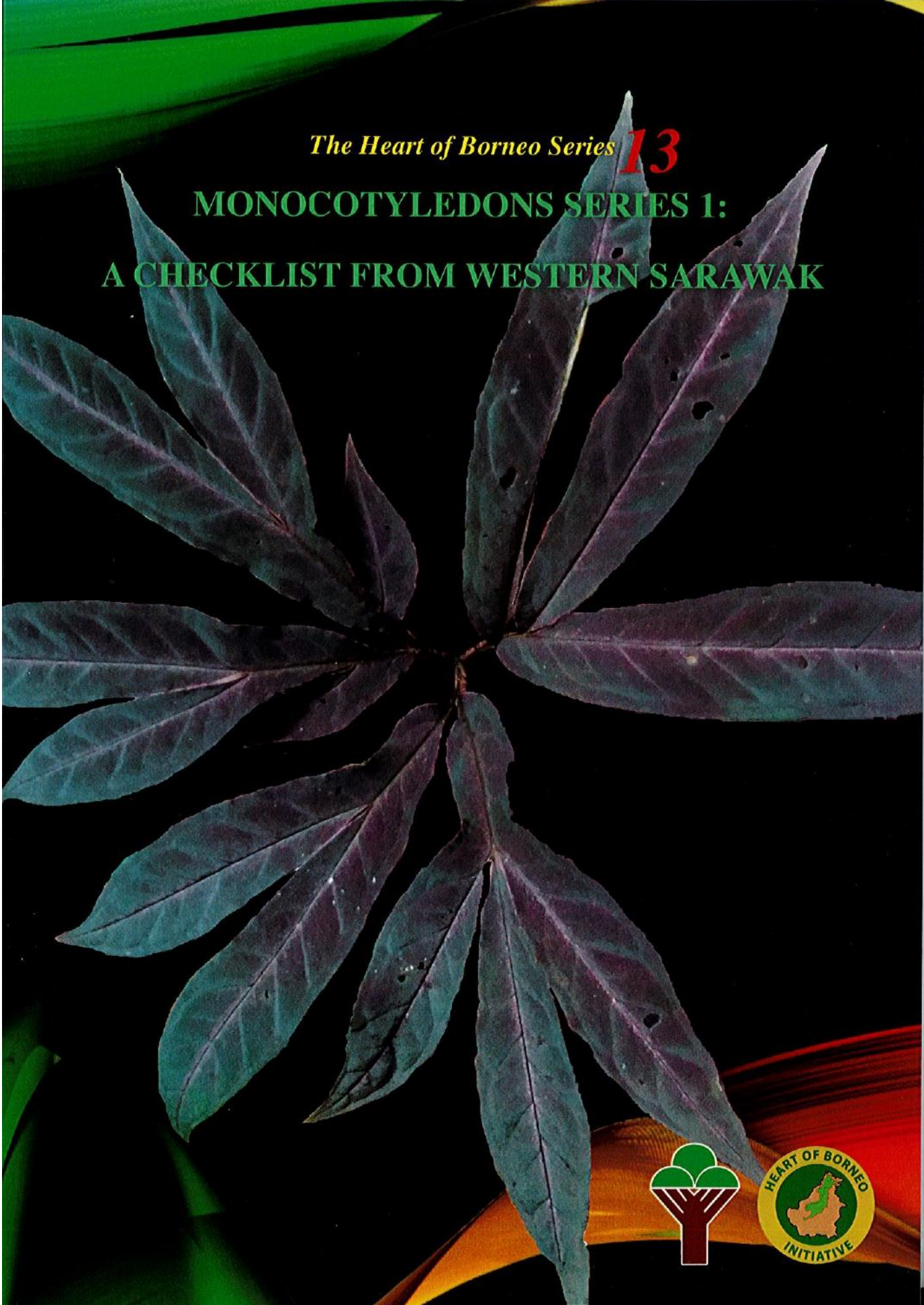
The Heart of Borneo Series 13

MONOCOTYLEDONS SERIES 1:

A CHECKLIST FROM WESTERN SARAWAK



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MONOCOTYLEDONS SERIES 1: A CHECKLIST FROM WESTERN SARAWAK

FOREST DEPARTMENT SARAWAK



Scaphochlamys yazidkalbii

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FOREWORD



Bismillahirrahmannirrahim....

This publication will be the first series of books under the Sarawak's Monocotyledon Plant Series, entitled *"The Heart of Borneo Series 13: Monocotyledon Series 1 – A Checklist From Western Sarawak"*. This first-ever book documented the checklist of monocotyledon plants based on a series of field expeditions that covers almost one-third of area in Sarawak. I believe this is an excellent start to showcase the flora diversity of Sarawak and look forward to more documentation on the diversity of monocotyledons flora in Sarawak.

A total of 35 families, 242 genera, and 880 species of monocotyledons plants have been documented in this book. It's showed a great diversity of monocotyledon species. As many localities are yet to be surveyed and many specimens are still at the verification stage, I am sure that the numbers of monocotyledon recorded in Sarawak will surely be increasing.

I would like to congratulate the leader of this project, Forest Department Sarawak staff and editors, for their effort and compilation of valuable information in this published checklist.

YBhg Datu Hamden Bin Haji Mohammad
Director of Forests
SARAWAK

PREFACE

This is the first book in The Sarawak's Monoctyledon Plant Series publication under the Monocotyledon Plant Project. The checklist of plants, specifically on the Monocotyledon group, is the first-ever published based on the records from Sarawak Permanent Forest Estates (PFE that includes Totally Protected Areas (TPAs), Communal Forests (CF), as well as the Sarawak's Heart of Borneo project areas). It covers all the monocotyledon families recorded and reported from the western part of Sarawak, namely Kelingkang Range Forest, Sabal Forest Reserve, Gunung Apeng National Park, Bungo Range National Park, Dered Krian National Park, Sampadi Forest Reserve, Pueh Range, Samunsam Wildlife Sanctuary, Tanjung Datu National Park, Kubah National Park, Santubong National Park and Bako National Park.

A total of 35 families, 242 genera and 880 species (including exotic species) have been recorded in this book. The family Orchidaceae, Arecaceae, Araceae, Zingiberaceae and Cyperaceae dominated and covering more than half of the names listed. The genera Bulbophyllum, Dendrobium and Calamus are the three most specious genus with 65, 47 and 34 species.

This is our first attempt in documenting the Monocotyledons plants in Sarawak, and this checklist is beyond complete. As many areas are yet to be surveyed and documenting works are ongoing, the species list is expected to be increased.

Editors.

Introduction

The monocotyledon plants, commonly refer to as monocots (or frequently refer to as the grasses or grass-like flowering plants), have, as the name implies, a single cotyledon or embryonic leaf in their seeds. They are distinguishable by their uniformity and diversity. The organisation of the shoots, leaf structure and floral configuration are more uniform from other angiosperms. The monocots include about 60,000 species, with the orchid family (Orchidaceae) the largest, with approximately half of the total number of all monocots (≈ 30,000 species) and followed by the grass family (Poaceae). The majority of the agricultural economic biomass come from monocotyledon plants. These include grains, forage grasses, sugar cane, bamboos, palms, bananas and plantains, leeks, onion and garlic, gingers and many more. Additionally, many of the horticultural and indoor decorative plants that are cultivated for their blooms are monocotyledons.

The monocots families can be found on almost every landmass and occupy a wide range of habitats. Many families are cosmopolitan (e.g., Poaceae, Cyperaceae), but few are restricted to specific regions or areas. The state of Sarawak is remarkably rich with flora, where it is estimated that about 13,000 species of flowering plants are available in the state. Of the number, about 85 percent is contributed by the monocots species (e.g., orchids alone contribute 10 percent of the total). A complete inventory and documentation on the monocots in Sarawak, however, has never been conducted before. Thus, our project, entitled, "*Survey on the monocotyledon plants in the Sarawak's Heart of Borneo areas*", is intended to provide series of extensive documentation on monocots for the whole of Sarawak.

The checklist is based on material housed at the herbaria [e.g., SAR, Herbarium UNIMAS). Also included is a list of plants that are extracted from technical reports, technical papers, books, field notes, or any published materials regarding the monocots plants from western Sarawak and encomposses the Sarawak's Heart of Borneo (HoB) areas. The nomenclature follows Turner (1995) and Forest Department Sarawak (2019).

What is the Heart of Borneo (HoB) Initiative?

Heart of Borneo (HoB) Initiative is a voluntary transboundary cooperation between Brunei, Indonesia and Malaysia to enable conservation and environment protection while enhancing sustainable development that improves the welfare of those living on the island. The collaboration of the three ASEAN nations was officially launched in Brazil on 27 March 2006. On 12 February 2007, the Minister of Natural Resources and Environment, Malaysia; the Minister of Forestry, Republic of Indonesia and the Minister of Industry and Primary Resources, Brunei Darussalam, signed and jointly issued a Declaration in Bali, Indonesia of the HoB initiative.

In view of the global concerns and controversies about tropical forest development, the long-term objective of the HoB Initiative, as enshrined in the Bali Declaration, is as follows:

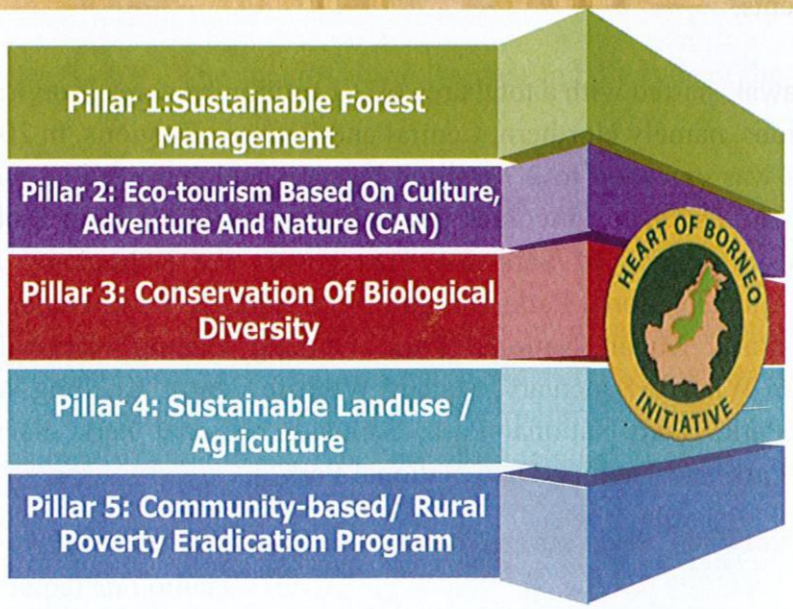
"With one conservation vision and with a view to promote peoples' welfare, we will cooperate in ensuring the effective management of forest resources and conservation of a network of protected areas, productive forests and other sustainable uses."



Bali Declaration 2007

1	Represents the area designated as the Heart of Borneo area.
2	Represents the boundary of Heart of Borneo.
3	Represents the integrity of the forest which is crucially important. All in gold denoting under the good care of the 3 respective countries.
4	Represents the forest as the core element of the HoB initiative.
5	Represents the Global Earth
6	• Leaves representing the three pillars of sustainable development which are Economic, Social and Environmental requirements. • They are interlinked to represent the importance of forest connectivity for biodiversity conservation.

5 PILLARS OF THE HEART OF BORNEO



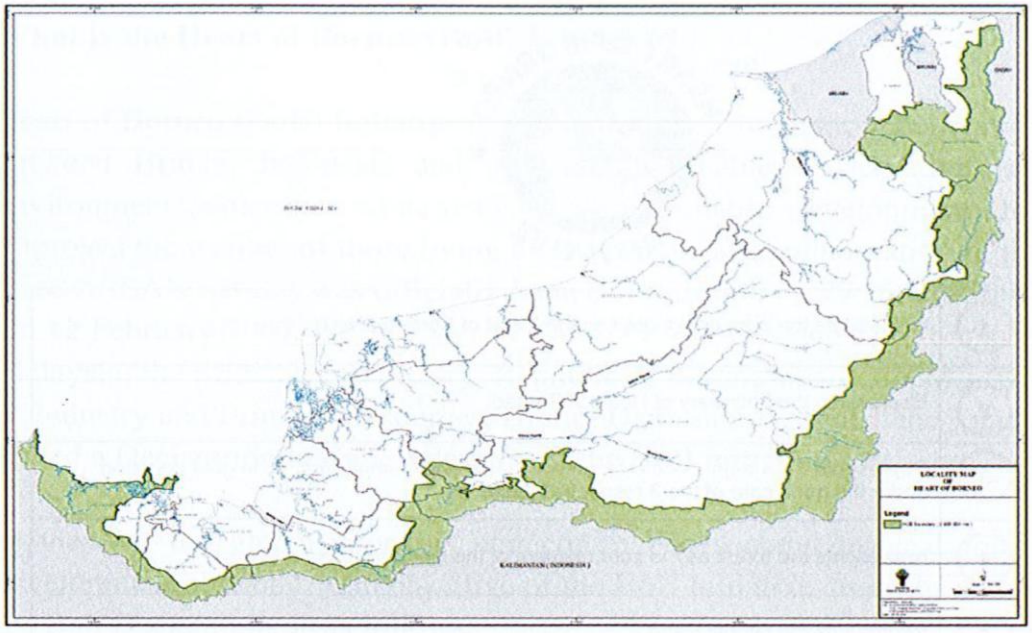


Figure. Map of Heart of Borneo (HoB) area in Sarawak

In Sarawak, the HoB covers 2.7 million ha over a contiguous block along Sarawak's boundaries with Kalimantan and with Sabah and Brunei. The HoB is entirely in line with existing policies by both state and federal governments.

HoB Sarawak started with a total area of 2.1 million hectares is divided into three regions, namely Northern, Central and Southern Regions. In 2018, the HoB area was extended to 2.7 million hectares and approved by the State Cabinet. The expansion involves the land area covering from Batang Ai to the western region of Sarawak. This covers the Kelingkang Range, Gunung Apeng National Park, Bungo Range National Park, Gunung Pueh National Park, Kubah National Park, Gunung Gading National Park, Samunsam Wildlife Sanctuary, Matang Wildlife Centre, Kuching Wetland National Park, Bako National Park, Sampadi National Park, Santubong National Park and Tanjung Datu National Park.

THE CHECKLIST

The checklist includes all monocotyledons species known to occur in western Sarawak (including the Heart of Borneo areas), exotic or introduced plant for any purposes by the local people within the regions, e.g., cultivated for agricultural use, ornamental and for medicine and also includes common weeds as long as the plants are found and recorded in the areas. A few species are referred to only with numbers, or as 'sp.' These are distinct species that are currently unidentified and may represent undescribed species in some instances.

Species entry format

The entry in this checklist for each species can be summarized as follows:

Code number; **species name**; synonym; habitat; uses; notes

Code number – each taxon is referred to by code (e.g., 4.4.14) of three numbers separated by stops. The first number refers to the family, the second for the genus and the third for the species. When a species is represented by more than one infraspecific taxon, then each is separately referred to by suffixed letters beginning from a.

Species name – The species name is given in bold type at the start of each entry.

Synonym/basionym – the synonym/basionym of the species is given in the box bracket, italicized but not bold type.

Habitat – the species' general habitat or niche area is given, mixed dipterocarp forest (MDF), peat swamp, limestone, montane forest, bottom valley, hill ridge, and riverine. The natural condition of the plant (occasionally) and the soil types are also included.

Uses/Note – Any uses of the reported plants are given, including general use, medicinal and others.

Abbreviation used in the list

Bid.	=	Bidayuh
Bt.	=	Bukit (hill)
elev.	=	elevation
FR	=	Forest Reserve
Gn.	=	Gunung (mount)
Ib.	=	Iban
Kay.	=	Kayan
Ken.	=	Kenyah
Kpg.	=	Kampung (village)
m	=	meter
Mal.	=	Malay
MDF	=	mixed dipterocarp forest
Mel.	=	Melanau
NP	=	National Park
Pen.	=	Penan
WC	=	Wildlife Centre
WS	=	Wildlife Sanctuary

RESULTS

From, *The Sarawak's Monocotyledon Plant Series 1: A Checklist of Monocotyledon Plants – Western Sarawak,* the number of taxa recorded from areas was representing as follow: -

35 families

A total of 880 plant species represented by 242 genera of flowering plants (monocotyledons).

The best-represented plant families are (7 most specious):
Orchidaceae – 93 genera with 388 species
Arecaceae – 22 genera with 125 species
Araceae – 26 genera with 99 species
Zingiberaceae – 18 genera with 81 species
Poaceae – 23 genera with 38 species
Cyperaceae – 13 genera with 34 species
Pandanaceae – 3 genera with 33 species

The most specious genera are (10 most specious):
Bulbophyllum – 65 species
Dendrobium – 46 species
Calamus – 34 species
Schismatoglottis – 26 species
Coelogyne – 22 species
Homalomena – 18 species
Appendicula – 16 species
Daemonorops, Licuala, Pandanus – 15 species

Ethnobotanical

The ethnobotanical uses recorded included medicinal plants the used by the humans, as food (included fruits, vegetables and spices), constructions and handicrafts, veterinary uses (mostly to treat worms and diseases in dogs, chickens and pigs), used for wrapping and as well as for ornamental.

THE PLANT LIST

1. ACORACEAE

1.1.1 ***Acorus calamus*** L. [synonym: *Calamus aromaticus* Garsault]. *JeRangeau putih* (Mal.), *Sweet flag, Sway* (Eng.), perennial herb, frequently on damp and wet places. **Note**: planted by local people mainly for medicinal uses.

2. ALISMATACEAE*

2.1.1 ***Limnocharis flava*** (L.) Buchenau. [synonym: *Alisma flavum* L.; *Limnocharis emarginata* Humb. & Bonpl.; *L. flava* var. *indica* Buchenau.; *L. plumieri* Rich.]. *Yelow velvetleaf, Sawah flower rush, Sawah lettuce*]. Aquatic herb, in drainage or pond. **Note**: not native. Sometimes harvested as a vegetable and medicinal used.

**current classification proposed placing this family under the Potenderiaceae.*

3. AMARYLLIDACEAE

3.1.1 ***Allium cepa*** L. *Bawang merah* (Mal.). cultivated.

3.2.1 ***Crinum asiaticum*** L. [synonym: *Bulbine asiaticum* (L.) Gaertn.]. *Spider lily, Poison bulb* (Eng.). Planted as ornamental.

3.3.1 ***Hymenocallis speciosa*** (L. *f. ex* Salisb.) Salisb. [synonym: *Pancratium speciosum* L. *f. ex* Salisb.; *P. formosum* M. Roem.]. *Green-tinged spiderlily* (Eng.). Planted as ornamental. **Note**: native to Caribbean.

4. ARACEAE

4.1.1 ***Aglaonema nitidum*** (Jack) Kunth. Herb up to 1 m tall, limestone boulder.

4.1.2 ***Aglaonema simplex*** (Bl.) Bl. Herb, 0.5 – 1.5 m tall, limestone boulders, deep shaded areas in limestone foothills.

4.2.1 ***Alocasia longiloba*** Miq. *Keladi rusa* (Mal.), herb up to 50 cm tall, recorded in MSF, MDF, limestone and kerangas. Recorded from Dered Krian NP, Kubah NP, Pueh NP and Bako NP.

4.2.2 ***Alocasia peltata*** M. Hotta. *Keladi* (Mal.). terrestrial herb, kerangas and MDF forests. Recorded from Gn. Serapi, Kubah NP.

4.2.3 ***Alocasia princeps*** Bull. Herb up to 1.5 m tall, on limestone slopes of Dered Krian NP, also recorded from Bako NP.

4.2.4 ***Alocasia reversa*** Ridl. Herb to 30 cm tall, limestone boulders at the base in thick soil.

4.2.5 ***Alocasia ridleyi*** A. Hay. Herb, 30 – 45 cm tall, limestone slope, on rock cliff, boulders at the base and on thick layer of soils.

4.2.6 ***Alocasia scabriuscula*** N.E. Br. Herb, on limestone base. Recorded from Dered Krian NP.

4.3.1 ***Amorphophallus angulatus*** Hett. & A. Vogel. *Mayak* (Ib.). Terrestrial herb, near rivers or stream, MDF. Recorded from Gn. Serapi, Kubah NP. Note: endemic to Borneo.

4.3.2 ***Amorphophallus brachyphallus*** W.L.A. Hetterscheid. *Bunga mayat, Bunga bangkai* (Mal.), *Mayak* (Ib.), herb, on limestone boulders. Note: endemic to Borneo.

4.3.3 ***Amorphophallus eburneus*** Bogner. *Bunga mayat, Bunga bangkai* (Mal.), *Mayak* (Ib.), herb to 50 cm tall (flowering), 2 m (in leaf), limestone base and valley, in deeply shaded areas. Note: endemic to Borneo.

4.3.4 ***Amorphophallus hewittii*** Alderw. *Mayak* (Ib.), herb, limestone base and valley, on deep shaded area.

4.3.5 ***Amorphophallus infundibuliformis*** Hett., A. Dearden & A. Vogel. *Mayak* (Ib.). Terrestrial herb. MDF. Recorded from Kubah NP.

4.3.6 ***Amorphophallus pendulus*** Bogner & Mayo. *Mayak, Pokok ular* (Ib.). Terrestrial herb, MDF, shaded areas, near to streams, valleys. Recorded from Gn. Serapi, Kubah NP, also Pueh FR. Note: endemic to Borneo.

4.4.1 ***Amydrium medium*** (Zoll. & Mor.) Nicolson. Climbing herb, recorded from limestone areas of Dered Krian NP, in rocky coastal of Bako NP.

4.5.1 ***Anadendrum microstachyum*** (de Vr. & Miq.) Back. & Alderw. Climbing herb, on limestone slope in Dered Krian NP, also recorded from Telok Paku of Bako NP.

4.5.2 ***Anadendrum montanum*** Schott. Recorded from Bako NP.

4.6.1 ***Arisaema filiforme*** Bl. *Keladi lidah naga* (Mal.), herb up to 30 cm tall, alluvial soil at the base of limestone.

4.6.2 ***Arisaema laminatum*** Bl. *Keladi lidah naga* (Mal.) herb, terrestrial/lithophyte, recorded from Penrissen Range. Note: new record for Sarawak.

4.7.1 ***Bakoa lucens*** (Bogner) P.C. Boyce & S.Y. Wong. [synonym: *Hottarum lucens* Bogner; *Piptospatha lucens* (Bogner) Bogner & A. Hay]. Recorded from Bako NP.

4.8.1 ***Bidayuha crassispatha*** S.Y. Wong & P.C. Boyce. Terrestrial /rheophyte herb. Recorded from Lundu (type locality).

4.9.1 ***Buchepalandra akantha*** S.Y. Wong & P.C. Boyce. Herb, rheophyte, lowland streams and rivers. Recorded from Penrissen Range.

4.10.1 ***Caladium bicolor*** Vent. Cultivated and naturalized. Uses: ornamental plant.

4.11.1 ***Colocasia esculenta*** (L.) Schott. *Taro, Keladi cina* (Mal.), widely cultivated and naturalized, at damp and wet places, base of limestone hills. Common throughout Sarawak. **Uses**: tuber harvested as staple food.

4.11.2 ***Colocasia oresbia*** A. Hay. *Taro.* Herb, on exposed but wetter depression along the ridges. Recorded from Penrissen Range. **Note**: native to Borneo.

4.12.1 ***Cryptocoryne ciliata*** (Roxb.) Fischer *ex* Wydler. [synonym: *Ambrosina ciliaris* Spreng; *A. ciliata* Roxb.; *Arum ciliatum* (Roxb.) Loudon; *Cryptocoryne alata* Griff.; *C. drymorrhisa* Zipp. *ex* Shott]. *Keladi payau* (Mal.), *Water trumpet.* Aquatic herb, coastal, mud soils. Recorded from Bako NP and common elsewhere.

4.12.2 ***Cryptocoryne ferruginea*** Engl. *Kelatai* (Ib.), aquatic herb, submerged or semi-submerged, in small stream. Single record from Gn. Batu.

4.12.3 ***Cryptocoryne keei*** Jacobsen. *Kelatai* (Ib.), aquatic herb, submerged or semi-submerged, in small stream. Recorded from Dered Krian NP. Note: endemic to Sarawak (type locality – Bau).

4.12.4 ***Cryptocoryne lingua*** Becc. *ex* Engl. *Keladi payau* (Mal.), aquatic herb, semi-submerged, on mud soils, estuarine or coastal. Recorded from Lundu and Sematan.

4.12.5 ***Cryptocoryne longicauda*** Becc. *ex* Engl. *Timun amun* (Mel.), *Kelatai* (Ib.), aquatic herb, submerged or semi-submerged. Frequently found in brackish water, swampy areas. Recorded from Bako NP.

4.12.6 ***Cryptocoryne striolata*** Engl. *Kelkatai* (Ib.), aquatic herb, submerged or semi-submerged, in rocky stream, single record from Gn. Jebong.

4.13.1 ***Cyrtosperma merkusii*** (Hassk.) Schott. [synonym: *Cyrtosperma chamissonis* (Schott.) Merr.; *Cyrtosperma edule* Schott.]. *Giant swamp taro,* herb, occasional on water logged swampy soil, at the base of limestone hills. Common throughout Sarawak.

4.14.1 ***Epipremnum falcifolium*** Engl. Epiphytic climber, creeping on the ground, at the base of limestone, on boulders and slopes. Also recorded in PSF and MDF.

4.15.1 ***Hestia longifolia*** (Ridl.) S.Y. Wong & P.C. Boyce. Moderate clumping-forming herb, lowland MDF, kerangas. Recorded from Gn. Matang, Kubah NP and Bungo Range NP, also scattered throughout Borneo.

4.16.1 ***Heteroaridarum borneense*** M. Hotta [synonym: *Aridarum borneense* (M. Hotta) Bogner]. Rheophyte of sandstone. Recorded from Bako NP.

4.16.2 ***Heteroaridarum nicolsonii*** (Bogner) S.Y. Wong & P.C. Boyce. [synonym: *Aridarum nicolsonii* Bogner]. Rheophyte on large sandstone boulders. Recorded from Sg. Delima, Bako NP and Santubong NP.

4.17.1 ***Homalomena acuminatum*** (Ridl.) S.Y. Wong & P.C. Boyce. Terrestrial/lithophyte, small herb, lowland MDF, riverine. Recorded from Bungo Range NP.

4.17.2 ***Homalomena caput-gorgonis*** S.Y. Wong & P.C. Boyce. Medium solitary evergreen, strongly aromatic mesophyte herb, occurs on soil on the tops and upper side of large granite boulders wunder lowland humid forest. Recorded from Gn. Pueh (type locality). Note: endemic to western Sarawak.

4.17.3 ***Homalomena debilicrista*** Y.C. Hoe. Terrestrial herb. Common in Gn. Serapi, Kubah NP and Matang (type locality). Note: endemic to Borneo.

4.17.4 ***Homalomena elliptica*** Hook. *f.* Terrestrial herb. Reported from Kerangas forest in Bako NP (*Purseglove, P.5578*).

4.17.5 ***Homalomena giamensis*** L.S. Tung, S.Y. Wong & P.C. Boyce. Terrestrial herb, endemic to the karst limestone areas.

4.17.6 ***Homalomena havilandii*** Ridl. Terrestrial herb. Recorded once from Bako NP (*Nicolson D.H. 1332*).

4.17.7 ***Homalomena hostifolia*** Engl. *Kemuyang* (Ib.), terrestrial or lithophytic on rocks, at damp and wet places, base of limestone hills, on boulders and gentle slopes. **Note**: ethno-plant.

4.17.8 ***Homalomena humilis*** (Jack) Hook. *f. Keladi* (Mal.), small herb, 25 – 30 cm tall, on limestone boulders, rock surfaces and soil pockets and in damp areas.

4.17.9 ***Homalomena lancea*** Ridl. Terrestrial herb. Recorded from Gn. Matang. Note: endemic to Borneo.

4.17.10 ***Homalomena lunduensis*** Furtado. Terrestrial herb. Described from Lundu areas, also recorded from Bako NP.

4.17.11 ***Homalomena matangae*** Y.C. Hoe, S.Y. Wong & P.C. Boyce. Terrestrial herb, on gentle and steep slopes in MDF. Recorded from Gn. Matang (type locality). Note: endemic to Borneo.

4.17.12 ***Homalomena paucinervia*** Ridl. Terrestrial/rheophyte herb. Recorded from Gn. Serapi, Kubah NP.

4.17.13 ***Homalomena punctulata*** Engl. Terrestrial herb. Recorded from Bako NP (*Nicolson D.H. 1325*) and Gn. Serapi, Kubah NP.

4.17.14 ***Homalomena ridleyi*** S.Y. Wong & P.C. Boyce. Terrestrial or lithophyte, small herb, lowland MDF, riverine. Recorded from Bungo Range NP.

4.17.15 ***Homalomena santubongensis*** S.Y. Wong & P.C. Boyce. Small strongly aromatic herb, rheophyte in the flood zone of relative sandstone waterfall and streambank under humid lowland forest. Recorded from Santubong NP. Note: endemic to western Sarawak.

4.17.16 ***Homalomena selaburensis*** P.C. Boyce & S.Y. Wong. Terrestrial herb. Recorded from limestone areas.

4.17.17 ***Homalomena succincta*** S.Y. Wong & P.C. Boyce. Evegreen, glabrous strongly aromatic herb, to 60 cm tall, occurs along riverbanks above flood level under lowland humid MDF. Recorded from Gn. Pueh (type locality). Note: endemic to western Sarawak.

4.17.18 ***Homalomena velutipedunculata*** Y.C. Hoe, S.Y. Wong & P.C. Boyce. Terrestrial/lithophyte herb. Recorded from Santubong NP.

4.18.1 ***Lasia spinosa*** (L.) Thwaites. *Keladi keris* (Mal.), *Bunger* (Mel.), herb, occasional in swampy areas, near water sources. Common in PSF throughout Sarawak.

4.19.1 ***Ooia glans*** S.Y. Wong & P.C. Boyce. Rheophyte herb. Recorded from Bungo Range NP. Note: endemic to Borneo.

4.20.1 ***Pedicellarum paiei*** M. Hotta. A monotypic genus, herb, on the steep bank of small stream, Recorded from Penrissen Range. **Note**: endemic to Borneo.

4.21.1 ***Photos beccarianus*** Engl. Slender, heterophyllous, root-climbing liana. Recorded from Santubong NP. Note: Endemic to Borneo.

4.21.2 ***Photos insignis*** Engl. Climbing herb (juvenile), liana (adult), on limestone slopes, on thick humus, deep shaded areas and foot of limestone hills.

4.21.3 ***Photos ovatifolius*** Merr. Creeping herb (juvenile), liana (adult), limestone base, cliff and bole climber.

4.22.1 ***Podolasia stipitata*** N.E. Br. Monotypic genus (with two varieties). Terrestrial herb. Recorded from Kubah NP.

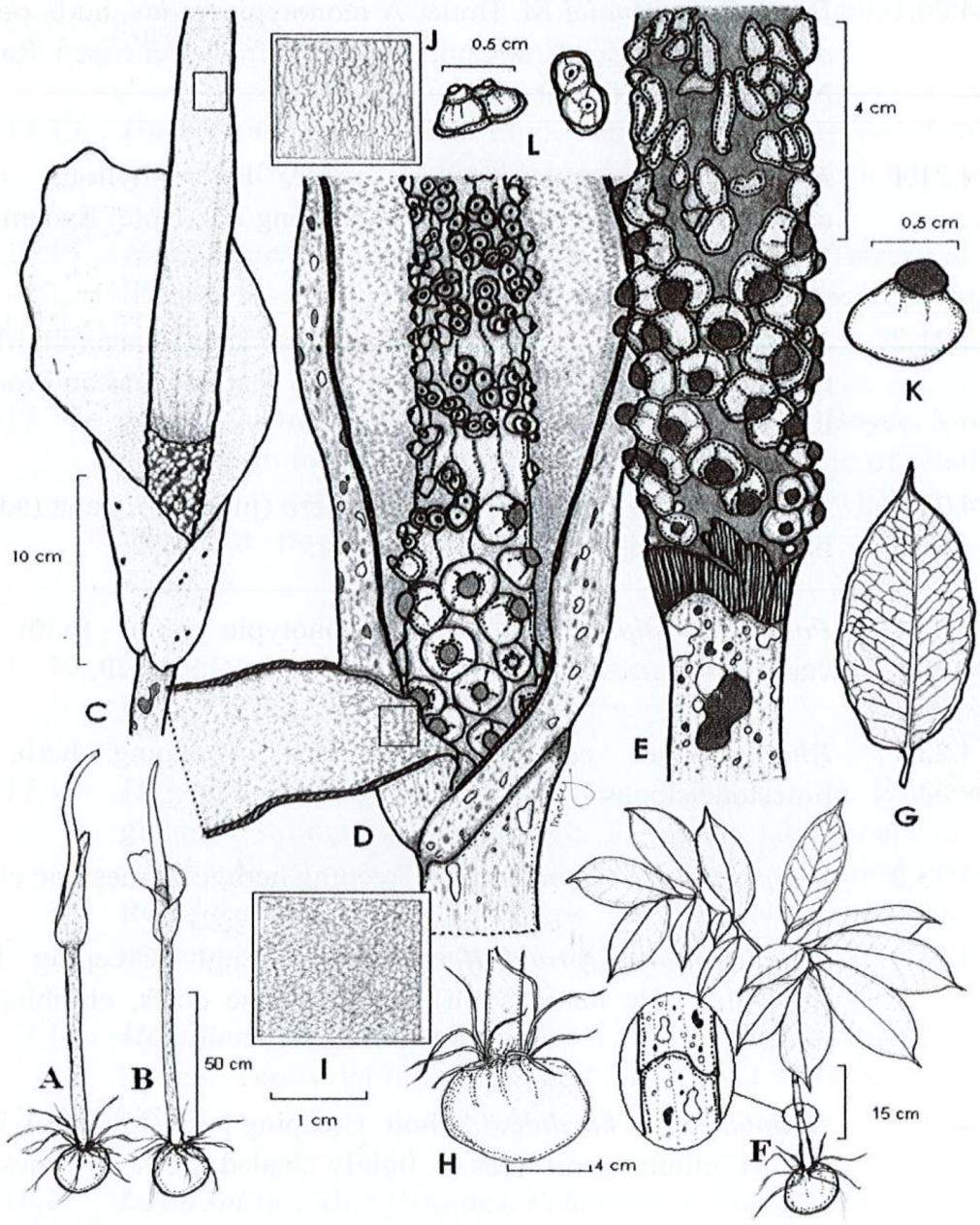
4.23.1 ***Rhapidophora conocephala*** Alderw. Creeping herb, on limestone slopes.

4.23.2 ***Rhapidophora elliptica*** Ridl. Creeping herb, on limestone cliffs.

4.23.3 ***Rhapidophora foraminifera*** (Engl.) Engl. Creeping herb (juvenile) bole liana (adult), on limestone cliffs, climbing on trees.

4.23.4 ***Rhapidophora korthalsii*** Schott. Creeping herb (juvenile), liana (adult), climbing on trees in lightly shaded areas on limestone hills.

4.23.5 ***Rhapidophora latevaginata*** M. Hotta. Creeping herb (juvenile), neotenic bole liana (adult), shady boulders.



Amorphophallus ranchanensis, A, B: inflorescence with tuber, D, E: inflorescence with opened and revovered spathe, F: whole plant, G: leaflet, H: tuber, I: inner surface of spathe, J: surface of strile part, K: female, L: male



Podolasia stipitata (insert: inflorescence), a monotypic genus recorded from Kubah National Park



A: *Homalomena velutipedunculata,* **B**: *Rhapidophora angustifolia,* **C**: *Rhynchopyle viridistigma,* **D**: *Schismatoglottis viridissima*

4.23.6 ***Rhapidophora lobbii*** Schott. Creeping herb (juvenile), bole liana (adult), limestone cliffs, climbing on tree.

4.24.1 ***Rhynchopyle elongata*** (Engl.) Engl. [synonym: *Schismatoglottis elongata* Engl.; *Piptospatha elongata* (Engl.) N.E. Br.; *Gamogyne pulchra* N.E. Br.]. Rheophyte herb. Recorded from Lundu.

4.24.2 ***Rhnchopyle impolita*** (S.Y. Wong, P.C. Boyce & Bogner) S.Y. Wong & P.C. Boyce. [synonym: *Piptospatha impolita* S.Y. Wong, P.C. Boyce & Bogner]. Rheophyte herb. Recorded from Sampadi, Kuching.

4.25.1 ***Schismatoglottis adducta*** S.Y. Wong & P.C. Boyce. Herb, river bank. Widespread in Sri Aman.

4.25.2 ***Schismatoglottis asperata*** Engl. Facultative rheophyte herb. Recorded from Gn. Matang.

4.25.3 ***Schismatoglottis baangongensis*** S.Y. Wong & P.C. Boyce. Moderately robust clumping herb, along small stream. Recorded from Padawan.

4.25.4 ***Schismatoglottis bauensis*** A. Hay & C.C. Lee. *Keladi* (Mal.), herb, often pendent on cliffs, limestone base and wet shaded cliffs.

4.25.5 ***Schismatoglottis calyptrata*** Zoll. & Mor. Small herb, in shaded areas, lowland MDF, base of limestone hills, valleys and riverine. Recorded from Gn. Matang and Dered Krian NP.

4.25.6 ***Schismatoglottis conoidea*** Engl. *Keladi* (Mal.), erect herb to 35 cm tall, on damp and wet soils in deeply shaded area.

4.25.7 ***Schismatoglottis evelyniae*** P.C. Boyce & S.Y. Wong. Lithophytic herb to 50 cm tall, form large colonies on vertical

clay-covered on limestone banks in deep shaded. Recorded from Kpg Tringgus (type locality), Bungo Range NP.

4.25.8 ***Schismatoglottis giamensis*** S.Y. Wong, Y.C. Hoe & P.C. Boyce. Moderately robust colonial mesophytic herb, alluvial sandy soil. Recorded only from type locality, Kpg Giam, Padawan.

4.25.9 ***Schismatoglottis heterodoxa*** S.Y. Wong. A rheophyte herb, MDF. Recorded from Santubong NP.

4.25.10 ***Schismatoglottis iliata*** S.Y. Wong & P.C. Boyce. Lithophyte herb, shaded damp sandstone bluffs above a river. Recorded from Lundu (type locality).

4.25.11 ***Schismatoglottis longifolia*** Ridl. Terrestrial/lithophyte, small herb, in shaded areas, lowland MDF or riverine. Recorded from Gn. Matang.

4.25.12 ***Schismatoglottis jipomii*** P.C. Boyce & S.Y. Wong. Small herb, in shaded areas, lowland MDF or riverine. Recorded from Gn. Matang.

4.25.13 ***Schismatoglottis mayoana*** Bogner & M. Hotta. Terrestrial herb, MDF. Only known from Matang and vicinity.

4.25.14 ***Schismatoglottis maelii*** P.C. Boyce & S.Y. Wong. Lithophyte herb, to 50 cm tall, on thin layer humus and in shallow litter pockets on sandstone boulders and cliff. Recorded from Bau (type locality).

4.25.15 ***Schismatoglottis motleyana*** (Schott) Engl. Small herb, in shaded areas, lowland MDF or riverine. Recorded from Gn. Matang.

4.25.16 ***Schismatoglottis multiflora*** Ridl. *Keladi* (Mal.), rheophyte on the rock surface, small stream at the base of limestone hill. Recorded once from Gn. Jebong.

4.25.17 ***Schismatoglottis nevosa*** Ridl. *Keladi* (Mal.), in shaded boulders areas. Recorded from Fairy Cave and Gn. Bidi.

4.25.18 ***Schismatoglottis nicolsonii*** A. Hay. Lithophytic in shade of primary lowland dipterocarp forest and by waterfalls. Only known from Bako NP and Santubong NP.

4.25.19 ***Schismatoglottis ranchanensis*** S.Y. Wong. Lithophyte herb, MDF, near stream. Type locality Ranchan Recreational Park, Serian.

4.25.20 ***Schismatoglottis roh*** S.Y. Wong, Y.C. Hoe & P.C. Boyce. Moderately robust colonial mesophytic herb, restricted to Cretaceous Karst in the Bau area of Kuching.

4.25.21 ***Schismatoglottis roseospatha*** Bogner. *Keladi* (Mal.), herb to 35 cm tall, rheophytic, near stream on limestone boulders. Two records, from Gn. Lanyang and Gn. Tai Ton.

4.25.22 ***Schismatoglottis simonii*** S.Y. Wong. *Keladi* (Mal.), herb, terrestrial/lithophyte or rheophyte, recorded from Penrissen Range.

4.25.23 ***Schismatoglottis tecturata*** (Schott) Engl. *Keladi* (Mal.), herb pendent to 30 cm, sometimes rheophytic, at the base of limestone hills. Record once from Dered Krian NP.

4.25.24 ***Schismatoglottis tegorae*** P.C. Boyce & S.Y. Wong. Facultative rheophyte herb, solitary or small clump. Recorded from Dered Krian NP. Note: type locality – Jambusan, Bau.

4.25.25 ***Schismatoglottis viridissima*** A. Hay. *Keladi* (Mal.), creeping or very rarely a climbing herb, at the base of limestone hills. Common in the Dered Krian NP.

4.25.26 ***Schismatoglottis wallichii*** Hook. *f.* Terrestrial herb, MDF. Recorded from Gn. Serapi, Kubah NP.

4.26.1 ***Scindapsus coriaceus*** Engl. Climbing herb (juvenile) bole liana (adult), limestone slopes, deep shaded areas, thick layer of soil at the base and limestone summit. Common in the Dered Krian NP.

4.26.2 ***Scindapsus geniculatus*** Engl. Climbing herb on tree trunk, MDF. Recorded from Lundu. Note: endemic to Borneo.

4.26.3 ***Scindapsus glaucescens*** (Engl. & K. Krause) Alderw. [synonym: *Rhapidophora glaucescens* Engl. & K. Krause]. Climbing herb on tree trunk. Recorded from Gn. Serapi, Kubah NP.

4.26.4 ***Scindapsus longistipitatus*** Merr. Climbing herb (juvenile) bole liana (adult), limestone base, cliffs climbing on tree trunks. Recorded from Dered Krian NP (Gn. Doya and Gn. Juita).

4.26.5 ***Scindapsus perakensis*** Hook. *f.* Climbing herb. Recorded from Bako NP (*Nicolson D.H. 1333*).

4.26.6 ***Scindapsus pictus*** Hassk. Creepeing herb (juvenile), bole liana (adult), on limestone boulders. Recorded from Wind Cave.

4.26.7 ***Scindapsis rupestris*** Ridl. Scrambling on tree, recorded from Bako NP.

4.26.8 ***Scindapsus treubii*** Engl. Climbing herb (juvenile) liana (adult), on limestone boulders. Recorded once from Dered Krian NP.

5. ARECACEAE

5.1.1 ***Areca furcata*** Becc. Small palm, to 2 m tall, in deeply shaded areas, at the base of limestone hill and boulders. **Note**: endemic to Sarawak.

5.1.2 ***Areca minuta*** Scheff. *Pinang surok pelandok* (Ib.), small palm, to 1 m tall, clustering, in deeply shaded areas at the base of limestone hill. Single record from Gn. Doya.

5.1.3 ***Areca subacaulis*** (Becc.) J. Dransf. *Pinang hutan* (Mal.), palm, lowland MDF, valleys and riverine. Recorded from Gn. Serapi, Kubah NP.

5.1.4 ***Areca triandra*** Roxb. *ex* Buch.-Ham. *Pinang hutan* (Mal.), palm to 2 – 3 m tall, clustering, at the base of limestone hill, near to water sources. Single record from Gn. Kawa.

5.2.1 ***Arenga borneensis*** (Becc.) J. Dransf. *Aping* (Ib.), palm, lowland MDF. Recorded from Kubah NP.

5.2.2 ***Arenga brevipes*** Becc. Palm, clustering, lowland MDF, riverine and valleys. Single recorded from Kubah NP.

5.2.3 ***Arenga hastata*** Becc. Palm, lowland to hill MDF, kerangas and secondary forest, riverine. Recorded from Kubah NP.

5.2.4 ***Arenga undulatifolia*** Becc. *Aping* (Ib.), *Jakah* (Pen.), palm to 5 – 6 m tall, clustering, at the base of limestone hill. Common in Dered Krian NP.

5.3.1 ***Borassodendron borneense*** J. Dransf. *Bidong* (Ib.), solitary palm, to 4 – 6 m tall, on the foothill of limestone. Single record from Gn. Stulang. Also recorded from MDF and hill forests throughout Sarawak, but not common.

5.4.1 ***Calamus bacularis*** Becc. *Wi tulang* (Ib.), solitary short-stemmed, erect or stemless, rarely more than 2 m, hill slopes and ridge tops in MDF. Endemic to Sarawak. Uses: the stem makes a good walking-stick.

5.4.2 ***Calamus blumei*** Becc. [synonym: *Calamus penibukanensis* Furtado; *C. slootenii* Furtado]. *Wi kijang* (Ib.), *Wae svit kup* (Pen.), *Wi bukon bo* (Kay.), clustering moderate rattan, climbing to 20 m, occurs in variety of habitats, from sea level to 800 m altitudes. Recorded from Kubah NP, elsewhere throughout Borneo.

5.4.3 ***Calamus caesius*** Bl. *Wi sega* (Mal.), *Wi letik* (Ib.), *Wi buru* (Bid.), clustering, moderate-size rattan, climbing to forest canopy, in secondary forest at the base of limestone hills. Common in the Bau limestone areas. Common throughout Sarawak in many types of habitats. Uses: for binding and weaving in the furniture industries.

5.4.4 ***Calamus conirostris*** Becc. *Wae savit pedan* (Pen.), *Wi ligur* (Kay.), moderate clustering short-stemmed rattan, rarely exceeding 10 m, lowland to 1000 m altitudes, most common in poor ridge top forest.

5.4.5 ***Calamus conjugatus*** Furtado. Slender clustering thicket-forming rattan with short-stemmed, rarely more than 4 m, hill forest on partially podzolized ridge. Recorded from Gn. Serapi and Gn. Matang. Endemic to Borneo.

5.4.6 ***Calamus corrugatus*** Becc. Slender clustering rattan, climbing to 15 m, lowland MDF to lower montane forest and kerangas. Recorded from Gn. Pueh, Gn. Matang, Bako NP, Sabal FR, Klingkang Range FR. Endemic to Borneo. **Uses**: cane appears to be of good quality.

5.4.7 ***Calamus crassifolius*** J. Dransf. Slender clustering rattan, climbing to 10 m, lowland MDF and kerangas forest, riverine. Recorded from Kubah NP, Sampadi FR. Endemic to Sarawak.

5.4.8 ***Calamus diepenhorstii*** Miq. *Rotan* (Mal.), clustering rattan, climbing to 20 m high, on the limestone boulders and at the base of limestone hills.

5.4.9 ***Calamus divaricatus*** Becc. var. ***divaricatus***. *Wi patong* (Ib.), *Wae savit usun* (Pen.), clustering rattan, climbing to 15 m, hill to lower montane forest, to 1400 m altitudes. Recorded from Kubah NP, and widespread in Sarawak.

5.4.10 ***Calamus erioacanthus*** Becc. *Wi buluh* (Ib.), clustering rattan, climbing to 10 m, lowland MDF to lower montane forest, occasional on hill ridges. Recorded from Kubah NP. **Note**: endemic to Borneo. **Uses**: cane of good quality for handicrafts.

5.4.11 ***Calamus flabellatus*** Becc. [synonym: *Calamus flabelloides* Furtado]. *Wi takong* (Ib.), *Wi tautuk* (Selako), slender clustering rattan, climbing to 20 m, lowland MDF. Recorded from Kubah NP and Pueh FR, elsewhere throughout Borneo, and more local in Peninsular Malaysia.

5.4.12 ***Calamus gonospermus*** Becc. *Wae pana* (Pen.), *Wi batu* (Selako), Clustering, very slender rattan, climbing to 10 m, lowland to hill MDF, hill ridges. Record from Kubah NP and Pueh FR. **Note**: endemic to Borneo.

5.4.13 ***Calamus hispidulus*** Bl. *Wae savit paya* (Pen.), solitary slender rattan, climbing to 10 m, occurring in forest on poor soils. A rare rattan recorded from Kuching Division, Note: endemic to Borneo.

5.4.14 ***Calamus javensis*** Bl. *Wi anak, Wi peladas* (Ib.), climber, on gentle slope, steep slope, ridge of limestone hills. Common in Dered Krian NP. Also recorded from MDF and upper montane forest. Note: used to make fish traps and craving baskets.

5.4.15 ***Calamus laevigatus*** Mart. var. ***laevigatus*** J. Dransf. [synonym: *Calamus retrophylus* Becc.] *Wi sugi* (Ib.), *Wi jalai* (Kay.), solitary, climbing rattan, to 30 m high, at the base of limestone hill. Common throughout Sarawak. **Uses**: harvested for furniture industries.

5.4.15 ***Calamus laevigatus*** Mart. var. ***mucronatus*** (Becc.) J. Dransf. [synonym; *Calamus mucronatus* Becc.] *Wi sugi* (Ib.), very slender solitary climbing rattan, to forest canopy, at the base of limestone hills. Common throughout Sarawak, but never very abundant. Endemic to Borneo. **Uses**: for binding purposes.

5.4.16 ***Calamus lobbianus*** Becc. [synonym: *Cornera lobbiana* (Becc.) Furtado]. *Wi tedong* (Ib.), *Wae savit pedun* (Pen.), solitary stemless or very short-stemmed, occurs on hill slopes and ridges top. Uses: fruit edible.

5.4.17 ***Calamus marginatus*** (Bl.) Mart. [synonym: *Daemonorops marginatus* Bl.; *Calamus rostratus* Furtado; *Calamus regularis* Burret]. *Wi matahari* (Ib.), *Wae mitai* (Pen.), solitary climbing rattan, to 15 m high, at the base of limestone hills. Common throughout Sarawak in many habitats. **Uses**: for frameworks and craving baskets.

5.4.18 ***Calamus mattanensis*** Becc. [synonym: *Calamus mattanensis* var. *sabut* Becc.; *C. ferrugineus* Becc.]. *Rotan* (Mal.), solitary or clustering rattan, climbing to 15 m, found in variety of forests, from sea level to 800 m altitudes. Recorded from Kubah NP, Gn. Santubong, Bungo Range NP. **Note**: endemic to Borneo.

5.4.19 ***Calamus muricatus*** Becc. [synonym: *Calamus sphaeruliferus* Becc.]. *Rotan* (Mal.), solitary slender to moderate rattan, climbing to 10 m, lowland to hill MDF, but appears to favour forest on poor soils. Recorded from Kubah NP, and scattered locality throughout Sarawak. Endemic to Borneo.

5.4.20 ***Calamus nanodendron*** J. Dransf. Massive solitary short-stemmed rattan with erect or sometimes decumbent stem, lowland kerangas forest, recorded from Kubah NP. **Note**: endemic to Borneo.

5.4.21 ***Calamus nematospadix*** Becc. Variable slender, solitary or clustered rattan, climbing to 5 m, wide range of habitats, from sea level to 1400 m altitudes, usually on poor soils. Common in Kuching Division. Endemic to Borneo.

5.4.22 ***Calamus optimus*** Becc. [synonym: *Calamus stramineus* Furtado; *C. stramineus* var. *megalocarpus* Furtado]. *Wi segak* (Ib.), *Wae inang* (Pen.), moderately robust clustering rattan, climbing to forest canopy (50 m), lowland MDF and alluvial forest, also kerangas. Recorded from Kubah NP, and scattered throughout Sarawak, but always rare. Note: endemic to Borneo.

5.4.23 ***Calamus ornatus*** Bl. *Wi jelayan* (Ib.), robust clustering rattan, climbing to 50 m high, at the base of limestone hills and boulders. Common in Bau limestone areas. Throughout Sarawak in primary MDF up to 1000 m elevations. Uses: produces good quality cane for furniture manufacture.

5.4.24 ***Calamus oxleyanus*** T. & B. *ex* Miq. Solitary rattan, climbing to 10 m, lowland MDF and kerangas forest. Recorded from Kubah NP, and common in Bako NP.

5.4.25 ***Calamus paspalanthus*** Becc. *Wi singkau* (Ib.), *Wae' jaging* (Pen.), solitary moderate rattan, climbing to 20 high, at the base of limestone hill.

5.4.26 ***Calamus periacanthus*** (Miq.) Miq. [synonym: *Daemonorops periacantha* Miq.; *Daemonorops dissitophylla* Becc.]. *Rotan* (Mal.), robust, climbing rattan, to 10 m high, at the base of limestone hill. Also recorded from MDF and PSF, to 1000 m elevations. **Note**: new record for Sarawak.

5.4.27 ***Calamus pilosellus*** Becc. *Wae' gu'un* (Mel.), slender clustering climbing rattan, to 10 high, at the base of limestone hill. Single record from Gn. Jambusan. **Uses**: for binding purposes. **Note**: not common in Sarawak.

5.4.28 ***Calamus poensis*** Becc. Solitary or clustered rattan, climbing to 5 m, lower montane mossy forest. Recorded from Gn. Pueh (type locality). Endemic to Sarawak.

5.4.29 ***Calamus pygmaeus*** Becc. *Wi anak* (Ib.), slender dwarf clustering rattan, abundant in ridge top forest at altitudes 700 – 800 m. Recorded from Gn. Serapi, Gn. Pueh. Endemic to Borneo.

5.4.30 ***Calamus ruptilis*** (Becc.) W.J. Baker [synonym: *Daemonorops ruptilis* Becc.]. robust climbing rattan, to 20 m high, at the base of limestone hills. Throughout Sarawak. **Note**: fruit edible.

5.4.31 ***Calamus sabalensis*** J. Dransf. *Wi duduk* (Ib.), clustering, stemless rattan, in deeply shaded areas at the base of limestone hill, single record from Gn. Doya. Note: new record for Bau limestone areas.

5.4.32 ***Calamus sarawakensis*** Becc. [synonym: *Calamus scabrifolius* Becc.]. Slender clustering rattan, climbing to 30 m, abundantly in lowland MDF and kerangas forest in Kuching Division, and scattered throughout Sarawak. Endemic to Borneo. **Uses**: A good slender cane used for binding.

5.4.33 ***Calamus semoi*** Becc. *Wi tut* (Ib.), clustering moderate rattan, climbing to 20 m, lowland MDF. Recorded from Kubah NP. Endemic to Borneo. **Uses**: produces an excellent cane for light construction (binding), furniture and basketry.

5.4.34 ***Calamus zonatus*** Becc. *Wi anak* (Ib.), slender to moderate solitary or clustered rattan, climbing to 10 m, common in lowland

MDF and peat swamp forest. Endemic to Borneo. Uses: apparently used locally in binding and weaving.

5.5.1 ***Caryota mitis*** Lour. *Fish-tailed palm, Buak uya* (Mel.), clustering palm, to 5 m tall, at the base of limestone hills. Common in Bau limestone areas. Also common throughout Sarawak.

5.6.1 ***Ceratolobus discolor*** Becc. *Wi kijang* (Ib.), *Wae duru* (Pen.), moderate clustering rattan, climbing to 15 m, lowland to lower montane forest, frequent in hill slopes and valley bottoms. Recorded from Gn. Serapi, Gn. Pueh, common and widespread throughout Sarawak.

5.6.2 ***Ceratolobus subangulatus*** (Miq.) Becc. *Wi janggut* (Ib.), slender clustering rattan, to 10 m high, on the limestone summit and shoulders. Also recorded from MDF and kerangas forest throughout Sarawak.

5.7.1 ***Daemonorops acamptostachys*** Becc. *Wi duduk* (Ib.), solitary stemless rattan or with very short stem, kerangas forest and peat swamp areas. Recorded from Kubah NP. Note: endemic to Sarawak.

5.7.2 ***Daemonorops collarifera*** Becc. [synonym: *Daemonorops acanthobola* Becc.], solitary climbing rattan, up 7 m, wide Range habitats, kerangas, MDF, peat swamp. Recorded from Kubah NP, Samunsam WS. Note: endemic to Borneo.

5.7.3 ***Daemonorops cristata*** Becc. *Wi empunok* (Ib.), moderate clustering with short-stemmed rattan, climbing up to 4 m, hill slopes and valley bottoms in MDF. Recorded from Kubah NP and Klingkang Range FR.

5.7.4 ***Daemonorops didymophylla*** Becc. [synonym: *Daemonorops mattanensis* Becc.; *D. motleyi* Becc.], *Wi jerenang* (Ib.), climbing

up to 3 m tall, at the base of limestone hill. Common throughout Sarawak. **Note**: ethno-plant; medicinal plant (dragon blood).

5.7.5 ***Daemonorops fissa*** Bl. *Rotan* (Mal.), clustering moderate to robust climbing rattan, climbing to 30 m, common in various habitats throughout Sarawak. **Uses**: produces a coarse medium-size cane for handicrafts.

5.7.6 ***Daemonorops formicaria*** Becc. *Wi labu* (Ib.), *Wi griang* (Kay.), slender to moderate, solitary or clustering, climbing to 20 m, variety of habitats, from valley bottoms to tops of ridges in lowlands. Recorded from Kubah NP, also common elsewhere. **Uses**: the cane is of good quality and is used split in basketry.

5.7.7 ***Daemonorops hystrix*** (Griff.) Mart. var. ***exulans*** Becc. Clustering small rattan, climbing to 5 m, lowland to hill MDF, frequently on hill ridges. Recorded from Kubah NP.

5.7.8 ***Daemonorops micracantha*** (Griff.) Becc. [synonym: *Calamus micranthus* Griff.; *Daemonorops draconcella* Becc.]. *Wi jerenang* (Ib.), moderate clustering rattan, climbing to 30 m, lowland forest up to 500 m altitudes. Recorded from Kubah NP, Pueh FR and Gn. Santubong. Uses: cane of moderate quality for handicrafts; dragon's blood used formerly in dyes and medicine.

5.7.9 ***Daemonorops microstachys*** Becc. *Wi duduk* (Ib.), clustering stemless rattan with a decumbent or short erect stem, often found on poor ridge top soil, kerangas forest. Recorded from Kubah NP, and scattered throughout the State.

5.7.10 ***Daemonorops oxycarpa*** Becc. *Wi tedong* (Ib.), moderate clustering rattan, climbing to 15 m, widespread and common in lowland habitats throughout Borneo. Note: endemic to Borneo.

5.7.11 ***Daemonorops periacanthus*** Miq. [synonym: *Daemonorops dissitophylla* Becc.; *D. florida* Becc.]. *Wi empunok* (Ib.), *Wae*

sawit madok (Pen.), robust clustering rattan, climbing to 10 m, lowland to hill MDF. Recorded from Kubah NP, and common throughout the Sarawak.

5.7.12 ***Daemonorops sabut*** Becc. [synonym: *Daemonorops annulata* Becc., *D. pseudomirabilis* Becc., *D. turbinata* Becc.]. *Wi lepo* (Ib.), *Wae' duru* (Pen.), *Wi griang* (Kay.), climbing to 15 m long, at the limestone base. **Uses**: produces a good quality cane.

5.7.13 ***Daemonorops scapigera*** Becc. [synonym: *Daemonorops lasiospatha* Furtado; *Calamus bifacialis* Burret]. *Wi empunok ruai* (Ib.), solitary, stemless rattan or with erect (rarely more than 2 m), wide Range of habitats, from sea level to 1000 m altitudes. Recorded from Kubah NP and Klingkang Range FR. **Uses**: edible fruits, and stem for walking-sticks.

5.7.14 ***Daemonorops sparsiflora*** Becc. *Wi ruah air* (Ib.), climbing to 20 m long, at the base of limestone hill. **Uses**: produces moderate quality cane.

5.7.15 ***Daemonorops verticillaris*** (Griff.) Mast. *Rotan sabong* (Mal.), solitary rattan, climbing to 15 m high, at the base of limestone hill. Single record from Gn Jambusan. **Note**: new record for Sarawak.

5.8.1 ***Eugeissona insignis*** Becc. *Pijatau* (Ib.), lowland disturbed MDF, secondary forest, hill ridges, along the rivers or streams. Common in western Sarawak. Endemic to Borneo. **Uses**: harvested for sago starch, palm cabbage as vegetable.

5.9.1 ***Iguanura ambigua*** Becc. *Pinang hutan* (Mal.), dwarf palm, stemless or with very short-stem, lowland MDF and base of limestone hills. Recorded from Kubah NP and Dered Krian NP (Gn. Doya). **Note**: rare palm and endemic to Sarawak.

5.9.2 ***Iguanura curvata*** Kiew. Solitary palm, to 1 – 1.5 m tall, in deeply shaded boulders and clay-rich soils at base of limestone hill.

5.9.3 ***Iguanura elegans*** Becc. Palm, solitary or clustering, to 1 – 1.5 m tall, in deeply shaded areas, on boulders and at the base of limestone hills. Common in Dered Krian NP. **Note**: endemic to Bau limestone areas.

5.9.4 ***Iguanura geonomiformis*** Mart. [synonym: *Iguanura malaccensis* Becc.; *I. wallichiana elatior* Kiew; *Slackia geonomiformis* (Mart) Griff.]. Danse clustering dwarf palm, to 3 m tall, lowland MDF, moist valley, along stream. Recorded from Kubah NP.

5.9.5 ***Iguanura minor*** Kiew. Palm, solitary, to 1 m tall, in deeply shaded areas, on limestone boulders and at the base of limestone hills. Recorded only from four limestone hills in Dered Krian NP. **Note**: endemic to Bau limestone areas.

5.9.6 ***Iguanura palmuncula*** Becc. var. ***palmuncula***. Small acaulescent palm, solitary, lowland MDF, on hill ridges and valley bottoms. Recorded from Kubah NP.

5.9.7 ***Iguanura sanderiana*** Ridl. An attractive palm with undivided paddle shaped leaves with prominent ridges, on damp near stream, lowland MDF. Recorded from Sampadi (type locality).

5.10.1 ***Johannesteijsmannia altifrons*** (Rchb. *f. et* Zoll.) H.E. Moore. *Palma ekor buaya* (Mal.), stemless or very short-stems, with large leaves (up to 5 m long), found in many habitats, lowland to hill forests, kerangas, foothill limestone. Recorded from Kubah NP, Bako NP, Sampadi FR and Bungo Range NP. **Note**: Protected plant under the Wildlife Protection Ordinance.

5.11.1 ***Korthalsia angustifolia*** Bl. Clustering and branching rattan, climbing to 25 m, lowland to hill MDF. Recorded from Kubah NP. **Uses**: fruit edible and canes are source of material for basket making and weaving.

5.11.2 ***Korthalsia cheb*** Becc. *Wae duru* (Pen.), *Rua* (Bid.), robust clustering and branching rattan, climbing to 40, hill MDF. Recorded from Kubah NP. **Note**: endemic to Borneo.

5.11.3 ***Korthalsia debilis*** Bl. *Wai selida* (Mel.), clustering, climbing up to 20 m, lowland MDF. Recorded from Kubah NP.

5.11.4 ***Korthalsia echinometra*** Becc. *Wi wisro* (Ib.), moderately robust clustering and branching rattan, climbing to 40 m, lowland and hill MDF. Recorded from Kubah NP. **Uses**: much sought after for use, split, in basket weaving.

5.11.5 ***Korthalsia ferox*** Becc. *Wai duei* (Mel.), robust clustering and branching, climbing high to the canopy, lowland to hill forest. Elevation up to 700 m. Recorded from Kubah NP. **Uses**: produces a large durable cane for furniture and handicrafts.

5.11.6 ***Korthalsia grandis*** Ridl. *Rotan* (Mal.), clustering, climbing rattan to 20 m high, at the base of limestone hill. **Note**: new record for Sarawak.

5.11.7 ***Korthalsia hispida*** Becc. *Wi asas* (Ib.), clustering moderate rattan with stem up to 30 m high, at the base of limestone hills. Throughout Sarawak but not common. **Uses**: for binding purposes.

5.11.8 ***Korthalsia rigida*** Bl. *Wi dahan* (Ib.), *Wae' gu'un* (Mel.), *Wi jaunungan* (Selako), moderate, clustering rattan, climbing up to 50 m high, in secondary forest at the base of limestone hills. Common throughout Sarawak. **Uses**: for binding and craving purposes.



Johannesteijsmannia altifrons (Rchb. f. et Zoll.) H.E. Moore. Bako NP, protected under the Sarawak Wildlife Protection Ordinance.



A: *Licuala bidentata,* B: *Licuala densiflora*

5.11.9 ***Korthalsia rostrata*** Bl. *Wi chit* (Ib.), *Wi pak lovo* (Kay.), slender clustering climbing rattan, to 20 m high, at the base of limestone hills. Common throughout Sarawak. **Uses**: durable slender rattan for binding purposes.

5.11.10 ***Korthalsia scaphigera*** Mart. *Rotan* (Mal.), clustering rattan, climbing up to 15 m high, at the base of limestone hill. **Note**: new record for Sarawak.

5.12.1 ***Licuala bidentata*** Becc. [synonym: *Licuala furcata* Becc.; *L. elegantissima* Ridl. *Palas* (Mal.), solitary, to 2 m tall, often found in kerangas on sandstone. Recorded from Gn. Santubong (type locality), Kubah NP and Samunsam WS. **Note**: endemic to Borneo.

5.12.2 ***Licuala bintuluensis*** Becc. *Gernis, Biru* (Ib.), solitary, acaulescent, rarely stemmed palm, lowland from the coast to 100 m altitudes, often found on periodically flooded alluvial plains. Recorded from Kubah NP. **Note**: endemic to Borneo.

5.12.3 ***Licuala densiflora*** Becc. *Biruk* (Selako), solitary with short-stems, rarely more than 1 m, lowland MDF, kerangas forest. Recorded from Pueh FR (type locality), Sampadi FR. Note: endemic to western Sarawak.

5.12.4 ***Licuala elliptica*** Saw. Solitary with short-stems to 1 m tall, with orbicular leaf-blade, hill MDF, recorded from Klingkang Range FR, Sabal FR and Tebakang. **Note**: endemic to western Sarawak.

5.12.5 ***Licuala exigua*** Saw. Small understory solitary palm, acaulescent, recorded from Klingkang Range FR (type locality). Note: endemic to western Sarawak.

5.12.6 ***Licuala flammula*** Saw. Solitary to 2 m tall, lowland MDF and common on lower slopes. Recorded from Bako NP (type locality) and Gn. Pueh. **Note**: endemic to western Borneo.

5.12.7 ***Licuala glabra*** Griff. [synonym: *Licuala arbuscula* Becc.; *L. longepedunculata* Ridl.]. Solitary with stems to 2.5 m tall, lowland to lower montane forest, often on the hill ridges. Recorded from Gn. Pueh, Gn. Raya (Lundu) and Klingkang Range FR.

5.12.8 ***Licuala kuchingensis*** Saw. Solitary to clustering, short-stemmed, to 1.5 m tall, foothill of limestone hills. Recorded from Bau limestone areas. **Note**: endemic to western Sarawak.

5.12.9 ***Licuala leocarpa*** Saw. Solitary small palm, lowland kerangas forest. Recorded from Samunsam WS (type locality). **Note**: endemic to western Sarawak.

5.12.10 ***Licuala mattanensis*** Becc. *Fan palm, Daon iseng* (Mel.), palm, up to 1.5–2 m tall, in deeply shaded areas, on limestone boulders, crevices and at the base of limestone hill. Common in the Bau limestone areas.

5.12.11a ***Licuala micholitzii*** Ridl. var. ***micholitzii***. Acaulescent palm, lowland MDF. Recorded from Gn. Brooke, Lundu (type locality). **Note**: endemic to western Sarawak.

5.12.11b ***Licuala micholitzii*** Ridl. var. ***leena*** Saw. Acaulescent to caulescent palm, up to 2 m tall, lowland MDF. Recorded from Tanjung Datu NP (type locality). **Note**: rare palm, endemic to Borneo.

5.12.12 ***Licuala orbicularis*** Becc. [synonym: *Licuala veitchii* W. Wats; *Pritchardia grandis* Veitch]. Solitary to clustered palm, acaulescent to short-stemmed, lowland MDF and kerangas, in moist valley and hill slopes. Recorded from Kubah NP and Klingkang Range FR. **Note**; endemic to western Borneo. Protected under the Wildlife Protection Ordinance.

5.12.13 ***Licuala petiolulata*** Becc. [synonym: *Licuala petiolulata* Becc. var. *kenepaiensis* Becc.]. *Katen* (Ib.), solitary, acaulescent with short-stemmed, to 2 m tall, understory lowland MDF to lower montane forest, kerangas and swampy areas. Recorded from Gn. Matang (type locality), also from Gn. Pueh and Sampadi.

5.12.14 ***Licuala spicata*** Becc. Solitary, to 1.5 m tall, hill MDF. Recorded from Gn. Matang (type locality). Note: rare palm and endemic to western Sarawak.

5.12.15 ***Licuala valida*** Becc. [synonym: *Licuala olivifera* Becc.; *L. paludosa* var. *winkleriana* Becc.]. Solitary to clustering, acaulescent to 4 m tall, widespread understory palm in variety of habitats. Recorded from Kubah NP, Klingkang Range FR, and widespread throughout Borneo. **Note**: endemic to Borneo.

5.13.1 ***Metroxylon sagu*** Roxb. *Sagu* (Mal.), *Mulong, Balau* (Mel.). Solitary or clustering palm, up to 25 m tall, usually on swampy areas. Recorded from Kubah NP, and common throughout Sarawak. Note: cultivated for starch.

5.14.1 ***Nenga pumila*** (Mart.) H.A. Wendl. Solitary or in small clustered, to 3 m tall, lowland to hill MDF, peat swamp and kerangas. Recorded from Gn. Matang. Common but scattered distribution throughout Sarawak.

5.15.1 ***Oncosperma horridum*** (Griff.) Scheff. *Nibong* (Mal.), *Nyibung* (Mel.), solitary or rarely clumping, degraded lowland to hill MDF. Recorded from Pueh FR and Kubah NP.

5.15.2 ***Oncosperma tigillarium*** (Jack) Ridl. *Nibong* (Mal.), clustering palm, frequent from coastal to lowland MDF, peat swamp and kerangas. Common in Bako NP, and throughout Sarawak.

5.16.1 ***Pholidocarpus maiadum*** Becc. *Jaong* (Ib.), solitary tree palm, to 15 m tall or more, lowland MDF, secondary forest, peat swamp and kerangas. Common in western Sarawak.

5.17.1 ***Pinanga angustisecta*** Becc. *Pinang hutan* (Mal.), palm, lowland to hill MDF, on steep slopes. Recorded from Kubah NP. Endemic to Borneo.

5.17.2 ***Pinanga auriculata*** Becc. *Pinang buding* (Ib.), palm, swampy areas or flat ground, impeded drainage, near fresh water. Recorded from Kubah NP. Endemic to Borneo.

5.17.3 ***Pinanga brevipes*** Becc. *Pinang hutan* (Mal.), acaulescent palm, on ground, in deeply shaded areas at the base of limestone hill.

5.17.4 ***Pinanga crassipes*** Becc. Acaulescent palm with short-stemmed, rarely more than 2 m, lowland MDF, kerangas, limestone and swampy areas. Recorded from Kubah NP, Dered Krian NP and Bungo Range NP. Endemic to Borneo.

5.17.5 ***Pinanga jambusana*** C.K. Lim. *Pinang biru, Pinang Jambusan* (Mal.), palm about 1 m tall, in deeply shaded area at the base of limestone hill and boulders. Recorded only from the type locality. Note: endemic to Dered Krian NP.

5.17.6 ***Pinanga ligulata*** Becc. Solitary, small treelet palm, to 2 m tall, pinnate leaves with narrow segments, lowland MDF. Recorded from Kubah NP.

5.17.7 ***Pinanga mooreana*** J. Dransf. *Pinang muring* (Ib.), dense clumping palm, to 8 m tall, purplish dark green crownshaft, lowland MDF, gentle slopes, well-drainage soil. Recorded from Kubah NP. Note: endemic to Sarawak.

5.17.8 ***Pinanga pachyphylla*** J. Dransf. Solitary or clustered treelet palm, to 3 m tall, lowland MDF to submontane forest. Recorded from Gn. Serapi. Note: rare and endemic to Sarawak.

5.17.9 ***Pinanga ridleyana*** Becc. *ex* Furtado. *Pinang hutan* (Mal.), palm, to 1.5 – 2 m tall, in deeply shaded areas at the base of limestone hill. Single record from Gn. Doya. Also recorded from MDF and kerangas forest.

5.17.10 ***Pinanga salicifolia*** Bl. *Pinang muring* (Ib.), treelet palm, lowland MDF, kerangas forest, valley bottoms, hill ridges and well-drainage soil. Recorded from Kubah NP.

5.17.11 ***Pinanga simplicifrons*** (Miq.) Becc. [synonym: *Ptychosperma simplicifrons* Miq.]. Small clustering understory palm, less than 1.5 m tall, lowland MDF and swampy areas. Recorded from Kubah NP.

5.17.12 ***Pinanga tomentella*** Becc. Palm, lowland to hill MDF, gentle slopes, ridges near running fresh water. Recorded from Kubah NP.

5.17.13 ***Pinanga variegata*** Becc. Small acaulescent palm, rarely more than 1 m tall, lowland MDF, valley bottoms, on hill ridges, riverine. Recorded from Kubah NP, elsewhere scattered distribution in Sarawak. Note: endemic to Borneo.

5.17.14 ***Pinanga veitchii*** Becc. small acaulescent palm, short-stemmed, rare exceed 1 m, lowland MDF, on hills slopes near streams. Recorded from Kubah NP.

5.18.1 ***Plectocomia mulleri*** Bl. [synonym: *Plectocomia minor* Ridl.]. Solitary or clustered moderate to robust rattan, climbing to 30 m or more, abundant in forest on poor soils, especially forest has been disturbed and kerangas. Recorded from Kubah NP and Pueh FR.

5.19.1 ***Plectocomiopsis mira*** J. Dransf. *Wi matar* (Ib.), moderately robust high-climbing rattan to 40 m, lowland to hill MDF, on variety of soils. Recorded from Gn. Matang, elsewhere scattered throughout Borneo.

5.20.1 ***Pogonotium ursinum*** (Becc.) J. Dransf. [synonym: *Daemonorops ursina* Becc.]. Solitary short-stemmed, erect rattan, rarely more than 4 m, submontane ridge tops, recorded from Gn. Matang and Gn. Gaharu (Klingkang Range FR).

5.21.1 ***Retispatha dumetosa*** J. Dransf. Robust thicket-forming pleonanthic rattan, with short massive stems, rarely more than 8 m, found in damp hollows on hillslopes and small streams in lowland MDF. Recorded from Kubah NP. Endemic to Borneo.

5.22.1 ***Salacca affinis*** Griff. *Salak* (Mal.), *Ridan* (Ib.), palm, on damp and wet places at the base of limestone hills. **Uses**: ethno-plant.

5.22.2 ***Salacca sarawakensis*** Mogea. Medium size, clumping palm, 3 – 4 m tall with simple notched leaves, lowland MDF, kerangas and base of limestone hills. Recorded from Kubah NP, Bungo Range NP and Dered Krian NP, common throughout Sarawak.

5.22.3 ***Salacca vermicularis*** Becc. *Kepela* (Ib.), *Lemaiong* (Ib.), acaulescent palm, lowland MDF, alluvial soil, flat ground or steep slopes. Recorded from Kubah NP. Uses: fruit edible, rachis for traditional fishing pole.

6. BURMANNIACEAE

6.1.1 ***Burmannia championii*** Thwaites. Mycoheterotrophic plant, on damp wet places, near streams. Recorded from Bungo Range NP.

6.1.2 ***Burmannia coelestis*** D. Don. Small herbaceous plant, in opened space, kerangas forest. Recorded from Bako NP.

6.1.3 ***Burmannia distichia*** L. Small herbaceous plant, in opened space, grassland, along the roadside. Recorded from Bako NP and Kubah NP, common elsewhere.

6.2.1 ***Thismia ornata*** Dancak, Hrones & Sochor. Mycoheterotroph, on thick humus on limestone summits, and limestone pockets. Single record from Gn. Tai Ton. Also recorded from Kubah NP and Santubong NP.

6.2.2 ***Thismia*** sp.2 Mycoheterotroph, on limestone slope, growing on leaf litter. Two records, from Gn. Ropih and Gn. Umbut.

7. COLCHICACEAE

7.1.1 ***Gloriosa superba*** L. [synonym: *Eugone superba* (L.) Salisb.; *Gloriosa angulata* Schumach.; *G. cirrhifolia* Stokes; *G. doniana* Schult. & Schult. *f.*; *G. nepalensis* G. Don; *G. rothschildiana* O'Brien; *Methonica gloriosa* Salisb.; *M. superba* (L.) Crantz]. *Cat's claw* (Eng.), *Climbing lily* (Eng.), perennial, usually climbing up to 3 m tall, lowland, from 30 – 600 m above sea level. Note: medicinal plant, mainly used for external applications.

8. COMMELINACEAE

8.1.1 ***Amischotolype gracilis*** (Ridl.) I.M. Turner [synonym: *Forrestia gracilis* Ridl.]. Herb with ascending stem to 2.5 m long, lowland MDF, recorded from Lundu and Pueh.

8.1.2 ***Amischotolype griffithii*** (C.B. Clarke) I.M. Turner. [synonym: *Forrestia griffithii* C.B. Clarke]. Herb to 1 m tall, at the base of limestone hills.

8.1.3 ***Amischotolype hirsuta*** (Hallier f.) Duist. [synonym: *Forrestia hirsuta* Hallier f.]. Herb with ascending stem to 2 m long, lowland MDF, swampy areas and foothill of limestone. Recorded from Lundu, Pueh and Dered Krian NP (Gn. Lanyang).

8.1.4 ***Amischotolype laxiflora*** (Merr.) Faden [synonym: *Forrestia laxiflora* Merr.]. Herb with ascending stem to 1.5 m long, primary or disturbed MDF, riparian or swamp forest, along streams, in wet swampy places and limestone. Altitude 0 – 800 m above sea level. Recorded from Gn. Lundu.

8.1.5 ***Amischotolype marginata*** Hassk. Shrub to 1.5 m tall, on lightly shaded areas at the base of limestone hills.

8.1.6 ***Amischotolype mollissima*** (Bl.) Hassk. [synonym: *Campelia mollissima* Bl.; *Forrestia bicolor* C.B. Clarke; *F. mollis* Hassk.; *F. mollissima* (Bl.) Koord.; *Pollia purpurea* C.B. Clarke]. Herb, in secondary forest, usually near running fresh water.

8.2.1 ***Murdannia nudiflora*** (L.) Brenan [synonym: *Commelina nudiflora* L.; *Aneilema nudiflorum* (L.) R. Br.; *A. nudicaule* (Burm. *f.*) G. Don]. *Naked-stem dewflower* (Eng.), common weed by the roadsides, usually on wet places.

9. CONVALLARIACEAE

9.1.1a ***Peliosanthes teta*** Andrews ssp. ***teta.*** *Bujang hilir, Derhaka mentua* (Mal.), herb, in various type of microhabitats, shaded area at valley, slopes, summits and base of limestone hills. **Note**: medicinal plant.

9.1.1b ***Peliosanthes teta*** Andrews ssp. ***humilis*** (Andrews) Jessop. *Bujang hilir, Derhaka mentua* (Mal.), herb, 30 – 35 cm tall, lower limestone slopes. Common in Dered Krian NP. **Note**: medicinal plant.

10. COSTACEAE

10.1.1 ***Hellenia globosa*** (Bl.) S.R. Dutta. *Setawar tanah* (Mal.), herb, clumping to 2 m tall, in deeply shaded areas at the base and

boulders of limestone hill. Also recorded fromsecondary, MSF, MDF and kerangas forest throughout Sarawak.

10.1.2 ***Hellenia speciosa*** (J. Koenig) S.R. Dutta. *Costus, Setawar hutan* (Mal.), herb, clumping, up to 1.5 – 2 m tall, occasional at damp and wet places, at the base of limestone hill. Elsewhere, common in many habitats throughout Sarawak. **Uses**: medicinal and ornamental plant.

10.2.1 ***Paracostus bullatus*** (Meekiong, Muliati & Ipor) Meekiong stat. nov. [synonym: *Costus bullatus* Meekiong, Muliati & Ipor]. Terrestrial herb, solitary, rarely in clump, up to 60 – 65 cm tall, on damp and wet place at the base of limestone hill. **Note**: hyper endemic to a single limestone hill in Bau limestone areas.

10.2.2 ***Paracostus eburneus*** (Meekiong, Muliati & Tawan) Meekiong stat. nov. [synonym: *Costus eburneus* Meekiong, Muliati & Tawan]. Terrestrial herb, solitary, rarely in clump, up to 50 cm tall, at the base of limestone hill. **Note**: hyper endemic to a single limestone hill in Bau limestone areas.

10.2.3 ***Paracostus paradoxus*** (K. Schum) C.D. Specht. [synonym: *Costus paradoxus* K. Schum.]. Terrestrial herb, shaded and wet places, near stream. Recorded from Klingkang Range FR. (Gn. Gaharu).

11. CYPERACEAE

11.1.1 ***Bulbostylis barbata*** (Rottb.) C.B. Clarke [synonym: *Scirpus barbatus* Rottb.; *Cyperus barbata* (Rottb.) Poir.; *Fimbristylus barbata* (Rottb.) Kuntze; *Isolepis barbata* (Rottb.) R. Br.; *Stenophyllus barbatus* (Rottb.) Fyson]. *Watergrass* (Eng.), common grass-liked plant by the roadsides.

11.2.1 ***Cyperus aromaticus*** (Ridl.) Mattf. & Kukenth [synonym: *Kyllinga aromatica* Ridl.; *Kyllinga polyphylla* Willd. ex Kunth.].

Rumput ganda (Mal.). Sedge, roadside or grassy places. **Note**: invasive perennial sedge.

11.2.2 ***Cyperus brevifolius*** (Rottb.) Hassk. [synonym: *Kyllinga brevifolia* Rottb.]. White Kyllinga. Sedge, wet land.

11.2.3 ***Cyperus compactus*** Retz. Herb, roadside, impeded drainage, sandy soil. Pantropical weed.

11.2.4 ***Cyperus compressus*** L. Herb, in secondary forest and exposed areas at the base of limestone hills. Common throughout Sarawak.

11.2.5 ***Cyperus digitatus*** Roxb. *Rumput bunga satuan* (Mal.). In wet places or waste ground, roadside or water-logged area. Pantropical weed.

11.2.6 ***Cyperus distans*** L. *f. Rumput bunga jauh* (Mal.). Common in damp places. Common in western Sarawak.

11.2.7 ***Cyperus iria*** L. Herb, roadside, open areas, impeded drainage, sandy soil. Pantropical weed.

11.2.8 ***Cyperus javanicus*** Houtt. Herb, open areas, impeded drainage, sandy soil. Common weed throughout Sarawak.

11.2.9 ***Cyperus rotundus*** L. Herb, on the roadside, near the base of limestone hills. Common throughout Sarawak.

11.3.1 ***Diplacrum caricinum*** R. Br. [synonym: *Diplacrum tridentatum* Brongn.; *D. zeylanicum* Nees; *Scelaria axillaris* Moon; *S. caricina* (R. Br.) Benth.]. Common in wet grassy field, roadsides, impeded drainage, near running fresh water. Common weed.

11.4.1 ***Eleocharis ochrostachys*** Steud. *Rumput purun* (Bid.), wet places, swampy areas, impeded drainage, near still fresh water.

11.5.1 ***Fimbristylis aciminata*** Vahl. Herb, on roadside, in secondary forest and opened spaces at the base of limestone hills. Common throughout Sarawak.

11.5.2 ***Fimbristylis dichotoma*** (L.) Vahl. Herb, degraded forest, at damp and wet places at the base of limestone, particularly on water logged areas. Common throughout Sarawak.

11.5.3 ***Fimbristylis globulosa*** (Retz.) Kunth. Herb, degraded forest areas, roadside near freshwater, clay soil and sandy soil. Common weed throughout Sarawak.

11.5.4 ***Fimbristylis pauciflora*** R. Br. Herb, kerangas forest, shrubby roadside, steep slopes, ridge, well-drained, sand stone, sandy soil. Common weed. **Uses**: medicinal plant used by the Iban community (to induce labour in pregnant women).

11.6.1 ***Fuirena ciliaris*** (L.) Roxb. [synonym: *Scirpus ciliaris* L.]. Tufted annual grass-liked herb, in wet places, swampy, pools, along watercourses.

11.7.1 ***Hypolytrum nemorum*** (Vahl) Spreng. [synonym: *Schoenus nemorum* Vahl; *Hypolytrum latifolium* Rich. *ex* Pers.; *H. ensifolium* Willd. *ex* Kunth]. *Rumput giring-giring* (Mal.), *Engkarong* (Ib.), herb, peatswamp, degraded peat areas, lowland MDF, near running freshwater. Common accros Borneo.

11.8.1 ***Kyllinga brevifolia*** Rottb. Herb, at damp and wet places, in opened spaces at the base of limestone hills. Common throughout Sarawak.

11.9.1 ***Lepironia articulata*** (Retz.) Domin [synonym: *Restio articulates* Retz.; *Chondrachne articulata* (Retz.) R. Br.; *Choricarpa aphylla* Boeckeler; *Lepironia compressa* Boeckeler; *L. conifera*

(Poir.) Druce; *L. mucronate* Rich. *ex* Pers.]. flat ground, impeded drainage, periodically flooded, near still fresh water.

11.10.1 ***Mapania bancana*** (Miq.) Benth. & Hook. *f. ex* B.D. Jackson var. ***bancana.*** *Sedge,* herb, frequent on damp and wet soils, near water source.

11.10.2 ***Mapania bauensis*** Miraadila, Shabdin & Meekiong. *Pandan tikus* (Mal.), in kerangas forest near to the foothill of limestone. **Note**: Endemic to Bau area, recorded only from type locality.

11.10.3 ***Mapania caudata*** Kuk. *Pandan tikus* (Mal.), sedge, on limestone boulders. **Note**: recorded once from single limestone hill in Bau, first record for Kuching division.

11.10.4 ***Mapania cuspidata*** Uittien var. ***cuspidata***. *Rumput serapat* (Mal.), *Pandan tikus* (Mal.), sedge, at the base of limestone hills. **Note**: medicinal plant (used after childbirth).

11.10.4b ***Mapania cuspidata*** Uittien var. ***angustifolia*** (Uittien) Uittien. *Rumput serapat* (Mal.), *Pandan tikus* (Mal.), sedge, kerangas forest and MDF. Recorded from Bako NP and Bungo Range NP. **Note**: endemic to Borneo; medicinal plant.

11.10.4c ***Mapania cuspidata*** Uittien var. ***merayap*** Shabdin & Meekiong. *Pandan tikus* (Mal.). Sedge, kerangas forest. Recorded from Matang (type locality). **Note**: endemic to Sarawak.

11.10.4 ***Mapania cuspidata*** Uittien var. ***petiolata*** (C.B. Clarke) Uittien. *Rumput serapat* (Mal.), *Pandan tikus* (Mal.), herb, at the base and boulders of limestone hills. **Note**: medicinal plant (used after childbirth).

11.10.5 ***Mapania debilis*** C.B. Clarke *ex* Ridl. *Pandan tikus* (Ib.), at base of limestone hill, recorded from Dered Krian NP.

11.10.6 ***Mapania hispida*** D.A. Simpson. *Rumput serapat* (Mal.), *Pandan tikus* (Mal.), herb, at the base of limestone hills. **Note**: medicinal plant.

11.10.7 ***Mapania lentaliffii*** Miraadila, Shabdin & Meekiong. Robust sedge, on damp and wet places, near stream, kerangas forest. Recorded from Klingkang Range FR (type locality). **Note**: endemic to Sarawak.

11.10.8 ***Mapania lorea*** Uittien. *Daun mang* (Ib.), herb, occasional on wet soils or sometimes aquatic, at the base of limestone hills or kerangas forest. Two records, from Dered Krian NP. Also recorded from Samunsam WS, Klingkang Range FR and Bako NP.

11.10.9 ***Mapania meditensis*** D.A. Simpson. *Rumput serapat* (Mal.), *Pandan tikus* (Mal.), herb, on the boulders and gullies at the base of limestone hills. **Note**: medicinal plant (used after childbirth).

11.10.10 ***Mapania palustris*** (Hassk. *ex* Steud.) F.-Vill. var. ***palustris***. *Daon isiet* (Mel.), herb, clumping, on rich clay-soil, damp and wet soils at the base of limestone hill. Also recorded from MSF throughout Sarawak.

11.10.11 ***Mapania rumputensis*** Shabdin & Meekiong. *Pandan mang* (Ib. Sri Aman). Herb, on damp wet places near stream, kerangas forest. Klingkang Range FR. **Note**: endemic to Sarawak.

11.10.12 ***Mapania wallichii*** C.B. Clarke. *Daon isiet* (Mel), herb, on rich-clay soils, occasional near water sources, at the base of limestone hill. Also recorded from MDF and kerangas forest, up to 1400 m elevations, common throughout Sarawak.



A: *Mapania bauensis*, B: *Mapania caudata*, C: *Mapania cuspidata* var. *angustifolia*, D: *Mapania hispida*, E: *Mapania lorea*

11.11.1 ***Paramapania radians*** (C.B. Clarke) Uittien. *Telincim,* terrestrial herb, on rich-clay soils at the base of limestone hills and on the vertical slopes, two records from Bau limestone hills; Gn Tai Ton and Gn. Podam.

11.12.1 ***Scleria sumatrensis*** Retz. *Gelegei* (Mel.), herb, occasional in damp and wet places, opened space at the base of limestone hills. Common throughout Sarawak.

12. DIOSCOREACEAE

11.1.1 ***Dioscorea bulbifera*** L. *Ubi jaga* (Mal.), *Ubei dudung* (Mel.), climbing shrub, up to 5 – 7 m high, in opened space at the base of limestone hill. Also recorded from MDF, kerangas and secondary forests throughout Sarawak. **Uses**: medicinal plant.

11.1.2 ***Dioscorea filiformis*** Bl. [synonym: *Dioscorea gibbiflora* Hook. *f.*; *Dioscorea myriantha* Kunth.] *Wauh* (Mal.), *Ubei dudung* (Mel.), climbing vin with twining stem, forest edge, at the base of limestone hill. Uses: tubers are harvested as staple food.

11.1.3 ***Dioscorea flabellifolia*** Prain ex Burkill. *Ubi jaga* (Mal.), climbing vine, opened space at the base of limestone hill. Uses: medicinal plant.

11.1.4 ***Dioscorea pyrifolia*** Kunth. *Ubi jaga* (Mal.), climbing vine or scrambling, creeping, in secondary forest or opened space at the base of limestone hill. Uses: medicinal plant.

11.2.1 ***Tacca borneensis*** Ridl. *Janggut murai* (Mal.), herb to 80 cm tall, at the base of limestone hill. Single record from Gn. Tabai.

11.2.2 ***Tacca integrifolia*** Kew Gawl. *Whitebat flower, Belimbing tanah, Janggut adam* (Mal.), terrestrial herb, on rich-clay soils, at the base of limestone and gentle slopes.

11.2.3 ***Tacca laevis*** Jack. *Janggut baung* (Mal.), herb to 50 cm tall, on limestone slopes, shaded valley, foothill and rock cervices. Common in the Dered Krian NP.

11.2.4 ***Tacca leontopetaloides*** (L.) Kuntze. [synonym: *Leontice leontopetaloides* L.; *Tacca artocarpifolia* Seem.; *T. viridis* Hemsl.; *T. involucrata* Schumach. & Thonn.]. Beach forest. Recorded from Bako NP.

11.2.5 ***Tacca palmata*** Bl. *Janggut murai, Janggut baung* (Mal.), herb 30 – 60 cm, on vertical cliff, soil on limestone slope and base. Common in Dered Krian NP.

11.2.6 ***Tacca reducta*** P.C. Boyce & S. Julia. *Janggut baung, Janggut murai* (Mal.), on the limestone. **Note**: type specimen from Bau limestone (Gn. Serambu).

13. DRACAENACEAE

12.1.1 ***Dracaena congesta*** Sweet. Small herb, to 30 cm tall, on the limestone boulders. Note: medicinal plant.

12.1.2 ***Dracaena elliptica*** Thunb. Small herb, to 30 – 45 cm tall, deeply shaded areas on limestone boulders and base. Note: medicinal plant.

14. ERIOCAULACEAE

13.1.1 ***Eriocaulon longifolium*** Nees. Terrestrial, opened space, kerangas, belukar, white soils. Recorded from Bako NP, common elsewhere throughout Sarawak.

13.1.2 ***Eriocaulon truncatum*** Mart. Terrestrial herb, sometimes aquatic, semi-submerged in drainages, clay soil. Recorded from Pueh FR, Bako NP, and common elsewhere.

15. FLAGELLARIACEAE

14.1.1 ***Flagellaria indica*** L. *Rotan tikus* (Mal.), *Wi cit* (Ib.), climber or scrambling shrub, often in often spaces or secondary forest, near to water sources, at the base of limestone hills. Note: used to tighten.

16. HANGUANACEAE

15.1.1 ***Hanguana bakoensis*** Siti Nurfazilah, Ahmad Sofiman & P.C. Boyce. Solitary to weakly clumping herb, kerangas, lowland MDF. Recorded from Bako NP (type locality). Note: endemic to western Sarawak.

15.1.2 ***Hanguana bognerii*** H.J. Tillich & E. Sill. *Bakong* (Ib.), terrestrial, lowland MDF. Originally described based on specimen from Semengoh Wildlife Center.

15.1.1 ***Hanguana malayana*** (Jack) Merr. *Bakong* (Ib.), terrestrial herb, on foot of limestone hills and boulders.

17. HYDROCHARITACEAE

16.1.1 ***Hydrilla verticillata*** (L. *f.*) Royle. *Waterthyme, Hydrilla,* submerged aquatic plant, stagnant water, pond or water logged at the base of limestone hill. Common throughout Sarawak in polluted water bodies. **Uses**: aquarium decoaration plant.

18. HYPOXIDACEAE

17.1.1 ***Molineria latifolia*** (Dryand) Herb. *ex* Kurz. *Lemba* (Ib.), terrestrial herb, on foot of limestone hills. Note: medicinal plant, fruits are edible.

19. JOINVILLEACEAE

181.1 ***Joinvillea borneensis*** Becc. Recorded from Kubah NP, Pueh NP and Santubong NP.

20. LILIACEAE

19.1.1 ***Lilium candidum*** L. *Madonna lily* (Eng.). Planted as ornamental plant. Note: not native.

21. LOWIACEAE

20.1.1 ***Orchidantha borneensis*** N.E. Br. Terrestrial, lowland to hill forest. Recorded from Sampadi FR, Gn. Pueh NP.

20.1.2 ***Orchidantha micrantha*** Skornick & A.D. Poulsen. Terrestrial herb, lowland MDF, riverine. Recorded from Kubah NP (type locality).

30.1.3 ***Orchidantha ranchanensis*** Syauqina & Meekiong. Terrestrial, lowland MDF, damp and wet places near streams. Recorded from Klingkang Range FR (type locality – Ranchan Recreational Park).

22. MARANTACEAE

21.1.1 ***Donax canniformis*** (G. Frost.) K. Schum. *Bemban* (Mal.), often in swampy or wet area, at the base of limestone hills. **Note**: harvested as material for handy crafts.

21.2.1 ***Phrynium aurantium*** (Clausager & Borchs.) Suksathan & Borchs. *Daun lirik* (Ib.), herb, in deeply shaded areas, near to the base of limestone hill. Rare in Bau limestone hills.

21.2.2 ***Phrynium hirtum*** Ridl. *Daun lirik* (Ib.), herb, in deeply shaded areas, near to the base of limestone hill. Single record from Gn. Doya.

21.2.3 ***Phrynium pubinerve*** Bl. *Daon luit* (Mel.), herb, in deeply shaded areas, near to the base of limestone hill, occasional on wet soils near to the water sources. Common in the Bau limestone areas.

21.2.3 ***Phrynium villosulum*** Miq. *Daun lirik* (Ib.), herb, in deeply shaded areas, at the base of limestone hill. Single record from Gn. Jambusan.

21.3.1 ***Stachyphrynium calcicola*** A.D. Poulsen & Clausager. *Daun lirik* (Ib.), herb, on limestone boulders, crevices and on clay-rich soils at the base of limestone hills. Recorded from three limestomes hills; Gn. Doya, Gn. Tai Ton (type locality) and Gn. Pambor. Note: endemic to Bau limestone areas.

21.3.2 ***Stachyphrynium latifolium*** (Bl.) K. Schum. [synonym: *Phrynium latifolium* Bl.]. *Daun lirik* (Ib.), herb, at the base of limestone hills, occasional on wet soils near water sources. Common in Bau limestone hills.

23. MUSACEAE

22.1.1a ***Musa acuminata*** Colla. var. ***acuminata***. *Pisang hutan, Pisang kera* (Mal.), *Lengkik* (Ib.), open area at the foot of limestone hills.

22.1.1b ***Musa acuminata*** Colla var. ***flava*** (Ridl.) Kiew. [synonym: *Musa flava* Ridl.]. *Pisang hutan* (Mal.), *Lengkik* (Ib.), opened space, secondary forest and along roadside. Recorded from Sematan and Klingkang Range FR.

22.1.1c ***Musa acuminata*** Colla var. ***microcarpa*** (Becc.) Nasution [synonym: *Musa microcarpa* Becc.]. *Lengkik* (Ib.). Lowland, opened spaces, secondary forest, along roadside and logging road. Recorded from Klingkang Range FR, and common elsewhere throughout Borneo.

22.1.1d ***Musa acuminata*** Colla var. ***sematanensis*** Meekiong, Ipor & Tawan. *Pisang hutan* (Mal.), lowland, secondary forest and along roadside. Recorded from Sematan.

22.1.2 ***Musa bauensis*** Hakkinen & Meekiong. *Pisang hutan* (Mal.), Kodon (Bid.), deep shaded among limestone boulders and secondary vegetation. **Note**: endemic to Bau limestone area (Jambusan).

22.1.3 ***Musa borneensis*** Becc. *Pisang hutan* (Mal.), Engkadan (Ib.), Kodon (Bid.), in flooded limestone swamps at the base of hills.

22.1.4 ***Musa campestris*** Becc. var. ***campestris***. *Pisang hutan, Pisang kera* (Mal.), *lengkik* (Ib.), *Baliek putei* (Mel.), among limestone boulders and secondary vegetation.

22.1.4b ***Musa campestris*** Becc. var. ***sarawakensis*** Hakkinen. *Baliek putei* (Mel.), lowland, secondary forest, wet and damp places, near streams. Recorded from Lundu, Sematan, Dered Krian NP, Bungo Range NP, and common elsewhere throughout Sarawak.

22.1.5 ***Musa hirta*** Becc. *Pisang hutan, Pisang kera* (Mal.), *Gentu* (Ib.), among limestone boulders and secondary forest. Reported once from Bau limestone area. **Note**: endemic to central part of Sarawak.

22.1.6 ***Musa x putei-gentu*** Meekiong & Anis Sabrina. A newly described natural hybrid. Lowland, foothill of limestone, wet places near streams. Recorded from Bau limestone areas.

24. ORCHIDACEAE

23.1.1 ***Acriopsis densiflora*** Lindl. var. *borneensis* (Ridl.) Minderh. & de Vogel [synonym: *Acriopsis borneensis* Ridl.]. Epiphyte, lowland to lower montane mossy forest, sometimes in kerangas,

elev. 50 – 1100 m. **Note**: protected under Wildlife Protection Ordinance.

23.1.2 ***Acriopsis indica*** Wight. Epiphyte, sometimes terrestrial, lowland MDF, kerangas forest to mossy forest. Elevation from 10 to 1100 m above sea level. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.1.3 ***Acriopsis lilifolia*** (Koen.) Ormerod. var. ***lilifolia.*** *Orkid* (Mal.), epiphyte on tree trunks or branches, on limestone boulders at 80 m alt. **Note**: protected under Wildlife Protection Ordinance.

23.1.3 ***Acriopsis lilifolia*** (Koen.) Ormerod. var. ***auriculata*** (Minderh. & de Vogel) J.J. Wood. [synonym: *Acriopsis javanica* Reinw. *ex* Bl. var. *auriculata* Minderh. & de Vogel]. Epiphyte, lowland, secondary forest, rubber plantation. **Note**: protected under Wildlife Protection Ordinance.

23.1.4 ***Acriopsis ridleyi*** Hook. *f.* Epiphyte, lowland kerangas forest. Recorded from Bukit Gondol and Pulau Lakei (Bako NP). **Note**: protected under Wildlife Protection Ordinance.

23.2.1 ***Adenoncos sumatrana*** J.J. Sm. Epiphyte, lowland MDF. Recorded from Gn. Pueh FR. **Note**: protected under Wildlife Protection Ordinance.

23.3.1 ***Aerides odorata*** Lour. *Orkid* (Mal.), lithophyte on rock surfaces or epiphyte on branches, in light shaded areas near summit of limestone. **Note**: protected under Wildlife Protection Ordinance.

23.4.1 ***Agrostophyllum arundinaceum*** Ridl. *Orkid* (Mal.), epiphytic, lowland on limestone hill forest, elevation 100 – 600 m. **Note**: protected under Wildlife Protection Ordinance.

23.4.2 ***Agrostophyllum elongatum*** (Ridl.) Schuit. [synonym: *Appendicula hasseltii* Bl.; *Agrostophyllum costatum* J.J. Sm.;

Agrostophyllum palawense Schltr.] Epiphytic limestone hill. Also common in MDF and keRangea at 30 – 50 m. **Note**: protected under Wildlife Protection Ordinance.

23.4.3 ***Agrostophyllum glumaceum*** Hook. *f. Orkid* (Mal.), epiphyte of tree trunks, base of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.4.4 ***Agrostophyllum longifolium*** (Bl.) Rchb. f. [synonym: *Appendicula longifolia* Bl.]. Epiphyte, lowland to lower montane mossy forest, wet kerangas forest, elev. 10 – 1100 m. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.4.5 ***Agrostophyllum majus*** Hook. *f.* Epiphytic, lowland limestone hill. Also recorded from PSF, hill riverine and montane forest at 20 – 1000 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.4.6 ***Agrostophyllum saccatum*** Ridl. Epiphyte, lowland MDF. Recorded from Gn. Pueh FR. **Note**: protected under Wildlife Protection Ordinance.

23.4.7 ***Agrostophyllum stipulatum*** (Griff.) Schltr. ssp. ***stipulatum*** [synonym: *Appendicula stipulata* Griff.; *Agrostophyllum confusum* J.J. Sm.; *Appendiculopsis celebica* (Schltr.) Szlach.]. *Orkid* (Mal.), epiphytic on trees, on limestone hill. Also recorded from mangrove and MDF, at 10 – 500 m elevation. **Note**: protected under Wildlife Protection Ordinance.

23.4.7 ***Agrostophyllum stipulatum*** (Griff.) Schltr. ssp. ***bicuspidatum*** (J.J. Sm.) Schuit. - Pueh

23.4.8 ***Agrostophyllum sumatranum*** Schltr. & J.J. Sm. *Orkid* (Mal.), lithophytes or epiphytes, near summit of limestone. **Note**: protected under Wildlife Protection Ordinance.

23.4.9 ***Agrostophyllum tenue*** J.J. Sm. Epiphyte, hill MDF to lower montane mossy forest, elev. 600 – 1000 m. Recorded from Lundu. **Note**: protected under Wildlife Protection Ordinance.

23.4.10 ***Agrostophyllum trifidum*** Schltr. [synonym: *Appendicula trifida* (Schltr.) Szlach.] Epiphytic on trees, on limestone hills. Also record from MDF and kerangas forest, at 10 – 1300 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.5.1 ***Anoectochilus longicalcaratus*** J.J. Sm. Terrestrial, hill mossy cloud forest. Recorded from Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.6.1 ***Aphyllorchis montana*** Rchb. *f.* [synonym: *Aphyllorchis prainii* Hook. *f.*; *A. borneensis* Schltr.]. Saprophyte, lowland MDF, also on limestone hills. Recorded from Gn. Serapi (Kubah NP). **Note**: protected under Wildlife Protection Ordinance.

23.6.2 ***Aphyllorchis pallida*** Bl. [synonym: *Aphyllorchis hasseltii* Bl.] *Orkid tanah* (Mal.), mycoheterotroph, on thick humus, on limestone summit and shoulders. Also recorded from MSF, MDF, kerangas and submontane forest, at 10 – 1100 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.7.1 ***Apostasia nuda*** R. Br. [synonym: *Apostasia brunonis* Griff.; *Apostasia lobbii* Rchb. *f.*]. *Orkid pandan* (Mal.), terrestrial, at the base of limestone hill. Also recorded from MDF and kerangas forest, at 60 – 1000 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.7.2 ***Apostasia odorata*** Bl. [synonym: *Apostosia platystylis* J.J. Sm.]. Terrestrial, hill forest to lower montane forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.7.3 ***Apostasia wallichii*** R. Br. *Orkid rumput* (Mal.), terrestrial, foot of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.8.1 ***Appendicula alba*** Bl. [synonym: *Podochilus albus* (Bl.) Schltr.], epiphytic, lowlands on limestone. **Note**: protected under Wildlife Protection Ordinance.

23.8.2 ***Appendicula anceps*** Bl. *Orkid* (Mal.), epiphytic on tree, occasional as lithophytic on rock surfaces. Common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.8.3 ***Appendicula buxifolia*** Bl. [synonym: *Dendrobium lycopodoides* Lindl.; *Appendicula frutex* Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.8.4 ***Appendicula cornuta*** Bl. *Orkid* (Mal.), epiphytic, on limestone hills. Also recorded from lowland hill forest and montane forest, at 20 – 1700 m altitudes. **Note**: protected under Wildlife Protection Ordinance.

23.8.5 ***Appendicula cristata*** Bl. [synonym: *Podochilus cristatus* (Bl.) Schltr.; *Appendicula divaricata* Ames & Schweinf.] *Orkid* (Mal.), epiphytic or lithophytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.8.6 ***Appendicula floribunda*** (Schltr.) Schltr. [synonym: *Podochilus floribundus* Schltr.]. Epiphyte, lowland to hill MDF. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.8.7 ***Appendicula foliosa*** Ames & C. Schweinf. Epiphyte/terrestrial, lowland to lower montane mossy forest, elev. 200 – 1800 m. **Note**: protected under Wildlife Protection Ordinance.

23.8.8 ***Appendicula lucida*** Ridl. [synonym: *Podochilus lucidus* (Ridl.) Schltr.]. *Orkid* (Mal.), epiphytic on tree. **Note**: protected under Wildlife Protection Ordinance.

23.8.9 ***Appendicula pendula*** Bl. [synonym: *Podochilus pendulus* (Bl.) Schltr.; *Appendicula latibracteata* J.J. Sm.; *A. latibracteata* J.J. Sm. var. *rajana* J.J. Sm.]. Epiphyte/lithophyte, MDF to lower montane forest, sometimes on limestone hills and riverine. Recorded from Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.8.10 ***Appendicula pilosa*** J.J. Sm. [synonym: *Appendicula niahensis* Carr]. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.8.11 ***Appendicula reflexa*** Bl. [synonym: *Appendicula micrantha* Lindl.; *A. viridiflora* Teijsm. & Binn.; *A. cordata* Hook. *f.*; *A. robusta* Ridl.]. Epiphyte, lowland, kerangas forest. Recorded from Tg. Sapi, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.8.12 ***Appendicula rupicola*** (Ridl.) Rolfe [synonym: *Podochilus rupicolus* Ridl.]. Lithophyte, lowland, kerangas, limestone, riverine MDF and lower montane mossy forest, elev. 200 – 1300 m. Recorded from Lundu (type locality), Gn. Matang, Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.8.13 ***Appendicula torta*** Bl. *Orkid* (Mal.), epiphytic on tree, common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.8.14 ***Appendicula uncata*** Ridl. ssp. ***sarawakensis*** J.J. Wood. Epiphyte or terrestrial, swampy forest, kerangas forest and MDF. Recorded from Kubah NP and Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.8.15 ***Appendicula undulata*** Bl. var. ***undulata.*** *Orkid* (Mal.), epiphytic on tree or lithophytic on rock surfaces. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.8.15 ***Appendicula undulata*** Bl. var. ***longicalcarata*** (Rolfe) Ames. *Orkid* (Mal.), occasional as lithophytic on rock surfaces, common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.8.16 ***Appendicula xytriophora*** Rchb. *f. Orkid* (Mal.), epiphytic, on limestone hills. Also recorded from MDF, riparian forest and submontane, at 100 – 1500 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.9.1 ***Arachnis breviscapa*** (J.J. Sm.) J.J. Sm. [synonym: *Arachnis moschifera* Bl.; *Renanthera arachnites* Lindl.], *Spider orchid*, epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.9.2 ***Arachnis calcarata*** Holttum. Epiphyte, lower montane forest. Elevation 1300 – 1700 m. Recorded from Gn. Berumput (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.9.3 ***Arachnis flosaeris*** (L.) Rchb. *f.* [synonym: *Epidendrum flosaeris* L.], *Spider orchid,* epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.9.4 ***Arachnis hookeriana*** (Rchb. *f.*) Rchb. *f.* [synonym: *Renanthera hookeriana* Rchb. f.]. Epiphyte, lowland. **Note**: protected under Wildlife Protection Ordinance.

23.10.1 ***Arundina graminifolia*** (D. Don) Hoch. var. ***graminifolia***. *Orkid buluh* (Mal.), terrestrial, on open spaced at the base of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.11.1 ***Ascidieria longifolia*** (Hook. *f.*) Seidenf. [synonym: *Eria longifolia* Hook. *f.*; *Eria verticillaris* Kraenzl.]. *Orkid* (Mal.), epiphytic or lithophytic, on limestone hills. Also recorded from MDF and mossy montane forest, 100 – 2400 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.12.1 ***Brachypeza indusiata*** (Rchb. *f.*) Garay. *Orkid* (Mal.), epiphyte on tree branches, in deeply shade area at the base of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.13.1a ***Bromheadia borneensis*** J.J. Sm. var. ***borneensis***. Terrestrial, lowland hills, on limestone. Recorded from Bako NP and Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.13.1b ***Bromheadia borneensis*** J.J. Sm. var. ***longiflora*** Scheindelen & de Vogel. Terrestrial, hill forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.13.2 ***Bromheadia devogelii*** Kruizinga. Epiphyte, lowland kerangas forest, elev. 50 m. Recorded from Lundu areas. **Note**: protected under Wildlife Protection Ordinance.

23.13.3 ***Bromheadia ensifolia*** J.J. Sm. Epiphyte, hill MDF to lower montane mossy forest. **Note**: protected under Wildlife Protection Ordinance.

23.13.4 ***Bromheadia finlaysoniana*** (Lindl.) Miq. [synonym: *Grammatophyllum finlaysonianum* Lindl.], *Orkid pukul 10* (Mal.), terrestrial, occasional in opened space at base of limestone hill. Common throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.13.5 ***Bromheadia scirpoidea*** Ridl. Terrestrial, lowland to lower montane mossy forest. Elevation: 10 – 1600 m. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.13.6 ***Bromheadia tenuis*** J.J. Sm. Terrestrial, hill forest and kerangas forest. Recorded from Gn. Pueh (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.13.7 ***Bromheadia truncata*** Seidenf. Epiphyte, hill MDF, elev. 500 m. Recorded from Gn. Silantek, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.14.1 ***Bulbophyllum acuminatum*** (Ridl.) Ridl. *Orkid* (Mal.), epiphyte on tree trunks, on the limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.2 ***Bulbophyllum apodum*** Hook. *f.* [synonym: *Bulbophyllum saccatum* Kraenzl.]. *Orkid* (Mal.), epiphytic, on limestone hills. Also recorded from MSF, MDF and submontane forest, at 90 – 1200 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.14.3 ***Bulbophyllum armeniacum*** J.J. Sm. *Orkid* (Mal.), epiphytic, on limestone hills. Single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.14.4 ***Bulbophyllum atratum*** J.J. Sm. Epiphyte, lowland MDF. Recorded from Gn. Silantek (Klingkang Range FR). **Note**: protected under Wildlife Protection Ordinance.

23.14.5 ***Bulbophyllum auratum*** (Lindl.) Rchb. *f.* [synonym: *Cirrhopetalum auratum* Lindl.; *C. borneense* Schltr.]. Epiphyte, lowland MDF to lower montane forest, wet kerangas forest, elev. 10 – 1000 m. Recorded from Gn. Silantek, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.14.6 ***Bulbophyllum beccarii*** Rchb. *f. Orkid telinga gajah* (Mal.), epiphytic on tree trunks, on boulders and shoulders of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.7 ***Bulbophyllum biflorum*** Teijsm. & Binn. *Orkid* (Mal.), epiphytic, common on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.8 ***Bulbophyllum binnendijkii*** J.J. Sm. Epiphyte, lower mossy forest, MDF. Recorded from Sabal FR, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.14.9 ***Bulbophyllum blumei*** (Lindl.) J.J. Sm. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.10 ***Bulbophyllum brevipes*** Ridl. epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.11 ***Bulbophyllum brienianum*** (Rolfe) J.J. Sm. [synonym: *Cirrhopetalum brienianum* Rolfe; *C. makoyanum* Rchb. f. var. *brienianum* (Ridl.) Ridl.; *C. brunnescens* Ridl.; *C. adenophorum* Schltr.; *Bulbophyllum makoyanum* (Rchb. f.) J.J. Sm.; *B. adenophorum* (Schltr.) J.J. Sm.]. Epiphyte, lowland MDF. Recorded from Gn. Santubong and Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.12 ***Bulbophyllum carinilabium*** J.J. Vermeulen. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.13 ***Bulbophyllum catenarium*** Ridl. [synonym: *Bulbophyllum carunculaelabrum* Carr]. Epiphyte on tree trunks, lowland limestone hills and MDF. Recorded from Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.14 ***Bulbophyllum caudatisepalum*** Ames & C. Schweinf. [synonym: *Bulbophyllum cuneifolium* Ames & C. Schweinf.; *B. pergracile* Ames & C. Schweinf.; *B. dulitensis* Carr; *B. koyanense* Carr]. Epiphyte, lowland to lower montane forest. Elevation: 300–1700 m. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.14.15 ***Bulbophyllum cernuum*** (Bl.) Lindl. [synonym: *Diphyes cernua* Bl.; *Bulbophyllum gibbilingue* J.J. Sm.]. *Orchid* (Mal.), epiphytic, on limestone summits. **Note**: protected under Wildlife Protection Ordinance.

23.14.16 ***Bulbophyllum chlorascens*** J.J. Sm. Epiphyte on tree trunk, kerangas forest. Recorded from Bako NP. *Bulbophyllum chlorascens*

23.14.17 ***Bulbophyllum clandestinum*** Lindl. [synonym: *Epidendrum sessile* J. Koenig; *Bulbophyllum sessile* (J. Koenig) J.J. Sm.] *Orkid* (Mal.), epiphytic, on limestone hills, at 30 – 100 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.14.18 ***Bulbophyllum cleistogamum*** Rolfe. Epiphyte, lowland MDF. Recorded from Matang. **Note**: protected under Wildlife Protection Ordinance.

23.14.19 ***Bulbophyllum concinnum*** Hook. *f.* Epiphyte, lowland and highland kerangas forest, also on limestone hills. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.20 ***Bulbophyllum dearei*** Rchb. *f. Orkid* (Mal.), epiphytic on trees, on limestone summits. **Note**: protected under Wildlife Protection Ordinance.

23.14.21 ***Bulbophyllum dentiferum*** Ridl. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.22 ***Bulbophyllum deltoideum*** Ames & C. Schweinf. [synonym: *Bulbophyllum angustifolium* J.J. Sm.]. Epiphyte, hill MDF to lower montane mossy forest, elev. 200 – 1600 m. **Note**: protected under Wildlife Protection Ordinance.

23.14.23 ***Bulbophyllum devogelii*** J.J. Vermeulen. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.24 ***Bulbophyllum flavescens*** (Bl.) Lindl. [synonym: *Bulbophyllum montigenum* Ridl.; *Bulbophyllum puberulum* Ridl.; *Bulbophyllum barrinum* Ridl.; *Bulbophyllum lanceolatum* Ames & Schweinf.]. *Orkid* (Mal.), epiphytic, on limestone hills. Also recorded from MDF, kerangas and mossy montane forest, 30 – 2400 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.14.25 ***Bulbophyllum foetidolens*** Carr. Epiphyte/lithophyte, hill MDF. Recorded from Sabal FR, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.14.26 ***Bulbophyllum gracillimum*** (Rolfe) Rolfe. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.27 ***Bulbophyllum hirtulum*** Ridl. [*Bulbophyllum trichoglottis* Ridl.]. Epiphyte, MDF, hill kerangas, elev. 800 m. Recorded from Gn. Apeng NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.28 ***Bulbophyllum hymenochilum*** Kraenzl. [synonym: *Cirrhopetalum rhomdifolium* Carr]. Epiphyte, lowland forest, elev. 300 m. Recorded from Gn. Matang (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.14.29 ***Bulbophyllum inunctum*** J.J. Sm. *Orkid* (Mal.), on limestone hill. Also recorded in MDF. **Note**: protected under Wildlife Protection Ordinance.

23.14.30 ***Bulbophyllum kubahense*** J.J. Verm. & A. Lamb. Epiphyte or lithophyte, lowland MDF. Recorded from Kubah NP (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.14.31 ***Bulbophyllum lasianthum*** Lindl. Epiphyte, lowland MDF. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.32 ***Bulbophyllum lobbii*** Lindl. [synonym: *Bulbophyllum claptonense* Rolfe]. Epiphyte on tree trunks, hill MDF and kerangas forest. Recorded from Gn. Pueh and Gn. Berumput. **Note**: protected under Wildlife Protection Ordinance.

23.14.33 ***Bulbophyllum longerepens*** Ridl. [synonym: *Odontostylis multiflora* Breda; *Bulbophyllum multiflorum* (Breda) Kraenzl.]. Epiphyte, lowland forests. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.14.34 ***Bulbophyllum longiflorum*** Thouars. *Orkid* (Mal.), epiphytic, lowland limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.35 ***Bulbophyllum macranthum*** Lindl. [synonym: *Sarcopodium macranthum* (Lindl.) Lindl.; *S. purpureum* Rchb. f.; *Phyllorchis macrantha* (Lindl.) Kuntze; *Bulbophyllum cochinchinense* Gagnep.]. Epiphyte, lowland to lower montane forest. Elevation: 20 – 1700 m. Recorded from Gn. Santubong and Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.36 ***Bulbophyllum macrochilum*** Rolfe [synonym: *Bulbophyllum mirandum* Kraenzl.; *B. intervallatum* J.J. Sm.; *B. stella* Ridl.] Epiphyte, lowland MDF, elev. 10 – 200 m. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.14.37 ***Bulbophyllum mahakamense*** J.J. Sm. Epiphyte/lithophyte, lowland MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.14.38 ***Bulbophyllum makoyanum*** (Rchb. *f*) Ridl. [synonym: *Cirrhopetalum makoyanum* Rchb. *f.*]. Epiphyte, lowlands to hill forest. Elevation: 10 – 600 m. Recorded from Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.39 ***Bulbophyllum marudiensis*** Carr. Epiphyte, lowland to lower montane forest. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.40 ***Bulbophyllum medusae*** (Lindl.) Rchb. *f. Orkid medusa,* epiphyte on tree trunk, on limestone hills, also commonly recorded in many types of habitat throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.14.41 ***Bulbophyllum megalanthum*** Griff. Epiphyte, lowland kerangas forest. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.42 ***Bulbophyllum membranaceum*** Teijsm. & Binn. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.43 ***Bulbophyllum mirum*** J.J. Smith. Small epiphytic orchid on tree trunks or branches, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.44 ***Bulbophyllum membranifolium*** Hook. *f.* [synonym: *Bulbophyllum insigne* Ridl.; *Bulbophyllum scandens* Kraenzl.; *Bulbophyllum dagamense* Ames; *Bulbophyllum badium* Ridl.; *Bulbophyllum costatum* Ames]. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.14.45 ***Bulbophyllum mutabile*** (Bl.) Lindl. var. ***mutabile*** [synonym: *Bulbophyllum altispex* Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.14.46 ***Bulbophyllum nematocaulon*** Ridl. [synonym: *Bulbophyllum johannis-winkleri* J.J. Sm.]. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance; new record for Bau limestone areas.

23.14.47 ***Bulbophyllum odoratum*** (Bl.) Lindl. [synonym: *Bulbophyllum elatius* Ridl.; *B. brookesii* Ridl.; *B. niveum* (J.J. Sm.) J.J. Sm.; *B. crassicaudatum* Ames & C. Schweinf.]. Epiphyte on tree trunks, lowland forest, riverine, kerangas and limestone. Recorded from Gn. Santubong, Gn. Matang and Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.48 ***Bulbopyllum ovalifolium*** (Bl.) Lindl. [synonym: *Bulbophyllum parvulum* Lindl.; *B. tinea* Ridl.]. Epiphyte on tree trunks, lowland, kerangas forest. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.14.49 ***Bulbophyllum perparvalum*** Schltr. *Orkid* (Mal.), epiphytic, on limestone hill. Known only from the type (*Brooks s.n.*), Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.14.50 ***Bulbophyllum prianganense*** J.J. Sm. [synonym: *Bulbophyllum hamatifolium* J.J. Sm.]. Epiphyte, hill forest. Recorded from Gn. Gn. Silantek, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.14.51 ***Bulbophyllum pulchellum*** Ridl. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.14.52 ***Bulbophyllum pumilio*** Ridl. Epiphyte, lowland on limestone, hill kerangas forest, lower montane mossy forest, elev. 100 – 1200 m. Recorded from Bau limestone areas (type locality – Gn. Bidi). **Note**: protected under Wildlife Protection Ordinance.

23.14.53 ***Bulbophyllum purpurascens*** Teijsm. & Binn. [synonym: *Bulbophyllum peyerianum* (Kraenzl.) Seidenf.; *Cirrhopetalum peyerianum* Kraenzl.; *Cirrhopetalum citrinum* Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hill. Also recorded from MSF, MDF and kerangas forest, 10 – 300 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.14.62 ***Bulbophyllum tortuosum*** (Bl.) Lindl. *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.63 ***Bulbophyllum uniflorum*** (Bl.) Hassk. [synonym: *Ephippium uniflorum* Bl.; *Bulbophyllum reinwardtii* (Lindl.) Rchb. *f.*; *Bulbophyllum variable* Ridl.; *Bulbophyllum hewittii* Ridl.; *Bulbophyllum aeolium* Ames; *Bulbophyllum sociale* Rolfe]. *Orkid* (Mal.), epiphytic, on limestone hills. Common throughout Sarawak in various habitats. **Note**: protected under Wildlife Protection Ordinance.

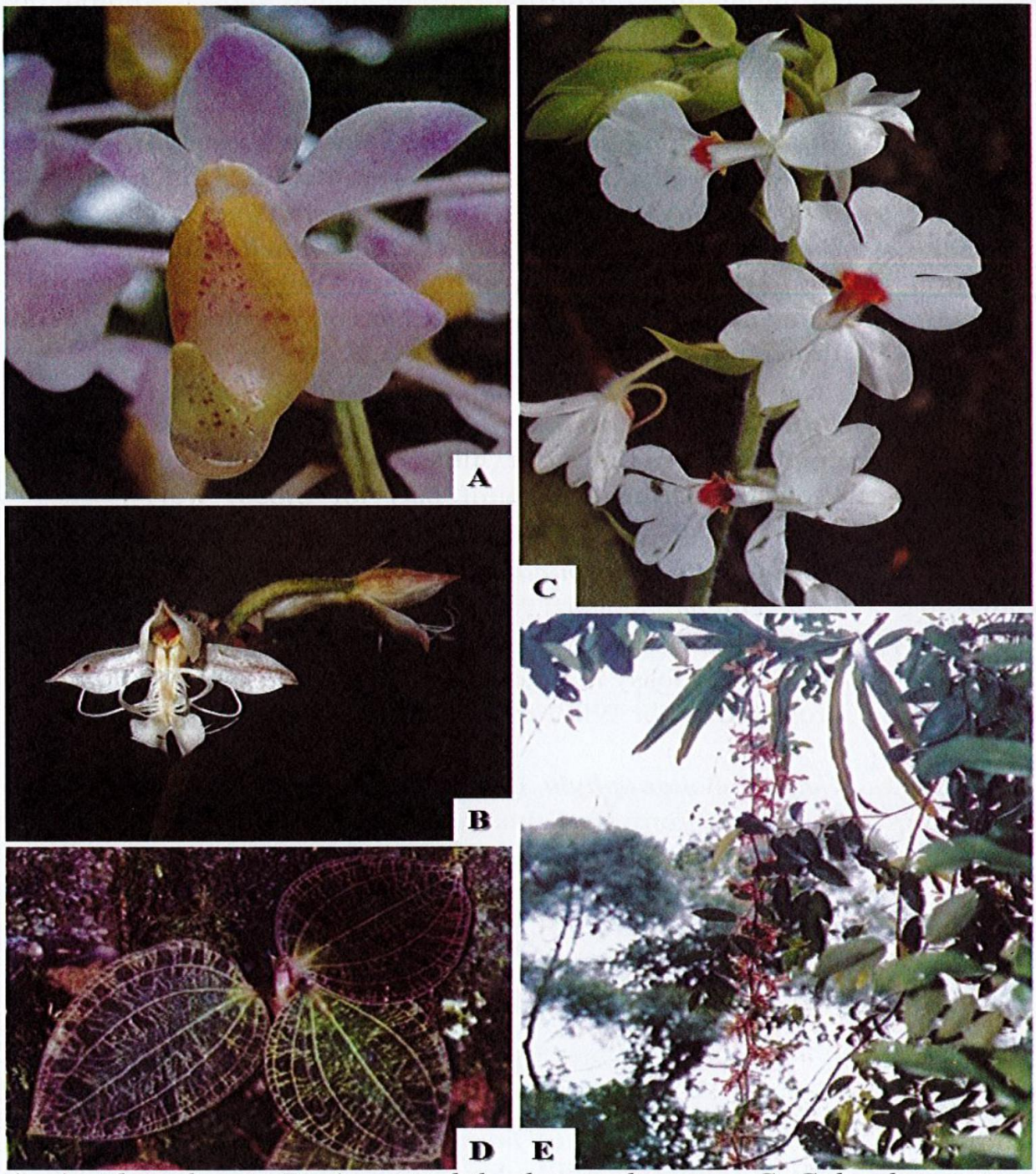
23.14.64 ***Bulbophyllum vaginatum*** (Lindl.) Rchb. *f.* *Orkid* (Mal.), epiphytic, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.14.65 ***Bulbophyllum vermiculare*** Hook. *f.* [synonym: *Bulbophyllum brookeanum* Kraenzl.; *Bulbophyllum gimagaanense* Ames]. *Orkid* (Mal.), epiphytic, on limestone. Also recorded from MDF and lower mossy montane forest, elevation 100 – 1700 m. **Note**: protected under Wildlife Protection Ordinance.

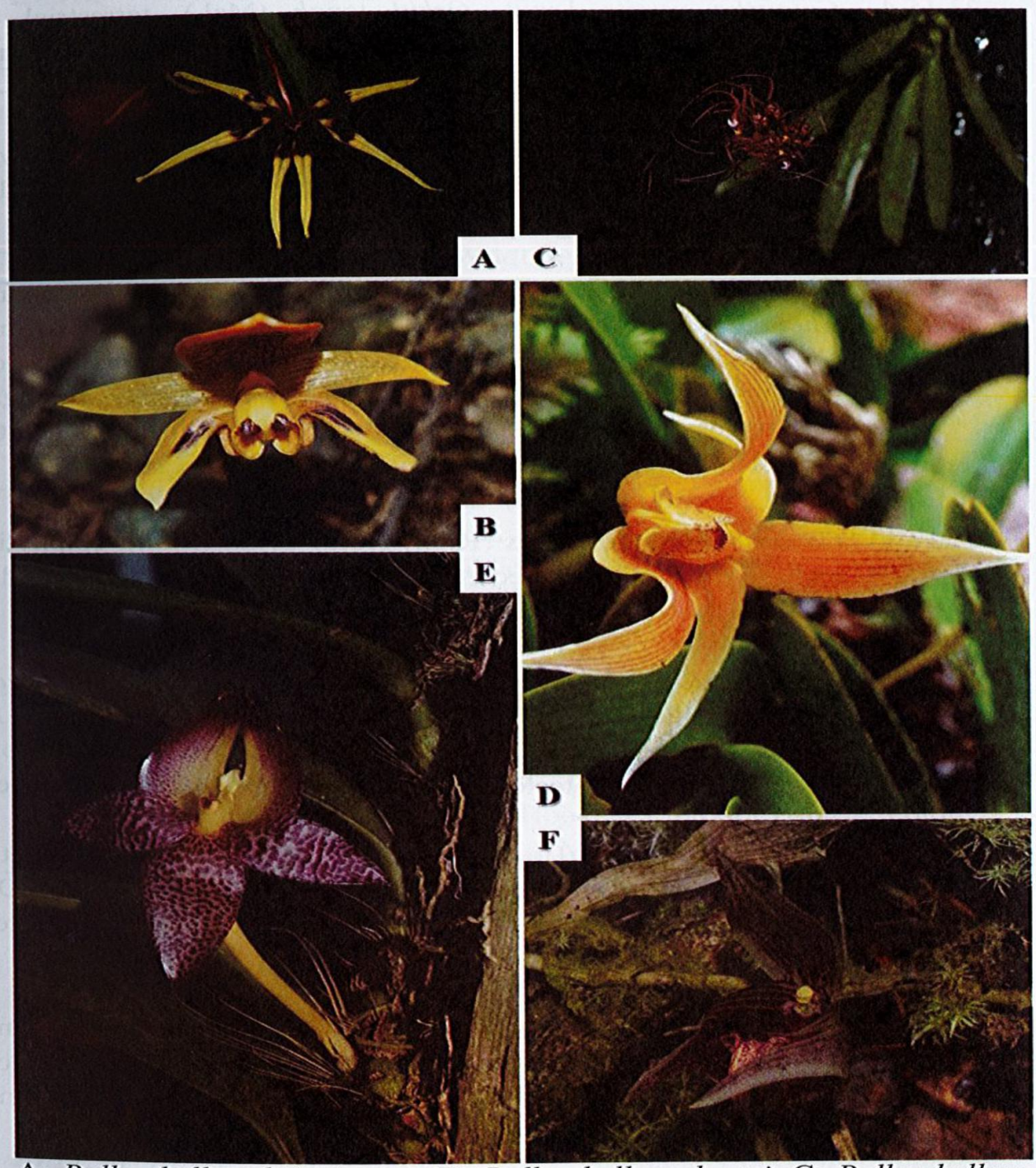
23.15.1 ***Calanthe monophyla*** Ridl. Terrestrial, lowland to hill forest. Recorded from Tg. Limau (Bako NP). **Note**: protected under Wildlife Protection Ordinance.

23.15.2 ***Calanthe pulchra*** (Bl.) Lindl. [synonym: *Amblyglottis pulchra* Bl.]. Terrestrial/epiphyte, hill kerangas forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.15.3 ***Calanthe triplicata*** (Willemet) Ames [synonym: *Calanthe veratrifolia* Willd.; *C. furcata* Bateman ex Lindl.]. Terrestrial, lowland limestone hills, lower montane mossy forest, elev. 40 – 1100 m. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.



A: *Aerides odorata,* B: *Aneoctochilus longicalcaratus, C: Calanthe vestita,* D: *Dossinia marmorata,* E: *Dimorphorchis lowii* var. *lowii*



A: *Bulbophyllum brienianum,* B: *Bulbophyllum dearei,* C: *Bulbophyllum lasianthum,* D: *Bulbophyllum lobbii,* E: *Bulbophyllum macranthum,* F: *Bulbophyllum reticulatum*

23.15.4 ***Calanthe vestita*** Lindl. *Orkid tanah* (Mal.), terrestrial or lithophytic, rarely epiphytic, on limestone boulders, crevices and slopes. **Note**: protected under Wildlife Protection Ordinance.

23.16.1 ***Ceratostylis gracilis*** Bl. Tufted epiphyte, lowland to lower montane forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.17.1 ***Chelonistele sulphurea*** (Bl.) Pfitzer var. ***sulphurea*** [synonym: *Chelonanthera sulphurea* Bl.; *Coelogyne pinniloba* J.J. Sm.; *Chelonistele cuneata* (J.J. Sm.) Carr]. *Orkid* (Mal.), epiphytic, on limestone hills. Common throughout Sarawak, in MDF, kerangas and lower mossy forest, at 200 -2100 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.18.1 ***Chroniochilus virescens*** (Ridl.) Holtt. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.19.1 ***Cirrhopetalum lepidum*** (Bl.) Schltr. [synonym: *Ephippium lepidum* Bl.; *Bulbophyllum lepidum* (Bl.) J.J. Sm.; *B. gamosepalum* (Griff.) J.J. Sm.]. Epiphyte, MDF. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.20.1 ***Claderia viridifolia*** Hook. *f. Orkid* (Mal.), terrestrial, epiphytic or climber, at the base of limestone hills. Also common in MDF and kerangas forest, at 90 – 700 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.21.1 ***Cleisostoma brachystachys*** (Ridl.) Garay. [synonym: *Saccolabium brachystachys* Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hill. Known only from the type (*Ridley,* Jambusan). **Note**: protected under Wildlife Protection Ordinance.

23.21.2 ***Cleisostoma discolor*** Lindl. [synonym: *Sarcanthus termissus* Rchb. *f.*; *Sarcanthus discolor* (Lindl.) J.J. Sm.]. *Orkid* (Mal.), epiphytic, lowland limestone hills. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.21.3 ***Cleisostoma flexum*** (Rchb. *f.*) Garay. [synonym: *Sarcanthus flexus* Rchb. *f.*]. Epiphyte, hill MDF. Recorded from Gn. Silantek, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.21.4 ***Cleisostoma halophilum*** (Ridl.) Garay [synonym: *Sarcanthus halophilus* Ridl.; *S. beccarii* Schltr.]. Epiphyte, lowland to hill kerangas forest, also in mangrove. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.21.5 ***Cleisostoma inflatum*** (Rolfe) Garay [synonym: *Sarcanthus inflatus* Rolfe; *Saccolabium laxum* Ridl.]. Epiphyte, lowland MDF. **Note**: protected under Wildlife Protection Ordinance.

23.21.6 ***Cleisostoma pinifolium*** (Ridl.) Garay [synonym: *Saccolonium pinifolium* Ridl.], *Orkid* (Mal.), epiphytic, on limestone hill. Known only from the type (*Brooks s.n.,* Gn. Bidi). **Note**: protected under Wildlife Protection Ordinance.

23.21.7 ***Cleisostoma ridleyi*** Garay [synonym: *Saccolabium ramosum* Ridl.]. Epiphyte, lowland limestone hills. Recorded from Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.21.8 ***Cleisostoma scorthechinii*** (Hook. f.) Garay [synonym: *Sarcanthus scorthechinii* Hook. f.] *Orkid* (Mal.), epiphytic, lowland limestone hill. *Orkid* (Mal.), epiphytic, on limestone hill. Known only from the type (*Ridley,* Jambusan). **Note**: protected under Wildlife Protection Ordinance.

23.21.9 ***Cleisostoma suaveolens*** Bl. [synonym: *Sarcanthus robustum* O'Brien; *Cleisostoma borneense* J.J. Wood]. Epiphyte, lowland limestone hills. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.21.10 ***Cleisostoma subulatum*** Bl. [synonym: *Sarcanthus subulatum* (Bl.) Rchb. f.; *Saccolobium secundum* (Griff.) Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hill. *Orkid* (Mal.), epiphytic, on limestone hill. Known only from the type (*Ridley,* Jambusan). **Note**: protected under Wildlife Protection Ordinance.

23.21.11 ***Cleisostoma teretifolium*** Teijsm. & Binn. [synonym: *Saccolabium machadonis* Ridl.; *Sarcanthus machadonis* (Ridl.) J.J. Sm.]. Epiphyte, lowland to hill forest. Recorded from Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.21.12 ***Cleisostoma williamsonii*** (Rchb. *f.*) Garay [synonym: *Sarcanthus williamsonii* Rchb. f.; *S. sacculatus* Ridl.; *Saccolabium sacculatum* (Ridl.) Ridl.]. Epiphyte, mangrove forest. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.22.1 ***Coelogyne asperata*** Lindl. Epiphyte or lithophyte on rock surface, on limestone hills. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.22.2 ***Coelogyne cumingii*** Lindl. [synonym: *Coelogyne longibracteata* Hook. *f.*; *C. casta* Ridl.]. Epiphyte, lowland to hill MDF. Recorded from Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.22.3 ***Coelogyne dayana*** Rchb. *f.* [synonym: *Coelogyne pulverula* Teijsm. & Binn.]. Epiphyte/lithophyte, hill MDF. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.22.4 ***Coelogyne distans*** J.J. Sm. Epiphyte, lowland MDF, kerangas forest, elev. 100 m. Recorded from Telok Assam, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.22.5 ***Coelogyne exalata*** Ridl. Epiphyte, hill to lower montane forest. Recorded from Gn. Santubong, and common throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.22.6 ***Coelogyne foerstermanni*** Rchb. *f.* Epiphyte, lowland MDF, peat swamp and kerangas. Recorded from Bungo Range NP, and throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.22.7 ***Coelogyne harana*** J.J. Sm. Epiphyte, hill forest on ridges, and limestone hills. Recorded from Gn. Serapi. **Note**: protected under Wildlife Protection Ordinance.

23.22.8 ***Coelogyne imbricans*** J.J. Sm. Epiphyte, hill forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.22.9 ***Coelogyne incrassata*** (Bl.) Lindl. var. ***incrassata.*** *Orkid* (Mal.), epiphyte on tree branches or lithophyte on rock surfaces, on limestone summits and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.22.10 ***Coelogyne kelamensis*** J.J. Sm. Epiphyte, lowland kerangas forest. Recorded from Bt. Gondol, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.22.11 ***Coelogyne marthae*** S.E.C. Sierra. Epiphyte, lowland kerangas forest, elev. 50 – 300 m. Recorded from Sematan and Lundu districts. **Note**: protected under Wildlife Protection Ordinance.

23.22.12 ***Coelogyne monilirachis*** Carr. *Orkid* (Mal.), epiphyte on tree branches or lithophyte on rock surfaces, on limestone summits and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.22.13 ***Coelogyne motleyi*** Rolfe ex J.J. Wood. *Orkid* (Mal.), terrestrial or lithophytic, lowland limestone hill. Single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.22.14 ***Coelogyne muluensis*** J.J. Wood. Epiphyte, lowland kerangas forest. Recorded from Kpg Keranji, Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.22.15 ***Coelogyne odoardii*** Schltr. Epiphyte, lowland MDF, kerangas and riverine. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.22.16 ***Coelogyne pallens*** Ridl. [synonym: *Coelogyne fimbriata* Lindl. var. *annamica* Finet *ex* Gagnep.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.22.17 ***Coelogyne peltastes*** Rchb. *f.* Epiphyte on tree trunks, peat swamp forest, lowland kerangas forest. Recorded from Telok Tajor, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.22.18 ***Coelogyne rhabdobulbon*** Schltr. Epiphyte, lowland to lower montane forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.22.19 ***Coelogyne rochussenii*** de Vries [synonym: *Coelogyne stellaris* Rchb. f.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from MDF and hill forest at 50 – 700 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.22.20 ***Coelogyne sanderiana*** Rchb. f. Epiphyte/terrestrial, wet kerangas forest, lower montane mossy forest, elev. 1100 – 1500 m. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.22.21 ***Coelogyne septemcostata*** J.J. Smith. *Orkid* (Mal.), lithophytic on rock surface. **Note**: protected under Wildlife Protection Ordinance.

23.22.22 ***Coelogyne swaniana*** Rolfe. *Orkid* (Mal.), epiphytic on tree or lithophytic on rock surface, on limestone summits. **Note**: protected under Wildlife Protection Ordinance.

23.23.1 ***Cordiglottis filiformis*** (Hook. *f.*) Garay. *Orkid* (Mal.), epiphytic on tree. **Note**: protected under Wildlife Protection Ordinance.

23.23.2 ***Cordiglottis pulverulenta*** (Carr) Garay. *Orkid* (Mal.), epiphytic on tree. **Note**: protected under Wildlife Protection Ordinance.

23.24.1 ***Corybas pictus*** (Bl.) Rchb. *f. Helmet orchid, Orkid satu daun* (Mal.), small (size 50 cent – maximum), on mosses or wet soils, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.25.1 ***Corymborkis veratrifolia*** (Reinw.) Bl. *Orkid buluh* (Mal.), terrestrial, to 2 m tall, at base of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.26.1 ***Cryptostylis arachnites*** (Bl.) Hassk. [synonym: *Zosterostylis arachnites* Bl.]. Terrestrial, lower montane forest. Recorded from Gn. Serapi and Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.27.1 ***Cymbidium bicolor*** Lindl. ssp. *pubescens* Lindl. [synonym: *Cymbidium pubescens* Lindl.]. Epiphyte, lowland, secondary forest. Recorded from Bungo Range NP, and common elsewhere. **Note**: protected under Wildlife Protection Ordinance.

23.27.2 ***Cymbidium dayanum*** Reichb. *f. Orkid* (Mal.), lithophyte of rock surface, on summit. Single recorded from limestone hill in Dered Krian NP.

23.27.3 ***Cymbidium finlaysonianum*** Lindl. *Orkid jamban* (Mal.), epiphyte or lithophyte on tree trunks or branches, on rock surfaces. Common in Dered Krian NP.

23.28.1 ***Cyrtosia javanica*** Bl. [synonym: *Galeola javanica* (Bl.) Benth. & Hook. *f.*]. Saprophyte, lowland riverine forest. Recorded from Gn. Perigi, Lundu. **Note**: protected under Wildlife Protection Ordinance.

23.29.1 ***Cystorchis aphylla*** Ridl. Saprophyte, lowland MDF and limestone hills. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.29.2 ***Cystorchis macrophysa*** Schltr. Saprophyte/terrestrial, lowland MDF and limestone hills. Recorded from Gn. Matang (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.30.1 ***Dendrobium acerosum*** Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas, Santubong NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.2 ***Dendrobium aciculare*** Lindl. *Orkid* (Mal.), epiphytic, on limestone summit and shoulders. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.30.3 ***Dendrobium anosmum*** Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.4 ***Dendrobium attenuatum*** Lindl. Epiphyte, lowland kerangas forest. Recorded from Bt. Tambi, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.5 ***Dendrobium bifarium*** Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.30.6 ***Dendrobium capitellatum*** J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. Single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.30.7 ***Dendrobium compressum*** Lindl. [synonym: *Dendrobium lamellatum auct. non* Bl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.30.8 ***Dendrobium concinnum*** Miq. [synonym: *Dendrobium atropurpureum* auct. non (Bl.) Miq.; *D. carnosum* (Bl.) Rchb. *f.*]. Epiphyte, lowland, secondary forest, mangrove and sometimes on limestone hills. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.30.9 ***Dendrobium crumenatum*** Sw. *Pigeon orchid, Tepasik* (Mel.), epiphytic on tree. Common throughout Sarawak in opened space.

23.30.10 ***Dendrobium cumulatum*** Lindl. Epiphyte, lowland to hill forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.30.11 ***Dendrobium derryi*** Ridl. [synonym: *Dendrobium cinereum* J.J. Sm.; *D. groeneveldtii* J.J. Sm.]. Epiphyte, hill forest on ridges. Recorded from Gn. Serapi, Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.12 ***Dendrobium erosum*** (Bl.) Lindl. [synonym: *Pedilonum erosum* Bl.]. Epiphyte, hill forest, wet kerangas forest to lower montane forest, elev. 500 – 1600 m. Recorded from Gn. Silantek, Klingkang Range FR. **Note**: protected under Wildlife Protection Ordinance.

23.30.13 ***Dendrobium flexile*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.30.14 ***Dendrobium gracile*** (Bl.) Lindl. [synonym: *Onychium gracile* Bl.]. Epiphyte, lowland to lower montane mossy forest, elev. 10 – 1700 m. Recorded from Gn. Pueh, Matang, and elsewhere scattered throughout the State. **Note**: protected under Wildlife Protection Ordinance.

23.30.15 ***Dendrobium gramineum*** Ridl. Epiphyte, lowland MDF, Recorded from Matang (known only from the type). **Note**: protected under Wildlife Protection Ordinance.

23.30.16 ***Dendrobium hendersonii*** A.D. Hawkes & A.H. Heller. [synonym: *Dendrobium fugax* Schltr.]. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.30.17 ***Dendrobium hosei*** Ridl. [synonym: *Dendrobium multicostatum* J.J. Sm.; *D. hosei* Ridl. var. *pelor* Carr]. Epiphyte on tree trunks, lowland MDF, riverine and limestone. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.30.18 ***Dendrobium indivisum*** (Bl.) Miq. var. ***indivisum*** [synonym: *Aporum indivisum* Bl.; *Dendrobium eulophotum* Lindl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from mangrove and kerangas forests. **Note**: protected under Wildlife Protection Ordinance.

23.30.19 ***Dendrobium indragiriensis*** Schltr. [synonym: *Dendrobium inconspicuiflorum* J.J. Sm.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from mangrove and MDF. **Note**: protected under Wildlife Protection Ordinance.

23.30.20 ***Dendrobium kentrophyllum*** Hook. *f.* *Orkid* (Mal.), epiphytic, on limestone summit. New record for Bau limestone areas. Also recorded from PSF. **Note**: protected under Wildlife Protection Ordinance.

23.30.21 ***Dendrobium lamellatum*** (Bl.) Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill, occasional in wet areas. **Note**: protected under Wildlife Protection Ordinance.

23.30.22 ***Dendrobium lamelluliferum*** J.J. Sm. Epiphyte, lower montane mossy forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.30.23 ***Dendrobium leonis*** (Lindl.) Rchb. *f.* [synonym: *Aporum leonis* Lindl.]. *Orkid* (Mal.), lithophytic or epiphytic, lowland limestone hill. Also recorded from lower mossy forest. **Note**: protected under Wildlife Protection Ordinance.

23.30.24 ***Dendrobium lobatum*** (Bl.) Miq. [synonym: *Aporum lobatum* Bl.]. Epiphyte, lowland MDF and kerangas forest. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.30.25 ***Dendrobium lobbii*** Teijsm. & Binn. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from MDF, kerangas, riparian and lower mossy forests, at elevation 100 – 1000 m. **Note**: protected under Wildlife Protection Ordinance.

23.30.26 ***Dendrobium lobolatum*** Rolfe & J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.30.27 ***Dendrobium microglaphys*** Rchb. f. [synonym: *Dendrobium callibotrys* Ridl.]. Epiphyte, lowland forest, sometimes kerangas forest, elev. 50 m. **Note**: protected under Wildlife Protection Ordinance.

23.30.28 ***Dendrobium orbiculare*** J.J. Sm. [synonym: *Dendrobium fuscopilosum* Ames & C. Schweinf.]. Epiphyte/terrestrial, lower montane forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.30.29 ***Dendrobium osmophytopsis*** Kraenzl. Epiphyte, hill forest. Recorded from Gn. Matang (known only from the type). **Note**: protected under Wildlife Protection Ordinance.

23.30.30 ***Dendrobium pachyglossum*** C.S.P. Parish & Rchb. *f.* [synonym: *Desmostrichum pusillum* Bl.; *Dendrobium pumilum* Roxb.; *D. borneense* Finet]. Epiphyte, lowland forest. Recorded from Telok Pandan, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.31 ***Dendrobium panduriferum*** Hook. f. *Orkid* (Mal.), epiphytic, lowland limestone hill, occasional in wet areas, near streams. **Note**: protected under Wildlife Protection Ordinance.

23.30.32 ***Dendrobium pinifolium*** Ridl. [synonym: *Dendrobium squarrosum* J.J. Sm.]. Epiphyte, lowlands, sometime on limestone hills. Recorded from Gn. Serapi, Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.33 ***Dendrobium plicatile*** Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.30.34 ***Dendrobium prostratum*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.30.35 ***Dendrobium rhodostele*** Ridl. *Orkid* (Mal.), epiphytic, on limestone hill. Single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.30.36 ***Dendrobium rosellum*** Ridl. *Orkid* (Mal.), epiphytic, on limestone hill. Widely recorded from mangrove, MDF, kerangas and hill forests at 10 – 600 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.30.37 ***Dendrobium salaccense*** (Bl.) Lindl. [synonym: *Dendrobium gemellumm* auct. non Lindl.; *Grastidium salaccense* Bl.]. Epiphyte, lowland limestone hills. Recorded from Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.30.38 ***Dendrobium sanguinolentum*** Lindl. [synonym: *Dendrobium cerinum* Rchb. *f.*]. Epiphyte, lowland to hill forest. Recorded from Gn. Lundu. **Note**: protected under Wildlife Protection Ordinance.

23.30.39 ***Dendrobium secundum*** (Bl.) Lindl. *Orkid* (Mal.), epiphytic, common in Dered Krian NP. Also common throughout Sarawak in various habitats. **Note**: protected under Wildlife Protection Ordinance.

23.30.40 ***Dendrobium singaporense*** Hawkers & Heller [synonym: *Dendrobium teres* Lindl.]. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.30.41 ***Dendrobium sinuatum*** (Lindl.) Lindl. *ex* Rchb. *f.* [synonym: *Aporum sinuatum* Lindl.] *Orkid* (Mal.), epiphytic, on limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.30.42 ***Dendrobium spurium*** (Bl.) J.J. Sm. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.30.43 ***Dendrobium truncatum*** Lindl. *Orkid* (Mal.), epiphytic, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.30.44 ***Dendrobium uniflorum*** Griff. [synonym: *Dendrobium quadrisulcatum* J.J. Sm.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from lower montane mossy forest, at 30 – 1800 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.30.45 ***Dendrobium villosulum*** Wall. ex. Lindl. [synonym: *Dendrobium melanochlamys* Holttum]. Epiphyte/terrestrial, hill forest on ridges. Recorded from Gn. Serapi, Kubah NP and Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.30.46 ***Dendrobium xiphophyllum*** Schltr. Epiphyte, hill to lower montane forest. Recorded from Gn. Matang (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.31.1 ***Dendrochilum globigerum*** (Ridl.) J.J. Sm. [synonym: *Dendrochilum minimum* (Ridl.) Ames; *D. minus* (Ridl.) Ames]. Epiphyte, hill forest on ridges. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.31.2 ***Dendrochilum gracile*** (Hook.*f.*) J.J. Sm. var. *gracile*. [synonym: *Dendrochilum lyriforme* J.J. Sm.; *D. tardum* J.J. Sm.]. Epiphyte, wet kerangas forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.31.3 ***Dendrochilum havilandii*** Pfitzer [synonym: *Dendrochilum hewittii* J.J. Sm.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance; endemic to Sarawak.

23.31.4 ***Dendrochilum kingii*** (Hook. *f.*) J.J. Sm. var. *kingii.* [synonym: *Dendochilum sarawakense* (Ridl.) J.J. Sm.; *D. palawanense* Ames; *D. bicallosum* J.J. Sm.]. Epiphyte, lowland MDF, kerangas and hill forest. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.31.5 ***Dendrochilum lacteum*** Carr. Epiphyte, lower montane forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.31.6 ***Dendrochilum mucronatum*** J.J. Sm. Epiphyte, lower montane mossy forest. Recorded from Gn. Pueh (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.31.7 ***Dendrochilum muluense*** J.J. Wood. *Orkid* (Mal.), epiphytic, on limestone summit. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.31.8 ***Dendrochilum ochralabium*** J.J. Wood. *Orkid* (Mal.), epiphytic, on limestone summit. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.31.9 ***Dendrochilum pallidiflavens*** Bl. var. ***pallidiflavens***. [synonym: *Dendrochilum conopseum* Ridl.; *D. intermedium* Ridl.; *D. ridleyi* Ames]. Epiphyte, lowland MDF, limestone, sandstone, kerangas and lower montane forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.42.9 ***Dendrolirium ornatum*** Bl. [synonym: *Eria ornata* (Bl.) Lindl.; *Eria armeniaca* Lindl.; *Pinalia ornata* (Bl.) Kuntze]. *Orkid* (Mal.), epiphytic, lowland limestone hill, at elevations 100 – 1800 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.33.1 ***Didymoplexiella borneensis*** (Schltr.) Garay [synonym: *Leucolaena borneensis* Schltr.]. Saprophyte, hill forest on ridges. Recorded from Gn. Matang (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.34.1 ***Dienia ophrydis*** (J. Koenig) Siendef. [synonym: *Epidendrum ophrydis* J. Koenig; *Gastroglottis montana* Bl.; *Malaxis ophrydis* (J. Koenig) Ormerod; *Crepidium ophrydis* (J. Koenig) M.A. Clen & D.L. Jones]. *Orkid tanah* (Mal.), terrestrial, peat swamp and secondary forest. **Note**: protected under Wildlife Protection Ordinance. New record for Sarawak.

23.35.1 ***Dimorphorchis lowii*** (Lindl.) Rolfe var. ***lowii*** [synonym: *Vanda lowii* Lindl.; *Renanthera lowii* (Lindl.) Rchb. *f.*; *Arachnis lowii* (Lindl.) Rchb. *f.*] *Orkid* (Mal.), epiphytic, lowland limestone hill, on summits and shoulders. Rare due to overcollected. **Note**: protected under Wildlife Protection Ordinance.

23.36.6 ***Diplocaulobium brevicolle*** (J.J. Sm.) Kraenzl. [synonym: *Dendrobium brevicolle* J.J. Sm.]. epiphytic on tree trunks, lowland MDF, elevation 50 – 700 m above sea level.

23.37.1 ***Dipodium pictum*** (Lindl.) Rchb. *f.* [synonym: *Wailesia picta* Lindl.] *Orkid* (Mal.), epiphytic on tree trunks and branches, at the base of limestone hill. Also recorded from PSF, MDF, kerangas, secondary and riparian forest, throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.38.1 ***Dossinia marmorata*** E. Morren. *Orkid batik ular* (Bid.), terrestrial or lithophyte, frequently on thick humus in limestone pockets. **Note**: protected under Wildlife Protection Ordinance; medicinal plant (antidote).

23.39.1 ***Dyakia hendersoniana*** (Rchb. *f.*) Christenson [synonym: *Saccolabium hendersonianum* Rchb. f.; *Ascocentrum hendersonianum* (Rchb. f.) Schltr.]. Epiphyte, lowland hill forest. Recorded from Gn. Matang. Endemic to Borneo. **Note**: protected under Wildlife Protection Ordinance.

23.40.1 ***Epigeneium kinabaluense*** (Ridl.) Summerh. [synonym: *Dendrobium kinabaluense* Ridl.; *Sarcopodium kinabaluense* (Ridl.) Rolfe; *Epigeneium suberectum* (Ridl.) Summerh.]. Epiphyte/terrestrial, hill to lower montane forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.40.2 ***Epigeneium radicosum*** (Rild.) Summerh. [synonym: *Dendrobium radicosum* Ridl.; *Sarcopodium radicosum* (Ridl.) Rolfe]. Epiphyte, lowland to lower montane mossy forest. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.40.3 ***Epigeneium treacherianum*** (Rchb. *f. ex* Hook. *f.*) Summerh. [synonym: *Dendrobium treacherianum* Rchb. *f. ex* Hook. *f.*; *Sarcopodium treacherianum* (Rchb. *f. ex* Hook. *f.*) Rolfe]. Epiphyte, lowland ridge forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.41.1 ***Epipogium roseum*** (D. Don) Lindl. [synonym: *Limodorum roseum* D. Don]. *Orkid tanah* (Mal.), mycoheterotroph, on thick humus, limestone pockets. Also recorded from MDF at 600 m elevation. **Note**: protected under Wildlife Protection Ordinance.

23.42.1 ***Eria densa*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.42.2 ***Eria discolor*** Lindl. *Orkid* (Mal.), epiphytic on limestone hill. Also recorded from PSF. **Note**: protected under Wildlife Protection Ordinance.

23.42.3 ***Eria iridifolia*** Hook.*f. Orkid* (Mal.), epiphytic, on limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.42.4 ***Eria javanica*** (Sw.) Bl. [synonym: *Dendrobium javanicum* Sw.; *Eria striolata* Rchb.*f.*] *Orkid* (Mal.), epiphytic, on limestone hill. New record for Bau limestone areas. Also recorded from PSF, MDF and lower mossy forests. **Note**: protected under Wildlife Protection Ordinance.

23.42.5 ***Eria jenseniana*** J.J. Sm. *Orkid* (Mal.), epiphytic, on limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.42.6 ***Eria leptocarpa*** Hook. f. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.42.7 ***Eria melaleuca*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from MDF, frequently on the riverine. **Note**: protected under Wildlife Protection Ordinance.

23.42.8 ***Eria nutans*** Lindl. *Orkid* (Mal.), epiphytic, on limestone summit. **Note**: protected under Wildlife Protection Ordinance.

23.42.9 ***Eria pulchella*** Lindl. [synonym: *Tylostylis rigida auct. non* Bl.; *Tylostylis pulchella* (Bl.) Ridl.] *Orkid* (Mal.), epiphytic, on limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.42.10 ***Eria rigida*** Bl. [synonym: *Eria elongata* Bl.; *Eria pendula* Ridl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill, single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.42.11 ***Eria saccifera*** Hook.*f.* [*Eria brookesii* Ridl.; *Eria saccata* Ridl.]. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.42.12 ***Eria tenuiflora*** Ridl. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.42.13 ***Eria tricallosa*** J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.42.14 ***Eria xanthochiela*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill, single record from Gn. Bidi. Also recorded from MDF and lower mossy forest, at 100 – 1600 m elevations. **Note**: protected under Wildlife Protection Ordinance.

23.43.1 ***Erythrorchis altissima*** (Bl.) Bl. [synonym: *Cyrtosia altissima* Bl.; *Galeola altissima* (Bl.) Rchb. *f.*]. Saprophyte, lowland MDF, peat swamp. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.44.1 ***Eulophia graminea*** Lindl. [synonym: *Eulophia decipiens* Kurz; *E. inconspicua* Griff.; *E. sinensis* Miq.; *E. venusta* Schltr.; *Graphorkis graminea* (Lindl.) Kuntze]. *Orkid bawang hutan* (Mal.), *Hantu bawang* (Mal.), *Kaling lilin* (Mal.). Terrestrial, secondary forests, open spaces by the roadside, 30 – 200 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.44.2 ***Eulophia spectabilis*** (Dennst.) Suresh [synonym: *Wolfia spectabilis* Dennst.; *Eulophia nuda* Lindl.; *E. squalida* Lindl.]. Terrestrial, lowland MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.45.1 ***Flingkingeria bancana*** (J.J. Sm.) A.D. Hawkes [synonym: *Dendrobium bancanum* J.J. Sm.]. Epiphyte, lowland, kerangas and limestone hills. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.45.2 ***Flingkingeria bicostata*** (J.J. Sm.) A.D. Hawkes [synonym: *Dendrobium bicostatum* J.J. Sm.; *D. mattangianum* Kraenzl.; *Desmotrichum bicostatum* (J.J. Sm.) kraenzl.]. Epiphyte, lowland, kerangas forest. Recorded from Lundu and Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.45.3 ***Flickingeria convexa*** (Bl.) A.D. Hawkes. *Orkid* (Mal.), epiphytic or lithophytic, on limestone summit. **Note**: protected under Wildlife Protection Ordinance.

23.45.4 ***Flingkingeria crenicristata*** (Ridl.) J.J. Wood. [synonym: *Dendrobium crenicristatum* Ridl.; *Ephemerantha crenicristata* (Ridl.) P.F. Hunt & Summerh.]. Epiphyte/terrestrial, lowland MDF and limestone hills. Recorded from Dered Krian NP and Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.45.5 ***Flickingeria fimbriata*** (Bl.) A.D. Hawkes, *Orkid* (Mal.), epiphytic of tree trunks or lithophytic on rock surfaces, on limestone hills. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance. [*transferred to genus Eria current classification*].

23.45.6 ***Flickingeria luxurians*** (J.J. Smith) A.D. Hawkes. *Orkid* (Mal.), epipyte of tree trunks or lithophyte on rock surfaces, on slopes. **Note**: protected under Wildlife Protection Ordinance. [*transferred to genus* Eria – *current classification*].

23.45.7 ***Flickingeria scopa*** (Lindl.) F.G. Brieger [synonym: *Dendrobium scopa* Lindl.]. Epiphyte, lowland limestone hills. Recorded from Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.46.1 ***Galeola nudifolia*** Lour. [synonym: *Erythrorchis kuhlii* Rchb. f.; *Galeola hydra* Rchb. f.; *G. kuhlii* (Rchb. f.) Rchb. f.]. Saprophyte, lowland MDF. Recorded from Bungo Range NP.

23.47.1 ***Geesinkorchis alaticallosa*** de Vogel. Epiphyte on tree trunks or terrestrial, lowland to lower montane forest. Recorded from Bungo Range NP. Endemic to Borneo. **Note**: protected under Wildlife Protection Ordinance.

23.47.2 ***Geesinkorchis phaiostele*** (Ridl.) de Vogel. [synonym: *Coelogyne ridleyana* Schltr.; *C. phaiostele* Ridl.; *Pholidota triloba* J.J. Sm.]. Terrestrial/epiphyte, hill forest on ridges. Recorded from Gn. Santubong (type loaclity) and Gn. Pueh. Endemic to Borneo. **Note**: protected under Wildlife Protection Ordinance.

23.48.1 ***Grammatophyllum speciosum*** Bl. *Orkid harimau* (Mal.), epiphytic, lowland limestone hill. Common throughout Sarawak in various habitats. **Note**: protected under Wildlife Protection Ordinance.

23.49.1 ***Habenaria damaiensis*** J.J. Sm. Terrestrial, lowland MDF. Recorded from Santubong (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.49.2 ***Habenaria elatius*** Ridl. Terrestrial, lowland MDF and limestone hills. Recorded from Bungo Range NP (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.49.3 ***Habenaria lobbii*** Ridl. *Orkid* (Mal.), terrestrial herb to 30 cm tall, on thick humus on the limestone pockets and boulder. **Note**: protected under Wildlife Protection Ordinance.

23.50.1 ***Hetaeria alta*** Ridl. [synonym: *Hetaeria alba* Ridl.]. *Orkid tanah* (Mal.), terrestrial, lowlands, MDF, kerangas and secondary forests. **Note**: protected under Wildlife Protection Ordinance. New record to Sarawak.

23.50.2 ***Hetaeria obliqua*** Bl. Terrestrial, lowland MDF. Recorded from Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.51.1 ***Hippeophyllum scortechinii*** (Hook. *f.*) Schltr. [synonym: *Oberonia scortechinii* Hook. *f.*]. *Orkid* (Mal.), epiphytic, on limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.52.1 ***Hylophila mollis*** Lindl. Terrestrial, lowland kerangas forest. Recorded from Bt. Keruing, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.53.1 ***Lecanorchis malaccensis*** Rild. Saprophyte, lowland MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.53.2 ***Lecanorchis multiflora*** J.J. Sm. *Orkid tanah* (Mal.), mycoheterotroph, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.54.1 ***Lepidogyne longifolia*** (Bl.) Bl. [synonym: *Neottia longifolia* Bl.]. Terrestrial, hill MDF. Recorded from Gn. Serapi, Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.55.1 ***Liparis brooksii*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. Known only from the type (*Brooks s.n.* Gn. Bidi). **Note**: protected under Wildlife Protection Ordinance.

23.55.2 ***Liparis caespitosa*** (Thouars) Lindl. [synonym: *Malaxis caespitosa* Thouars]. Epiphyte, lowland MDF to lower montane forest. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.55.3 ***Liparis compressa*** (Bl.) Lindl. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from MDF and lower mossy forest. **Note**: protected under Wildlife Protection Ordinance.

23.55.4 ***Liparis condylobulbon*** Rchb. *f.* [synonym: *Liparis confusa* J.J. Sm.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.55.5 ***Liparis elegans*** Lindl. [synonym: *Liparis stricta* J.J. Sm.]. *Orkid* (Mal.), epiphytic, rarely terrestrial, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.55.6 ***Liparis gibbosa*** Finet. [synonym: *Liparis disticha auct. non* (Thouars) Lindl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from MDF and lower montane at elevation 100 – 1600 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.55.7 ***Liparis lacerata*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded in PSF and MDF. **Note**: protected under Wildlife Protection Ordinance.

23.55.8 ***Liparis lobongensis*** Ames. *Orchid* (Mal.) epiphytic on tree trunks or lithophytic on rock surfaces. Recorded from two limestone hills, Gn. Batu Payung and Gn. Jebong. **Note**: protected under Wildlife Protection Ordinance.

23.55.9 ***Liparis rhombea*** J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.55.10 ***Liparis terretris*** J.B. Comber. *Orkid* (Mal.), epiphytic, lowland limestone hill, single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.55.11 ***Liparis tricallosa*** Rchb. *f. Orkid* (Mal.), epiphytic, lowland limestone hill. Also recorded from PSF. **Note**: protected under Wildlife Protection Ordinance.

23.56.1 ***Macodes petola*** (Bl.) Lindl. [synonym: *Neottia petola* Bl.]. Terrestrial, wet cliffs, gullies and valleys. Recorded from Gn. Pueh and Sabal FR. **Note**: protected under Wildlife Protection Ordinance.

23.57.1 ***Malaxis clemensii*** (J.J. Sm.) J.J. Wood [synonym: *Microstylis clemensii* J.J. Sm.]. Terrestrial, lowland MDF and limestone hills. Recorded from Dered Krian NP (Bidi – type loaclity). **Note**: protected under Wildlife Protection Ordinance.

23.57.2 ***Malaxis commelinifolia*** (Zoll. & E. Morren) Kuntze. *Orkid tanah* (Mal.), terrestrial herb, on thick humus or leaf litters, on limestone summits and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.57.3 ***Malaxis lowii*** (E. Morren) Ames. *Orkid tanah* (Mal.), terrestrial herb, occasional on damp and wet soil, at the base of limestone, in limestone pockets on the slopes and limestone summits. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.57.4 ***Malaxis metallica*** (Rchb. *f.*) Kuntze. *Orkid tanah* (Mal.), terrestrial herb, on thick humus, limestone slopes and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.57.5 ***Malaxis micrantha*** (Hook. f.) Kuntze [synonym: *Microstylis micrantha* Hook. f.; *Crepidium micrantha* (Hook. f.) Szlach.] *Orkid* (Mal.), terrestrial, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.57.1 ***Malleola dentifera*** J.J. Sm. Epiphyte on tree trunk, lowland MDF to lower montane forest. Recorded from Kpg Biawak and Kpg Rengas, also Gn Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.58.1 ***Micropera callosa*** (Bl.) Garay [synonym: *Camarotis callosa* (Bl.) J.J. Sm.; *Cleisostoma callosum* Bl.; *Sarcanthus callosus* (Bl.) Rchb. *f.*]. Epiphytic on tree trunks or branches. Lowland MDF, kerangas, limestone and swampy areas, common species from 30 – 600 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.59.1 ***Mischobulbum scapigerum*** (Hook. *f.*) Schltr. [synonym: *Nephelaphyllum scapigerum* Hook. *f.*; *Tainia scapigerum* (Hook. *f.*) J.J. Sm.]. Terrestrial, occasionally near riverine. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.60.1 ***Nephelaphyllum beccarii*** Schltr. [synonym: *Tania beccarii* (Schltr.) Gagnep.]. Terrestrial, lowland MDF, on ridges. Recorded from Bungo Range NP (type – Gn Singai, Bau). **Note**: protected under Wildlife Protection Ordinance.

23.60.2 ***Nephelaphyllum pulchrum*** Bl. *Orkid tanah* (Mal.), *Cloudy orchid,* terrestrial herb, at the base of limestone hill. **Note**: also recorded from various habitats throughout Sarawak; protected under Wildlife Protection Ordinance.

23.60.3 ***Nephelaphyllum tenuiflorum*** Bl. [synonym: *Tania tenuiflora* (Bl.) Gagnep.] *Cloudy orchid, Orkid tanah* (Mal.), terrestrial, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.61.1 ***Nervilia aragoana*** Gaud. *Orkid tanah* (Mal.), terrestrial, singled-leaf herb, at the base of limestone hills. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.61.2 ***Nervilia borneensis*** (J.J. Sm.) Schltr. [*Pogonia borneensis* J.J. Sm.]. Terrestrial, hill forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.61.3 ***Nervilia calcicola*** Kerr. *Orkid tanah* (Mal.), terrestrial, singled-leaf herb, at the base of limestone hills, boulders and on thick humus of limestone pockets. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.61.4 ***Nervilia dilatata*** (Bl.) Schltr. [*Pogonia dilatata* Bl.] Terrestrial, lowland MDF to lower mossy forest, also on limestone hills. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.61.5 ***Nervilia plicata*** (Andrews) Schltr. *Orkid tanah* (Mal.), terrestrial, singled-leaf herb, on wet soils at the base of limestone hills. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.62.1 ***Neuwiedia borneensis*** de Vogel. *Orkid tanah* (Mal.), terrestrial herb, to 1 m tall, at the base of limestone hills. **Note**: also recorded from MDF, kerangas and secondary forests; protected under Wildlife Protection Ordinance.

23.62.2 ***Neuwiedia veratrifolia*** Bl. *Orkid tanah* (Mal.), terrestrial herb, to 1 – 1.5 m tall, at the base of limestone hills. **Note**: also recorded from MDF, kerangas and secondary forests; protected under Wildlife Protection Ordinance.

23.63.1 ***Oberonia ciliolata*** Hook. *f. Orkid* (Mal.), epiphyte of tree trunks or branches, on limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.63.2 ***Oberonia insectifera*** Hook. *f. Orkid* (Mal.), epiphyte of tree trunks or branches, on limestone summits. **Note**: protected under Wildlife Protection Ordinance.

23.63.3 ***Oberonia rosea*** Hook. *f. Orkid* (Mal.), epiphyte of tree trunks or branches, on limestone summits and slopes. **Note**: protected under Wildlife Protection Ordinance.

23.63.4 ***Oberonia sarawakensis*** Schltr. Epiphyte, hill forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance. Known only from the type specimen.

23.63.5 ***Oberonia transversiloba*** Holtt. *Orkid* (Mal.), epiphyte of tree trunks or branches, on limestone hills. **Note**: also recorded from another habitat; protected under Wildlife Protection Ordinance.

23.64.1 ***Paphiopedilum bullenianum*** (Rchb. *f.*) Pfitzer. *Slipper orchid,* terrestrial on thick humus, on limestone summits and shoulders. Single record from limestone hill in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.64.2 ***Paphiopedilum hookerae*** (Rchb. *f.*) Stein var. ***hookerae***. *Slipper orchid,* terrestrial, on thick humus, limestone pockets, slopes at elevation more than 150 m above sea level. **Note**: protected under Wildlife Protection Ordinance; recorded from only single location in Bau limestone area.

23.64.3 ***Paphiopedilum lowii*** (Lindl.) Stein. *Slipper orchid,* epiphytic on tree trunks or branches, on summit of limestone hills. **Note**: protected under Wildlife Protection Ordinance; also recorded from MDF and riparian forest throughout Sarawak (rare).

23.64.4 ***Paphiopedilum stonei*** (Hook. *f.*) Stein. *Slipper orchid,* terrestrial or lithophyte on rock surfaces, on vertical cliffs, on limestone pocket with thick humus. **Note**: protected under Wildlife Protection Ordinance; endemic to limestone areas of western Sarawak.

23.65.1 ***Peristylus hallieri*** J.J. Sm. [synonym: *Habenaria hallieri* (J.J. Sm.) Schltr.]. Terrestrial, lowland MDF to hill, sometimes riverine. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.65.2 ***Peristylus lacertifer*** (Lindl.) J.J. Sm. [synonym: *Coeloglossum lacertiferum* Lindl.; *Habenaria lacertiferus* (Lindl.) J.J. Sm.] *Orkid tanah* (Mal.), terrestrial, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.65.3 ***Peristylus maingayi*** (King & Pantl.) J.J. Wood & Ormerod. [synonym: *Habenaria maingayi* King & Pantl.; *Peristylus candidus* J.J. Sm.]. *Orkid tanah* (Mal.), terrestrial, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.66.1 ***Phauis flavus*** (Bl.) Lindl. [synonym: *Limodorum flavum* Bl.; *Phaius crispus* Bl.; *P. platychilus* Rchb. *f.*; *P. indigoferus* Rchb. *f.*; *P. maculatus* Lindl.; *P. flexus* Bl.]. Terrestrial, lowland MDF. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.67.1 ***Phalaenopsis bellina*** (Rchb. *f.*) Christenson. *Orkid normah* (Mal.), epiphyte on tree trunks or branches, on summit of limestone hills. **Note**: protected under Wildlife Protection Ordinance; also recorded in MDF, kerangas and riparian forests in western Sarawak (rare).

23.67.2 ***Phalaenopsis cornucervi*** (Breda) Bl. & Rchb. *f. Moth orchid,* epiphyte on tree trunks and branches. Common in the Dered Krian NP, from bases to summits of limestone hills.

23.67.1 ***Phaleonopsis delicosa*** Rchb. *f.* [synonym: *Kingidium deliciosum* (Rchb. *f.*) Sweet.]. *Orkid* (Mal.), epiphytic on tree trunks and branches, at the base of limestone hills. Two records, from Gn. Pambor and Gn. Batu Payong. **Note**: protected under Wildlife Protection Ordinance.

23.67.3 ***Phalaenopsis maculata*** Rchb. *f. Moth orchid,* terrestrial or lithophytic, rarely epiphyte, on limestone slopes and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.68.1 ***Pholidota carnea*** (Bl.) Lindl. var. ***carnea*** [synonym: *Crinonia carnea* Bl.; *Pholidota elisabethiana* Ridl.; *Crinonia elisabethiana* (Ridl.) Ridl.] Epiphyte, secondary hill forest to lower montane forest. Recorded from Gn. Pueh and Gn Berumput. **Note**: protected under Wildlife Protection Ordinance.

23.68.2 ***Pholidota imbricata*** Hook. *f. Orkid* (Mal.), epiphytic, common in Dered Krian National Park, from bases to summits. **Note**: protected under Wildlife Protection Ordinance.

23.68.3 ***Pholidota longubulba*** Holtt. *Orkid* (Mal.), epiphytic or lithophytic, on limestone summit. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.69.1 ***Phreatia plantaginifolia*** (J. Koenig) Ormerod. [synonym: *Epidendrum plantaginifolia* J. Koenig; *Phreatia secunda* (Bl.) Lindl.; *Phreatia minutiflora* Lindl.]. *Orkid* (Mal.), epiphytic or lithophytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.70.1 ***Plocoglottis acuminata*** Bl. *Orkid* (Mal.), terrestrial herb, at the base of limestone hills, common in Bau limestone areas. Also recorded from MDF, throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.70.2 ***Plocoglottis borneensis*** Ridl. *Orkid* (Mal.), terrestrial herb, on limestone boulders and screes. **Note**: protected under Wildlife Protection Ordinance.

23.70.3 ***Plocoglottis hirta*** Ridl. *Orkid* (Mal.), terrestrial herb, on limestone boulders and crevices. **Note**: protected under Wildlife Protection Ordinance.

23.70.4 ***Plocoglottis lowii*** Rchb. *f. Orkid* (Mal.), terrestrial herb or lithophyte on rock surface, on limestone boulders. Rare in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.71.1 ***Podochilus cucullatus*** J.J. Sm. Epiphyte/lithophyte, hill to lower montane forest. Recorded from Gn. Pueh (type locality). **Note**: protected under Wildlife Protection Ordinance.

23.71.2 ***Podochilus lucescens*** Bl. *Orkid* (Mal.), epiphytic or lithophytic, at the base of limestone hill. Common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.71.3 ***Podochilus marsupialis*** Schltr. Epiphyte, hill MDF forest. Recorded from Gn. Silantek, (Klingkang Range FR – type locality). **Note**: protected under Wildlife Protection Ordinance.

23.71.4 ***Podochilus microphyllus*** Lindl. *Orkid* (Mal.), lithophytic on the rock surface. **Note**: protected under Wildlife Protection Ordinance.

23.71.5 ***Podochilus muricatus*** (Teijsm. & Binn.) Schltr. *Orkid* (Mal.), epiphytic or lithophytic, on the limestone boulders and slopes. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.71.6 ***Podochilus sciuroides*** Rchb. *f. Orkid* (Mal.), epiphytic or lithophytic, on limestone summit. **Note**: protected under Wildlife Protection Ordinance.

23.71.7 ***Podochilus serpyllifolius*** (Bl.) Lindl. [synonym: *Cryptoglottis serpyllifolius* Bl.]. Tufted or climbing epiphyte, hill to lower montane forest. Recorded from Gn. Berumput. **Note**: protected under Wildlife Protection Ordinance.

23.72.1 ***Pomatocalpa diffusum*** Breda. Epiphytic on trees, lowland MDF, kerangas, secondary forest, from 30 – 800 m above sea level. **Note**: protected under Wildlife Protection Ordinance.

23.72.1 ***Pomatocalpa kunstleri*** (Hook.*f.*) J.J. Sm. [synonym: *Cleisostoma kunstleri* Hook. f.; *Saccolabium pubescens* Ridl.]. *Orkid* (Mal.), epiphytic or lithophytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.73.1 ***Pristiglottis hydrocephala*** J.J. Sm. Terrestrial, lowland MDF to lower mossy forest. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.74.1 ***Pteroceras cladostachyum*** (Hook. *f.*) H. Ae. Peders. Epiphyte, hill MDF to lower mossy forest. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.74.2 ***Pteroceras fragrans*** (Ridl.) Garay [synonym: *Sarcochilus fragrans* Ridl.; *Sarcochilus spathipetalus* J.J. Sm.]. *Orkid* (Mal.), epiphytic, on limestone summit. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.74.3 ***Pteroceras teres*** (Bl.) Holttum [*Dendrocolla teres* Bl.; *Thrixspermum teres* (Bl.) Rchb. f.; *Sarcochilus suaveolens* (Roxb.) Hook. f.]. Epiphyte, lowland MDF, sometimes riverine and hill kerangas. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.75.1 ***Renanthera auyongii*** Christenson [synonym: *Renantherella histrionica* (Rchb. *f.*) Ridl.]. Epiphyte on tree, lowland MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance. Endemic to Sarawak.

23.75.2 ***Renanthera elongata*** (Bl.) Lindl. [synonym: *Aerides elongatum* Bl.; *Saccolabium reflexum* Lindl.; *Renanthera micrantha* Bl.]. *Orchid* (Mal.), epiphytic on tree, at the base of limestone hills. Common in the Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.76.1 ***Robiquetia crassa*** (Ridl.) Schltr. [synonym: *Saccolabium crissum* Ridl.]. Epiphyte, lowland, sometimes on limestone. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.76.2 ***Robiquetia spatulata*** (Bl.) J.J. Smith. *Orchid* (Mal.), epiphytic on tree, in deeply shaded areas, near to the streams. Common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.77.1 ***Sarcoglyphis fimbriatus*** (Ridl.) Garay. [synonym: *Saccolabium fimbriatum* Ridl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.78.1 ***Schoenorchis micrantha*** Bl. [synonym: *Saccolabium perpusillum* Hook. *f.*]. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.78.2 ***Schoenorchis paniculata*** Bl. [synonym: *Saccolabium ramulosum* Lindl.]. *Orkid* (Mal.), epiphytic, on limestone summit. **Note**: protected under Wildlife Protection Ordinance.

23.79.1 ***Spathoglottis aurea*** Lindl. [synonym: *Spathoglottis wrayi* Hook. *f.*]. Terrestrial, lowland MDF, sometimes riverine. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.79.3 ***Spathoglottis chrysantha*** Ames. Terrestrial, kerangas forest. Recorded from Bako NP. **Note**: protected under Wildlife Protection Ordinance. New Record for Sarawak.

23.79.2 ***Spathoglottis confusa*** J.J. Sm. Terrestrial, lowland kerangas forest, MDF up to lower montane forest. Recorded from Telok Assam (Bako NP) and Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.79.4 ***Spathoglottis microchilina*** Kraenzl. Terrestrial, lower mossy forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.79.5 ***Spathoglottis plicata*** Bl. *Orkid tanah,* terrestrial herb, on damp and wet soils, particularly exposed area near to the base of limestone hills. Also recorded from submontane forest, throughout Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.80.1 ***Strongyleria leiophylla*** (Lindl.) Schuit., Y.P. Ng & H.A. Pedersen. [synonym: *Eria leiophylla* Lindl.; *Ceratostylis pellita* Rchb. *f. ex* Hook. *f.*; *Pinalia biophylla* Kuntze; *Trichotosia leiophylla* (Lindl.) Kraenzl.] *Orkid* (Mal.), epiphytic, lowland limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.80.2 ***Strongyleria hirsutipetala*** (Ames) Schuit., Y.P. Ng & H.A. Pedersen. [synonym: *Eria hirsutipetala* Ames; *E. pseudoleiophylla* J.J. Wood.] *Orkid* (Mal.), epiphytic, on limestone summits and shouldes. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.81.1 ***Taeniophyllum filiforme*** J.J. Smith. *Ghost orchid,* leafless herb, epiphytic on tree trunks and branches, on limestone hills. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.81.2 ***Taeniophyllum stella*** Carr. *Ghost orchid,* leafless herb, epiphytic on tree branches, foothill of limestone. Single record from Gn. Tai Ton. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.82.1 ***Tania pauciflora*** (Breda) J.J. Sm. [synonym: *Octomeria pauciflorum* Breda; *Tania plicata* (Bl.) Lindl.] *Orkid tanah* (Mal.), terrestrial, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.82.2 ***Tania speciosa*** Bl. [synonym: *Mitopetalum speciosum* (Bl.) Bl.; *Eria specioca* (Bl.) Rchb. *f.*]. Terrestrial, hill MDF. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.83.1 ***Thecopus secunda*** (Ridl.) Seidenf. [synonym: *Thecostele secunda* Ridl.]. Epiphyte, lowland MDF, sometimes in kerangas forest. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.84.1 ***Thecostele alata*** (Roxb.) Parish & Rchb. *f.* [synonym: *Thecostele zollingeri* Rchb. *f.*; *Thecostele maculosa* Ridl.] *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.85.1 ***Thelasis borneensis*** Schltr. *Orkid* (Mal.), epiphytic, lowland limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.85.2 ***Thelasis carinata*** Bl. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.85.3 ***Thelasis cebolleta*** J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.85.4 ***Thelasis micrantha*** (Brongn.) J.J. Sm. [synonym: *Oxyanthera micrantha* Brongn.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. Common in Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.85.5 ***Thelasis pygmaea*** (Griff.) Bl. [synonym: *Euproboscis pygmaea* Griff.; *Thelasis triptera* Rchb. *f.*; *Thelasis elongata* Bl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.86.1 ***Thrixspermum amplexicaule*** (Bl.) Rchb. *f. Orkid* (Mal.), epiphyte on the tree branches, or scrambling. **Note**: common in the Bau limestone areas in various habitats. Protected under Wildlife Protection Ordinance.

23.86.2 ***Thrixspermum centipeda*** Lour. *Orkid* (Mal.), epiphyte on the tree branches. **Note**: common in the Bau limestone areas in various habitats. Protected under Wildlife Protection Ordinance.

23.86.3 ***Thrixspermum merguense*** (Hook. *f.*) Kuntze. *Orkid* (Mal.), epiphytic or scrambling epiphytic on tree, at the base of limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.86.4 ***Thrixspermum scopa*** (Rchb. *f. ex* Hook. *f.*) Holtt. *Orkid* (Mal.), epiphytic, on limestone summit. New record for Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.86.5 ***Thrixspermun tortum*** J.J. Sm. Epiphyte on tree trunk, lowland MDF. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.86.6 ***Thrixspermum trichoglottis*** (Hook. *f.*) Kuntze. *Orkid* (Mal.), epiphytic on tree. Common in Bau limestone hill areas. **Note**: protected under Wildlife Protection Ordinance.

23.87.1 ***Trichoglottis bipenicillata*** J.J. Sm. Epiphyte on tree trunk, lowland MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.87.2 ***Trichoglottis celebica*** Rolfe. Epiphyte, lowland limestone hills. Recorded from Bungo Range NP. **Note**: protected under Wildlife Protection Ordinance.

23.87.3 ***Trichoglottis germinata*** (T & B) J.J. Smith. *Orkid* (Mal.), epiphytic on tree, at the limestone summit and shoulders. **Note**: protected under Wildlife Protection Ordinance.

23.87.4 ***Trichoglottis javanica*** J.J. Sm. *Orkid* (Mal.), epiphytic, lowland limestone hill. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.87.5 ***Trichoglottis scapigera*** Ridl. *Orkid* (Mal.), epiphytic on tree, on limestone boulders, shoulders and summits. Common in many limestone hills in Bau limestone areas. New record for Sarawak. **Note**: protected under Wildlife Protection Ordinance.

23.87.6 ***Trichoglottis valida*** Ridl. *Orkid* (Mal.), epiphytic, lowland limestone hill, single record from Gn. Bidi. **Note**: protected under Wildlife Protection Ordinance.

23.87.7 ***Trichoglottis winkleri*** J.J. Smith var. ***minor*** J.J. Smith. *Orkid* (Mal.), epiphytic on tree. Rare in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.87.8 ***Trichoglottis zollingeriana*** (Kraenzl.) J.J. Sm. [synonym: *Cleisostoma zollingeriana* Kraenzl.]. *Orkid* (Mal.), epiphytic, lowland limestone hill. **Note**: protected under Wildlife Protection Ordinance.

23.88.1 ***Trichotosia aurea*** (Ridl.) Carr [synonym: *Eria aurea* Ridl.; *E. rhombilabris* J.J. Sm.] Epiphyte on tree trunk, lowland to mossy forest, also kerangas and MDF. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.88.2 ***Trichotosia ferox*** Bl. [synonym: *Eria ferox* (Bl.) Bl.; *E. pyrrhotricha* Ridl.; *Trichotosia pyrrhotricha* (Ridl.) Ridl.]. *Orkid bulu* (Mal.), epiphytic or lithophytic, on limestone summits and shoulders. Common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.88.3 ***Trichotosia gracilis*** (Hook. *f.*) Kraenzl. [synonym: *Eria gracilis* Hook. *f.*; *E. oligantha* Hook. *f.*]. Epiphyte, coastal lowland to hill mossy forest on ridges. Recorded from Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.88.4 ***Trichotosia lawiensis*** (J.J. Sm.) J.J. Wood [synonym: *Eria lawiensis* J.J. Sm.] Epiphyte, lowland to lower mossy forests, also on limestone. Recorded from Gn. Matang and Dered Krian NP. **Note**: protected under Wildlife Protection Ordinance.

23.88.5 ***Trichotosia poculata*** (Ridl.) Kraenzl. [*Eria poculata* Ridl.]. Epiphyte, hill to lower mossy forest. Recorded from Gn Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.88.6 ***Trichotosia rubiginosa*** (Bl.) Kranezl. [synonym: *Eria rubiginosa* Bl.]. Epiphyte on tree trunk, lowland MDF to lower mossy forest. Recorded from Gn. Pueh. **Note**: protected under Wildlife Protection Ordinance.

23.88.7 ***Trichotosia teysmannii*** (J.J. Sm.) Kraenzl. [synonym: *Eria teysmannii* J.J. Sm.; *Trichotosia dajakorum* Kraenzl.; *Eria dajakorum* (Kraenzl.) Ames]. Epiphyte, lowland kerangas forest to lower mossy forest. Recorded from Telok Assam, Bako NP. **Note**: protected under Wildlife Protection Ordinance.

23.88.8 ***Trichotosia velutina*** (Lodd. Ex Lindl.) Kraenzl. [synonym: *Eria velutina* Lodd. *ex* Lindl.]. Epiphyte, coastal lowlands. Recorded from Sematan and Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.88.9 ***Trichotosia vestita*** (Lindl.) Kraenzl. [synonym: *Eria vestita* Lindl.]. Epiphyte, lowland to hill forests at 200 – 500 m altitudes. Recorded from Sabal FR and Gn. Santubong. **Note**: protected under Wildlife Protection Ordinance.

23.89.1 ***Tropidia graminea*** Bl. *Orkid tanah* (Mal.), terrestrial, at the base of limestone hill. Common in Bau limestone areas. **Note**: protected under Wildlife Protection Ordinance.

23.89.2 ***Tropidia pedunculata*** Bl. *Orkid* (Mal.), terrestrial, on limestone boulders and slopes. Recorded from Dered Krian NP, also from Gn. Serapi, Kubah NP. **Note**: protected under Wildlife Protection Ordinance.

23.90.1 ***Vanda scandens*** Holtt. *Orkid labah-labah,* lithophyte, climbing orchid, on boulders and cliffs. **Note**: protected under Wildlife Protection Ordinance.

23.91.1 ***Vanilla havilandii*** Rolfe. *Orkid vanilla,* climbing, up to 10 m long, on limestone hills. Common in western Sarawak, recorded from Dered Krian NP, Bungo Range NP, Pueh NP and Santubong NP. **Note**: protected under Wildlife Protection Ordinance.

23.92.1 ***Vrydagzynea albida*** (Bl.) Bl. Small terrestrial orchid, 5 – 10 cm tall, on thick humus, at the wet base of limestone hills. **Note**: protected under Wildlife Protection Ordinance. – Santubong

23.92.2 ***Vrydagzynea beccarii*** Schltr. Terrestrial, hill to lower mossy forest. Recorded from Gn Matang. **Note**: protected under Wildlife Protection Ordinance. Endemic to Sarawak.

23.92.3 ***Vrydagzynea tristriata*** Ridl. Small terrestrial orchid, 5 – 8 cm tall, on thick humus, in deeply shaded area at the base and boulders of limestone hills. **Note**: protected under Wildlife Protection Ordinance.

23.93.1 ***Zeuxine purpurascens*** Bl. Terrestrial, lowland MDF. Recorded from Gn. Matang. **Note**: protected under Wildlife Protection Ordinance.

23.93.2 ***Zeuxine strateumatica*** (L.) Schltr. [synonym: *Adenostylis emarginata* Bl.; *A. integerrima* Bl.; *A. strateumatica* (L.) Ames; *Orchis strateumatica* L.; *Spiranthes strateumatica* (L.) Lindl.; *Zeuxine bracteata* Wight; *Z. stenochila* Schltr.; *Z. sulcata* (Roxb.) Lindl ex Wight] *Lawn orchid* (Eng.). Terrestrial, open spaces, wet grasses field, by the roadside. **Note**: protected under Wildlife Protection Ordinance. New record to Sarawak.

25. PANDANACEAE

24.1.1 ***Benstonea affinis*** (Kurz.) Callm. & Buerki [synonym: *Pandanus affinis* Kurz.; *P. merrillii* Warb.; *P. sarawakensis* Mart.] *Mengkuang bunga* (Mal.), *Pandan ikan* (Mal.), erect branching shrub tree pandan, up to 5 m tall, swampy, near streams or rivers, lowland MDF. **Uses**: medicinal plant, fruit use as fish bait.

24.3.2 ***Benstonea alticola*** (Holttum & St. John) Callm. & Buerki [basionym: *Pandanus alticola* Holttum & St. John], epiphytic herb, hill to lower mossy montane forest, recorded from Gn. Pueh.

24.3.3 ***Benstonea andersonii*** (St. John) Callm. & Buerki [basionym: *Pandanus andersonii* St. John], terrestrial herb, swampy areas, near running freshwater. Recorded from Lundu and Sematan.

24.3.4 ***Benstonea brunigii*** (B.C. Stone) Callm. & Buerki [basionym: *Pandanus brunigii* B.C. Stone]. *Pandan* (Mal.), terrestrial herb, lowland MDF, recorded from Sabal FR and Serian.

24.3.5 ***Benstonea calcinactus*** (B.C. Stone) Callm. & Buerki [basionym: *Pandanus calcinactus* B.C. Stone). Terrestrial/lithophyte, limestone boulder. Recorded from Gn. Pueh FR. **Note**: first record from outside limestone area.

24.1.6 ***Benstonea epiphytica*** (Mart.) Callm. & Buerki [basionym: *Pandanus epiphyticus* Mart.]. epiphyte herb, on tree trunk or branches or lithophyte on limestone rock, recorded from Gn. Matang (type locality), Dered Krian NP and Bungo Range NP.

24.3.7 ***Benstonea herbacea*** (Mart.) Callm. & Buerki [basionym: *Pandanus herbaceous* Mart.]. Terrestrial herb, lowland to montane forest. Elevation: 600 – 1300 m), Recorded from Gn. Serapi and Gn. Santubong.

24.3.8 ***Benstonei korthalsii*** (Solm) Callm. & Buerki [basionym: *Pandanus korthalsii* Solm], occurs on wetter areas, near fresh running water. Recorded from Gn. Matang.

24.1.9 ***Benstonea platystigma*** (Mart.) Callm. & Buerki. [basionym: *Pandanus platystigma* Mart.]. Terrestrial pandan, lowland to hill MDF. Recorded from Gn. Matang (type locality), also from Gn. Pueh.

24.1.10 ***Benstone pumila*** (St. John) Callm. & Buerki [basionym: *Pandanus pumilus* St. John]. Terrestrial pandan, lowland MDF. Recorded from Gn. Pueh (type locality). **Note**: endemic to lowland MDF of Borneo.

24.3.11 ***Benstonea sylvaticus*** (B.C. Stone) Callm. & Buerki [basionym: *Pandanus sylvaticus* B.C. Stone]. Terrestrial pandan, lowland MDF. Recorded from Semengoh (type locality) to Bungo Range NP. **Note**: endemic to lowland forests of Borneo.

24.3.12 ***Benstonea thomissophylla*** (B.C. Stone) Callm. & Buerki [synonym: *Pandanus thomissophyllus* B.C. Stone]. *Pandan* (Mal.), stemless, on limestone slopes, hillsides and exposed summits. Common in Dered Krian NP.

24.2.1 ***Freycinetia angustifolia*** Bl. *Akar ular* (Mal.), *Rancang besi* (Mal.), climbing pandan with very slender stem, lowland to hill MDF, occasionally in wetter area, near running freshwater. Recorded from Gn. Pueh and Lundu.

24.2.2 ***Freycinetia ensifolia*** Merr. *Pandan* (Mal.), climbing up to 9 m tall, lower limestone slope. Single record from Gn. Krian.

24.2.3 ***Freycinetia imbricata*** Bl. *Pandan* (Mal.), climbing up to 6 m tall, lower limestone slope. Single record without specific location (*S.23799 – SAR*).

24.2.4 ***Freycinetia javanica*** Bl. [synonym: *Freycinetia lucens* Ridl.; *F. montana* Ridl.]. Climbing pandan with rather stout stem, lowland to lower montane mossy forest, occasional in wetter areas, near running fresh water. Recoded from Lundu, Gn. Pueh.

24.2.5 ***Freycinetia kalimantanica*** B.C. Stone. Climbing pandan, lowland to hill forest, shaded moist area. Recorded from Gn. Matang.

24.2.6 ***Freycinetia rigidifolia*** Hemsley. Climbing pandan, wet and moist area, foothill of limestone hill. Recorded from Bau limestone areas.

24.2.7 ***Freycinetia sarawakensis*** Mart. *Pandan* (Mal.), climbing up to 7 m tall, at the base of limestone hills. Common in Dered Krian NP.

24.3.1 ***Pandanus acuminatus*** Hort. *ex* Wendl. Terrestrial pandan, shaded to semi-shaded, wetter areas, near running freshwater, swampy or well-drained soil, lowland MDF, swamp forest and limestone. Recorded from Bau limestone areas and Bungo Range NP.

24.3.2 ***Pandanus amaryllifolius*** Roxb. *Pandan* (Mal.). – cultivated.

24.3.3 ***Pandanus apicalis*** St. John. Terrestrial pandan, opened spaces, wetter condition, near running freshwater, lowland to hill MDF. Recorded from Gn. Matang and Kubah NP.

24.3.4 ***Pandanus basilocularis*** Mart. Terrestrial pandan, lowland forest. Recorded from Sematan and Lundu areas.

24.3.5 ***Pandanus calamianensis*** Merr. Terrestrial pandan, lowland to hill forest, recorded from Gn. Matang.

24.3.6 ***Pandanus dictyotus*** St. John *ex* B.C. Stone. Terrestrial pandan, sometimes with branches trunk, no more than 1 m tall, shaded and wetter areas, near streams or running freshwater, lowland MDF, swampy and limestone. Recorded from Dered Krian NP, Bungo Range NP and Klingkang Range FR.

24.3.7 ***Pandanus dorystigma*** Mart. Terrestrial pandan, wet places, near stream, swampy or well drained soil, lowland forest. Recorded from Gn. Matang, Sabal FR and Klingkang Range FR.

24.3.8 ***Pandanus dubius*** Spreng [synonym: *Pandanus tetrodon* (Gaudich.) Balf. *f.*]. Terrestrial tree pandan, open spaces, wetter areas near running freshwater, swampy. Recorded from Gn. Matang, Bungo Range NP and Klingkang Range FR.

24.3.9 ***Pandanus fusinus*** Mart. Terrestrial pandan, semi-shaded, wetter areas or swampy, lowland forest. Recorded from Bau limestone areas, Gn. Pueh FR and Samunsam WS.

24.3.10 ***Pandanus kamiae*** B.C. Stone. *Pandan* (Mal.), terrestrial herb, lowland MDF, wetter areas near running freshwater. Uses: making mat, the leaves sliced thinly tied on fingers and wrist are believed to prevent injuries during heavy works.

24.3.11 ***Pandanus motleyanus*** Solms. *Mengkuang, Pandan* (Mal.), stem up to 2 m tall, in disturbed and exposed areas, near to limestone base. Single record from Gn. Tabai.

24.3.12 ***Pandanus odaratissimus*** L. *f.* [synonym: *Pandanus fascicularis* Lam; *P. sabotan* Blanco]. Terrestrial tree pandan, often in coastal areas. Recorded from Bako NP.

24.3.13 ***Pandanus pectinatus*** Mart. Terrestrial pandan, sometimes with branching trunk, not more than 2 m tall, wetter areas, well-drained soil. Lowland MDF, foothill limestone, swamp area. Recorded from Bau limestone area, Samunsam WS.

24.3.14 ***Pandanus undulatifolius*** Holtt. *Pandan* (Mal.), stem up to 1.5 m tall, on limestone slopes and boulders. Two records from Gn. Pambor and Gn. Tabai.

24.3.15 ***Pandanus vinaceus*** B.C. Stone. Terrestrial tree pandan, up to 3 m tall, wetter areas, well-drained soil, lowland to hill MDF, kerangas forest. Recorded from Gn. Pueh.

26. PHORMIACEAE

25.1.1 ***Dianella ensata*** (Thunb.) Henderson. *Mulong itik* (Ib.), herb, on clay-rich soil at the base of limestone hill. Also recorded from secondary forest, MDF and kerangas forest throughout Sarawak. **Note**: medicinal plant.

25.1.2 ***Dianella ensifolia*** (L.) DC. *Mulong itik* (Ib.), herb, on clay-rich soil, in secondary forest at the base of limestone hill. **Note**: medicinal plant.

27. POACEAE

26.1.1 ***Bambusa multiplex*** (Lour.) Rauesch. Ex J.A. & J.H. Schultes [synonym: *Bambusa glaucescens* (Willd.) Munro] *Buluh* (Mal.) – cultivated.

26.1.2 ***Bambusa vulgaris*** Schrad. *ex* J.C. Wendl. [synonym: *Bambusa striata* Lodd. *ex* Lindl.; *B. blancoi* Steud.] *Buluh kuning* (Mal.) – cultivated.

26.2.1 ***Coix lacryma-jobi*** L. [synonym: *Coix palustris* Koord.; *C. pendula* Salisb.; *C. pumila* Roxb.; *C. ovata* Stokes; *C. lacryma* L.]. *Job's tear* (Eng.), *Bilat* (Mel.), buah tasbih (Mal.), perennial herb – cultivated. Uses: medicinal plant, fruits are edible (cooked).

26.3.1 ***Cynodon dactylon*** (L.) Pers. [synonym: *Panicum dactylon* L.]. *Bermuda grass* (Eng.), *Rumput minyak* (Mal.), common on roadsides, plantation crops.

26.4.1 ***Digitaria ciliaris*** (Retz.) Koeler. [synonym: *Panicum ciliare* Retz.; *Digitaria fimbriata* Link.]. *Southern crabgrass* (Eng.), widespread worldwide across tropic. **Note**: invasive weed.

26.4.2 ***Digitaria fuscescens*** (Presl.) Henr. [synonym: *Paspalum fuscescens* Presl.; *Syntherisma fuscenscens* (Presl.) Scribn.; *Digitaria pseudoischaemum* Mig.]. Humid, sandy to rocky soil in disturbed places.

26.4.3 ***Digitaria setigera*** R. & S. [synonym: *Digitaria consanguinea* Gaud; *D. horizontalis* Ohwi non Willd.; *D. microbachne* (Presl.) Henr.; *D. microstachya* Hern.] *Crab grass* (Eng.), *Jelamparan* (Mal.), in plantation crops, in waste ground and by the roadsides.

26.5.1 ***Dinochloa robusta*** S. Dransf. *Buluh* (Mal.), on limestone summit. Single record from Gn. Doya.

26.6.1 ***Echinochloa colona*** (L.) Link [synonym: *Panicum colonum* L.]. *Bird's rice* (Eng.), *Rumput kusa-kusa* (Mal.), common in dryland field crops, wetland paddy field, in open damp sandy or clay soils.

26.6.2 ***Echinochloa crus-galli*** (L.) Beauv. [synonym: *Panicum crus-galli* L.; *Echinochloa hispidula* (Retz.) Nees ex Royle]. *Barnyard grass* (Eng.), *Rumput padi burung* (Mal.), wetland paddy field, on sandy and loamy soils.

26.7.1 ***Eleusine indica*** (L.) Gaertn. Tufted grass, roadside, sandy soil. Common throughout Sarawak.

26.8.1 ***Eragrostis atrovirens*** (Desf.) Trin. *ex* Steud. [synonym: *Eragrostis elegantula* Steud.]. *Wiry Eragostis* (Eng.), *Rumput dawai* (Mal.), perennial grass in open wet places.

26.8.2 ***Eragrostis tenella*** (L.) Beauv. *ex* R. & S. [synonym: *Eragrostis amabilis* Wight & Arn. *ex* Hook *et.* Arn.; *Poa tenella* L.]. *Feathery Eragrostis* (Eng.), *Rumput telur kutu* (Mal.), in open wasteground and grassy paths.

26.9.1 ***Gigantochloa balui*** K.M. Wong. *Buluh* (Mal.), secondary forest, Gn. Pueh FR.

26.10.1 ***Imperata cylindrica*** (J. Presl.) Ohwi. *Lalang* (Mel.), in opened spaces and degraded areas. Common throughout Sarawak. Note: medicinal plant.

26.11.1 ***Isachne globosa*** (Thunb.) O. Ktze [synonym: *Milium globosum* Thunb.]. *Rounded Isachne* (Eng.), *Rumput minyak* (Mal.), in open wet places, wet paddy fields and ditches.

26.12.1 ***Ischaemum magnum*** Rendle. *Rumput sabau* (Mal.), opened spaces, near roadside, degraded soils. Common throughout Sarawak.

26.12.2 ***Ischaemum muticum*** L. *Seashore centipede grass* (Eng.), *Rumput kemarau* (Mal.), common in sandy places, a common beach grass.

26.12.3 ***Ischaemum timorense*** Kunth. *Centipede grass* (Eng.), *Rumput sarang buaya* (Mal.), common on turf, roadsides and grassy places.

26.13.1 ***Leersia hexandra*** Sw. [synonym: *Leersia luzonensis* Presl.; *L. abyssinica* A. Rich.; *L. capensis* C. Mueller]. *Tiger's tongue grass* (Eng.), *Benta* (Mal.), *Rumput lidah harimau* (Mal.), in open

swampy places, common in wet paddy fields and shallow water channels.

26.14.1 ***Leptaspis urceolata*** (Roxb.) R. Br. Herb, up to 1 m tall, on flatland at base of limestone hill. Single record from Gn. Lanyang.

26.15.1 ***Ottochloa nodosa*** (Kunth) Dandy [synonym: *Panicum nodosum* Kunth; *Ottochloa arnottiana* (Nees) Dandy]. *Slender panic grass* (Eng.), *Rumput pait* (Mal.), *Rumput rawa* (Mal.), in open and wet places. Common in plantation crops.

26.16.1 ***Panicum brevifolium*** L. [synonym: *Panicum ovalifolium* Poir]. *Short-leaved panic grass* (Eng.), *Rumput kumbai daun pendek,* lowlands, in shady places.

26.16.2 ***Panicum maximum*** Jacq. [synonym: *Panicum giganteum* Mez.; *P. polyganum* Sw.; *P. jumentorum* Pers.]. *Guinea grass* (Eng.), *Rumput bengala* (Mal.), in open wet places.

26.16.3 ***Panicum repens*** L. [synonym: *Panicum ischaemoides* Retz.]. *Creeping panic grass* (Eng.), *Kenunong padi* (Mal.), occurs in waterlogged, in sandy soils, in poorly drained heavy soils.

26.17.1 ***Paspalum conjugatum*** Berg. *Rumput kerbau* (Mal.), opened spaces, near roadside, degraded soils. Common throughout Sarawak.

26.17.2 ***Paspalum districhum*** L. *Knotgrass* (Eng.). Common throughout Sarawak. **Note**: invasive weed.

26.17.3 ***Paspalum longifolium*** Roxb. *Belena* (Ib.), *Rumput kerbau* (Mal.), tufted grass, plantation. Recorded from Pueh.

26.17.4 ***Paspalum scrobiculatum*** L. [synonym: *Paspalum frumentaceum* Rottb.; *P. barbatum* Schum.; *P. polystachyum* R. Br.] *Ricegrass*

paspalum (Eng.), common along roadside. Throughout Sarawak. **Note**: invasive weed.

26.18.1 ***Pennisetum polystachyon*** (L.) Shult. [synonym: *Pennisetum triticoides* (Poir.) R. & S.; *P. setosum* (Sw.) L. Rich.; *Panicum polystachyon* L.]. *Feather Pennisetum* (Eng.), *Rumput gajah* (Mal.), common by roadsides or wastelands.

26.19.1 ***Perotis indica*** (L.) Kuntze. Tufted grass, degraded kerangas, near brackish water. Recorded from Bako NP.

26.20.1 ***Sacciolepis indica*** (L.) Chase [synonym: *Panicum indicum* L.; *Hymenachne indica* (L.) Buese.]. *Short-spiked Sacciolepis* (Eng.), *Rumput bidis* (Mal.), common in open grassy places, gregarious in swampy areas.

26.21.1 ***Setaria palmifolia*** (Koen.) Stapf [synonym: *Panicum palmaefolium* Koen.; *P. plicatum* Willd.]. *Broadleaved bristle grass* (Eng.), *Lachang* (Mal.), mainly in damp and shaded places.

26.22.1 ***Schizostachyum brachycladum*** (Kurz) Kurz. *Buluh lemang* (Mal.) common bamboo throughout the State, in various type of habitats. Recorded from Bungo Range NP, Sabal FR, Klingkang Range FR.

26.22.2 ***Schizostachyum latifolium*** Gamble. *Buluh enkalad* (Ib.), clump-forming bamboo, on dry soils at the base of limestone hills. **Uses**: the culms are used to make fine woven basket (*seraung*)

26.22.3 ***Schizostachyum grande*** Ridl. *Buluh Semeliang* (Mal.), clump-forming bamboo, base of limestone hills.

26.22.4 ***Schizostachyum zollingeri*** Steud. [synonym: *Melocanna zollingeri* (Steud.) Kurz ex Munro]. Evergreen bamboo forming a dense clump, in primary forest but often in disturbed areas.

26.23.1 ***Themeda villosa*** (Poix) A. Camus. *Greater tassle grass* (Eng.), *Rumput perimping* (Mal.), common in open places in lowlands, by raodsides and river banks.

28. PONTEDERIACEAE

27.1.1 ***Pontederia crassipes*** Mart. [synonym: *Eichhornia crassipes* (Mart.) Solms]. *Water hyacinth* (Eng.), *Kiambang* (Mal.), *Bakong* (Mel.). Floating aquatic plant, in drainage, ponds and rivers. **Note**: not native, invasive weed.

27.1.2 ***Pontederia hastata*** L. [synonym: *Monochoria chinensis* Gand.; *M. dilatata* (Buch.-Ham.) Kunth; *M. sagittata* Kunth; *M. hastata* (L.) Solms]. *Leaf pondweed* (Eng.), aquatic plant, semi-submerged, drainage. Common throughout Sarawak. Note: not native, invasive weed.

27.1.3 ***Pontederia vaginalis*** Burm. *f.* [*Monochoria vaginalis* (Burm. *f*) C. Presl. *ex* Kunth]. *Heartshape false pickerelweed, Oval-leafed pondweed* (Eng.). aquatic plant, semi-submerged, drainage. Common throughout Sarawak. Note: not native, invasive weed.

29. RESTIONACEAE*

28.1.1 *Centrolepis philippinensis* Merr. Small herbaceous plant, opened space. Recorded once from Kubah NP.

**Previously as Centrolepidaceae*

30. SMILACACEAE

29.1.1 ***Smilax barbata*** A. DC. *Akah gerawat* (Mel.). lowland MDF, secondary forest, peat swamp. Climber. Recorded from Matang.

29.1.2 ***Smilax borneensis*** C. DC. *Ramugang* (Ib.), climber, lowland MDF, secondary forest. Recorded from Klingkang Range FR.

29.1.3 ***Smilax hypoglauca*** Benth. *Ramugang* (Ib.), *Akah gerawat* (Mel.), climber, hill ridge, hill MDF.

29.1.4 ***Smilax mysotiflora*** A. DC. *Akar dawai* (Mal.), *Akar dedingin* (Mal.), *Akar restung* (Mal.), *Ali bertinggung* (Mal.). climber, in secondary forest, hill ridge and swamp areas.

31. STEMONACEAE

30.1.1 ***Stemona tuberosa*** Lour. [synonym: *Stemona minor* Hook. f.; *S. moluccana* (Bl.) C.H. Wright; *S. acuta* C.H. Wright; *Roxburghia moluccana* Bl.; *R. gloriosa* Pers.]. MDF. Recorded from Tanjung Datu NP.

32. TRIURIDACEAE

31.1.1 ***Sciaphila*** sp. Mycoheterotroph, on limestone boulders, growing on leaf litter. Single record from Dered Krian NP.

33. TYPHACEAE

32.1.1 ***Typha orientalis*** C. Presl. [synonym: *Typha japonica* Miq.; *T. muelleri* Rohrb.]. *Bulrush, Cumbungi* (Eng.), semi-aquatic plant, on damp and wet places, in drainage. Recorded from Matang. **Note**: not native.

34. XYRIDACEAE

33.1.1 ***Xyris bancana*** Miq. [synonym: *Xyris subcomplanata* Malme; *X. ridleyi* Rendle var. *penicillata; X. papuana* P. Royen; *X. chinensis* Malme; *X. borneensis* Rendle]. On white sand, degraded kerangas and by roadsides.

33.1.2 ***Xyris complanata*** R. Br. [synonym: *Xyris laevis* R. Br.; *X. scabra* R. Br.]. *Feathered yellow-eye* (Eng.), grows in moist areas, often near swampy. Common along the roadside.

33.1.3 ***Xyris pauciflora*** Willd. [synonym: *Synoliga pauciflora* (Willd.) Raf.; *Xyris dajacensis* P. Royen; *X. denticulata* R. Br.; *X. oryzetorum* Miq.; *X. pusilla* R. Br.]. Degraded kerangas forest, open wet sand area, by the roadside.

35. ZINGIBERACEAE

34.1.1 ***Alpinia aquatica*** (Retz.) Roscoe. *Tepus* (Mal.), herb, trailing formed large colony, up 1.5 m tall, occasional on damp and wet soils, near water sources. Common trhoroughout Sarawak, in PSF and coastal areas, also hill MDF up to 800 m elevations.

34.1.2 ***Alpinia capitellata*** Jack [synonym: *Alpinia grandiceps* Ridl.; *Languas capitellata* (Jack) Merr.; *A. grandiceps* (Ridl.) Merr.]. *Tepus* (Mal.), herb, clumping, in shaded areas, valley, MDF. Recorded from Kubah NP.

34.1.3 ***Alpinia galanga*** L. *Galangal.* **Note**: cultivated.

34.1.4 ***Alpinia glabra*** Rild. var. ***reticulata*** R.M. Sm. *Lelamas hutan* (Ib.), herb, to 1.7 m tall, clumping, at the base and gentle slopes of limestone hill. Single record from Dered Krian NP, also recorded from Bako NP and Kubah NP. **Note**: endemic to Borneo.

34.1.6 ***Alpinia latilabris*** Ridl. *Teben belugen* (Mel.). **Note**: cultivated purposely for medicinal used – to treat women after giving birth.

34.1.7 ***Alpinia ligulata*** K. Schum. *Sibodog* (Bid.), herb to 1.5 m tall, clumping or trailing, occasional on damp and wet soils, at the base of limestone hills. Common in Dered Krian NP.

34.1.8 ***Alpinia mutica*** Roxb. Terrestrial, to 1.2 m tall, riverine. Recorded from Dered Krian NP.

34.1.9 ***Alpinia zerumbet*** (Pers.) B.L. Burtt & R.M. Sm. – cultivated for medicinal purposes.

34.2.1 ***Amomum stenosiphon*** K. Schum. [synonym: *Elettariopsis stenosiphon* (K. Schum.) B.L. Burtt & R.M. Sm.]. *Tepus panggau* (Ib.), herb, to 1 m tall, trailing, on clay-rich soils, at the base of limestone hill. Single record from Gn. Podam.

34.3.1 ***Boesenbergia flaboalba*** R.M. Sm. Small herb on forest floor, lowland to lower montane mossy forest, elev. 60 – 1100 m. Recorded from Gn. Serapi, Matang WC.

34.3.2 ***Boesenbergia grandifolia*** (Val.) Merr. *Halia hutan* (Mal.). Herb, up 1 m tall. One record from Serian area.

34.3.3 ***Boesenbergia oligosperma*** K. Schum. *Jerangau kuning* (Mal.), small herb, kerangas forest. Recorded from Pueh FR.

34.3.4 ***Boesenbergia pulchella*** (Ridl.) Merr. *Jerangau merah* (Mal.), herb, 30 – 45 cm tall, at the base of limestone hills. **Note**: medicinal plant.

34.3.5 ***Boesenbergia stenophylla*** R.M. Sm. *Jerangau* (Mal.). A small herb, lithophyte on rock, peat soil at high elevation (above 200 m). Recorded from Klingkang Range FR. **Note**: medicinal plant.

34.4.1 ***Burbidgea pauciflora*** Val. *Halia hutan* (Mal.), epiphytic or lithophytic on rocks, on thick humus in limestone pockets, or on vertical cliffs. Recorded only from Gn. Pambor. Common in MDF (LEWS), riparian and lower montane forest up to 1700 m above sea level.

34.5.1 ***Camptandra gracillima*** (K. Schum.) Val. [synonym: *Camptandra parvula* Ridl. var. *angustifolia* Ridl.] *Cekur batu* (Mal.), lithophytic on rock, in deeply shaded areas, at the base of limestone hill. Rare in Bau limestone areas, but also recorded from MDF (Bako NP, Kubah NP) and kerangas forest (Bungo Range NP).

34.61 ***Conamomum xanthophlebium*** (Baker) Skornick. & A.D. Poulsen [*Amomum xanthophlebium* Baker]. *Tepus* (Mal.), herb, to 1.5 – 2 m tall, occasionally on wet soils, at the base of limestone hills. Also recorded from PSF and kerangas forest, up to 1700 m elevations.

34.7.1 ***Etlingera brachychila*** (Ridl.) R.M. Sm. *Tepus uduok* (Ib.), herb to 2 m tall, shoots usually thrilling formed large colonies, at the base of limestone hills. **Note**: ethno-plant (used to cured ill dog).

34.7.2 ***Etlingera coccinea*** (Bl.) S. Sakai & Nagam. *Tepus* (Mal.), terrestrial herb, trailing formed large colonies, to 2.5 – 3 m tall, in opened space or secondary forest at the base of limestone hill. Common gingers in secondary forests throughout Sarawak.

34.7.3 ***Etlingera crispata*** C.K. Lim. Terrestrial herb, hill to lower montane forest. Recorded from Bungo Range NP.

34.7.4 ***Etlingera elatior*** (Jack) R.M. Sm. *Torch ginger, Kantan* (Mal.), *kenchala* (Mel.). Cultivated. **Uses**: as vegetable and food flavouring.

34.7.5 ***Etlingera foetens*** (Bl.) R.M. Sm. *Tepus udouk* (Ib.), terrestrial herb, to 2 – 2.5 m tall, trailing to formed large colonies, in secondary forest or fringe of forests, at the base of limestone hill. Also recorded from MDF and secondary forest throughout Sarawak. **Uses**: the pith or young shooths used to treated ill dogs.

34.7.6 ***Etlingera nasuta*** (K. Schum.) R.M. Sm. *Tepus* (Mal.), herb, trailing, up to 1 m tall (sometimes to 2 m), opened spaces or exposed areas, near the foothill of limestone. Common throughout Sarawak in PSF, MDF, kerangas and secondary forests.

34.7.7 ***Etlingera rubromarginata*** A.D. Poulsen & Mood. Terrestrial herb, trailing, shaded areas, valleys and ridges, lowland to hill forest. Recorded from Gn. Matang and Gn. Serapi, Kubah NP.

34.7.8 ***Etlingera velutina*** (Ridl.) R.M. Sm. ssp. ***velutina***. *Tepus* (Mal.), herb, trailing, up to 2 m tall, semi shaded areas at the base of limestone hills and boulders. Common throughout Sarawak in MDF.

34.7.8b ***Etlingera velutina*** (Ridl) R.M. Sm. ssp. ***longipedunculata*** A.D. Poulsen. Terrestrial rhizomatous herb, trailing, up 1.8 m tall, semi shaded, lowland MDF, on the hill ridges. Recorded from Gn. Serapi, Kubah NP (type locality).

34.8.1 ***Geocharis rubra*** Ridl. Tepus, clumping, up to 3 m tall, in secondary forest, at the base of limestone hills. Common in Dered Krian NP.

34.9.1 ***Globba atrosanguinea*** Teijsm. & Binn. *Teben pelanuk* (Mel.), herb, frequently on wet soils, at the base of limestone hills, also recorded from other habitats. **Note**: ethno-plant (used for spiritual event).

34.9.2 ***Globba brachyanthera*** K. Schum. *Torvu* (Pen.), small terrestrial herb, to 70 cm tall, at the base and boulders of limestone hills. Common in Bau limestone areas.

34.9.3 ***Globba tricolor*** Ridl. *Teben pelanuk* (Mel.), small herb, to 20 cm tall, on clay-rich soils or thick humus on boulders, at the base of limestone hills. Also recorded in MDF, kerangas and riparian forest throughout Sarawak.

34.10.1 ***Haniffia santubongensis*** S.Y. Wong & P.C. Boyce. Small herb, to 50 cm tall, lowland MDF. Recorded from Gn. Santubong (type locality).

34.11.1 ***Hedychium borneense*** R.M. Sm. Epiphyte on tree branches, deep shaded, lower montane forest. Recorded from Gn. Serapi.

34.11.2 ***Hedychium coronarium*** J. Koenig – cultivated as ornamental and for medicinal purposes.

34.12.1 ***Hornstedtia affinis*** Ridl. Terrestrial herb, up 1.7 m tall, lowland MDF to lower montane forest. Recorded from Gn. Pueh.

34.12.2 ***Hornstedtia conica*** Ridl. *Tepus* (Mal.), herb, to 2 m tall, clumping, in deeply shaded areas at the base of limestone hills. Also recorded from MDF.

34.12.3 ***Hornstedtia havilandii*** (K. Schum.) K. Schum. *Senggang* (Ib.), herb to 2.5 m tall, clumping, at the base of limetone hills. Note: ethno-plant (fruits edible, inflorescences harvested as a vegetable).

34.12.4 ***Hornstedtia incana*** R.M. Sm. *Tepus* (Mal.), herb to 2 m tall, small clump with stilt roots, sub-montane forest. Recorded once from Pueh NP, but common in eastern north Sarawak.

34.12.5 ***Hornstedtia merahjambu*** Angela, Tawan & Meekiong. *Tepus* (Mal.), herb up to 1.4 m tall, small clump, kerangas forest. Recorded only from Klingkang Range FR. (type locality).

34.12.6 ***Hornstedtia pininga*** var. ***borneense*** R.M. Sm. *Tepus* (Mal.), herb to 2 m tall with stilt root, big clump, kerangas sub-montane forest. Recorded from Gn. Serapi, Kubah NP and Pueh NP.

34.12.7 ***Hornstedtia putih*** Angela, Tawan & Meekiong. *Tepus* (Mal.), herb, up to 1 m tall with stilt roots. Flower white. Recorded only from Gn. Serapi, Kubah NP (type locality).

34.12.8 ***Hornstedtia reticulata*** (K. Schum.) K. Schum. *Sengang* (Ib.), herb, to 2 – 3 m tall, clumping, frequently in opened space or exposed areas at the base of limestone hill. Common in secondary forests throughout Sarawak. **Note**: ethno-plant.

34.12.9 ***Hornstedtia scyphifera*** (J. Koenig) Steud. Terrestrial herb, up 2 m tall, with stilt roots. Recorded from Gn. Serapi, Kubah NP and Gn. Pueh, and also from elsewhere throughout Sarawak.

34.12.10 ***Hornstedtia tomentosa*** (Bl.) Bakh. *f. Tepus* (Mal.), herb up to 2 m tall, clumping, in deeply shaded areas or interior of forest, on limestone slopes, at the base of limestone hills. **Note**: ethno-plant (vegetable).

34.13.1 ***Plagiostachys albiflora*** Ridl. *Tepus* (Mal.), herb, to 1 m tall, occasional in deeply shaded areas of valley bottom, base of limestone hill. Common in Dered Krian NP.

34.13.2 ***Plagiostachys altistachya*** Meekiong & C.K. Lim. *Tepus* (Mal.), herb up to 1.5 m tall, clumping, usually near to the water bodies, or on wet soils, at the base of limestone hills.

34.13.3 ***Plagiostachys crocydocalyx*** (K. Schum.) B.L. Burtt & R.M. Sm. *Bajang* (Ib.), herb up to 3 m tall, in open-spaced or in secondary forest near to the limestone hills. **Note**: sometimes produce long inflorescence up to 1 m long; ethno-plant (used for spiritual event).

34.14.1 ***Scaphochlamys argentea*** R.M. Sm. Small terrestrial creeping herb, hill MDF to lower montane forest. Recorded from Gn. Pueh (type locality).

34.14.2 ***Scaphochlamys biru*** Meekiong. Small terrestrial herb, lowland MDF and kerangas forest. Recorded from Matang Wildlife Center (type locality) and Kubah NP. **Note**: endemic to western Sarawak.

34.14.3 ***Scaphochlamys calcicola*** Poulsen & Searle. Herb to 30 cm tall, on thick humus of limestone pockets, at the base of limestone hills. **Note**: endemic to Bau limestone areas.

34.14.4 ***Scaphochlamys dugra*** Ooi, Meekiong & S.Y. Wong. Small terrestrial herb, lowland limestone hills. Recorded from Bau limestone areas. **Note**: endemic to western Sarawak.

34.14.5 ***Scaphochlamys graveolens*** Ooi, Meekiong & S.Y. Wong. Small terrestrial rhizomatous herb, on moist mollisolic yellow-oRange soil at the base of limestone hills. Recorded from Pichin. Note: endemic to western Sarawak.

34.14.6 ***Scaphochlamys hasta*** Ooi, Meekiong & S.Y. Wong. Small terrestrial herb, lowland MDF and limestone hills. Recorded from Dered Krian NP and Gn. Matang.

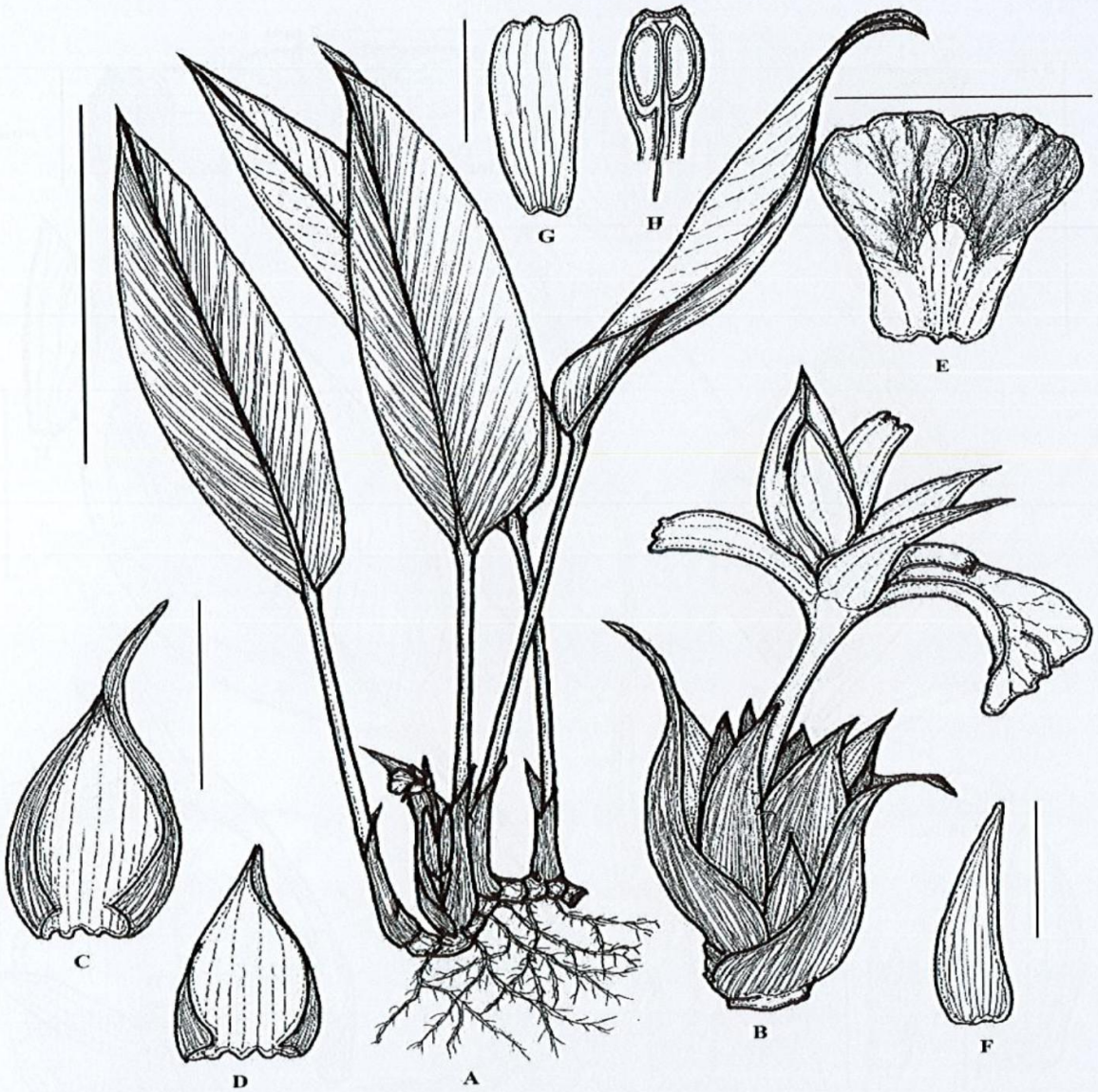
34.14.7 ***Scaphochlamys limiana*** Meekiong & Hidir. Small terrestrial herb, lowland kerangas forest. Recorded from Samunsam WS (type locality). **Note**: endemic to western Sarawak.

34.14.8 ***Scaphochlamys lucens*** Ooi, Meekiong & S.Y. Wong. Small terrestrial rhizomatous herb, on deep litter humus pocket of limestone. Recorded from Gn. Temugan, Padawan. **Note**: endemic to western Sarawak.

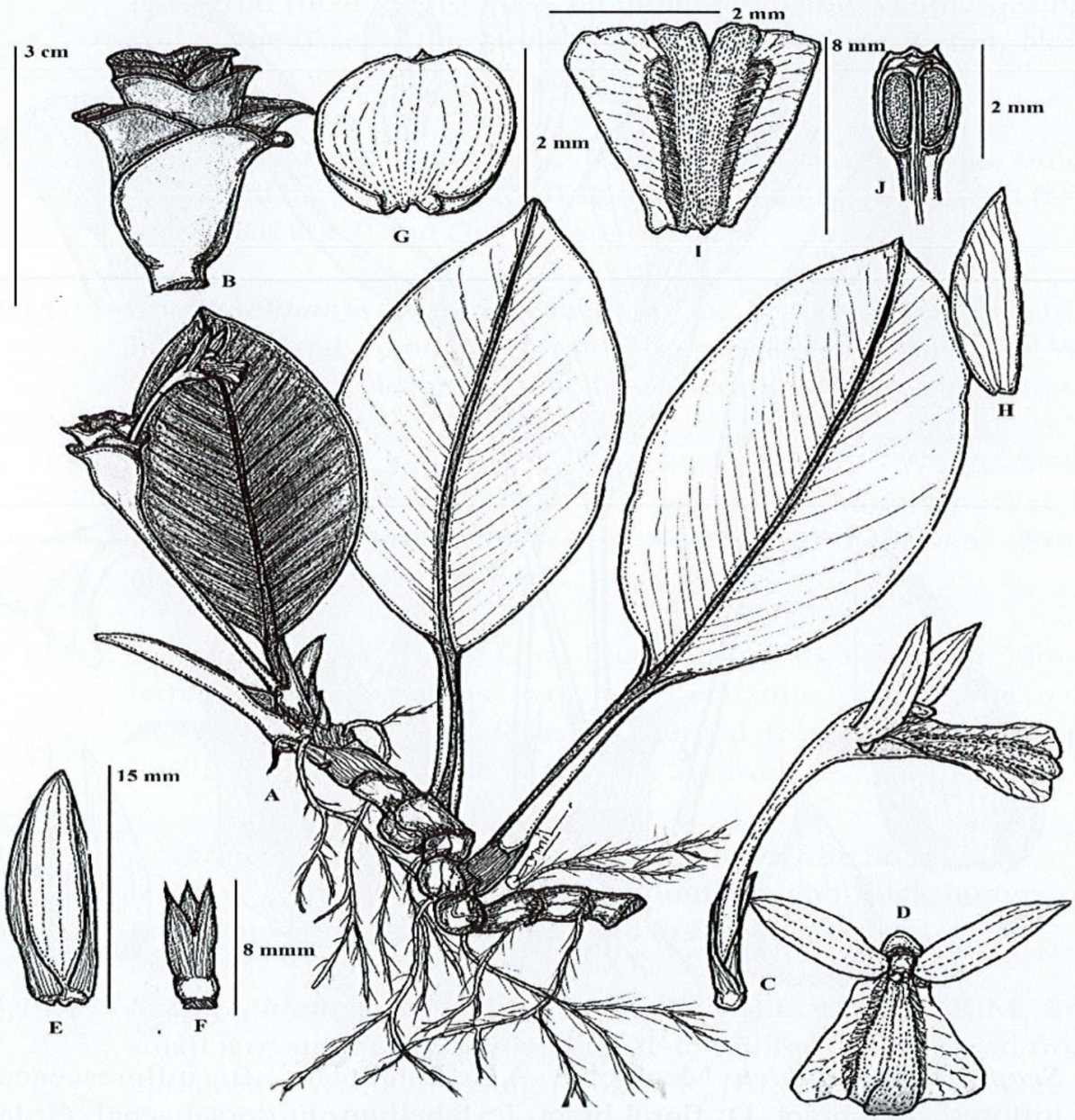
34.14.9 ***Scaphochlamys nigra*** Ooi, Meekiong & S.Y. Wong. Small terrestrial rhizomatous herb, on podzolic black soil over sandstone in kerangas forest. Recorded from Gn. Buan (type locality). Note: endemic to western Sarawak.

34.14.10 ***Scaphochlamys petiolata*** (K. Schum.) R.M. Sm. Small terrestrial herb, to 20 cm tall, on boulders and thick humus on limestone pockets. **Note**: endemic to Sarawak.

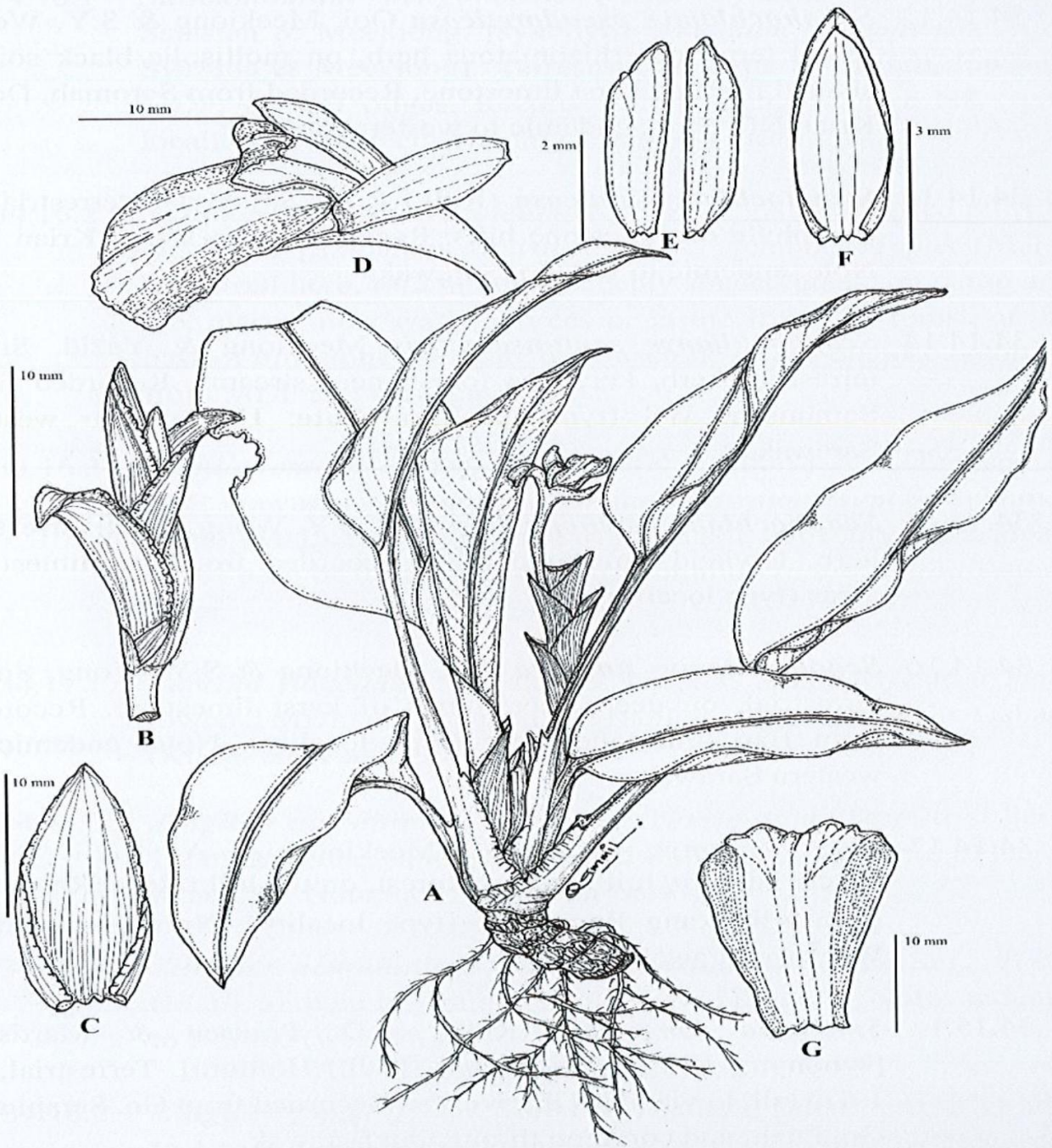
34.14.11 ***Scaphochlamys polyphylla*** (K. Schm.) B.L. Burtt & R.M. Sm. small terrestrial herb, lowland MDF to hill forest. Recorded from Samunsam WS, Klingkang Range FR. **Note**: the only species in the genus with widely distribution to central part of Sarawak.



Scaphochlamys biru Meekiong. A. whole plant, B: inflorescence, C: inflorescence bract, D: floral bract, E: labellum, F: dorsal sepal, G: lateral sepal, H: theca, anther crest, filament and pollinia.



Scaphochlamys limiana Meekiong & Hidir A: whole plant, B: inflorescence head, C, D: flower, E: bract, F: calyx, G. bracteole; H: ventral sepal, I: labellum; J: theca, anther crest, filament and pollinia.



Scaphochlamys samunsamensis Meekiong & Yazid. A: whole plant, B: Inflorescence head, C: bract, D: flower, E: lateral sepals, F: ventral sepal, G: labellum

34.14.12 ***Scaphochlamys pseudoreticosa*** Ooi, Meekiong & S.Y. Wong. Small terrestrial rhizomatous herb, on mollisolic black soil in shaded forested karst limestone. Recorded from Seromah, Dered Krian NP. **Note**: endemic to western Sarawak.

34.14.13 ***Scaphochlamys reticosa*** (Ridl.) R.M. Sm. Small terrestrial or lithophyte on limestone hills. Recorded from Dered Krian NP. Note: endemic to western Sarawak.

34.14.14 ***Scaphochlamys samunsamensis*** Meekiong & Yazid. Small terrestrial herb, kerangas forest, near streams. Recorded from Samunsam WS (type locality). **Note**: Endemic to western Sarawak.

34.14.15 ***Scaphochlamys stenophylla*** Ooi & S.Y. Wong. Small terrestrial herb, lowland limestone hills. Recorded from Bau limestone areas (type locality).

34.14.16 ***Scaphochlamys uniflora*** Ooi, Meekiong & S.Y. Wong. Small terrestrial, on deep litter/humus of karst limestone. Recorded from Bau limestone areas (type locality). Note: endemic to western Sarawak.

34.14.17 ***Scaphochlamys yazidkalbii*** Meekiong & A. Raffi. Small terrestrial herb, hill kerangas forest, on the hill ridges. Recorded from Klingkang Range FR (type locality). **Note**: endemic to Western Sarawak.

34.15.1 ***Sulettaria longituba*** (Ridl.) A.D. Poulsen & Martisen. [synonym: *Elettaria longituba* (Ridl.) Holttum]. Terrestrial, to 1.6 m tall, lowland MDF, riverine. Recorded from Gn. Serapi and Gn. Pueh, and common throughout Sarawak.

34.15.2 ***Sulettaria surculosa*** (K. Schum.) A.D. Poulsen & Martisen. [synonym: *Elettaria surculose* (K. Schum.) B.L Burtt & R.M. Sm.]. Terrestrial herb, lowland MDF, riverine and kerangas forest. Recorded from Gn. Serapi, Bungo Range NP and Klingkang Range FR. Common throughout Sarawak.

34.16.1 ***Sundamomum bengohensis*** (Aimi Syazana & Meekiong) Salasiah & Meekiong. [synonym: *Amomum bengohensis* Aimi Syazana & Meekiong]. Terrestrial herb, to 1.5 m tall, lowland MDF, on hill ridges. Recorded from Bunga Range NP (type locality). **Note**: recorded only from type locality.

34.16.2 ***Sundamomum dictyocoleum*** (K. Schum.) A.D. Poulsen & M.F. Newman. [*Amomum dictyocoleum* K. Schum.]. *Tepus* (Mal.), terrestrial herb, to 2 m tall, in deeply shaded areas, on damp and wet places, near water sources or in the fringe of forest, at the base of limestone hill. Rare on limestone forest, but also recorded from MDF and kerangas forest.

34.16.3 ***Sundamomum laxesquamosum*** (K. Schum.) A.D. Poulsen & M.F. Newman. [synonym: *Amomum laxisquamosum* K. Schum.]. *Tepus* (Mal.), terrestrial herb, to 1.5 m tall, in deeply shade areas, at the base of limestone foothill. Common in the Bau limestone areas.

34.17.1 ***Tamijia flagellaris*** S. Sakai & Nagam. Small terrestrial herb, lowland MDF, deep shaded, clay soil. Recorded from Gn. Gaharu (Klingkang Range FR).

34.18.1a ***Zingiber acuminatum*** Val. var. ***acuminatum***. Terrestrial herb, 1.2 m tall, small clump. Recorded from limestone areas of Dered Krian NP. Note: new record for Sarawak.

34.18.1b ***Zingiber acuminatum*** Val. var. ***borneense*** R.M. Sm. *Tepus* (Mal.), herb up to 1 m tall, boulders and foothills. **Note**: endemic to Borneo (western part).

34.18.2 ***Zingiber flagelliforme*** Mood & Theilade. Small terrestrial herb to 1 m tall, lowland MDF and also peat swamp areas. Recorded from Matang WC and Samunsam WS.

34.18.3 ***Zingiber griffithii*** Bak. *Tepus* (Mal.), small herb, less than 1 m tall, frequently on wet soils, at the base of limestone hills. **Note**: ethno-plant (vegetable).

34.18.4 ***Zingiber incomptum*** B.L. Burtt & R.M. Sm. Terrestrial herb, to 1.8 m tall, lowland MDF to lower montane forest. Recorded from Gn. Poi (type locality) and Gn. Serapi, Kubah NP. Note: endemic to western Sarawak.

34.18.5 ***Zingiber longipedunculatum*** Ridl. *Tepus* (Mal.), herb to 1.5 – 2 m tall, clumping, on limestone hills. **Note**: also recorded from another habitat, endemic to Borneo.

34.18.6 ***Zingiber matangense*** Noor Ain, Tawan & Meekiong. Small terrestrial herb, lowland kerangas forest. Recorded from Matang WC (type locality).

34.18.7 ***Zingiber mawangense*** Noor Ain, Tawan & Meekiong. Terrestrial herb, to 1.2 m tall, medium to big clump, lowland MDF. Recorded from Tebedu area (type locality) and Bungo Range NP. Note: endemic to western Sarawak.

34.18.8 *Zingiber officinale* Roscoe – cultivated

34.18.9 *Zingiber ottensi* Val. - cultivated

34.18.10 ***Zingiber pachysiphon*** B.L. Burtt & R.M. Sm. *Ligun* (Ib.), terrestrial herb, lowland to lower montane forest. Elevation: 150 – 1500 m. Recorded from Gn. Pueh and Bungo Range NP. Not common in western Sarawak.

34.18.11 ***Zingiber puberulum*** Ridl. var. ***borneense*** R.M. Sm. *Teben* (Mel.), terrestrial, Lowland MDF, peat swamp and limestone areas. Recorded from Dered Krian NP, Bungo Range FR, and common theroughout Sarawak.

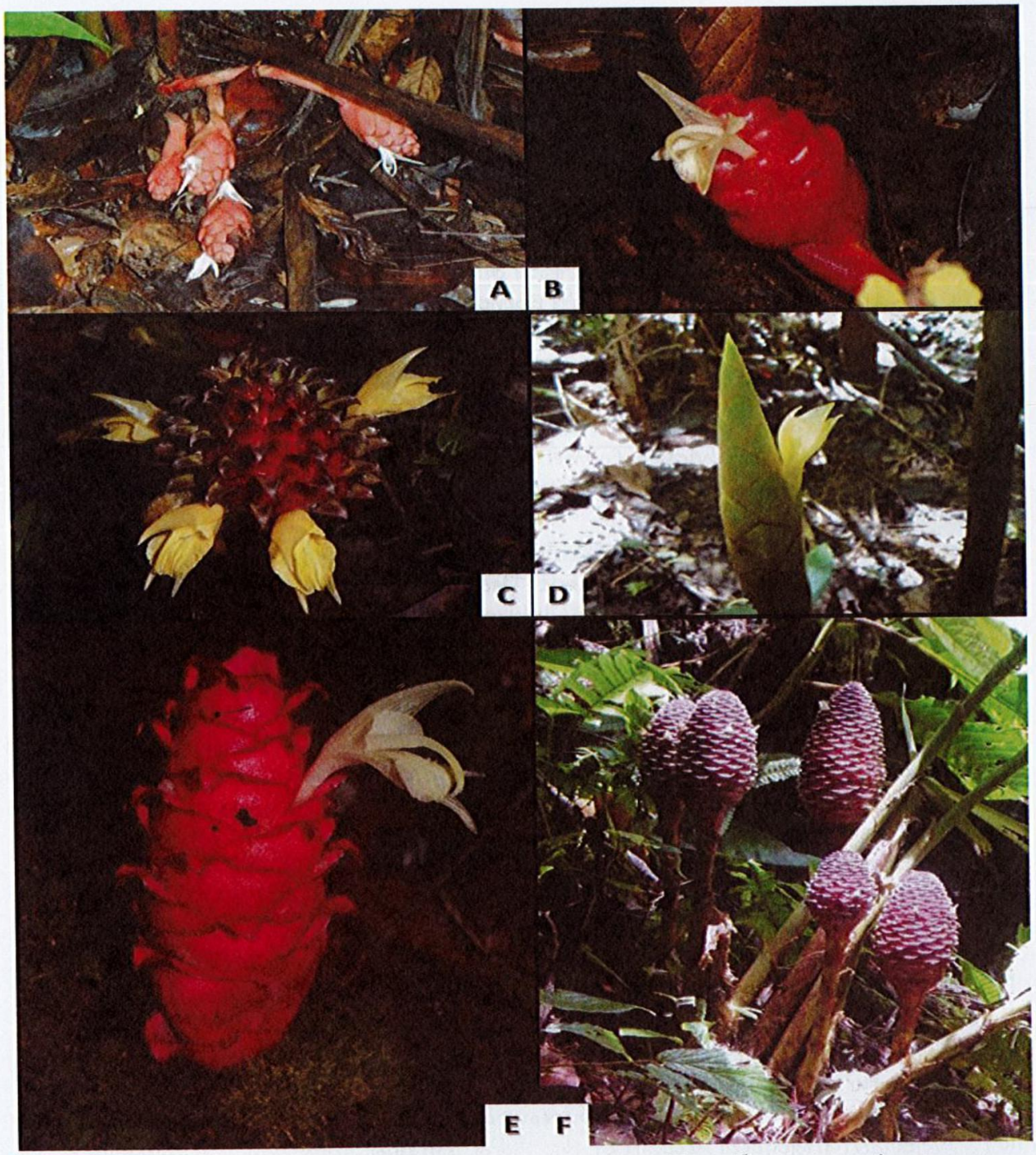
34.18.12 *Zingiber zerumbet* (L.) Roscoe *ex* Sm. - cultivated



Zingiber acuminatum Val. var. *borneense* R.M. Sm.



Zingiber mawangense Noor Ain, Tawan & Meekiong. A: plant with inflorescence, B: leaves (upper), C: leaves (lower), D: inflorescence, E: flower



A: *Zingiber acuminatum* var. *borneense,* B: *Zingiber acuminatum* var. *acuminatum,* C: *Zingiber incomptum,* D: *Zingiber puberulum* var. *borneense,* E: *Zingiber matangense,* F: *Zingiber pachysiphon*

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Photos Credit

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N – Noor Ain Che Ahmad
Y – Yazid Kalbi
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REMINDER

TRADITIONAL KNOWLEDGE AS INTELLECTUAL PROPERTY

The ethnobotanical information documented in this book was provided by the said communities. It is traditional knowledge and the intellectual property of the said communities.

The Convention on Biological Diversity, agreed in 1992 and signed by Malaysia, seeks to promote biodiversity conservation and the equitable sharing of benefits arising out of the utilization of genetic resources. Article 15 of the Convention on Biological Diversity notes that access to genetic resources should be on the basis of prior informed consent and on mutually agreed terms that provide fair and equitable sharing of the results of research and development and the benefits of commercialization and utilization. It also calls for the fair and equitable sharing of the benefits derived from the use of traditional knowledge. The Sarawak Biodiversity Centre (Amendment) Ordinance 2018 also relates to research on State's biodiversity (traditional knowledge and pharmaceutical).

Organizations or persons looking for access to genetic resources of the species documented herein as having ethnobotanical uses would need to take due understanding of the requirements of the Convention on Biological Diversity and the Sarawak Biodiversity Centre Ordinance.

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