

Tree Taxa Inventory at Ayer Hitam Forest Base-Camp

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Keywords: Base-camp, tree species, endemic, education, Ayer Hitam

ABSTRAK

Inventori yang dijalankan di sekitar kawasan perkhemahan melalui 6 denai baru mendapati 86 spesies pokok tumbuhan berbiji yang terkandung di dalam 68 genera dan 32 famili. Daripada jumlah tersebut 22 merupakan spesies balak, 9 spesies buah-buahan, 3 spesies ubat-ubatan dan 8 spesies pokok yang mengeluarkan bahan pencelup dan tanin. Daripada kesemua takson ini sebanyak 6 spesies yang endemik kepada Semenanjung Malaysia juga terdapat di kawasan ini; dua daripadanya adalah rekod baru bagi Negeri Selangor. Kawasan tapak perkhemahan ini sesuai dijadikan kawasan pembelajaran dan latihan amali bagi kursus-kursus berkaitan perhutanan dan alam sekitar.

ABSTRACT

An inventory at the base camp along 6 new trails recorded a total of 86 species of seed plant taxa in 68 genera and 32 families. Of this number 22 timber species, 9 fruit tree species, 3 species with medicinal values and 8 species producing dye and tannins were identified. 6 Peninsular Malaysian endemics are also found here, two being new records for Selangor. This area is useful for teaching and practical training for forestry related and environmental courses.

INTRODUCTION

Ayer Hitam Forest Reserve, which is located within the Multimedia Super Corridor that connects Kuala Lumpur with the new administrative city of Putrajaya and business city of Cyberjaya plays a major role in teaching, research and extension works for Universiti Putra Malaysia. It is a support facility of the university for studies in forest management, recreation, botany, wildlife and other related fields. Besides being used for various educational purposes, this forest also offers research opportunities for scientists interested in working on tropical lowland forest ecosystems (Awang Noor *et al.* 1999).

At least 60 different studies have been carried out since 1996 when the Selangor State Government leased this forest to UPM for 80 years and the Faculty of Forestry is entrusted to manage. A few related aspects of plant diversity studies in this forest have been discussed in Faridah Hanum and Nurulhuda Hamzah (1999), Faridah Hanum (1999) and Faridah Hanum and Zamri Rosli (2000).

In this paper, an assessment on the suitability of the Ayer Hitam Forest base camp area for teaching forest related courses and environment in the university and its vicinity will be discussed. The base camp was established in 1996 in Compartment 15 at the entrance of the forest fringing a new housing estate. This compartment covers an area of 200 ha with slopes up to 10%.

METHODOLOGY

6 trails namely A, B, C, D, E and F were identified based on easy accessibility from the base camp area (Figure 1). All trees greater than 5 cm at diameter breast height were aluminum tagged systematically and identified along these trails. Fertile specimens were collected and deposited at the Herbarium, Faculty of Forestry, Universiti Putra Malaysia.

RESULTS AND DISCUSSION

Eighty-six species of tree taxa in 68 genera and 32 families were recorded from the base camp area. The most diverse families in terms of spe-

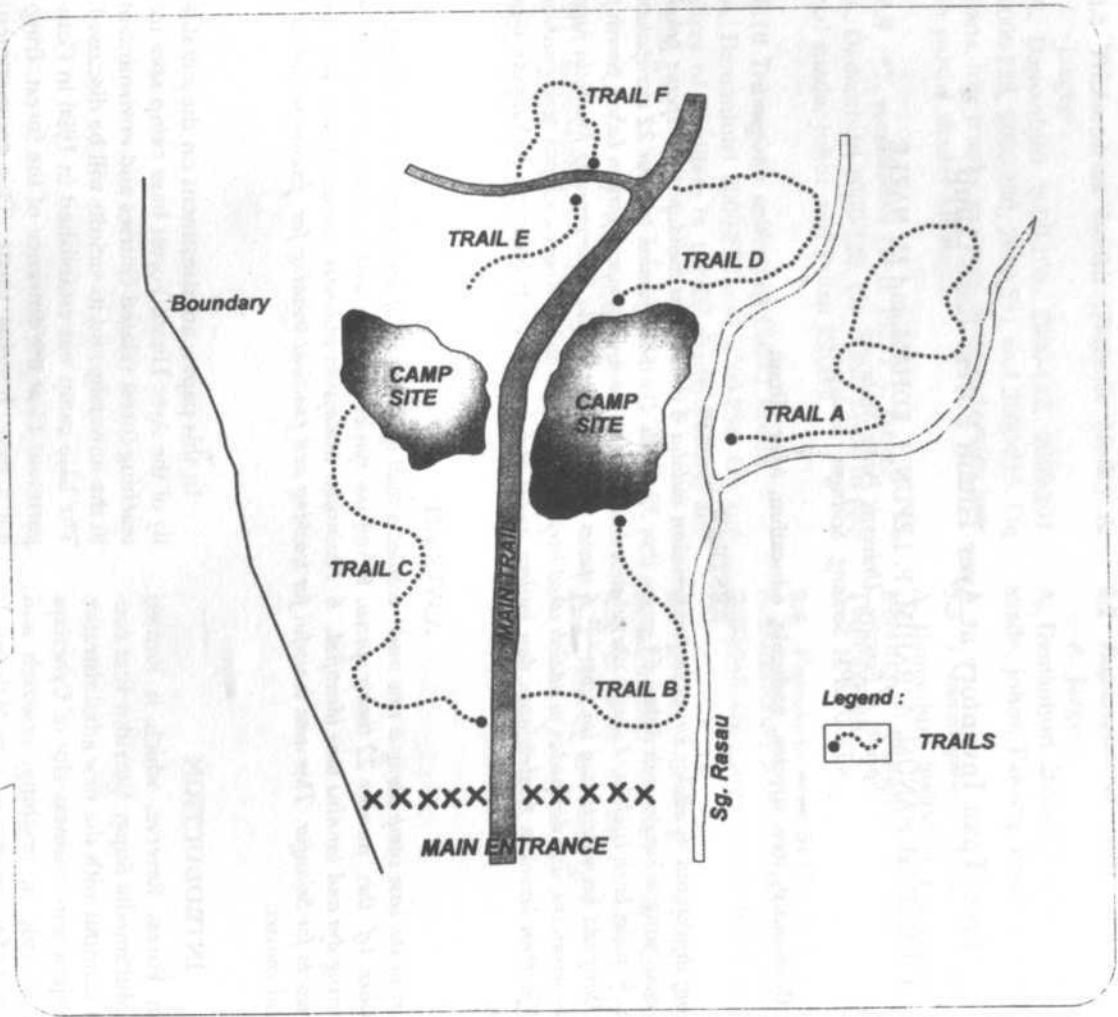
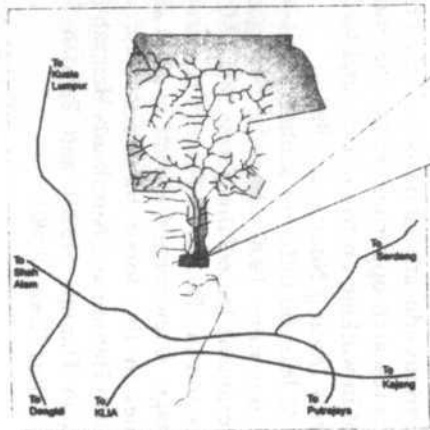


Fig. 1: Location of trails at Ayer Hitam Forest Reserve base camp

cies are Anacardiaceae (7 spp.), Euphorbiaceae (7 spp.) and Myristicaceae (7 spp.). (Table 1). Twenty two species from the total number of species identified in this area are classified as major commercial timbers included in 18 genera and 12 families as categorized by Soerianegara and Lemmens (1994) (Table 1). This constitutes about one-sixth of the total number of known timber species existing in this forest (Faridah Hanum 1999). Nine tree species recorded are edible fruit trees (Verheij and Coronel 1992), viz., Anacardiaceae (1 species), Burseraceae (2 species), Euphorbiaceae (2 species), Meliaceae (1 species) and Sapindaceae (2 species). These wild species were seen eaten by birds and small mammals during the inventory (Table 1).

Tree species with medicinal properties are *Calophyllum rubiginosum*, *Endospermum diadenum*, *Scaphium macropodum* and *Shorea leprosula* (Jansen *et al.* 1991). Details on the composition and uses of medicinal plants of this forest were discussed at length in Faridah Hanum and Nurulhuda Hamzah (1999). Besides timber, edible fruit and medicinal trees, this area houses a number of ethnobotanically useful species for tannins and dyes as a secondary product. 8 taxa were recorded to produce tannin and dye (Lemmens and Soetjipto 1992) (Table 1). Besides producing a dye, *Garcinia cowa* is also a vegetable (Lemmens and Soetjipto 1992).

TABLE 1
List of species at Ayer Hitam Forest Reserve base camp

Family	Scientific name	Uses	Remarks
Anacardiaceae	<i>Bouea macrophylla</i> Griff.	EF	
	<i>Bouea oppositifolia</i> (Roxb.) Meisn.	T	
	<i>Buchanania sessifolia</i> Blume		
	<i>Camposperma squamatum</i> Ridl.	T	
	<i>Gluta malayana</i> (Corner) Ding Hou		
	<i>Gluta torquata</i> (King) Tardieu		
	<i>Melanochyla fulvinervis</i> (Blume) Ding Hou		
Annonaceae	<i>Monocarpia marginalis</i> (Scheff.) J. Sinclair		
	<i>Polyalthia rumphii</i> (Blume) Merr.		
	<i>Xylopia fusca</i> Maingay <i>ex</i> Hook. <i>f</i> & Thomson var. <i>sessiliflora</i> Kochummen & Whitmore	Endemic	New record for Selangor. Previously recorded from Kedah, Negeri Sembilan and Johor only.
Apocynaceae	<i>Dyera costulata</i> (Miq.) Hook. <i>f</i> .		
Burseraceae	<i>Canarium littorale</i> Blume	EF	
	<i>Canarium pseudosumatranum</i> Leenh.	EF	Endemic
	<i>Dacryodes rugosa</i> (Blume) H.J.Lam		
	<i>Scutinanthe brunnea</i> Thwaites		
Dilleniaceae	<i>Dillenia obovata</i> (Blume) Hoogl.		
Dipterocarpaceae	<i>Shorea leprosula</i> Miq.	T,M,t	
	<i>Shorea macroptera</i> Dyer.	T	
	<i>Shorea parvifolia</i> Dyer ssp. <i>velutina</i> P.S. Ashton	T	
	<i>Shorea platycarpa</i> F. Heim	T	
	<i>Vatica cuspidata</i> (Ridl.) Symington	T	Endemic
Ebenaceae	<i>Diospyros buxifolia</i> (Blume) Hiern		
	<i>Diospyros sumatrana</i> Miq.		

TABLE 1 (Continued)

Elaeocarpaceae	<i>Elaeocarpus nitidus</i>		Endemic : New record for Selangor. Previously recorded from Terengganu, Perak and Pahang only
Euphorbiaceae	<i>Antidesma cuspidatum</i> Mull. Arg.		
	<i>Baccaurea javanica</i> (Blume) Mull. Arg.	d	
	<i>Elaterospermum tapos</i> Blume	EF	
	<i>Endospermum diadenum</i> (Miq.) Airy Shaw	T,M	
	<i>Macaranga gigantea</i> (Rchb.f & Zoll.) Mull. Arg.	d,t	
	<i>Macaranga triloba</i> (Blume) Mull. Arg.		
	<i>Sapium baccatum</i> Roxb.	EF	
Fagaceae	<i>Lithocarpus rassa</i> (Miq.) Rehder		
Guttiferae	<i>Calophyllum rubiginosum</i> M.R. Hend. & Wyatt-Sm.	T,M	
	<i>Cratogeomum arborescens</i> (Vahl) Blume	T	
	<i>Garcinia cowa</i> Roxb.	d,v	
	<i>Mesua ferrea</i> L.	T,d	
Irvingiaceae	<i>Irvingia malayana</i> Oliv. ex Benn.		
Ixonanthaceae	<i>Ixonanthes icosandra</i> Jack		
Lauraceae	<i>Cinnamomum iners</i> Reinw. <i>Litsea grandis</i> (Wall. ex Nees) Hook.f.		
Lecythidaceae	<i>Barringtonia macrostachya</i> (Jack) Kurz	Rare	
Leguminosae	<i>Adenanthera malayana</i> Kosterm.		
	<i>Adenanthera pavonina</i> L.	T	
	<i>Callerya atropurpurea</i> (Wall.) Schot		
	<i>Koompassia malaccensis</i> Maing. ex Benth	T	
	<i>Parkia speciosa</i> Hassk.	EF	
Melastomataceae	<i>Pternandra echinata</i> Jack		
Meliaceae	<i>Aglaia malaccensis</i> (Ridl.) Pannell <i>Sandoricum koetjape</i> (Barn.f.) Merr.	EF,d	
Moraceae	<i>Artocarpus dadah</i> Miq. <i>Artocarpus elasticus</i> Reinw. ex Blume <i>Artocarpus lanceifolius</i> Roxb. <i>Ficus benjamina</i> L. <i>Ficus oligodon</i> Miq. <i>Streblus elongatus</i> (Miq.) Corner	T T	
Myristicaceae	<i>Gymnacranthera farquhariana</i> (Hook.f. & Thomson) Warb. <i>Horsfieldia polysphelura</i> (Hook.f.) J. Sinclair <i>Knema furfuracea</i> (Hook.f. & Thomson) Warb. <i>Knema intermedia</i> (Blume) Warb <i>Knema patentinervia</i> (J. Sinclair) W.J. de Wilde <i>Knema scortechinii</i> (King) J. Sinclair <i>Myristica iners</i> Blume		

TREE TAXA INVENTORY AT AYER HITAM FOREST BASE-CAMP

TABLE 1 (Continued)

Myrtaceae	<i>Rhodamnia cinerea</i> Jack <i>Syzygium papillosum</i> (Duthie) Merr. & L. Perry <i>Tristaniopsis whiteana</i> (Griff.) Peter G. Wilson & J. T. Waterh.	T,d,t	
Olacaceae	<i>Ochanostachys amentacea</i> Mast. <i>Strombosia javanica</i> Blume	T	
Rhizophoraceae	<i>Carallia brachiata</i> (Lour.) Merr. <i>Pellacalyx axillaris</i> Korth.		
Rubiaceae	<i>Nauclea officinalis</i> (Pierre ex Pit) Merr. & Chun <i>Pertusadina malaccensis</i> Ridsdale <i>Porterandia anisophyllea</i> (Jack ex Roxb.) Ridl. <i>Timonius wallichianus</i> (Korth.) Valetton		
Rutaceae	<i>Melicope glabra</i> (Blume) T.G. Hartley		
Sapindaceae	<i>Nephelium lappaceum</i> L. var. <i>lappaceum</i> <i>Nephelium maingayi</i> Hiern <i>Xerospermum noronhianum</i> (Blume) Blume	EF EF	
Sapotaceae	<i>Palaquium gutta</i> (Hook.f.) Baill. <i>Palaquium maingayi</i> (C.B. Clarke) King & Gamble <i>Pouteria malaccensis</i> (C.B. Clarke) Baehni	T T T	Endemic : Kedah, Kelantan, Perak, Pahang, Selangor, Negeri Sembilan, Melaka, Johor
Sterculiaceae	<i>Scaphium macropodum</i> (Miq.) Beumee ex Heyne	T,M	
Thymelaeaceae	<i>Aquilaria malaccensis</i> Lam <i>Gonystylus affinis</i> Radlk.	T	
Tiliaceae	<i>Microcos antidesmifolia</i> (King) Burret		
Ulmaceae	<i>Girroniera nervosa</i> Planch		
Verbenaceae	<i>Vitex pinnata</i> L.	T,d	

Note : T = timber
M = medicine
EF = edible fruit
t = tannin
d = dye
v = vegetable

Noteworthy trees around the Ayer Hitam Forest base camp include the endemic taxa in Peninsular Malaysia such as *Canarium pseudosumatranum*, *Elaeocarpus nitidus*, *Xylopius fusca* var. *sessiliflora*, *Palaquium maingayi* and *Vatica cuspidata*, the latter two being recorded for the first time in Selangor (Turner 1995). This area contains nearly half the total number of tree families, nearly one-third the total number of genera and one-quarter the total number of

known taxa enumerated from this forest previously (Table 2).

CONCLUSION

Due to a good representation of taxa over a small area, the base-camp area is suitable for conducting forestry related courses and practicals in the university and its immediate vicinity. Caution though on areas having rare and endemic species as they are potentially at the highest risk

TABLE 2
Comparison of the total number of tree taxa in
Ayer Hitam Forest

Source	No. family	No. genus	No. species
Faridah Hanum (1999)	56	160	400
Present enumeration	32	68	86

of endangerment when not adequately represented and unprotected as is the case with the Ayer Hitam Forest. Should this forest be opened to the public in the future, all trails except one which houses the rare and endemic species can be used as interpretation trails exhaustively. Since species have a critical minimum population size and range for optimal existence, very small residual populations of the rare and endemic taxa in this forest maybe unlikely to persist (Simberloff 1992). This is further aggravated by the edge effects which may include invasion and modification of the species composition by the more common species abundant just outside this forest.

ACKNOWLEDGEMENT

This study was carried out with funding from IRPA 08-02-04-0089 for which the authors are grateful. We would also like to thank En. Mohamad Talib and Erak for the assistance rendered in preparing the trails.

REFERENCES

AWANG NOOR ABD. GHANI, MOHD SHAHWAHID HAJI OTHMAN, RUSLI MOHD., SHUKRI MOHD., I. FARIDAH HANUM and MOHAMED ZAKARIA. 1999. Economic valuation of forest goods and services of Ayer Hitam Forest, Puchong, Selangor. *Pertanika Journal of Tropical Agricultural Science* 22(2): 147-160.

FARIDAH HANUM, I. and NURULHUDA HAMZAH. 1999. Composition and uses of medicinal plants of Ayer Hitam Forest, Selangor, Peninsular Malaysia. *Pertanika Journal of Tropical Agricultural Science* 22(2): 85-94.

FARIDAH HANUM, I. 1999. Plant diversity and conservation value of Ayer Hitam Forest, Selangor, Peninsular Malaysia. *Pertanika Journal of Tropical Agricultural Science* 22(2): 73 - 83.

FARIDAH HANUM, I. and ZAMRI ROSLI. 2000. Species composition of Ayer Hitam Forest Reserve, Puchong Selangor. In *Proceedings of the Langat Basin Research Symposium*, ed. Mohd. Nordin Hj. Hassan, p. 239 - 244. UKM.

JANSEN, P.C.M., R.H.M.J. LEMMENS, L.P.A. OYEN, J.S. SIEMOONSMA, F.M. STAVAST and J.L.C.H. VAN VALKENBURG (Eds.). 1991. *Plant Resources of South-East Asia. Basic List of Species and Commodity grouping*. 372 p. Wageningen: Pudoc.

LEMMENS, R. H. M. J. and N.W. SOETJIPTO (Eds.). 1992. *Plant Resources of South-East Asia. Dye and Tannin-producing Plants*. 195 p. Bogor, Indonesia.

SIMBERLOFF, D. 1992. Species - area relationships, fragmentation and extinction in tropical forests. In *Proc. Intern. Conf. Tropical Biodiversity in Harmony With Nature*. ed. S.K. Yap and S.W. Lee. p. 398-413. MNS.

SOERIANEGARA, I. and R.H.M.J. LEMMENS (Eds.). 1994. *Plants Resources of South-East Asia. Timbertress No. 5(1) Major Commercial Timbers*. 605 p. Leiden: Backhuys Publisher.

TURNER, I. M. 1995. A catalogue of the vascular plants of Malaya. *The Gardens' Bulletin Singapore* 47(1): 1 - 346.

VERHEIJ, E. W. M. and R. E. CORONEL (Eds.). 1992. *Plant Resources of South-East Asia No. 2 Edible Fruits and Nuts*. 446 p. Wageningen: Pudoc.