

SIFAT FISIKA DAN MEKANIKA KAYU SENGON BUTO (*Enterolobium cyclocarpum* Griseb) PADA ARAH RADIAL DAN AKSIAL YANG TUMBUH DI KLATEN

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INTISARI

Kayu sengon buto merupakan tanaman eksot yang berasal dari Mexico yang sekarang dikembangkan oleh perhutani untuk tanaman HTI. Berbagai manfaat dapat diperoleh dari kayu sengon buto. Dalam penggunaan kayu ini untuk, berbagai keperluan perlu dipertimbangkan sifat-sifat dasarnya dan faktor-faktor yang mempengaruhinya. Penelitian ini dilaksanakan untuk mengetahui variasi sifat fisika dan mekanika kayu sengon buto pada arah radial dan aksial yang tumbuh di Klaten.

Bahan penelitian ini adalah kayu sengon buto dari desa Kwarangan, Kecamatan Tulung Kabupaten Klaten dengan diameter $\pm 40,93$ cm. penelitian ini menggunakan rancangan acak lengkap dengan 3 ulangan dan 2 faktor yaitu kedudukan aksial (pangkal, tengah, ujung) dan radial (dekat hati, tengah, dekat kulit). Hasil analisis keragaman jika berbeda nyata kemudian diuji lanjut dengan uji HSD (*Honestly Significant Difference*). Pembuatan sampel uji dan pengujian mengikuti standard ASTM nomor 143 tahun 1981.

Hasil penelitian menunjukkan hasil rerata kadar air segar tebang dan kadar air kering udara kayu sengon buto seluruhnya sebesar 153,16% dan 13,96%; berat jenis segar, berat jenis kering angin dan berat jenis kering tanur berturut-turut sebesar 0,306, 0,326, dan 0,337; penyusutan radial, tangensial dan longitudinal dari keadaan segar sampai kering angin berturut-turut sebesar 2,14%, 2,21% dan 0,128%; penyusutan radial, tangensial dan longitudinal dari keadaan segar sampai kering tanur berturut-turut sebesar 2,43%, 3,41% dan 0,202%; pengembangan radial, tangensial dan longitudinal sampai maksimum berturut-turut 2,13%, 2,77% dan 0,178%. Keteguhan lengkung statik sampai batas proporsi, MOR dan MOE rata-rata sebesar 185,75 kg/cm², 311,21 kg/cm² dan 50,57 x 10³ kg/cm²; keteguhan tekan sejajar serat sampai batas proporsi, MOR dan MOY rata-rata sebesar 153,35 kg/cm², 189,80 kg/cm² dan 98,54 x 10³ kg/cm²; keteguhan belah sejajar serat sebesar 26,93 kg/cm²; keteguhan geser sebesar 50,97 kg/cm² dan keteguhan tekan tegak lurus serat sebesar 71,64 kg/cm². Analisis menunjukkan kedudukan radial berbeda nyata (0,05) pada kadar air kering angin, BJ kondisi segar, BJ kering angin, BJ kering tanur, penyusutan longitudinal dari segar sampai kering tanur dan keteguhan tekan sejajar serat sampai batas proporsi sedangkan kedudukan aksial berpengaruh nyata pada BJ kondisi segar, BJ kondisi kering angin, BJ kondisi kering tanur dan keteguhan belah .

Kata kunci : sifat fisika kayu, sifat mekanika kayu, radial, aksial, tangensial, longitudinal, BP, MOR, MOE, MOY

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**Physical and Mechanical Properties in Axial and Radial Ways of Sengon Buto
Wood (*Enterolobium cyclocarpum* Griseb) Which Grow in Klaten**

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Abstract

Sengon buto is an exotic plant from Mexico which is being developed by Perhutani for industrial plantation forest. Various uses can be obtained from sengon buto wood. In using of this wood for various purposes, it is necessary to consider its basic properties and influential factors. This research was conducted to find out the Physic and mechanical properties in axial and radial ways of sengon buto wood which grow in Klaten.

The material for this research is 40.93 cm in diameter breast high sengon buto woods which were taken from Kwarangan village, sub district of Tulung, Klaten district. This research uses complete randomized design with 3 repetitions and 2 factors, which are axial way (bottom, middle, top) and radial way (near to the pitch, middle, near to the bark). If any significant differences in analysis of variants found, HSD (honesty significant difference) post test will be conducted. The samples were made and tested according to ASTM standard no. 143 year 1981.

The result of this research shows that the average green and air-dry moisture content of sengon buto wood consecutively are 153.16% and 13.96%; green, air-dry and moisture free specific gravity consecutively are 0.306, 0.326 and 0.337; radial, tangential and longitudinal shrinkage from green condition to air-dry condition consecutively are 2.14%, 2.21% and 0.128%; radial, tangential and longitudinal shrinkage from green condition to moisture free condition consecutively are 2.43%, 3.41% and 0.202%; radial, tangential and longitudinal swelling to maximum condition consecutively are 2.13%, 2.77% and 0.178%. Average static bending strength till proportion limit, MOR and MOE consecutively are 185.75 kg/cm², 311.21 kg/cm² and 50.57 x 10³ kg/cm²; average compression strength parallel to grain till proportion limit, MOR and MOY consecutively are 153.35 kg/cm², 189.80 kg/cm² and 98.54 x 10³ kg/cm²; cleavage strength parallel to grain is 26.93 kg/cm²; sheer strength is 50.97 kg/cm² and compression strength perpendicular to grain is 71.64 kg/cm². The analysis shows a significant difference in radial way of air-dry moisture content, green specific gravity, air-dry specific gravity, moisture free specific gravity, longitudinal shrinkage form green to moisture free condition and compression strength parallel to grain till proportion limit. Axial way affect significantly to green specify gravity, air-dry specify gravity, moisture free specify gravity and sheer strength.

Key words: Physical properties of wood, mechanical properties of wood, radial, axial, tangential, longitudinal, BP, MOR, MOE, MOY.

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