

Short Notes

Taxonomic Composition and Conservation Status of Plants in Imbak Canyon, Sabah, Malaysia

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Abstract

A study of plant diversity and their conservation status was conducted in Batu Timbang, Imbak Canyon Conservation Area (ICCA), Sabah. The study aimed to document plant diversity and to identify interesting, endemic, rare and threatened plant species which were considered high conservation value species. A total of 413 species from 82 families were recorded from the study area of which 93 taxa were endemic to Borneo, including 10 endemic to Sabah. These high conservation value species are key conservation targets for any forested area such as ICCA. Proper knowledge of plant diversity and their conservation status is vital for the formulation of a forest management plan for the Batu Timbang area.

Keywords: Vascular plant, floral diversity, endemic, endangered, Borneo

Introduction

The earth as it is today has a lot of important yet beneficial natural resources such as tropical forests. Tropical forests are one of the world's richest ecosystems, providing a wide range of important natural resources comprising vital biotic and abiotic components (Darus, 1982). These forests are classified into various types such as lowland forest, mixed dipterocarp forest (MDF), peat swamp forest, mangrove forest, hill forest and heath forest, providing crucial habitats for a diverse array of plants and animals that interact with each other and in providing a healthy ecosystem.

Received 01 March 2019

Reviewed 08 August 2019

Accepted 18 September 2019

Published 15 October 2019

Borneo as the second largest tropical island in the world is a biodiversity hotspot region that harbours approximately 15,000 varieties of plant species of which c. 3000 species are trees (MacKinnon et al., 1996). According to Whitmore (1984), most of the tree species are found in lowland rainforests with species of Dipterocarpaceae usually dominating the forest tree community.

The need for studies of the forest community especially in Borneo's tropical forests is due to species richness and endemism that require greater attention mainly for conservation purposes. Borneo was once connected through land bridges with the Asian mainland together with Java and Sumatra (Morley, 2000). However, glaciation events that occurred during the Pleistocene period had separated the island from the mainland and seemed to have influenced the presence of tree flora in Borneo today (Slik et al. 2003).

However, Borneo is today projected to see socio-economic development and to be part of the aspirations of a high-income nation. This continuously creates pressures on the biodiversity of its tropical rainforest and problems to the environment. Apart from this, habitat fragmentation, invasive alien species, pollution, increasing competition for land, and climate change are among the threats to the vast amount of biodiversity (Ministry of Natural Resource and Environment, 2016) especially to the floral and faunal communities. Many species are trying to survive amidst development transition, while some are not known about due to lack of discovery. Therefore, monitoring biological diversity is essential for sustainable forest management. According to Noss (1999), the challenge lies in defining sound and practical biodiversity monitoring systems that deliver the scientific basis for sustainable forest management. The use of inventories on biodiversity for forest management operations is a common way of gathering information on the composition, diversity of tree species and species-rich communities (Suratman, 2012) while Pesiu et al. (2016) strongly believe that to understand such complex ecological interaction requires basic baseline studies of the tree community.

The surrounding forest of Batu Timbang Research Station, Imbak Canyon Conservation Area, is classified as a typical tropical rainforest of Borneo. Apart from its importance in representing the surrounding forest ecosystems in the region, it is also an important catchment system for several major rivers in the state. In this paper, we present the tree species inventory data gathered from the latest scientific expedition to Batu Timbang, Imbak Canyon Conservation Area in 2017. Our aims are to record and list plant resources and to identify the conservation status of plant species.

Methodology

Batu Timbang is within Imbak Canyon Conservation Area, located over 140 kilometers south east of Kota Kinabalu or 145 km south west of Sandakan. It is geographically located between latitude 04° 54' 21" to 05° 11' 53" N and longitude 116° 49' 28" to 117° 06' 08" E within the Imbak Canyon Forest Reserve, a Class I Protection Forest Reserve in the middle part of Sabah (Figure 1). The area has experienced timber extraction in the past, except for the steep area on the western side towards Kuli peak. The topography of Batu Timbang is mostly hilly with very steep slopes and the highest point is Kuli peak about 1400 m above sea level at the west of the base camp. The area at the base camp is currently dominated by secondary forest (*Macaranga* spp.).

Prior to the field survey, various maps including soil map, satellite image (world map), and natural vegetation map were obtained for field survey planning. From the maps, areas of interest were identified and located. The field surveys were conducted from 21 to 25 August, 2017. All plant species and trees ≥ 10 cm diameter at breast height (dbh) were recorded from 6 of 0.1 ha circle plots which were established in various forest conditions (Table 1). Plant specimens with reproductive parts were collected (including voucher specimens) and deposited at the Sandakan Herbarium (SAN). Collecting and preserving plant specimens follow Bridson et al., (1992). The common plant species were identified directly to species level in the field by means of their distinctive field characteristics. For those that could not be readily identified, voucher specimens were collected for subsequent determination at SAN. The voucher specimen collections were oven-dried to 55° C for several days before determining their identities.

Table 1. Plot numbers and their corresponding geographical position points for the forest assessment and rapid plant diversity inventory in ICCA-Batu Timbang Imbak Canyon Conservation Area, Sabah, Malaysia.

Plot No	Soil Association	Forest Formation	Coordinates	Altitude (m)
1	Maliau	Lowland mixed dipterocarp forest and kerangas forest	4°59'50.0"N, 117°04'38.8"E	515
2	Maliau	Upland mixed dipterocarp and kerangas forest	4°59'57.9"N, 117°04'29.1"E	624
3	Maliau	Upland mixed dipterocarp and kerangas forest	5°00'03.8"N, 117°04'04.8"E	777
4	Maliau	Lower Montane kerangas forest	5°00'1.2"N, 117°03'43.5"E	1099
5	Maliau	Lowland disturbed mixed dipterocarp forest	5°00'06.4"N, 117°04'41.5"E	366
6	Maliau	Lowland disturbed mixed dipterocarp forest	5°00'03.6"N, 117°04'40.2"E	413

All specimens were sorted according to morphospecies and attempted for identification to species level by cross-referencing with the existing specimens in the herbarium related flora references such as Tree Flora of Sabah and Sarawak (Soepadmo & Wong, 1995; Soepadmo et al., 1996; Soepadmo & Saw, 2000; Soepadmo et al., 2002; Soepadmo et al., 2004; Soepadmo et al., 2007; Soepadmo et al., 2011; Soepadmo et al., 2014), The Bamboo of Sabah (Soetjani, 1992) and The Rattan of Sabah (Dransfield, 1984). Plant classification of the Angiosperm Group is based on Stevens (2001) onwards. Some plant specimens could not be identified to species level due to incomplete specimens.

For plant conservation status, we used the IUCN Red list of Threatened species (IUCN, 2019), Malaysia Plant Red List, Peninsular Malaysian Dipterocarpaceae (Chua *et al.*, 2010), Sabah Forest Enactment (Sabah Forest Department, 1968), Sabah Wildlife Conservation Enactment (Sabah Wildlife Department, 1997) and CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 2018).

Results and discussion

Based on the tree enumeration and voucher specimens, a total of 413 taxa from 82 families were recorded from the study area. Details on the overall checklist of plant species recorded was shown in Appendix I. The most species rich family is Dipterocarpaceae with 42 species followed by Lauraceae and Euphorbiaceae with 23 and 21 species respectively. The other family that has more than ten species are Annonaceae, Clusiaceae, Meliaceae, Myrtaceae, Ebenaceae,

Rubiaceae, Phyllanthaceae, Fagaceae and Malvaceae. There are 29 plant families that are only represented by one species as shown in Table 2. In terms of biological types, the highest number of family recorded was trees with 54 families followed by herbs and climbers with 11 families. Ferns and shrubs each with 9 and 3 families respectively while grass, leucophytes, palm and saprophyte were only represented by one family. The number of taxa recorded with respect to each biological type was shown in Table 3.

Table 2. The number of genera and species for each respective family recorded in Batu Timbang Imbak Canyon Conservation Area (ICCA).

Family	No of genera	No of species
Dipterocarpaceae	6	42
Lauraceae	8	23
Euphorbiaceae	10	21
Annonaceae	9	17
Clusiaceae	3	17
Meliaceae	4	16
Myrtaceae	2	16
Ebenaceae	1	15
Rubiaceae	12	15
Phyllanthaceae	4	13
Fagaceae	3	11
Malvaceae	7	11
Arecaceae	5	10
Zingiberaceae	7	9
Achariaceae	1	7
Burseraceae	2	7
Fabaceae	4	7
Sapotaceae	2	7
Anacardiaceae	3	6
Lecythidaceae	2	6
Melastomataceae	5	6
Polygalaceae	1	6
Primulaceae	4	6
Araceae	4	5
Celastraceae	2	5
Lamiaceae	2	5
Myristicaceae	3	5
Convolvulaceae	1	4
Cornaceae	2	4
Pandanaceae	2	4
Podocarpaceae	4	4
Proteaceae	2	4
Actinidiaceae	1	3
Hymenophyllaceae	2	3
Orchidaceae	3	3
Pentaphragmataceae	1	3
Pteridaceae	2	3
Symplocaceae	1	3
Dilleniaceae	1	2
Dryopteridaceae	1	2
Elaeocarpaceae	1	2
Gesneriaceae	2	2
Magnoliaceae	1	2

Marantaceae	2	2
Poaceae	2	2
Polypodiaceae	2	2
Rhamnaceae	1	2
Rutaceae	1	2
Salicaceae	1	2
Sapindaceae	2	2
Selaginellaceae	1	2
Stemonuraceae	2	2
Tectariaceae	2	2
Vitaceae	1	2
Araucariaceae	1	1
Begoniaceae	1	1
Casuarinaceae	1	1
Combretaceae	1	1
Connaraceae	1	1
Costaceae	1	1
Cyatheaceae	1	1
Dichapetalaceae	1	1
Ericaceae	1	1
Flagellariaceae	1	1
Gentianaceae	1	1
Hypoxidaceae	1	1
Juglandaceae	1	1
Lindasaeaceae	1	1
Lygodiaceae	1	1
Menispermaceae	1	1
Moraceae	1	1
Olaceae	1	1
Oleaceae	1	1
Oleandraceae	1	1
Piperaceae	1	1
Putranjivaceae	1	1
Rafflesiaceae	1	1
Rosaceae	1	1
Sabiaceae	1	1
Simaroubaceae	1	1
Tetramelaceae	1	1
Theaceae	1	1
Urticaceae	1	1
Total	189	413

Table 3. Number of plant taxa classified by biological type from Batu Timbang, ICCA, Sabah, Malaysia.

	T	Sh	h	c	g	f	l	pt	sa
Families	54	3	11	11	1	9	1	1	1
Genera	122	6	24	16	2	13	1	3	1
Species	324	8	27	30	2	16	2	3	1

* Biological type: t=tree; c=climber; sh=shrub; h=herb; g=grass, f=fern; ep=epiphyte; l=lycophyte; pt=palm tree; sa= saprophytic

Of the 413 taxa that have been recorded, 93 taxa are endemic to Borneo, including 10 taxa endemic to Sabah (Appendix I). These Sabah and Borneo

endemics were recorded from the recent survey areas/plots. In terms of legal protection, two endemic plants (*Durio acutifolius* and *Shorea macrophylla*) are protected under the Sabah Forest Enactment (Sabah Forest Department, 1968) while six (*Caryota no*, *Boesenbergia gracilipes*, *B. pulchella*, *Burbidgea schizochella*, *Plagiostachys parva* and *Rafflesia tengku-adlinii*) through the Sabah Wildlife Conservation Enactment (Sabah Wildlife Department, 1997). All the Sabah endemic plants that were recorded from Batu Timbang are also found in other places in Sabah.

The IUCN Red List Categories and Criteria were designed for global taxon assessments. There may be differences between the Malaysian Plant Red List and the IUCN Red List, and in such cases, the Malaysian Red Data Book should always take precedence. Conservation status in parenthesis are based on the Malaysian Red List. There are six plant species that are listed as Vulnerable (VU), four Endangered (EN) and four are Critically Endangered (CR) from the Batu Timbang area (Appendix I). In terms of legal protection, only two threatened species (*Eusideroxylon zwageri* and *Shorea macrophylla*) are protected under state law (Sabah Forest Enactment 1968).

In terms of legal protection, only two threatened species (*Eusideroxylon zwageri* and *Shorea macrophylla*) are protected under state law (Sabah Forest Department, 1968). Three taxa, namely *Rafflesia tengku-adlinii*, *T. diepenhorstii* and *T. lanceolarium* are under Schedule 1, part II, are classified as Totally Protected Plant Species. There were 15 plant taxa, comprising nine species of gingers, one *Caryota*, one *Rhododendron*, one *Podocarpus*, and three orchids that fall under Schedule 2, part II, Protected Plant Species while three species are listed under CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) from the orchid family (Appendix I). There are 25 plant species that are prohibited under the Sabah Forest Enactment (1968), mostly fruits trees and threatened tree species (Appendix I).

Imbak Canyon Conservation Area provides a wide range of plant resources and this can be seen by the high number of plant species that were previously recorded in Imbak Canyon Conservation Area (Appendix 1). A provisional checklist in de Kok and Utteridge (2010) based on the collections on databases in the Herbarium of the Sabah Forest Department and the Royal Botanic Gardens Kew, recorded a total of 470 plant species from 82 families. Based on comparison with the checklist in de Kok and Utteridge (2010), this study has recorded a total of 297 additional plant species (species identified until species level) with 62 species being shared species or have been recorded in previous studies.

Meanwhile, previous expeditions in Mount Kuli by Suratman et al. (2011) recorded 153 tree species from 46 families, Sugau et al. (2011) on the study of Dipterocarpaceae recorded a total 42 species. Rosea et al. (2011) has reported a total of 109 species of orchids in ICCA while Chong et al. (2011) on the study of *Begonia* recorded eight species. Shim et al. (2011) on the study of ferns recorded a total of 104 taxa from 21 families.

Conclusion

The forests in Batu Timbang area contain highly diverse and high conservation value plant species. It is recommended that forest monitoring should be done and is a prerequisite tool to measure ecological integrity and functionality of this conservation area, with support of protection and environmental awareness campaign programmes. This paper lays a foundation in studies in the future on the floral species richness and diversity in our tropical rainforest as well as for forest succession.

Acknowledgements

We would like to express our deep appreciation to Yayasan Sabah especially to Dr. Yap Sau Wai, Mrs. Roselia and staff for administrative and logistic support throughout the survey. We also thank the Chief Conservator of Forests, Deputy Chief Conservator of Forests (FSP), Deputy Chief Conservator of Forests (R&D), Institute of Tropical Biodiversity and Sustainable Development and School of Marine and Environmental Science, Universiti Malaysia Terengganu, for their continuous support. Also thank to En. Jumri Abd. Hamid for providing maps and the staff of the Systematic Botany section from Sabah Forest Department are gratefully acknowledged for their hard work in the field.

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Appendix I. List of vascular plant species recorded from Batu Timbang, ICCA. The species are arranged by family in alphabetical order

Species	Family	G	H	End	IUCN/ Malaysia Red List	SFDpro	SWCE	CITES
<i>Hydnocarpus borneensis</i>	Achariaceae	Ad	t	Borneo	NE	No	No	No
<i>Hydnocarpus</i> cf. <i>woodii</i>	Achariaceae	Ad	t			No	No	No
<i>Hydnocarpus polypetalus</i>	Achariaceae	Ad	t	Not	NE	No	No	No
<i>Hydnocarpus</i> sp.	Achariaceae	Ad	t			No	No	No
<i>Hydnocarpus subfalcatus</i>	Achariaceae	Ad	t	Not	NE	No	No	No
<i>Hydnocarpus sumatranus</i>	Achariaceae	Ad	t	Not	NE	No	No	No
<i>Hydnocarpus woodii</i>	Achariaceae	Ad	t	Not	NE	No	No	No
<i>Saurauia agamae</i>	Actinidiaceae	Ad	t	Sabah	NE	No	No	No
<i>Saurauia oblancifolia</i>	Actinidiaceae	Ad	t	Borneo	NE	No	No	No
<i>Saurauia strigosa</i>	Actinidiaceae	Ad	t	Not	NE	No	No	No
<i>Gluta</i> cf. <i>oba</i>	Anacardiaceae	Ad	t			No	No	No
<i>Gluta rugulosa</i>	Anacardiaceae	Ad	t	Borneo	NE	No	No	No
<i>Gluta</i> sp.	Anacardiaceae	Ad	t			No	No	No
<i>Gluta wallichii</i>	Anacardiaceae	Ad	t	Not	NE	No	No	No
<i>Mangifera</i> cf. <i>macrocarpa</i>	Anacardiaceae	Ad	t			Yes	No	No
<i>Swintonia</i> cf. <i>schwenkii</i>	Anacardiaceae	Ad	t			No	No	No
<i>Artabotrys</i> cf. <i>suaveolens</i>	Annonaceae	Ad	c			No	No	No
<i>Enicosanthum grandifolium</i>	Annonaceae	Ad	t	?	?	No	No	No
<i>Fissistigma latifolium</i>	Annonaceae	Ad	c	Not	NE	No	No	No
<i>Friesodielsia glauca</i>	Annonaceae	Ad	c	Not	NE	No	No	No
Indet.	Annonaceae	Ad						
<i>Orophea alba</i>	Annonaceae	Ad	t	Borneo	NE	No	No	No
<i>Orophea myriantha</i>	Annonaceae	Ad	t	Borneo	NE	No	No	No
<i>Orophea rubra</i>	Annonaceae	Ad	t	Borneo	NE	No	No	No
<i>Polyalthia cauliflora</i>	Annonaceae	Ad	t	Not	NE	No	No	No
<i>Polyalthia insignis</i>	Annonaceae	Ad	t	Not	NE	No	No	No
<i>Polyalthia microtus</i>	Annonaceae	Ad	t	Not	NE	No	No	No
<i>Polyalthia</i> sp.	Annonaceae	Ad	t					
<i>Polyalthia sumatrana</i>	Annonaceae	Ad	t	Not	NE	No	No	No
<i>Popowia odoardi</i>	Annonaceae	Ad	t	Borneo	NE	No	No	No
<i>Sagaraea</i> sp.	Annonaceae	Ad	t			No	No	No
<i>Sageraea lanceolata</i>	Annonaceae	Ad	t	Not	NE	No	No	No
<i>Uvaria</i> cf. <i>littoralis</i>	Annonaceae	Ad	t			No	No	No
<i>Alocasia denudata</i>	Araceae	Am	h	Not	NE	No	No	No
<i>Amorphophallus pendulus</i>	Araceae	Am	h	Borneo	NE	No	No	No
<i>Raphidophora maingayi</i>	Araceae	Am	h	Not	NE	No	No	No

<i>Scindapsus rupestris</i>	Araceae	Am	h	Not	NE	No	No	No
<i>Scindapsus</i> sp.	Araceae	Am	h			No	No	No
<i>Agathis lenticula</i>	Araucariaceae	G	t	Sabah	VU	No	No	No
<i>Calamus javensis</i>	Arecaceae	Am	c	Not	NE	No	No	No
<i>Calamus kiahii</i>	Arecaceae	Am	c	Borneo	NE	No	No	No
<i>Calamus marginatus</i>	Arecaceae	Am	c	Not	NE	No	No	No
<i>Calamus pogonacanthus</i>	Arecaceae	Am	c	Borneo	NE	No	No	No
<i>Caryota no</i>	Arecaceae	Am	pt	Borneo	NE	No	Yes	No
<i>Korthalsia echinometra</i>	Arecaceae	Am	c	Not	NE	No	No	No
<i>Korthalsia furtadoana</i>	Arecaceae	Am	c	Borneo	NE	No	No	No
<i>Korthalsia rigida</i>	Arecaceae	Am	c	Not	NE	No	No	No
<i>Licuala campestris</i>	Arecaceae	Am	pt	Borneo	NE	No	No	No
<i>Pinanga lepidota</i>	Arecaceae	Am	pt	Borneo	NE	No	No	No
<i>Begonia rotundibracteata</i>	Begoniaceae	Ad	h	Sabah	NE	No	No	No
<i>Dacryodes</i> cf. <i>longifolia</i>	Burseraceae	Ad	t			Yes	No	No
<i>Dacryodes</i> cf. <i>rugosa</i>	Burseraceae	Ad	t			Yes	No	No
<i>Dacryodes incurvata</i>	Burseraceae	Ad	t	Not	NE	Yes	No	No
<i>Dacryodes rostrata</i>	Burseraceae	Ad	t	Not	LC	Yes	No	No
<i>Dacryodes</i> sp.	Burseraceae	Ad	t			Yes	No	No
<i>Santiria apiculata</i>	Burseraceae	Ad	t	Not	LC	Yes	No	No
<i>Santiria oblongifolia</i>	Burseraceae	Ad	t	Not	NE	Yes	No	No
<i>Gymnostoma sumatranum</i>	Casuarinaceae	Ad	t	Not	NE	No	No	No
Indet.	Celastraceae	Ad	t			No	No	No
<i>Lophopetalum glabrum</i>	Celastraceae	Ad	t	Borneo	NE	No	No	No
<i>Lophopetalum</i> sp.	Celastraceae	Ad	t			No	No	No
<i>Salacia korthalsiana</i>	Celastraceae	Ad	t	Not	NE	No	No	No
<i>Salacia</i> sp.	Celastraceae	Ad	t			No	No	No
<i>Calophyllum blancoi</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Calophyllum</i> cf. <i>biflorum</i>	Clusiaceae	Ad	t			No	No	No
<i>Calophyllum</i> cf. <i>gracilipes</i>	Clusiaceae	Ad	t			No	No	No
<i>Calophyllum nodosum</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Calophyllum</i> sp.	Clusiaceae	Ad	t			No	No	No
<i>Calophyllum</i> sp1	Clusiaceae	Ad	t			No	No	No
<i>Calophyllum</i> sp2	Clusiaceae	Ad	t			No	No	No
<i>Calophyllum venulosum</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Garcinia</i> cf. <i>parvifolia</i>	Clusiaceae	Ad	t			No	No	No
<i>Garcinia desrousseauxii</i>	Clusiaceae	Ad	t	Borneo	NE	No	No	No
<i>Garcinia maingayi</i>	Clusiaceae	Ad	t	Not	LC	No	No	No
<i>Garcinia parvifolia</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Garcinia rostrata</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Garcinia</i> sp.	Clusiaceae	Ad	t			No	No	No
<i>Garcinia tetragonus</i>	Clusiaceae	Ad	t	Not	NE	No	No	No

<i>Garcinia venulosa</i>	Clusiaceae	Ad	t	Not	NE	No	No	No
<i>Kaya</i>	Clusiaceae	Ad	t	Borneo	NE	No	No	No
<i>Terminalia phellocarpa</i>	Combretaceae	Ad	t	Not	NE	No	No	No
<i>Connarus euphlebius</i>	Connaraceae	Ad	t	Not	NE	No	No	No
<i>Erycibe praecipua</i> subsp. <i>borneensis</i>	Convolvulaceae	Ad	c	Sabah	NE	No	No	No
<i>Erycibe</i> sp.	Convolvulaceae	Ad	c			No	No	No
<i>Erycibe stapfiana</i>	Convolvulaceae	Ad	c	Not	NE	No	No	No
<i>Erycibe stenophylla</i>	Convolvulaceae	Ad	c	Borneo	NE	No	No	No
<i>Alangium javanicum</i> var. <i>ebenaceum</i>	Cornaceae	Ad	t	Not	LC	No	No	No
<i>Alangium</i> sp.	Cornaceae	Ad	t			No	No	No
<i>Mastixia cuspidata</i>	Cornaceae	Ad	t	Not	NE	No	No	No
<i>Mastixia</i> sp.	Cornaceae	Ad	t			No	No	No
<i>Costus globosus</i>	Costaceae	Am	h	Not	NE	No	No	No
<i>Cyathea ramispina</i>	Cyatheaceae	F	f	Borneo	NE	No	No	No
<i>Dichapetalum grandifolium</i>	Dichapetalaceae	Ad	t	Borneo	NE	No	No	No
<i>Tetracera akara</i>	Dilleniaceae	Ad	c	Not	NE	No	No	No
<i>Tetracera korthalsii</i>	Dilleniaceae	Ad	c	Not	NE	No	No	No
<i>Dipterocarpus applanatus</i>	Dipterocarpaceae	Ad	t	Borneo	CR	No	No	No
<i>Dipterocarpus caudiferus</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Dipterocarpus hasseltii</i>	Dipterocarpaceae	Ad	t	Not	CR (VU)	No	No	No
<i>Dipterocarpus kunstleri</i>	Dipterocarpaceae	Ad	t	Not	CR (NT)	No	No	No
<i>Dryobalanops keithii</i>	Dipterocarpaceae	Ad	t	Borneo	CR	No	No	No
<i>Dryobalanops lanceolata</i>	Dipterocarpaceae	Ad	t	Borneo	EN	No	No	No
<i>Hopea ferruginea</i>	Dipterocarpaceae	Ad	t	Not	CR (LC)	No	No	No
<i>Hopea</i> sp.	Dipterocarpaceae	Ad	t					
<i>Parashorea tomentella</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea agamii</i>	Dipterocarpaceae	Ad	t	Borneo	EN	No	No	No
<i>Shorea argentifolia</i>	Dipterocarpaceae	Ad	t	Borneo	EN	No	No	No
<i>Shorea</i> cf. <i>hopeifolia</i>	Dipterocarpaceae	Ad	t					
<i>Shorea</i> cf. <i>micans</i>	Dipterocarpaceae	Ad	t					
<i>Shorea confusa</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea faguetiana</i>	Dipterocarpaceae	Ad	t	Not	EN (LC)	No	No	No
<i>Shorea fallax</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea ferruginea</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea flaviflora</i>	Dipterocarpaceae	Ad	t	Borneo	CR	No	No	No
<i>Shorea havilandii</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea hopeifolia</i>	Dipterocarpaceae	Ad	t	Not	CR (NT)	No	No	No
<i>Shorea johorensis</i>	Dipterocarpaceae	Ad	t	Not	CR (NT)	No	No	No
<i>Shorea laevis</i>	Dipterocarpaceae	Ad	t	Not	LC (NT)	No	No	No
<i>Shorea leprosula</i>	Dipterocarpaceae	Ad	t	Not	EN (LC)	No	No	No
<i>Shorea macrophylla</i>	Dipterocarpaceae	Ad	t	Borneo	VU	Yes	No	No
<i>Shorea monticola</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea obscura</i>	Dipterocarpaceae	Ad	t	Borneo	EN	No	No	No
<i>Shorea ovalis</i>	Dipterocarpaceae	Ad	t	Not	EN (NT)	No	No	No
<i>Shorea ovata</i>	Dipterocarpaceae	Ad	t	Not	EN (NT)	No	No	No

<i>Shorea parvifolia</i>	Dipterocarpaceae	Ad	t	Not	NE (LC)	No	No	No
<i>Shorea parvistipulata</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea patoiensis</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea platyclados</i>	Dipterocarpaceae	Ad	t	Not	EN (NT)	No	No	No
<i>Shorea rubra</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Shorea scorbiculata</i>	Dipterocarpaceae	Ad	t	Not	NE (LC)	No	No	No
<i>Shorea</i> sp.	Dipterocarpaceae	Ad	t			No	No	No
<i>Shorea symingtonii</i>	Dipterocarpaceae	Ad	t	Sabah	CR	No	No	No
<i>Shorea venulosa</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Vatica</i> cf. <i>rassak</i>	Dipterocarpaceae	Ad	t			No	No	No
<i>Vatica oblongifolia</i>	Dipterocarpaceae	Ad	t	Borneo	NE	No	No	No
<i>Vatica odorata</i> subsp. <i>mindanaensis</i>	Dipterocarpaceae	Ad	t	Not	NE	No	No	No
<i>Vatica</i> sp.	Dipterocarpaceae	Ad	t			No	No	No
<i>Vatica umbonata</i>	Dipterocarpaceae	Ad	t	Not	LC	No	No	No
<i>Bolbitis heteroclita</i>	Dryopteridaceae	F	f	Not	NE	No	No	No
<i>Bolbitis</i> sp.	Dryopteridaceae	F	f			No	No	No
<i>Diospyros</i> sp.	Ebenaceae	Ad	t			No	No	No
<i>Diospyros</i> sp 1	Ebenaceae	Ad	t			No	No	No
<i>Diospyros</i> sp 2	Ebenaceae	Ad	t			No	No	No
<i>Diospyros buxifolia</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros</i> cf. <i>elliptifolia</i>	Ebenaceae	Ad	t			No	No	No
<i>Diospyros curanii</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros foxworthyii</i>	Ebenaceae	Ad	t	Not	LC	No	No	No
<i>Diospyros frutescens</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros macrophylla</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros mindanaensis</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros oligantha</i>	Ebenaceae	Ad	t	Borneo	NE	No	No	No
<i>Diospyros perfida</i>	Ebenaceae	Ad	t	Borneo	NE	No	No	No
<i>Diospyros pilosantha</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros subrhomboidea</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Diospyros sumatrana</i>	Ebenaceae	Ad	t	Not	NE	No	No	No
<i>Elaeocarpus</i> cf. <i>pendunculatus</i>	Elaeocarpaceae	Ad	t			No	No	No
<i>Rhododendron</i> cf. <i>durionifolium</i>	Ericaceae	Ad	t			No	Yes	No
<i>Elaeocarpus</i> sp.	Elaeocarpaceae	Ad	t			No	No	No
<i>Agrostistachys longifolia</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Blumeodendron concolor</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Blumeodendron kurzii</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Blumeodendron</i> sp.	Euphorbiaceae	Ad	t			No	No	No
<i>Blumeodendron tokbrai</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Koilolepas laevigatum</i>	Euphorbiaceae	Ad	t	Borneo	NE	No	No	No

<i>Koilodepas longifolium</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Macaranga glandibracteolata</i>	Euphorbiaceae	Ad	t	Borneo	NE	No	No	No
<i>Macaranga hypoleuca</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Mallotus lackeyi</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Mallotus penangensis</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Mallotus stipularis</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Neoscortechinia cf. forbesii</i>	Euphorbiaceae	Ad	t			No	No	No
<i>Neoscortechinia philippinensis</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Neoscortechinia sp</i>	Euphorbiaceae	Ad	t			No	No	No
<i>Neoscortechinia sumatrensis</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Omphalea sargentii</i>	Euphorbiaceae	Ad	c	Not	NE	No	No	No
<i>Ptychopyxis arborea</i>	Euphorbiaceae	Ad	t	Borneo	NE	No	No	No
<i>Ptychopyxis sp.</i>	Euphorbiaceae	Ad	t			No	No	No
<i>Spathiostemon javensis</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Sumbaviopsis albicans</i>	Euphorbiaceae	Ad	t	Not	NE	No	No	No
<i>Bauhinia endertii</i>	Fabaceae	Ad	c	Borneo	NE	No	No	No
<i>Bauhinia kockina</i> var. <i>kockiana</i>	Fabaceae	Ad	c	Not	NE	No	No	No
<i>Caesalpinia sappan</i>	Fabaceae	Ad	c	Not	LC	No	No	No
<i>Ormosia bancana</i>	Fabaceae	Ad	t	Not	NE	No	No	No
<i>Spatholobus cf. gyrocarpus</i>	Fabaceae	Ad	c			No	No	No
<i>Spatholobus hirsutus</i>	Fabaceae	Ad	c	Not	NE	No	No	No
<i>Spatholobus macropterus</i>	Fabaceae	Ad	c	Not	NE	No	No	No
<i>Castanopsis hypophoenicea</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus cantleyanus</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus elegans</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus ferrugineus</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus gracilis</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus lucidus</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus pseudokunstleri</i>	Fagaceae	Ad	t	Not	NE	Yes	No	No
<i>Lithocarpus sp.</i>	Fagaceae	Ad	t			Yes	No	No
<i>Quercus argentata</i>	Fagaceae	Ad	t	Not	NE	No	No	No
<i>Quercus lineata</i>	Fagaceae	Ad	t	Not	NE	No	No	No
<i>Quercus sp.</i>	Fagaceae	Ad	t			No	No	No
<i>Flagellaria indica</i>	Flagellariaceae	Am	c	Not	NE	No	No	No
<i>Utania spicata</i>	Gentianaceae	Ad	t	Not	NE	No	No	No
<i>Cyrtandra sarawakensis</i>	Gesneriaceae	Ad	h	Borneo	NE	No	No	No
<i>Henckelia amoena</i>	Gesneriaceae	Ad	h	Borneo	NE	No	No	No

<i>Cephalomanes javanicum</i>	Hymenophyllaceae	F	f	Not	NE	No	No	No
<i>Crepidomanes bipunctatum</i>	Hymenophyllaceae	F	f	Not	NE	No	No	No
<i>Vandenboschia maxima</i>	Hymenophyllaceae	F	f	Not	LC	No	No	No
<i>Curculigo latifolia</i>	Hypoxidaceae	Am	h	Not	NE	No	No	No
<i>Engelhardia serrata</i>	Juglandaceae	Ad	t	Not	NE	No	No	No
<i>Teijsmanniodendron bogoriense</i>	Lamiaceae	Ad	t	Not	NE	No	No	No
<i>Teijsmanniodendron glabrum</i>	Lamiaceae	Ad	t	Not	NE	No	No	No
<i>Teijsmanniodendron smilacifolium</i>	Lamiaceae	Ad	t	Borneo	NE	No	No	No
<i>Teijsmanniodendron</i> sp.	Lamiaceae	Ad	t					
<i>Vitex vestita</i>	Lamiaceae	Ad	t	Not	NE	No	No	No
<i>Actinodaphne borneensis</i>	Lauraceae	Ad	t	Borneo	NE	No	No	No
<i>Actinodaphne</i> cf. <i>borneensis</i>	Lauraceae	Ad	t			No	No	No
<i>Actinodaphne glomerata</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Alseodaphne oblanceolata</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Beilschmedia assamica</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Beilschmedia lucidula</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Beilschmedia tawaensis</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Beilschmedia</i> sp.	Lauraceae	Ad	t					
<i>Caryodaphnopsis tonkensis</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Cryptocarya ferrea</i> var. <i>ferrea</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Cryptocarya griffithianum</i> var. <i>strictifolia</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Cryptocarya teysmanniana</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Eusideroxylon zwageri</i>	Lauraceae	Ad	t	Not	VU	Yes	No	No
indet 1	Lauraceae	Ad	t					
indet 2	Lauraceae	Ad	t					
<i>Litsea cylindrocarpa</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Litsea ficoidea</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Litsea firma</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Litsea fulva</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Litsea grandis</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Litsea oppositifolia</i>	Lauraceae	Ad	t	Borneo	NE	No	No	No
<i>Litsea</i> sp.	Lauraceae	Ad	t					
<i>Phoebe macrophylla</i>	Lauraceae	Ad	t	Not	NE	No	No	No
<i>Barringtonia</i> cf. <i>lanceolata</i>	Lecythidaceae	Ad	t					
<i>Barringtonia curranii</i>	Lecythidaceae	Ad	t	Not	NE	No	No	No
<i>Barringtonia lanceolata</i>	Lecythidaceae	Ad	t	Borneo	NE	No	No	No
<i>Barringtonia sarcostachys</i>	Lecythidaceae	Ad	t	Not	NE	No	No	No

<i>Barringtonia scortechinii</i>	Lecythidaceae	Ad	t	Not	NE	No	No	No
<i>Planchonia valida</i>	Lecythidaceae	Ad	t	Not	NE	No	No	No
<i>Lindsaea parasitica</i>	Lindsaeaceae	F	f	Not	NE	No	No	No
<i>Lygodium circinatum</i>	Lygodiaceae	F	f	Not	NE	No	No	No
<i>Magnolia bintuluensis</i>	Magnoliaceae	Ad	t	Not	NE	No	No	No
<i>Magnolia gigantifolia</i>	Magnoliaceae	Ad	t	Not	NE	No	No	No
<i>Brownlowia stipulata</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Byttneria reinwardtii</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Durio grandiflorus</i>	Malvaceae	Ad	t	Borneo	VU	Yes	No	No
<i>Heritiera elata</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Heritiera sumatrana</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Microcos hirsuta</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Microcos sp.</i>	Malvaceae	Ad	t					
<i>Microcos triflora var longipetiolata</i>	Malvaceae	Ad	t	Borneo	NE	No	No	No
<i>Pterospermum elongatum</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Pterospermum subpeltatum</i>	Malvaceae	Ad	t	Borneo	NE	No	No	No
<i>Sterculia rubiginosa</i>	Malvaceae	Ad	t	Not	NE	No	No	No
<i>Phacelophrynium aurantium</i>	Marantaceae	Am	h	Borneo	NE	No	No	No
<i>Phrynium pubinerve</i>	Marantaceae	Am	h	Not	NE	No	No	No
<i>Memecylon scolopacium</i>	Melastomataceae	Ad	t	Borneo	NE	No	No	No
<i>Memecylon sp.</i>	Melastomataceae	Ad	t					
<i>Anerinclaistus quintuplinervis</i>	Melastomataceae	Ad	sh	Not	NE	No	No	No
<i>Oxyspora beccarii</i>	Melastomataceae	Ad	sh	Borneo	NE	No	No	No
<i>Pternandra rostrata</i>	Melastomataceae	Ad	t	Not	NE	No	No	No
<i>Sonerila borneensis</i>	Melastomataceae	Ad	h	Borneo	NE	No	No	No
<i>Aglaia cf. macrocarpa</i>	Meliaceae	Ad	t					
<i>Aglaia cf. teysmannia</i>	Meliaceae	Ad	t					
<i>Aglaia edulis</i>	Meliaceae	Ad	t	Not	NT	No	No	No
<i>Aglaia elliptica subsp. clementis</i>	Meliaceae	Ad	t	Not	LC	No	No	No
<i>Aglaia grandis</i>	Meliaceae	Ad	t	Not	NT	No	No	No
<i>Aglaia korthalsii</i>	Meliaceae	Ad	t	Not	NT	No	No	No
<i>Aglaia odoratissima</i>	Meliaceae	Ad	t	Not	LC	No	No	No
<i>Aglaia sp.</i>	Meliaceae	Ad	t					
<i>Aglaia tomentosa subsp. tomentosa</i>	Meliaceae	Ad	t	Not	LC	No	No	No
<i>Aphanamixis borneensis</i>	Meliaceae	Ad	t	Not	NE	No	No	No
<i>Chisocheton sarawakanus</i>	Meliaceae	Ad	t	Not	NE	No	No	No
<i>Chisocheton sp.</i>	Meliaceae	Ad	t					
<i>Dysoxylum crytobotryum</i>	Meliaceae	Ad	t	Not	NE	No	No	No

<i>Dysoxylum excelsum</i>	Meliaceae	Ad	t	Not	NE	No	No	No
<i>Dysoxylum parasiticum</i>	Meliaceae	Ad	t	Not	NE	No	No	No
<i>Dysoxylum</i> sp.	Meliaceae	Ad	t					
<i>Tinospora merrilliana</i>	Menispermaceae	Ad	c	Not	NE	No	No	No
<i>Ficus sumatrana</i>	Moraceae	Ad	t	Not	NE	No	No	No
<i>Gymnacranthera farquhariana</i>	Myristicaceae	Ad	t	Not	NE	No	No	No
<i>Knema korthalsii</i>	Myristicaceae	Ad	t	Not	NE	No	No	No
<i>Knema latericia</i>	Myristicaceae	Ad	t	Not	NE	No	No	No
<i>Knema latericia</i> var. <i>albifolia</i>	Myristicaceae	Ad	t	Borneo	NE	No	No	No
<i>Myristica cinnamomea</i>	Myristicaceae	Ad	t	Not	LC	No	No	No
<i>Syzygium bankense</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium castaneum</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium cephalophorum</i>	Myrtaceae	Ad	t	Borneo	NE	No	No	No
<i>Syzygium</i> cf. <i>palembanica</i>	Myrtaceae	Ad	t					
<i>Syzygium fastigiatum</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium korthalsiana</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium leucoxydon</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium roseomarginatum</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Syzygium</i> sp 3	Myrtaceae	Ad	t					
<i>Syzygium</i> sp.	Myrtaceae	Ad	t					
<i>Syzygium</i> sp 1	Myrtaceae	Ad	t					
<i>Syzygium</i> sp 2	Myrtaceae	Ad	t					
<i>Syzygium subdecusata</i>	Myrtaceae	Ad	t	?	?	No	No	No
<i>Syzygium valdevenosum</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Tristaniopsis bilocularis</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Tristaniopsis</i> cf. <i>whiteana</i>	Myrtaceae	Ad	t	Not	NE	No	No	No
<i>Ochanostachys amentacea</i>	Olacaceae	Ad	t	Not	DD	No	No	No
<i>Chionanthus pluriflorus</i>	Oleaceae	Ad	t	Not	NE	No	No	No
<i>Oleandra pistillaris</i>	Oleandraceae	F	f	Not	NE	No	No	No
<i>Bulbophyllum</i> sp.	Orchidaceae	Am	h	?	?	No	Yes	Yes
<i>Agrostophyllum stipulatum</i>	Orchidaceae	Am	h	Not	NE	No	Yes	Yes
<i>Liparis</i> cf. <i>viridiflora</i>	Orchidaceae	Am	h			No	Yes	Yes
<i>Freycinetia biloba</i>	Pandanaceae	Am	sh	Borneo	NE	No	No	No
<i>Freycinetia discoidea</i>	Pandanaceae	Am	sh	Not	NE	No	No	No
<i>Pandanus affinis</i>	Pandanaceae	Am	sh	Not	NE	No	No	No
<i>Pandanus discostigma</i>	Pandanaceae	Am	sh	Borneo	NE	No	No	No
<i>Ternstroemia aneura</i>	Pentaphragaceae	Ad	t	Not	NE	No	No	No
<i>Ternstroemia beccarii</i>	Pentaphragaceae	Ad	t	Borneo	NE	No	No	No

<i>Ternstroemia</i> sp.	Pentaphylacaceae	Ad	t					
<i>Antidesma neurocarpum</i>	Phyllanthaceae	Ad	t	Not	NE	No	No	No
<i>Aporosa acuminatissima</i>	Phyllanthaceae	Ad	t	Not	NE	No	No	No
<i>Aporosa confusa</i>	Phyllanthaceae	Ad	t	Not	NE	No	No	No
<i>Aporosa frutescens</i>	Phyllanthaceae	Ad	t	Not	NE	No	No	No
<i>Aporosa</i> sp.	Phyllanthaceae	Ad	t					
<i>Baccaurea lanceolata</i>	Phyllanthaceae	Ad	t	Not	NE	Yes	No	No
<i>Baccaurea membranacea</i>	Phyllanthaceae	Ad	t	Not	VU	Yes	No	No
<i>Baccaurea minor</i>	Phyllanthaceae	Ad	t	Not	NE	Yes	No	No
<i>Baccaurea sumatrana</i>	Phyllanthaceae	Ad	t	Not	NE	Yes	No	No
<i>Baccaurea tetrandra</i>	Phyllanthaceae	Ad	t	Not	NE	Yes	No	No
<i>Cleistanthus myrianthus</i> var. <i>concinus</i>	Phyllanthaceae	Ad	t	Not	NE	No	No	No
<i>Cleistanthus podopyxis</i>	Phyllanthaceae	Ad	t	Borneo	NE	No	No	No
<i>Cleistanthus</i> sp.	Phyllanthaceae	Ad	t					
<i>Piper blumei</i>	Piperaceae	Ad	c	Not	NE	No	No	No
<i>Dinochloa sublaevigata</i>	Poaceae	Am	c	Borneo	NE	No	No	No
<i>Scrotochloa urceolata</i>	Poaceae	Am	g	Not	NE	No	No	No
<i>Falcatifolium falciforme</i>	Podocarpaceae	G	t	Not	LC	No	No	No
<i>Nageia wallichiana</i>	Podocarpaceae	G	t	Not	LC	No	No	No
<i>Phyllocladus hypophyllus</i>	Podocarpaceae	G	t	Not	LC	No	No	No
<i>Podocarpus</i> cf. <i>neriifolius</i>	Podocarpaceae	G	t			No	Yes	No
<i>Xanthophyllum adenotus</i> var. <i>adenotus</i>	Polygalaceae	Ad	t	Not	NE	No	No	No
<i>Xanthophyllum flavescens</i>	Polygalaceae	Ad	t	Not	NE	No	No	No
<i>Xanthophyllum griffithii</i> var. <i>angustifolium</i>	Polygalaceae	Ad	t	Not	NE	No	No	No
<i>Xanthophyllum montanum</i>	Polygalaceae	Ad	t	Sabah	NE	No	No	No
<i>Xanthophyllum schizoarpon</i>	Polygalaceae	Ad	t	Borneo	NE	No	No	No
<i>Xanthophyllum trichocladium</i>	Polygalaceae	Ad	t	Borneo	NE	No	No	No
<i>Calymmodon gracilis</i>	Polypodiaceae	F	f	Not	NE	No	No	No
<i>Selliguea stenophylla</i>	Polypodiaceae	F	f	Not	NE	No	No	No
<i>Ardisia forbesii</i>	Primulaceae	Ad	t	Not	NE	No	No	No
<i>Ardisia pachysandra</i>	Primulaceae	Ad	t	Not	NE	No	No	No
<i>Ardisia</i> sp.	Primulaceae	Ad	t					
<i>Embelia philippinensis</i>	Primulaceae	Ad	c	Not	NE	No	No	No
<i>Labisia pumila</i>	Primulaceae	Ad	h	Not	NE	No	No	No
<i>Myrsine porteri</i>	Primulaceae	Ad	t	Not	NE	No	No	No
<i>Helicia attenuata</i>	Proteaceae	Ad	t	Not	NE	No	No	No
<i>Helicia petiolaris</i>	Proteaceae	Ad	t	Not	NE	No	No	No

<i>Helicia</i> sp.	Proteaceae	Ad	t					
<i>Heliciopsis artocarpoides</i>	Proteaceae	Ad	t	Not	NE	No	No	No
<i>Antrophyum callifolium</i>	Pteridaceae	F	f	Not	NE	No	No	No
<i>Antrophyum sessilifolium</i>	Pteridaceae	F	f	Not	NE	No	No	No
<i>Taenitis blechnoides</i>	Pteridaceae	F	f	Not	NE	No	No	No
<i>Drypetes</i> sp.	Putranjivaceae	Ad	t					
<i>Rafflesia tengku-adlinii</i>	Rafflesiaceae	Ad	sa	Sabah	NE	No	Yes	No
<i>Ziziphus angustifolia</i>	Rhamnaceae	Ad	t	Not	NE	No	No	No
<i>Ziziphus borneensis</i>	Rhamnaceae	Ad	t	Borneo	NE	No	No	No
<i>Prunus javanica</i>	Rosaceae	Ad	t	Not	NE	No	No	No
<i>Acranthera velutinervia</i>	Rubiaceae	Ad	sh	Sabah	NE	No	No	No
<i>Argostemma borragineum</i>	Rubiaceae	Ad	sh	Not	NE	No	No	No
<i>Cyanoneuron pubescens</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Diplospora malaccensis</i>	Rubiaceae	Ad	t	Not	NE	No	No	No
<i>Hedyotis pulchella</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Hymenodictyon orixense</i>	Rubiaceae	Ad	t	Not	NE	No	No	No
<i>Ixora brachyantha</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Ixora linggensis</i>	Rubiaceae	Ad	t	?	?	No	No	No
<i>Ixora miliensis</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Ludekia borneensis</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Neonauclea artocarpoides</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Pleiocarpidia enneandra</i>	Rubiaceae	Ad	t	Not	NE	No	No	No
<i>Praravinia suberosa</i>	Rubiaceae	Ad	t	Borneo	NE	No	No	No
<i>Urophyllum glabrum</i>	Rubiaceae	Ad	t	Not	NE	No	No	No
<i>Urophyllum griffithianum</i>	Rubiaceae	Ad	t	Not	NE	No	No	No
<i>Maclurodendron pubescens</i>	Rutaceae	Ad	t	Sabah	NE	No	No	No
<i>Maclurodendron</i> sp.	Rutaceae	Ad	t			No	No	No
<i>Meliosma simplicifolia</i>	Sabiaceae	Ad	t	Not	NE	No	No	No
<i>Casaria grewiaefolia</i> var. <i>gelonioides</i>	Salicaceae	Ad	t	?	NE	No	No	No
<i>Casaria grewiaefolia</i> var. <i>grewiaefolia</i>	Salicaceae	Ad	t	?	NE	No	No	No
<i>Dimocarpus longan</i>	Sapindaceae	Ad	t	Not	NT	No	No	No
<i>Nephelium ramboutan-ake</i>	Sapindaceae	Ad	t	Not	NE	Yes	No	No
<i>Madhuca mindanaensis</i>	Sapotaceae	Ad	t	Not	NE	No	No	No
<i>Madhuca multinervia</i>	Sapotaceae	Ad	t	Sabah	NE	No	No	No
<i>Madhuca</i> sp.	Sapotaceae	Ad	t			No	No	No

<i>Palaquium dasyphyllum</i>	Sapotaceae	Ad	t	Not	NE	No	No	No
<i>Palaquium leiocarpum</i>	Sapotaceae	Ad	t	Not	NE	No	No	No
<i>Palaquium rostratum</i>	Sapotaceae	Ad	t	Not	NE	No	No	No
<i>Palaquium sericeum</i>	Sapotaceae	Ad	t	Borneo	NE	No	No	No
<i>Selaginella brevipes</i>	Selaginellaceae	L	l	Borneo	NE	No	No	No
<i>Selaginella intermedia</i>	Selaginellaceae	L	l	?	NE	No	No	No
<i>Eurycoma longifolia</i>	Simaroubaceae	Ad	t	Not	NE	No	No	No
<i>Gomphandra cumingiana</i>	Stemonuraceae	Ad	t	Not	NE	No	No	No
<i>Stemonurus grandifolius</i>	Stemonuraceae	Ad	t	Borneo	NE	No	No	No
<i>Symplocos fasciculata</i>	Symplocaceae	Ad	t	Not	NE	No	No	No
<i>Symplocos</i> sp.	Symplocaceae	Ad	t			No	No	No
<i>Symplocos tricocata</i>	Symplocaceae	Ad	t	Not	NE	No	No	No
<i>Pleocnemia irregularis</i>	Tectariaceae	F	f	Not	NE	No	No	No
<i>Tectaria pleiosora</i>	Tectariaceae	F	f	Not	NE	No	No	No
<i>Octomeles sumatrana</i>	Tetramelaceae	Ad	t	Not	LC	No	No	No
<i>Schima wallichii</i>	Theaceae	Ad	t	Not	NE	No	No	No
<i>Elatostema kabayense</i>	Urticaceae	Ad	h	Not	NE	No	No	No
<i>Tetrastigma</i> cf. <i>diepenhorstii</i>	Vitaceae	Ad	c			No	Yes	No
<i>Tetrastigma</i> cf. <i>lanceolarium</i>	Vitaceae	Ad	c			No	Yes	No
<i>Alpinia capitellata</i>	Zingiberaceae	Am	h	Not	NE	No	Yes	No
<i>Amomum testaceum</i>	Zingiberaceae	Am	h	Not	NE	No	Yes	No
<i>Boesenbergia gracilipes</i>	Zingiberaceae	Am	h	Borneo	NE	No	Yes	No
<i>Boesenbergia pulchella</i>	Zingiberaceae	Am	h	Borneo	NE	No	Yes	No
<i>Burbridgea schizocheila</i>	Zingiberaceae	Am	h	Borneo	NE	No	Yes	No
<i>Elettaria longituba</i>	Zingiberaceae	Am	h	Not	NE	No	Yes	No
<i>Plagiostachys parva</i>	Zingiberaceae	Am	h	Borneo	NE	No	Yes	No
<i>Zingiber griffithii</i>	Zingiberaceae	Am	h	Not	NE	No	Yes	No
<i>Zingiber</i> sp.	Zingiberaceae	Am	h			No	Yes	No

Notes:

IUCN/Malaysia Red List: CR=Critically endangered; EN=Endangered; VU=Vulnerable; NT=Near threatened; LC=Least concern; NE=Not Evaluated

G=Plant Group: Ad=Angiosperm (Dicotyledon); Am=Angiosperm (Monocotyledon); G=Gymnosperm; F=Fern; L=Lycophyte

H=habit: t=tree; c=climber; sh=shrub; h=herb; g=grass; sd=sedge; f=fern; ep=epiphyte; l=lycophyte;

pt=palm tree; sa= saprophytic; str=strangler

SFDpro=Sabah Forestry Department prohibited species under Sabah Forest Enactment 1968

SWCE=Sabah Wildlife Conservation Enactment 1997

CITES=Convention on International Trade in Endangered Species of Wild Fauna and Flora

IdLoc= Location: BT=Batu Timbang