TIMBER TECHNOLOGY BULLETIN
No. 55, 2015
ISSN: 139-258
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT, MALAYSIA

# IDENTIFICATION OF SELECTED LESSER KNOWN TIMBER 13: ANGSANA/SENA (*PTEROCARPUS* SP.), BAYUR (*PTEROSPERMUM* SPP.), BEBUTA (*EXCOECARIA* SPP.) AND KEKABU (*BOMBAX* SPP.)

AS Nordahlia & SC Lim

## INTRODUCTION

Lesser known timbers (LKT) have been used in Malaysia in the form of mixed species or `chap-char' for a long time. LKT generally refers to logs or timber in which their identities are unknown to the timber traders and in most cases, the supply of LKT logs or timber is always in small volume or inconsistent. With the declining supply of logs from the forest, there is a need to fully utilise all the logs available including LKT. The used of LKT depends on their properties such as density, strength, wood working properties, seasoning, durability and the colour of wood. This paper describes the macroscopic features, physical properties, wood working, seasoning properties, durability and uses of the four selected lesser known timbers, they are: Angsana/ Sena (*Pterocarpus indicus*), Bayur (*Pterospermum* spp.), Bebuta (*Excoecaria* spp.) and Kekabu (*Bombax* spp.).

Angsana or Sena is the Standard Malaysian Name for the timber of *Pterocarpus indicus* (Leguminosae). Generally the wood of Angsana/Sena has an attractive appearance, works easily and is used for ornamental purpose in high-class furniture, cabinet work and wood crafts. In Japan this species is among the most popular timbers and has been long used for decorative wooden articles together with timbers like rosewood (*Dalbergia* spp.) and Ebony (*Diospyros* spp.) (Ogata *et al.* 2008). Bayur is the Standard Malaysian Name for the timber of *Pterospermum* spp. (Sterculiaceae). Generally the woods of Bayur have good wood working properties and the finishes well, and suitable for interior works. Bebuta is the common Malaysian name for the timber of *Excoecaria* spp. which belongs to the family of Euphorbiaceae. The tree is well-protected by chemical defences and the milky latex of bebuta is very poisonous and when in contact with skin, causes irritation and rapid blistering, slight contact with eyes can cause temporary blindness. However, this plant has been traditionally used to treat sores and stings from marine creatures and the bark oil has been reported to be effective against rheumatism, leprosy and paralysis (Varahalarao et al. 2009). Kekabu is the Standard Malaysian name for the timber of *Bombax* spp. which belongs to the family of Bombacaceae. Kekabu is a fast growth species that this species is the most promising tree in the afforestation and reforestation program in the central dry zone such as Mynmmar and India (Khin et al. 2013). The floss from the capsule of Kekabu tree can be used for stuffing cushions and pillows. The gum from the bark and roots has been used as a medicine against diarrhea, dysentery and fever (Sosef et al. 1998). Kekabu tree is sometimes planted as an ornamental tree for its bright red flower (Whitmore 1972).

## ANGSANA/SENA
## (*Pterocarpus* sp.) (Figure 1)
## (Family: Leguminosae)

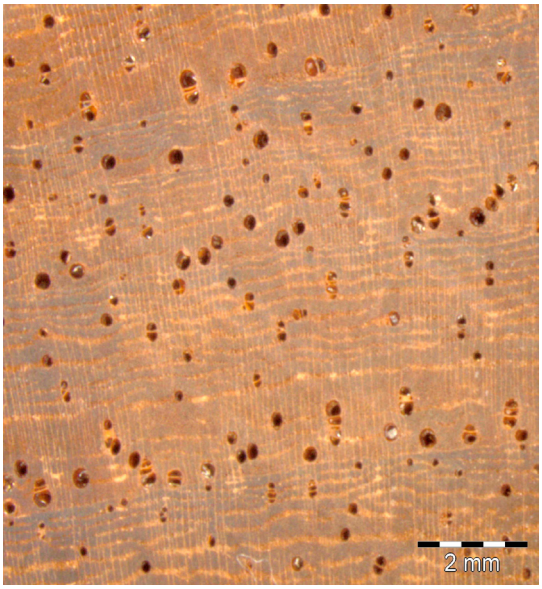


**Figure 1** Angsana/Sena (*Pterocarpus indicus*) (×15)

### Main species

Only one species is recorded for this country which is *Pterocarpus indicus*.

### Tree and distribution

Angsana is a big tree which can grow up to 40 m tall, 200 cm in diameter and larger, bole form often rather poor, deeply fluted and gnarled. This species occurs along tidal creeks and rivers along the east coast of Johor and Rompin, it is also commonly planted along roadsides (Whitmore 1972).

### Characteristics, properties, durability and treatability

The sapwood is pale greyish yellow to pale yellowish brown and sharply differentiated from the heartwood, which is reddish brown, dark pinkish brown, dark brown or golden brown. Texture is moderately coarse and uneven, due to the ring-porous structure. Grain is interlocked and sometimes wavy. The timber is moderately hard and moderately heavy with a density of 580 to 650 kg/m$^3$. Shrinkage from green to air dry is low with the average radial shrinkage of 0.9% and tangential shrinkage is 1%. The timber is easily workable either with hand tools or with machine, can be lathed, colored, varnished satisfactorily; and can hold nail quite well, planning is easy but the finish is only moderately smooth. Seasons fairly slowly, with very little degrade, 13 mm boards take approximately 4 months to air dry and 38 mm boards take 5 months. The sapwood is highly perishable, the wood is rated as moderately durable and difficult to be preserved (Lim & Chung 2002; Anonymous 2009).

### Macroscopic structures

Growth rings are distinct. Vessel predominantly solitary and some with radial multiples of 2 to 5, diffuse, sometimes arrange in radial series, mainly oval, sometimes round. Tyloses infrequent. Wood parenchyma confluent to banded. Rays very fine and not visible to naked eye. Ripple mark present due to the storied structure.

## Uses

Suitable for high class furniture, for all forms of decorative work, interior finishing, cabinets, sliced veneers, craft pulp and paper and fancy articles (Anonymous 2009).

# BAYUR
# (*Pterospermum* spp.) (Figure 2)
# (Family: Sterculiaceae)

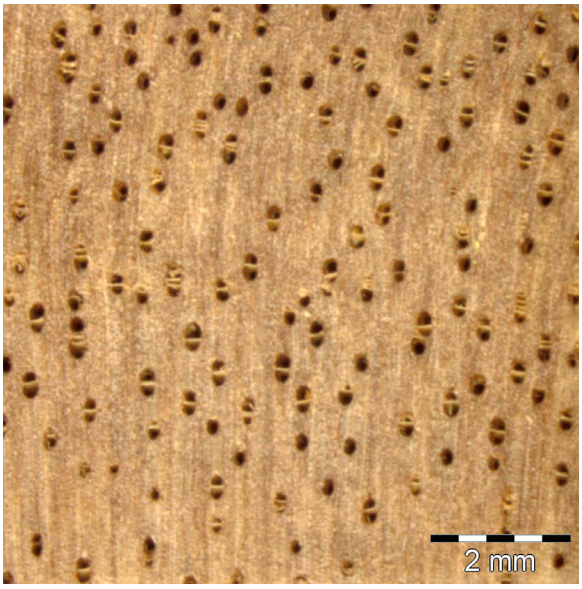


**Figure 2** Bayur (*Pterospermum* sp.) (×15)

## Main species

*Pterospermum diversifolium*, *P. jackianum*, *P. javanicum* and *P. subpeltatum*.

## Tree and distribution

Bayur is a medium to large tree, 42 m tall and can reach up to 300 cm diameter, bole with short buttresses and occasionally fluted (Abdurahim et al. 2005). The tree of Bayur is reported as fast growing and can be found in the open land, limestone, river banks and secondary forest up to 1000 m (Kochumen, 1972). According to Ogata et al. (2008), the genus *Pterospermum* consists of 20 woody species distributed from Southeast Asia to the Moluccas.

## Characteristics, properties, durability and treatability

The sapwood is grayish white to pale pinkish grey while the heartwood is pale pinkish brown to pale brown or yellowish brown. Texture moderately fine to slightly coarse and even. Grain is straight or shallowly interlocked grain. The timber is soft to moderately hard with a density 385 to 705 kg/m$^3$. Shrinkage from green to air dry is high with the average radial shrinkage of 2.0% and tangential shrinkage of 3.7%. The timber is easy to work and produces a smooth finish. Seasons fairly fast with little degrade, 13mm boards take 1.5 months to air dry and 38 mm boards take 3 months. The timber is rated as non-durable under exposed conditions but would be moderately durable under cover and can be easily treated with preservatives (Anonymous 1997, Lim & Chung 2002, Abdurahim et al. 2005).

## Macroscopic structures

Growth rings are absent. Vessel predominantly solitary and some with radial multiples of 2 to 7, arrange in radial series, vessels round to oval shaped. Deposit and tyloses absent. Wood parenchyma vasicentric and diffuse to diffuse in aggregates. Broad rays and visible to naked eye. Ripple mark usually present due to the storied structure, sometimes not very distinct according to the species.

## Uses

Suitable for posts (above stumps) beams, joists, rafters, floorings, sheathing, ceilings, furniture and cabinet works, combs, baseball bats, tool handles, carriage, charcoal and agricultural implements (Anonymous 1997, Lim & Chung 2002, Abdurahim et al. 2005).

# BEBUTA
# (*Excoecaria* spp.) (Figure 3)
# (Family: Euphorbiaceae)


**Figure 3** Bebuta (*Excoecaria aggallocha*) (×15)

## Main species

Only one species attains timber size namely *Excoecaria aggallocha.*

## Tree and distribution

The tree of Bebuta can grow up to 15 m high (Whitmore1972). Bebuta is a mangrove species and it is found at higher elevations back away from the ocean where salinity is lower (Joshi & Ghose 2003).

## Characteristics, properties, durability and treatability

The sapwood is straw-coloured normally not differentiated from heartwood which is pink-white to pale brown. Texture is moderately fine and even. Grain is straight or interlocked grain. The timber is moderately hard to moderately heavy with a density of 340 to 780 kg/m$^3$. The timber is easy to work and rated as non-durable (Lim & Chung 2002).

## Macroscopic structures

Growth rings are absent. Vessel predominantly solitary and some with radial multiples of 2 to 3, vessel diffuse, mainly round in shaped. Deposit and tyloses absent. Wood parenchyma predominantly apotracheal, diffuse in aggregats, banded parenchyma. Rays very fine and not visible to naked eye. Ripple mark absent.

## Uses

Suitable for manufacturing toys, furniture, packing cases, woden sandals and fuelwood and charcoal (Lim & Chung 2002).

# KEKABU
# (*Bombax* spp.) (Figure 4)
# (Family: Bombacaceae)

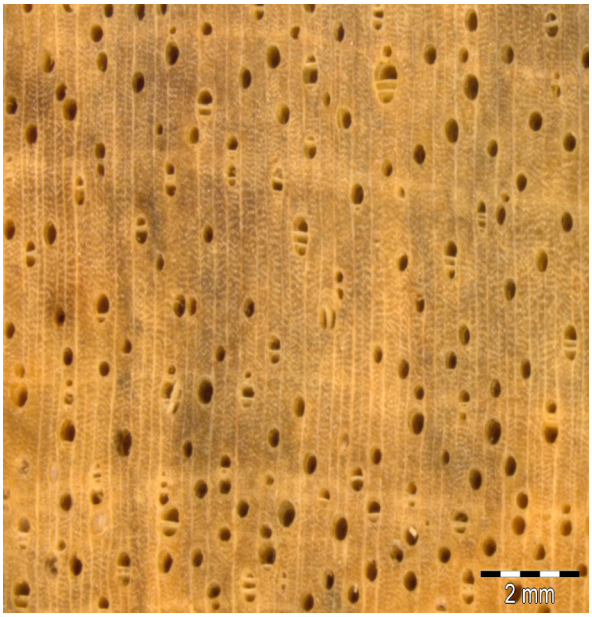


**Figure 4** Kekabu (*Bombax* sp.) (×15)

## Main species

*Bombax anceps*, *B.ceiba* and *B.valetonii*.

## Tree and distribution

Kekabu is small to big tree that can reach up to 40 m tall and 300 cm in diameter. This tree is found close to the sea in rocky places usually on limestone, primary and secondary forest especially near rivers (Whitemore 1972).

## Characteristics, properties, durability and treatability

The sapwood is white and sharply differentiated from the heartwood which is pale straw-coloured. Texture is moderately coarse and even. Grain is straight or slightly interlocked. The timber is soft and light with a density of 415 to 545 kg/m$^3$. Shrinkage from green to air dry is high with the average radial shrinkage of 1.7% and tangential shrinkage of 2.4%. The timber is easy to work, easy to resaw and cross cut, planning is easy and the planed surface produced

is moderately smooth to smooth, nailing property is excellent. Seasons fairly rapidly, 13 mm boards take approximately 2.5 months to air dry, while 38 mm boards take 3.5 months. The timber is non-durable, but extremely easy to treat with preservatives (Sosef et al. 1998, Lim & Chung 2002).

## Macroscopic structures

Growth rings are absent. Vessel predominantly solitary and some with radial multiples of 2 to 4, rarely in cluster, vessel diffuse, round to oval in shaped. Deposit absent and tyloses common. Wood parenchyma diffuse to diffuse in aggregats. Broad rays and visible to naked eye. Ripple mark usually present due to the storied structure, sometimes not very distinct according to the species.

## Uses

Suitable for packing cases, matchboxes, matches, core veneer, temporary construction, musical instruments, mouldings, household appliances, low grade furniture and interior partitioning (Sosef et al. 1998).

## REFERENCES


Abdurahim M, Iding K, Mandang YI, Soewanda AP & Kosasi K. 2005. Atlas Kayu Indonesia Jilid II. Departmen kehutanan badan penelitian dan pengembangan kehutanan bogor indonesia.

Anonymous. 1997. Manual on the properties and uses of lesser-used species of Philippines Timbers. FPRDI-ITTO Project PD 47/88 Rev. 3(1). Utilization of Lesser-Used Species as Alternative Raw Materials for Forest-Based Industries.

Anonymous. 2009. Technical report No. 4. Experimental use of twenty three Indonesian lesser used wood species. Forest Products Research and Development Centre (FPRDC) in Collaboration with Indonesian Sawmill and Woodworking Association (ISWA) and ITTO Project PD 286/04 Rev. 1 (I).

Khin MS, Stergios A, Gerald K, Frantisek H & Holger M. 2013. Wood Anatomy and Topochemistry of *Bombax ceiba* L. and *Bombax insigne* Wall. Journal of Bioresources. 8(1): 530–544.

Lim SC & Chung RCK. 2002. *A Dictionary of Malaysian Timbers. Malayan Forest Records No.30.* Kepong: Forest Research Institute Malaysia.

Joshi H & Ghose M. 2003. Forest structure and species distribution along soil salinity and pH gradient in mangrove swamps of the Sundarbans. Tropical Ecology. 44: 197–206.

Kochumen KM. 1972. Sterculiaceae. Pp 353–383 in Whitmore, TC. *Tree Flora of Malaya: A Manual for Foresters. Malayan Forest Records No. 26.* Jilid1. Kepong: Forest Research Institute Malaysia.

Ogata K, Fujii T, Abe H, & Baas P. 2008. *Identification of the Timbers of Southeast Asia and the Western Pacific.* Tsukuba, Japan: Forestry and Forest Product Reserach Institute Japan.

Sosef MSM, Hong LT & Prawirohatmodjo. 1998. Timber trees: Lesser-known timbers. Plant Resources of South – East Asia No 5(3) Leiden, Netherlands.

Varahalarao V, Varaprasad B, Somasekhar P & Chandrasekhar NK. 2009. *Excoecaria agalloca* L. Antimicrobial properties against important pathogenic microorganism. International Journal of ChemTech Research. 1 (4): 865–867.

Whitmore, TC. 1972. *Tree Flora of Malaya: A Manual for Foresters. Malayan Forest Records No. 26.* Jilid1. Kepong: Forest Research Institute Malaysia.

## Back Issues

Available on-line (http://info.frim.gov.my/cfdocs/infocenter/booksonline/index cfm?menu=ttb)

| | |
|---|---|
| TTB27 | Saw Doctoring Practices in Peninsular Malaysia |
| TTB28 | Nomenclature and Equivalent Names of Malaysian Timbers |
| TTB29 | Identification and Utilisation of Lesser-Known Commercial TimbersinPeninsular Malaysia 1: Ara, Bangkal, Bebusok and Bekoi |
| TTB30 | Identification and Utilisation of Lesser-Known Commercial Timber in Peninsular Malaysia 2: Berembang Bukit, Biku-Biku, Chichah and Chinta Mula |
| TTB33 | Shrinkage Allowance of Some Malaysian Timbers |
| TTB38 | Timber of Sentang |
| TTB39 | Identification and Utilization of Lesser-Known Commercial Timbers in Peninsular Malaysia 5: Balek Angin, Bayur Bukit, Berbatu and Beka |
| TTB40 | Identification and Utilization of Lesser-Known Commercial Timbers in Peninsular Malaysia 6: Bungor, Chenderai, Dungun Paya and Gelam |
| TTB41 | Identification and Utilization of Lesser-Known Commercial Timbers in Peninsular Malaysia 7: Hantu Duri, Jarum-Jarum, Jelutong Pipit and Kasah |
| TTB42 | Advantages of Wood Lamination for Modern Applications |
| TTB43 | Identification and Utilization of Lesser-Known Commercial Timbers in Peninsular Malaysia 8: Keruntum, Kundang, Leban and Malabera |
| TTB44 | Identification and Utilization of Lesser-known Commercial Timbers in Peninsular Malaysia 9: Mempoyan, Mengkirai, Mengkundor and Mentulang |
| TTB45 | Review on Six Types of Log cutting methods in Various Applications: Part 1 |
| TTB48 | Review on Six Types of Log cutting methods in Various Applications: Part 2 |
| TTB49 | Identification and Utilization of Lesser-known Commercial timbers in Peninsular Malaysia 12: Pagar Anak, Pepauh, Pepijat dan Pepulut |
| TTB50 | Use of Timber Engineering |
| TTB51 | Wood Properties of Selected Plantation Species: *Khaya ivorensis* (African mahogany), *Azadirachta excelsa* (sentang), *Endospermum malaccense* (sesenduk) and *Acacia mangium* |
| TTB53 | Focus on Forest Products |
| TTB54 | Wood Properties of Selected Plantation Species: *Tectona grandis* (teak), *Neolamarckia cadamba* (kelempayan/laran), *Octomeles sumatrana* (binuang) and *Paraserianthes falcataria* (batai) |

Series Editor : KS Gan
Managing Editor : YF Ho
Typesetter : Y Rohayu

Set in NewBaskerville 11

MS ISO 9001:2008

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