

## Identification and utilization of lesser-known commercial timbers in Peninsular Malaysia 6: Bungor, Chenderai, Dungun Paya and Gelam

S. C. Lim & K. S. Gan

### Introduction

This article looks at four more lesser-known commercial timbers (LKCT) i.e. bungor (*Lagerstroemia* spp.), chenderai (*Grewia* and *Microcos* spp.), dungun paya (*Engelhardtia* spp.) and gelam (*Melaleuca cajuputi*). Bungor is a medium-weight timber. The tree ranges from medium to large-sized tree but it may not have a good-formed stem. The advantage of using bungor is that it is one of the few trees in the country to possess ring porous feature i.e. with fairly prominent growth rings feature which makes the flat-sawn surface very attractive. Chenderai is made up of the species of genera *Grewia* and *Microcos* of the family Tiliaceae. The timber is medium to heavy in density. The trees are small to medium with usually straight bole. Like the timber of melunak of the same family, the timber is rather featureless. Uses of the timber are confined to some general utility purposes only. Dungun paya is a medium to large tree with large and steep buttresses (up to 3 m tall). The timber is light to medium in weight but generally light. The presence of not so distinct banded parenchyma provides a very vague growth ring figure on the flat-sawn surface. Gelam is a monospecific timber, which occurs in swamp forest behind sea beaches and mangrove. The trees are often crooked with poor-formed stems but some trees may produce fairly clear and tall boles. The diameter is seldom large. The timber is medium in density and rather featureless.

### Bungor (*Lagerstroemia* spp.) (Figure 1) (Family: Lythraceae)

#### *Main species*

*Lagerstroemia floribunda* Jack., *L. ovaliliformis* T. et B., *L. speciosa* (L) Pers.

#### *Tree and distribution*

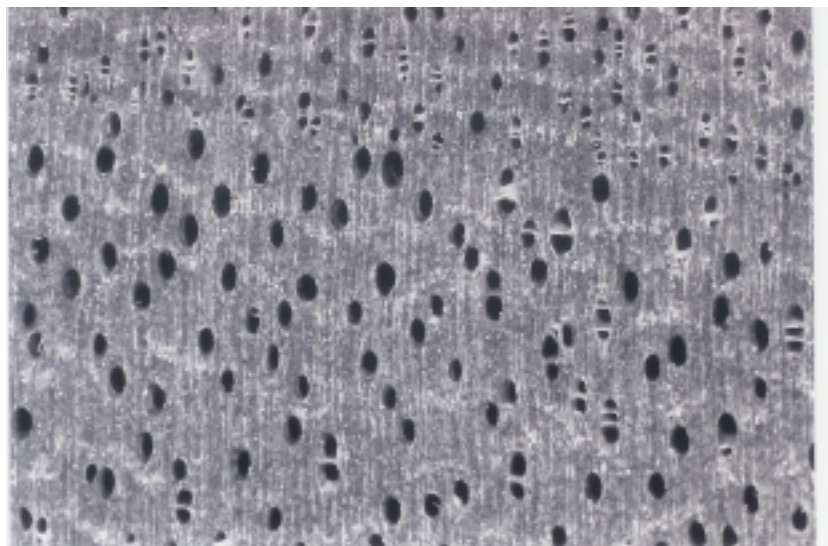
Small to medium-sized and sometimes large trees to 45 m tall, branchless up to 18 m tall but low branching is common, bole seldom straight and diameter of up to 100 cm but mostly less than 60 cm, often fluted and sometimes with small buttresses. Trees are also cultivated in parks and as roadside trees. Most trees are found in lowland forests and in comparatively open spaces, secondary forest, along rivers and also in primary forest. Most species are scattered but may become locally dominant.

### *Characteristics and physical properties*

The sapwood is light yellow-brown and up to 8 cm wide which merges gradually to the heartwood which is pale red-brown darkening upon exposure to red-brown. Texture is moderately fine to coarse and uneven due to ring porous formation. Grain is straight, interlocked or sometimes wavy. Attractive growth rings figure on flat-sawn surface as a result of layers of parenchyma as well as pore rings. The timber is light to moderately hard with an air-dry density of 504 to 790 kg m<sup>-3</sup>.

### *Macroscopic structures*

**Growth rings** distinct due to the presence of pore rings. **Vessels** moderately small to large, the larger vessels arranged in single, rarely radial pairs or multiples of up to 4 in concentric rings in the earlywood, forming a ring whereas the smaller vessels are found in the latewood region and arranged in solitary but mostly in radial multiples of 2 to 3, occasionally to about 8. Tyloses abundant, deposit is red-brown colour. **Wood parenchyma** abundant, mainly as paratracheal parenchyma vasicentric, aliform with tendency to confluent; apotracheal parenchyma as terminal bands. **Rays** fine to very fine and indistinct to the naked eye. **Ripple marks** absent. **Intercellular canals** not observed.



**Figure 1** Bungor (*Lagerstroemia floribunda* × 20)

### *Uses*

A light to medium density timber suitable for use under cover. The timber normally has ring or semi ring porous structure giving rise to prominent growth rings figures on flat-sawn surface. The timber is suitable for interior finishing, panelling, sliced and rotary peeled veneer, furniture manufacture and domestic flooring. The timber is reported to be popular for use in boat building in Thailand and some parts of Indo-China regions.

## Chenderai

(*Grewia/Microcos* spp.) (Figures 2 & 3)  
(Family: Tiliaceae)

### *Main species*

*Grewia polygama*, *Microcos antidesmaefolia* (King) Burret (chenderai), *M. latifolia* Burret (damak-damak), *M. laurifolia* (Hk. ex Mast.) Burret

### *Tree and distribution*

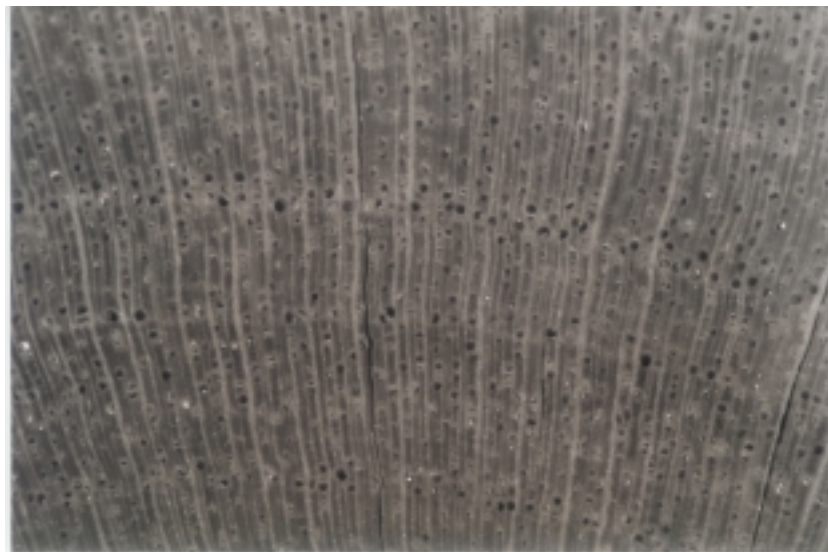
Small to medium-sized trees up to 30 m tall and up to 60 cm in diameter. Bole is usually straight. The species of *Microcos* are locally abundant in primary and secondary lowland dipterocarp forest up to 1000 m altitude. They are also found in fresh water swamp, waterlogged area and along rivers.

### *Characteristics and physical properties*

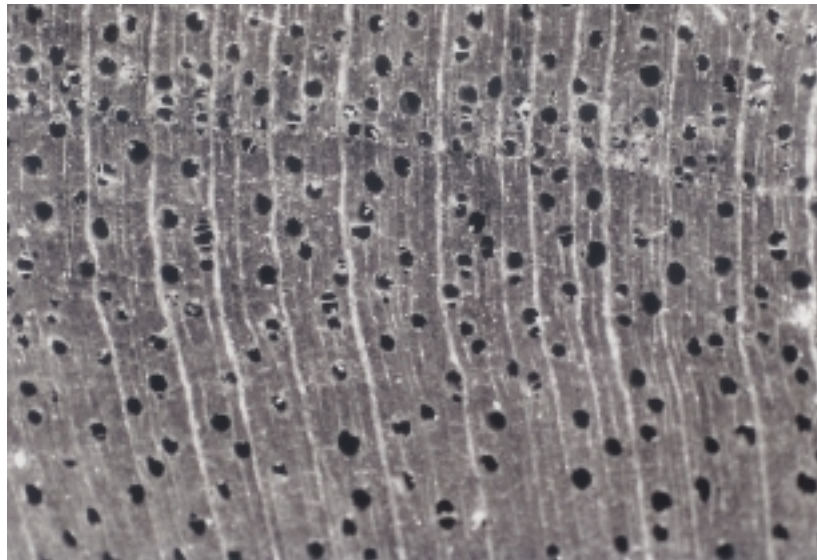
The sapwood is paler in colour and not well defined from the heartwood which is pale-brown to grey-brown on exposure. Texture is fine (mainly in *G. polygama*) to moderately coarse (mainly in *Microcos* spp.) and even. Grain is straight or interlocked. Vague 'silver grain' figure, on quarter-sawn material, particularly in *Microcos* species. The timber is moderately hard to hard with an air-dry density of 730 to 900 kg m<sup>-3</sup>.

### *Macroscopic structures*

**Growth rings** absent or indistinct, marked by layers of denser and darker-coloured fibres or the absence of vessels. **Vessels** moderately fine (*G. polygama*) to medium-sized (*Microcos* spp.), solitary and in radial multiples of 2 to 4, sometimes more and also in clusters. Tyloses present in *G. polygama* but not in *Microcos* species. Deposit present but sparse. **Wood parenchyma** abundant, predominating apotracheal parenchyma diffuse and diffuse in aggregates, visible with hand lens. Thin layer of marginal parenchyma bands presence. **Rays** fine to moderately fine, visible with hand lens. **Ripple marks** present and visible to naked eye. **Intercellular canals** not observed.



**Figure 2** Chenderai (*Grewia polygama* × 20)



**Figure 3** Chenderai (*Microcos latifolia* × 20)

#### *Uses*

The timber is suitable for light to medium purposes under cover. Uses include veneer and plywood, tool handle, general utility furniture, flooring, cladding, wooden pallet, moulding and possibly sport equipments.

### **Dungun paya**

**(*Engelhardtia* spp.) (Figure 4 )**  
**(Family: Juglandaceae)**

#### *Main species*

*Engelhardtia apoensis* Elmer ex Nagel, *E. roxburghiana* Wall. (par, pa'ar), *E. serrata* Bl. (dungun paya), *E. spicata* Lechen ex Bl.

#### *Tree and distribution*

Medium to large tree up to 35 m tall and 3 m girth, normally with straight bole but steep buttresses of up to 3 m high. The tree is found scattered in primary or montane rain forest up to 2000 m altitude. It occurs in both dry-lands as well as in peat swamp forest.

#### *Characteristics and physical properties*

The sapwood is pale grey-brown and merges gradually to the heartwood which is grey-brown. Texture is moderately coarse and even. Grain is straight, shallowly interlocked or sometimes wavy. Corewood with dark streaky colour. Wood is soft to moderately hard with air-dry density of 464 to 714 kg m<sup>-3</sup>.

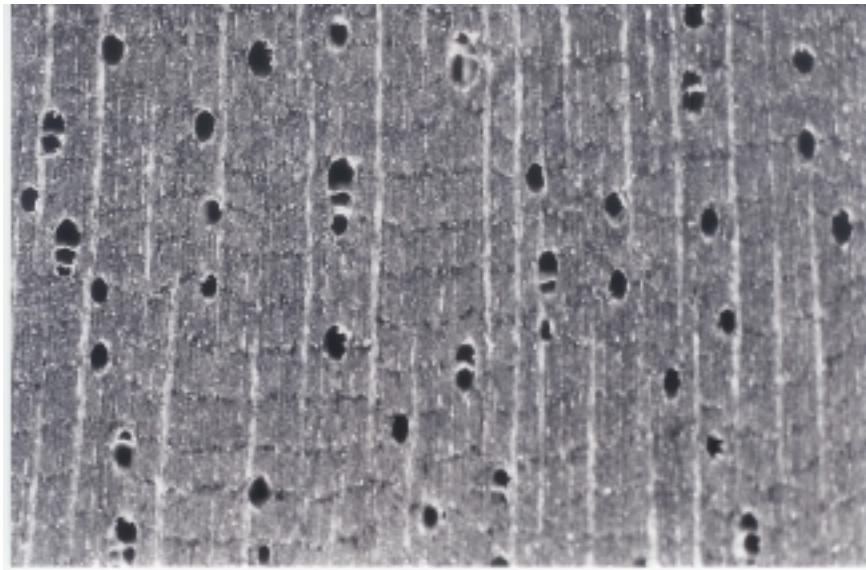
#### *Macroscopic structures*

**Growth rings** absent or indistinct, may be formed by thicker layers of fibres. **Vessels** rather sparse, medium to moderately large-sized, solitary and in radial multiples of 2 to 3, rarely

up to 6, clusters sparse. Tyloses absent. Deposit absent. **Wood parenchyma** of both apotracheal and paratracheal parenchyma. Apotracheal parenchyma diffuse in aggregates and also in narrow, discontinuous bands. Paratracheal parenchyma scanty. Parenchyma hardly visible to the naked eye or with hand lens due to the lack of contrast between parenchyma and the background fibre tissue. **Rays** fine or very fine and visible with the hand lens. **Ripple marks** absent. **Intercellular canals** not observed.

#### *Uses*

It is a fairly light timber and as such, it should not be used in situation where excessive strength and impact forces are required. Uses of the timber include veneer and plywood, turnery, moulding, tool handle for non-impact purposes, domestic flooring and general utility furniture. Corewood is decorative and it may be used for small ornamental items.



**Figure 4** Dungun paya (*Engelhardtia apoensis* × 20)

#### **Gelam**

**(*Melaleuca cajuputi*) (Figure 5)**  
**(Family: Myrtaceae)**

#### *Main species*

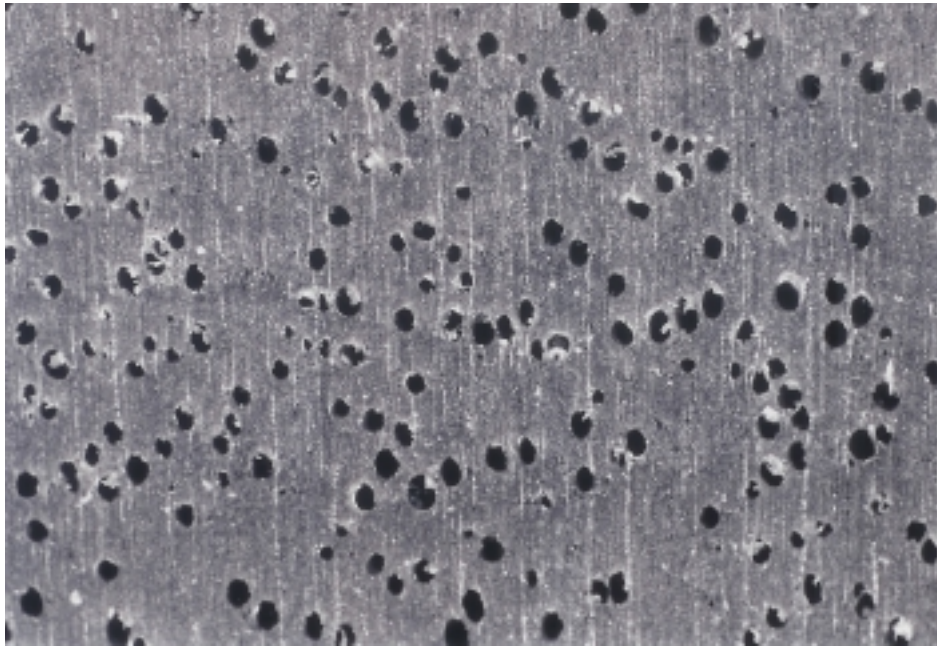
*Melaleuca cajuputi* Powell

#### *Tree and distribution*

Only one species found in Peninsular Malaysia. Large shrub to tall trees, about 24 m tall, trunk often twisted and poorly formed but straight and cylindrical boles have also been reported. The trees occur as small to medium-sized trees in swamp forests behind the sea beaches and the mangrove, particularly in the states of Kedah, Kelantan, Terengganu, Malacca and Negeri Sembilan.

### *Characteristics and physical properties*

The sapwood is lighter in colour and merges gradually to the heartwood which is grey brown. Texture is fine and even. Grain is straight or shallowly interlocked. The wood is moderately hard to hard with an air-dry density of 717 to 820 kg m<sup>-3</sup>.



**Figure 5** Gelam (*Melaleuca cajuputi* × 20)

### *Macroscopic structures*

**Growth rings** absent. **Vessels** fine or moderately fine, mainly solitary and others in oblique pairs. Tyloses present. Deposit absent. **Wood parenchyma** sparse and indistinct even with hand lens. Apotracheal parenchyma consisting of diffuse strands, sometimes joining from ray to ray. Paratracheal parenchyma forming an incomplete sheath to the vessels. **Rays** very fine and visible only with hand lens. **Ripple marks** absent. **Intercellular canals** not observed.

### *Uses*

The trees are generally crooked and poor in form but some of trees may also be quite straight. The possibility of obtaining long and straight plank is rather limited. Timber is medium to heavy in density and as such, it is possible to use the timber for medium construction under cover. Possible uses of the timber include flooring, laminated structure, laminated table top, furniture parts, pallet, crate and boxes.

### **Bibliography**

- LEMMENS, R. H. M. J., SOERIANEGARA, I. & WONG, W. C. (Eds.). 1995. *Plant Resources of South East Asia No. 5(2) Timber Trees: Minor Commercial Timbers*. Backhuys Publishers, Leiden.
- LIM, S. C., SAMSUDDIN MUSA & GAN, K. S. 2001. Availability and utilization of lesser-known timbers. Pp. 23-37 in Ahmad Shakri, M. S. *et al.* (Eds.) *Proceedings of the National Seminar on Alternative to Rubberwood*. 26 September 2000. Forest Research Institute Malaysia, Kepong.

- NG, F. S. P. (Ed.). 1978. *Tree Flora of Malaya*. Vol. 3. Malayan Forest Records No. 26. Longman, Kuala Lumpur.
- NG F. S. P. (Ed.). 1989. *Tree Flora of Malaya*. Vol.4. Malayan Forest Records No. 26. Longman, Kuala Lumpur.
- SOSEF, M. S. M., HONG, L. T. & PRAWIROHATMODJO, S. (Eds.). 1998. *Plant Resources of South East Asia No. 5(3). Timber Trees: Lesser-Known Timbers*. Backhuys Publishers, Leiden.
- WONG, T. M. 2002. *A Dictionary of Malaysian Timbers*. Second edition. Revised by Lim, S. C & Chung, R. C. K. Malayan Forest Records No. 30. Forest Research Institute Malaysia, Kepong.
- WHITMORE, T. C. (Ed.). 1972. *Tree Flora of Malaya*. Vol. 1. Malayan Forest Records No. 26, Longman, Kuala Lumpur.
- WHITMORE, T. C. (Ed.). 1973. *Tree Flora of Malaya*. Vol. 2. Malayan Forest Records No. 26, Longman, Kuala Lumpur.