

AESTHETICALLY PLEASING FURNITURES FROM *MAESOPSIS EMINII*

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INTRODUCTION

The species *Maesopsis eminii* belongs to the family Rhamnaceae. It is also known as Manasti, Masira, Muguruka, Muhongera, Muhumula, Muhunya and Musizi. It originated from Africa (Angola, Cameroon, Gabon, Ghana, Ivory Coast, Kenya, Liberia, Nigeria, Sudan, Tanzania, Togo, Uganda, Zaire), and the species is reported to be distributed in the Western, Central, and Eastern Africa; it is also found along the equator. It is typically found at the edge of forests. The species has also been successfully cultivated on plantations in Zaire and Uganda (Anon 2017). In West and Central Africa, *M. eminii* can reach a height of 27 to 37 m with a trunk diameter of 120 to 180 cm. It develops short and blunt buttresses or root canals, and boles are usually straight and free of branches to about 18 m. The size of the tree is reported to decrease from east to west across the range of the species. Trees growing in Nigeria are reported to be rather small in size and rarely reach a height of 15 m (S. Ani & H. Aminah 2006).

The species grows best in temperatures ranging from 22 to 37 °C, and it prefers a mean annual rainfall of 1200–1300 mm. It tolerates a dry season of up to two months and grows best on deep fertile soils (Sandrasegaran. 1966). The good growth rate of *M. eminii* has been obtained on alluvial and sedimentary granite derived soils. However, it can tolerate a wide range of soils from medium to light and from neutral to very acidic soils, but it does not tolerate waterlogged soils. It yields relatively well on poor soils and can play a role in the reclamation of degraded land. Seeds are available when trees start to fruit from about five years of age (Sandrasegaran 1966).

This tree was introduced in Forest Research Institute Malaysia (FRIM) in 1952 with seeds obtained from Bogor, Indonesia for reforestation trial (Sandrasegaran 1966). There are more than 4000 *M. eminii* trees planted from year 1952 to 1957 at various spacings in FRIM (Selvaraj & Muhammad 1980). In this project, our aim is to produce a finished product by using *Measopsis eminii* tree. The material for the project was obtained from felled *M. eminii* trees at Field 31, FRIM. The trees were at least 40 years old and have an average height of 20 m and 50 cm in dbh.

The logs of *M. eminii* were then processed into sawn timber by FRIM's Sawmill Unit. A total of 68 pieces of *M. eminii* sawn timber (width of 15 cm to 48 cm, length of 1.5 m to 4.4 m) were obtained after recovery process. The Saw-Dry-Rip (SDR) process was followed to maintain the unique feature of the bark. The slabs were dried by using forced-air circulation for 6 months.



Figure 1 *Maesopsis eminii* (Photo taken at Field 31, FRIM on 3th August 2017) copyright Zahidah



Figure 2 Leaves of *Maesopsis eminii* (Photo Taken at Field 31, FRIM on 3th August 2017) copyright Zahidah



Figure 3 Fruit of *Maesopsis eminii* (Source: Wikimedia commons 29 March 2013)

GENERAL CHARACTERISTICS, PROPERTIES, DURABILITY AND USES

General characteristics, anatomical, mechanical, wood working and drying properties, durability and the uses of *Maesopsis eminii* are presented below.

Table 1 General characteristics

Parameter	Description
Timber classification	Light Hardwood ^a
Sapwood Colour	White ^a
Heartwood Colour	Yellowish in color when freshly cut, darkening to golden brown or dark brown after exposure. ^a
Grain	Interlocked grain but generate a clear figure on quarter-sawn surfaces. ^a
Wood Texture	Moderately coarse and even. ^a
Wood Luster	Satin-like luster. ^b
Odour	There is no characteristic odour or taste. ^b
Movement in service	The tree is prone to split during felling and in storage. The dried timber is dimensionally stable, and retains its shape well after manufacture. ^b

Source: (S. Ani & H. Aminah. 2006^a) and Zairul pers. comm.2017^b

Table 2 Anatomical properties

Parameter	Description
Vessel	Vessels are mostly solitary and in radial multiples of two with simple perforation, moderately small to large, generally moderately few.
Wood parenchyma	Wood parenchyma moderately abundant, paratracheal tending to aliform, incomplete vasicentric.
Rays	Rays are of two distinct sizes. Fibres are non-septate. Prismatic crystals in chambered axial parenchyma strands. Silica absent. Ripple marks and intercellular canals absent.

Source: Nordahlia pers. comm.2017

Table 3 Mechanical properties

Mechanical properties	Green		Dry	
	FRIM	Other source *	FRIM	Other source*
Density (kg/m ³)	1,075	-	465	-
Moisture content (%)	169	-	13.6	-
Modulus of elasticity (MOE) (Mpa)	7400	6150	7900	9160
Modulus of rupture (MOR) (Mpa)	48	22	68	39
Compression (Mpa)	21	-	34.1	-
Specific Gravity	0.40	0.41	0.41	-

Source: (Lee et al. 1979) and Anon.2017*

Table 4 Wood working properties

Parameter	Description
Cutting Resistance	Easy to saw.
Planing	Plane to a smooth finish.
Boring	The wood is easy to bore. It is recommended that the timber be supported during boring to prevent chipping out at the exit.
Routing and Recessing	The wood is easy to route and recess.
Mortising	It is recommended that the timber be supported during mortising to prevent chipping out at the exit.
Gluing	Gluing characteristics are rated as good.
Nailing	Nail holding properties are satisfactory. The wood nails well without splitting.
Screwing	Screwing and screw-holding qualities are good.
Sanding	It yields a smooth finish.
Finishing	The material is easy to be finished by Alkyd/Urea (AC) and Nitro-cellulose (NC) coating due to its soft texture.

Source: Roslee pers. comm. 2017

DRYING PROPERTIES

For practicality the specimens for making furniture in this project was simply dried using forced-air circulation under constant elevated temperature range of 50 °C to 60 °C.

DURABILITY

The wood for this project was not tested for durability, but according to Fauzi et al. (2015), they found that *M. eminii* possessed heartwood that was having low resistance to decay and was readily attacked by termites, marine borers, and decay fungi. Both hardwood and sapwood were rated as poorly resistant (natural durability class 4) against subterranean termite named *Coptotermes curvignathus*.

M. eminii is difficult to treat because it is resistant to impregnation and more even absorption is reported to be obtained with waterborne preservatives than with creosote. An extended pressure treatment has been suggested (woodworkersource.com). However, the wood for this project did not undergo any treatment to prevent the furniture users from being exposed to toxic elements.

USES

The timber of *M. eminii* is suitable for general utilities such as stair, boxes and crates, furniture components, plywood, decorative veneer, general moulding, parquet flooring, pulp and paper product, and utility furniture.

Examples of table, bench & shoe rack products are illustrated in Figure 4, 5, 6, 7 & 8.



Figure 4 Table made from *M. eminii* slabs (1200 mm × 2440 mm × 500 mm) Copyright Asmar, FRIM



Figure 5 Perspective view of the table



Figure 6 Wooden bench (1800 mm length)



Figure 7 Wavy feature



Figure 8 Shoe rack (600 mm × 380 mm × 1150 mm)

CONCLUSION

Maesopsis eminii has been found to be a carpenter-friendly species. Even though it is a light hardwood with non-durable properties, the attractive wavy grain feature can prove to be an aesthetical asset in furniture making.

ACKNOWLEDGEMENT

This publication would not have been possible without the involvement of many parties. The authors wish to express their sincere gratitude and appreciation to Dr Woon Weng Chuen, Head of Flagship Commercialization Project and Mr Choo Kheng Ten, FRIM fellow, for their support and guidance. The appreciation is also extended to all staff of the following units: Eco-tourism and Urban Forestry Unit, Wood Processing Workshop, Machining and Prototype Workshop, Wood Anatomy Laboratory and Multimedia Unit for their cooperation and commitment in this project.

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Maesopsis eminii is an exotic species originated from the African continent, and it was planted in FRIM in 1952. But by now due to the numerous quantities of fallen dead trees and trees marked for removal, an effort was made to produce functional art pieces out of these salvaged trees. Thus, a fallen *Maesopsis eminii* tree was chosen as a material for this project. The tree was obtained from Field 31, FRIM. It was processed by using Saw-Dry-Rip (SDR) method to maintain the unique feature of the bark, and later it underwent forced-air circulation treatment for 6 months. Thereafter, the slabs were successfully transformed into aesthetically pleasing office furnitures.

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Series Editor : MK Mohamad Omar
Managing Editor : S Vimala
Typesetter : Y Rohayu

Set in NewBaskerville 11

MS ISO 9001:2015



Printed by Publications Branch, Forest Research Institute Malaysia
52109 Kepong, Selangor