

## **Anatomical characteristics of Gigantochloa scortechinii bamboo rhizome in relation with hydraulic conductance**

### **ABSTRACT**

Structural development and modification of bamboo culm's anatomical characteristics occur during the maturation period. This process affects the conductivity efficiency in individual bamboo culms (above ground). The present study clarified this process in the sympodial type of bamboo rhizome (belowground). This study aimed to observe the anatomical characteristics of *Gigantochloa scortechinii* rhizome, examine their relationship with different study sites and rhizome ages, and investigate their relationship with hydraulic conductance. Destructive sampling on four consecutive rhizomes was conducted using a selective random sampling method. All rhizome anatomical characteristics were significantly different between study sites except parenchyma diameter, parenchyma lumen diameter, and fiber cell wall thickness. The results also indicated that the vascular bundle diameter, parenchyma diameter, parenchyma lumen diameter, parenchyma cell wall thickness, fiber diameter, fiber cell wall thickness, and fiber length increased with age, but radial to tangential ratio decreased with age. All measured characteristics including the conductance elements had no relationship with hydraulic conductance, except parenchyma diameter and parenchyma lumen diameter. The sizes parenchyma diameter and lumen diameter did not imply a determinant factor in hydraulic conductance. Further studies on rhizome chemical attributes should be carried out to isolate the cause of decreasing hydraulic conductance.

**Keyword:** Fiber; Parenchyma; Phloem; Vascular bundles; Xylem