Final report of "Development of specific conservation measures and monitoring procedures to maintain and enhance the conservation attribute in Jerangau HCVF, Terengganu, Malaysia"

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Contents

1.0 Introduction

1.1 Forest Management

The management objective of the natural forests and its resources in Malaysia takes the two-pronged approach of conservation and production. The functions of the natural forests are protected by various legal instruments and these gazettes range from total protection, such as national parks and wildlife sanctuaries, to those that support varying degrees of uses such as Permanent Reserved Forests (PRF). Under PRF, forest areas are delineated following the classification outlined in Section 10 of the National Forestry Act 1984. The production forests under PRF has more than a century-old history of management, namely in the form of Modified Malayan Uniform System, Selective Management System and Sustainable Forest Management System. The system had evolved to ensure that forest resources are managed for the sustainable production of timber and non-timber products in addition to safeguarding the overall ecological, climatic functions and environmental quality. Adherence to cutting limits, determination of annual allowable coupe, harvesting prescriptions and specifications are among the most critical and these are all set out in various regulations and guidelines. In this regards, Malaysia fully subscribes to the International Tropical Timber Organisation (ITTO) Guidelines for the Sustainable Management of Natural Tropical Forests (1992) and its corresponding criteria and indicators (2005).

1.2 Identification and management of HCVF in Peninsular Malaysia

Currently, the identification and management of HCVF in Peninsular Malaysia is guided by the "Guideline on the establishment and management of HCVF at Permanent Reserve Malaysia in Peninsular Malaysia" issued by The Forestry Department of Peninsular Malaysia in February 2015. There are two main components in the guideline:

1) HCVF identification is carried out using National Forest Inventory (NFI), pre-F and post-F inventory data, findings from scientific expedition, interviews with local community, other published reports and stakeholder consultations.
2) The spatial planning for management of a HCVF which includes delineating specific area for HCVF area and buffer zone, maintaining HCVF boundary and controlling illegal encroachment.

2.0 Objective

Specific management strategies and prescription to maintain HCV1 Species diversity is not yet available. Therefore, this report based on scientific research aims to provide specific management prescriptions to maintain the population of *Dipterocarpus sarawakensis* and other rare and Threatened species in HCVF Jerangau, Terengganu.

3.0 Methodology and site description

3.1 Site description

High Conservation Value Forest (HCVF) Jerangau (4°55'29" N, 103°5'31"E) is situated in Compartment 31 of Jerangau Forest Reserve in the state of Terengganu, Malaysia (Figure 1). The 63-ha HCVF Jerangau was established by Terengganu State Forest Department in 2008 for the conservation of *Dipterocarpus sarawakensis*. The western part of the compartment is adjacent to the oil palm plantation and the eastern part is adjacent to the rubber plantation. The HCVF itself was excluded from logging when the compartment and its adjacent Compartment 34 were logged in 2008. The boundary of the HCVF is well demarcated on the ground and is managed as HCVF and Genetic Resource Area (GRA) (Figure 2).

Mean annual rainfall for the period 2006-2015 at Jerangau was 3905 mm (2653-5581 mm) with low rainfall between February to April. Mean annual temperature ranged between 23-31°C (Data provided by Meteorological Department of Malaysia). The topography is undulating with the highest elevation being about 52 m and the lowest area being in the seasonal swamp at the eastern and western parts. The soil in the HCVF belongs to the Marang-Apek series which comprises of phyllite, slate, shale and sandstone (Soil Map and Geological map of Peninsular Malaysia). The vegetation comprises lowland dipterocarp forest interspersed with seasonally freshwater swamp forest. The water level fluctuate between rainy season and dry season. This creates diverse ecological niches that supports different type of vegetations. The main canopy of the lowland forest is dominated by *Dryobalanops aromatica* and *Shorea* such as *Shorea balanocarpoides*, *Shorea macroptera* and *Shorea multiflora*.

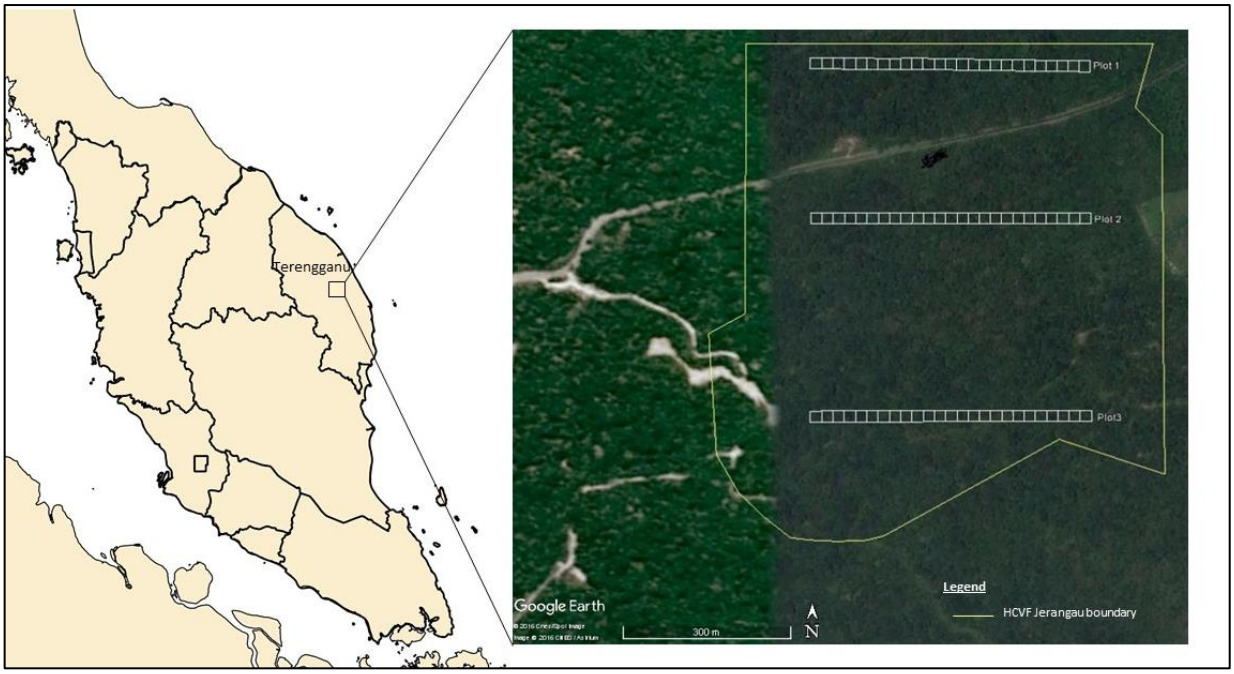


Figure 1: Location of the HCVF Jerangau and plot layout.

Figure 2: Signage of the HCVF Jerangau and Genetic Resource Area (GRA) at the study site.

3.2 Plot setting

Three permanent belt transects (500 x 20 m) were established. For plot selection, the whole 63-ha HCVF area was divided into 47 (West-East) strips of 20 m width and this was stratified into three parts based on the topographical feature. Only strips longer than 500 m was considered in the selection. Plot location was then selected through the use of random number.

The method for plot establishment followed Condit (1998). Survey equipment such as laser range finder, angle encoder and compass were used to establish the transects. For better precision, position of the starting point (reference point) was obtained using Trimble R8 Digital Global Positioning System (DGPS).

Each transect was divided into 10x10 m quadrats and marked with 1.5 m long polyvinyl chloride (PVC) pipe tied with an orange colour flagging tape. The edges of quadrats were marked with raffia strings.

3.3 Plant inventory

Standards collection protocol of herbarium specimen was adopted (Bridson, 1998). Complete specimens with flower and/or fruit were collected and deposited at Kepong Herbarium (KEP) in the Forest Research Institute Malaysia. The identification was done using taxonomic key in botanical publications and by comparing specimens collected with the herbaria specimens deposited in Kepong Herbarium. Seventy two percent of the total 682 taxa recorded were identified to species level whilst the remaining 28% were only able to be identified to morphospecies or genus level.

3.3.1 Trees

Trees with diameter at breast height (DBH) above 10 cm were enumerated in the transects. All trees were measured following Condit's rules, 1998 (pg 46-54). Each tree was tagged with aluminum tag with

six-character alphanumeric identification code. The first two characters represent the plot number, followed by 4 digits of the tree number, eg. P10001.

3.3.2 Non-trees

All shrubs and herbaceous plants except climbers, epiphyte and ferns were surveyed. These were not tagged. The cover of each species in the quadrat was enumerated using Modified Daubenmire Cover Scale by Bailey & Poulton (Muller & Heinz, 1974). The proportion of ground area occupied by vertical projection of a species was scored based on the scale as below (Table 1). Actual number of stems (density) was difficult to be determined because some of the herbaceous plants and shrubs have stoloniferous and rhizomatous growth habit. Single individual of these plants produce a number of stems and they grow in clusters or clumps. For these reason, abundance of non-tree species was measured by plant cover instead of density.

Cover class	**Range of cover (%)**
7	95 – 100
6	75 – 95
5	50 – 75
4	25 – 50
3	5 – 25
2	1 – 5
1	0 – 1

*adopted from Muller & Heinz, 1974

Table 1: Modified Daubenmire Cover Scale

3.3.3 Canopy closure

Canopy closure is defined as “proportion of the sky hemisphere obscured by vegetation when viewed from a single point” (Jennings, et al, 1999). Canopy closure increases beneath a taller tree as more of the sky is obscured and less light reaches to the forest floor. A healthy forest with dense and tall trees has higher canopy closure compared to a disturbed area where the upper strata is removed. Fall of trees and broken branches, wind throw, skid trails and log decks create tree gaps and reduce canopy closure. Consequently, this gaps will then be colonized by early successional plant species. With this assumption, high canopy closure (75-100%) indicates that the area has no disturbance or less disturbed (50-75%).

Canopy closure of each quadrat was scored by simple visual assessment based on the scale below (Table 2). This method is simple and can be easily adopted by foresters and forest managers.

Canopy closure class	Range of canopy closure (%)
1	0 – 25
2	25 – 50

3	50 – 75
4	75 – 100

Table 2: Canopy closure scale

3.3.4 Analysis

Species diversity of each plot was measured using Shannon and Simpson Diversity Indices. The Shannon index is more sensitive to evenness than richness, while Simpson's is more sensitive to dominance species. Species similarity between plots was analyzed using Jaccard and Sorensen similarity index. The diversity of non-tree was described based on richness because the abundance of each species was enumerated in percentage cover.

4.0 Result and discussion

A total of 682 taxa of plants belongs to 78 families and 238 genera were recorded from three 1-ha plots. Species composition of the tree layer and the understorey layer is presented separately for better understanding of the forest structure.

4.1 Tree diversity

A total of 493 taxa were recorded from three 1-ha plots. Plot 2 had the highest tree species richness with 270 taxa followed by Plot 1 with 267 taxa and Plot 3 with 241 taxa (Table 3). The mean tree species richness was 164 taxa per ha. There is not much different in richness and diversity of tree species between Plot 1 and Plot 2 as indicated by Shannon's and Simpsom's. Figure 3 shows that species rank abundance curve of the plots has steep gradient. This indicates the plots have low evenness of species abundance distribution and are dominated by few high-ranking species that have much higher abundance than the lower ranking species such as *Dryobalanops aromatica*, *Shorea balanocarpoides* and *Croton laevifolius*. These three species constitute about 14.5% of the species composition in Plot 1, 11.8% in Plot 2 and 15.6% in Plot 3. About 30% of the total taxa had 3 stems or less. High number of rare taxa contributes to the high diversity and low evenness within plot.

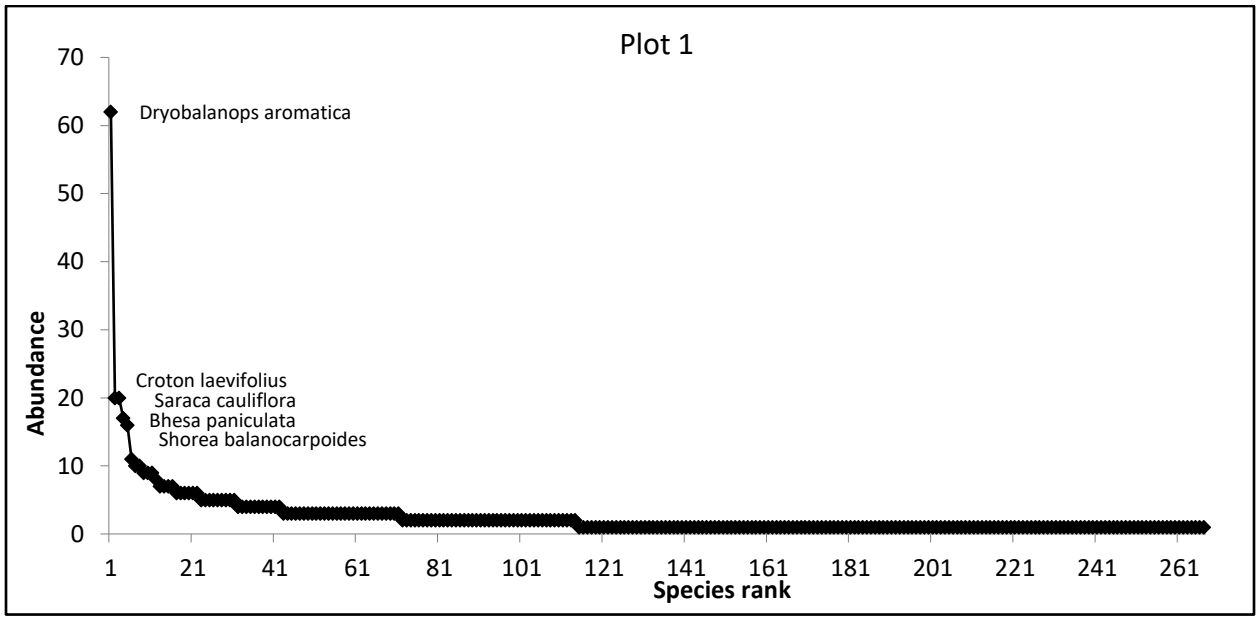
The Jaccard index shows that there is low similarity between plots. On average, only 31.3% of the taxa are shared between plots. Sixty one percent of the total taxa are only found in one plot (Table 4). This could be due to the habitat heterogeneity that support different group of taxa.

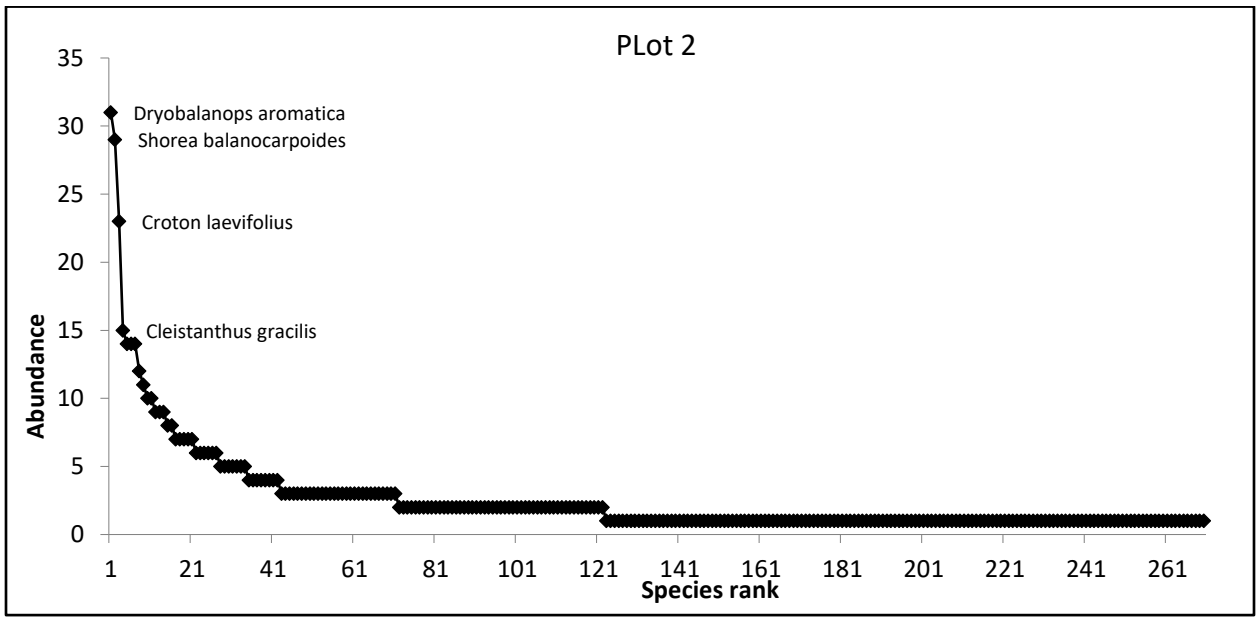
	Plot 1	**Plot 2**	**Plot 3**
Family	50	45	48
Genera	125	110	111
Species richness	267	270	241
Shannon Index	5.02	5.09	4.91
Shannon Effective number of species	151.411	162.390	135.639
Simpson Index	0.984	0.989	0.984
Simpson Effective number of species	62.500	90.909	62.500

Table 3: Tree species diversity of three 1-ha plots.

Plot	Jaccard Classic	Sorensen Classic	Number of shared species	% similarity
Plot 1 & 2	0.326	0.492	132	32.6
Plot 1 & 3	0.299	0.461	117	30.0
Plot 2 & 3	0.314	0.477	122	31.4

Table 4: Tree species similarity between plots.





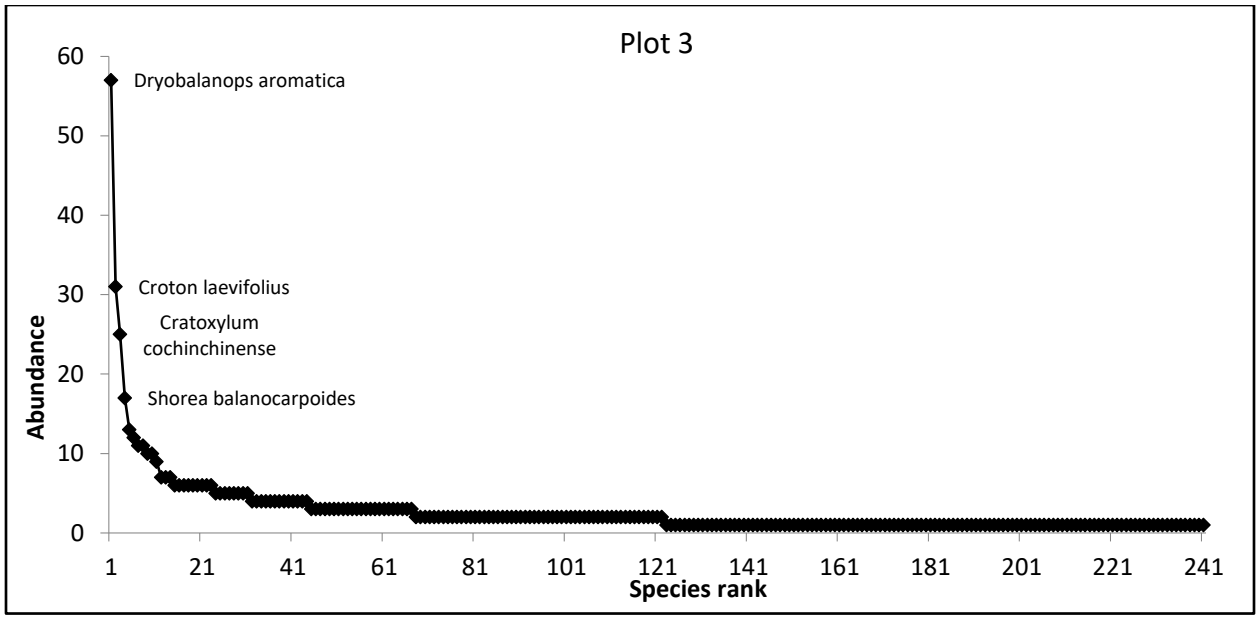


Figure 3: Species rank abundance for tree species in 3 plots.

4.2 Stand structure/Basal area

A total 2045 stems >10 cm DBH with total basal area of 87.754 m² (mean = 29.251 m²/ha) were recorded from the three plots. The mean density is 682 stems/ha. More than 67.9% of the trees were less than 20 cm DBH. Only 4.0% (81 stems) of the trees were of more than 50 cm DBH (Figure 4 and 5; Table 5 and 6).

Dipterocarpaceae is the most dominant family in all plots with a total basal area of 28.530 m² (32.5%) and had the highest stem numbers with 393 stems (19.2%). Species richness was highest in Myrtaceae with 48 taxa and contributed second most to the total basal area of 5.614 m² (6.40%). The third and fourth largest families, Lauraceae and Phyllanthaceae only had basal area of 3.268 m² (3.7%) and 2.354 m² (2.7%) respectively (Table 7).

All three plots had higher density of small trees (<10 cm DBH) than large trees. This indicates that the forest is regenerating particularly in patches of open canopy. Canopy gap allows more light to reach the forest ground and promote the growth of juvenile trees and understorey plants species.

From the observation throughout the study, the occurrence of strong wind had increased and tree fall became more common. Strong wind could be associated with the clearing of the adjacent oil palm plantations for replanting. This could be associated to the felling of the adult oil palm trees for replanting at the plantation adjacent the study site. Prior to this, the adult oil palm trees might have acted as wind breaker that reduce the wind speed and subsequently minimize the impact of strong wind to the forest.

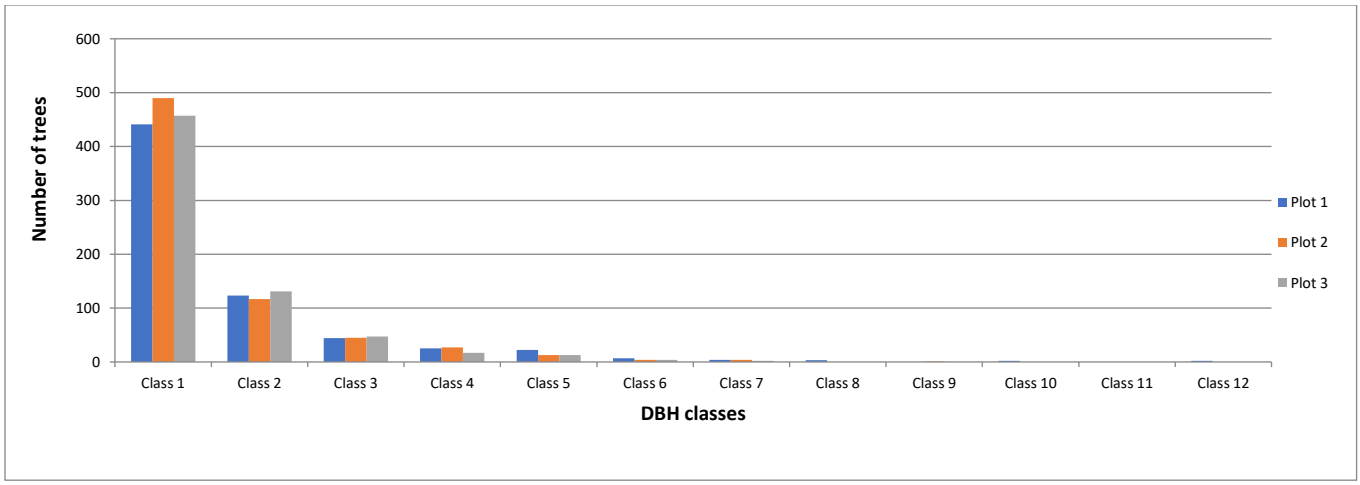


Figure 4: Diameter class distribution for trees of 10 cm dbh and above in three plots

	Class 1 10.0-19.9	Class 2 20.0-29.9	Class 3 30.0-39.9	Class 4 40.0-49.9	Class 5 50.0-59.9	Class 6 60.0-60.9	Class 7 70.0-79.9	Class 8 80.0-89.9	Class 9 90.0-99.9	Class 10 100.0-109.9	Class 11 110.0-119.9	Class 12 120.0-129.9
Plot 1	441	123	44	25	22	7	4	3	0	2	0	2
Plot 2	490	117	45	27	13	4	4	0	1	0	0	0
Plot 3	457	131	47	17	13	4	2	0	0	0	0	0
Total	**1388**	**371**	**136**	**69**	**48**	**15**	**10**	**3**	**1**	**2**	**0**	**2**
Mean	**462.667**	**123.667**	**45.333**	**23.000**	**16.000**	**5.000**	**3.333**	**1.000**	**0.333**	**0.667**	**0.000**	**0.667**
Standard deviation	**24.987**	**7.024**	**1.528**	**5.292**	**5.196**	**1.732**	**1.155**	**1.732**	**0.577**	**1.155**	**0.000**	**1.155**
Coefficients of variation	**0.054**	**0.057**	**0.034**	**0.230**	**0.325**	**0.346**	**0.346**	**1.732**	**1.732**	**1.732**	**0.000**	**1.732**

Table 5: Diameter class distribution for trees of 10 cm dbh and above in three plots

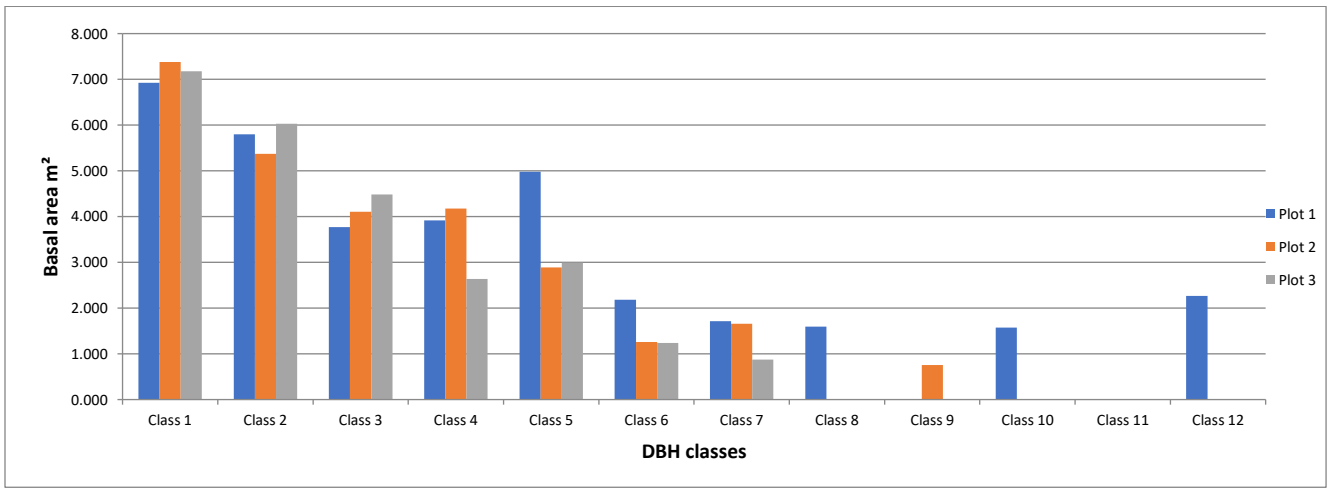


Figure 5: Basal area distribution across diameter class for trees of 10 cm dbh and above in three plots

	Class 1 10.0-19.9	Class 2 20.0-29.9	Class 3 30.0-39.9	Class 4 40.0-49.9	Class 5 50.0-59.9	Class 6 60.0-60.9	Class 7 70.0-79.9	Class 8 80.0-89.9	Class 9 90.0-99.9	Class 10 100.0-109.9	Class 11 110.0-119.9	Class 12 120.0-129.9
Plot 1	6.923	5.800	3.771	3.920	4.980	2.184	1.712	1.595	0.000	1.573	0.000	2.265
Plot 2	7.380	5.370	4.109	4.172	2.891	1.261	1.658	0.000	0.755	0.000	0.000	0.000
Plot 3	7.177	6.031	4.484	2.638	2.993	1.237	0.876	0.000	0.000	0.000	0.000	0.000
Total	**21.480**	**17.201**	**12.363**	**10.730**	**10.864**	**4.682**	**4.246**	**1.595**	**0.755**	**1.573**	**0.000**	**2.265**
Mean	**7.160**	**5.734**	**4.121**	**3.577**	**3.621**	**1.561**	**1.415**	**0.532**	**0.252**	**0.524**	**0.000**	**0.755**
Standard deviation	**0.229**	**0.336**	**0.357**	**0.823**	**1.178**	**0.540**	**0.468**	**0.921**	**0.436**	**0.908**	**0.000**	**1.308**
Coefficients of variation	**0.032**	**0.059**	**0.087**	**0.230**	**0.325**	**0.346**	**0.330**	**1.732**	**1.732**	**1.732**	**0.000**	**1.732**

Table 6: Basal area distribution across diameter class for trees of 10 cm dbh and above in three plots

	Plot 1		Plot 2			Plot 3		
Family	**Density (%)**	**Basal area ,m² (%)**	**Family**	**Density (%)**	**Basal area ,m² (%)**	**Family**	**Density (%)**	**Basal area ,m² (%)**
Dipterocarpaceae	133 (19.8)	13.808 (39.8)	Dipterocarpaceae	118 (16.8)	7.419 (26.9)	Dipterocarpaceae	141 (21.0)	7.303 (28.7)
Myrtaceae	58 (8.6)	2.852 (8.2)	Myrtaceae	57 (8.1)	1.995 (7.2)	Guttiferae	68 (10.1)	2.134 (8.4)
Euphorbiaceae	39 (5.8)	1.531 (4.4)	Sapotaceae	53 (7.6)	1.686 (6.1)	Euphorbiaceae	55 (8.2)	1.707 (6.7)
Myristicaceae	32 (4.8)	1.421 (4.1)	Lauraceae	51 (7.3)	1.615 (5.9)	Sapotaceae	28 (4.2)	1.361 (5.4)
Guttiferae	32 (4.8)	1.406 (4.1)	Myristicaceae	48 (6.8)	1.610 (5.8)	Tiliaceae	27 (4.0)	1.228 (4.8)
Sapotaceae	32 (4.8)	1.170 (3.4)	Euphorbiaceae	34 (4.9)	1.240 (4.5)	Moraceae	27 (4.0)	1.078 (4.2)
Leguminosae	30 (4.5)	1.050 (3.0)	Phyllanthaceae	33 (4.7)	1.142 (4.1)	Leguminosae	27 (4.0)	1.020 (4.0)
Lauraceae	29 (4.3)	1.033 (3.0)	Guttiferae	25 (3.6)	1.119 (4.1)	Burseraceae	26 (3.9)	1.004 (3.0)
Apocynaceae	23 (3.4)	0.827 (2.4)	Leguminosae	25 (3.6)	0.936 (3.4)	Myrtaceae	24 (3.6)	0.766 (3.0)
Burseraceae	22 (3.3)	0.809 (2.3)	Bombacaceae	23 (3.3)	0.877 (3.2)	Myristicaceae	20 (3.0)	0.688 (2.7)

Table 7: The density and basal area of the 10 most common families in three plots.

4.3 Non-tree diversity

A total of 190 of non-tree taxa from 33 families were recorded from the three transects. Plot 2 has the highest species richness among the plots followed by Plot 1 and Plot 3. Palmae was the largest family with 55 taxa, followed by Rubiaceae with 29 taxa, Araceae with 16, Zingiberaceae with 14 and Cyperaceae with 11 taxa. The similarity between plots is higher in non-tree species compared to tree species. The canopy closure and vegetation (seasonally swamp and lowland) forms unique fragment within the various microclimates within the area that support different group of plants. The low lying and swampy areas were dominated by Palmae such as *Licuala bayana*, *Calamus perakensis*, and

Pholidocarpus macrocarpus. Some were swamp specific species such as *Cyrtosperma merkusii* and *Ochthocharis decumben*s.

	Plot 1	Plot 2	Plot 3
Family	28	28	25
Genera	71	75	63
Species richness	134	139	112
Shannon Index	4.31	4.43	4.18
Shannon Effective number of species	74.440	89.931	65.366
Simpson Index	0.981	0.984	0.979
Simpson Effective number of species	52.632	62.500	47.619

Table 8: Non-tree species diversity of three 1-ha plots.

Plot	Jaccard Classic	Sorensen Classic	Number of shared species	% similarity
Plot 1 & 2	0.578	0.733	100	57.8
Plot 1 & 3	0.473	0.642	79	47.0
Plot 2 & 3	0.579	0.733	92	57.9

Table 9: Non-tree species similarity between plots.

5.0 Endemic and Threatened species

Threatened species is defined as species classified as Vulnerable (VU), Endangered (EN) and Critically Endangered (CR) according to the Malaysia Red List. Whereas, Endemic species is defined as species that only found in Malaysia.

Out of the total 682 taxa recorded, 48 species (7.0%) are endemic to Malaysia. Seven species, namely *Aglaonema flemingianum* (Araceae), *Calamus perakens*is var. *crassus* (Palmae), *Licuala bayana* (Palmae), *Licuala fractiflexa* (Palmae), *Scaphochlamys breviscapa* (Zingiberaceae), *Scaphochlamys grandis* (Zingiberaceae) and *Thottea terengganuensis* (Aristolochiaceae) are only found in the state of Terengganu and have not been recorded from other part of Malaysia so far (Table 10). Eighteen taxa of Threatened species were recorded from the plots. Eleven out of the 18 taxa were Dipterocarps (Table 10).

Family	Number of endemic taxa	Number of Threatened taxa		
		CR	EN	VU
Achariaceae	1			
Anacardiaceae	1			
Annonaceae	3			
Araceae	1			
Aristolochiaceae	1			1
Chrysobalanaceae	0			1
Dipterocarpaceae	2	1	3	7
Euphorbiaceae	2			
Gesneriaceae	3			1
Guttiferae	3			
Lauraceae	3			
Leguminosae	1			
Myristicaceae	0			1
Myrtaceae	4			
Oxalidaceae	1			
Palmae	6			
Pentaphylacaceae	1			
Phyllanthaceae	3			
Rubiaceae	4			
Salicaceae	1			
Sapotaceae	1			
Symplocaceae	0			1
Theaceae	1			
Thymelaeaceae	0			1
Tiliaceae	1			
Zingiberaceae	4			1
TOTAL	**48**	**1**	**3**	**14**

Table 10: Summary of endemic and Threatened taxa recorded in three plots

6.0 Specific management prescriptions for *Dipterocarpus sarawakensis* and other rare and Threatened species

6.1 *Dipterocarpus sarawakensis*

Conservation status: Critically Endangered (Malaysia Plant Red List)

Distribution: Peninsular Malaysia and Borneo. In Peninsular Malaysia, this species has only been recorded from Jerangau Forest Reserve, Terengganu.

Population structure: To date, a total of 65 trees (DBH above 1 cm) were recorded within the 63-ha HCVF, Jerangau. The population showed an inverse J-shaped curved indicating that the population is stable (Figure 6). The population had the highest number of individual in 1.0-9.9 cm class but relatively low number of individual between 10 cm and 30 cm in diameter. This shows that the population has slow regeneration.

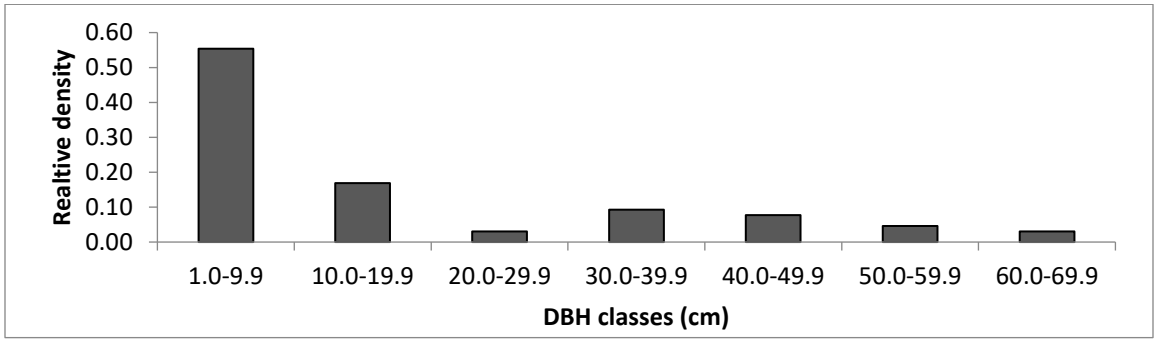
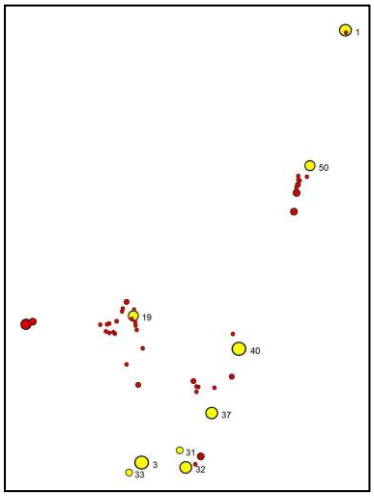


Figure 6: Diameter class distribution for *Dipterocarpus sarawakensis* in Jerangau HCVF, Terengganu.

Phenological trend: Phenological observations on nine mature trees of *D. sarawakensis* (Critically Endangered, CR A4c) had been conducted in Jerangau Forest Reserve, Terengganu since 2010 (Figure 7).



Tree number	DBH (cm)
1	44.7
3	47.9
19	34.6
31	21.2
32	40.6
33	18.9
37	43.1
50	31.6

Figure 7: Position of the nine mature tree of *D. sarawakensis* and its DBH

This species flowered annually during the dry season between February and April. In 2011, 2012 and 2013, almost every individual tree observed had more than 75% of its crown in flower. While in 2010, 2014 and 2015, the flower production was quite low where only 25-50% of the crown was in flower (unpublished data). The low production of flowers could be due to the drought that occurred during the same period. Based on the data from Malaysia Meteorological Department for MARDI Jerangau Station, the total rainfall recorded between February and April in 2010, 2014 and 2015 was 352 mm, 123 mm and 229 mm respectively, which was extremely low compared to the same period in 2011, 2012 and 2013 with 1205mm, 763 mm and 1104 mm respectively.

A mature tree could produce up to 10,000 seeds during mast flowering. However, this species has suffered severe seed predation. More than 90% of the seeds were attacked by the larvae of *Damnux* sp. at early development. After mature fall, more seeds were loss due to post-dispersal predator such as rodents or squirrel. Therefore, only less than 0.5% of the total seeds produced in each reproductive event would germinate (unpublished data).

Threat: The population in Jerangau FR has shown slow natural regeneration. This could be due to low viable seed availability due to seed predation. This species is tapped for its oleoresin by local people.

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes No oleo-resin harvesting is allowed	Under MC&I Criterion 6.10 Forest conversion to plantation or non forest land uses shall not occur, except in circumstances where conversion:- does not occur in HCVF areas
2. Assisted natural regeneration	Assisted natural regeneration and scheduled seed harvesting.	Low viable seed availability is affecting the natural regeneration of *D. sarawakensis.* Too few viable seeds were produced in each fruiting event due to severe pre-dispersal predation. Therefore, scheduled seed harvesting before mature fall should be conducted to avoid further seed loss to post-dispersal predation. Seeds were sowed in nursery and grown until it reach the size for transplanting. Seedling should be

		transplanted within the crown shade of its mother tree and other area within the HCVF Jerangau to assist regeneration of the species. Seeds should only be harvested in alternate masting year. This is important to protect the population from over collection and also to allow natural regeneration.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species. Seed collection should be monitored to avoid over collection.
4. Capacity building	Training for field staff	Field staff need to be trained: a) to identify *Dipterocarpus sarawakensis* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	**Parameter measured/indicator**	**Remarks**
Annual survey of species population	Mortality Recruitment	Monitoring regeneration of the population
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure
Periodical flowering and fruiting phenology observation	Flower and fruit production	Monitoring production and predation of flower and fruits
Regular patrol/checking of trees	Number of tree tapped for oleo-resin	Monitor the threat

6.2 *Dipterocarpus eurynchus*

Family: Dipterocarpaceae

Vernacular name: keruing baran

Conservation status: Vulnerable

Geographical distribution: Sumatra, Peninsular Malaysia (Terengganu, Pahang, Negeri Sembilan and Johor), Borneo (Sarawak and Brunei) and the Philippines

Stand density: 2.3 per ha

Basal area: 0.350 m² per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
	No entry except for research and monitoring purposes	
	No oleo-resin harvesting is allowed	
2. Assisted natural regeneration	Assisted natural regeneration and scheduled seed harvesting	This species also suffered severe seed predation as observed in *D. sarawakensis* (personal observation). Therefore, assisted natural regeneration should be adopted to maintain the population of *D. eurynchus*.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species. Seed collection should be monitored to avoid over collection.

4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *D. eurynchus* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Annual survey of species population	Mortality Recruitment	Monitoring regeneration of the population
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure
Periodical flowering and fruiting phenology observation	Flower and fruit production	Monitoring production and predation of flower and fruits

6.3 *Hopea mengerawan*

Family: Dipterocarpaceae

Vernacular name: merawan penak

Conservation status: Vulnerable

Geographical distribution: Borneo, Peninsular Malaysia (Pahang, Negeri Sembilan and southward), Sumatra and Singapore

Stand density: 0.3 per ha

Basal area: 0.082 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not

	No entry except for research and monitoring purposes	occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *H. mengerawan* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	**Parameter measured/indicator**	**Remarks**
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.4 *Hopea nutans*

Family: Dipterocarpaceae

Vernacular name: giam

Conservation status: Vulnerable

Geographical distribution: East coast of Peninsular Malaysia and Borneo

Stand density: 4.0 per ha

Basal area: 0.246 m² per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	This species does not have severe seed predation (personal observation). The species produced enough viable seed for natural regeneration.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *H. nutans* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.5 *Hopea sulcata*

Family: Dipterocarpaceae

Conservation status: Not threatened but endemic to Malaysia

Geographical distribution: Peninsular Malaysia (Terengganu, Perak, Selangor and Johor)

Stand density: 0.3 per ha

Basal area: 0.34 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
	No entry except for research and monitoring purposes	
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *H. sulcata* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.6 *Shorea exelliptica*

Family: Dipterocarpaceae

Vernacular name: balau tembaga

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia (Kedah, Terengganu, Perak, Pahang and Johor) and Borneo

Stand density: 1.0 per ha

Basal area: 0.202 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.

3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *S. excelliptica* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.7 *Vatica havilandii*

Family: Dipterocarpaceae

Vernacular name: resak degong

Conservation status: Endangered

Geographical distribution: Peninsular Malaysia (Terengganu, Perak and Pahang) and Borneo

Stand density: 0.7 per ha

Basal area: 0.015 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. havilandii* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.8 *Vatica mangachapoi*

Family: Dipterocarpaceae

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia (Kedah, Kelantan, Terengganu and Perak), Peninsular Thailand, Borneo and Philippines

Stand density: 1.3 per ha

Basal area: 0.032 m² per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. mangachapoi* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.9 *Vatica mizaniana*

Family: Dipterocarpaceae

Conservation status: Endemic to Malaysia

Geographical distribution: Peninsular Malaysia (Jerangau FR, Terengganu)

Stand density: 1.7 per ha

Basal area: 0.020 m^2 per ha

Specific management strategies and prescription

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
	No entry except for research and monitoring purposes	
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.

3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. mizaniana* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.2.10 *Vatica odorata*

Family: Dipterocarpaceae

Vernacular name: resak ranting

Conservation status: Vulnerable

Geographical distribution: Myanmar, Thailand, Indo-China, Peninsular Malaysia (Pahang, Negeri Sembilan and northwards), Borneo and Philippines

Stand density: 0.3 per ha

Basal area: 0.005 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. odorata* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.2.11 *Vatica stapfiana*

Family: Dipterocarpaceae

Vernacular name: resak

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia

Stand density: 0.3 per ha

Basal area: 0.017 m² per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. stapfiana* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.2.12 *Vatica venulosa*

Family: Dipterocarpaceae

Vernacular name: resak

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia (Perak and Pahang), Borneo, Sumatra, West of Java

Stand density: 1.0 per ha

Basal area: 0.024 m^2 per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.

4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *V. venulosa* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.2.13 *Aquilaria hirta*

Family: Thymelaeaceae

Vernacular name: karas

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia (Johor, Pahang and Terengganu) and Myanmar

Stand density: 0.7 per ha

Basal area: 0.006 m² per ha

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
	No entry except for research and monitoring purposes	
2. Natural regeneration	Natural	Seedlings allowed to establish from seeds

	regeneration	dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *A. hirta* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	**Parameter measured/indicator**	**Remarks**
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure
Regular patrol/checking trees	Number of tree harvested	Monitor the threat

6.2.14 *Licuala bayana*

Family: Palmae

Conservation status: Not threatened but endemic Malaysia

Geographical distribution: Peninsular Malaysia (Jerangau FR, Terengganu)

Specific management strategies and prescription:

Management strategies	**Prescription**	**Remarks**
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 “Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not

	No entry except for research and monitoring purposes	occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Wildings should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *A. hirta* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	**Parameter measured/indicator**	**Remarks**
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

6.2.15 *Johannesteijsmannia altifrons*

Family: Palmae

Conservation status: Vulnerable

Geographical distribution: Peninsular Malaysia (Kelantan, Pahang, Selangor, Johor) and Sumatra

Specific management strategies and prescription:

Management strategies	Prescription	Remarks
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging) No entry except for research and monitoring purposes	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"
2. Natural regeneration	Natural regeneration	Seedlings allowed to establish from seeds dispersed naturally from mother tree.
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Wildings should be collected from different mother trees to preserve the genetic variation of the species.
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify *A. hirta* (seedling, juvenile and adult) b) to identify mature seed before dispersal c) to conduct other monitoring activities

Monitoring:

Strategic monitoring	Parameter measured/indicator	Remarks
Recensus every 5 years	DBH	Monitoring growth rate of individual tree
Annual habitat quality assessment	Canopy closure and tree fall	Monitoring change in vegetation structure

Table 11a: Summary of specific management and monitoring of *Dipterocarpus sarawakensis* and other rare species

Species			***Dipterocarpus sarawakensis***	***Dipterocarpus eurynchus***	***Hopea mengerawan***	***Hopea nutans***	***Hopea sulcata***	***Shorea exelliptica***	***Vatica havilandii***	***Vatica mangachapoi***
Family			**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**
Vernacular name			keruing layang	keruing baran	merawan penak	Giam	—	balau tembaga	resak degong	—
Conservation status			Critically Endangered	Vulnerable	Vulnerable	Vulnerable	Endemic to Malaysia	Vulnerable	Endangered	Vulnerable
Total stems				7	1	12	1	3	2	4
Stand density (ha^{-1})			1.0	2.3	0.3	4.0	0.3	1.0	0.7	1.3
Basal area ($m^2\ ha^{-1}$)			—	0.350	0.082	0.246	0.034	0.202	0.015	0.032
Management strategies	**Prescription**	**Remarks**								
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"	√	√	√	√	√	√	√	√
	No entry except for research and monitoring purposes		√	√	√	√	√	√	√	√
	No oleo-resin harvesting is allowed		√	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2. Natural regeneration	Natural regeneration	The population are allowed to regenerate naturally.	Not applicable	Not applicable	√	√	√	√	√	√
	Assisted natural regeneration and scheduled seed harvesting guideline	The species is facing severe predispersal predation dan low viable seed production.	√	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.	√	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify seedling, juvenile and adult b) to identify mature seed before dispersal c) to conduct other monitoring activities	√	√	√	√	√	√	√	√

Strategic monitoring	Parameter measured	Remarks	*Dipterocarpus sarawakensis*	*Dipterocarpus eurynchus*	*Hopea mengerawan*	*Hopea nutans*	*Hopea sulcata*	*Shorea exelliptica*	*Vatica havilandii*	*Vatica mangachapoi*
Annual species population survey	Mortality & Recruitment	Provide information in regeneration of the population	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Recensus every 5 years	DBH	Monitor growth rate of individual tree	√	√	√	√	√	√	√	√
Annual habitat quality assessment	Canopy closure & tree fall	Monitor change in vegetation structure	√	√	√	√	√	√	√	√
Periodical flowering and fruiting phenology observation	Flower and fruit production	Monitor production and predation of flower and fruits.	√	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Regular patrol/checking trees	Number of tree harvested		√	√	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

Table 11b: Summary of specific management and monitoring of *Dipterocarpus sarawakensis* and other rare species

Species			***Vatica mizaniana***	***Vatica odorata***	***Vatica stapfiana***	***Vatica venulosa***	***Aquilaria hirta***	***Licuala bayana***	***Johannesteijsmannia altifrons***
Family			**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Dipterocarpaceae**	**Thymelaeaceae**	**Palmae**	**Palmae**
Vernacular name			—	resak ranting kesat	resak mempening	resak letup	karas	—	Sal
Conservation status			Rare. Endemic to Malaysia	Vulnerable	Vulnerable	Endangered	Vulnerable	Endemic to Jerangau FR	Vulnerable
Total stems			5	1	1	3	2	—	—
Stand density (ha^{-1})			1.7	0.3	0.3	1.0	0.7	—	—
Basal area ($m^2\ ha^{-1}$)			0.020	0.005	0.017	0.024	0.006	—	—
Management strategies	**Prescription**	**Remarks**							
1. Maintaining the integrity of forest and its ecosystem	No production activities (eg. logging)	Under MC&I Criterion 6.10 "Forest conversion to plantation or non-forest land uses shall not occur, except in circumstances where conversion: - does not occur in HCVF areas"	√	√	√	√	√	√	√
	No entry except for research and monitoring purposes		√	√	√	√	√	√	√
	No oleo-resin harvesting is allowed		Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
2. Natural regeneration	Natural regeneration	The population are allowed to regenerate naturally.	√	√	√	√	√	√	√
	Assisted natural regeneration and scheduled seed harvesting guideline	The species is facing severe predispersal predation dan low viable seed production.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
3. *Ex situ* conservation of threatened species through the establishment in national and regional networks of botanic gardens	Seed collection guidelines	Seeds should be collected from different mother trees to preserve the genetic variation of the species.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
4. Capacity building	Training for field staff	Field staffs need to be trained: a) to identify seedling, juvenile and adult b) to identify mature seed before dispersal c) to conduct other monitoring activities	√	√	√	√	√	√	√

Strategic monitoring	Parameter measured	Remarks	*Vatica mizaniana*	*Vatica odorata*	*Vatica stapfiana*	*Vatica venulosa*	*Aquilaria hirta*	*Licuala bayana*	*Johannesteijsmannia altifrons*
Annual species population survey	Mortality & Recruitment	Provide information in regeneration of the population	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Recensus every 5 years	DBH	Monitor growth rate of individual tree	√	√	√	√	√	√	√
Annual habitat quality assessment	Canopy closure & tree fall	Monitor change in vegetation structure	√	√	√	√	√	√	√
Periodical flowering and fruiting phenology observation	Flower and fruit production	Monitor production and predation of flower and fruits.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Regular patrol/checking trees	Number of tree harvested		Not applicable	Not applicable	Not applicable	Not applicable	√	Not applicable	Not applicable

7.0 Reference

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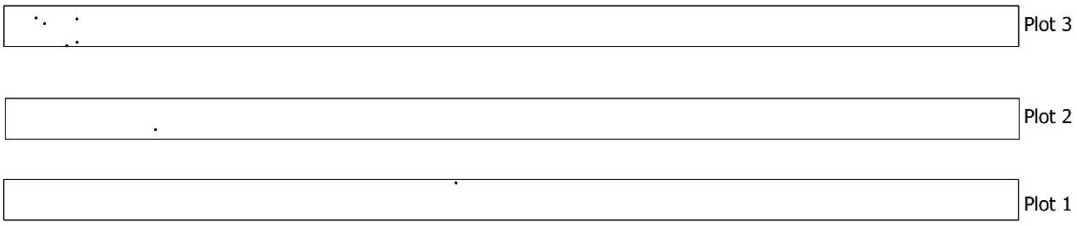
Jennings, S.B., Brown, N.D. & Sheil, D. 1999. Assessing forest canopies and understorey illumination: canopy closure, canopy cover and other measures. Forestry. 72(1), p.59-74.

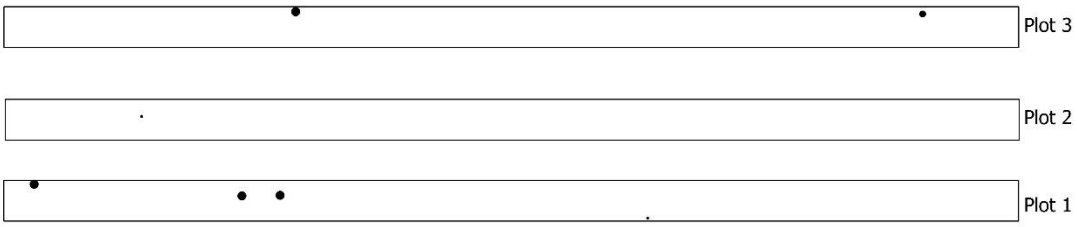
Appendix 1: Spatial Distribution of Dipterocarps species

1) *Dipterocarpus cornutus*

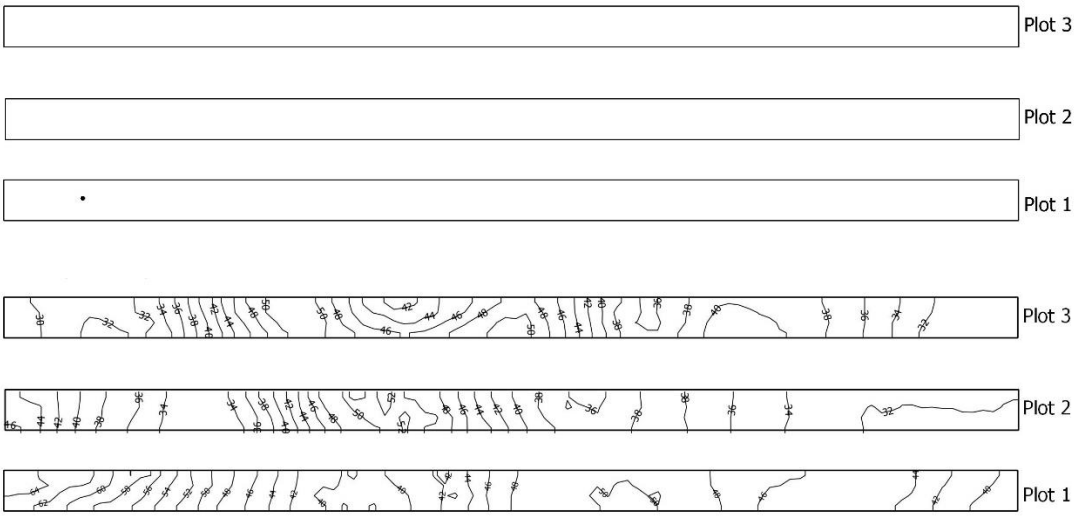


2) *Dipterocarpus costulatus*

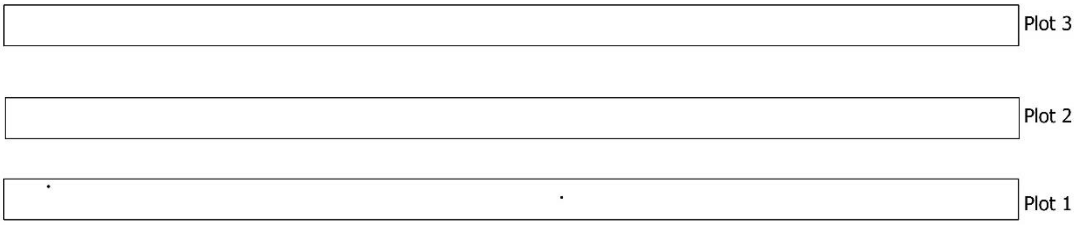
3) *Dipterocarpus eurynchus*



4) *Dipterocarpus gracilis*

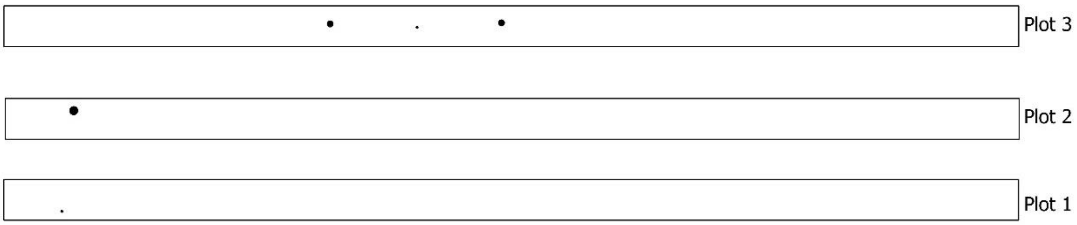


5) *Dipterocarpus lowii*

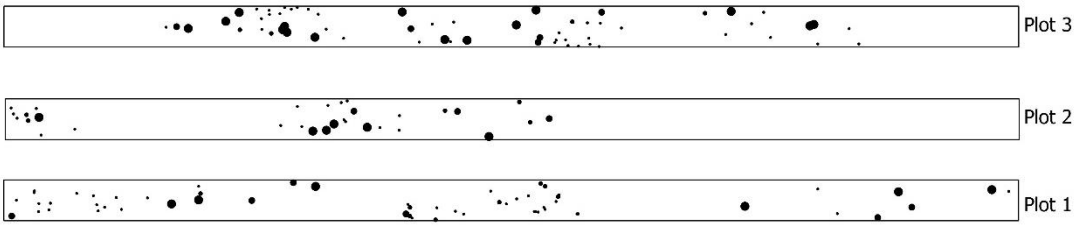


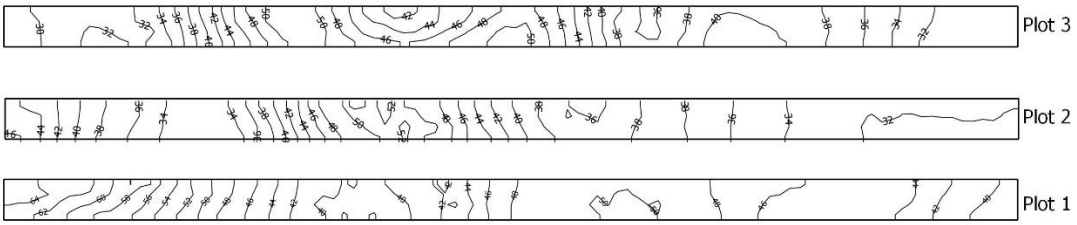
6) *Dipterocarpus sarawakensis*

7) *Dipterocarpus verrucosus*



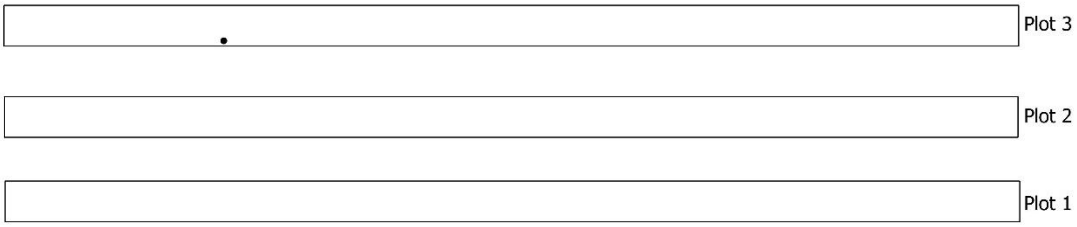
8) *Dryobalanops aromatica*



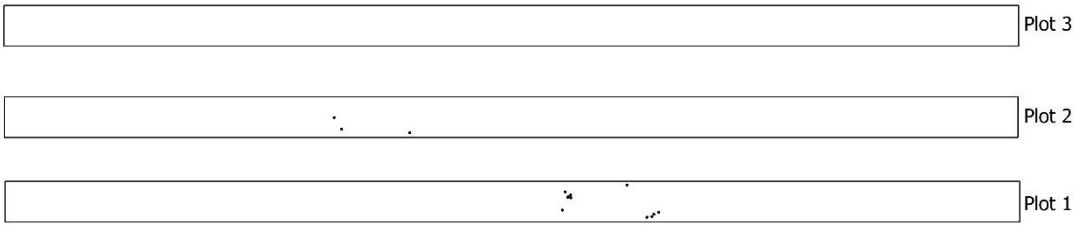


9) *Dryobalanops lanceolata*

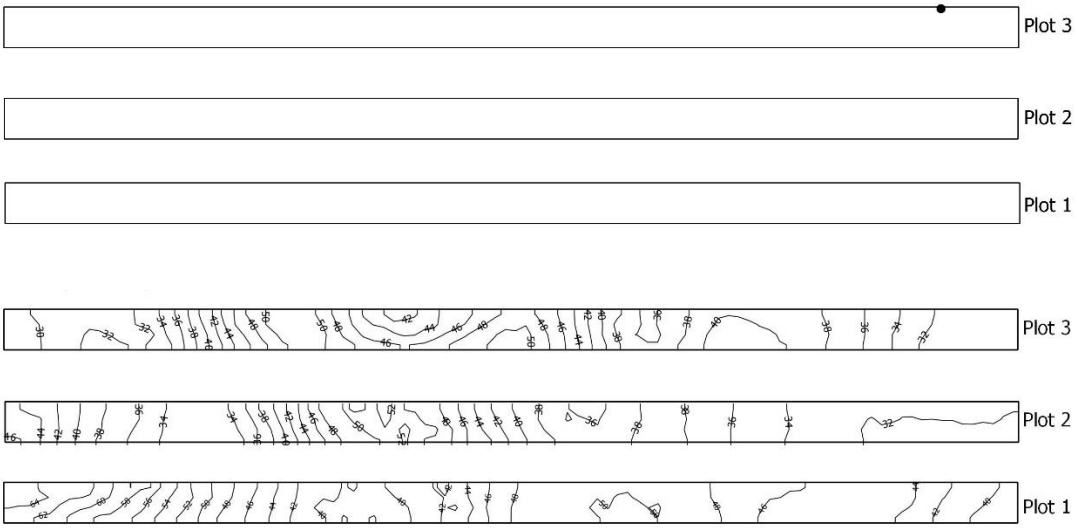
10) *Hopea ferruginea*



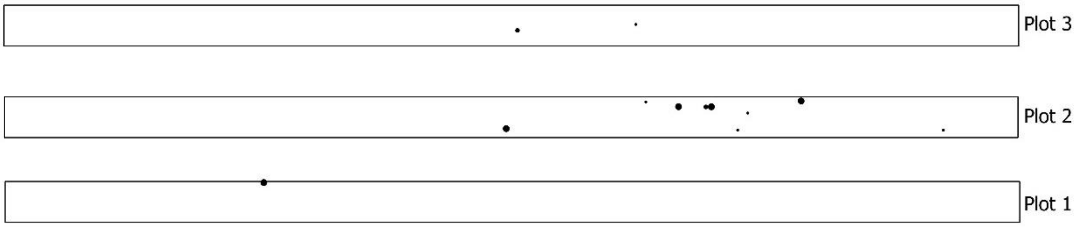
11) *Hopea griffithii*



12) *Hopea mengerawan*



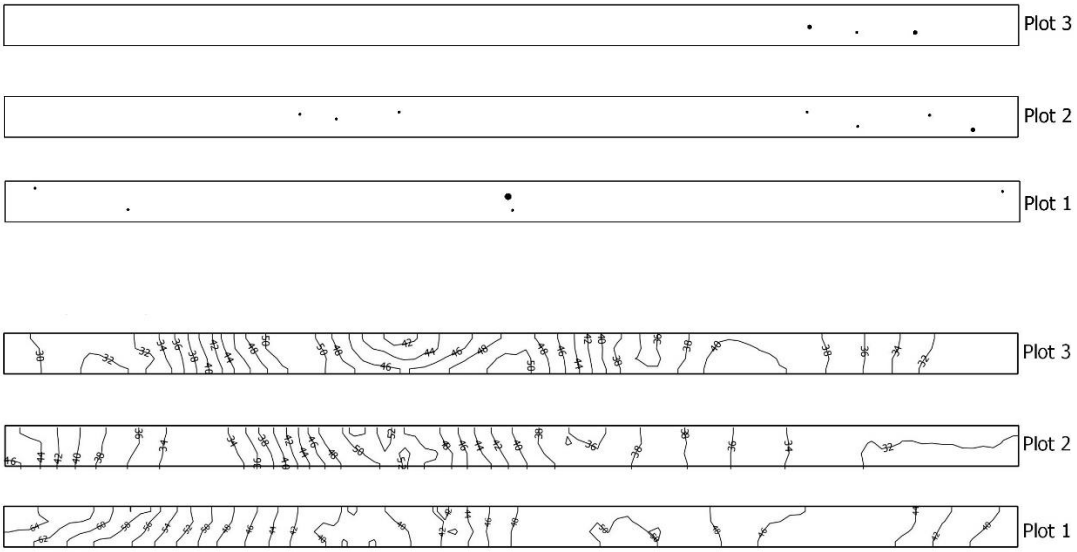
13) *Hopea nutans*



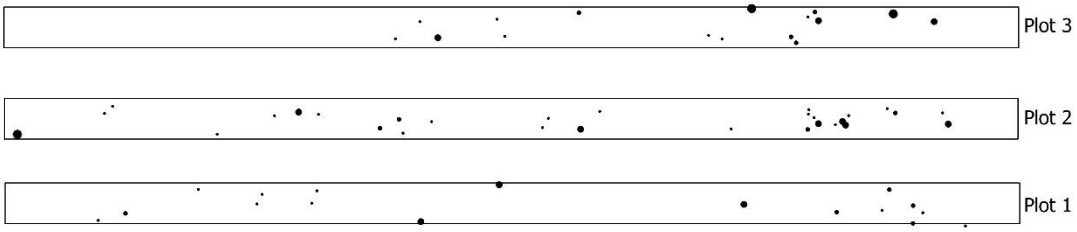
14) *Hopea sangal*

15) *Hopea sulcata*

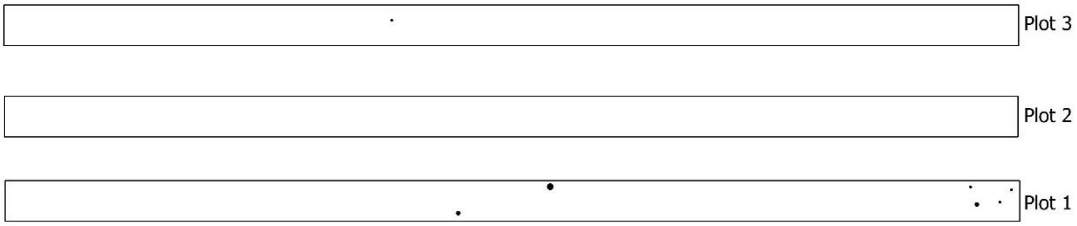
16) *Shorea acuminata*



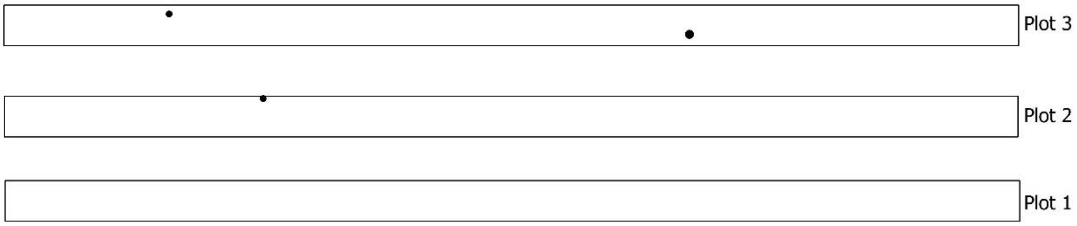
17) *Shorea balanocarpoides*



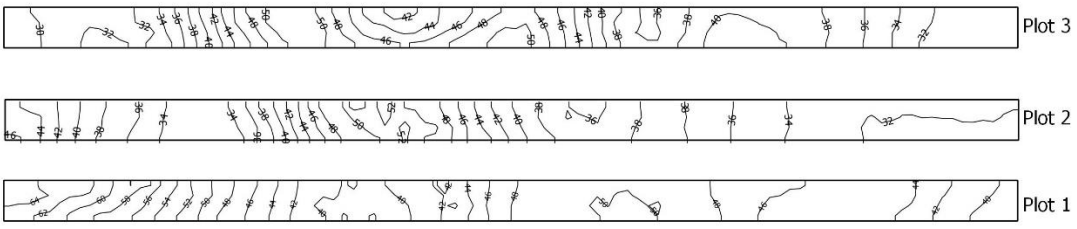
18) *Shorea bracteolata*



19) *Shorea exelliptica*

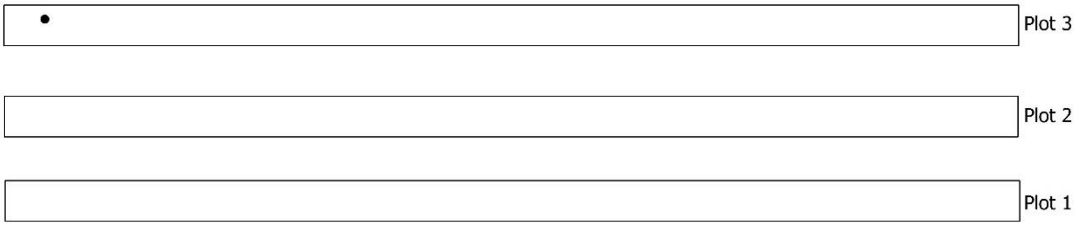


20) *Shorea glauca*



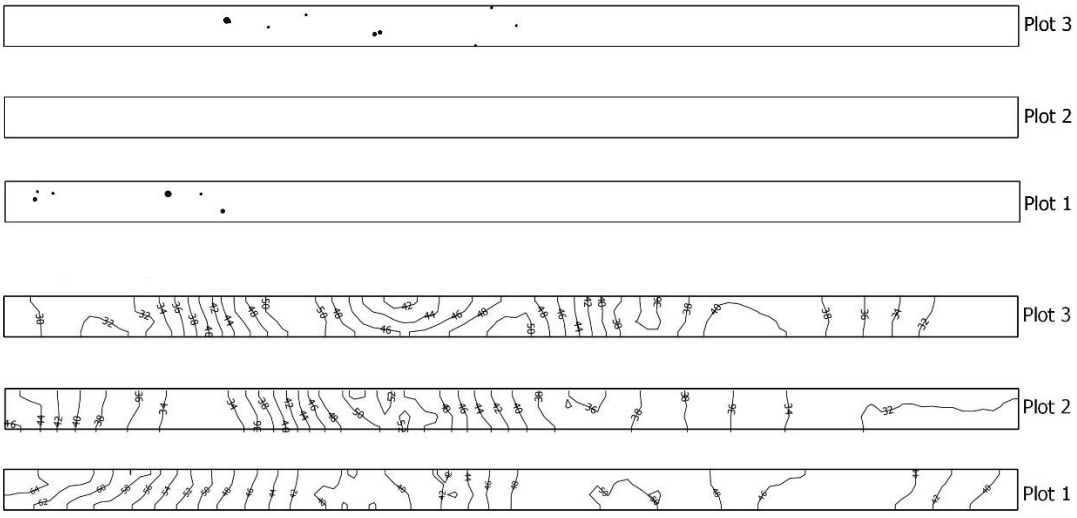
21) *Shorea laevis*

22) *Shorea lepidota*

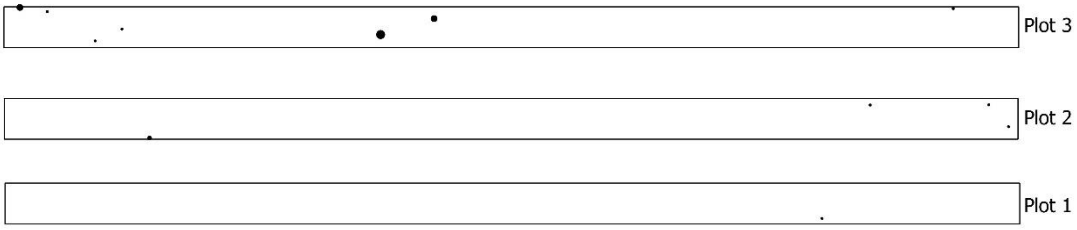


23) *Shorea macroptera*

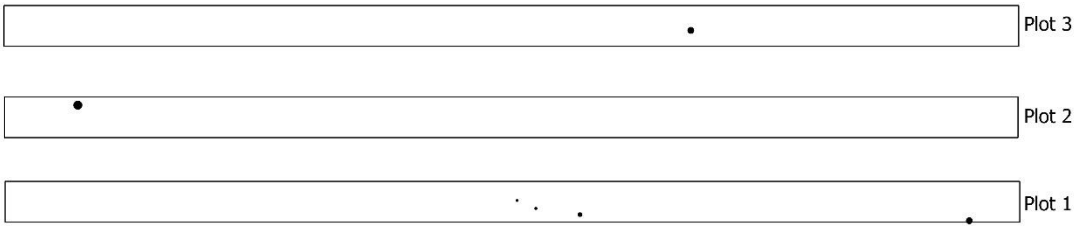
24) *Shorea multiflora*



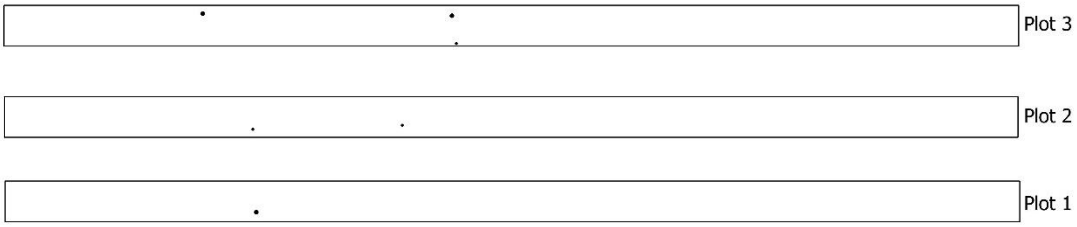
25) *Shorea ovalis*



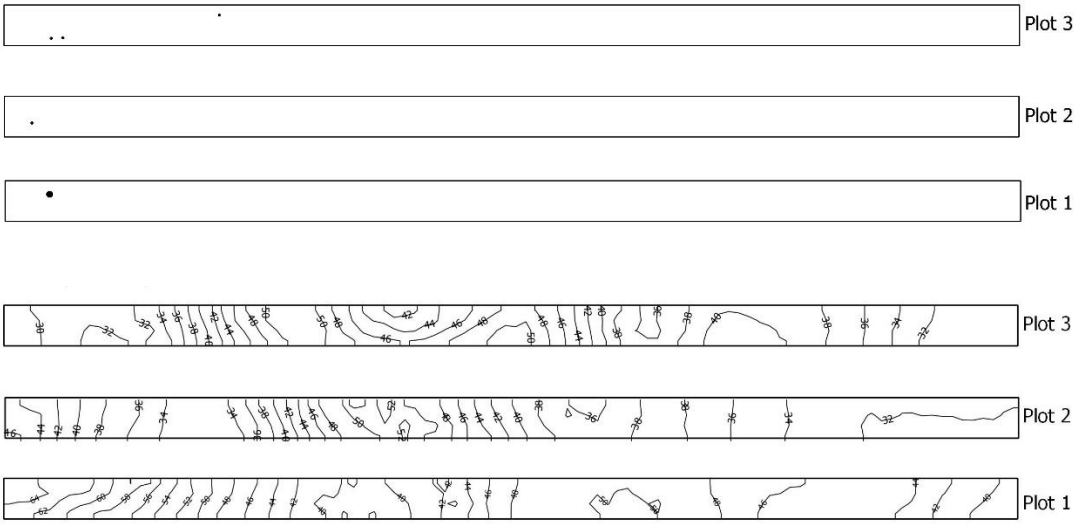
26) *Shorea parvifolia*



27) *Shorea singkawang*



28) *Vatica bella*

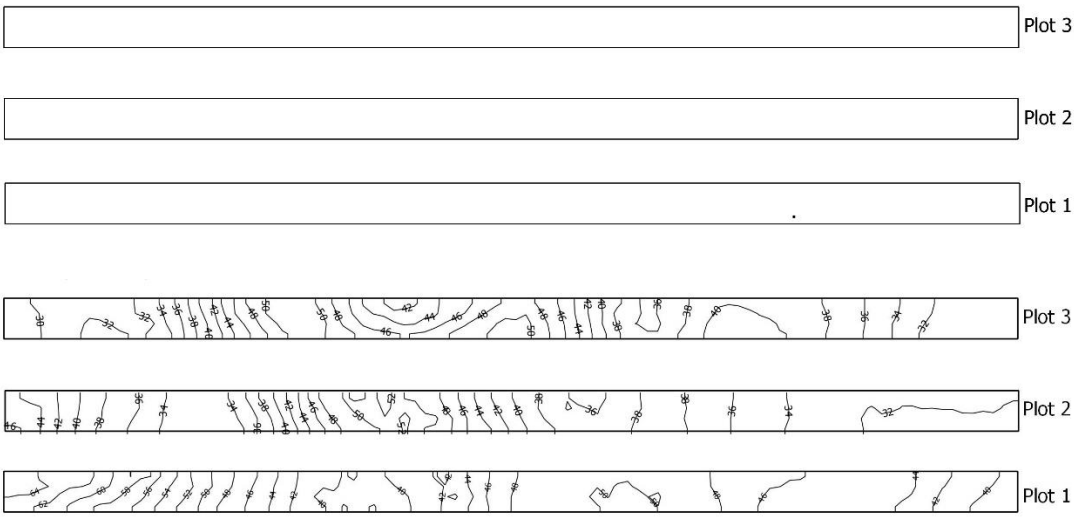


29) *Vatica havilandii*

30) *Vatica mangachapoi*

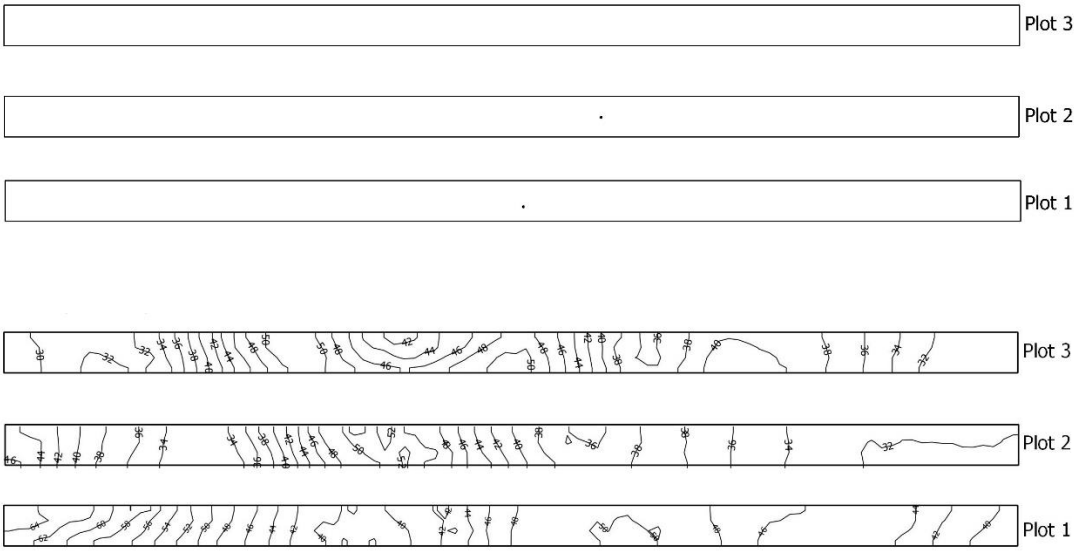
31) *Vatica mizaniana*

32) *Vatica odorata*



33) *Vatica pallida*

34) *Vatica pauciflora*



Appendix 2: Photos of species

Plate 1: Araceae. A. *Aglaodorum griffithii*, B. *Aglaonema flemingianum*, C–D. *Aglaonema nitidum*

Plate 2: Aristolochiaceae. A–B. *Thottea terengganuensis;* Dracaenaceae. C. *Dracaena longifolia* D. *Dracaena elliptica*

Plate 3. Dipterocarpaceae. A–C. *Dipterocarpus sarawakensis*

Plate 4: Melastomataceae. A. *Sonerila maculate*; Phyllanthaceae B. *Breynia coronata*; Rubiaceae. C. *Rennellia speciosa*; Zingiberaceae D. *Globba uniflora*




Plate 5: Palmae. A–B. *Areca montana*, C– D. *Daemonorops geniculata*

Plate 6: Palmae. A–B. *Daemonorops verticillaris*, C. *Eugeissona brachystachys*, D. *Korthalsia echinometra*

Plate 7: Palmae A–B. *Licuala bayana*, C–D. *Pinanga disticha*

Appendix 3. Checklist of species recorded from three 1-ha transects

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Achariaceae	Hydnocarpus kunstleri	Peninsular Malaysia	Pk, Ph, Sl	
Achariaceae	Hydnocarpus woodii		Ps, Tg, Pk, Ph, Sl, NS, Jh.	
Achariaceae	Hydnocarpus wrayi	Peninsular Malaysia	Kl, Tg, Pk, Ph, Jh	
Achariaceae	Ryparosa fasciculata	Peninsular Malaysia, Southern Thailand	Pk, Ml, Ph northward	
Achariaceae	Ryparosa kunstleri	Peninsular Malaysia, Sumatra	Kd, Pk, Ph, Sl	
Achariaceae	Scaphocalyx spathacea[E]	Peninsular Malaysia	Kl, Ph, Sl, NS, Ml, Jh	
Alangiaceae	Alangium javanicum			
Anacardiaceae	Bouea oppositifolia	Peninsular Malaysia, Andaman Islands, Myanmar, Thailand, Indo-China, Laos, Cambodia, Borneo, Indonesia	Widespread in PM, Sb, Sr	
Anacardiaceae	Buchanania sessifolia	Thailand, Laos, Cambodia, Vietnam, China, Sumatra, Peninsular Malaysia, Borneo	Thoughout PM, Sb, Sr	
Anacardiaceae	Campnosperma auriculatum	Thailand, Sumatra, Peninsular Malaysia, Borneo	Widespread in PM, Sb, Sr	
Anacardiaceae	Gluta aptera	Peninsular Malaysia, Sumatra, Borneo	Kl, Tg, Pn, Pk, Ph, Sl, Jh, Sb	
Anacardiaceae	Gluta malayana	Peninsular Malaysia, Sumatra	Kd, Tg, Pk, Ph, Sl, Jh	
Anacardiaceae	Mangifera foetida	Peninsular Malaysia, Thailand, Indo-China, Indonesia, Borneo, Sumatra, Java	Widespread in PM, Sb, Sr	
Anacardiaceae	Mangifera griffithii	Borneo, Sumatra, Peninsular Malaysia	Sb, Sr, Kd, Kl, Tg, Pk, Ph, Sl, Ml, Jh	
Anacardiaceae	Melanochyla bullata	Borneo	Sb, Sr	
Anacardiaceae	Melanochyla caesia	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Kl, Tg, Pk, Ph, Sl, NS, Jh	
Anacardiaceae	Melanochyla longipetiolata[E]		Tg, Ph	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Anacardiaceae	Parishia insignis	Myanmar, Andaman Islands, Sumatra, Thailand, Borneo, Peninsular Malaysia, Singapore	Kd, Kl, Pn, Pk, Ph, Ml, Jh,Sb, Sr	
Anacardiaceae	Parishia paucijuga	Borneo, Peninsular Malaysia, Sumatra	Sr, Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Anacardiaceae	Semecarpus curtisii	Peninsular Malaysia, Singapore	Ps, Kd, Ph, Sl, NS, Jh	
Anacardiaceae	Swintonia floribunda	Peninsular Malaysia	Kd, Pn, Kl, Ph, Sl, NS, Jh	
Anisophylleaceae	Anisophyllea corneri	Peninsular Malaysia, Borneo, Kalimantan	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Anisophylleaceae	Anisophyllea curtisii	Peninsular Malaysia	Pn, Pk, Jh	
Annonaceae	Alphonsea maingayi[E]	Peninsular Malaysia	Pk, Sl, NS, Ml, Jh	
Annonaceae	Goniothalamus fulvus[E]	Peninsular Malaysia	Tg, Ph, Ml, Jh, Kl, NS	
Annonaceae	Goniothalamus macranii	Peninsular Malaysia, Thailand	Ph, Sl, Jh	
Annonaceae	Goniothalamus macrophyllus	Sumatra, Peninsular Malaysia, Java, Borneo, Peninsular Thailand	Sr, Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Annonaceae	Maasia glauca	Peninsular Malaysia to New Guinea, Borneo	Sb, Sr, widespread in PM	
Annonaceae	Meiogyne monosperma	Peninsular Malaysia, Borneo	Sr, Kd, Kl, Pk, Ph, Sl, Ml, Jh	
Annonaceae	Monocarpia marginalis	Peninsular Malaysia	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Annonaceae	Phaeanthus ophthalmicus	Peninsular Malaysia, Java, Borneo, The Philippines, Sulawesi, Lesser Sunda Island, Moluccas & New Guinea	Kl, Pn, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Annonaceae	Polyalthia glauca	Peninsular Malaysia	Tg, Pk, Ph, Sl, Jh	
Annonaceae	Polyalthia rumphii	Peninsular Malaysia	Kd, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Annonaceae	Polyalthia stenopetala	Peninsular Malaysia, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Annonaceae	Polyalthia sumatrana	Peninsular Malaysia, Singapore, Sumatra, Borneo	Kl, Tg, Pk, Ph, Sl, NS, Jh	
Annonaceae	Xylopia caudata	Peninsular Malaysia, Singapore, Sumatra, Borneo	Pk, Ph, Sl, NS, Ml, Jh	
Annonaceae	Xylopia ferruginea	Peninsular Malaysia, Thailand, Borneo, Sumatra	Widespread in PM, Sr	
Annonaceae	Xylopia ferruginea var. oxyanth	Peninsular Malaysia	Ph, Sl, NS, Jh	
Annonaceae	Xylopia malayana	Peninsular Malaysia, Borneo	Pk, Tg, Sb, Sr	
Annonaceae	Xylopia stenopetala	Peninsular Malaysia, Borneo, Sumatra	Pn, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Annonaceae	Xylopia subdehiscens[E]	Peninsular Malaysia	Pn, Tg, Pk, Ph, Sl, Jh	
Apocynaceae	Alstonia angustifolia	Sumatra, Peninsular Malaysia, Singapore, Borneo, Kalimantan	Pn, Ph, Sl, Ml, Jh, Sb, Sr	
Apocynaceae	Dyera costulata	Peninsular Malaysia, Singapore, Borneo	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Araceae	Aglaodorum griffithii	Peninsular Malaysia, Singapore, Sumatra, Borneo	Ml	
Araceae	Aglaonema flemingianum[E]	Peninsular Malaysia	Tg	
Araceae	Aglaonema nitidum var. nitidum			
Araceae	Aglaonema simplex	Peninsular Malaysia	Widespread in PM	
Araceae	Alocasia longiloba			
Araceae	Cyrtosperma merkusii	Peninsular Malaysia	Tg, Pk, Ph, Sl, NS, Ml, Jh	
Araceae	Homalomena rostrata	Peninsular Malaysia, Sumatra, Borneo, Thailand	Widespread in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Araceae	Homalomena sagittifolia	Peninsular Malaysia, Singapore	Pn, Pk, Sl, Jh	
Bombacaceae	Coelostegia borneensis	Peninsular Malaysia	Ph, Jh	
Bombacaceae	Durio malaccensis	Peninsular Malaysia	Tg, Sl, NS, Ml, Jh	
Burseraceae	Canarium apertum	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Ph, NS, Sl	
Burseraceae	Canarium littorale f. littorale	Peninsular Malaysia, Borneo, Sumatra, Java	Throughout of PM, Sb, Sr	
Burseraceae	Canarium littorale f. rufum	Indo-China, Sumatra, Peninsular Malaysia, Borneo, Java	PM, Sb, Sr	
Burseraceae	Canarium patentinervium	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Burseraceae	Canarium pilosum	Peninsular Malaysia	Widespread in PM	
Burseraceae	Dacryodes costata	Indonesia, Borneo, Philppines, Singapore	Kd, Tg, Pn, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Burseraceae	Dacryodes laxa	Peninsular Malaysia, Indonesia, Borneo	Widespread in PM, Sb, Sr	
Burseraceae	Dacryodes nervosa	Borneo, Peninsular Malaysia, Sumatra	Sr, Pk, Jh	
Burseraceae	Dacryodes rostrata	Peninsular Malaysia, Singapore, Indo-China, Indonesia, Philippines	Ps, Kd, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh	
Burseraceae	Dacryodes rugosa	Peninsular Malaysia, Indonesia, Borneo	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh.	
Burseraceae	Santiria apiculata	Peninsular Malaysia, Sumatra, Borneo, Philippines	Kd, Kl, Pk, Ph, Sl, NS, Ml, Jh	
Burseraceae	Santiria apiculata var. rubra	Peninsular Malaysia	Widespread in PM	
Burseraceae	Santiria conferta	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Not in extreme north of PM	
Burseraceae	Santiria griffithii	Peninsular Malaysia, Borneo, Sumatra	Not in the far north in PM, Sb, Sr	
Burseraceae	Santiria laevigata	Peninsular Malaysia, Singapore	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Burseraceae	Santiria rubiginosa	Peninsular Malaysia	Sl	
Cardiopteridaceae	Gonocaryum lobbianum	Peninsular Malaysia, China, Myanmar, Thailand, Indo-China, Borneo	Ps, Pk.	
Celastraceae	Bhesa paniculata	Peninsular Malaysia, Singapore, Peninsular Thailand, India, Philippines, Sumatra, Borneo	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Celastraceae	Bhesa robusta	Borneo, Peninsular Malaysia, Sumatra, India, Bhutan, Chittagong, Burma, Andaman Islands, Thailand, Indo-China	Sb, Sr, Kd, Pn, Kl, Pk, Ph, Sl, NS, Ml	
Celastraceae	Kokoona reflexa	Throughout malaya, Singapore, Borneo	Kd, Pk, Sl, Sb, Sr	
Chrysobalanaceae	Atuna racemosa ssp. racemosa	Peninsular Malaysia, Thailand, Sumatra, Borneo, Sulawesi, Philippines, Maluku, New Guinea, east Pacific Island, Singapore, Celebes, Molucas, New Britain	Kd, Pk, Sl, Sb, Sr	VU
Chrysobalanaceae	Atuna racemosa subsp. excelsa	Peninsular Malaysia, Singapore, Indonesia, Borneo, Sumatra, N Celebes	Kd, Pk, Sl, NS, Tg, Ph, Jh, Sb, Sr	
Commelinaceae	Amischotolype gracilis	Peninsular Malaysia, Borneo, Singapore, Sumatra	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sr	
Commelinaceae	Amischotolype griffithii	Peninsular Malaysia, Sumatera	Pn, Kl, Pk, Ph, NS, Ml, Jh	
Convallariaceae	Peliosanthes teta subsp. humilis	Peninsular Malaysia	Widespread in PM	
Crypteroniaceae	Crypteronia paniculata var. paniculata	Peninsular Malaysia, India, Myanmar, Borneo, Sumatra, Java, Lesser Sunda Islands, Philippines	Ps, Kd, Kl, Pn, Pk, Ph, Sl, NS, Sb, Sr	
Ctenolophonaceae	Ctenolophon parvifolius	Peninsular Malaysia, Singapore, Borneo, Sumatra, New Guinea, Philippines	Ps, Kd, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Cyperaceae	Mapania caudata	Peninsular Malaysia, Borneo	Tg	
Cyperaceae	Mapania cuspidata var. cuspidata	Peninsular Malaysia	Kl, Pk, Ph, Sl, Jh	
Cyperaceae	Mapania palustris var. palustris	Peninsular Malaysia, Singapore	Tg, Pk, Ph, Sl, NS, Ml, Jh	
Dilleniaceae	Acrotrema costatum	Peninsular Malaysia	Widespread in PM	
Dilleniaceae	Dillenia reticulata	Peninsular Malaysia, Sumatra, Borneo		
Dipterocarpaceae	Dipterocarpus cornutus	Sumatra, Peninsular Thailand, Peninsular Malaysia, Singapore and Borneo	Jh, Kd, Kl, Ml, Ns, Ph, Pn, Pk, Sl	
Dipterocarpaceae	Dipterocarpus costulatus	Peninsular Malaysia	Widespread in PM, Sb, S	
Dipterocarpaceae	Dipterocarpus eurynchus	Sumatra, Peninsular Malaysia, Borneo (Sarawak and Brunei) and the Philippines.	Tg, Ph, NS, Jh, Sr	VU
Dipterocarpaceae	Dipterocarpus gracilis	Borneo, Andamans, Chittagong, Philippines, Java	Sr, Sb, Widespread in PM	
Dipterocarpaceae	Dipterocarpus lowii	Sumatra, Peninsular Malaysia and Borneo	Scattered in PM. Jh, Kd, Ph, Pk, Sl, Tg, Sb, Sr	
Dipterocarpaceae	Dipterocarpus sarawakensis	Peninsular Malaysia and Borneo.	Once from Tg, Sr	CR
Dipterocarpaceae	Dipterocarpus verrucosus	Peninsular Thailand, Peninsular Malaysia and Borneo.	Commoner in the south. Jh, Kl, Ns, Ph, Pk, Sl, Tg, Sb, Sr	
Dipterocarpaceae	Dryobalanops aromatica	Peninsular Malaysia, Sumatra, Borneo	Tg, Ph, Sl, NS, Jh, Sb, Sr	
Dipterocarpaceae	Dryobalanops oblongifolia subsp. occidentalis	Peninsular Malaysia, Sumatra	Pk, Sl, Kl, Tg, Ph,Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Dipterocarpaceae	Hopea ferruginea	Sumatra, Peninsular Malaysia and Borneo.	Pk and Ph southward. Jh, Kd, Kl, Ml, Ns, Pn, Sl, Tg, Sb, Sr	
Dipterocarpaceae	Hopea griffithii	Peninsular Myanmar, Peninsular Thailand, Peninsular Malaysia, Borneo	Widespread in PM, Sb, Sr	
Dipterocarpaceae	Hopea mengerawan	Borneo, Peninsular Malaysia, Sumatra, Singapore	Sr, Sb, Ph, NS southward	VU
Dipterocarpaceae	Hopea nutans	Peninsular Malaysia, Borneo	East coast, Tg southward. Sb, Sr	VU
Dipterocarpaceae	Hopea sangal	Myanmar, Peninsular Thailand, Peninsular Malaysia, Sumatra, Java, Bali and Borneo.	Jh, Kd, Kl, Ml, Ns, Ph, Pn, Pk, Sl, Tg, Sb, Sr	
Dipterocarpaceae	Hopea sulcata[E]	Peninsular Malaysia	Tg, Pk, Sl, Jh	
Dipterocarpaceae	Shorea acuminata	Peninsular Malaysia, Borneo	Ml, NS, Pk and Tg southward in PM	
Dipterocarpaceae	Shorea balanocarpoides	Sumatra, Peninsular Malaysia and Borneo	Kd, Kl, Tg, Pk, Ph, Jh, Sr	
Dipterocarpaceae	Shorea bracteolata	Sumatra, Peninsular Malaysia, Singapore and Borneo.	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Dipterocarpaceae	Shorea exelliptica	Borneo, Peninsular Malaysia	Kd, Tg, Pk, Ph, Jh, Sr, Sb	VU
Dipterocarpaceae	Shorea glauca	Peninsular Malaysia, Sumatra	Ps, Kd, Pn, Kl, Tg, Pk, Ph, NS, Ml, Jh	
Dipterocarpaceae	Shorea laevis	Myanmar, Peninsular Thailand, Peninsular Malaysia, Sumatra and Borneo.	Kd and Ph southward, Jh, Ns, Pk, Sl, Tg, Sb, Sr	
Dipterocarpaceae	Shorea lepidota	Sumatra and Peninsular Malaysia.	Kd, Pn, Tg, Pk, Ph, NS, Ml, Jh	
Dipterocarpaceae	Shorea macroptera	Peninsular Malaysia, Singapore, Sumatra, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Dipterocarpaceae	Shorea multiflora	Sumatra, Peninsular Malaysia and Borneo.	Throughout in PM, Sb, Sr	
Dipterocarpaceae	Shorea ovalis	Sumatra, Peninsular Malaysia, Borneo		
Dipterocarpaceae	Shorea parvifolia	Peninsular Malaysia, Singapore, Sumatra, Borneo		

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Dipterocarpaceae	Shorea singkawang	Peninsular Malaysia		
Dipterocarpaceae	Vatica bella	Peninsular Malaysia	Pk and Ph southward, Jh, Kd, Kl, Ns, Ps, Sl, Tg	
Dipterocarpaceae	Vatica havilandii	Borneo, Peninsular Malaysia	Sr, Sb, Tg, Pk, Ph	EN
Dipterocarpaceae	Vatica mangachapoi	Peninsular Malaysia, Peninsular Thailand, Borneo, Philippines	Kd, Kl, Tg, Pk	VU
Dipterocarpaceae	Vatica mizaniana	Peninsular Malaysia	Tg	RA
Dipterocarpaceae	Vatica odorata ssp. odorata	Borneo, Peninsular Malaysia, S China, Myanmar, Thailand, Indo-China, Philippines	Sb, Ph, NS northwards	VU
Dipterocarpaceae	Vatica pallida[E]	Peninsular Malaysia	Pn	EN
Dipterocarpaceae	Vatica pauciflora	Peninsular Malaysia	Widespread in PM	
Dipterocarpaceae	Vatica stapfiana	Peninsular Malaysia	Widespread in PM	VU
Dipterocarpaceae	Vatica venulosa ssp. venulosa	Borneo, Peninsular Malaysia, Sumatra, Java	Sr, Sb, Pk, Ph	EN
Dracaenaceae	Dracaena cantleyi	Peninsular Malaysia	Widespread in PM	
Dracaenaceae	Dracaena conferta	Peninsular Malaysia	Widespread in PM	
Dracaenaceae	Dracaena elliptica	Peninsular Malaysia	Widespread in PM	
Dracaenaceae	Dracaena longifolia	Peninsular Malaysia	Ph	
Dracaenaceae	Dracaena maingayi	Peninsular Malaysia	South of Malaya	
Ebenaceae	Diospyros buxifolia	Peninsular Malaysia, Borneo	Widespread in PM, Sb, Sr	
Ebenaceae	Diospyros latisepala	Throughout Malaysia, Peninsular Thailand	Widespread in PM	
Ebenaceae	Diospyros ridleyi	Borneo, Peninsular Malaysia, Andamans	Sb, Sr, Pn, Tg, Ph, Sl, Jh	
Ebenaceae	Diospyros rigida	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Kl, Tg, Pk, Ph, Sl, Jh	
Ebenaceae	Diospyros singaporensis	Peninsular Malaysia, Singapore	Kd, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Ebenaceae	Diospyros sumatrana	Borneo, Peninsular Malaysia, Sumatra, Thailand	Sb, Sr, Widespread in PM	
Ebenaceae	Diospyros venosa	Peninsular Malaysia, Thailand, Vietnam, Borneo, Indonesia		
Elaeocarpaceae	Elaeocarpus ferrugineus	Peninsular Malaysia	Widespread in PM	
Elaeocarpaceae	Elaeocarpus griffithii	Peninsular Malaysia	Kd, Pk, Ph, Sl, Jh	
Elaeocarpaceae	Elaeocarpus mastersii	Peninsular Malaysia	Common throughout in PM	
Elaeocarpaceae	Elaeocarpus nitidus var. nitidus	Peninsular Malaysia	Common throughout in PM	
Elaeocarpaceae	Elaeocarpus obtusatus subsp. apiculatus	Peninsular Malaysia	Kd, Kl, Tg, Pk	
Elaeocarpaceae	Elaeocarpus petiolatus	Peninsular Malaysia, Singapore, India, Indo-China, Indonesia, Borneo	Widespread in PM	
Elaeocarpaceae	Elaeocarpus robustus var. megacarpus	Peninsular Malaysia	Widespread in PM	
Euphorbiaceae	Agrostistachys gaudichaudii	Peninsular Malaysia, Singapore, Peninsular Thailand	Kd, Kl, Tg, Pk, Ph, Jh	
Euphorbiaceae	Agrostistachys longifolia var. longifolia	Peninsular Malaysia	Throughout in PM	
Euphorbiaceae	Balakata baccata			
Euphorbiaceae	Blumeodendron calophyllum	Peninsular Malaysia, Brunei, Borneo	Kd, Tg, Pk, Ph, Sl, Jh	
Euphorbiaceae	Blumeodendron tokbrai	Peninsular Malaysia, Singapore, Indonesia, Borneo	Tg, Pk, Ph, Sl, Ns, Jh, Sp.	
Euphorbiaceae	Cephalomappa lepidotula	Peninsular Malaysia, Sumatra, Borneo	Sb, ?Sr, S.E. Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Euphorbiaceae	Croton argyratus	Peninsular Malaysia	Widespread in PM	
Euphorbiaceae	Croton laevifolius	Peninsular Malaysia	Widespread in PM	
Euphorbiaceae	Drypetes kikir	Peninsular Malaysia	Tg, Pk, Ph	
Euphorbiaceae	Drypetes longifolia[E]	Peninsular Malaysia	Widespread in PM	
Euphorbiaceae	Endospermum diadenum	Throughout Malaya, Sumatra, Borneo	Widespread in PM	
Euphorbiaceae	Koilodepas longifolium	Peninsular Malaysia, Borneo, Southern Thailand, Sumatra	Kd, Tg, Ml, Jh, Ph, Pk, Pn, Sb, Sr	
Euphorbiaceae	Macaranga amissa[E]	Peninsular Malaysia	Tg, Pk, Ml, Jh	
Euphorbiaceae	Macaranga bancana	Peninsular Thailand, Malay Peninsula, Sumatra, Borneo	Sb, Sr	
Euphorbiaceae	Macaranga hypoleuca	Peninsular Malaysia, Thailand, Sumatra, Borneo	Throughout PM	
Euphorbiaceae	Macaranga lowii	Throughout Malaya, Siam, Borneo	Throughout PM, Commoner in the north.	
Euphorbiaceae	Macaranga motleyana ssp. griffithiana	Peninsular Malaysia	Throughout PM	
Euphorbiaceae	Macaranga triloba	Throughout Malaya, Myanmar, Thailand	Throughout PM	
Euphorbiaceae	Mallotus leucodermis	Peninsular Malaysia, Borneo	Kl, Ph, Sl	
Euphorbiaceae	Mallotus muticus	Peninsular Malaysia, Borneo, Sumatra	Ps, Kl, Pn, Tg, Pk, NS, Ml, Jh	
Euphorbiaceae	Mallotus resinosus			
Euphorbiaceae	Neoscortechinia nicobarica	Peninsular Malaysia, Myanmar	Kd, Kl, Ph, Sl, Jh	
Euphorbiaceae	Pimelodendron griffithianum	Peninsular Malaysia, Singapore, Borneo	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Fagaceae	Lithocarpus cyclophorus	Peninsular Malaysia	Widespread in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Fagaceae	Lithocarpus elegans	Borneo, Peninsular Malaysia, India, Burma, Thailand, Laos, Cambodia, Vietnam, China, Sumatra, Singapore, Java, Sulawesi	Sb, Sr, Widespread in PM	
Fagaceae	Lithocarpus ewyckii	Borneo, Peninsular Malaysia, Sumatra, Singapore	Sb, Sr, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Fagaceae	Lithocarpus lucidus	Borneo, Peninsular Malaysia, Sumatra, Singapore	Sb, Sr, widespread in PM	
Fagaceae	Lithocarpus rassa	Peninsular Malaysia, Sumatra, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Fagaceae	Lithocarpus sundaicus	Borneo, Peninsular Malaysia, Sumatra, Singapore, Thailand, Java, Philippines	Sb, Sr, widespread in PM	
Fagaceae	Lithocarpus urceolaris	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Tg, Ph, Jh	
Fagaceae	Lithocarpus wrayi	Peninsular Malaysia	Kd, Kl, Tg, Pk, Ph, NS	
Gesneriaceae	Codonoboea atrosanguinea[E]	Peninsular Malaysia	Kl, Tg, Ph	
Gesneriaceae	Codonoboea codonion[E]	Peninsular Malaysia	Ph, Tg	VU
Gesneriaceae	Codonoboea puncticulata	Peninsular Malaysia, Singapore	Jh, Ph, Tg	
Gesneriaceae	Codonoboea quinquevulnera[E]	Peninsular Malaysia	Kl, Ph, Sl, Ml, Jh	
Guttiferae	Calophyllum dioscurii	Peninsular Malaysia	Kd, Pk, Ph, NS, Ml, Jh	
Guttiferae	Calophyllum ferrugineum var. oblongifolium[E]	Peninsular Malaysia	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Guttiferae	Calophyllum gracillimum[E]	Peninsular Malaysia	Tg, Ph, Sl	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Guttiferae	Calophyllum inophyllum	Peninsular Malaysia	Kd, Pn, Kl, Pk, Ph, Sl, NS, Ml, Jh	
Guttiferae	Calophyllum molle	Peninsular Malaysia, Borneo	Kd, Pn, Tg, Pk, Ph, Sl, Jh	
Guttiferae	Calophyllum rubiginosum	Peninsular Malaysia	Sl, NS, Ml, Jh	
Guttiferae	Calophyllum sclerophyllum	Peninsular Malaysia, Borneo	Kd, Kl, Tg, Pk, Ph, Jh	
Guttiferae	Calophyllum tetrapterum var. tetrapterum	Peninsular Malaysia	P.Langkawi, Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Guttiferae	Calophyllum teysmannii var. teysmannii	Peninsular Malaysia	Kl, Tg, Ph, Jh	
Guttiferae	Cratoxylum arborescens	Borneo, Peninsular Malaysia, Burma, Sumatra, Thailand, Myanmar	Sb, Sr, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Guttiferae	Cratoxylum cochinchinense	Peninsular Malaysia, Borneo, Burma, Indo-China, South China, Sumatra, Philippines	Kd, Pn, Kl, Pk, Ph, Sl, NS, Ml, Sb, Sr	
Guttiferae	Cratoxylum formosum	Borneo, Peninsular Malaysia, Indo-China, Andaman Island, Sumatra, Java, Philippines, Celebes	Widespread PM, Sb, Sr	
Guttiferae	Garcinia costata[E]	Peninsular Malaysia	Kd, Pk	
Guttiferae	Garcinia griffithii	Peninsular Malaysia, Sumatra	Scattered throughout in PM	
Guttiferae	Garcinia malaccensis	Peninsular Malaysia, Brunei	Kl, Tg, Ph, Sl, NS, Jh	
Guttiferae	Garcinia mangostana	Peninsular Malaysia, Burma and Malesia	Tg	
Guttiferae	Garcinia nigrolineata	Peninsular Malaysia, Myanmar	Throughout in PM	
Guttiferae	Garcinia parviflora	Peninsular Malaysia, Sumatra, Borneo	Throughout in PM	
Guttiferae	Garcinia scortechinii	Peninsular Malaysia	Common throughout in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Guttiferae	Garcinia urophylla	Peninsular Malaysia	Widely scattered in PM	
Guttiferae	Kayea grandis	Peninsular Malaysia	Sl, Ph, NS, Ml, Tg and Pk southward.	
Guttiferae	Kayea racemosa	Peninsular Malaysia	Kd, Kl, Tg, Pk, Ph, Sl, Ml.	
Guttiferae	Mesua ferrea	Peninsular Malaysia, India, Myanmar, Peninsular Thailand	Throughout but commoner in the north of PM	
Guttiferae	Mesua grandis	Peninsular Malaysia	Tg and Pk southward	
Hanguanaceae	Hanguana malayana	Widespread	Widespread in PM	
Hypoxidaceae	Molineria latifolia			
Irvingiaceae	Irvingia malayana	Thailand, Indo-China, Sumatra, Peninsular Malaysia, Borneo,	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Ixonanthaceae	Ixonanthes icosandra	Peninsular Malaysia, Sumatra	Widespread in PM	
Ixonanthaceae	Ixonanthes reticulata	Peninsular Malaysia, Sumatra, Borneo	Widespread in PM	
Labiatae	Teijsmanniodendron holophyllum	Peninsular Malaysia	Tg, Jh	
Labiatae	Vitex pinnata	Peninsular Malaysia	Throughout in PM	
Lauraceae	Actinodaphne robusta	Peninsular Malaysia, Borneo, Philippines	Jh, Ph, Sr	
Lauraceae	Alseodaphne insignis	Peninsular Malaysia	Tg, Pk, Ph, Sl	
Lauraceae	Alseodaphne intermedia	Peninsular Malaysia	Kd, Kl, Tg, Pk, Ph, Sl, Jh	
Lauraceae	Beilschmiedia kunstleri	Peninsular Malaysia	Tg, Pk, Ph, Jh	
Lauraceae	Beilschmiedia lucidula	Peninsular Malaysia	P.Langkawi, Kd, Kl, Ph	
Lauraceae	Beilschmiedia madang	Peninsular Malaysia	Pn, Tg, Pk, Ph, Sl, Jh	
Lauraceae	Cinnamomum aureofulvum[E]	Peninsular Malaysia	Sl, Ph	
Lauraceae	Cinnamomum javanicum	Peninsular Malaysia, Singapore, Indonesia, Borneo	Kd, Pk, Ph, Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Lauraceae	Cryptocarya amygdalina	Peninsular Malaysia, Sumatra, Thailand, Southern China, India, Andaman Islands, Bhutan, Myanmar		
Lauraceae	Cryptocarya bracteolata[E]	Peninsular Malaysia	Pk, Ph	
Lauraceae	Cryptocarya griffithiana	Peninsular Malaysia, Borneo, Singapore	Pk, Ph, Sl, NS, Ml, Jh	
Lauraceae	Cryptocarya infectoria	Peninsular Malaysia	Kd, Kl, Pk, Ph, Sl, NS, Jh	
Lauraceae	Litsea accedens var. accedens	Peninsular Malaysia	Widespread in PM, Jh	
Lauraceae	Litsea castanea	Peninsular Malaysia, Borneo, Sumatra, Thailand, Singapore	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Lauraceae	Litsea costalis	Peninsular Malaysia, Singapore	Pk, Ph, Sl, Ml	
Lauraceae	Litsea curtisii[E]	Peninsular Malaysia	Kd, Pn, Pk, Sl, Jh	
Lauraceae	Litsea cylindrocarpa	Peninsular Malaysia	Kd, Pn, Kl, Tg, Pk, Jh	
Lauraceae	Litsea elliptica	Peninsular Malaysia, Borneo, Thailand, Singapore, Java, New Guinea	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Lauraceae	Litsea machilifolia	Peninsular Malaysia, Thailand, Singapore	Pn, Pk, Ph, NS, Ml, Jh	
Lauraceae	Litsea myristicifolia	Peninsular Malaysia	Kd, Pn, Tg, Pk, Ph, NS, Ml	
Lauraceae	Nothaphoebe aff. umbelliflora	Peninsular Malaysia	Pn, Kl, Pk, Ph, Sl, NS, Jh	
Lauraceae	Nothaphoebe coriacea	Peninsular Malaysia	Tg, Ph, Sl	
Lauraceae	Nothaphoebe panduriformis	Peninsular Malaysia	Kd, Pk, Ph, Sl, NS, Ml, Jh	
Lauraceae	Phoebe elliptica	Peninsular Malaysia	Pk, Ph, Sl, NS	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Lecythidaceae	Barringtonia macrostachya	Peninsular Malaysia, Singapore, Borneo, Philippines, Myanmar, China, Vietnam, Sulawesi, Maluku	Widespread PM, Sb, Sr	
Lecythidaceae	Barringtonia pendula	Peninsular Malaysia, Thailand, Borneo, China, Myanmar, Indonesia	Widespread PM, Sb, Sr	
Lecythidaceae	Barringtonia scortechinii	Thailand, Indonesia, Peninsular Malaysia, Singapore, Borneo	Widespread PM, Sb, Sr	
Leguminosae	Adenanthera bicolor	Widespread, Ceylon, Borneo.		
Leguminosae	Adenanthera malayana	Peninsular Malaysia	Widespread in PM	
Leguminosae	Archidendron bubalinum	Peninsular Malaysia	Widespread in PM	
Leguminosae	Crudia curtisii[E]	Peninsular Malaysia	Tg, Pn, Pk, Ph, Sl, Ml	
Leguminosae	Cynometra malaccensis	Peninsular Malaysia, Singapore, Indo-Malay, Australia	Pk, Ph, Sl, Ml.	
Leguminosae	Dialium indum var. indum	Borneo, Peninsular Malaysia, Southern Thailand, Sumatra, Singapore, Java	Sb, Sr, Widespread in PM	
Leguminosae	Dialium platysepalum	Sumatra, Peninsular Malaysia, Singapore, Borneo	Widespread in PM, Sb, Sr	
Leguminosae	Intsia palembanica	India, Bruma, Thailand, Borneo, Malesia	Throughout in PM, Sb, Sr	
Leguminosae	Koompassia malaccensis	Peninsular Malaysia, Singapore, Sumatra, Borneo	Widespread in PM, Sr	
Leguminosae	Ormosia sumatrana	Peninsular Malaysia	Kd, Kl, Ph, Jh	
Leguminosae	Ormosia venosa	Peninsular Malaysia	Tg, Sl, Ml	
Leguminosae	Parkia speciosa	Peninsular Malaysia	Widespread in PM	
Leguminosae	Saraca cauliflora	Peninsular Malaysia	Ml and Ph northward in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Leguminosae	Saraca declinata	Throughout Malaya, Indo-China, Myanmar, Thailand, Indonesia	Widespread in PM	
Leguminosae	Sindora coriacea	Peninsular Malaysia, Peninsular Thailand, Sumatra, Singapore, Borneo	Widespread in PM, Sb	
Magnoliaceae	Magnolia betongensis	Thailand, Peninsular Malaysia, Borneo	Kd, Pk, Sl, Ph, Kl, Tg, Jh	
Melastomataceae	Clidemia hirta	Peninsular Malaysia, South America, Indonesia, Fiji	Widespread in PM	
Melastomataceae	Melastoma malabathricum	Peninsular Malaysia, India	Widespread in PM	
Melastomataceae	Ochthocharis decumbens	Peninsular Malaysia	Sl, Jh	
Melastomataceae	Pternandra coerulescens	Peninsular Malaysia, Thailand, Sumatra, Borneo, Singapore	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Melastomataceae	Sonerila integrifolia	Peninsular Malaysia	Common on the Main Range of PM	
Melastomataceae	Sonerila maculata	Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam, China		
Melastomataceae	Sonerila moluccana	Peninsular Malaysia	Widespread in PM	
Meliaceae	Aglaia elliptica	Peninsular Malaysia, Borneo, Myanmar, Thailand, Sumatra, Riau-Lingga Archipelago, Philippines, Java, Bali, Flores and Sulawesi	Kd, Pk, Sl, NS, Kl, Tg, Ph, Jh, Sb, Sr	
Meliaceae	Aglaia erythrosperma	Peninsular Malaysia, Thailand, Sumatra, Singapore and Borneo	Pk, Sl, NS, Tg, Ph, Jh, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Meliaceae	Aglaia forbesii	Peninsular Malaysia, Borneo, Myanmar, Thailand, Sumatra	Kd, Kl, Tg, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Meliaceae	Aglaia rubiginosa	Peninsular Malaysia, Sumatra, Singapore, Borneo	Kd, Tg, Pk, Ph, Sl, Ml, Jh, Sb, Sr	
Meliaceae	Dysoxylum cauliflorum	Peninsular Malaysia, Myanmar, Indo-China, Thailand, Sumatra, Singapore, Borneo, and Philippines	Pn, Kl, Tg, Pk, Ph, Sl, Ml, Jh, Sb, Sr	
Meliaceae	Lansium domesticum	Peninsular Malaysia, Peninsular Thailand, Borneo, Phillippines, Indonesia	Widespread in PM, Jh, Kd, Kl, Ml, NS, Ph, Pn, Pk, Sl, Tg, Sb, Sr	
Meliaceae	Sandoricum koetjape	Peninsular Malaysia, Indonesia, Borneo, Philippines, New Guinea	Widespread in PM. Jh, Kd, Kl, Ml, NS, Ph, Pn, Pk, Sl, Tg, Sb, Sr	
Memecylaceae	Memecylon amplexicaule	Peninsular Thailand, Peninsular Malaysia, Singapore, Borneo, Indonesia	Kd, Pn, Kl, Tg, Pk, Ph, NS, Ml, Jh	
Memecylaceae	Memecylon cantleyi	Peninsular Malaysia, Thailand, Singapore, Borneo, Indonesia	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Memecylaceae	Memecylon megacarpum	Peninsular Malaysia, Singapore, Borneo	Kd, Pn, Kl, Tg. Pk, Ph, Sl, NS, Ml, Jh, Sr	
Memecylaceae	Memecylon paniculatum	Peninsular Malaysia, Peninsular Thailand, Sumatra, Singapore, Java, Borneo, Sulawesi, Maluku and Philippines	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Moraceae	Artocarpus elasticus	Myanmar, Thailand, Sumatra, Peninsular Malaysia, Borneo	Widespread in PM	
Moraceae	Artocarpus glaucus	Borneo, Peninsular Malaysia, Sumatra, Java, Lesser Sunda Islands	Sb, Sr, Kd, Pk, Ph, Sl, Jh	
Moraceae	Artocarpus integer	Thailand, Peninsular Malaysia, Sumatra, Borneo, Sulawesi, Maluku & New Guinea	Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Moraceae	Artocarpus kemando	Sumatra, Peninsular Malaysia, Singapore, Borneo	Tg, Ph, Pk, Sl, Jh, Sb, Sr	
Moraceae	Artocarpus lacucha			
Moraceae	Artocarpus nitidus	Assam, Myanmar, Thailand, Indo-China, S China, Sumatra, Peninsular Malaysia, Borneo, Philippines	Widespread in PM, Sb, Sr	
Moraceae	Artocarpus rigidus	Sothern Myanmar, Southern Thailand, Sumatra, Peninsular Malaysia, Borneo, java, Kangean Archipelago, Bali.	Throughout in PM, Sb, Sr	
Moraceae	Parartocarpus bracteatus	Peninsular Malaysia, Borneo, Sumatra, Singapore	Pn, Sl, NS, Ml, Jh, Sb, Sr	
Moraceae	Streblus elongatus	Peninsular Malaysia, Sumatra , Singapore, Borneo, Sulawesi	Kd, Pn, Tg, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Moraceae	Streblus ilicifolius	Borneo, Peninsular Malaysia, Chittagong, Burma, Indo-China, Thailand, Hainan, Philippines, Sulawesi, Maluku, Key Is., Timor	Sb, Sr, Widespread in PM	
Myristicaceae	Gymnacranthera farquhariana var. eugeniifolia	Peninsular Malaysia, Sumatra, Singapore, Borneo	P. Langkawi, Kd, Pn, Tg, Pk, Ph, Sl, Ml, Jh, Sb, Sr	
Myristicaceae	Gymnacranthera farquhariana var. farquhariana	Borneo, Peninsular Malaysia, Peninsular Thailand, Sumatra, Singapore	Sb, Sr, Pn, Tg, Pk, Ph, Sl, Ml, Jh	
Myristicaceae	Gymnacranthera forbesii	Southern Thailand, Sumatra, Peninsular Malaysia, Singapore, Borneo.	Sb, Sr, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Myristicaceae	Horsfieldia crassifolia	Borneo, Peninsular Malaysia, S Thailand, Sumatra, Singapore	Sb, Sr, Tg, Pk, Sl, NS, Ml, Jh	VU
Myristicaceae	Horsfieldia fulva	Peninsular Malaysia	Pk, Sl, NS, Ml	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Myristicaceae	Horsfieldia polyspherula var. polyspherula	Borneo, Peninsular Malaysia, Sumatra, Philippines	Sb, Sr, Kd, Tg, Pk, Ph, Sl, Ml, Jh	
Myristicaceae	Horsfieldia polyspherula var. sumatrana	Borneo, Peninsular Malaysia, Sumatra, Singapore	Kd, Kl, Pk, Ph, Sl, NS, Jh	
Myristicaceae	Horsfieldia sucosa	Borneo, Peninsular Malaysia	Sb, Sr, Kl, Tg, Pk, Ph, Sl, Ml, Jh	
Myristicaceae	Horsfieldia superba	Peninsular Malaysia	Widespread in PM	
Myristicaceae	Knema curtisii	Sumatra, Peninsular Malaysia, Borneo		
Myristicaceae	Knema furfuracea	Peninsular Malaysia, Singapore, Indo-China, Thailand, Indonesia, Borneo	P. Langkawi, Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Myristicaceae	Knema hookeriana	Throughout Malaya, Sumatra, Singapore	Pn, Kl, Tg, Pk, Ph, NS, Ml, Jh	
Myristicaceae	Knema kunstleri	Peninsular Malaysia, Philippines, Borneo	Kl, Tg, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Myristicaceae	Knema laurina	Peninsular Malaysia, Indo-China, Myanmar, Thailand, Indonesia, Borneo	Widespread in PM, Sb, Sr	
Myristicaceae	Knema patentinervia	Throughout	Kl, Tg, Pk, Ph, Ml, Jh.	
Myristicaceae	Knema scortechinii	Peninsular Malaysia	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Myristicaceae	Myristica cinnamomea	Sumatra, Peninsular Malaysia, Singapore, Borneo, Philippines	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Myristicaceae	Myristica elliptica	Borneo, Peninsular Malaysia, Peninsular Thailand, Sumatra	Sb, Sr, widespread in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Myristicaceae	Myristica maxima	Peninsular Thailand, Sumatra, Peninsular Malaysia, Singapore, Borneo	Commonest in the south of PM, Sb, Sr	
Myrsinaceae	Ardisia crassa	Peninsular Malaysia	NS, Ml	
Myrsinaceae	Labisia pumila var. pumila	Peninsular Malaysia, Singapore	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Myrtaceae	Rhodamnia cinerea	Myanmar, Peninsular Thailand, Sumatra, Peninsular Malaysia, Java, Borneo, Philippines	Widespread in PM	
Myrtaceae	Syzygium attenuatum ssp. attenuatum	Borneo, Peninsular Malaysia, Sumatra, Java, Philippines, Sulawesi	Sb, Sr, Kd, Pn, Ph, Sl, Ml, Jh	
Myrtaceae	Syzygium burkillianum[E]	Peninsular Malaysia	Pk	
Myrtaceae	Syzygium cerina	Peninsular Malaysia, Borneo, Sumatra	Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Myrtaceae	Syzygium chloranthum	Borneo, Peninsular Malaysia, Vietnam, Thailand, Sumatra, Singapore	Sb, Sr, Kd to Sp [Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh]	
Myrtaceae	Syzygium chloroleucum	Peninsular Malaysia	Pk, Ph, Sl, Jh	
Myrtaceae	Syzygium claviflorum	Borneo, throughout Malaysia to Australia, India, Bangladesh, Myanmar, China, Thailand	Sb, Sr, Ps, Tg, Kd, Pn, Pk, Ph	
Myrtaceae	Syzygium duthieanum[E]	Peninsular Malaysia	Kd, Pn, Tg, Pk, Ph, Jh	
Myrtaceae	Syzygium dyerianum	Peninsular Malaysia	Widespread in PM	
Myrtaceae	Syzygium fastigiatum	Widespread in Indo-Burma and WMalaysia including throughout Borneo	Sb, Sr, widespread in PM	
Myrtaceae	Syzygium filiforme var. filiforme	Peninsular Malaysia, Thailand, Singapore, Brunei, Java	Pk to Sp [Pk, Ph, Sl, NS, Ml, Jh]	
Myrtaceae	Syzygium graeme-andersoniae[E]	Peninsular Malaysia	Kl, Ph	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Myrtaceae	Syzygium leptostemon	Borneo, Peninsular Malaysia, Indo-Burma, Thailand	Sb, Sr, Kd to Sp [Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh]	
Myrtaceae	Syzygium ngadimanianum[E]	Peninsular Malaysia	Kl, Jh	
Myrtaceae	Syzygium papillosum	Peninsular Malaysia, Singapore	Pk and Tg to Sp [Tg, Pk, Ph, Sl, NS, Ml, Jh]	
Myrtaceae	Syzygium polyanthum	Peninsular Malaysia, Borneo, Indo-Burma, Sundaland, Philippines	P.Langkawi and Kl to Sp [Kl, Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh] Sb, Sr	
Myrtaceae	Syzygium polyanthum var. polyanthum	Peninsular Malaysia, Borneo, Indo-Burma, Sundaland, Philippines	Sb, Sr, P.Langkawi & Kl to Sp [Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh]	
Myrtaceae	Syzygium ridleyi	Peninsular Malaysia	Kd to Sp [Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh] (TGBS)	
Myrtaceae	Syzygium rugosum	Borneo, Peninsular Malaysia	Sr, Ps, Kd, Tg, Pk, Ph, Sl, Ml, Jh	
Myrtaceae	Tristaniopsis merguensis	Peninsular Thailand, Sumatra, Peninsular Malaysia, Borneo	Widespread in PM	
Myrtaceae	Tristaniopsis whiteana	Sumatra, Peninsular Malaysia, Singapore, Borneo	Widespread in PM	
Ochnaceae	Campylospermum serratum	Peninsular Malaysia, India, Sri Lanka, China, Indo-China, Thailand, Sumatra, Borneo, Java, Philippines, and Sulawesi	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Ochnaceae	Sauvagesia serrata	Peninsular Malaysia	Tg, Ph, Jh	
Olacaceae	Strombosia javanica	Myanmar, Southern Thailand, Sumatra, Peninsular Malaysia, Singapore, Java, Borneo and Natuna Islland.	Kd, Pn, Kl, Pk, Ph, Sl, NS, Jh, Sr	
Orchidaceae	Arundina graminifolia	Peninsular Malaysia	Widespread in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Orchidaceae	Bromheadia finlaysoniana	Peninsular Malaysia	Widespread in PM	
Orchidaceae	Hetaeria oblongifolia	Peninsular Malaysia	Kd, Pn, Pk	
Orchidaceae	Plocoglottis gigantea	Peninsular Malaysia	Widespread in PM	
Oxalidaceae	Sarcotheca monophylla[E]	Peninsular Malaysia	Pk, Ph, Sl, Ml	
Palmae	Areca montana	Peninsular Malaysia	Widespread in PM	
Palmae	Areca ridleyana[E]	Peninsular Malaysia	Tg, Ph, Jh	
Palmae	Arenga hastata	Peninsular Malaysia, Borneo	Tg, Pk, Ph, Sl, Jh, Sb, Sr	
Palmae	Arenga obtusifolia	Peninsular Malaysia	Widespread in PM	
Palmae	Calamus blumei	Peninsular Malaysia, Borneo, Indonesia	Pk, Ph, Sl, NS, Jh, Sb, Sr	
Palmae	Calamus burkillianus	Peninsular Thailand, Peninsular Malaysia, Borneo	Pk, Ph, Sl, NS, Jh, Sb, Sr	
Palmae	Calamus castaneus	Peninsular Malaysia	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Palmae	Calamus densiflorus	Peninsular Malaysia, Singapore, Thailand	Kd, Tg, Pk, Ph, Sl, NS	
Palmae	Calamus diepenhorstii	Peninsular Malaysia, Singapore, Sumatra, Borneo, Philippines, Thailand	Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Palmae	Calamus flabellatus	Peninsular Malaysia, Borneo	Jh, Sr	
Palmae	Calamus insignis	Peninsular Malaysia	PM	
Palmae	Calamus laevigatus var. laevigatus	Peninsular Malaysia	Pk, Ph, Sl, Tg	
Palmae	Calamus perakensis var. crassus[E]	Peninsular Malaysia	Tg	
Palmae	Calamus perakensis var. perakensis	Peninsular Malaysia, West Sumatra	Pk, Ph, Sl.	
Palmae	Calamus sedens	Peninsular Thailand, Peninsular Malaysia.	Kd, Kl, Tg, Pk, Ph, Sl, NS, Jh	
Palmae	Calamus tumidus	Peninsular Malaysia, Sumatra	Tg, Ph, NS, Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Palmae	Ceratolobus subangulatus	Peninsular Malaysia, Singapore, Borneo, Indonesia	Tg, Pk, Ph, Sl, Ml, Sb, Sr	
Palmae	Daemonorops calicarpa	Peninsular Malaysia, Sumatra	Pk, Ph, Sl, NS, Ml, Jh	
Palmae	Daemonorops didymophylla	Peninsular Malaysia, Borneo, Sumatra, Singapore	Kl, Tg, Pn, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Palmae	Daemonorops geniculata	Peninsular Malaysia, Sumatra, Borneo	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml	
Palmae	Daemonorops hystrix var. hystrix	Peninsular Malaysia, Singapore, Indonesia	Kl, Pk, Ph, Sl, NS, Ml, Jh, Sr	
Palmae	Daemonorops kunstleri	Peninsular Malaysia, Singapore, Sumatra, Borneo	Kd, kl, Tg, pk, Ph, Sl, NS, Jh,	
Palmae	Daemonorops leptopus	Peninsular Thailand, Peninsular Malaysia, Singapore.	Kl, tg, Pk, ph, Sl, NS, Ml, Jh	
Palmae	Daemonorops micracantha	Peninsular Malaysia, Singapore, Borneo	Tg, Pk, Ph, NS, Jh, Sb, Sr	
Palmae	Daemonorops sabut	Peninsular Malaysia, Singapore, Borneo	Tg, Pk, Ph, NS, Jh, Sb, Sr	
Palmae	Daemonorops verticillaris	Peninsular Malaysia, Thailand, Sumatra	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Palmae	Eleiodoxa conferta	Throughout Malaya, Borneo	Throughout of PM, Sb, Sr	
Palmae	Eugeissona brachystachys[E]	Peninsular Malaysia	Tg, Ph	
Palmae	Iguanura wallichiana	Peninsular Malaysia, Sumatra, Borneo	Kd, Pn, Pk, Ph	
Palmae	Johannesteijsmannia altifrons	Peninsular Malaysia, Borneo	Kl, Ph, Sl, Jh, Sr	
Palmae	Korthalsia echinometra	Peninsular Malaysia, Singapore, Sumatra, Borneo	Tg, Ph, Sl, Jh, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Palmae	Korthalsia laciniosa	Peninsular Malaysia, Singapore	Kl, Pn, Pk, Ph, Sl, NS, Jh	
Palmae	Korthalsia rigida	Peninsular Malaysia, Borneo	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml, Sb, Sr	
Palmae	Korthalsia rostrata	Peninsular Malaysia, Singapore, Borneo	Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Palmae	Licuala bayana[E]	Peninsular Malaysia	Tg	
Palmae	Licuala fractiflexa[E]	Peninsular Malaysia	Tg	
Palmae	Licuala glabra var. glabra	Peninsular Malaysia, Peninsular Thailand	Kl, Tg, Pk, Ph, Sl, Ml, Jh. Central to North Peninsular Malaysia	
Palmae	Licuala khoonmengii[E]	Peninsular Malaysia	Only known from type Ulu Terengganu F.R, Tg.	
Palmae	Licuala malajana var. malajana	North Peninsular Malaysia, Peninsular Thailand	Pn, Kl, Tg, Pk, Ph, Sl, Jh	
Palmae	Myrialepis paradoxa	Peninsular Malaysia, Singapore	Tg, Pk, Ph, Sl, NS, Jh	
Palmae	Nenga pumila var. pachystachya	Peninsular Malaysia	Kd, Kl, Pk, Ph, Sl, NS, Jh	
Palmae	Oncosperma horridum	Peninsular Malaysia, Borneo, Philippines	Widespread in PM, Sb, Sr	
Palmae	Pholidocarpus macrocarpus	Peninsular Malaysia	Widespread in PM	
Palmae	Pinanga disticha	Peninsular Malaysia	Common throughout	
Palmae	Pinanga limosa	Peninsular Malaysia, Borneo	PM, Sr	
Palmae	Pinanga malaiana	Peninsular Malaysia, Sumatra, Borneo	Widespread in PM	
Palmae	Pinanga simplicifrons	Peninsular Malaysia, Sumatra	PM	
Palmae	Salacca affinis	Peninsular Malaysia, Borneo, Sumatra	Widespread in PM	
Passifloraceae	Paropsia vareciformis	Peninsular Malaysia	Tg, Pk, Ph, Sl, NS, Ml	
Pentaphragmataceae	Pentaphragma horsfieldii	Peninsular Malaysia	Pk, Ph, Sl, Ml	
Pentaphylacaceae	Adinandra corneriana[E]	Peninsular Malaysia	Tg, Ph, Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Pentaphylacaceae	Adinandra integerrima	Peninsular Malaysia, Cambodia, Singapore, Myanmar, Thailand, Vietnam and China	Kd, Pn, Pk, Ph, Jh	
Pentaphylacaceae	Adinandra sarosanthera	Peninsular Malaysia	Pn, Kl, Tg, Pk, Ph, Sl, Jh	
Pentaphylacaceae	Adinandra villosa	Peninsular Malaysia	Pn, Tg, Pk, Ph, Sl	
Phyllanthaceae	Antidesma coriaceum	Peninsular Malaysia, North Borneo	Widespread in PM	
Phyllanthaceae	Aporosa aurea	Peninsular Malaysia, Singapore	Widespread in PM	
Phyllanthaceae	Aporosa globifera	Peninsular Malaysia, Singapore, Sumatra	Kd, Pn, Kl, Pk, Ph	
Phyllanthaceae	Aporosa lucida	Peninsular Malaysia	Widespread in PM	
Phyllanthaceae	Aporosa nervosa	Peninsular Malaysia, Singapore, Peninsular Thailand, Sumatra, Borneo	Widespread in PM	
Phyllanthaceae	Aporosa prainiana	Peninsular Malaysia	Kd, Pn, Tg, Pk, Ph, Ml, Jh	
Phyllanthaceae	Aporosa stellifera	Peninsular Malaysia	Kl, Tg, Ph, Sl, Jh	
Phyllanthaceae	Aporosa subcaudata			
Phyllanthaceae	Baccaurea kunstleri	Peninsular Malaysia	Kl, Tg, Sl southward of PM	
Phyllanthaceae	Baccaurea maingayi	Peninsular Malaysia, Borneo	Pk, Tg, NS, Jh	
Phyllanthaceae	Baccaurea minor	Peninsular Malaysia, Borneo, Singapore	Kl, Pk, Ph, NS, Jh	
Phyllanthaceae	Baccaurea parviflora	Peninsular Malaysia, Sumatra	Widespread in PM	
Phyllanthaceae	Baccaurea pyriformis[E]	Peninsular Malaysia	Pn, Ph, Sl, Ml, Jh	
Phyllanthaceae	Baccaurea sumatrana	Peninsular Malaysia	Widespread in PM	
Phyllanthaceae	Breynia coronata[E]	Peninsular Malaysia	Widespread in PM	
Phyllanthaceae	Cleistanthus glaucus[E]	Peninsular Malaysia	Pk	
Phyllanthaceae	Cleistanthus gracilis	Peninsular Malaysia	Ps, P. Langkawi, Kd, Tg, Pk, Ph, Jh.	
Phyllanthaceae	Cleistanthus myrianthus	Singapore, Peninsular Malaysia, Myanmar, Indonesia, Borneo		

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Phyllanthaceae	Cleistanthus oblongifolius	Peninsular Malaysia	Tg, Pk, Ph, Sl, Jh	
Phyllanthaceae	Glochidion glomerulatum	Peninsular Malaysia	Pn, Tg, Pk, Sl, Ml, Jh	
Phyllanthaceae	Glochidion hypoleucum	Peninsular Malaysia, Myanmar, S. China	Widespread in PM	
Phyllanthaceae	Glochidion superbum	Peninsular Malaysia	Widespread in PM	
Phyllanthaceae	Phyllanthus emblica	Peninsular Malaysia	Widespread in PM	
Polygalaceae	Xanthophyllum rufum	Peninsular Malaysia, Borneo, Singapore	Kd, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Polygalaceae	Xanthophyllum vitellinum	Thailand, Sumatra, Peninsular Malaysia, Borneo, Java, Singapore	Pn, Kl, Pk, Ph, NS, Ml, Jh, Sb, Sr	
Rhizophoraceae	Gynotroches axillaris	Peninsular Malaysia, Myanmar, Thailand, Australia, Malesia except the Lesser Sunda Islands, to Malesiana and Micronesia.	Throughout in PM, Sb, Sr	
Rhizophoraceae	Pellacalyx axillaris	Borneo, Peninsular Malaysia, Sumatra, Mindanao (Philippines)	Sb, Sr, widespread in PM	
Rosaceae	Eriobotrya bengalensis	Peninsular Malaysia	Widespread in PM	
Rosaceae	Prunus arborea	Peninsular Malaysia		
Rosaceae	Prunus grisea	Kedah, Pahang, Thailand, Taiwan		
Rubiaceae	Argostemma klossii[E]	Peninsular Malaysia	NS, Jh	
Rubiaceae	Argostemma tenue[E]	Peninsular Malaysia	NS	
Rubiaceae	Argostemma yappii[E]	Peninsular Malaysia	Pk, Ph, Sl	
Rubiaceae	Diplospora malaccensis	Peninsular Malaysia, Singapore, Sumatra, Borneo		
Rubiaceae	Ixora congesta	Throughout Malaya	Widespread in PM	
Rubiaceae	Ixora pendula	Peninsular Malaysia	Widespread in PM	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Rubiaceae	Oldenlandia cristata			
Rubiaceae	Pavetta graciliflora	Peninsular Malaysia	Widespread in PM	
Rubiaceae	Pavetta humilis[E]	Peninsular Malaysia	Ph, Ml	
Rubiaceae	Porterandia anisophylla	Peninsular Malaysia, Singapore, Sumatra	Kd, Tg, Pn, Pk, Sl, NS, Ml, Jh	
Rubiaceae	Rennellia speciosa	Peninsular Malaysia, Borneo, Burma, Thailand, Sumatra, Indonesia	Widespread in PM	
Rubiaceae	Rothmannia macrophylla	Peninsular Malaysia, Singapore, Sumatra	Kd, Kl, Tg, Pn, Pk, Ph, Sl, NS, Ml, Jh	
Rubiaceae	Tarenna mollis	Peninsular Malaysia, Singapore, Sumatra	Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Rubiaceae	Urophyllum arboreum			
Rubiaceae	Urophyllum griffithianum	Peninsular Malaysia	Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Rutaceae	Melicope glabra	Borneo, Peninsular Malaysia, Sumatra, Singapore, Java	Tg, Pn, Pk, Ph, Sl, Sb	
Salicaceae	Homalium dasyanthum	Peninsular Malaysia	P.Langkawi, Kd, Ph, Jh	
Salicaceae	Homalium longifolium	Peninsular Malaysia	Widespread in PM	
Salicaceae	Homalium panayanum	Peninsular Malaysia	Sl, NS, Ml	
Salicaceae	Homalium spathulatum[E]	Peninsular Malaysia	Pk	
Salicaceae	Scolopia spinosa	Peninsular Malaysia, Singapore, Indo-China, Myanmar, Thailand	Widespread in PM	
Sapindaceae	Guioa bijuga	Borneo, Peninsular Malaysia, Thailand, Sumatra, Philippines	Sb, Sr, Common throughout in PM	
Sapindaceae	Lepisanthes tetraphylla	Peninsular Malaysia, Borneo, Sri Lanka and Deccan Peninsular to Hainan, Sumatra, Java, Timor, Borneo, Philippines, Sulawesi, New Guinea	Widespread in PM, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Sapindaceae	Nephelium cuspidatum var. eriopetalum	Peninsular Malaysia, Sumatra, Borneo, Java	Sb, Sr, Kl, Ph, Sl, NS, Jh	
Sapindaceae	Nephelium lappaceum	Peninsular Malaysia, Yunnan, Hainan, indo-China, Sumatra, Java, Borneo, Philippines, Sulawesi		
Sapindaceae	Pometia pinnata var. alnifolia	Throughout Malaysia, Sri Lanka, Andaman, Nicobar Is., Indo-China, Taiwan, Pacific to Fiji, Samoa, and Tonga	Sb, Sr	
Sapindaceae	Xerospermum laevigatum	Borneo, Peninsular Malaysia, Myanmar, Sumatra	Sb, Sr, Throughout in PM	
Sapindaceae	Xerospermum noronhianum	Throughout Malaya, Borneo	Widespread in PM, Sb, Sr	
Sapotaceae	Madhuca kingiana	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Tg, Pk, Ph, Sl, Jh	
Sapotaceae	Madhuca korthalsii	Borneo, Peninsular Malaysia, Sumatra	Sb, Sr, Pk, Ph, Sl	
Sapotaceae	Madhuca malaccensis	Thailand, Sumatra (Bangka), Peninsular Malaysia, Singapore, Borneo	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Restricted to the east coast of Sb.	
Sapotaceae	Madhuca motleyana	Borneo, Peninsular Malaysia, Sumatra, Peninsular Thailand	Sb, Sr, Widespread in PM	
Sapotaceae	Madhuca sericea	Borneo, Peninsular Malaysia, Sumatra, Singapore	Sb, Sr, Pk, Ph, NS	
Sapotaceae	Palaquium dasyphyllum	Borneo, Sumatra	Sb, Sr	
Sapotaceae	Palaquium hexandrum	Peninsular Malaysia, Singapore	Kd, Pn, Kl, Pk, Ph, Sl, NS, Ml, Jh	
Sapotaceae	Palaquium leiocarpum	Borneo, Peninsular Malaysia, Sumatra, Sulawesi	Sb, Sr, Kl, Tg	
Sapotaceae	Palaquium oxleyanum[E]	Peninsular Malaysia	Pk, Ph, Sl	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Sapotaceae	Palaquium rostratum	Borneo, Peninsular Malaysia, Thailand, Sumatra, Java, Sulawesi, Ambon	Sb, Sr, Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Sapotaceae	Palaquium semaram	Peninsular Malaysia	Kl, Tg, Ph, Jh	
Sapotaceae	Palaquium xanthochymum	Peninsular Malaysia, Borneo, Sumatra, Java	Tg, Pk, Ph, Sl, Jh, Sr	
Sapotaceae	Payena lucida	Peninsular Malaysia, Singapore, Myanmar, Thailand, Sumatra, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Sapotaceae	Pouteria malaccensis	Peninsular Malaysia	Throughout PM	
Sapotaceae	Pouteria paucinervia	Peninsular Malaysia	Tg, Jh	
Stemonuraceae	Stemonurus scorpioides	Peninsular Malaysia	Tg, Pk, Ph, Sl, Jh	
Sterculiaceae	Heritiera javanica	Peninsular Malaysia, Borneo, Indo-China, Thailand, Vietnam, Java, Philippines, Sulawesi	Kd, Kl, Tg, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Sterculiaceae	Heritiera simplicifolia	Peninsular Malaysia, Singapore, Sumatra, Borneo	Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Sterculiaceae	Heritiera sumatrana	From E. Africa to Thailand, Peninsular Malaysia, Sumatra, Borneo	Kd, Pn, Tg, Pk, Ph, Sl, Jh, Sb, Sr	
Sterculiaceae	Scaphium linearicarpum	Peninsular Malaysia, Singapore,	Kd, Kl, Tg, Pk, Ph, Sl, Jh, Sb, Sr	
Sterculiaceae	Sterculia hyposticta	Peninsular Malaysia, Indo-China, Sumatra	Kd, Pn, Tg, Pk, Ph, NS, Ml, Jh	
Sterculiaceae	Sterculia parviflora	Sumatra, Peninsular Malaysia, Singapore, Borneo	P. Langkawi, Kl, Tg, Ph, Sl, NS, Jh, Sb, Sr	
Sterculiaceae	Sterculia parvifolia	Peninsular Malaysia, Borneo	Pn, Pk, Sl, Sr	
Styracaceae	Styrax benzoin	Peninsular Malaysia, Indonesia	Kl, Pn, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Symplocaceae	Symplocos barringtoniifolia	Peninsular Malaysia, Lao, Cambodia, Vietnam, Singapore, Borneo	Tg, Pk, Ph, Sl, Ml, Jh	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Symplocaceae	Symplocos crassipes var. ernae	Peninsular Malaysia, Borneo	Sl, NS, Tg, Jh, Pk, Sb, Sr	VU
Symplocaceae	Symplocos henschelii var. henschelii	Peninsular Malaysia, Java, Borneo, Myanmar, Thailand, Lao, Cambodia, Vietnam, Sumatra, Indo-China, Philippines	Kd, Ph, Jh, Sb, Sr	
Taccaceae	Tacca integrifolia	Widespread in Peninsular Malaysia	Widespread in PM	
Theaceae	Gordonia concentricicatrix[E]	Peninsular Malaysia	Pk, Ph, Sl, NS, Ml, Jh	
Thymelaeaceae	Aquilaria hirta	Peninsular Malaysia, SIngapore	Tg, Ph, Jh	VU
Thymelaeaceae	Gonystylus bancanus	Sumatra, Peninsular Malaysia, Borneo	Pk, Sl, Jh, Sb, Sr	
Thymelaeaceae	Gonystylus brunnescens	Peninsular Malaysia, Borneo	Pn, Tg, Pk, Ph, Sb, Sr	
Thymelaeaceae	Gonystylus confusus	Sumatra, Peninsular Malaysia, Singapore	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Jh	
Thymelaeaceae	Gonystylus maingayi	Sumatra, Peninsular Malaysia, Borneo	Kl, Pk, Ph, Sl, NS, Jh, Sb, Sr	
Tiliaceae	Grewia latifolia	Peninsular Malaysia, sumatra	Sl	
Tiliaceae	Microcos tomentosa	Myanmar, China, IndoChina, Thailand, Sumatra, Peninsular Malaysia, Singapore, Java, Borneo and Philippines	Widespread in PM	
Tiliaceae	Pentace acuta[E]	Peninsular Malaysia	Tg, Pk	
Tiliaceae	Pentace triptera	Sumatra, Peninsular Malaysia, Singapore, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Ulmaceae	Gironniera hirta	Peninsular Malaysia	Kl, Ph, Jh	
Ulmaceae	Gironniera nervosa	Borneo, Peninsular Malaysia, Thailand, Sumatra, Maluku, New Guinea	Sb, Sr, Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh	
Ulmaceae	Gironniera parvifolia	Sri Lanka, Sumatra, Peninsular Malaysia, Singapore, Borneo	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	

Family	Species	Phytogeographical range	Distribution in Malaysia	Conservation status (Malaysia Red List)
Ulmaceae	Gironniera subaequalis	Andaman Islands, Myanmar, China, Hong Kong, Indo-China, Thailand, Malesia (except the Lesser Sunda Island)	Kd, Pn, Kl, Tg, Pk, Ph, Sl, NS, Ml, Jh, Sb, Sr	
Violaceae	Rinorea anguifera	Throughout Malaya, Indo-China, Thailand, Sumatra, Borneo	Widespread in PM	
Zingiberaceae	Alpinia rafflesiana var. rafflesiana	Peninsular Malaysia	Widespread in PM	
Zingiberaceae	Camptandra parvula	Peninsular Malaysia	Widespread in PM	
Zingiberaceae	Globba unifolia[E]	Peninsular Malaysia	Kl, Tg	
Zingiberaceae	Scaphochlamys breviscapa[E]	Peninsular Malaysia	Tg	VU
Zingiberaceae	Scaphochlamys grandis[E]	Peninsular Malaysia	Tg	
Zingiberaceae	Zingiber gracile[E]	Peninsular Malaysia	Kd, Pn, Ph, Pk, Sl, NS, Ml, Jh	

Notes:

1. Conservation status is based on the Malaysia Plant Red List. CR= Critically Endangered, EN=Endangered, VU=Vulnerable, NT=Near Threatened, LC=Least Concern, DD=Data Deficient, NE=Not Evaluated.
2. PM=Peninsular Malaysia, Ps=Perlis, Lg= Langkawi, Kd=Kedah, Pn=Penang, Kl=Kelantan, Tg=Terengganu, Ph=Pahang, Pk=Perak, Sl=Selangor, NS=Negeri Sembilan, Ml=Melaka, Jh=Johor, Sb=Sabah, Sr=Sarawak.
3. The endemism (E) refers to plants that are endemic to Malaysia which include all states in Peninsular Malaysia, Sabah and Sarawak.