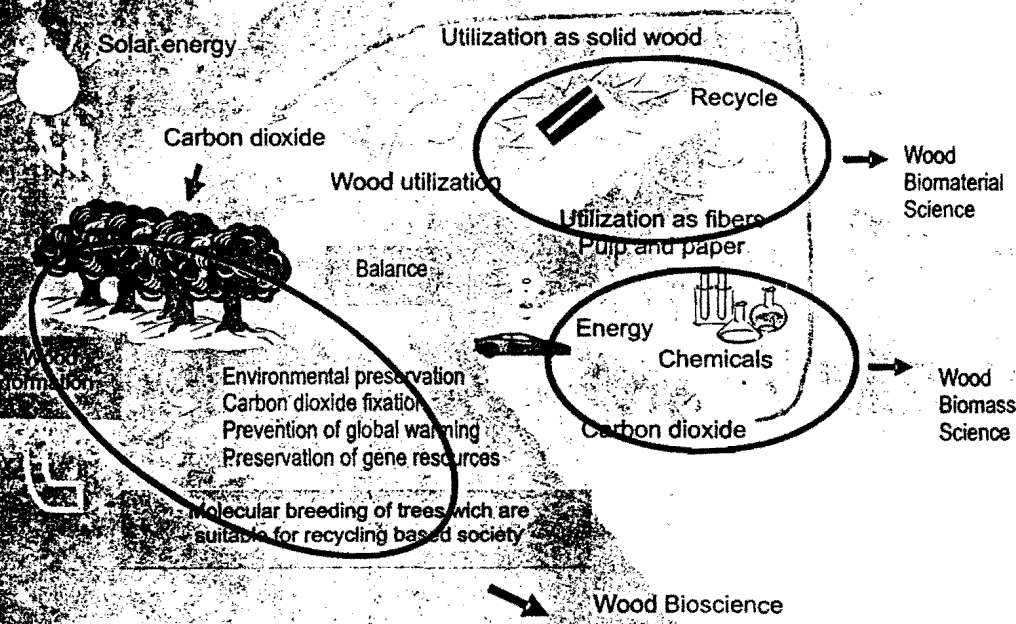


# Towards Ecology and Economy Harmonization of Tropical Forest Resources

Proceedings of the 6<sup>th</sup> International Wood Science Symposium  
EIPK-JSPS Core University Program in the Field of Wood Science



August 29 – 31, 2005  
Inna Grand Bali Beach Hotel  
Eka Karya Botanical Garden  
Bali, Indonesia

# TOWARDS ECOLOGY AND ECONOMY HARMONIZATION OF TROPICAL FOREST RESOURCES

PROCEEDING OF THE 6<sup>TH</sup> INTERNATIONAL WOOD SCIENCE SYMPOSIUM  
LIPI - JSPS CORE UNIVERSITY PROGRAM IN THE FIELD OF WOOD SCIENCE

ORGANIZED BY



RESEARCH AND DEVELOPMENT UNIT FOR BIOMATERIALS  
INDONESIAN INSTITUTE OF SCIENCES - INDONESIA



RESEARCH INSTITUTE FOR SUSTAINABLE HUMANOSPHERE  
KYOTO UNIVERSITY



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## Characteristic of Basswood (*Ochroma bicolor* Rowlee) Planted Indonesia

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Five trees of Basswood (*Ochroma bicolor*) planted in Faculty of Forestry IPB campus area were sampled along their radii to evaluate the characteristic of the wood macro- and microscopically. It was observed that the weaknesses of the wood are resulted from a higher proportion of parenchyma elements. These cells have thinner wall and larger lumen compared than those of the fibers. It was also observed that vessel elements and fibers are making up between 4.5-8.7% and 20-33% of wood volume, respectively; while more than 60% of Basswood is parenchyma cells.

**Key words:** Basswood, *Ochroma bicolor* Rowlee.

### Introduction

Recently plantation of Basswood tree (*O. bicolor* Rowlee) -a monotypic genus occurring in tropical Central and South America from southern Mexico to Bolivia, tends to increase and becomes locally naturalized in many countries. In Java, the tree is sometimes planted as an ornamental or to provide shade expediently. In trials in Bogor, West Java, Indonesia the mean annual increment was 2.0-6.6 cm in diameter, and 1.2-3.3 m in height. However, after 12-15 years it slows down and the tree generally deteriorates rapidly.

From previous study some information was available on the general anatomy of Basswood (Sosef et al., 1998). However, there is very limited information on why this wood is very soft and light. Since demand for this wood tending to increase year-by-year, its anatomical structure is very important to be understood not only to support the utilization of the wood more properly, but also to figure out the scientific reasons of the question. Thus, this study was carried out to examine its anatomical characteristics macro- and microscopically in order to find out the answer.

### Material and Method

Five healthy trees of 10 year-old *O. bicolor* varies in diameter from plantation area located at Faculty of Forestry IPB in Darmaga campus were randomly selected. From each tree, 1 disk of 5 cm thick at breast height (130 cm from the ground) was extracted for macroscopic observation namely wood color, texture, growth ring existence, and heartwood proportion. In this study, heartwood proportion was measured using millimeter square block method.

From the disc, radial strips of 2 cm wide and 2 cm thick were cut from pith towards the bark. From these strips, 4-5 cm long cubes were prepared at 3 different positions namely near the pith, halfway the radius (center), and near the bark. The cube was then divided into 2; one for microscopic observation i.e. vessel elements, ray parenchyma, axial parenchyma, and intercellular canal by sectioning, and the rest for

determination of fiber morphology i.e. fiber length, wall thickness, and lumen diameter by hydrogen peroxide and acetic acid glacial maceration. Microscopic characteristic was observed on wood section of 20  $\mu$  thick representing transversal-, tangential- and radial surfaces. Prior to sectioning, the samples were boiled in water for 2 hours and then soaked in glycerol for 4 hours before slicing. Fiber dimension was measured on 100 macerated fibers individually. In this study, safranin 2% and fast-green were used for staining successively.

### Results and Conclusion

**Nonstructural Characteristics.** It was observed that heartwood is white to grey-white and not clearly demarcated from sapwood. Wood grain is straight, texture varies from very fine to moderate and even. Wood has silky luster and the heartwood portion is 75% in average. Growth ring is indistinct.

### Structural Characteristics

Basswood is diffuse-porous. Pores are usually very small to small in diameter, very few, scattered and mostly solitary (Fig. 1). On average, vessels make up between 4.5 to 8.7% of wood volume. Fiber varied from short to long. However, it makes a small portion of the volume; on average, only 20-33% of Basswood is fiber. The fiber wall is very thin. The axial parenchyma is predominantly paratracheal, mostly vasicentric, however, diffuse-in-aggregate of apotracheal parenchyma is also found. Both of them are indistinct with the hand lens of 10-15X. Parenchyma cells make up a high proportion of the volume. On average, more than 50% of Basswood is parenchyma. Rays are fine to medium-sized; mostly bi-seriates and narrowly spaced. It makes up between 15 to 20% of wood volume and proportion of procumbent and up-right cells is almost similar. The radial intercellular canal is found within the rays. Since the wood consists of higher portion of parenchyma elements and lower portion of thin-walled fibers, it makes Basswood becomes very soft and light in general.

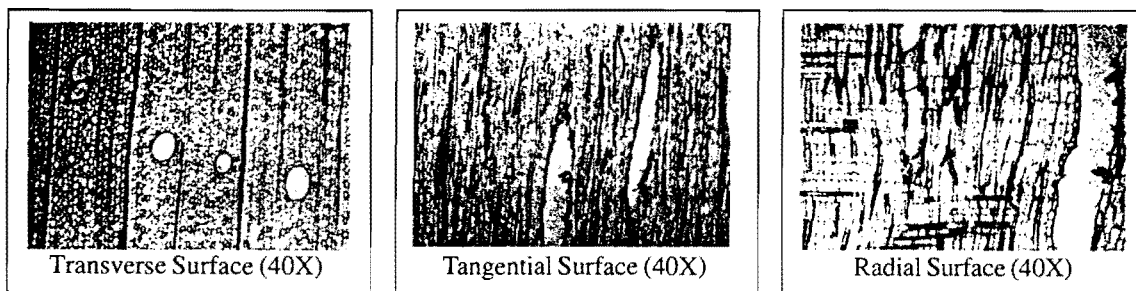


Figure 1. Anatomical features of Basswood

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