

## VARIASI AKSIAL dan RADIAL SIFAT FISIKA dan MEKANIKA KAYU TREMBESI (*Samanea saman* (Jacquin) Merrill) yang TUMBUH DI KECAMATAN KALASAN, KABUPATEN SLEMAN

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### INTISARI

Usaha untuk meningkatkan nilai tambah kayu trembesi (*Samanea saman* (Jacquin) Merrill) telah dilakukan dengan mula-mula mempelajari sifat fisika dan mekanikanya. Kayu trembesi yang diteliti adalah yang tumbuh di hutan rakyat Kecamatan Kalasan, Kabupaten Sleman.

Penelitian ini menggunakan rancangan acak lengkap dengan dua faktor dan tiga ulangan yaitu kedudukan aksial (pangkal, tengah, dan ujung) dan radial (dekat empulur, tengah, dan dekat kulit). Bila hasil analisis keragamannya menunjukkan perbedaan yang nyata, maka dilakukan uji lanjut dengan uji HSD (*Honestly Significant Difference*). Metode pengujian dan pembuatan contoh uji mengikuti Standar British Nomor 373 Tahun 1957.

Hasil penelitian menunjukkan bahwa kayu trembesi memiliki nilai rerata kadar air segar dan kering udara sebesar 165,38% dan 18,69%. Berat jenis (BJ) volume segar, BJ kering udara, dan BJ kering tanur sebesar 0,41; 0,43; dan 0,45. Penyusutan longitudinal, tangensial, radial, dan volume dari segar sampai kering udara sebesar 0,50%; 1,90%; 1,17%; dan 1,56% serta rasio T/R sebesar 2,36. Penyusutan longitudinal, tangensial, radial, dan volume dari segar sampai kering tanur sebesar 0,81%; 5,24%; 2,94%; dan 6,37% serta rasio T/R sebesar 2,52. Pengembangan longitudinal, tangensial, radial, dan volume dari kering tanur sampai basah sebesar 1,58%; 6,69%; 4,51%; dan 7,22% serta rasio T/R sebesar 1,55. Keteguhan lengkung statik pada batas proporsi, MoE, dan MoR sebesar 334,56 kg/cm<sup>2</sup>; 47,59 (x 1.000kg/cm<sup>2</sup>); dan 541,07 kg/cm<sup>2</sup>. Keteguhan tekan sejajar serat sebesar 236,36 kg/cm<sup>2</sup>. Keteguhan tekan tegak lurus serat sebesar 121,64 kg/cm<sup>2</sup>. Keteguhan geser sejajar serat sebesar 234,77 kg/cm<sup>2</sup>. Kekerasan sebesar 58,89 kg/cm<sup>2</sup>. Interaksi antara kedudukan aksial dan radial berpengaruh nyata terhadap penyusutan volume dari segar sampai kering tanur. Kedudukan aksial maupun kedudukan radial berpengaruh nyata terhadap seluruh sifat fisika kayu, namun tidak berpengaruh nyata terhadap sifat mekanika kayu.

Kata kunci: kayu trembesi, sifat fisika, sifat mekanika, kedudukan aksial, kedudukan radial

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**AXIAL and RADIAL VARIATION of PHYSICAL and MECHANICAL  
PROPERTIES of TREMBESI (*Samanea saman* (Jacquin) Merrill) WOOD  
SPECIES GROWN in SUB-DISTRICT KALASAN, SLEMAN REGENCY**

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**ABSTRACT**

An effort to increase the added value of trembesi (*Samanea saman* (Jacquin) Merrill) had been done by first studying its physical and mechanical properties. Trembesi wood used in this study was from community forest in Sub-District Kalasan, Sleman Regency, Yogyakarta

This study used Completely Randomized Design (CRD) with three replications and two factors, namely axial position (bottom, middle, and top of the stem) and radial position (near the pith, middle, and near the bark). When the result of analysis of variance was significant different then would be tested using HSD (Honestly Significant Difference). Preparation for testing and sample size specimens method followed The British Standard Number 373 Year 1957.

These results indicates that trembesi wood has average value of green moisture content 165.38% and air-dry moisture content 18.69%. Specific gravity (SG) by green volume, SG by air-dry volume, and SG by oven-dry volume are 0.41, 0.43, and 0.45. Shrinkage values from green to air-dry condition of longitudinal, tangential, radial, and volume are 0.50%, 1.90%, 1.17%, and 1.56% then the value of T/R ratio is 2.36. Shrinkage from green to oven-dry condition of longitudinal, tangential, radial, and volume are 0.81%, 5.24%, 2.94%, and 6.37% then T/R ratio is 2.52. Swelling values from oven-dry to wet condition of longitudinal, tangential, radial, and volume are 1.58%, 6.69%, 4.51% and 7.22% then value of T/R ratio is 1.55. Average values of statics bending strength in Proportion Point, Modulus of Elasticity (MoE), and Modulus of Rupture (MoR) are 334.56 kg/cm<sup>2</sup>, 47.59 (x 1,000 kg/cm<sup>2</sup>), and 541.07 kg/cm<sup>2</sup>. Compression parallel to grain is 236.36 kg/cm<sup>2</sup>, compression perpendicular to grain is 121.64 kg/cm<sup>2</sup>. Shear parallel to grain is 234.77 kg/cm<sup>2</sup>. Hardness is 58.89 kg/cm<sup>2</sup>. Interaction between axial and radial position affect significantly to the volume shrinkage from green to oven-dry condition. Axial and radial position factor affect significantly to the whole nature of physical properties but they don't affect significantly to all of mechanical properties.

Keywords: trembesi wood, physical properties, mechanical properties, axial position, radial position

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