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A PRELIMINARY FLORA SURVEY IN GUNUNG KAJANG, PULAU TIOMAN, PAHANG DARUL MAKMUR, MALAYSIA

MOHD. NORFAIZAL G.*, MASROM, H., OMAR, Y. and AISHAH-FARHANA, S.

**Strategic Resource Research Research Centre,*
Malaysian Agricultural Research and Development Institute (MARDI),
MARDI Headquarters, Persiaran MARDI-UPM, 43400 Serdang, Selangor, Malaysia.
Email: mnfaizal@mardi.gov.my; mohd.n.faizal.ghazalli@gmail.com

ABSTRACT

Gunung Kajang is one of the main area in Pulau Tioman, Pahang Darul Makmur. It is therefore, important to study her ecosystem and documenting various existing biodiversity components for management and conservation purposes. The Management and Utilization of Biological Resources Unit from Strategic Resources Research Centre (SR), MARDI Headquarters was tasked with documenting the rare and wild edible fruit species from the region and collecting the wild genetic resources of plants from this area for conservation purpose. From this survey, 51 families of flowering plants were identified, consists of 131 species, followed by monocotyledons with 11 families and 32 species. On the other hand, gymnosperm was represented by 3 species only, namely *Agathis borneensis*, *Gnetum latifolium* and *Podocarpus polystachus*. There were 26 species of rare and wild edible fruit species that are important for the food security and food sources for the wild animals community here. Many wild fruit species found are not known and are underutilised. Information on their potential health benefits is critical in efforts at promoting these fruits. This paper provides a preliminary checklist of rare and wild fruit trees recorded following a survey carried out from 5 – 10 April 2011.

Key words: Checklist, flora, Gunung Kajang

INTRODUCTION

Forest genetic resources in Malaysia and Asia in particular are now on a rapid decline and in some regions their future looks jeopardized. It is a must to inventorize and record with the aim of conservation of our Malaysian rainforests before it become too late. One of our natural heriage is Pulau Tioman FR. Pulau Tioman is situated in between 02" 43' to 02" 54'N latitude and 104" 07' to 104' 3.5'E longitude in South China Sea and about 32 km southeast of peninsula coast. The flora of Pulau Tioman had been explored by British botanist, H. N. Ridley in 1889 who had collected some specimens at Teluk Nipah on the west coast of Pulau Tioman. Since then, various collectors came to observe and collect the plants on the various parts of the island; Tanjung Duata (Robinson & Burkill, 1915), Teluk Juara (Robinson & Burkill, 1915; Kloss, 19 16. Stone *et al.,* 1974), Gunung Kajang (Henderson, 1927; Kadim & Noor, 1962; Samsuri. 1973; Soepadmo & Lee, 1974). The geology of the Tioman area is dominated by granitoid boulder-beds which give the rocky structures such as exposed granite rocks and thin layer of soil. Exposed boulders are found at several other places along the trail to the summit of Gunung Kajang; highest peak (1030m). A plant survey was carried out in Gunung Kajang Forest Reserve, Pulau Tioman, Pahang Darul Makmur on 5th till 10th April 2011. The site was accessible from Kampung Genting Jetty and turn off to the Gunung Kajang Coastal side area. The first area in this site is dominated by coastal vegetation. While the other areas in Gunung Kajang dominated by rocky and uphill area. Topographically, Pulau Tioman is fairly rugged with very little flat lands which is mainly limited to the coasts, especially around Teluk Juara and Kampung Tekek. Much of other terrains are steeply sloping and there are often many rocky outcrops. Many small streams flow into the sea from the central highland (Latiff, 1999).

* To whom correspondence should be addressed.

MATERIALS AND METHODS

Aims and methods of the study

The main aims of this study were to conduct a plant inventory through general field collections at different times of year, as well as to include records

of earlier herbarium collections of Pulau Tioman flora and to highlight the conservation value of this habitat and the plants it harbours. This will provide baseline data on the flora of Pulau Tioman, specifically in Gunung Kajang (Fig. 1) that can serve as a useful tool for the authorities in-charge of protecting the site to monitor changes pattern to the flora.

Field surveys

Collections were made of fertile vascular plants for herbarium specimens, but also of sterile specimens of major timber trees as vouchers. Plant identification and description were referred to Corner, 1952; Ohash, 1973; Saw, 1997; Stone 1977; Turner 1995; Lee 1971; Henderson 1930 & Latiff *et al.,* 1999. Specimens are deposited in the Malaysian Agricultural Research and Development Institute Herbarium and are recorded in the Agrobiodiversity Information System (AgroBIS) database.

During the field survey, six (6) trails were selected and botanised. They were Trail Durian, Trail Kubong, Trail Batu, Trail Vanilla, Trail Lubuk and Coastal area. Plant listing and collection were also made along the coastal area in Gunung Kajang. Rapid assessment technique; i.e: plant listing based on trail survey was used during the survey to record the species composition and diversity. Standard collecting materials and methods and note taking were used (Bridson and Forman, 1992). Herbarium specimens were collected for plants bearing fertile materials, while vouchers were collected for plants that were not flowering or fruiting. Floristic notes and habitat types were also recorded. All voucher and herbarium collections were lodged at the MARDI herbarium.

The checklist contained vouchers, herbarium records, and sighted records (these are species which were sighted in the sites but not collected and do not have a voucher). Sterile materials known only at the family level are not included in the checklist, while taxa known only to the genus level e.g. *Garcinia, Mangifera* and *Durio* are included.

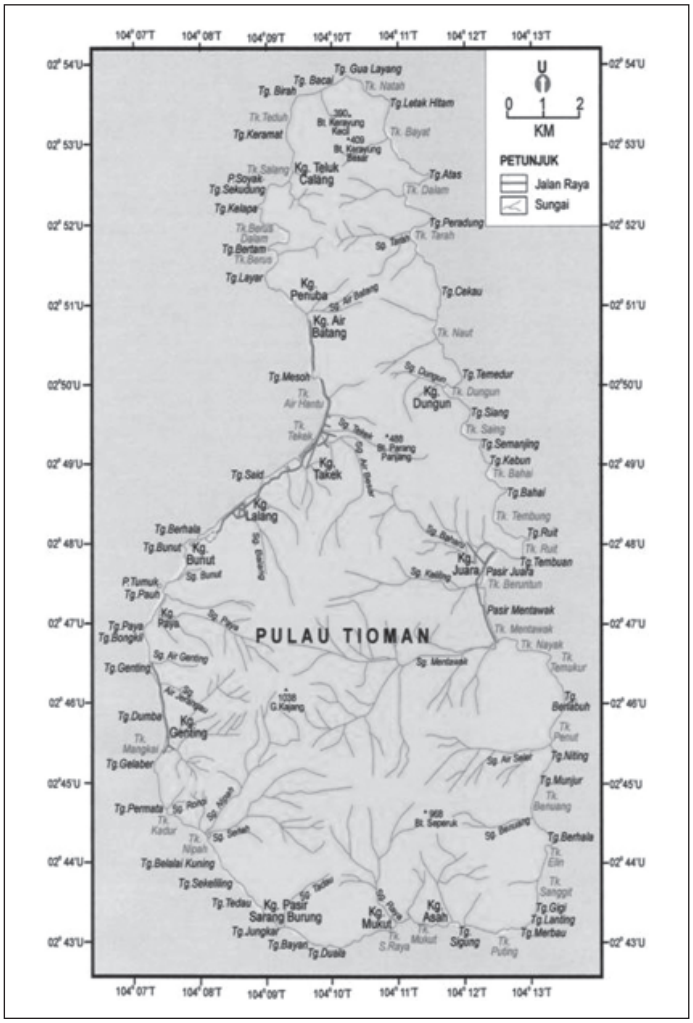

Fig. 1. Map of Pulau Tioman (source: www.ukm.my)

RESULTS AND DISCUSSION

A total of 132 species were observed from all five trails in Kem Saga, Gunung Kajang, Pulau Tioman, Pahang Darul Makmur reflecting a density of 418 trees/trails. Tree communities were dominated by medium sized trees, whereby the highest number of individuals with a total of 282 tree. Table 1 shows the number of individuals observation that obviously decreasing as the DBH class size increase.

Taxonomic composition of the trees reveals a total of 134 genera from 65 families. The Leguminosae is the largest family represented by 14 species from 12 genera. This was followed by the Euphorbiaceae and Rubiaceae with both families represented by 11 and 8 species respectively. It is interesting to note that there are 30 families present five trails in Gunung Kajang base camp that are represented by only one species – Anisophylleaceae, Bombacaeae, Boraginaceae, Cecropiaceae, Compositae,

Table 1: List of species inventorized in 6 trails in Gunung Kajang

Angiospermae: Dicotyledones			
Family	**Species**	**Common name**	**Plant type**
Anacardiaceae	*Buchanania arborescens*	Otak Udang Bulat	Tree
	Mangifera indica	Mangga	Tree (fruiting)
Anisophylleaceae	*Anisophyllea sp.*		Strangler
Annonaceae	*Artabotrys suaveolens*		Strangler & Climber
	Kingstonia nervosa		Tree
	Phaeanthus ophthalamicus		Shrub-treelet
	Polyalthia rumphii	Mempisang	Tree
	Uvaria macrophylla	Larak	Woody climber
	Xylopia ferruginea	Jangkang	Tree
Apocynaceae	*Alstonia angustiloba*	Pulai	Tree
	Dyera costulata	Jelutong	Tree
Araliaceae	*Arthrophyllum diversifolium*		Tree
	Schefflera elliptica		Xerophytic climber
Bombacaceae	*Durio lowianus*	Durian hutan	Tree
Boraginaceae	*Ehretia macrophylla*		Small tree
Burseraceae	*Dacryodes rostrata*	Kedondong kerut	Tree
	Dacryodes rubiginosa		Tree
Cecropiaceae	*Poikilospermum suaveolens*		Epiphytic climber
Combretaceae	*Terminalia catappa*	Ketapang	Tree
	Terminalia phellocarpa	Jelawai	Tree
Compositae	*Vernonia arborea*		Tree
Connaraceae	*Cnestis palala*		Scrambling shrub
Dilleniaceae	*Tetracera scandens*	Mempelas	Strangler
Ebenaceae	*Diospyros cauliflora*	Kayu arang	Tree
	Diospyros lanceifolia	Kayu arang	Tree
Erythroxyllaceae	*Erythroxylum sp.*	Cinta mula	Tree
Euphorbiaceae	*Agrostistachys longifolia*		Shrub-treelet
	Antidesma montanum	Bernai	Tree
	Aporusa benthamiana		Tree
	Baccaurea parviflora	Setambun	Tree
	Blumeodendron sp.		Tree
	Fahrenheitia sp.		Tree
	Macaranga gigantea	Mahang gajah, Kubin	Tree
	Macaranga hypoleuca	Mahang putih	Tree
	Macaranga triloba		Tree
	Phyllanthus sp.		Shrub-treelet
Fagaceae	*Lithocarpus sp.*	Mempening	Tree
Flacourtiaceae	*Flacourtia rukam*	Rokam	Shrub-treelet
Goodeniaceae	*Scaevola sericea*	Ambong-ambong	Shrub-treelet
Guttiferae	*Calophyllum sp.*	Bintangor	Tree
	Cratoxylum sp.	Derum	Tree
	Garcinia eugeniaefolia		Shrub-treelet
	Garcinia penangiana		Tree
	Garcinia sp.		Tree
Icacinaceae	*Stemonurus malaccensis*		Tree
Ixonanthaceae	*Ixonanthes icosandra*	Pagar anak	Tree

Table 1 continue...

Table 1 continued...

Lauraceae	*Cinnamomum porrectum*	Medang serai	Tree
	Cinnamomum sintoc	Medang kemangi	Tree
	Crytocarya kurzii	Medang	Tree
	Litsea castanea	Medang	Tree
	Litsea costalis	Medang	Tree
Lecythidaceae	*Barringtonia macrostachya*	Putat	Tree
Leguminosae	*Archidendron bubalinum*	Kerdas	Tree
	Archidendron clyperia		Tree
	Bauhinia bidentata		Stout woody climber
	Cynometra malaccensis	Kekatong	Tree
	Dalbergia sp.		Stout woody climber
	Derris sp.	Tuba hutan	Woody climber
	Desmodium umbellatum		Shrub-treelet
	Koompassia malaccensis	Kempas	Tree
	Milletia atropurpurea (Callerya)	Tulang daing	Tree
	Milletia sericea		Woody climber
	Ormosia venosa	Saga hutan	Tree
	Pongamia pinnata	Mempari	Tree
	Sindora sp.	Sepetir	Tree
	Sophoro tomentosa	Giring laut	Shrub
Loganiaceae	*Fagraea auriculata*		Shrub-treelet
	Strychnos ignatii		Woody climber
Magnoliaceae	*Talauma candolii*		Shrub-treelet
Malvaceae	*Thespesia populnea*		Tree
Melastomataceae	*Clidemia hirta*	Senduduk bulu	Shrub
	Melastoma malabathricum	Senduduk	Shrub
	Ptenandra echinata	Sial menahun	Tree
Menispermaceae	*Pericampyllus glaucus*		Woody climber
	Tinomiscium petiolare	Akar menkunyit	Stout woody climber
Moraceae	*Artocarpus integer* var. *sylvestris*	Bangkong	Tree
	Artocarpus lowii	Miku	Tree
	Ficus aurantiaca	Akar tengkuk biawak	Climber
	Ficus deltoidea	Mas cotek	Epiphytic shrub
	Ficus fistulosa	Ara lempong	Shrub-treelet
	Ficus hispida		Shrub-treelet
	Ficus globosa		Scrambling shrub
	Ficus grossularioides	Ara perak	Shrub-treelet
	Ficus variegata		Tree
	Streblus elongatus	Tempinis	Tree
Myrsinaceae	*Ardisia crenata*	Mata pelanduk	Shrub
	Ardisia kunstleri		Shrub-treelet
	Ardisia oxyphylla		Shrub-treelet
	Maesa ramentacea		Shrub-treelet
Myrtaceae	*Rhodamnia cinerea*	Mempoyan	Shrub-treelet
	Rhodomyrtus tomentosa	Kemunting	Shrub
	Syzygium acuminatissium		Shrub-treelet
	Syzygium chloranthum		Tree
	Syzygium grandis	Kelat jambu	Tree
	Syzygium griffithii		Tree
	Syzygium polyanthum	Serai kayu	Tree
Ochnaceae	*Campylospermum serratum*	Mata ketam	Shrub-treelet
	Brackenridgea hookeri	Mata ketam	Tree
Opiliaceae	*Champereia manillana*	Cemperai	Shrub-treelet
Pandaceae	*Galleria fulva*		Shrub-treelet
	Microdesmis caseariifolia		Shrub-treelet
Piperaceae	*Piper sp.*	Sireh hutan	Creeper
Polygalaceae	*Xanthophyllum eurhynchum*	Minyak beruk	Tree
	Xanthophyllum stipitatum	Minyak beruk	Tree
Rhizophoraceae	*Gynotroches axillaris*	Mata keli	Tree
Rubiaceae	*Aidia densiflora*		Tree
	Ixora congesta	Siantan malaya/hutan	Shrub-treelet
	Ixora grandifolia	Siantan	Shrub-treelet
	Ixora javanica var. javanica	Siantan	Shrub-treelet
	Ixora lobbii	Siantan	Shrub-treelet
	Psychotria sp.		Shrub-treelet
	Timonius wallichianus		Tree
	Uncaria sp.	Kekait	Stout woody climber

Table 1 continue...

Table 1 continued...

Rutaceae	*Glycosmis chlorosperma*		Shrub-treelet
	Paramigyna lobata		Strangler
Sapindaceae	*Guioa pleurotis*		Shrub-treelet
	Xerospermum noronhianum	Rambutan pacat	Tree
Sapotaceae	*Manilkara achras*	Ciku	Tree
	Palaquium sp.	Nyatoh	Tree
	Palaquium malaccensis	Nyatoh nangka kuning	Tree
Simaroubaceae	*Eurycoma longifolia*	Tongkat ali	Tree
Sterculiaceae	*Scaphium macropodum*	Kembang semangkuk	Tree
	Sterculia parvifolia	Kelumpang	Tree
Theaceae	*Adinandra dumosa*	Tiup-tiup	Tree
Tiliaceae	*Schoutenia accrescens*	Bayur bukit	Tree
Ulmaceae	*Gironniera nervosa*	Hampas tebu	Tree
Verbenaceae	*Vitex pinnata*	Leban	Tree
	Vitex vestita	Leban	Tree
Violaceae	*Rinorea anguifera*		Shrub-treelet
Vitaceae	*Cissus sp.*		Climber
	Nothocissus spicifera		Climber
	Tetrastigma pedunculare		Stout woody climber
ANGIOSPERMAE: MONOCOTYLEDONES			
Araceae	*Aglaonema nitidum*		Herb
	Alocasia denudata	Keladi candek	Herb
	Amydrium medium		Creeper
	Epipremnum giganteum		Climber
	Homalomena propinqua	Kelemoyang	Herb
	Schismatoglottis calyptrata		Herb
	Scindapsus sp.		Creeper
Dioscoreaceae	*Dioscorea bulbifera*		Climber
	Dioscorea hispida	Ubi gadung	Climber
Dracaenaceae	*Dracaena elliptica*	Pandan serani	Shrub-treelet
	Dracaena fragrans		Tree
	Dracaena surculosa		Shrub-treelet
	Dracaena sp.		Shrub-treelet
Flagellariaceae	*Flagellaria indica*	Rotan dini	Climber
Hypoxidaceae	*Molineria latifolia*	Lemba	Herb
Maranthaceae	*Donax grandis*	Bemban	Woody stem herb
Orchidaceae	*Agrostophyllum hullettii*		Herb
	Bulbophyllum sp.		Herb
	Ludisia bicolor	Jewel Orchid	Herb
	Vanilla griffithii	Wild vanilla	Climber
Palmae	*Arenga westerhoutii*	Langkap	Tree
	Calamus sp.	Rotan	Climber
	Caryota mitis	Tukas, Fishtail palm	Tree
	Cocos nucifera	Kelapa	Tree
	Eleiodoxa conferta	Kelubi	Stemless large herb
	Eugeissona tristis	Bertam	Stemless large herb
	Korthalsia sp.	Rotan	Climber
	Oncosperma horridum	Bayas	Tree
Pandanaceae	*Pandanus tectorius*	Pandan mengkuang	Tree
	Pandanus sp.		Stemless herb
Phormiaceae	*Dianella ensifolia*	Siak-siak	Herb
Taccaceae	*Tacca integrifolia*	Keladi murai, Belimbing tanah	Herb
GYMNOSPERMAE			
Araucariaceae	*Agathis borneensis*	Damar minyak	Tree
Gnetaceae	*Gnetum latifolium*	Belinjau akar	Stout woody climber
Podocarpaceae	*Podocarpus polystachyus*	Podo laut	Tree

Dilleniaceae, Erythroxyllaceae, Fagaceae, Flacourtiaceae, Goodeniaceae, Opiliaceae, Piperaceae, Rhizophoraceae, Simaroubaceae, Theaceae, Tiliaceae, Ulmaceae, Violaceae, Ixonanthaceae, Lechytidaceae, Magnoliaceae, Malvaceae, Flagellariaceae, Hypoxidaceae, Maranthaceae, Phormiaceae, Taccaceae, Araucariaceae, Gnetaceae and Podocarpaceae.

From this survey, there were 26 species of rare and wild edible fruit species that are important for

Plate 1: Fruits of *Barringtonia macrostachys*

Plate 2: *Scaevola sericea*

Plate 3: *Dioscorea hispida*

Plate 4: *Vanilla* sp.

Plate 5: Fruits of *Gnetum latifolium*

Plate 6: *Tacca integrifolia*

Plate 7: *Garcinia* spp.

the food security and food sources for the wild animals community here. The important species observed in this area are showed in Plate 1-7 (*Barringtonia macrostachya, Scaevola sericea, Dioscorea hispida*, *Vanilla* sp., *Gnetum latifolium, Tacca integrifolia* and *Garcinia* spp.). The species are *Mangifera indica, Buchanania arborescens, Uvaria macrophylla, Durio lowianus, Baccaurea parviflora, Phyllanthus sp., Flacourtia rukam, Garcinia eugeniaefolia, Syzygium griffithii, Syzygium polyanthum, Xerospermum noronhianum, Manilkara achras, Scaphium macropodum, Garcinia penangiana, Garcinia* sp., *Barringtonia macrostachya, Archidendron bubalinum, Archidendron clyperia, Artocarpus integer* var. *sylvestris, Artocarpus lowii, Ficus grassulariodes, Ardisia crenata, Ardisia kuntsleri, Ardisia oxyphylla, Cocos nucifera,* and *Gnetum latifolium.*

CONCLUSIONS

Pulau Tioman including their neighbouring islands are sparsely populated. Most of the natural forest communities and habitats, especially those in the interior of the island were left intact. Therefore the best possible use of the island is to leave the natural habitats in the present condition and efforts should be taken to develop more ecotourism activities, with more emphasise and constructive efforts for conservation of her natural habitats as well as ecosystem services.

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