this species.

24.2. *Ophioglossum* L., Sp. Pl.: 1062. 1753.

Ophioglossum intermedium Hook., Icon. Pl. 10: t. 995. 1854.

BEL: Labi, Wasai Wong Kadir, *Coode* MC7209; Melilas, Sg Ingei, *Kessler* PK417. **TEM:** Amo, Sg Temburong, *Edwards* 638. **TUT:** Lamunin, Kpg Lamunin, *Edwards* 964.

Distribution. Indonesia (Sumatra, Java), Brunei, Malaysia (Sabah), Philippines, Papua New Guinea and Australia.

Ecology. In forest margins, secondary forest, and disturbed forest. Threat: Least Concern.

Ophioglossum nudicaule L.f., Suppl. Pl. 443. 1782.

BRM: UBD campus, *Edwards* 2325.

Distribution. Pantropical.

Ecology. In disturbed areas and meadows. Threat: Least Concern.

Ophioglossum pendulum L., Sp. Pl. (ed. 2) 2: 1518. 1763.

BEL: Labi, Sg Rampayoh, *Coode* MC7283.

Distribution. Old World tropics and subtropics, Madagascar, Sri Lanka, India, China, Korea, Japan, Indochina, throughout Malesia, Australia and the Pacific Islands.

Ecology. From lowlands to montane forests; epiphytic, occasionally terrestrial. Threat: Least Concern.

Ophioglossum reticulatum L., Sp. Pl. 2: 1063. 1753.

BRM: Gadong, Kpg Gadong, *Edwards* 2325.

Distribution. Pantropical in tropical and subtropical regions.

Ecology. Lowlands to montane areas. In forests, secondary forests, and urban areas. Threat: Least Concern.

Family 25. PLAGIOGYRIACEAE

25.1. *Plagiogyria* (Kunze) Mett., Abh. Seckenberg. Naturf. Ges. 2: 265. 1858.

Plagiogyria egenolfioides (Baker) Copel., J. Straits Branch Roy. Asiat. Soc. 63: 72. 1912.

TEM: Amo, G Pagon, *Coode* MC7544; Amo, G Pagon, *Wong* WKM1763; Amo, Bkt Retak, *Edwards* 846; Amo, G Pagon, *Ariffin* ARK136.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, Solomon Islands.

Ecology. In mossy forests and on shaded sandstone cliffs between 1200–4000 m a.s.l. Threat: Least Concern.

Family 26. POLYPODIACEAE

26.1. *Acrosorus* Copel., Philipp. J. Sci. 1(Suppl. 2): 158. 1906.

Acrosorus pectinatus Parris, **sp. nov.**

Type: Brunei, Mt Galagas [= Gelagas], 350–500 m a.s.l., 24 Oct. 1991, *Simpson & Marsh* s.n. (holotype K!). Paratype: Sabah: Imbak Canyon, Mt Kuli, c. 600 m, Nov. 2010, *Ezzawanis & Yao* FRI 63983 (KEP images seen).

Diagnosis

Differs from all other species in the genus by the following combination of characters: rhizomes radial, stipes in whorls and longest fertile pinnae c. 0.5 mm wide.

Description

Stipes 2–3 × c. 0.2 mm, dull dark brown; glabrous. Laminae 72–85+ × 5–6 mm, linear, apex bluntly acute, base long-attenuate, deeply pinnately divided to wing 0.1–0.2 mm wide along rachis, pinnae 38–45 pairs, lowest 2–3 pairs reduced to auricles, longest pinnae 3–4 × c. 0.5 mm, narrowly oblong, apex bluntly acute to acute, base adnate to slightly decurrent on acroscopic margin, decurrent on basiscopic margin, entire, acroscopic and/or basiscopic margins folded over sori; texture thinly coriaceous; with ± appressed 1-forked hairs c. 0.1 mm with translucent or pale to

medium red-brown base, a dark red-brown seta as branch and glandular apex occasional to sparse on abaxial surface of rachis and sometimes occasional on abaxial surface of lamina on pinna vein adjacent to rachis, and ± appressed translucent to pale red-brown simple catenate hairs c. 0.1 mm with pale to medium red-brown cross-walls occasional on abaxial surface of lamina and abaxial surface of rachis and occasional to sparse on margin, sometimes occasional on adaxial surface of lamina and adaxial surface of rachis; rachis slightly prominent and concolorous with lamina to slightly darker than it on abaxial surface, sunken and concolorous with lamina to darker than it on adaxial surface; veins unbranched, without hydathodes. Sori narrowly elliptic, slightly sunken in shallow depressions in lamina and protected by folded acroscopic and/or basiscopic margin, opening at right angles to abaxial surface of lamina.

Etymology

Latin, *pectinatus* = comb-like, referring to the narrow parallel pinnae.

Distribution

Brunei, Malaysia (Sabah). **TEM:** Bkt Gelagas, *Simpson & Marsh* s.n.

Ecology

On mossy rocks near rivers (350–500 m a.s.l.). Threat: Rare in Brunei; known from two collections, one in Brunei and one in Sabah.

Acrosorus streptophyllus (Baker) Copel., Philipp. J. Sci. 56(4): 480. 1935. (Fig. 39).

TEM: Bkt Biang, *Ashton* A179; Bkt Retak, *Johns* RJ6575, *Wong* WKM733, *Edwards* 835; G Pagon, *Coode* MC7495, *Wong* WKM1799; Ulu Temburong, *Wong* WKM3317.

Distribution. Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Kalimantan).

Ecology. Epiphyte on mossy tree trunks and mossy tree branches in montane mossy forest and upland mixed dipterocarp forest in transition to lower montane forest (370–150 m a.s.l.). Threat: Least Concern.

26.2. *Calymmodon* C.Presl., Tent. Pterid.: 203. 1836.

Calymmodon ashtonii Parris, **sp. nov.**

Type: Brunei, Bkt Patoi, 960 ft, 9 April 1957, *Ashton* 132 (holotype K!, plant in centre of sheet, middle of second vertical row; isotypes K! all other plants on sheet). Paratype: Brunei: Temburong: Bkt Patoi, on rock face amongst moss and orchids, just below mixed dipterocarp forest, 10 Oct. 1987, *Edwards* 880 (*BRUN* 016255 image seen).

Diagnosis

Calymmodon ashtonii Parris, resembles *C. clavifer* (Hook.) T.Moore in membranous to chartaceous laminar texture, lamina

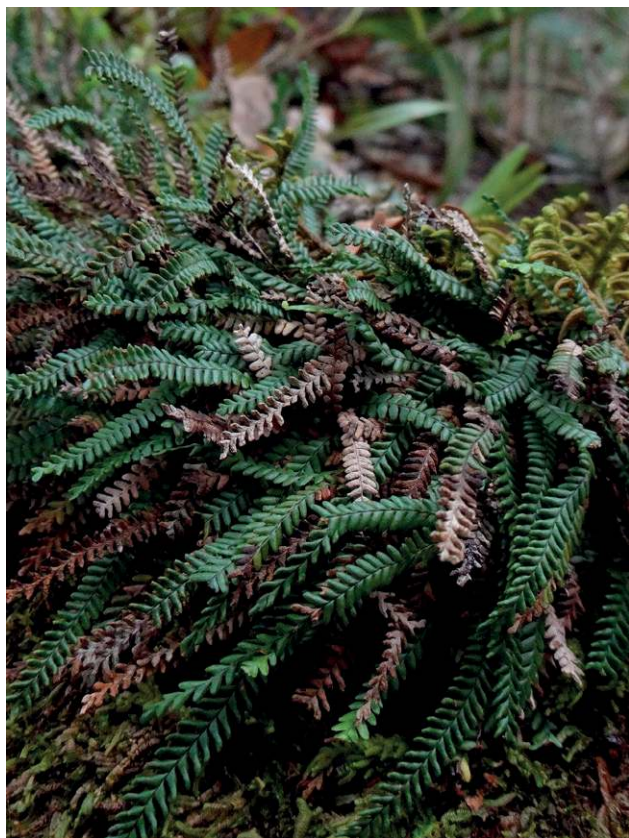


Figure 39. Polypodiaceae. *Acrosorus streptophyllus* (Photo KM. Wong).

pinnate or deeply pinnately divided to wing c. 0.1 mm wide along rachis, setae present on the abaxial surface of the rachis and the longest fertile pinnae with a distinct stalk at least 1 mm long, but differs in the absence of branched hairs and in having setae only on the abaxial surface of the rachis and on the lamina margin, rather than being more widely distributed.

Description

Stipes $\pm$ winged to base. Laminae (37–)38–50(–53) $\times$ 8–11(–12) mm, narrowly lanceolate to narrowly elliptic, apex bluntly acute to obtuse, base long-attenuate, deeply pinnately divided to wing c. 0.1 mm wide along rachis, pinnae 9–12 pairs, longest fertile pinnae (3.0–)4.0–5.5 $\times$ (1.2–)1.3–1.6(–1.7) mm, $\times$ 0.6–0.9 mm folded, on stalk c. 2 mm long, spatulate when unfolded, narrowly semicircular when folded, apex obtuse, base slightly surcurrent on acroscopic margin, decurrent on basiscopic margin, lowest fertile pinnae shorter than uppermost sterile pinnae, longest sterile pinnae (4.2–)4.9–7.1(–7.2) $\times$ (0.8–)0.9–1.2(–1.3) mm, linear-oblongate, apex bluntly acute to acuminate, base slightly surcurrent on acroscopic margin, decurrent on basiscopic margin, entire; texture chartaceous; with $\pm$ patent pale yellow-brown setae sparse to scattered on abaxial surface of rachis (0.6–0.9 mm) and occasional on margin (0.3–0.4 mm); veins ending in a dark elongate hydathode 0.2–0.3 $\times$ c. 0.1 mm on adaxial surface of lamina.

Etymology

Named in honour of Peter Ashton, an English botanist (fl. 1957) who worked in Brunei and Sarawak.

Distribution

Brunei. **TEM:** Bkt Patoi, *Ashton A132*, *Edwards 880*.

Ecology

On tertiary sandstone rocks in primary kerangas forest and mixed dipterocarp forest (c. 290 m a.s.l.). Threat: Rare in Brunei; known only from the type locality.

Calymmodon gracilis (Fée) Copel., *Philipp. J. Sci.* 34(3): 266. 1927.

TEM: Bkt Gelagas, *Simpson 2308*; G Pagon, *Wong WKM1772*; Bkt Retak, *Johns RJ6633*, *Johns RJ6634*, *Wong WKM868*, *Wong WKM869*; Bkt Belalong, *De Vogel 9019*, *De Vogel 9030*.

Distribution. Taiwan, Vietnam, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea and Solomon Islands.

Ecology. Epiphyte on mossy tree trunks in hill dipterocarp forest and lower montane forest (620–1480 m a.s.l.). Threat: Least Concern.

***Calymmodon minutus* Parris, sp. nov.**

Type: Brunei, Temburong, Amo, G Pagon, around helipad, 418'N 115°20'E, 1480 m, 1 April 1993, *Coode 7598*, *Ferguson*, *Niga*, *Ariffin*, *Awon*, *Jangarun*, *Ramlee & Melinau* (holotype K!).

Diagnosis

Calymmodon minutus Parris, resembles *C. gracilis* (Fée) Copel. and *C. persimilis* Tagawa in fronds having marginal setae and setae on the adaxial surface of the fertile veins, but differs from them in having all or most of the setae on the adaxial surface of the fertile veins c. 0.1 mm long, rather than more than 0.4 mm long.

Description

Stipes $\pm$ winged to base. Laminae 18–24(–25) $\times$ 3–4 mm, narrowly oblanceolate, obtuse to bluntly acute at apex, long-attenuate at base, pinnate or deeply pinnately divided to wing c. 0.1 mm wide along rachis, pinnae 7–10 pairs, lowest pair sometimes reduced to auricles, longest fertile pinnae (2.0–)2.2–2.8 $\times$ 0.6–0.9(–1.1) mm folded, $\times$ c. 1.5 mm unfolded, not stalked, $\pm$ semicircular when folded, obovate when unfolded, apex obtuse, base slightly surcurrent on acroscopic margin, decurrent on basiscopic margin, lowest fertile pinnae slightly longer than to slightly shorter than uppermost sterile pinnae, longest sterile pinnae 2.0–2.7(–3.0) $\times$ (1.0–)1.1–1.4 mm, narrowly obovate to broadly oblanceolate, apex obtuse, base slightly surcurrent on acroscopic margin, decurrent on basiscopic margin, entire; texture chartaceous to thinly coriaceous; with $\pm$ patent whitish to pale red-brown setae c. 0.1 mm sparse to scattered on abaxial surface of rachis, occasional to scattered on margin particularly near pinna apex, occasional on

adaxial surface of lamina and occasional to scattered on adaxial surface of vein particularly above receptacle, and $\pm$ appressed pale red-brown 1–3-forked hairs c. 0.1 mm with catenate base, setae as branches and glandular apex occasional to sparse on abaxial surface of rachis and occasional on adaxial surface of vein; veins ending in a dark $\pm$ elongate hydathode c. 0.2×0.1 mm on adaxial surface of lamina.

Etymology

Latin, *minutus* = very small, referring to the size of the plants relative to other species in the genus.

Distribution

Brunei. **TEM:** G Pagon, *Coode MC7598*.

Ecology

c. 1480 m a.s.l. Threat: Rare in Brunei; known only from the type collection.

Calymmodon pectinatus Parris, *Fern Gaz.* 21(6): 254. 2021.

TEM: Bkt Retak, *Johns RJ6578*.

Distribution. Indonesia (Sumatra, Java, Maluku, Indonesian New Guinea), Brunei, Malaysia (Sabah, Sarawak), Philippines, Papua New Guinea.

Ecology. Epiphyte in montane forest (1300–1350 m a.s.l.). Threat: Rare in Brunei.

***Calymmodon rupicola* Parris, sp. nov.**

Type: Brunei, Belait District, Ulu Ingei, Bkt Batu Patam, $4^{\circ}5'N$ $114^{\circ}42'E$, 200 m, 9 June 1989, *S Dransfield 947, KM Wong, J Dransfield & PC Boyce* (holotype K!; isotype BRUN 016047 images seen). Paratype: Brunei: Belait: Ulu Ingei, Bkt Batu Patam, $4^{\circ}5'N$ $114^{\circ}42'E$, mixed dipterocarp forest, Belait series sandstone, 13 June 1989, 90 m a.s.l., *S Dransfield 969* et al. (K, BRUN 016046 image seen).

Diagnosis

Calymmodon rupicola Parris, differs from the few other species of *Calymmodon* that lack hydathodes by the following combination of characters: rachis wing c. 0.1 mm wide; membranous to chartaceous laminar texture; setae absent, branched hairs, if present, with dark red-brown setae as branches; lithophyte on sandstone rocks.

Description

Stipes $\pm$ winged to base or $1-2 \times c. 0.2$ mm, dull dark brown to black; glabrous or with occasional $\pm$ appressed 1-forked hairs c. 0.1 mm with translucent catenate base, a dark red-brown seta as branch and pale to medium red-brown glandular apex. Laminae $(30-40-64(-87+) \times 3-4$ mm, linear, apex bluntly acute to obtuse, base long-attenuate, pinnate or deeply pinnately divided to wing c. 0.1 mm wide along rachis, pinnae $(18-24-33(-37+)$ pairs, lowest 1–2(–3) pairs usually reduced to auricles, longest fertile pinnae

$(1.2-1.5-2.3 \times (0.7-0.8-1.2$ mm unfolded, $\times 0.4-0.6(-0.7)$ mm folded, apex obtuse, base adnate on acroscopic margin, decurrent on basiscope margin, obovate when unfolded, oblong to $\pm$ hemispherical when folded, not stalked, basiscope and/or acroscopic margin partly folded over sori, lowest fertile pinnae slightly shorter than uppermost sterile pinnae, longest sterile pinnae $(1.7-1.8-2.2(-2.5) \times (0.6-0.8-1.0$ mm, oblong, oblanceolate or narrowly obovate, apex obtuse to bluntly acute, base adnate on acroscopic margin, decurrent on basiscope margin, entire; texture membranous to chartaceous; glabrous or with $\pm$ appressed 1-(2-)forked hairs 0.1–0.2 mm with translucent catenate base, dark red-brown setae as branches and medium red-brown glandular apex occasional to scattered on abaxial surface of rachis, sometimes occasional to sparse on abaxial surface of lamina especially on veins, occasional on margin, adaxial surface of lamina especially on veins and adaxial surface of rachis near base of lamina, sometimes with $\pm$ appressed translucent or pale to medium red-brown simple catenate hairs c. 0.1 mm with medium to dark red-brown gland occasional to scattered on abaxial surface of lamina adjacent to rachis, occasional on abaxial surface of rachis, margin and adaxial surface of lamina adjacent to rachis, and occasional to sparse on adaxial surface of rachis; veins without hydathodes

Etymology

Latin, *rupicola* = growing on rocks, referring to the habitat, unusual in the genus.

Distribution

Brunei, Malaysia (Sabah). **BEL:** Bkt Batu Patam, *Dransfield SD947, Dransfield SD969*.

Ecology

On mossy rocks in mixed dipterocarp forest and ridge-top kerangas forest transitional to mixed dipterocarp forest (90–200 m a.s.l.). Threat: Rare in Brunei, known only from the type locality.

26.3. *Ctenopterella* Parris, *Gard. Bull. Singapore* 58: 234. 2007.

***Ctenopterella blechnoides* (Grev.) Parris, *Gard. Bull. Singapore* 58(2): 235. 2007.**

TEM: K Belalong, *Ashton A364*; G Pagon, *Liaw 22*.

Distribution. India, Sri Lanka, China, Indochina, Singapore, Indonesia (Sumatra, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea, Australia, the Solomon Islands to Society Islands, Micronesia.

Ecology. Epiphyte along rivers and in submontane heath forest (60–890 m a.s.l.). Threat: Rare in Brunei.

***Ctenopterella rivularis* Parris, sp. nov.**

Type: Brunei, Temburong River valley, along stream to E of helicopter pad, c. 30–50 m, 27 April 1992, *R J Johns 7362, Niga, Salleh, Shanang, Ham & Ramlee* (holotype K!; isotypes BRUN, K!). Paratype: Brunei: Temburong: Temburong River at Wong Nuang rap-

ids, 4°3'N 115°15'E, mixed lowland forest, shales, 120 m, 9 April 1990, Coode 6679 *et al.* (BRUN 016285 image seen).

Diagnosis

Ctenopterella rivularis Parris, differs from all other species in the genus by the following combination of characters: rhizome scales concolorous; vein endings with hydathodes; branched hairs with setae as branches present on fronds, but setae absent.

Description

Rhizome scales narrowly lanceolate to linear-lanceolate, pale to medium red-brown, glabrous, concolorous. Stipes 2–3 × c. 0.3 mm, dull black; with scattered ± appressed pale red-brown 1-forked hairs c. 0.1 mm with catenate base, a seta as branch and glandular apex. Laminae 81–118(–120+) × 10–22(–33) mm, narrowly elliptic, apex long-caudate and bluntly acute, base narrowly cuneate, pinnate, pinnae c. 31 pairs, lowest 1–2(–3) pairs reduced to auricles, longest pinnae 5–11(–13) × 1–2 mm, narrowly oblong to linear, apex obtuse to bluntly acute, base adnate to slightly surcurrent on acroscopic margin, decurrent on basiscopic margin, entire; texture chartaceous; with ± appressed pale to medium red-brown 1–4-forked hairs 0.1–0.2 mm with catenate base, setae as branches and glandular apex occasional on abaxial surface of lamina and abaxial surface of costa, scattered on abaxial surface of rachis, occasional to sparse on margin, occasional on adaxial surface of lamina and adaxial surface of costa and occasional to sparse on adaxial surface of rachis; vein endings with a moderately dark ± circular hydathode c. 0.1 mm diam. on adaxial surface of lamina. Sori circular to broadly elliptic, superficial or slightly sunken in broad shallow depressions on abaxial surface of lamina, in 2 rows per pinna, 1 each side of costa, 2–4(–5) in each row on longest pinnae.

Etymology

Latin, *rivularis* = of streams, referring to the stream-side habitat.

Distribution

Brunei. **TEM:** Temburong River, Coode MC6679, Johns RJ7392.

Ecology

In lowland dipterocarp forests and mixed lowland forests, along rivers (30–120 m a.s.l.). Threat: Rare in Brunei; known only from the type locality.

26.4. *Dasygrammitis* Parris, Gard. Bull. Singapore 58: 238. 2007.

***Dasygrammitis brevivenosa* (Alderw.) Parris**, Gard. Bull. Singapore 58(2): 239. 2007.

TEM: Bkt Pagon, Edwards & Cantley 730, Booth P14; Amo, Bkt Retak, Edwards 862.

Distribution. Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sulawesi), Solomon Islands.

Ecology. Epiphyte in mossy montane forests (1520–1610 m a.s.l.). Threat: Rare in Brunei.

26.5. *Drynaria* (Bory) J.Sm., J. Bot (Hooker) 4: 60. 1841, *nom. cons.*

***Drynaria quercifolia* (L.) J.Sm.**, J. Bot. (Hooker) 3: 398. 1841. (Fig. 40).

BEL: Labi, Bkt Teraja, Johns RJ6900. **BRM:** Jln Kota Batu, Edwards 453; Pulau, Muara, Grindrod JG/BR16. **TEM:** Amo, Ulu Belalong LP382, Kirkup DK863. **TUT:** Rambai, Sg Tutong, Simpson 2608; Telisai, Pasir Puteh, Johns RJ6506; Kpg Bakok, Cicuzza 2707.

Distribution. Sri Lanka, India, Nepal, Bhutan, Bangladesh, Indochina, throughout Malesia to Australia.

Ecology. Epiphytic, spirally climbing; in forests, sparse forests, and plantations from the lowlands to 1200(–1900) m a.s.l. Threat: Least Concern.

***Drynaria sparsisora* (Desv.) T.Moore**, Index Fil. (T. Moore) 348. 1862.

BEL: Labi Hills, Edwards 792. **TEM:** Amo, Batu Apoi FR, Sands MS5804; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2269; Amo, Sg Temburong, Wong WKM458; Amo, K Belalong, Dransfield SD1024, Dransfield SD1033; Batu Apoi, Sg Selapon, Wong

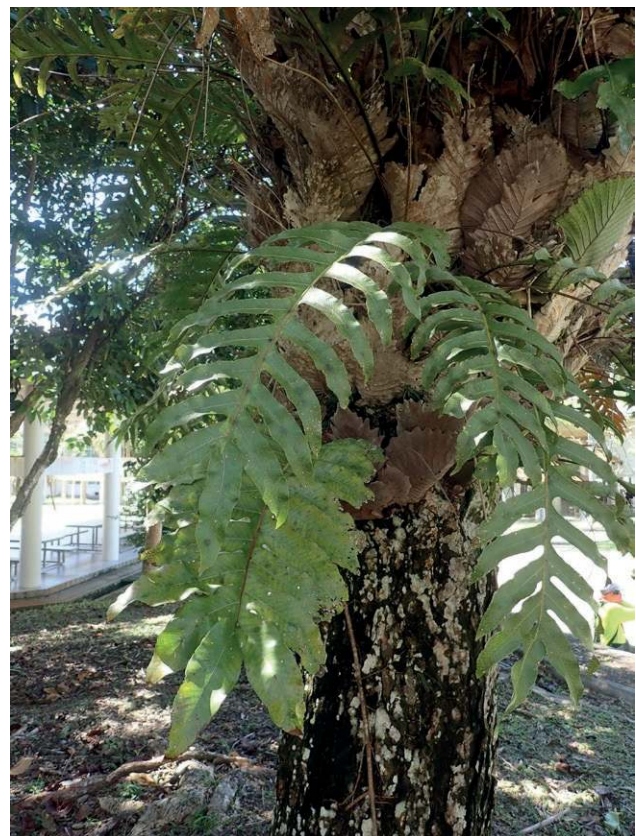


Figure 40. Polypodiaceae. *Drynaria quercifolia* (Photo D. Cicuzza).

WKM2090; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP81*, *Middleton DJM793*; Amo, Bkt Belalong, *Sands MS5541*; Amo, Sg Sibut, *Johns RJ6905*; Amo, Bkt Lutut LP297, *Ariffin et al. BRUN20820*; Amo, Sg Temburong, *Johns RJ7194*; Bkt Patoi, *Edwards 878*; Sg Belalong FSC, *Edwards 2085*; Sg Dolhakim, *Edwards 572*; Amo, Belalong, FSC, *Cicuzza 2603*. **TUT**: Rambai, Ulu Tutong, *Johns RJ7479*, *Johns RJ7523*; Telisai, Pasir Puteh, *Johns RJ6772*.

Distribution. Sri Lanka, Indochina, throughout Malesia to the Solomon Islands and Australia.

Ecology. Epiphytic, spirally climbing; in primary and secondary forests from near sea level to 1400(–1900) m a.s.l. Threat: Least Concern.

Drynaria speciosa (Blume) Christenh., *Phytotaxa* 230: 299. 2015.

TEM: Bkt Patoi, *Edwards 2408*; Sg Dolhakim, *Edwards 563*; Belalong, FSC, *Edwards 2290*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Sulawesi), Philippines.

Ecology. In mature forests. Threat: Least Concern.

26.6. *Glabriagrammitis* Li Bing Zhang, X.M.Zhou, Jian Jun Yang & Parris, *Phytotaxa* 597: 34. 2023.

Glabriagrammitis vittariifolia (C.Chr.) Parris, *Fern Gaz.* 22(3): 145. 2024.

BEL: Bkt Teraja, *Hotta MH12824*.

Distribution. Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah).

Ecology. 300–430 m a.s.l. Threat: Rare in Brunei.

26.7. *Goniophlebium* (Blume) C.Presl, *Tent. Pterid.*: 185. 1836.

Goniophlebium percussum (Cav.) W.H.Wagner & Grether, *Occ. Pap. Bernice Pauahi Bishop Mus.* 19: 88. 1948.

BEL: Wasai Wong Kadir, *Edwards 2564*; Sg Ayam Ayam, *Edwards 677*. **TEM**: Amo, Sg Temburong, *Johns RJ7260*; Amo, Bkt Belalong, *Wong WKM1474*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1976*; Bato Api, Sg Motong, *Samhan SN8(B)*; Sg Belalong, FSC, *Edwards 2199*; Bkt Patoi, *Edwards 2264*. **TUT**: Lamunin, Ladan Hills FR, *Ariffin et al. BRUN17589*; Lamunin, Kpg Lamunin, *Edwards 958*; Rambai, Sg Medit, *Simpson 2614*; Ukong, Kpg Rampau, *Edwards 656*; Sg Padang, Merimbun, *Edwards 665*; Tasek Merumbun, *Edwards 595*; Benutan Lake, *Edwards 2218*.

Distribution. Thailand, throughout Malesia, to Australia.

Ecology. Epiphytic species in forests; also in sparse, disturbed sites; near sea level to 1100(–1600) m a.s.l. Threat: Least Concern.

Goniophlebium persicifolium (Desv.) Bedd., *Suppl. Ferns Brit. Ind.* 21: pl. 79. 1876.

TEM: Amo, Sg Temburong, *Johns RJ7233*; Amo, Bkt Retak, *Johns RJ6712*.

Distribution. India, China, throughout Malesia, to the Pacific Islands.

Ecology. A forest species, usually epiphytic (rarely terrestrial); between 150–1900 m a.s.l. Threat: Least Concern.

26.8. *Lecanopteris* Reinw., *Flora* 8(2, Beibl.): 48. 1825.

Lecanopteris crustacea Copel., *Univ. Calif. Publ. Bot.* 12: 406. 1931. (Fig. 41).

BEL: Bkt Sawat, Jln Labi (Merangking junction), *Wong WKM1616*; Liang, Andulau FR (Sg Liang), *Wong WKM184*; Melilas, Sg Ingei, *Wong WKM s.n.* **TEM**: Amo, Kpg Batang Duri, *Edwards 884*; Labu, Bkt Patoi (Peradayan FR), *Dransfield SD971*; Amo, Belalong, KBFSC, *Cicuzza 2720*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

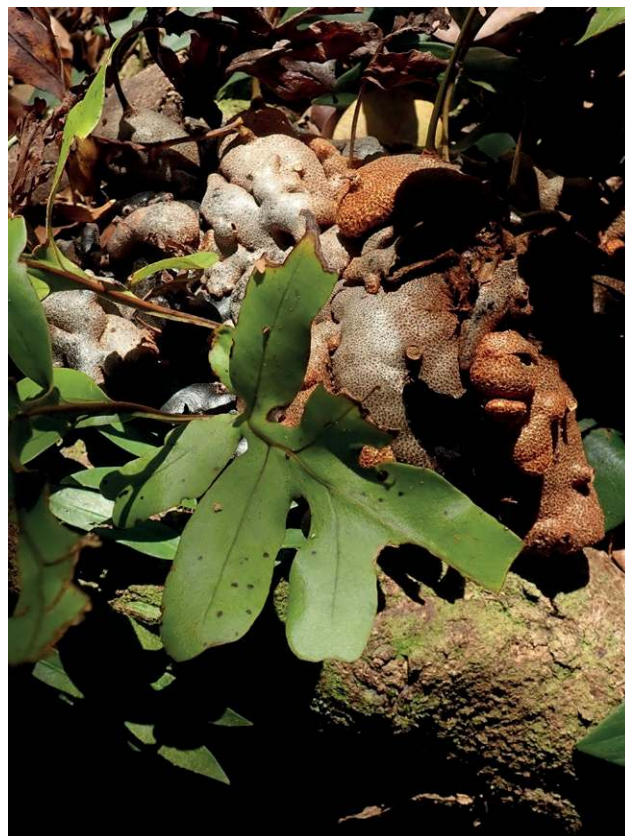


Figure 41. Polypodiaceae. *Lecanopteris crustacea* (Photo D. Cicuzza).

Ecology. Epiphyte in lowland evergreen heath and freshwater swamp forest; often found at very low densities. Threat: Rare in Brunei.

Lecanopteris pumila Blume, Fl. Javae Fil.: t. 94 B. 1829. (Fig. 42).

TEM: Amo, G Pagon, *Ariffin ARK137, Booth P21*; Amo, G Pagon ridge, *Wong WKM1909*; Amo, G Pagon Periok, *Ashton A416*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Kalimantan).

Ecology. Epiphyte in mid-montane forest. Threat: Rare in Brunei.

Lecanopteris sinuosa (Wall. ex Hook.) Copel., Univ. Calif. Publ. Bot. 16: 123. 1929. (Fig. 43).

BEL: Bkt Sawat, Jln Labi (km 13), *Chin CSC4551, Gay s.n.*; Seria, Badas SL, *Gay 1200, Niga NN30*; K Belait, Sg Belait, *Dransfield SD1122*; Liang, Andalau FR (Sg Liang), *Niga et al. BRUN15443*;

Seria, Anduki, *Idris et al. BRUN15865*; Seria, Badas FR. **BRM:** UBD Campus, *Kian 14*; Berakas coastal forest, *Edwards 456*; Beribi Gadong, *Azlan et al. BRUN23092*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP197*; Sg Dolhakim, *Edwards 656*.

Distribution. Taiwan, Indochina, throughout Malesia to the Pacific Islands, and Australia.

Ecology. Epiphyte in lowland forests, from evergreen to seasonal and disturbed forests below 500 m a.s.l. Threat: Least Concern.

26.9. *Lepisorus* (J.Sm.) Ching, Bull. Fan. Mem. Inst. Biol. 4: 56. 1933.

Lepisorus accedens (Blume) Hosok., Trans. Nat. Hist. Soc. Formosa 31: 477. 1941.

TEM: Amo, Sg Temburong, *Johns RJ7160*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2078, Edwards 2459, Edwards 2008*; Amo, Sg Belalong (Amo), *Wong WKM1322, Wong WKM1159*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2341, Simpson 2440*.

Distribution. Thailand, throughout Malesia, to the Pacific Islands, and Australia.



Figure 42. Polypodiaceae. *Lecanopteris pumila* (Photo KM. Wong).



Figure 43. Polypodiaceae. *Lecanopteris sinuosa* (Photo D. Cicuzza).

Ecology. Epiphyte in mature mixed dipterocarp forest. Threat: Least Concern.

Lepisorus annamensis (C.Ch.) Li Wang, Bot. J. Linn. Soc. 162: 35. 2010.

TEM: Amo, Sg Temburong, *Johns RJ7340*.

Distribution. China, Indochina, Indonesia (Kalimantan), Brunei, Malaysia (Sarawak).

Ecology. Epiphytic or lithophytic in evergreen forests; lowlands to 1900 m a.s.l. Threat: Rare in Brunei.

Lepisorus longifolius (Blume) Holttum, Rev. Fl. Malaya 2: 151. 1955.

BEL: Labi, Bkt Teraja, *Johns RJ6898*; Labi, Bkt Teraja, *Johns RJ6891*; Peatswamp Badas, *Dransfield SD1127*. **TEM:** Amo, Sg Temburong, *Idris et al. BRUN15300*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2073*, *Samhan SN91/1*; Amo, Bkt Belalong, *De Vogel 9023*; Amo, Bkt Belalong, *De Vogel 9015*; Amo, Sg Belalong (Amo), *Wong WKM1323*; Amo, Sg Temburong, *Wong WKM1309*; Amo, Sg Temburong, *Wong WKM467*; Amo, K Belalong, *Dransfield SD1202*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2229*; Amo, Sg Temburong; *Coode MC6506*; Amo, Sg Temburong, *Johns RJ7201*; Amo, Sg Temburong; *Johns RJ7329*; Amo, Sg Temburong; *Johns RJ7175*; Amo, K Belalong; *Johns RJ7005*; Amo, K Belalong; *Johns RJ6984*; Sg Sitam, *Edwards 993*; Batu Apoi, *Ariffin et al. BRUN23427*; Amo, G Pagon, *Liaw 52*; Kpg Bakok, *Cicuzza 2710*.

Distribution. India, China (Hainan), Taiwan, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, and Indonesia (Sumatra, Java, Kalimantan, Sulawesi).

Ecology. Epiphytic, rarely terrestrial, in various types of forests; lowlands to 800(–1350) m a.s.l. Threat: Least Concern.

Lepisorus mucronatus (Fée) Li Wang, Bot. J. Linn. Soc. 162: 35. 2010.

TEM: Amo, K Belalong, *Ashton A61*; Amo, K Belalong, *Dransfield SD1027*; Amo, Sg Temburong, *Sands MS5338*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2407*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1986*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2327*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2491*; Amo, Sg Belalong, *Cicuzza 2734*.

Distribution. Sri Lanka, Taiwan, Indochina, throughout Malesia to Australia, and the Pacific Islands.

Ecology. Epiphyte or lithophyte in primary and secondary forests; lowlands to 1500 m a.s.l. Threat: Least Concern.

Lepisorus spicatus (L.f.) Li Wang, Bot. J. Linn. Soc. 162: 35. 2010.

TEM: Amo, Bkt Retak, *Johns RJ6594*.

Distribution. Old World tropics.

Ecology. Epiphyte or lithophyte in primary and secondary forests; common in montane areas to 3000 m a.s.l. Threat: Rare in Brunei.

Lepisorus validinervis (Kunze) Li Wang, Bot. J. Linn. Soc. 162: 36. 2010.

TEM: Amo, Bkt Retak, *Wong WKM856*.

Distribution. Throughout Malesia, to New Caledonia.

Ecology. Epiphyte or lithophyte in primary and secondary montane forests between 1200–4000 m a.s.l. Threat: Rare in Brunei.

26.10. *Leptochilus* Kaulf., Enum. Filic.: 147. 1824.

Leptochilus macrophyllus (Blume) Noot., Blumea 42: 289. 1997.

(=) *Colysis acuminata* (Baker) Holttum, Rev. Fl. Malaya 2: 162, f. 73. 1955.

BEL: Labi, Labi Hills FR (Compt 12), *Ariffin et al. BRUN21320*; Labi, Sg Teraja, *Edwards 696*, *Ariffin et al. BRUN22560*; Pipeline, *Edwards 979*; Sg Teraja, *Edwards 781*. **BRM:** Pengkalan Batu, Kpg Wasan, *Edwards 979*. **TEM:** Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2058*; Sg Temburong, *Edwards 2191*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2019*, *Edwards 2456*, *Samhan SN19*; Amo, Sg Temburong, *Coode MC6653*; Amo, K Belalong, *Dransfield SD1021*; Amo, Sg Temburong, *Johns RJ7375*; Amo, Sg Temburong, *Johns RJ7141*; Amo, K Belalong, *Johns RJ7023*; Amo, Sg Temburong, *Johns RJ7155*; Amo, Batu Apoi FR, *Sands MS5817*; Amo, Belalong FSC, *Cicuzza 2641*. **TUT:** Lamunin, Ladan Hills FR, *Edwards 952*; Lamunin, Ladan Hills FR, *Ariffin et al. BRUN17579*; Merimbun Lake, MDF, *Cicuzza 2548*.

Distribution. China, Japan, Indochina, throughout Malesia, Solomon Islands.

Ecology. Terrestrial or lithophytic, sometimes epiphytic, along streams and at forest margins or forest sites with partially-open forest canopy; near sea level to 1800 m a.s.l. Threat: Least Concern.

Leptochilus pedunculatus (Hook. & Grev.) Fraser-Jenk., Taxon. Revis. Indian Subcontinental Pteridophytes: 62. 2008.

(=) *Gymnogramma membranacea* (Blume) Hook., Sp. Fil. 5: 159. 1864.

TUT: Pipeline road, *Edwards 981*.

Distribution. India, Bangladesh, China, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java), Philippines.

Ecology. Open sites and areas with stagnant water. Threat: Rare in Brunei.

26.11. *Loxogramme* (Blume) C.Presl, Tent. Pterid.: 214. 1836.

***Loxogramme antrophyoides* (Baker) C.Chr., Mitt. Inst. Hamburg 7. 163. 1928.**

TEM: Amo, Kerangan Meritam, *Hussain et al. BRUN15674*; Amo, K Belalong, *Dransfield SD992, Johns RJ6994, RJ7011A*; Amo, Sg Belalong (Amo), *Wong WKM1324*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 998, Edwards 2183*.

Distribution. Malaysia (Sabah, Sarawak), Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku), Brunei, Papua New Guinea.

Ecology. Epiphyte in mature tropical forests; lowlands to 1000 m a.s.l. Threat: Least Concern.

***Loxogramme scolopendrioides* (Gaudich.) C.V.Morton, Contr. U.S. Natl. Herb. 38: 242. 1973.**

TEM: Amo, Bkt Retak, *Wong WKM847*; Amo, G Pagon, *Ariffin ARK140*.

Distribution. Indochina, throughout Malesia and the Pacific Islands.

Ecology. Epiphyte or lithophyte, sometimes found on limestone; usually found in lowland forests between 100–500 m a.s.l. Threat: Least Concern.

***Loxogramme wallichiana* (Hook.) M.G.Price, Amer. Fern J. 74(2): 61. 1984.**

(=) *Loxogramme forbesii* Copel., Philipp. J. Sci., C 9: 232. 1914.

TEM: Amo, Bkt Retak, *Johns RJ6748*; Amo, Bkt Retak, *Johns RJ6718*; Amo, Sg Temburong, *Johns RJ7153*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2010, Edwards 2454, Samhan SN91/2*; Amo, Sg Temburong, *Johns RJ7136*; Amo, Sg Belalong (Amo), *Edwards 2131*; Amo, Sg Belalong (Amo), *Edwards 2100, Edwards 2114*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2182*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2388*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2393*; Sg Baki, *Edwards 2182*; Sg Sitam, *Edwards 2024*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi).

Ecology. Epiphyte near rivers in lowland forests or humid areas in mature forest between 200–1500 m a.s.l. Threat: Least Concern.

26.12. *Microsorium* Link, Hort. Berol. 2: 110. 1833, *nom. cons.*

***Microsorium congregatifolium* (Alderw.) Holttum, Rev. Fl. Malaya 2: 178. 1954.**

BEL: Labi, Kpg Rampayoh, *Ariffin et al. BRUN21735*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Kalimantan), Brunei, Philippines.

Ecology. Epiphytic, sometimes lithophytic, near streams or valleys, in densely shaded forests; between 30–1300 m a.s.l. Threat: Least Concern.

***Microsorium heterocarpum* Ching, Bull. Fan Mem. Inst. Biol. 4: 295. 1933.**

BEL: Wasai Wong Kadir, *Cicuzza 2593*; Labi Hill, *Cicuzza 2694*.

TEM: Amo, Bkt Retak, *Johns RJ6648*; Amo, Bkt Retak, *Johns RJ6707*; Amo, Bkt Retak, *Johns RJ6708*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2415*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2487*; Labu, Bkt Patoi (Peradayan FR), *Edwards 879*; Labu, Bkt Patoi (Peradayan FR), *Edwards 887*; Labu, Bkt Patoi (Peradayan FR), *Edwards 924*; Labu, Bkt Patoi (Peradayan FR), *Ashton A121*; Labu, Bkt Patoi (Peradayan FR), *Edwards 903*; Bkt Retak, *Johns RJ6684*; Amo, Sg Belalong, *Cicuzza 2741*.

Distribution. Malaysia, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, and Maluku), Brunei, Philippines.

Ecology. Lithophyte, epiphyte, or terrestrial in primary forest, often on slopes in shady places between 50–2200 m a.s.l. Threat: Least Concern.

***Microsorium membranifolium* (R.Br.) Ching, Bull. Fan Mem. Inst. Bil. 10: 239. 1941. (Fig. 44).**

(=) *Phymatosorus membranifolius* (R.Br.) S.G.Lu, Guihaia 19: 27. 1999.

BEL: Melilas, Kpg Melilas, *Forman LFF1211*; Wasai Wong Kadir, *Edwards 2528, Edwards 2569*; Sg Teraja, *Edwards 685*; Telingan waterfall, *Ariffin et al. BRUN24483*. **TEM:** Sg Anak Babi, *Wong WKM3448*; Amo, K Belalong, *De Vogel 8944, Dransfield SD987*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 990*; Batu Apoi, Sg Selapon, *Wong WKM2041*; Amo, Batu Apoi FR, Sg Apan, *Ariffin et al. BRUN15752*; Amo, Sg Temburong, *Johns RJ6968, Johns RJ6978, Johns RJ7277*; Amo, Batu Apoi FR, *Niga et al. BRUN15051*; Amo, Bkt Belalong, *Sands MS5542*; Labu, Bkt Patoi (Peradayan FR), *Edwards 902*; Labu, Peradayan FR, *Ariffin et al. BRUN19899*; Sg Enkiang, *Edwards 2064*. **TUT:** Lamunin, Benutan dam, *Edwards 2245, Edwards 2339*.

Distribution. India, Sri Lanka to Indochina, China, throughout Malesia, the Pacific Islands.

Ecology. Terrestrial, epiphyte, or lithophyte, often on limestone and granite; to 1700 m a.s.l. Threat: Least Concern.

***Microsorium musifolium* (Blume) Copel., Univ. Calif. Publ. Bot. 16: 112. 1929.**

TEM: Amo, Bkt Retak, *Johns RJ6719, Sands MS5373*; Amo, Sg Belalong (Amo), *Edwards 2115*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1955*.

Distribution. Malaysia, Indonesia (Sumatra, Kalimantan, Indonesian New Guinea), Philippines.



Figure 44. Polypodiaceae. *Microsorium membranifolium* (Photo D. Cicuzza).

Ecology. Epiphyte on tree trunks in mature tropical forests between 200–1000 m a.s.l. Threat: Rare in Brunei.

***Microsorium punctatum* (L.) Copel., Univ. Calif. Publ. Bot. 16: 111. 1929.**

BEL: Liang, Brunei Forestry Centre, *Ariffin et al. BRUN20436*. **BRM:** Jln Muara, *Edwards 550*.

Distribution. Old World tropics and subtropics.

Ecology. Epiphyte, lithophyte, or terrestrial in various types of forests, including sparse forest and secondary forest; near sea level to 2800 m a.s.l. Threat: Least Concern.

***Microsorium sarawakense* (Baker) Ching, Bull. Fan Mem. Inst. Biol. 4: 295. 1933.**

TEM: Amo, Bkt Retak, *Wong WKM863*; Amo, Belalong, FSC, *Cicuzza 2578*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah) Indonesia (Sumatra, Java, Kalimantan), Brunei, Philippines.

Ecology. Terrestrial or epiphytic, in humid places between 500–1500 m a.s.l. Threat: Least Concern, but rare in Brunei.

***Microsorium scolopendria* (Burm.f.) Copel., Univ. Calif. Publ. Bot. 16: 112. 1929. (Fig. 45).**

(≡) *Phymatosorus scolopendria* (Burm.f.) Pic.Serm., Webbia 28(2): 457, 460. 1973.

BEL: Seria, Badas FR, *Jangarun BRUN20217*. **BRM:** Serasa, Meragang Beach, *Idris et al. BRUN17361*; Jln Residency, *Edwards 419*; Sg Dolhakim, *Edwards 566*; Jln Gadong, *Edwards 434*; P Punyit, *Wong & Kamariah 11*. **TEM:** K Belalong stream, *De Vogel 8944*. **TUT:** Tg Maya, Jln Tutong-Belait (Pasir Puteh), *Paing BRUN15553*; Tg Maya, Kpg Bkt Udal, *Ariffin et al. BRUN21719*; Telisai, Kpg Telamba, *Ariffin et al. BRUN20764*; Telisai, Pasir Puteh, *Johns RJ6780*; Telisai, Pasir Puteh, *Johns RJ6505*; Telisai, Pasir Puteh, *Johns RJ6790*; Telisai, Jln Tutong-Telisai, *Idris et al. BRUN15856*; Telisai Pasir Puti, *Cicuzza 2521*; Telisai, Kpg Danau, *Kirkup DK788*; Lamunin, *Edwards 967*, *Edwards 969*; Tg Maya, *Nasibah et al. BRUN24571*, *Ariffin et al. BRUN24790*.

Distribution. Old World tropics.

Ecology. Epiphyte, lithophyte, or terrestrial in secondary forests, plantations, and urban areas; near sea level to 2100 m a.s.l. Threat: Least Concern.



Figure 45. Polypodiaceae. *Microsorium scolopendria* (Photo KM. Wong).

26.13. *Oreogrammitis* Copel., Philipp. J. Sci., C 12: 64: 1917.

***Oreogrammitis adspersa* (Blume) Parris, Gard. Bull. Singapore 58(2): 255. 2007.**

TEM: Bkt Retak, *Johns RJ6632 p.p.*

Distribution. Taiwan, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Sabah, Sarawak), Philippines, Papua New Guinea, Solomon Islands, Vanuatu, New Caledonia, Fiji.

Ecology. Epiphytic in montane forests (c. 1125 m a.s.l.). Threat: Rare in Brunei.

***Oreogrammitis bongoensis* (Copel.) Parris, Kew Bull. 65(1): 123. 2010.**

TEM: Bkt Retak, *Johns RJ6577.*

Distribution. Brunei, Malaysia (Sarawak), Indonesia (Kalimantan).

Ecology. Epiphyte in montane forest (1300–1350 m a.s.l.). Threat: Rare in Brunei.

***Oreogrammitis insularis* (Copel.) Parris, Gard. Bull. Singapore 58(2): 261. 2007.**

TEM: Bkt Retak, *Wong WKM870 p.p., Johns RJ6611.*

Distribution. Indonesia (Sumatra, Java, Maluku, Indonesian New Guinea), Brunei, Malaysia (Sabah, Sarawak), Papua New Guinea, Samoa.

Ecology. Epiphyte on mossy tree trunks in montane forest (c. 1125 m a.s.l.). Threat: Rare in Brunei.

***Oreogrammitis oblanceolata* (Baker) Parris, Gard. Bull. Singapore 58(2): 264. 2007.**

TEM: Bkt Retak, *Wong WKM825, Wong WKM870, Johns RJ6632 p.p.*

Distribution. Indonesia (Sumatra, Java, Kalimantan, Maluku, Indonesian New Guinea), Brunei, Malaysia (Sabah, Sarawak), Papua New Guinea, Solomon Islands.

Ecology. Epiphyte on tree trunks in montane forest (c. 1125 m a.s.l.). Threat: Rare in Brunei.

***Oreogrammitis reinwardtioides* (Copel.) Parris, Kew Bull. 65(1): 123. 2010.**

TEM: Bkt Pagon, *Ashton A471.*

Distribution. Brunei, Malaysia (Sabah, Sarawak), Indonesia (Kalimantan).

Ecology. c. 1590 m a.s.l. Threat: Rare in Brunei.

***Oreogrammitis sarawakensis* (Parris) Parris & Sundue, Phytotaxa 436(1): 50. 2020.**

TEM: Bkt Pagon, *Ashton A444.*

Distribution. Brunei, Malaysia (Sarawak).

Ecology. c. 1590 m a.s.l. Threat: Rare in Brunei.

***Oreogrammitis torricelliana* (Brause) Parris, Gard. Bull. Singapore 58(2): 270. 2007.**

TEM: Bkt Retak, *Johns RJ6742.*

Distribution. Brunei, Philippines, Papua New Guinea, Solomon Islands, New Caledonia.

Ecology. Epiphyte in lower montane forest (750–800 m a.s.l.). Threat: Rare in Brunei.

26.14. *Platyserium* Desv., Mém. Soc. Linn. Paris 6: 213. 1827.

***Platyserium coronarium* (König ex Müller) Desv., Mém. Soc. Linn. Paris 6: 213. 1827. (Fig. 46).**

BRM: Bandar Seri Begawan, *Edwards 494. TEM:* Labu, Bkt Patoi (Peradayan FR), *Wong WKM1301, Johns RJ7463; Sg Temburong, Edwards 634.*

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Java, Kalimantan), Philippines.

Ecology. Epiphytic on exposed branches in primary and secondary forest as well as in plantations and disturbed places; near sea level to 500(–1000) m a.s.l. Threat: Least Concern.

***Platyserium ridleyi* Christ, Ann. Buit. II. Suppl. III. 8 t. 2, 1909.**

BEL: Bkt Sawat, Jln Labi (Merangking junction), *Wong WKM967; Labi, Bkt Teraja, Johns RJ6901; TUT:* Lamunin, Benutan dam, *Edwards 2340.*

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Kalimantan).

Ecology. Epiphytic, often with several individuals on a single tree; in humid forest and swamps from near sea level to 200 m a.s.l. Threat: Least Concern.

26.15. *Prosaptia* C.Presl., Tent. Pterid.: 165. 1836.

***Prosaptia alata* (Blume) Christ, Bull. Jard. Bot. Buitenzorg, Ser. 2, 5: 127. 1905.**

BEL: Melilas, Batu Melintang, *Kessler PK413; Teraja Forest*



Figure 46. Polypodiaceae. *Platycerium coronarium* (Photo KM. Wong).

Reserve, Hotta MH12702. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), Edwards 992; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2072; Amo, K Belalong, Ashton A23; Amo, K Belalong, Wong WKM276; Amo, K Belalong, Dransfield SD984; Amo, Sg Belalong (Amo), Wong WKM1337; Amo, K Belalong, Dransfield SD1016; Amo, K Belalong, De Vogel 8927; Amo, Sg Belalong (Amo), Wong WKM1335, Edwards 2136; Amo, K Belalong, Dransfield SD1005; Amo, Ulu Temburong NP, Low LYW686; Bkt Belalong, De Vogel 9029, Dransfield SD1268; Sg Belalong, Johns RJ7008; Sg Belalong & Sg Temburong, Jacobs MJ5617; Sg Temburong above Sg Apan, Idris et al. BRUN017869; Sg Enkiang, Edwards 2072; Sg Sitam, Edwards 992; Bkt Retak, Johns RJ6593, Johns RJ6761; Sg Temburong, Johns RJ7168, Johns RJ71770, Johns RJ7404; Sg Selapon, Wong WKM2077. **TUT:** Sg Ingei, Edwards 2382.

Distribution. India, Sri Lanka, Thailand, Vietnam, Indonesia (Sumatra, Java, Kalimantan, Sulawesi, Maluku), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea, the Pacific Islands.

Ecology. A common epiphyte in lowland forest, often along rivers, up to 1000 m a.s.l. Threat: Least Concern.

Prosaptia barathrophylla (Baker) M.G.Price, Contr. Univ. Michigan Herb. 17: 276. 1990.

TEM: Amo, Bkt Retak; Wong WKM874, Johns RJ6625.

Distribution. China, Indochina, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea.

Ecology. Epiphytic in montane forest (c. 1250 m a.s.l.). Threat: Rare in Brunei.

Prosaptia contigua (G.Forst.) C.Presl, Tentamen: 166 no. 463. 1836.

BEL: Labi, Sg Teraja, Edwards 800.

Distribution. China, Taiwan, South India, Sri Lanka, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea, Australia, the Pacific Islands.

Ecology. Epiphyte in montane forest. Threat: Rare in Brunei.

Prosaptia obliquata (Blume) Mett., Reise Novara 1: 214. 1870.

TEM: Amo, Bkt Retak, Wong WKM872.

Distribution. China, Taiwan, India, Sri Lanka, Indochina, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Philippines, Papua New Guinea.

Ecology. Epiphyte in montane forest. Threat: Rare in Brunei.

26.16. Pyrrosia Mirb. in J.B.A.M. de Lamarck & C.F.B. de Mirbel, Hist. Nat. Vég. Cl. Fam. 3: 471. 1802.

Pyrrosia angustata (Sw.) Ching, Bull. Chin. Bot. Soc. 1: 49. 1935.

BEL: Labi, Kpg Teraja, Sands MS5688; Melilas, Batu Melintang, Wong WKM657; Melilas, Kpg Melilas, Forman LFL1209; Melilas, Ulu Ingei, Dransfield SD965; Melilas, Bkt Batu Patam (Ulu Ingei), Wong WKM1071, Kessler PK403; Sg Pasir, Sg Ingei, Kessler PK381; Sg Ingei, Kessler PK371; Sukang, Kpg Buau, Ariffin et al. BRUN19187; Sukang, Buau, Lee 952. **TEM:** Selirong, Edwards 894; Amo, Batu Apoi FR (K Belalong FSC), Sands MS5842; Batu Apoi, Sg Temburong-Machang, Wong WKM1975; Amo, Sg Temburong, Wong WKM6640; Amo, K Belalong, Dransfield SD1008; Amo, Sg Belalong (Amo), Edwards 2172; Amo, K Belalong, Johns RJ7006; Amo, Sg Temburong, Johns RJ6966; Amo, Sg Sibut, Johns RJ6908; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP5; Amo, Batu Apoi FR (K Belalong FSC), Hansen CH1503; Amo, K Belalong, Ashton A22; Amo, K Belalong, Ashton A5; Bangar, Pekan Bangar; Edwards 866; Batu Apoi, Sg Selapon, Wong WKM2089; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2334; FSC, Wong WKM3309; Amo, Belalong FSC, Cicuzza 2625. **TUT:** Lamunin,

Benutan dam, *Edwards* 2231; Lamunin, Ladan Hills FR, *Johns RJ7100*; Rambai, Sg Medit, *Simpson* 2584; Rambai, Ulu Tutong, *Johns RJ7532*; Rambai, Ulu Tutong, *Johns RJ7493*; Amo, Belalong, *FSC, Cicuzza* 2514.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Maluku); not confirmed in Java and New Guinea.

Ecology. Epiphytic in forests, also lithophytic, or terrestrial on sand; sea level to 900 m a.s.l. Threat: Least Concern.

Pyrrosia christii (Giesenh.) Ching, Bull. Chin. Bot. Soc. 1: 58. 1935.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2185; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2069; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2004; Amo, K Belalong, *Ashton A54, Edwards* 2110; Amo, Sg Temburong, *Johns RJ7193, Hovenkamp BR008*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. Mainly epiphytic, sometimes lithophytic; in shady areas or open sites between 300–1150 m a.s.l. Threat: Least Concern.

Pyrrosia lanceolata (L.) Farw., Amer. Midl. Naturalist 12(8): 245. 1930.

(=) *Pyrrosia adnascens* (Sw.) Ching, Bull. Chin. Bot. Soc. 1(1): 45–46. 1935.

BEL: Bkt Sawat, Jln Labi (Bkt Sawat), *Idris et al. BRUN15846*; Liang, Kpg Sg Liang, *Junaidi et al. BRUN18914*; Seria, Anduki, *Idris et al. BRUN15864*. **BRM:** Serasa, Jln Tg Batu, *Edwards* 2323, *Edwards* 567; Jln Residency, *Edwards* 446; P Berambang, *Edwards* 617. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2075; Amo, Sg Temburong, *Johns RJ6947, Johns RJ7245*; Amo, K Belalong, *De Vogel* 8928; Bangar, Bkt Bangar, *Johns RJ7037*; Batu Apoi, Kpg Selapon, *Dransfield SD1157*; Sg Baki, *Edwards* 2152; Sg Dolhahim, *Edwards* 567, *Edwards* 583. **TUT:** Telisai, Pasir Puteh, *Ariffin ARK4*; Telisai, Kpg Telamba, *Ariffin et al. BRUN20746*; Rambai, Sg Medit, *Simpson* 2623; Merimbun, Sg Padang, *Edwards* 666; Sg Lamunin, *Edwards* 738.

Distribution. Old World tropics.

Ecology. Epiphytic, sometimes lithophytic, rarely terrestrial; common in a broad range of habitats, mainly in the lowlands on trees along streams and rivers, but can be found at altitudes of up to 1500 m a.s.l. Threat: Least Concern.

Pyrrosia longifolia (Burm.f.) C.V.Morton, J. Wash. Acad. Sci. 36: 168. 1946. (Fig. 47).

BEL: Labi, Bkt Teraja, *Johns RJ6892*; Labi, Bkt Teraja, *Johns RJ6899*; Liang, Andulau FR (Sg Liang), *Ashton A142*; Liang, Andulau FR (Sg Liang), *Idris et al. BRUN15274*; Melilas, Kpg Melilas, *Forman LLF1210*; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong*

WKM1096; Arboretum, Sg Liang, *Edwards* 485. **BRM:** Angrek Hotel, *Edwards* 404; Berakas, *Edwards* 793. **TEM:** Amo, Sg Temburong, *Idris et al. BRUN15299*; Amo, Sg Temburong, *Wong WKM1308*; Amo, K Belalong, *Dransfield SD986*; Amo, Sg Temburong, *Wong WKM467B*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2273, *Idris et al. BRUN18786*; Sg Dolhahim, *Edwards* 571; Bkt Belalong, *Edwards & Cantley* 841; Sg Belalong, *Edwards* 2173; Amo, Belalong, *Cicuzza* 2517. **TUT:** Rambai, Sg Tutong (Belabau), *Wong WKM1692*; Rambai, Kpg Merimbun, *Edwards* 607; Rambai, Sg Medit, *Simpson* 2538; Rambai, Bkt Bahak, *Coode MC7101*; Rambai, Ulu Tutong, *Johns RJ7586*; Telisai, Kpg Danau, *Forman LLF1013*; Kpg Merimbun, *Edwards* 607.

Distribution. Indochina, throughout Malesia, to Australia and the Pacific islands.

Ecology. Epiphytic, rarely lithophytic or terrestrial, in a broad range of habitats including lowland mangrove forest; up to 300(–1000) m a.s.l. Threat: Least Concern.

Pyrrosia nummulariifolia (Sw.) Ching, Bull. Chin. Bot. Soc. 1: 47. 1935.

BEL: Labi, Sg Teraja, *Edwards* 698. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2193; Amo, K Belalong, *De Vogel* 8920; Sg Baki, *Hovenkamp BR010*.

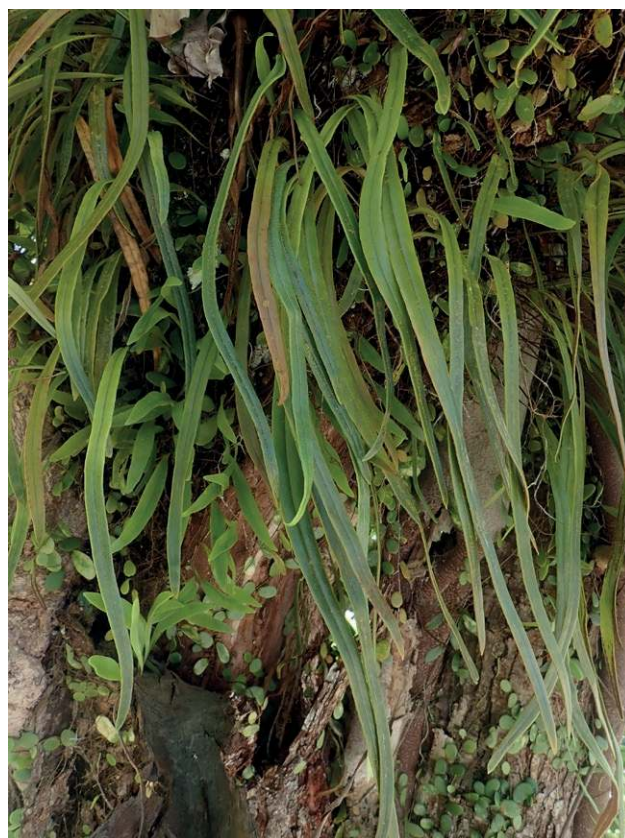


Figure 47. Polypodiaceae. *Pyrrosia longifolia* (Photo D. Cicuzza).

Distribution. India, Bhutan, China, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Sulawesi), Philippines.

Ecology. Epiphytic or lithophytic in exposed sites from near sea level to 1200 m a.s.l. Threat: Least Concern.

***Pyrrosia piloselloides* (L.) M.G.Price**, *Kalikasan* 3: 176. 1974.

BEL: Bkt Sawat, Bkt Sawat, *Azlan et al. BRUN20514*; Labi, Kpg Tenajor, *Niga s.n.* **BRM:** UBD campus, *Hamid NAH2*. **TEM:** Bangar, Bkt Bangar, *Johns RJ7041*. **TUT:** Rambai, Tasek Merimbun, *Hussain et al. BRUN15685*; Ukong, Kpg Ukong, *Johns RJ7085*.

Distribution. India to China, Indochina, throughout Malesia.

Ecology. Epiphytic (sometimes lithophytic) in primary and secondary forests and other disturbed vegetation; near sea level to 1000 m a.s.l. Threat: Least Concern.

26.17. *Scleroglossum* Alderw., Bull. Jard. Buitenzorg, sér. 2, 7: 37. 1912.

***Scleroglossum crassifolium* (Baker) C. Chr., Gard. Bull. Straits. Settle. 4:407. 1929.**

TEM: Amo, Bkt Retak, *Johns RJ6574 p.p., Johns RJ6576 p.p., Johns RJ6630, Johns RJ6661; Wong WKM797, Wong WKM875, Wong et al. BRUN016548*.

Distribution. Brunei, Malaysia (Sarawak).

Ecology. Epiphyte in montane forest (1250–1370 m a.s.l.). Threat: Rare in Brunei.

***Scleroglossum pusillum* (Blume) Alderw., Bull. Jard. Bot. Buitenzorg 2, 7: 39 t. 5 f. 1-2. 1912.**

TEM: Bkt Retak, *Johns RJ6562*.

Distribution. China, Sri Lanka, Indochina, throughout Malesia, Solomon Islands.

Ecology. Epiphyte in montane forest (1300–1350 m a.s.l.). Threat: Rare in Brunei.

***Scleroglossum pyxidatum* Alderw., Bull. Jard. Bot. Buitenzorg 2, 16: 37. 1914.**

TEM: Bkt Belalong, *Argent GA91159*; Bkt Retak, *Johns RJ6536, Johns RJ6636 p.p., Said et al. BRUN15802, Wong WKM402, Wong WKM759*; G Pagon, *Wong WKM1800*.

Distribution. Vietnam, Indonesia (Sumatra, Java, Sulawesi), Brunei, Malaysia (Sabah, Sarawak).

Ecology. Epiphyte on mossy trunks in montane forest (1060–1370 m a.s.l.). Threat: Least Concern.

***Scleroglossum sulcatum* (Kuhn) Alderw., Bull. Jard. Bot. Buitenzorg 2, 7: 39. 1912.**

BEL: N of Batu Patam, *Wong WKM1105*; Bkt Teraja, *Johns RJ6874*. **TEM:** Bkt Retak, *Johns RJ6515, Johns RJ6574 p.p., Johns RJ6663, Johns RJ6665, Wong WKM765*; G Pagon, *Wong WKM1794*; Temburong River valley, *Johns RJ7230, Johns RJ7344*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7534*.

Distribution. China, Sri Lanka, Indochina, throughout Malesia, the Pacific Islands.

Ecology. Epiphyte on mossy tree trunks, or terrestrial in lowland and hill dipterocarp forest and montane forest (50–1480 m a.s.l.). Threat: Least Concern.

26.18. *Selliguea* Bory, Dict. Class. Hist. Nat. 6: 587. 1824.

***Selliguea albidopaleata* (Copel.) Parris, Pl. Mt. Kinabalu 1: 151. 1992.**

TEM: Amo, G Pagon, *Coode MC7435, Ariffin ARK130, Booth P02*.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Maluku.

Ecology. Epiphyte or terrestrial in lower montane forest between 1250–2850 m a.s.l. Threat: Least Concern.

***Selliguea albidosquamata* (Blume) Parris, Pl. Mt. Kinabalu 1: 152. 1992.**

TEM: Amo, Bkt Retak, *Johns RJ6764, Wong WKM890*; Amo, K Belalong, *Wong WKM1319*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2001*; Sg Enkiang, *Edwards 2076*.

Distribution. Throughout Malesia, Solomon Islands.

Ecology. In primary forest, secondary forest, and scrubland, often near streams; lowlands to 3500 m a.s.l. Threat: Least Concern.

***Selliguea ceratophylla* (Copel.) Hovenkamp, Blumea 43(1): 86. 1998.**

TEM: Amo, Bkt Belalong, *Dransfield SD1269*; Amo, Bkt Belalong, *Wong WKM1527*; Amo, Bkt Belalong, *Wong WKM1525*; Amo, Bkt Belalong, *De Vogel 9017*; Amo, Bkt Belalong, *De Vogel 9014*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7611*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. Epiphytic, rarely terrestrial, in mature forests between 650–1900 m a.s.l. Threat: Least Concern.

Selliguea enervis (Cav.) Ching, Bull. Fan Mem. Inst. Biol. Bot. 10: 239. 1941.

TEM: Amo, Bkt Belalong, *Dransfield SD1244*, *Dransfield SD1251*, *Wong WKM1470*, *Wong WKM1526*, *Wong WKM1533*; Amo, G Pagon, *Wong WKM1795*.

Distribution. Indochina, throughout Malesia, Solomon Islands.

Ecology. Epiphytic, rarely lithophytic, in various types of forests between 280–3500 m a.s.l. Threat: Least Concern.

Selliguea heterocarpa Blume, Enum. Pl. Javae 2: Add. 1828. (Fig. 48).

TEM: Amo, Bkt Retak, *Wong WKM866*; Telisai Pasir Puti, *Cicuzza 2525*.

Distribution. Indochina, throughout Malesia.

Ecology. Epiphyte in various types of montane forests between 1200–2000 m a.s.l. Threat: Rare in Brunei

Selliguea lateritia (Baker) Hovenkamp, Blumea 43(1): 71. 1998.

BEL: Seria, Pekan Seria, *Edwards 917*; Bkt Sawat, Sg Mau SL, *Ariffin et al. BRUN20779*; Bkt Sawat, Jln Labi (km 13), *Idris et al. BRUN19546*; Labi, Jln Labi, *Edwards 2046*; Melilas, Sg Ingei, *Edwards 2374*; Melilas, Sg Ingei, *Edwards 2356*; Melilas, Batu Melintang, *Kessler PK388*; Melilas, Ulu Ingei, *Sands MS5926*; Melilas, K Ingei, *Kirkup DK784*; Seria, Badas FR, *Wong WKM7*; Sg Teraja, *Edwards 700*. **TEM:** Sg Enkiang, *Edwards 2079*; Amo, Sg Temburong, *Johns RJ7300*; Amo, Bkt Retak, *Johns RJ6582*; Amo, Bkt Retak, *Wong WKM798*; Amo, Sg Temburong, *Idris et al. BRUN15604*; Bkt Patoi, *Edwards 872*; Amo, Sg Temburong, *Johns RJ7163*; Amo, Sg Temburong, *Johns RJ7205*; Amo, K Belalong, *Dransfield SD977*; Amo, K Belalong, *Dransfield SD978*; Amo, K Belalong, *Dransfield SD1004*; Amo, Sg Belalong (Amo), *Wong WKM1334*; Amo, Sg Temburong, *Coode MC6690*; Batu Apoi, Sg Selapon, *Wong WKM2080*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2009*; Amo, Sg Temburong, *Wong WKM462*; Amo, Bkt Retak, *Wong WKM778*; Amo, Bkt Retak, *Wong WKM799*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1957*; Amo, K Belalong, *Johns RJ7007*; Amo, K Belalong, *Johns RJ7024*; Amo, K Belalong, *Johns RJ7030*; Amo, G Pagon, *Coode MC7542*; Amo, G Pagon, *Wong WKM1771*; Amo, Bkt Retak, *Johns RJ6549*; Amo, Sg Temburong, *Coode MC6516*; Amo, K Belalong, *Dransfield SD1009*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP179*; Amo, Batang Duri, *Schatz GS3289*; Amo, Bkt Lutut LP297, *Ariffin et al. BRUN20812*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2219*; Batu Apoi, Sg Temburong (Batu Apoi), *Edwards 2161*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2432*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2332*; Labu, Bkt Patoi (Peradayan FR), *Dransfield SD975*; Labu, Bkt Patoi (Peradayan FR), *Ashton A123*; Labu, Peradayan FR, *Ariffin et al. BRUN19908*; G Pagon, *Booth P26*. **TUT:** Rambai, Ulu Tutong, *Johns RJ7601*; Rambai, Ulu Tutong, *Johns RJ7533*.

Distribution. Indochina, throughout Malesia.



Figure 48. Polypodiaceae. *Selliguea heterocarpa* (Photo D. Cicuzza).

Ecology. Epiphyte, lithophyte, or terrestrial in various types of forests and along rivers from near sea level to 1200 m a.s.l. Threat: Least Concern.

Selliguea leucophora (Baker) Christenh., Global Fl. 4: 51. 2018.

TEM: Amo, Sg Temburong, *Johns RJ7273*; Amo, Sg Temburong, *Johns RJ7172*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Epiphyte in shady mature forests between 200–450 m a.s.l. Threat: Rare in Brunei.

Selliguea oodes (Kunze) Hovenkamp, Blumea 43(1): 89. 1998.

TEM: Amo, Sg Temburong, *Coode MC6491*; Amo, Bkt Retak, *Johns RJ6722*.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Indonesia (Kalimantan, Sulawesi), Philippines.

Ecology. Lithophytic, rarely epiphytic, often in river beds; between 600–1500 m a.s.l. Threat: Least Concern.

Selliguea rigida (Hook.) Hovenkamp, *Blumea* 43(1): 92. 1998.

TEM: Amo, Ulu Belalong, *Idris et al. BRUN16653*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Epiphyte in kerangas and lowland dipterocarp forest to 380 m a.s.l. Threat: Rare in Brunei.

Selliguea setacea (Copel.) Hovenkamp, *Blumea* 43(1): 72. 1998.

TEM: Amo, Sg Temburong, *Johns RJ7173*; Amo, Sg Temburong, *Johns RJ7250*; Amo, Sg Temburong, *Wong WKM1706*; Amo, Sg Temburong, *Wong WKM464*; Amo, Bkt Belalong, *De Vogel 8985*. **TUT:** Sg Ingei, *Edwards 2823*.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. Epiphyte in hill summit of dry or heath forests between 150–1900 m a.s.l. Threat: Least Concern.

Selliguea soridens (Hook.) Parris, *Malayan Nat. J.* 50(4): 267. 1997.

TEM: Amo, Bkt Tudal, *Idris et al. BRUN15826*; Amo, Bkt Retak, *Johns RJ6541*; Amo, Bkt Retak, *Wong WKM s.n.*; Amo, G Pagon, *Coode MC7499*; Amo, G Pagon, *Wong WKM1770*; Amo, Bkt Retak, *Johns RJ6766*; Amo, Bkt Retak, *Johns RJ6671*; Amo, Bkt Retak, *Johns RJ6581*; Amo, Bkt Retak, *Wong WKM756*; Amo, Bkt Retak, *Wong WKM731*; Amo, Bkt Retak, *Edwards 825*; Amo, G Pagon, *Edwards 725*, *Booth P35*; Amo, G Pagon Periok, *Ashton A288*.

Distribution. Malaysia (Sarawak, Sabah), Indonesia (Kalimantan, Sulawesi, Maluku).

Ecology. Epiphyte, lithophyte, or terrestrial in montane or mossy forest between 750–3150 m a.s.l. Threat: Least Concern.

Selliguea sri-ratu Hovenkamp, *Blumea* 41(1): 19. 1996.

TEM: Amo, Bkt Retak, *Johns RJ6765*.

Distribution. Endemic to Borneo (Brunei, Kalimantan).

Ecology. Epiphytic in mature dipterocarp forests between 660–960 m a.s.l. Threat: Least Concern.

Selliguea stenophylla (Blume) Parris, *Pl. Mt. Kinabalu* 1: 151. 1992.

TEM: Amo, Bkt Belalong, *Dransfield SD1242*, *Edwards & Cantley 840*; Amo, Ulu Belalong LP382, *Dransfield JD7369*; Amo, Sg Temburong, *Johns RJ7339*; Amo, Sg Temburong, *Coode MC6518*; Amo, Bkt Belalong, *De Vogel 9026*; Amo, Bkt Retak, *Wong s.n.*; Amo, Sg Temburong, *Johns RJ7342*; Amo, Bkt Tudal, *Davis APD462*; Bkt Belalong, *Samhan SN2*, *Simpson 2316*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2217*. **TUT:** Lamunin, Ladan Hills FR, *Joffe et al. BRUN18276*.

Distribution. Indochina, throughout Malesia.

Ecology. Epiphytic, rarely terrestrial, between 100–2550 m a.s.l. Threat: Least Concern.

Selliguea subsparsa (Baker) Hovenkamp, *Blumea* 43(1): 80. 1998.

TEM: Amo, Bkt Belalong, *De Vogel 8977*; Amo, Bkt Retak, *Johns RJ6672A*.

Distribution. Malay Peninsula, Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi).

Ecology. Epiphyte or lithophyte; in montane or summit forests between 1200–1500 m a.s.l. Threat: Least Concern.

Selliguea taeniata (Sw.) Parris, *Pl. Mt. Kinabalu* 1: 152. 1992.

(=) *Polypodium lepidosorum* C. Chr., *Leaf. Philipp. Bot.* 9: 3166. 1933.

(=) *Polypodium mjöbergii* C. Chr., *Dansk Bot. Ark.* 9: 70. 1937.

(=) *Phymatopteris pakkaensis* (C. Chr.) Parris, *Pl. Mt. Kinabalu* 1: 107. 1992.

BEL: Labi, Labi Hills FR, *Idris et al. BRUN18756*. **TEM:** Amo, Bkt Retak, *Johns RJ6666*; Amo, Bkt Retak, *Johns RJ6642*; Amo, Sg Temburong, *Johns RJ7383*; Amo, Sg Temburong, *Johns RJ7164*; Amo, G Pagon, *Ariffin ARK134*; Amo, Bkt Retak, *Johns RJ6597*; Amo, G Pagon, *Wong WKM1789*; Amo, Sg Temburong, *Coode MC6548*; Amo, Bkt Belalong, *Dransfield SD1233*; Amo, Bkt Retak, *Johns RJ6711*; Amo, G Pagon, *Ariffin ARK141*; Amo, Bkt Tudal, *Idris et al. BRUN15801*; Amo, Bkt Belalong, *De Vogel 9013*; Amo, Bkt Retak, *Wong WKM844*; Amo, Bkt Belalong, *De Vogel 9022*; Amo, Bkt Belalong, *Wong WKM1471*; Amo, Bkt Retak, *Wong WKM751*; Amo, Ulu Temburong, *Wong WKM s.n.*; Amo, Bkt Retak, *Wong WKM407*; Amo, Bkt Retak, *Wong WKM406*; Amo, Bkt Retak, *Edwards 861*; Amo, Bkt Belalong, *Edwards 2314*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2315*; Amo, Batu Apoi, *Samhan SN91*; Sg Enkiang, *Edwards 2093*; G Pagon, *Booth P36*; Bkt Retak, *Edwards 823*. **TUT:** Rambai, Ulu Tutong, *Kirkup DK576*; Rambai, Ulu Tutong, *Johns RJ7636*.

Distribution. Taiwan, Thailand, throughout Malesia.

Ecology. Epiphyte or terrestrial in forests or along roadsides; lowlands to 3400 m a.s.l. Threat: Least Concern.

Selliguea triloba (Houtt.) M.G.Price, *Contr. Univ. Michigan Herb.* 17: 276. 1990.

TEM: Amo, G Pagon, *Ariffin ARK129*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2270*; Amo, Bkt Retak, *Wong WKM823*; Amo, Batu Apoi FR, *Idris et al. BRUN18787*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2267*; Bkt Belalong, *Edwards 2317*.

Distribution. China, Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines.

Ecology. Epiphyte, lithophyte, or terrestrial in primary or secondary forests between 540–3200 m a.s.l. Threat: Least Concern.

26.19. *Thylacopteris* Kunze ex J.Sm., Hist. Fil.: 87. 1875.

Thylacopteris papillosa (Blume) J.Sm., Hist. Fil. 87. 1875.

TEM: Amo, Batu Apoi FR, *Idris et al. BRUN18778*, Samhan SN12; Amo, Bkt Retak, *Johns RJ6677*; Batu Apoi, Sg Temburong-Machang, *Wong WKM1945*; Amo, Sg Belalong (Amo), *Edwards 2129*.

Distribution. Throughout Malesia except New Guinea.

Ecology. Epiphyte or lithophyte, always in shaded areas; lowlands to 1500(–3500) m a.s.l. Threat: Least Concern.

26.20. *Tomophyllum* (E.Fourn.) Parris, Gard. Bull. Singapore 58: 245. 2007.

Tomophyllum minutum (Blume) Parris, Gard. Bull. Singapore 58(2): 247. 2007.

TEM: Amo, Sg Temburong, *Coode MC6492*; Bkt Retak, *Wong WKM873*.

Distribution. Indonesia (Sumatra, Java), Brunei, Malaysia (Sarawak).

Ecology. Epiphyte in mixed lowland forest and montane forest (120–1350 m a.s.l.). Threat: Rare in Brunei.

Tomophyllum subrepandulum (Christ) Parris, Gard. Bull. Singapore 58(2): 249. 2007.

TEM: Amo, Ulu Belalong, *Dransfield JD7361*; Ulu Temburong, *Wong WKM3353*.

Distribution. Indonesia (Java, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Brunei, Malaysia (Sarawak), Papua New Guinea, and the Solomon Islands.

Ecology. Epiphyte in lowland dipterocarp forest and upland mixed dipterocarp forest in transition to lower montane forest (450–1000 m a.s.l.). Threat: Rare in Brunei.

26.21. *Xiphopterella* Parris, Gard. Bull. Singapore 58: 249. 2007.

Xiphopterella murudensis (Copel.) Parris, Bull. Nat. Mus. Sci. Tokyo, B. 38(3): 119. 2012.

TEM: Bkt Retak, *Johns RJ6638*, *Johns RJ6740*; Amo, Temburong westward toward G Pagon LP 307, *Wong WKM1827*.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. Epiphyte or lithophyte in montane forests (750–1125 m a.s.l.). Threat: Rare in Brunei.

Family 27. PSILOACEAE

27.1. *Psilotum* Sw., J. Bot. (Schrader) 1800(2): 8, 109. 1801.

Psilotum complanatum Sw., J. Bot. (Schrader) 1800(2): 110. 1801.

BRM: Sg Dolhakim, P Berambang (HUBD), *Edwards 558*. **TEM:** Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2223*.

Distribution. Thailand, throughout Malesia, Australia, to the Pacific islands, and New World tropics.

Ecology. Epiphyte along shore and coastal vegetation to 400 m a.s.l. Threat: Rare in Brunei.

Psilotum nudum (L.) P.Beauv., Prod. Aethéogam. 112. 1805.

BRM: Berakas, Berakas, *Vermeulen 1260*; Sg Dolhakim, *Edwards 556*. **TUT:** Ukong, Jln Rampau (Sg Padang), *Edwards 786*.

Distribution. World-wide in tropical and subtropical regions.

Ecology. Lowlands, in primary and secondary forests, parks, and plantations. Threat: Least Concern.

Family 28. PTERIDACEAE

28.1. *Acrostichum* L., Sp. Pl.: 1067. 1753.

Acrostichum aureum L., Sp. Pl. 2: 1069. 1753. (Fig. 49).

BRM: Serasa, Muara (Brunei Bay), *Johns RJ7081*. **TEM:** Labu, Peradayan FR, *Johns RJ7046A*; P Berambang, *Edwards 618*. **TUT:** Lamunin, Ladan Hills FR, *Watu et al. BRUN21424*; Lamunin, Benutan dam, *Edwards 2330*.

Distribution. Pantropical.

Ecology. A lowland species common in mangrove forests and estuary rivers, it is also present in water bodies of urban areas such as drainages and channels. Threat: Least Concern.

Acrostichum speciosum Willd., Sp. Pl., ed. 5: 117. 1810. (Fig. 50).

BRM: Jln Mulaut, *Edwards 405*; Jln Gadong, *Edwards 417*; Kapok Kanan, *Grindrod JG4*, *Edwards 2473*. **TUT:** Telisai, Kpg Telisai, *Idris et al. BRUN15908*; Telisai, Kpg Danau, *Forman LLF1011*.

Distribution. West Indian Ocean Islands, throughout Malesia to Australia and Pacific Islands.



Figure 49. Pteridaceae. *Acrostichum aureum* (Photo D. Cicuzza).

Ecology. Similar to *A. aureum* in mangrove forest within mangrove vegetation but preferring slightly less inundated sites. Threat: Least Concern.

28.2. *Antrophyum* Kaulf., Enum. Filic.: 197. 1824.

Antrophyum callifolium Blume, Enum. Pl. Javae 2: 111. 1828. (Fig. 51).

BEL: Bkt Sawat, Ulu Sg Singap, Hairun BRUN22228; Labi, Labi Hills FR, Ariffin et al. BRUN22561; Melilas, Sg Ingei, Kessler PK423; Sg Teraja, Edwards 695; Sg Sagat, Wong WKM3224; Labi, Wasai Wong Kadir, Cicuzza 2589, Cicuzza 2668. **TEM:** Amo, Ulu Belalong, Idris et al. BRUN16669; Sg Temburong, Edwards 637; Amo, Batu Apoi FR, Sands MS5818; Amo, Sg Belalong (Amo), Wong WKM1168; Amo, Batang Duri, Edwards 2394; Amo, Sg Belalong (Amo), Middleton DJM759; Amo, Sg Temburong, Johns RJ6951; Amo, Batu Apoi FR, Sands MS5806; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2006; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2028; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2027; Amo, K Belalong, Johns RJ7029; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2328; Batu Apoi, Selapon (Bkt Beliton), Dransfield JD7446; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2433; Batu Apoi, Kpg Selapon, Dransfield SD1156; Labu, Peradayan FR, Johns RJ7057; Bkt Patoi, Edwards 2250; Sg Belalong, Edwards 2122, Edwards 2104; Sg Belalong, FSC, Edwards



Figure 50. Pteridaceae. *Acrostichum speciosum* (Photo KM. Wong).

22101; Batu Apoi, Samhan SN17, Samhan SN13. **TUT:** Lamunin, Ladan Hills FR, Ariffin et al. BRUN17584; Lamunin, Ladan Hills FR, Wong WKM1672, Edwards 755, Edwards 960; Ulu Sg Medit, Jangarun BRUN22855.

Distribution. China, Indochina, throughout Malesia, Australia, the Pacific Islands.

Ecology. Epiphyte in primary forest, sometimes also in disturbed sites; lowlands. The species has a broad morphological variability within the samples collected in Brunei. Threat: Least Concern.

Antrophyum semicostatum Blume, Enum. Pl. Javae 2: 110. 1828.

TEM: Amo, Bkt Retak, Johns RJ6671A; Amo, Bkt Retak, Johns RJ6739; Amo, Bkt Retak, Johns RJ6616A; Amo, Bkt Retak, Wong WKM893.

Distribution. Throughout Malesia, to the Pacific Islands.

Ecology. In mature tropical forest. Threat: Rare in Brunei.



Figure 51. Pteridaceae. *Antrophyum callifolium* (Photo KM. Wong).



Figure 52. Pteridaceae, *Ceratopteris thalictroides* (Photo D. Cicuzza).

Antrophyum subfalcatum Brack., U.S. Expl. Exped., Filic. 16: 65. 1854.

TEM: Amo, K Belalong, *Johns RJ7012*.

Distribution. Malaysia (Sabah, Sarawak), Brunei, Indonesia (Kali-mantan, Maluku), Papua New Guinea, Australia (Queensland), the Pacific Islands.

Ecology. Epiphyte on tree trunks in lowland primary forest. Threat: Rare in Brunei.

28.3. *Ceratopteris* Brongn., Bull. Sci. Soc. Philom. Paris 1821: 186. 1821.

Ceratopteris thalictroides (L.) Brongn., Bull. Sci. Soc. Philom. Paris 8: 186. 1821. (Fig. 52).

BRM: MISSR, Muara, *Edwards 639*. TUT: Keriam, Muara-Tutong Highway, *Idris et al. BRUN15878*; Lamunin, Kpg Layong, *Edwards 965*; Benutan Reservoir, *Edwards 926*; Lamunin, Kpg Lamunin, Wong WKM1921; Kpg Batang, *Edwards 2574*.

Distribution. Pantropical.

Ecology. Common along shores of lakes or ponds, channels, and wet habitats. Threat: Least Concern.

28.4. *Cheilanthes* Sw., Syn. Fil. (Kiliae): 5, 126. 1806.

Cheilanthes tenuifolia (Burm.f.) Syn. Fil. 129, 332. 1806.

BRM: Tasek Gorge, *Edwards 528*. TUT: Lamunin Pipeline, *Edwards 2043*.

Distribution. Sri Lanka, India, Nepal, China, Thailand, Malaysia (Malay Peninsula, Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea, Australia, and the Pacific Islands.

Ecology. Along rivers, and humid sites in open areas. Threat: Least Concern.

28.5. *Haplopteris* C.Presl, Tent. Pterid.: 141. 1836, *nom. cons.*

Haplopteris angustifolia (Blume) E.H.Crane, Syst. Bot. 22(3): 514, 1998.

BEL: Labi, Sg Rampayoh, *Coode MC7805*; Amo, Belalong FSC, *Cicuzza 2623*. TEM: Amo, Sg Temburong, *Johns RJ7334*; Amo,

Ulu Belalong, *Idris et al. BRUN16656*; Amo, Belalong ridge, *De Vogel 8936*.

Distribution. Indochina, throughout Malesia.

Ecology. Epiphytic, sometimes lithophytic, in primary forests and lowland areas. Threat: Least Concern.

Haplopteris dareicarpa (Hook.) S.Linds. & C.W.Chen, *Gard. Bull. Singapore* 66(2): 171. 2014.

BEL: Sg Teraja, *Edwards 805, Edwards 2541*; PSF, Seria, *Edwards 920*. **TEM:** Obud dam, *Edwards 2397*; Bkt Patoi, *Edwards 885*. **TUT:** Lamunin, *Edwards 756*.

Distribution. Malesia, the Pacific Islands and Australia.

Ecology. Epiphyte in mature forests, humid forest sites, and along streams. Threat: Least Concern.

Haplopteris elongata (Sw.) E.H.Crane, *Syst. Bot.* 22(3): 514. 1998.

BEL: K Belait, Sg Belait, *Dransfield SD1124*; Seria, Pekan Seria, *Edwards 919*; Labi, Wasai Mendaram, *Johns RJ6801*; Labi, Wasai Wong Kadir (= Wasai Rampayoh), *Johns RJ7443*; Labi, Bkt Teraja, *Johns RJ6873*; Labi, Wasai Wong Kadir, *Cicuzza 2672*. **BRM:** Kumbang Pasang, Jln Kumbang Pasang, *Johns RJ7068*; Mentiri, Jln Muara, *Edwards 552*; Sg Tilog, Jln Muara, *Edwards 539*; Sg Layong, Kpg Rambai, *Edwards 474*; Labi hill, *Cicuzza 2689*. **TEM:** Amo, Sg Temburong, *Dransfield SD1026*; Amo, Sg Belalong, *Wong WKM1338*; Amo, Sg Temburong, *Johns RJ6942*; Amo, Sg Temburong, *Sands MS5539*; Amo, Bkt Retak, *Wong WKM s.n.*; Amo, K Belalong, *Johns RJ7004*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2038*; Amo, Sg Temburong, *Coode MC6524*; Amo, Sg Temburong, *Edwards 633*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2071*; Bangar, Bkt Bangar, *Johns RJ7042*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2326*; Batu Apoi, Sg Selapon, *Wong WKM2039*; Amo, Batu Apoi FR, Sg Temburong-Machang, *Wong WKM2002*; Bandar, Forest area (wildlife park), *Edwards 502*; Amo, Belalong, *Cicuzza 2611*. **TUT:** Rambai, Sg Medit, *Simpson 2613*; Rambai, Sg Tutong, *Wong WKM1662*; Rambai, Sg Medit, *Simpson 2560*; Merimbun Lake, *Cicuzza 2540*; Kago dam, *Cicuzza 2651*.

Distribution. Old World tropics.

Ecology. Epiphyte on tall trees in primary and secondary forest, sometimes in plantations or parks; between 5–600 m a.s.l. Threat: Least Concern.

Haplopteris ensiformis (Sw.) E.H. Crane, *Syst. Bot.* 22(3): 514. 1998.

BEL: Labi, Sg Rampayoh, *Sands MS6002*; Melilas, Kpg Melilas, *Forman LLF1208*; Labi, Bkt Teraja, *Johns RJ6839*; Melilas, Sg Mutip, *Sands MS5972*; Melilas, Ulu Ingei, *Sands MS5898*; Arboretum Sg Liang, *Edwards 511*; Kpg Rambai, Lamunin, *Edwards 475*; Sg Dolhakim, *Edwards 570*; Jln Tanah Jambu, Jln Muara, *Edwards 424*; Sg Dolhakim, *Edwards 569*; Arboretum Sg Liang, *Edwards 492*. **BRM:** Jln Muara, *Edwards 553*; Kerangas, Muara on coast road, *Edwards 789*. **TEM:** Amo, K Belalong, *Ashton A60*; Amo, Batu Apoi FR (K

Belalong FSC), *Poulsen ADP84*; Amo, Bkt Belalong, *Sands MS5552*; Amo, Sg Temburong, *Johns RJ7347*; Amo, Sg Temburong, *Johns RJ6928*; Amo, Sg Temburong, *Johns RJ7251*; Amo, Ulu Belalong, *Idris et al. BRUN16667*; Labu, Peradayan FR, *Ariffin et al. BRUN19909*; Amo, G Pagon LP 61, *Liaw 3*; Bkt Patoi, *Edwards 874*; Amo, Kpg Batang Duri, *Edwards 2035*; Amo, Belalong, FSC, *Cicuzza 2507*; Kpg Bakok, *Cicuzza 2706*. **TUT:** Lamunin, Ladan Hills FR, *Johns RJ7116*; Lamunin, Kpg Lamunin, *Edwards 961*. Lamunin, Ladan Hills FR, *Johns RJ7102*; Rambai, Ulu Tutong, *Johns RJ7531*; Rambai, Ulu Tutong, *Johns RJ7573*; Lamunin, Ladan Hills FR, *Wong WKM1650*.

Distribution. Old World tropics.

Ecology. A common epiphyte in lowland primary and secondary forests and plantations; near sea level to 1000 m a.s.l. Threat: Least Concern.

Haplopteris flexuosa (Fée) E.H.Crane, *Syst. Bot.* 22(3): 514. 1998.

BEL: Wasai Wong Kadir, *Cicuzza 2581*.

Distribution. India, China, Korea, Japan, Indochina, Malay Peninsula, Brunei.

Ecology. Epiphytic on tree trunks along rivers and in mature humid forests. Threat: Rare in Brunei.

Haplopteris hirta (Fée) S.Linds., *Gard. Bull. Singapore* 62(1): 119. 2010.

TEM: Amo, Kpg Batang Duri, *Edwards 2036*.

Distribution. Malay Peninsula, Borneo (Brunei, Sabah, Sarawak).

Ecology. Epiphytic on tree trunks in lowland forest up to 300 m a.s.l. Threat: Rare in Brunei.

Haplopteris longicoma (Christ) E.H.Crane, *Syst. Bot.* 22(3): 514. 1998.

TEM: Amo, Sg Temburong, *Johns RJ7147*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2410*; Labu, Bkt Patoi (Peradayan FR), *Dransfield SD972*. **TUT:** Rambai, Tasek Merimbun, *Wong WKM593*; Rambai, Ulu Tutong, *Johns RJ7527*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. Epiphytic on tree trunks in humid forest sites, c. 700 m a.s.l. Threat: Rare in Brunei.

Haplopteris palustris C.W.Chen, S.Linds. & Cicuzza, *Syst. Bot.* 49(1): 227–235. 2024. (Fig. 53).

BEL: Badas, Sg Ayam Ayam, *Edwards 680*; Seria, PSF behind Seria, *Edwards 913*; Badas, PSF, *Cicuzza 3026, Cicuzza 3101, Cicuzza 3102*.

Distribution. Malaysia (Johor, Sarawak), Brunei.



Figure 53. Pteridaceae. *Haplopteris palustris* (Photo D. Cicuzza).

Ecology. This terrestrial species occurs only in peat swamp forests or in the humid aspects of heath forests in Brunei. Threat: Least Concern.

Haplopteris scolopendrina (Bory) C.Presl, Tent. Pterid. 141, pl. 5, f. 21. 1836.

BEL: Labi, Sg Patai, Ariffin *et al.* BRUN20446; Labi, Kpg Tena-jor, Ariffin *et al.* BRUN16415. **TEM:** Amo, Sg Temburong, Johns RJ7235; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2030; between Kpg Batang Duri & K Belalong, Edwards 2037; Labu, Peradayan FR, Ariffin *et al.* BRUN19911. **TUT:** Rambai, Sg Medit, Simpson 2539, Simpson 2559; Rambai, Sg Tutong (Belabau), Coode MC6336.

Distribution. West Indian Ocean Islands, Sri Lanka, Thailand, throughout Malesia, to the Pacific Islands.

Ecology. Epiphyte in primary forests to 200 m a.s.l. Threat: Least Concern.

Haplopteris sessilifrons (Miyam. & H.Ohba) S.Linds, Gard. Bull. Singapore 66(2): 171. 2014.

BEL: Melilas, Sg Ingei, Edwards 2357; Labi, Sg Gelugos or Wasai Wong Kadir, Edwards 2561. **TEM:** Bkt Patoi, Edwards 873.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Kalimantan).

Ecology. In mature lowland forests, along streams and humid sites. Threat: Least Concern.

28.6. *Mickelopteris* Fraser-Jenk., Annot. Checkl. Ind. Pterid. 1: 246. 2016.

Mickelopteris cordata (Roxb. ex Hook. & Grev.) Fraser-Jenk., Annot. Checkl. Ind. Pterid. 1: 247. 2016.

(=) *Parahemionitis arifolia* (Burm.f.) Panigrahi, Indian Fern J. 9: 244. 1992 publ. 1993.

(≡) *Parahemionitis cordata* (Roxb. ex Hook. & Grev.) Fraser-Jenk., New Sp. Syndr. Indian Pteridol. 187. 1997.

TEM: Amo, Bkt Retak, Wong WKM897.

Distribution. Sri Lanka, India, China, Indochina, Brunei, Malay Peninsula, Java, Lesser Sunda Islands, Philippines.

Ecology. Terrestrial in rocky ravines, usually on limestone in lowland forests. Threat: Rare in Brunei.

28.7. *Pityrogramma* Link, Handbuch 3: 19. 1833.

Pityrogramma calomelanos (L.) Link, Handb. Gewachse 3: 20. 1833.

BEL: Bkt Sawat, Luagan Lalak FRP, Forman LLF855; K Belait, Kpg K Balai, Ariffin ARK78. **BRM:** Kumbang Pasang, Jln Kumbang Pasang, Johns RJ7066. **TEM:** Amo, Sg Temburong, Wong WKM1747, Johns RJ7459; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2171. **TUT:** Lamunin, Ladan Hills FR, Johns RJ7089.

Distribution. Originally from tropical and subtropical America; now distributed in many tropical countries.

Ecology. Terrestrial, preferring open sites and disturbed areas along drainages or wet forest habitats; sea level to 3000 m a.s.l. Threat: Least Concern.

28.8. *Pteris* L., Sp. Pl.: 1073. 1753

Pteris hovenkampii Y.S.Chao, Syst. Bot. 46(3): 746. 2021.

BEL: Kpg Terawan, van Niel 3514 (L [3599738]).

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. In evergreen forests, along paths or riversides below 500 m a.s.l. The species is only known from three localities, viz., Sabah, Sarawak (Mulu) and Brunei. Threat: Rare in Brunei.

Pteris ligulata Gaudich., Voy. Uranie: 385. 1829.

(=) *Pteris furcans* Baker., J. Bot. 26: 324. 1888.

TEM: Amo, Sg Temburong, *Johns RJ7416*, *Edwards 500*, *Edwards 2162*; Sg Belalong, *Edwards 2107*; Amo, K Belalong, *Johns RJ7022*; Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2016*.

Distribution. Borneo (Brunei, Sabah), Sumatra, Sulawesi, Maluku, New Guinea, the Solomon Islands, and the Caroline Islands.

Ecology. Disturbed sites along roads and plantations in the lowlands. Threat: Least Concern.

Pteris quadriaurita Retz., *Observ. Bot.* 6: 38. 1791.

TUT: Rambai, Sg Tutong (Belabau), *Coode MC6374*.

Distribution. America, Africa and Asia.

Ecology. In open sites, at forest edges or in secondary forests or plantations; sea level to 500 m a.s.l. Threat: Least Concern.

Pteris semipinnata L., *Sp. Pl.* 2: 1076. 1753.

TEM: Bkt Biang, *Ashton A173*.

Distribution. China, Korea, Japan, Indochina, throughout Malaysia; naturalised in Australia.

Ecology. Lowland forests. Threat: Rare in Brunei.

Pteris tripartita Sw., *J. Bot. (Schrader)* 1800(2). 67. 1801.

BEL: Seria, Badas SL, *Ashton A152*. **BRM:** Jln Muara, *Edwards 543*; Jln Tasek, *Edwards 784*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2169*; Bangar town, *Edwards 865*.

Distribution. Old World tropics, widely naturalised in the New World.

Ecology. In open habitats, plantations with humid soil; lowlands below 300 m a.s.l. Threat: Least Concern.

Pteris vittata L., *Sp. Pl.* 2: 1074. 1753.

BRM: Jln Residency, *Edwards 418*.

Distribution. Old World tropics and temperate regions; widely naturalised in the New World.

Ecology. In disturbed sites, urban areas, and parks. Threat: Least Concern.

28.9. *Syngamma* J.Sm., *London J. Bot.* 4: 168. 1845.

Syngamma alismifolia (C.Presl) J.Sm., *London J. Bot.* 4: 168, t. 7-8, f B. 1845.

BEL: Labi, Sg Teraja, *Edwards 767*; Labi, Bkt Teraja, *Ariffin et al. BRUN20770*; Labi, Bkt Teraja, *Johns RJ6835*; Labi, Kpg Teraja, *Wong WKM989*; Labi, Kpg Teraja, *Ariffin et al. BRUN232333*; Labi, Bkt Teraja, *Johns RJ6846*; Labi, Labi Hills FR, *Idris et al.*

BRUN18758; Melilas, Sg Ingei, *Suhaili SZ7*; Melilas, Ulu Ingei, *Dransfield SD953*; Seria, Pekan Seria, *Edwards 911*; Sukang, Kpg Buau, *Idris et al. BRUN18621*; Melilas, Sg Ingei, *Atkins 578*; Labi, Andulau, *Cicuzza 2556*. **BRM:** Sg Akar, *Edwards 513*; Sg Ayam Ayam, *Edwards 678*; Jln Kota Batu, *Edwards 648*. **TEM:** Amo, Bkt Retak, *Johns RJ6603*; Amo, Ulu Temburong (Wong Nguan), *Hussain s.n.*; Amo, Bkt Lutut LP297, *Ariffin et al. BRUN20788*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP338*; Amo, Sg Temburong, *Johns RJ7238*; Amo, Ulu Belalong, *Idris et al. BRUN16688*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2149*; Bangar, Pekan Bangar, *Ashton A78*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2228*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2379*; Batu Apoi, Kpg Selapon, *Dransfield SD1155*; Labu, Peradayan FR, *Ariffin et al. BRUN19907*; Belalong, FSC, *Edwards 2165*; G Retak, *Johns RJ6613*; Bkt Belalong, *De Vogel 8076*; Bkt Pagon, *Liaw 49*; Belalong, FSC, *Wong WKM3310*; Sg Baki, *Hovenkamp BR006*; Amo, Belalong, FSC, *Cicuzza 2509*. **TUT:** Lamunin, Benutan dam, *Edwards 2242*; Lamunin, Ladan Hills FR, *Coode MC6429*; Lamunin, Ladan Hills FR, *Johns RJ7103*; Lamunin, Ladan Hills FR, *Idris et al. BRUN17656*; Rambai, Bkt Bahak, *Coode MC7094*; Rambai, Ulu Tutong, *Paing s.n.*; Rambai, Sg Medit, *Simpson 2562*; Rambai, Ulu Tutong, *Johns RJ7480*; Sg Ingei, *Edwards 2369*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku), Philippines.

Ecology. Terrestrial along streams in primary forest and humid, shady habitats; lowlands to 1000 m a.s.l. Threat: Least Concern.

Syngamma borneensis (Hook.) J.Sm., *Hist. Fil.* 152. 1875.

BEL: Labi, Bkt Teraja, *Simpson 2045*; Labi, Kpg Labi, *Johns RJ6823*; Labi, Kpg Labi, *Johns RJ6824*; Labi, Bkt Teraja, *Johns RJ6871*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD936*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD967*; Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1139*; Wasai Wong Kadir, *Edwards 2256*; Bkt Teraja, *Cicuzza 2676*. **BRM:** Kumbang Pasang, Jln Kumbang Pasang, *Johns RJ7069B*; Kumbang Pasang, Jln Kumbang Pasang, *Sands MS5657*. **TEM:** Labu, Bkt Patoi (Peradayan FR), *Ariffin et al. BRUN19903*; Bkt Patoi, *Edwards 2258*; Sg Temburong, *Hovenkamp BR005*. **TUT:** Rambai, Ulu Tutong, *Ashton BRUN5636*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Papua New Guinea, and Pacific Islands.

Ecology. Lithophytic, or rarely epiphytic, in shade along cliffs or ridges of lowland forests. Threat: Least Concern.

Syngamma cartilagidens (Baker) Diels, *Nat. Pflanzenfam. [Engler & Prantl]* 1 (4): 257. 1899.

BEL: Labi, Sg Rampayoh, *Sands MS5995*. **TEM:** Amo, Bkt Retak, *Sands MS5227*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, and Papua New Guinea.

Ecology. Shady and wet rocks along streams between 300–1000 m a.s.l. Threat: Rare in Brunei.

Syngamma lobbiana (Hook.) J.Sm., Hist. Fil. 152. 1875. (Fig. 54).

BEL: Bkt Sawat, *Cicuzza* 3031.

Distribution. Endemic to Borneo.

Ecology. Shaded areas in mature forests, temporarily waterlogged sites, and rocky areas. Threat: Rare in Brunei.

Syngamma wallichii (Hook.) Bedd., Ferns Brit. Ind. 1: t. 153. 1866.

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1025*, *Dransfield* SD937; Labi, Kpg Teraja, *Wong WKM988*. **TEM:** Labu, Bkt Patoi (Peradayan FR), *Edwards* 868; Amo, Belalong, KBFSC, *Cicuzza* 2717; Amo, Sg Belalong, *Cicuzza* 2733.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku), Philippines.

Ecology. Shady habitats with humid soil in mature forests. Threat: Least Concern.



Figure 54. Pteridaceae. *Syngamma lobbiana* (Photo D. Cicuzza).

28.10. *Taenitis* Willd. ex Schkuhr, Deutschl. Krypt. Gew. 1: 21. 1805.

Taenitis blechnoides (Willd.) Sw., Syn. Fil. (Swartz) 24, 220. 1806. (Fig. 55).

BEL: Melilas, Bkt Batu Patam (Ulu Ingei), *Wong WKM1016*, *Dransfield* SD946; Melilas, Sg Ingei, *Edwards* 2353; Labi, Bkt Teraja, *Johns* RJ6840, *Johns* RJ6881A; Labi, Bkt Telingan, *Dransfield* SD1134; Liang, Andulau FR (Sg Liang), *Ibrahim et al.* BRUN19833, *Ashton* A190; Sg Mendaram, *Ariffin et al.* BRUN22792. **BRM:** Jln Muara, *Edwards* 423; Jln Tg Batu, *Edwards* 2306; Tanah Jambu, proposed estate, *Edwards* 2419; Kpg Dadap, *Edwards* 2281. **TEM:** Amo, Bkt Retak, *Johns* RJ6511, *Johns* RJ6667; Amo, Ulu Belalong, *Idris et al.* BRUN16665; Amo, Bkt Belalong, *Dransfield* SD1224, *Edwards* 2318; Bangar, Bkt Biang, *Ashton* A97. G Pagon, *Liaw* 36; Belalong, FSC, *Tagane* B583; Bkt Belalong, *Edwards & Cantley* 814. **TUT:** Rambai, Bkt Tangan, *Suzuki* K13078; Rambai, Kpg Panchong, *Forman* LLF996; Rambai, Ulu Tutong, *Johns* RJ7604; Telisai, Kpg Telamba, *Ariffin et al.* BRUN20765; Sg Layong, *Edwards* 471; Tasek Merimbun, *Edwards* 594; Kago dam, *Cicuzza* 2649.

Distribution. Sri Lanka, India, China, Indochina, throughout Malesia, to Fiji and Micronesia.



Figure 55. Pteridaceae. *Taenitis blechnoides* (Photo D. Cicuzza).

Ecology. Terrestrial, in forest shade as well as dry sites; common in lowland mixed dipterocarp forest or mature coastal forest. Threat: Least Concern.

Taenitis dimorpha Holttum, Gard. Bull. Singapore 11(4): 274. 1947.

TEM: Amo, Bkt Belalong, *Wong WKM1430*.

Distribution. Malay Peninsula and Borneo (Brunei).

Ecology. Lowland forests. Threat: Rare in Brunei.

Taenitis hookeri (C.Chr.) Holttum, Kew Bull. 30: 334. 1975.

TEM: Amo, Bkt Retak, *Johns RJ6628*, *Johns RJ6596*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sabah, Sarawak).

Ecology. In lowland forest sites. Threat: Rare in Brunei.

Taenitis interrupta Hook. & Grev., Icon. Filic. t. 63. 1828.

BEL: Melilas, Batu Melintang, *Edwards 2344*; Melilas, Bkt Batu Patam (Ulu Ingei), *Dransfield SD959*; Melilas, Sg Ingei, *Wong WKM1103*; K Belait, Sg Belait, *Forman LLF1148*. **BRM:** Kpg Dadap, *Edwards 2278*, *Edwards 2280*. **TEM:** Amo, Bkt Retak, *Wong WKM422*; G Pagon, *Ashton A312*. **TUT:** Rambai, Sg Medit, *Simpson 2572*.

Distribution. Malaysia, Singapore, Brunei, Indonesia (Kalimantan).

Ecology. Confined to wet ground, often in lowland forests. Threat: Least Concern, but occurs at low frequencies in Brunei.

28.11. *Vaginularia* Fée, Mém. Foug., 3. Hist. Vittar.: 50. 1852.

Vaginularia trichoidea Fée, Mém. Foug., 3. Hist. Vittar.: 34. 1852.

TEM: Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2022*; Sg Belalong, *Edwards 2135*. **TUT:** Lamunin, *Edwards 757*.

Distribution. China, Thailand, Malesia, to the Pacific Islands.

Ecology. Epiphytic in primary forests, often on tree fern trunks; between 500–2000 m a.s.l. Threat: Rare in Brunei.

Family 29. SACCOLOMATACEAE

29.1. *Saccoloma* Kaulf., Berin Jahrb. Pharm. Verbundenen Wiss. 21: 51. 1820.

Saccoloma kingii (Bedd.) Parris, Pl. Mt. Kinabalu 1: 151. 1992.

TEM: Amo, Bkt Retak, *Wong WKM781*.

Distribution. Sumatra, Malay Peninsula, Borneo (Brunei, Kalimantan, Sabah), Philippines, Maluku, New Guinea.

Ecology. Terrestrial; in montane forests. Threat: Rare in Brunei.

Notes

The taxonomy and nomenclature of this species could be complex and as yet not fully resolved.

Family 30. SCHIZAEACEAE

30.1. *Actinostachys* Wall., Numer. List.: n°1. 1829.

Actinostachys digitata (L.) Wall. ex Reed, Bol. Soc. Brot. 21: 130. 1947.

(≡) *Schizaea digitata* (L.) Sw., Syn. Fil. (Swartz) 150, 380, t. 4, f. 1. 1806.

BEL: Labi, Bkt Teraja, *Johns RJ6862*; Liang, Andulau FR (Sg Liang), *Edwards 907*; Melilas, Sg Ingei, *Wong WKM649*; Arbo-retum Sg Liang, *Edwards 509*, *Edwards 483*. **BRM:** Kumbang Pasang, Jln Kumbang Pasang, *Sands MS5658*; UBD campus, Tan s.n.; Tasek Gorge, *Edwards 530*; Kpg Dadap, *Edwards 2284*. **TEM:** Amo, K Belalong, *Johns RJ6998*; Amo, Sg Temburong, *Johns RJ7338*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP360*; Amo, Belalong hilltop, *Cicuzza 2510*; Bukok, Kpg Temada, Temada, *Simpson 89/151*. **TUT:** Telisai, Bkt Beruang, *Forman LLF803*; Telisai, Bkt Beruang, *Forman LLF812*; Telisai, Pasir Puteh, *Johns RJ6771*; Tasek Merimbun, *Edwards 597*; Telisai Pasir Puti, *Cicuzza 2522*.

Distribution. From Madagascar, tropical Asia to China, throughout Malesia, to Australia and Polynesia.

Ecology. Terrestrial in dry and sparse forests with sandy soil; it shares the same habitat as *Schizaea dichotoma* but is less common; near sea level to 1500 m a.s.l. Threat: Least Concern.

Actinostachys wagneri (Selling) Reed, Bol. Soc. Brot. 21: 131. 1947.

(≡) *Schizaea wagneri* Selling, Svensk Bot. Tidskr. 40: 278. 1946.

BRM: Meragang Ridge, *Edwards 2326*.

Distribution. Peninsular Malaysia, Singapore, Brunei, Maluku, New Guinea, Australia, and Solomon Islands.

Ecology. On dry aspects of lowland forests. Threat: Rare in Brunei. Despite a single collection, this species can be easily overlooked, so further studies are needed to confirm its distribution within the country.

30.2. *Schizaea* Sm., Mém. Acad. Roy. Sci. (Turin) 5: 419. 1793.

***Schizaea dichotoma* (L.) Sm.,** Mém. Acad. Roy. Sci. (Turin) 5: 422, t. 9, f. 9. 1793. (Fig. 56).

BEL: Bkt Sawat, Meranking-Buau, Coode MC7697; Labi, Kpg Teraja, Sands MS6018; Labi, Wasai Wong Kadir (Wasai Rampayoh), Johns RJ7455; Labi, Bkt Teraja, Johns RJ6895; Liang, Andulau FR (Sg Liang), Edwards 906; Melilas, Sg Mutip, Sands MS5974; Melilas, Sg Ingei, Wong WKM644; Melilas, Sg Ingei, Edwards 2354; Sukang, Sg Paleh Bangawong, Kirkup DK688; K Belait, Sg Belait, Dransfield SD1139; Sg Liang, Arboretum, Edwards 484. **BRM:** Berakas, Kpg Tanah Jambu, Edwards 2420; Kpg Dadap, Edwards 547, Edwards 2285; Jln Kota Batu, Edwards 641. **TEM:** Amo, K Belalong, Dransfield SD1031; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP127; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2310; Sg Temburong, Edwards 627; Amo, Belalong, hill-

top, Cicuzza 2516. **TUT:** Tg Maya, Kpg Bkt Udai, Voeks RV554; Tg Maya, Jln Tutong-Belait (Pasir Puteh), Paing BRUN15105; Tg Maya, Jln Tutong-Belait (Pasir Puteh), Idris et al. BRUN15855; Rambai, Kpg Panchong, Forman LLF993; Rambai, Tasek Merimbun, Bernstein JHB11; Rambai, Sg Medit, Simpson 2534; Rambai, Tasek Merimbun, Suzuki K13090; Telisai, Pasir Puteh, Johns RJ6770; Tasek Merimbun, Edwards 598; Telisai Pasir Puti, Cicuzza 2523, Cicuzza 2536, Cicuzza 2537.

Distribution. Old World tropics.

Ecology. Terrestrial in dry forests with sandy soil, also in drier areas on hilltops; found throughout the lowlands to 2000 m a.s.l. Threat: Least Concern.

***Schizaea malaccana* Baker,** Syn. Fil. (Hooker & Baker) 428. 1868.

TEM: Amo, Bkt Retak, Johns RJ6662, Johns RJ6580, Edwards 860, Sands MS5222.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Philippines, New Guinea, the Solomon Islands, and Australia.

Ecology. In dry, sparse forests with poor sandy soil, often on mountaintops; lowland forests up to 1200(–1500) m a.s.l. Threat: Rare in Brunei.



Figure 56. Schizaeaceae. *Schizaea dichotoma* (Photo KM. Wong).

Family 31. TECTARIACEAE

31.1. *Draconopteris* Li Bing Zhang & Liang Zhang, Taxon 65: 732. 2016.

***Draconopteris grandidentata* (Ces.) Christenh.,** Global Fl. 4: 40. 2018.

BEL: Labi, Wasai Teraja, Sands MS5684; Labi, Sg Mendaram, Johns RJ6826; Rampayoh Timur, Ariffin et al. BRUN24487. **TEM:** Amo, Sg Temburong, Johns RJ7296; Batu Apoi, Edwards 2450; Amo, Sg Temburong, Cicuzza 2585; Amo, Sg Belalong, Cicuzza 2638. **TUT:** Rambai, Ulu Tutong, Johns RJ7484; Benutan Lake, Edwards 2238; Sg Apan, Edwards 2202.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. An obligate lithophyte that occurs only on rocks or cliffs close to streams in mature lowland tropical forest. Threat: Least Concern; however, population density in Brunei is low.

31.2. *Polydictyum* C.Presl, Abh. König. Böhm. Ges. Wiss., ser. 5,6: 52. 1851.

***Polydictyum ternatum* (Baker) S.Y.Dong & C.W.Chen,** J. Syst. Evol. 56: 146. 2017.

BEL: Labi, Sg Rampayoh, Coode MC7262; Labi, Bkt Teraja, Johns RJ6902; Labi, Sg Mendaram, Johns RJ6818; Melilas, Bkt Batu Patam (Ulu Ingei), Wong WKM1031; Sg Teraja, Edwards 682,

Edwards 2532; Wasai Wong Kadir, *Edwards 2550*; Ulu Sg Malay-an, *Ariffin et al. BRUN23290*; Wasai Wong Kadir, *Cicuzza 2590*. **BRM**: Pipeline Wasan, *Edwards 982*. **TEM**: Amo, Ulu Belalong, *Idris et al. BRUN16686*; Amo, Sg Sibut, *Johns RJ6920*; Amo, Sg Sibut, *Johns RJ6915*; Amo, Sg Temburong, *Coode MC6688*; Amo, Bkt Belalong, *Dransfield SD1258*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP112*; Amo, Bkt Belalong, *Wong WKM1460*; Amo, Bkt Lutut LP297, *Ariffin et al. BRUN20815*; Bangar, Pekan Bangar, *Ashton A84*; Bangar, Bkt Biang, *Forman LLF923*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2197*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2360*; Batu Apoi, Sg Apan, *Idris et al. BRUN15287*; Labu, Peradayan FR, *Johns RJ7062*; Labu, Peradayan FR, *Ariffin et al. BRUN19900*; Labu, Bkt Patoi (Peradayan FR), *Edwards 886*; Sg Baki, *Edwards 2178*; Batu Apoi, *Edwards 2451*; Batu Apoi, *Samhan SN6*; Sg Belalong, *Edwards 2176*; Kpg Lamaling, *Cicuzza 2660*. **TUT**: Lamunin, Ladan Hills FR, *Joffre et al. BRUN18139*; Lamunin, Benutan dam, *Edwards 2232*, *Edwards 746*.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Lowland forests below 300 m a.s.l.; usually in humid habitats near rocky streams. Threat: Least Concern.

31.3. *Tectaria* Cav., *Anales Hist. Nat.* 1: 115. 1799.

Tectaria angulata (Willd.) Copel., *Sarawak Mus. J.* 2: 370. 1917. (Fig. 57).

BEL: Labi, Wasai Wong Kadir, *Johns RJ7447*; Wasai Wong Kadir, *Edwards 2571*; Wasai Wong Kadir, *Cicuzza 2587*; Labi, Sg Teraja, *Edwards 798*; Labi, Bkt Teraja, *Simpson 2089*; Labi, Sg Mendar-am, *Johns RJ6819*; Sg Teraja, *Edwards 686*; Wasai Wong Kadir, *Cicuzza 2594*; Bkt Teraja, *Ariffin et al. BRUN232425*. **TEM**: Amo, Sg Temburong, *Johns RJ7142*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2021*; Batu Apoi, *Samhan SN12*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP163*; Amo, Sg Temburong, *Johns RJ7128*; Amo, Sg Sibut, *Johns RJ6919*; Amo, Bkt Retak, *Johns RJ6695*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson 2434*; Bangar, Bkt Biang, *Forman LLF919*; Labu, Bkt Patoi (Peradayan FR), *Edwards 898*; Labu, Peradayan FR, *Johns RJ7063*; Labu, Peradayan FR, *Johns RJ7053*; Sg Belalong, *Edwards 2175*; Amo, Belalong, FSC, *Cicuzza 2511*. **TUT**: Lamunin, Benutan dam, *Edwards 2241*; Sg Teraja, *Edwards 2529*; Benutan dam, *Ariffin et al. BRUN24288*.

Distribution. Thailand, throughout Malesia, and the Solomon Islands.

Ecology. Along streams in primary forest, and in sites with boulders. Threat: Least Concern.

Tectaria barberi (Hook.) Copel., *Philipp. J. Sci.*, C 2: 414. 1907. (Fig. 58).

BEL: Labi, Kpg Teraja, *Ariffin et al. BRUN21738*; Melilas, Batu Melintang, *Kessler PK392*; Sg Teraja, *Edwards D2538*; Sg Liang, *Edwards 493*; Belait Sukang, *Lee 933*. **BRM**: Pengkalan Batu, Kpg Wasan, *Edwards 971*; Jln Kota Batu, *Edwards 644*; Jln Sg Akar, *Edwards 514*; Tanah Jambu, *Edwards 2421*; Tasek Gorge, *Edwards 526*; Kpg Dadap, *Edwards 2286*. **TEM**: Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP125*; Labu, Peradayan FR, *Ariffin et*



Figure 57. Tectariaceae. *Tectaria angulata* (Photo D. Cicuzza).

al. BRUN19915; Bangar, Pekan Bangar, *Ashton A88*; Bangar, Pekan Bangar, *Ashton A81*; Bkt Patoi, *Edwards 2249*; Kpg Bakok, *Cicuzza 2708*; Amo, Belalong, KBFSC, *Cicuzza 2725*. **TUT**: Lamunin, Ladan Hills FR, *Johns RJ7112*; Lamunin, Ladan Hills FR, *Johns RJ7118*; Rambai, Tasek Merimbun, *Johns RJ7469*; Benutan reservoir, *Edwards 932*; Benutan lake, *Edwards 2220*, *Edwards 2228*, *Edwards D2229*; Kago dam, *Cicuzza 2652*.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan), and the Philippines.

Ecology. Lowlands, along rivers and humid habitats in pristine forests. Threat: Least Concern.

Tectaria crenata Cav., *Descr. Pl.* 250. 1802.

(=) *Aspidium tectaria* Desv. *Mém. Soc. Linn. Paris* 6: 254. 1827.

BEL: Wasai Telingan, *Cicuzza 3038*. **TEM**: Amo, Ulu Belalong, *Idris et al. BRUN16699*.

Distribution. Indochina, throughout Malesia, to Micronesia and Polynesia.



Figure 58. Tectariaceae. *Tectaria barberi* (Photo D. Cicuzza).

TEM: Amo, Sg Temburong, *Coode MC6689*; Amo, Bkt Retak, *Johns RJ6710*; Amo, Sg Temburong, *Johns RJ7374*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP354*.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. In pristine forests with mature and humid soil, and along streams. Threat: Rare in Brunei.

Tectaria jacobsii Holttum, *Blumea* 35(2): 552. 1991.

TEM: Sg Enkiang, *Edwards 2047*; Sg Belalong, *Edwards 2109*; Sg Esu, *Edwards 2121*; Sg Belalong, *Hovenkamp BR018*.

Distribution. Endemic to Brunei.

Ecology. In pristine lowland forests. Threat: Rare in Brunei.

Tectaria johannis-winkleri (C.Chr.) C.Chr., *Index Filic.*, Suppl. 3, 180. 1934.

TEM: Amo, Bkt Retak, *Johns RJ6598*, *Johns RJ6705*.

Distribution. Endemic to Borneo (Brunei, Kalimantan).

Ecology. Hilly sites in mature hill forest, c. 650 m a.s.l. Threat: Rare in Brunei.

Tectaria lobbii (Hook.) Copel, *Philipp. J. Sci.* 10: 146. 1915.

(=) *Tectaria hosei* (Baker) Copel., *Sarawak Mus. J.* 2: 371. 1917.

TEM: Batu Apoi, *Samhan SN5*; Amo, Sg Belalong (Amo), *Middleton DJM754*; Amo, Sg Temburong, *Idris et al. BRUN15609*; Amo, K Belalong, *Johns RJ6985*; Amo, Sg Temburong, *Johns RJ7122*; Amo, Batu Apoi FR, *Poulsen ADP299*; Sg Sitam, *Edwards 2014*; Sg Belalong, *Edwards 962*; Sg Enkiang, *Edwards 2058*; Sg Temburong, *Edwards 2213A*; Sg Belalong, *Ashton A113*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2058*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2014*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 962*; Amo, Sg Temburong, *Sands MS5563*; Amo, Sg Belalong (Amo), *Wong WKM1330*; Amo, Sg Temburong, *Coode MC6626*; Amo Belalong, FSC, *Cicuzza 2512*.

Distribution. Borneo (Brunei, Kalimantan, Sarawak), Philippines, and Maluku.

Ecology. Terrestrial or lithophytic along streams and humid sites in lowland forest. Threat: Least Concern.

Tectaria pleiosora (Alderw.) C.Chr., *Gard. Bull. Straits Settlm.* 7: 260. 1934.

TEM: Amo, Bkt Belalong, *Dransfield SD1240*; Amo, Batu Apoi FR, *Sands MS5850*; KBFSC, Rhizanthess plot, *Edwards 2291*.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Sulawesi, Maluku, Indonesian New Guinea, Papua New Guinea.

Ecology. Shady habitats in mature forests between 500–900 m a.s.l. Threat: Rare in Brunei.

Tectaria profereoides (Christ.) S.Y.Dong, *Phytotaxa* 178: 226. 2014.

TEM: Batu Apoi, Sg Temburong (Batu Apoi), *Sands MS5816*.

Distribution. Malaysia (Sabah, Sarawak), Brunei, Philippines, Indonesia (Indonesian New Guinea), Papua New Guinea.

Ecology. Shady habitats with humid soil in pristine forests. Threat: Least Concern.

Tectaria singaporeana (Hook. & Grev.) Copel., *Sarawak Mus. J.* 2: 368. 1917.

TEM: Labu, Bkt Patoi (Peradayan FR), *Edwards 870*.

Distribution. Thailand, Malay Peninsula, Sumatra, Borneo (Brunei, Kalimantan), and Maluku.

Ecology. Shady and humid sites in lowland forests, often lithophytic on rocks and boulders. Threat: Least Concern.

Notes

This species is poorly collected in Borneo, and presumably often confused with the more common species *Polydictyum ternatum*. This species often has juvenile leaves with a single pinna, but always sterile. Moreover, the sori arrangement and density between the two species is rather different, with *T. singaporeana* having denser sori density.

Tectaria tricuspis (Bedd.) Copel., Sarawak Mus. J. 2: 369. 1917.

BEL: Melilas, Ulu Ingei, *Sands MS5920*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC), *Hansen CH1523*. **TUT:** Lamunin, Kpg Lamunin, *Ariffin ARK100*.

Distribution. Malay Peninsula, Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Lowland forests, in rocky sites. Threat: Least Concern.

Tectaria vasta (Blume) Copel., Philipp. J. Sci., C 2: 411. 1907.

BEL: Bkt Sawat, Ulu Sg Singap, *Hairun BRUN22218*; Labi, Labi Hills FR, *Ariffin et al. BRUN22570*; Labi, Labi Hills FR, *Ariffin et al. BRUN21448*. **TEM:** Amo, Batu Apoi FR (K Belalong FSC); *Edwards 988*; Amo, K Belalong FSC, *Schatz GS3274*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP138*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards 2053*; Amo, K Belalong, *Dransfield 1032*; Amo, Batu Apoi FR (K Belalong FSC), *Middleton DJM790*; Amo, Bkt Belalong, *Sands MS5548*; Batu Apoi, Selapon (Bkt Beliton), *Wong WKM2068*.

Distribution. India, China, Indochina, through Malesia.

Ecology. Along streams with large boulders (granite) in mature lowland forests. Threat: Least Concern.

Family 32. THELYPTERIDACEAE

32.1. *Abacopteris* Fée, Mém. Foug., 5. Gen. Filic.: 309. 1852.

Abacopteris nitida (Holttum) S.E.Fawc. & A.R.Sm. ex Kovalchuk, Phytotaxa 619(2): 203. 2023 (Fig. 59).

BEL: Bkt Sawat, Kpg Merangking, *Ariffin et al. BRUN21988*; Melilas, Kpg Melilas, *Forman LLF1212*; Sg Teraja, *Edwards 2524*. **BRM:** Sg Subok, *Edwards 413*; Sg Tilong, *Edwards 545*. **TEM:** Amo, Sg Belalong (Amo), *Johns RJ7032*; Amo, K Belalong, *Johns RJ6949*; Amo, K Belalong, *Johns RJ6956*; Amo, K Belalong FSC, *Poulsen ADP129*; Bangar, Jln Temada, *Forman LLF938*; Bangar, Bkt Biang, *Ashton A96*; Batu Apoi, Kpg Selapon, *Idris et al. BRUN19559*; Labu, Bkt Patoi (Peradayan FR), *Edwards 2251*; Sg Enkiang, *Edwards 2057*; Bangar, *Edwards 497*. **TUT:** Rambai, Kpg Benutan, *Ariffin ARK58*; Rambai, Tasek Merimbun, *Bernstein JHB226*; Rambai, Tasek Merimbun, *Bernstein JHB511*; Rambai, Tasek Merimbun, *Suzuki K13315*.



Figure 59. Thelypteridaceae. *Abacopteris nitida* (Photo D. Cicuzza).

Distribution. Brunei, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Kalimantan, Sulawesi), Philippines.

Ecology. In primary and secondary forests along streams with thick, humid soil. Threat: Least Concern.

32.2. *Amblovenatum* J.P.Roux, Strelitzia 23: 200. 2009.

Amblovenatum immersum (Blume) Mazumdar, Int. J. Adv. Res. Innov. Ideas Educ. 3(2): 5060. 2017. (Fig. 60).

BRM: Wasan Pipeline, *Edwards 976*. **TEM:** Amo, K Belalong FSC, *Edwards 2217*. **TUT:** Lamunin, Benutan dam, *Edwards 2426*; Lamunin, Benutan dam, *Edwards 928*.

Distribution. India, China, Thailand, throughout Malesia, to Australia, and the Pacific Islands.

Ecology. Common on limestone and along streams in forests; lowlands below 500 m a.s.l. Threat: Least Concern.

Amblovenatum opulentum (Kaulf.) J.P.Roux, Strelitzia 23: 201. 2009.

TEM: Amo, Bkt Retak, *Wong WKM850*. **TUT:** Lamunin, Benutan dam, *Edwards 2334*.



Figure 60. Thelypteridaceae. *Amblovenatum immersum* (Photo D. Cicuzza).

Distribution. Old World tropics; naturalised in tropical America.

Ecology. Sparse forests, secondary forests, and swampy forests in the lowlands. Threat: Rare in Brunei.

32.3. *Chingia* Holttum, Blumea 19: 31. 1971.

Chingia clavipilosa Holttum, Kalikasan 3: 23. 1974.

TEM: Bkt Belalong, Samhan SN3.

Distribution. Java, Borneo (Brunei, Sarawak), and the Philippines.

Ecology. In mature forests. Threat: Rare in Brunei

32.4. *Christella* H.Lév., Fl. Kouy-Tchéou: 472. 1915.

Christella dentata (Forssk.) Brownsey & Jermy, Brit. Fern Gaz. 10: 338. 1973.

TUT: Tasek Merimbun, Edwards 593.

Distribution. Old World tropics; widely naturalised in the New World.

Ecology. Close to bodies of freshwater in forests. Threat: Rare in Brunei.

Christella subpubescens (Blume) Holttum, Webbia 30(1): 193. 1976.

TEM: Bangar, Edwards 499.

Distribution. India, Sri Lanka, China, Japan, Indochina, throughout Malesia, to Australia and the Pacific Islands.

Ecology. In disturbed sites, urban areas, and parks. Threat: Least Concern.

32.5. *Coryphopteris* Holttum, Blumea 19: 33. 1971

Coryphopteris viscosa (Baker) Holttum var. *viscosa*, Blumea 19: 33. 1971.

TEM: Amo, G Pagon, Edwards 847.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei.

Ecology. In montane forests. Threat: Rare in Brunei.

Coryphopteris viscosa (Baker) Holttum var. *borneensis* Holttum, Blumea 23(1): 29. 1976.

TEM: Amo, G Pagon, Ariffin ARK133; Amo, G Pagon, Coode MC7508; Amo, G Pagon, Coode MC6551; Amo, G Pagon, Wong WKM1792.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. The few collections were from mature montane forest on rich and humid soil near ridges above 2000 m a.s.l. Threat: Rare in Brunei.

32.6. *Cyclosorus* Link, Hort. Berol. 2: 128. 1833.

Cyclosorus interruptus (Willd.) H.Itô, Bot Mag. (Tokyo) 51: 714, f. 9. (1937).

BEL: Sg Teraja, Edwards 2543. BRM: Jln Mulaut, Edwards 406. TEM: Amo, G Pagon, Coode 7508; Amo, Bkt Retak, Johns RJ6551; Amo, G Pagon, Wong WKM1792. TUT: Lamunin, Benutan dam, Edwards 2222; Lamunin, Benutan dam, Edwards 927; Ukong, Kpg Ukong, Niga NN176.

Distribution. Pantropical.

Ecology. In forests along rivers, and in secondary forests and plantations. Threat: Least Concern.

32.7. *Grypothrix* (Holtum) S.E.Fawc. & A.R.Sm., Sida, Bot. Misc. 59: 46. 2021.

Grypothrix cuspidata (Blume) S.E.Fawc. & A.R.Sm., Sida, Bot. Misc. 59: 47. 2021.

TEM: Amo, Bkt Belalong, Poulsen ADP352. **TUT:** Lamunin, Ladan Hills FR, Johns RJ7088; Lamunin, Ladan Hills FR, Johns RJ7119.

Distribution. China, Vietnam, Taiwan, Malaysia (Sabah), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan, Maluku) and the Pacific Islands.

Ecology. Terrestrial or lithophytic (on rocks or steep valley-sides) in forests or along streams; lowlands to c. 1200 m a.s.l. Threat: Rare in Brunei.

Grypothrix salicifolia (Wall. ex Hook.) S.E.Fawc. & A.R.Sm., Sida, Bot. Misc. 59: 47. 2021.

TEM: Amo, Sg Belalong (Amo), Edwards 2118.

Distribution. Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Kalimantan), Brunei.

Ecology. Terrestrial or lithophyte in swampy areas or along streams in lowland forest. Threat: Rare in Brunei.

Grypothrix triphylla (Sw.) S.E.Fawc. & A.R.Sm., Sida, Bot. Misc. 59: 48. 2021.

TUT: Rambai, Kpg Panchong, Forman LLF1002; Sg Padang, Merimbun, Edwards 657.

Distribution. India, Sri Lanka, China, Taiwan, Japan, Indochina, Malaysia (Malay Peninsula), Brunei, Indonesia (Sumatra, Java, Lesser Sunda Islands, Kalimantan), Philippines, New Guinea, Australia, Fiji.

Ecology. In secondary forests or plantations, around villages; lowlands up to 500 m a.s.l. Threat: Rare in Brunei.

32.8. *Macrothelypteris* (H.Itô) Ching, Acta Phytotax. Sin. 8: 308. 1963

Macrothelypteris torresiana (Gaudich.) Ching, Acta Phytotax. Sin. 8(4): 310. 1963.

BRM: Gadong, Tunku-Gadong Highway, Edwards 2424.

Distribution. Old World tropics; widely naturalised in the New World.

Ecology. In sparse forest, particularly in areas with dry spells; lowlands to 1500 m a.s.l. Threat: Least Concern.

32.9. *Mesophlebion* Holttum, Blumea 19: 29. 1971

Mesophlebion beccarianum (Ces.) Holttum, Blumea 22(2): 230. 1975.

BEL: Sukang, Buau-Sindum, Idris et al. BRUN18623. **TEM:** Amo, Ulu Belalong, Idris et al. BRUN16698; Amo, Ulu Belalong, Idris et al. BRUN15893; Amo, Bkt Belalong, Wong WKM1355; Amo, Sg Temburong, Wong WKM482; Amo, K Belalong, Ashton A355; Amo, Sg Temburong, Johns RJ7345; Amo, Bkt Belalong, Dransfield SD1217; Amo, Bkt Belalong, Poulsen ADP92; Amo, K Belalong FSC, Schatz GS3308; Amo, Bkt Belalong, Edwards 2312, Edwards & Cantley 809; Bkt Belalong, Samhan SN5.

Distribution. Malaysia (Malay Peninsula, Sarawak), Brunei, Indonesia (Sumatra, Kalimantan, Indonesian New Guinea), Papua New Guinea.

Ecology. In forests with dry and well-drained soil between 200–1200 m a.s.l. Threat: Least Concern.

Mesophlebion crassifolium (Blume) Holttum, Blumea 22(2): 232. 1975.

(=) *Mesophlebion chlamydophorum* (Rosenst. ex C.Chr.) Holttum, Blumea 22(2): 231. 1975.

BEL: Melilas, Sg Ingei, Edwards 2351; Melilas, Batu Melintang, Edwards 2346. **TEM:** Amo, Bkt Pagon, Wong WKM1776. **TUT:** Rambai, Sg Medit, Simpson 2519; Ukong, Kpg Talad-Bang Pagan, Ariffin et al. BRUN20454.

Distribution. Indochina, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan, Sulawesi, Maluku, Indonesian New Guinea), Philippines, Papua New Guinea.

Ecology. Lowland (freshwater swamp forest), submontane, and montane forests between 700–1800 m a.s.l. Threat: Least Concern.

Mesophlebion dulitense Holttum, Blumea 22(2): 229. 1975.

TEM: Amo, G Pagon, Coode MC7539; Amo, Bkt Retak, Wong WKM438, Edwards 845; Amo, G Pagon, Coode MC7608.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. In mature forests between 600–1500 m a.s.l. Threat: Rare in Brunei.

Mesophlebion falcatilobum Holttum, Fl. Males. Ser 2, Pterid. 1(5): 382. 1982.

BEL: Melilas, Sg Ingei, Edwards 2370; Batu Melintang, Edwards 2347. **TEM:** Amo, Sg Belalong (Amo), Middleton DJM767; Amo, Batu Apoi FR (K Belalong FSC), Edwards 989; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2055; Amo, Sg Belalong (Amo), Edwards 936; Amo, Batu Apoi FR (K Belalong FSC), Edwards 2056; Amo, Bkt Belalong, Middleton DJM801; Amo, K Belalong, Johns RJ6914; Amo, Bkt Belalong, Middleton DJM808; Amo, Batu Apoi FR (K Belalong FSC), Poulsen ADP134; Amo, Ulu Belalong, Idris et al. BRUN16651; Batu Apoi, Sg Temburong (Batu Apoi), Johns RJ6974; Batu Apoi, Bkt Gelagas (Bkt Suang), Simpson 2346; Belalong, FSC, Edwards 2113; Amo, Belalong, FSC, Nielsen 1900; Amo, Belalong, FSC, Cicuzza 2508, Cicuzza 2599; Amo Sg Bela-

long, *Cicuzza* 2622, *Cicuzza* 2626. **TUT:** Lamunin, Ladan Hills FR, *Edwards* 945.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. In mature lowland forests. Threat: Least Concern.

Mesophlebion motleyanum (Hook.) Holttum, Companion Handb. Ferns Brit. India 209. 1974.

TEM: Kpg Bakok, *Cicuzza* 2703; Amo, Bkt Belalong, *Poulsen ADP351*; Amo, Bkt Retak, *Wong WKM865*; Bangar, Pekan Bangar, *Ashton A77*. **TUT:** Lamunin, *Edwards* 747; Rambai, Ulu Tutong, *Johns RJ7641*.

Distribution. South Thailand, Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. In mature forests; lowlands to 1200 m a.s.l. Threat: Rare in Brunei.

Mesophlebion oligodictyon (Baker) Holttum, *Blumea* 22(2): 227. 1975.

BEL: Labi, Andulau, *Cicuzza* 2575. **TEM:** Amo, K Belalong, *Ashton A53*; Amo, Sg Temburong, *Wong WKM1219*; Amo, Sg Temburong, *Johns RJ7402*; Amo, Sg Temburong, *Edwards* 940; Amo, K Belalong, *Johns RJ6973*; Amo, Sg Temburong, *Edwards* 2159; Amo Belalong FSC, *Cicuzza* 2634.

Distribution. Endemic to Borneo (Brunei, Kalimantan, Sarawak).

Ecology. Terrestrial or lithophyte along streams and on rocks along rivers in the lowlands. Threat: Least Concern.

Mesophlebion trichopodium (C.Chr.) Holttum, *Blumea* 22(2): 226. 1975.

TUT: Rambai, Bkt Bahak, *Kirkup DK498*.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Kalimantan).

Ecology. Terrestrial, along streams and in humid forests; sea level to 1000 m a.s.l. Threat: Rare in Brunei.

32.10. *Plesioneuron* (Holttum) Holttum, *Blumea* 22: 232. 1975

Plesioneuron medusella Holttum, Fl. Males. Ser. 2, Pterid. 1(5): 400. 1982.

TUT: Lamunin, Benutan dam, *Edwards* 931.

Distribution. Endemic to Borneo (Brunei, Sarawak).

Ecology. Lithophytic in mature forests. Threat: Rare in Brunei.

32.11. *Pronephrium* C.Presl, Abh. Königl. Böhm. Ges. Wiss., ser. 5,6: 258. 1851

Pronephrium hosei (Baker) Holttum, *Blumea* 20(1): 120. 1972.

TEM: Amo, Sg Belalong (Amo), *Johns RJ6995*; Amo, Sg Temburong, *Johns RJ7146*; Amo, Sg Belalong (Amo), *Ashton A114*; Amo, K Belalong, *Johns RJ6969*; Amo, K Belalong, *Ashton A11*; Amo, Sg Temburong, *Edwards* 935; Amo, Batang Duri, *Schatz GS3287*; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2436; Batu Apoi, Kpg Selapon, *Dransfield SD1160*; Batu Apoi, *Edwards* 2443; Batu Apoi, *Samhan SN11*; Sg Sitam, *Edwards* 2016; Amo, Belalong, *Cicuzza* 2635.

Distribution. Borneo (Brunei, Kalimantan, Sabah, Sarawak), Philippines.

Ecology. Terrestrial or lithophyte on rocky stream banks in lowland forest to 500 m a.s.l. Threat: Least Concern.

Pronephrium menisciocarpon (Blume) Holttum, *Blumea* 20(1): 111. 1972.

BRM: Pengkalan Batu, Kpg Wasan, *Edwards* 978. **TEM:** Amo, K Belalong FSC, *Poulsen ADP291*; Amo, K Belalong, *Ashton A35*; Amo, Sg Belalong (Amo), *Edwards* 2132; Batu Apoi, *Edwards* 2458. **TUT:** Lamunin, *Edwards* 754.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Brunei, Indonesia (Sumatra, Java, Kalimantan, Maluku, Indonesia New Guinea), Philippines, Papua New Guinea.

Ecology. In mature forests close to streams at low altitudes. Threat: Least Concern.

32.12. *Sphaerostephanos* J.Sm. in W.J.Hooker, Gen. Fil.:t.24. 1839

Sphaerostephanos heterocarpus (Blume) Holttum, Companion Handb. Ferns Brit. India: 209. 1974.

BEL: Labi, Sg Teraja, *Edwards* 770, *Edwards* 2510; Melilas, Sg Ingei, *Edwards* 2364; Melilas, Sg Ingei, *Edwards* 2363. **TEM:** Amo, Bkt Retak, *Johns RJ6702*; Amo, Bkt Retak, *Johns RJ6738*; Amo, Sg Temburong, *Johns RJ7252*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP361*; Amo, Bkt Retak, *Wong WKM853*.

Distribution. China, Indochina, throughout Malesia, to Australia, and the Pacific Islands.

Ecology. Terrestrial, in primary forests; lowlands to 1500 m a.s.l. Threat: Least Concern.

Sphaerostephanos inconspicuus (Copel.) Holttum, Fl. Males., Ser. 2, Pterid. 1(5): 493. 1982.

TEM: Amo, Bkt Retak, *Johns RJ6619*; Amo, Bkt Retak, *Wong WKM894*; Amo, Bkt Retak, *Johns RJ6654*.

Distribution. Endemic to Borneo (Brunei, Sabah, Sarawak).

Ecology. Terrestrial, in primary montane forest between 1000–1800 m a.s.l. Threat: Rare in Brunei.

Sphaerostephanos larutensis (Bedd.) C.Chr., Index Filic. Suppl. 3: 172. 1934.

BRM: Pengkalan Batu, Kpg Wasan, *Edwards* 972. **TEM:** Amo, Sg Temburong, *Edwards* 939; Batu Apoi FR (K Belalong FSC), *Poulsen ADP290*. **TUT:** Lamunin, Benutan dam, *Edwards* 933; Pipeline Wasan, *Edwards* 752.

Distribution. Malaysia (Malay Peninsula, Sarawak, Sabah), Indonesia (Sumatra, Kalimantan), Brunei, Philippines.

Ecology. Terrestrial, in waterlogged sites within mature forests; lowlands to 1000 m a.s.l. Threat: Least Concern.

Sphaerostephanos latebrosus (Kunze ex Mett.) Holttum, Companion Handb. Ferns Brit. India 209. 1974.

TEM: Batu Apoi, *Edwards* 2442; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2060; Sg Temburong, *Edwards* 939; Batu Apoi, *Poulsen ADP290*.

Distribution. Malay Peninsula, Brunei, Sumatra, Java, Philippines.

Ecology. Lowland mature forests, in humid sites or close to streams. Threat: Rare in Brunei.

Sphaerostephanos perglanduliferus (Alderw.) Holttum, *Kalikasan* 4: 59. 1975.

TEM: Amo, K Belalong, *Johns RJ6957*; Amo, Batu Apoi FR (K Belalong FSC), *Edwards* 2061; Amo, Sg Belalong (Amo), *Edwards* 2108; Amo, Sg Temburong, *Johns RJ7378*. **TUT:** Lamunin, Benutan dam, *Edwards* 2333.

Distribution. Malaysia (Sarawak, Sabah), Brunei, Indonesia (Sumatra, Sulawesi), Philippines, Micronesia.

Ecology. Terrestrial or lithophyte along streams and rivers; lowlands to 1200 m a.s.l. Threat: Least Concern.

Sphaerostephanos polycarpus (Blume) Copel. Univ. Cal. Publ. Bot. 16: 60. 1929.

BRM: Wasan, Pipeline, *Edwards* 975. **TEM:** Bangar, *Edwards* 498; Belalong, FSC, *Middleton DJM834*; Sg Temburong, *Johns RJ6959*.

Distribution. Indochina, throughout Malesia, to the Pacific Islands.

Ecology. Lowland forest. Threat: Least Concern.

Sphaerostephanos pterosporus (Alderw.) Holttum, Fl. Males., Ser. 2, Pterid. 1(5): 486. 1982.

BEL: Labi, Sg Mendaram, *Johns RJ6816*; Labi, Wasai Wong Kadir (= Wasai Rampayoh), *Johns RJ7448*; Telingan waterfall, *Ariffin et al. BRUN23692*; Rampayoh waterfall, *Johns RJ7427*; Mendaram valley, *Johns RJ6817*; Teraja waterfall, *Sands MS5689*. **TEM:** Amo, Bkt Belalong, *Middleton DJM807*; Amo, Batu Apoi FR (K Belalong FSC), *Poulsen ADP124*; Amo, Sg Belalong (Amo), *Edwards* 937; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2394; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2474; Batu Apoi, Bkt Gelagas (Bkt Suang), *Simpson* 2324; Bkt Patoi, *Edwards* 901; Sg Esu, *Edwards* 2301; Sg Belalong, *Edwards* 2289. **TUT:** Lamunin, Benutan dam, *Edwards* 2239; Sg Ingei, *Edwards* 2365.

Distribution. Malay Peninsula, Borneo (Brunei, Sarawak).

Ecology. Terrestrial or lithophyte along streams and rivers in lowland mature forests. Threat: Least Concern.

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