

Anatomical and microstructures features of tropical bamboo *Gigantochloa* brang, *G. levis*, *G. scotechinii* and *G. wrayi*.

Abstract

Anatomical and microstructure studies on four of cultivated tropical bamboo species of genus *Gigantochloa* were studied. *Gigantochloa* brang, *G. levis*, *G. scotechinii* and *G. wrayi* of age-group 3 were selected, harvested and processed for use in the studies. The studies focussed mainly on the vascular bundles and fibers located at the internodes and nodes at the outer, middle and inner sections of the bamboo culm wall. The sizes of the vascular bundles length, vascular bundles width, fiber length, fiber diameter, fiber lumens diameter, fiber walls thickness and fiber Runkle's ratio were measured between each of the species in relation to the samples positions at the internodes, nodes, and positions in the cross-section of the bamboo culms. The results in the fibers morphology studies showed that the fibers for each species have different lengths, diameters, cell walls thickness and lumen sizes. The size of vascular bundle is smaller at outer position and becomes bigger at the inner position. All the four (4) bamboo species exhibited similar in characteristics but their anatomical features and microstructures were different.

Introduction Bamboo has been the focus of research and development in recent years. Bamboos are considered to be among the fastest growing plant on earth. This makes them the best possible alternative to replace timber as a source of cellulose in the future. Research and development which covers all aspects in silviculture, propagation, processing, properties and utilization of bamboo found naturally growing wild in the forest and cultivated has been intensified. However, study on cultivated bamboo stands has so far mostly confined to selected species in silviculture and fertilizers application to enhance growing (Azmy et al. 2007). Information on the properties such as anatomical and structural properties of various bamboo species is rather limited. The anatomy and physical properties of bamboo culms have been known to have

significant effects on their durability and strength (Liese, 1985; Latif & Tamizi, 1993; Razak, 1998). Studies on the anatomical and physical properties of cultivated *Bambusa vulgaris* conducted by Razak et al. (2010) support this statement. Information generated on the anatomical properties of bamboo can be used to determine their possible proper utilization. Currently, bamboo used for making traditional products such as handicraft, basketry, and high-value added products of panels, parquets, furniture and construction materials. *Gigantochloa* species of bamboo are among the most popular tropical bamboo species for plantation. These bamboo are easily cultivated and possess thick culms wall, and having uniform sizes between the nodes and internodes. This makes them suitable as materials for industrial usage.