

Timber of Gelam (*Melaleuca cajuputi* Powell)

By

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Introduction

Gelam (*Melaleuca cajuputi* Powell) belongs to the family Myrtaceae. Other better-known members of the family include kelat (*Syzygium* spp.), gelam bukit or china maki (*Leptospermum* spp.), mepoyan (*Rhodamnia* spp.), pelawan (*Tristania* spp.) and *Eucalyptus* (not indigeneous). Locally the timber of gelam is also known as kayu putih.

Gelam grows as large shrub to tall evergreen tree of 24 m height, often with twisted trunk (Plates 1 & 2). However, trees grow in park and along roadsides have been found to be fairly straight producing trunk of more than 45 cm in diameter.

The species of *Melaleuca* occurs naturally in swamp forests between the old raised sea beaches, and is a characteristic feature of the deep seasonal swamps of the coastal alluvial flats behind the sandy beaches and the mangroves, in particular in the states of Kedah, Melaka, Negeri Sembilan, Kelantan and Terengganu. In Melaka, the trees of gelam have been used as a road-side shade trees in low lying stretches where they cross rice-swamps, but the crown is not enough to shade wide road. The trees can be easily recognised by their distinctive thick papery flaky bark (Plate 3) that can be peeled off easily.

Timber and properties

The sapwood is light pink-brown in colour and sharply defined from heartwood which has a slightly darker shade. The timber is moderately hard, and moderately heavy to heavy with an air dry density of 720 to 820 kg m⁻³ (average 755 kg m⁻³). Texture is moderately fine to fine and even. Grain is straight to shallowly interlocked. The timber has been reported to be durable especially in contact with wet ground and sea water. Based on the density, the timber appears to be stronger than rubberwood (*Hevea brasiliensis*) (density 560 – 640 kg m⁻³), light red meranti (*Shorea* spp.) (density 385 – 755 kg and mersawa (*Anisoptera*) (density 515 0 735 kg m⁻³) but weaker than such timber as red balau (*Shorea* spp.) (density 800 – 880 kg m⁻³), keruing (*Dipterocarpus* spp.) (density 690 – 945 kg m⁻³) and kempas (*Koompassia malaccensis*) (density 770 – 1120 kg m⁻³).

Features of the wood visible to the naked eye or with a lens

Growth rings not observed. Vessels medium sized; few; usually distinct oval; almost exclusively solitary but with very occasional oblique pairs; open. Wood parenchyma rather sparse, indistinct even with a lens; paratracheal parenchyma, as incomplete vasicentric to the vessels; apotracheal parenchyma, consisting of diffuse strands but sometimes forming a narrow layer between the rays. Rays very fine and visible only with a lens on end and tangential surface, not conspicuous on radial surface. Ripple marks absent. Intercellular canals not observed. (Plate 4)

Uses

The use of this timber is limited as the trees are available only in some restricted locations, particularly in the coastal swamp areas. The trees are often crooked and small, unattractive for use as sawn timber except for firewood. However, those well-shaped trees of good height can be used for poles, fishing stakes and piling works. The timber can also be used for parquet and strip flooring. When laminated, it can be used for such purposes as floor boards, stair steps, hand rails, table top and chair seat.

The papery bark has been used for caulking wooden boats. The leaves yield cajuput oil that has been used as external applications for headache, tooth-ache, ear-ache, rheumatism cramp and fresh wounds.

References

- BURKILL, T. H. 1935. A dictionary of the economic products of the Malay Peninsula. Vol.2. Crown Agents for the Colonies, London. p.1431 – 1433.
- DESCH, H. E. 1954. Manual of Malayan timbers. Malayan Forest Records No.15 Vol.II. p 397 – 399.
- KONCHUMMEN, K. M. 1973. A Dictionary of Malaysian Timbers. Malayan Forest Records No.30. Forestry Department, Peninsular Malaysia, 259 pp.



Plate 1. Gelam tree with fairly large bole



Plate 2. Gelam tree with 'multiple' stems



Plate 3. Gelam's 'papery' and flaky bark

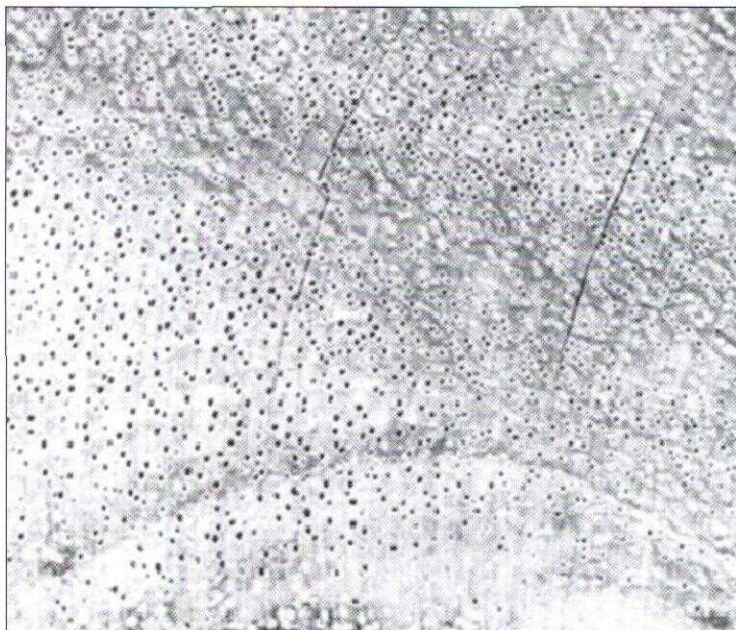


Plate 4. Cross-section of Gelam (*Melaleuca cajuputi* Powell)

BACKGROUND INFORMATION

1. Tree type and distribution

The distribution and size of tree are given.

2. Wood characteristics

The colours of sapwood and heartwood, figure, appearance on planed surface and any other characteristic features of the timber.

3. Timber classification

Under the Malaysian Grading Rules (1984), timbers are classified as Heavy Hardwood (HHW) when their density exceeds 800 kg m^{-3} and the timbers are naturally durable. Medium Hardwoods (MHW) are timbers with density exceeding 729 kg m^{-3} but lack sufficient natural durability. Light Hardwoods (LHW) are timber with density below 720 kg m^{-3} and not naturally durable in exposed condition.

4. Wood density

Green density of freshly sawn board, defined as green mass divided by green volume. It varies with the freshness of the log in the log yard before processing and seasoning. Air dry density is the average mass divided by volume at 15 per cent moisture content.

5. Drying and relative movement

Air drying time for 13 mm and 40 mm boards and moisture content are from Grewal (1979), "Air-seasoning Properties of Some Malaysian Timbers", Timber Trade Leaflet No. 41. Suitable kiln drying schedule is mentioned [Schedules based on Grewal (1988), "Kiln Drying Characteristic of Some Malaysian Timbers", Timber Trade Leaflet No.42]. The relative movement (whenever is available) is defined as the change in dimension of a piece of timber when exposed to the service conditions of 60% RH/ 30 °C and 95% RH/ 30 °C respectively, and expressed as percentage of the value at 60% RH/ 30 °C. The movement ratings stated are based on values of the corresponding tangential movement [Choo *et al.* (1998), "Movement of Seasoned Timber in Service", FRIM Technical Information Handbook No. 18].

Movement rating	Tangential movement
Class I	< 1.5 %
Class II	1.5% to 2.0%
Class III	2.1% to 2.5%
Class IV	2.6% to 3.0%
Class V	> 3.1 %

6. Machining properties

Comments are made on the comparative ease or difficulty of sawing, planing, turning, boring, peeling, gluing and other wood working properties.

7. Durability

Durability ratings of Malaysian Timbers are based on performance of test-sticks in graveyard testing. Test-stakes of 50 x 50 x 600 mm are buried in test grounds and their performance monitored. The number of years that the timber can last under such conditions is used to classify the durability of the timber. Under the system, timbers are classified as follows;

Rating	Number of years
Very durable	more than 10 years
Durable	5-10 years
Moderately durable	2-5 years
Non-durable	0-2 years

Susceptibility to fungal and termite attacks may be mentioned.

8. Strength grouping

In the strength grouping of timber under each trade name, ranking is allocated from A (strongest) to D (weakest). Minimum values for strength groups based on common grade for dry timber (below 19% moisture content) (units are in MPa).

Strength group	A	B	C	D
Modulus of elasticity	9700	6600	5500	3100
Bending and tension parallel to grain	12.41	9.65	7.24	4.83
Compression parallel to grain	11.03	7.93	5.51	4.14
Compression perpendicular to grain	1.45	0.90	0.55	0.45
Shear parallel to grain	1.45	0.90	0.62	0.62

9. Strength properties

Values are from Lee *et al.* 1979, "The Strength Properties of Some Malaysian Timbers". Malaysian Forest Service Trade Leaflet No. 34.

10. Uses

Various past and potential uses are given, but the list is obviously not exhaustive.