

Strength Classification of Aras as fast-growing indigenous species timber in Sarawak

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Keywords: Bending parallel to grain, compression stress parallel to grain, shear parallel to grain, modulus of elasticity, basic stress, grade stress.

Abstract. Strength properties' tests are conducted in the form of small clear sample. This paper aimed to acquire the strength group of fast-growing indigenous species of Aras and exotic species of *Acacia mangium*. Thus, the information of strength properties of species is acquired from strength property's test at green and air-dry conditions. The required information namely, bending parallel to grain, compression stress parallel to grain, shear parallel to grain and modulus of elasticity. The ultimate stresses obtained from strength properties of the species is to be converted into basic and grade stresses to determine the strength group of the species based on MS 544: Part 2 (2001). The results from the study indicated that, *Acacia mangium* classified under strength group SG5, whilst Aras was classified under strength group SG7. The timber is classified as medium density of Light Hardwood ranging from 0.37-0.52 g/cm³ at air-dry condition.

Introduction

Aras is one of the indigenous species found in Sarawak. It is known by its botanical name as *Ilex cissoidea*. In Sabah, this species is known as *bangkulatan* and *morogis*, while in Peninsular Malaysia, this species is known as *timah-timah*. Meanwhile, in Indonesia it is known as *Mensira gunung*. *Ilex cissoidea* is categorized in Aquifoliaceae family that is commonly found throughout the temperate and tropical regions of the world, mainly in South East Asia. This species classified under medium density of light hardwood, ranging from 0.560 to 0.595 g/cm³ at air-dry condition [8]. *Acacia mangium* (Fabaceae: Mimosoideae) is a perennial tree native to Australia and Asia. Common names for it include Black Wattle, Hickory Wattle and Mangium. This species is selected for this study as a reference point. At the green soaked volume the density value ranges from 0.420 to 0.483 g/cm³ meanwhile at the dry condition it varies between 0.5 to 0.6 g/cm³ ([6],[9],[10],[11],[13]).

Although the density of timber is relatively reflected the strength of the timber, but it should not be the definite measurement of its strength. It was understood that timber is heterogeneous material thus some physical testing have to be conducted to reveal and confirmed the timber strength group as identified from its density. The most suitable sample to be tested was small clear sample which is