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**WORKSHOP ON THE EMPOWERMENT
OF HUMAN CAPITAL DEVELOPMENT
IN THE TIMBER INDUSTRY**

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BENGANG (*NEESIA ALTISSIMA*): SUITABLE FOR LIGHT CONSTRUCTION



Bengang saplings.



Wood colour and texture.

Bengang (*Neesia altissima*) is native to Peninsular Malaysia, Borneo, Java, Singapore, Sumatra and Thailand, where it grows in the pluvial primary forests, often along the water streams banks, up to about 1,800 m of altitude. The genus is honoured to the German botanist and pharmacologist Theodor Friedrich Ludwig Nees von Esenbeck (1787-1837); the specific name is the absolute superlative of the Latin adjective "altus, a, um" = high, with obvious reference. Its common names are Apa-apa, Bengang, Bungal, Dendulang, Durian daun, Durian tupai, Punggai (Malaysia); Ki bengang (Java); Bengang, Durian (Indonesia); Duyin (Myanmar); Si bengang (Sumatra); Chang baik (Thailand).

The *Neesia altissima* (Blume) Blume (1835) is an evergreen tree that may exceed the height of 40 m in older specimens, with an erect trunk, of up to more than 1.2 m in diameter, with slightly grooved bark of greyish brown colour. The leaves, on a 10 cm long petiole, are alternate, simple, obovate-oblong with obtuse or retuse apex, entire margin and prominent pinnate veins, coriaceous, 25-30 cm long and 10 cm broad, of intense green colour above, green grey and pubescent below.

The leaves in the initial phase of growth are protected by two linear-lanceolate stipules, 2-4 cm long, deciduous. Corymbiform inflorescences at the axil of the fallen leaves bear small flowers of 1-1.5 cm of diameter, enclosed in the bud by a deciduous epicalyx. Cup-shaped calyx and corolla with five petals precociously deciduous, oblong with obtuse apex, white-pinkish, and several stamens merge at the base. The fruits are ovoid-pentagonal capsules with pointed apex, woody, externally covered by pyramidal tubercles of dark

brown colour, 15-20 cm long and 10-15 cm broad, dehiscent at the apex in five valves, containing numerous black ellipsoid seeds with yellow aril; the inner walls are thickly covered by irritating hairs of orange colour.

General Properties

Examination of a limited number of timbers grouped under the trade, *Neesia altissima* indicates that the air-dry weight ranges from 29 to 47 lb. per ft³ (1466 to 753 kg. per m³). The average for species of *Neesia altissima* is about 40 lb. (641) per m³. The sapwood of *Neesia altissima* is white or pale yellow-brown and is sharply defined from the heartwood which is normally brown to deep brown; the sapwood of *Neesia altissima* is pale yellow or light reddish yellow and cannot always be differentiated from the reddish or light red-brown heartwood. In both the timber, the width of sapwood is about 3 mm, the grain is straight or only very slightly interlocked, and the texture is moderately coarse and even; both timbers are comparatively featureless.

The characteristic of the structure of all timbers of the Malaysian *Bombacaceae* is as follows; growth rings are generally distinct they are delimited by layers without parenchyma towards the outer limits of the ring or by zone of thick-walled, radially-flattened fibre. The vessel is very few to few, medium sized to occasionally very large, solitary or in radial groups of two to five or more, mostly open but sometimes filled with gum-like deposits. Wood parenchyma is abundant occurring in the narrow metatracheal layers close together and continuous from ray to ray; it is usually only visible with a lens. The rays are the two distinct sizes. Medium sized

rays are very few to few, distinct to the naked eye on the end and tangential surfaces, and yellow brown and red-brown in colour; the very fine rays are sometimes not even visible with a lens. Ripple marks are present but not always apparent. Vertical traumatic canals have been observed in species of *Neesia altissima*.

Defects

The logs of all the timber producing species of the *Bombacaceae* are normally sound and free of defects excepts for a small area of sponginess around the pith, and damage by ambrosia and, occasionally, longicorn beetles. An area of two or three inches of sponginess has been observed in logs of *Neesia altissima* but the compression failures usually associated with this type of defect have not been encountered. The timber of this species contains abundant starch, and although not very susceptible to sap stain, is liable to attack by all forms of wood-boring insects and heavy infestation by Lyctus. On the other hand, the limited amount of material of *Neesia altissima* that has been examined revealed very little starch and was attacked only by a small number of pinhole borers.

Working Qualities

The timber of *Neesia altissima* saws very easily, but the planed finish of Bengang is inclined to be rough, particularly on radial surfaces. All the timbers can be made to take a reasonably good polish and their nailing qualities are good.

Seasoning Properties

The experience of the seasoning properties of the timber of the *Bombacaceae* has been confined to those of *Neesia altissima*. The timber of this species

is very wet when freshly felled, containing up to 100% moisture, but they season rapidly during the period of drying from green to air-dry under cover in Malaysia.

Natural Durability and Amenability to Preservative Treatment

In contact with the ground or in exposed position, none of the timber is durable, but under cover they are reported to last reasonably well. As mentioned previously the timber is particularly liable to Lyctus attack. The timber absorbs wood preservatives very readily and absorptions up to 6 lb. per ft³ are obtained by soaking in cold creosote and diesel fuel mixture. This easy response to wood preservative treatment is probably characteristic of all the timbers of the *Bombacaceae*.

Mechanical Properties

The mechanical properties of this timber are similar to those of Red Meranti and very roughly 25% better than those of Scots Pine.

Uses and Supplies

The timber of this species has recently been utilised by local mills where it is sawn into boards, scantling and battens. It is perfectly suitable for use in light construction and cheaper grades of furniture and fittings, provided against attack by Lyctus. It is used locally for clog manufacture and is known to be very suitable for plywood. Bengang has the advantage of being much less susceptible to damage by Lyctus. It does not have the deep, attractive, brown colour of the timber. This timber is not available in large quantities, and will normally be supplied in mix consignments of light hardwoods. 

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