

# PHYSICAL AND MECHANICAL PROPERTIES OF ACACIA MANGIUM X ACACIA AURICULIFORMIS HYBRID (ACACIA HYBRID) AND ACACIA MANGIUM SUPERBULK PLANTED IN SARAWAK

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Recently two new wood materials were introduced in Sarawak, namely *Acacia mangium* x *Acacia auriculiformis* (*Acacia* hybrid) and *Acacia mangium* superbulk (*A. mangium* superbulk) which have desirable characteristics of rapid growth rates and greater resistance to heart rot. Studies of their basic characteristics are important for future utilization. The objectives of this study were to determine the physical and mechanical properties and to compare the properties among *A. mangium*, *A. auriculiformis*, *A. hybrid* and *A. mangium* superbulk. *Acacia* trees of six years age were studied and sampled by cutting at dbh, 50%, 70% and 90% heights of the clear bole. The basic densities of *A. auriculiformis*, *A. mangium*, *A. hybrid* and *A. mangium* superbulk were 636, 464, 472 and 334 kg m<sup>-3</sup> respectively, and statistically the basic densities of *A. hybrid* and *A. mangium* were similar. Volumetric shrinkages for all acacias ranged between 14.39 and 15.99% and the differences were not statistically different. Static bending test showed that the modulus of rupture (MOR) of *A. auriculiformis* was 89 N mm<sup>-2</sup>, *A. hybrid* 85 N mm<sup>-2</sup>, *A. mangium* 78 N mm<sup>-2</sup> and *A. superbulk* 55 N mm<sup>-2</sup>. For compression parallel to grain, the maximum crushing strength (MCS) of *A. hybrid* was the highest (62 N mm<sup>-2</sup>), followed by *A. auriculiformis* (59 N mm<sup>-2</sup>), *A. mangium* (53 N mm<sup>-2</sup>) and *A. mangium* superbulk (50 N mm<sup>-2</sup>). Further analyses revealed that the MOR, MOE and MCS among *A. mangium*, *A. auriculiformis* and *A. hybrid* were not statistically different. However, the strength properties of *A. mangium* superbulk were significantly lower compared with *A. mangium*, *A. auriculiformis* and *A. hybrid*. It can be concluded that improvements of *Acacia* hybrid and *A. mangium* superbulk are only confined to growth characteristics and heart-rot resistance but not wood properties.

Key words: Physical and mechanical properties - *Acacia* hybrid - *Acacia mangium* superbulk - growth rate

## Introduction

Recently *Acacia mangium* x *Acacia auriculiformis* hybrid, hereafter refer to as *Acacia* hybrid, and *Acacia mangium* superbulk were introduced in Sarawak. The hybrids planted in Sarawak originated from the Research Centre for Forest Tree Improvement, a division of Forest Science of Vietnam. Borneo Tree Seeds & Seedlings Supplies Sdn. Bhd. (BTSSSB), a subsidiary company of Ta Ann Holding, brought seven clones in the form of tissue culture plantlets of best-performing Vietnamese hybrids for evaluation in Sarawak (Juing 2007). The planted hybrids appear to acquire many desirable properties such as faster growth, straighter