(1976) hypothesised that decayed heartwood of tropical trees was of an adaptive trait to provide a source of mineral supply to the trees.

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RESEARCH NOTE ON SOME PHYSICAL AND MECHANICAL PROPERTIES OF *MACARANGA HOSEI*

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Macaranga (family Euphorbiaceae) is a genus of small to medium sized trees found in the Old World tropics, from west Africa to Fiji, but strongly centred in Malesia. The species are common pioneers, and are among the earliest plants to succeed when the forests are opened extensively. The *Macaranga* are common along logging tracks, clear felled areas or on burnt sites. However, some of the species do occur as relatively big trees in peat swamp and lowland dipterocarp forests. Although *Macaranga* are common, they have not been extensively exploited as timbers in the past, because they are comparatively soft timbers. Nevertheless, with the increasing diversification in the use of tropical timbers, this common tree has a potential. Furthermore, it is a vast resource.

The timber of *Macaranga* has not been examined extensively for its physical and mechanical properties. An opportunity presented itself when a *Macaranga hosei* from the peat swamp at Ulu Langat, Banting, Selangor, Peninsular Malaysia, was felled for comparative tests on fungicides (Muller-Lindenhof 1988). The tree had an overall height of 24 *m*, and a dbh of 31 *cm*. The straight, oval bole was branch-free up to 7 *m*. The age could not be determined.

One hundred and twenty samples were randomly taken and tested according to ISO 3130 (1975) for moisture content. The green density was also assessed. Thirty samples were tested for Modulus of Elasticity (MOE), Modulus of Rupture (MOR), Compression || and Janka Hardness (radial as well as tangential) according to ASTM 143-1973.

The results for density green, density oven dry and initial moisture content (mc) are given in Table 1.

Table 1. Density green, density oven dry and initial moisture content (mc) of *Macaranga hosei*

	Min.	$\bar{x}$	Max.	V%
Density green (*g cm*^{3}) mg/vg	0.52	0.618	0.7	4.9
Specific gravity (mo/v green)	0.26	0.288	0.33	5.4
MC (%)	96	115	137	7.0

The mechanical properties were assessed at an mc of 19.2.....20...21.4%. The results are shown in Table 2.

Table 2. Mechanical properties of *Macaranga hosei*

		Min.	$\bar{x}$	Max.	V%
Specific gravity at test		0.271	0.29	0.337	6.9
MOR (*N mm*^{2})		34.8	41.8	52.6	10.8
MOE (*N mm*^{2})		4170	4940	5860	8.9
Comp ll (*N mm*^{2})		15.8	18.6	22	8.1
Hardness	rad (*N*)	950	1380	2190	17.7
	tan (*N*)	1052	1440	2300	19.3

The specific gravity lies within the range for Malaysian *Macaranga* quoted by Wong (1982): converted from *kg m*^{3} for *Macaranga* species in Malaysia with 0.24 to 0.442 *g cm*^{3} as well as for *Macaranga hosei* - 0.324....0.343. Wong (1980) assessed for *Macaranga gigantea* 0.252 *g cm*^{3}, and for *Macaranga populifolia* 0.382 *g cm*^{3}. However, the results for specific gravity as well as for mechanical properties of the conditioned samples are below those assessed by Kusuma *et al.* (1985) for *Macaranga triloba* from east Kalimantan, Indonesia (basic density 0.35 *g cm*^{3}; MOR 53.4 *N cm*^{2}; MOE 6780 *N cm*^{2}; Comp || 25 *N cm*^{2}). The different results could be attributed to differences in species, age or site of sample.

Both density and mechanical properties are rather low compared to other white timbers like ramin (*Gonystylus bancanus*, basic density: 0.53 - 0.78 *g cm*^{3}, MOE: 12000 - 16400 *N cm*^{2}, MOR: 88 - 73 *N cm*^{2}). Thus, uses for construction or furniture are out of question. However, *Macaranga* is known to be used for matches, and it could be used for one way material, example packing. With the imminent shortage of ramin, it might be worthwhile to assess *Macaranga*'s moulding properties.

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