

**PENGARUH POSISI RADIAL DAN ARAH MATA ANGIN TERHADAP  
SIFAT FISIKA KAYU MAHONI (*Swietenia macrophylla* King.)  
UMUR MUDA YANG TUMBUH DI GAMPING, SLEMAN**

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**INTISARI**

Mahoni merupakan salah satu jenis pohon komersial yang mudah ditemui di hutan rakyat. Oleh petani umumnya pohon telah ditebang ketika masih berusia muda dan pembeli mengaggap kayu hasil tebangannya bermutu rendah sehingga dibeli dengan harga murah. Keadaan ini terjadi karena terbatasnya informasi yang tersedia mengenai sifat-sifat dasar kayu tersebut. Oleh karena itu dalam penelitian ini telah dipelajari sifat dasar kayunya yang terdiri dari kadar air, berat jenis, perubahan dimensi serta kandungan ekstraktif.

Tiga batang pohon yang sehat dan bebas cacat di Desa Patukan, Kecamatan Gamping, Kabupaten Sleman, Yogyakarta ditebang dan dibuat sampel yang mengacu pada *British Standard 373* (1957). Penelitian ini menggunakan dua faktor yaitu kedudukan radial (dekat empulur, tengah, dan dekat kulit) dan arah mata angin (utara, timur, barat, dan selatan). Parameter yang diukur meliputi kadar air, berat jenis, penyusutan dan pengembangan serta dilakukan pengujian kadar ekstraktif (larut etanol-toluena dan larut air panas) pada bagian teras dan gubal.

Hasil penelitian menunjukkan bahwa kayu mahoni memiliki rata-rata kadar ekstraktif larut air panas sebesar 10,28% (teras) dan 6,67% (gubal), sedangkan kadar ekstraktif larut etanol-toluena sebesar 13,79% (teras) dan 6,40% (gubal). Rata-rata kadar air segar 58,62% (53,10-66,76%), kadar air kering udara 13,44% (13,10-13,61%), berat jenis segar 0,57 (0,47-0,62), berat jenis kering udara 0,59 (0,51-0,66) dan berat jenis kering tanur 0,62 (0,54-0,71). Penyusutan radial, tangensial dan longitudinal dari kondisi segar sampai kering udara sebesar 1,11% (0,65-1,29%), 1,95% (1,45-2,44%), dan 0,43% (0,24-0,65%), serta rasio T/R sebesar 2,09 (1,71-2,95). Penyusutan radial, tangensial dan longitudinal dari kondisi segar sampai kering tanur sebesar 3,06% (2,62-3,34%), 4,98% (3,55-5,59%) dan 0,60% (0,46-0,85%), serta rasio T/R sebesar 1,66 (1,14-1,88). Pengembangan radial, tangensial dan longitudinal dari kering tanur sampai basah sebesar 2,86% (2,53-3,20%), 4,93% (3,67-5,73%) dan 0,45% (0,29-0,60%), serta rasio T/R sebesar 1,75 (1,28-2,06). Variasi arah radial memberikan pengaruh nyata terhadap sifat fisika kayu mahoni pada parameter kadar air segar, berat jenis segar, berat jenis kering udara, berat jenis kering tanur, dan pengembangan arah longitudinal. Sedangkan arah mata angin serta interaksi kedua faktor tidak memberikan pengaruh nyata terhadap sifat fisika kayu mahoni.

Kata kunci: mahoni, sifat fisika, ekstraktif, umur muda, Gamping-Sleman

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**EFFECT OF RADIAL POSITION AND CARDINAL DIRECTION ON  
PHYSICAL PROPERTIES of YOUNG TREE MAHOGANY  
(*Swietenia macrophylla* King.) GROWN in GAMPING, SLEMAN**

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**ABSTRACT**

Mahogany is one species of commercial tree that is easily found in community forests. In most cases, the farmers cut down mahogany trees when they are still young and consequently, the buyer assume that harvested mahogany trees have low quality and would get only a low price. This is due to the lack of basic knowledge about mahogany wood properties. This research, therefore, has an objective to study more about the basic properties of mahogany wood which focusing on its moisture content, specific gravity, dimensional changes, and extractive content.

Three healthy and defect-free trees in Patukan Village, Gamping District, Sleman Regency, Yogyakarta were felled and sampled with reference to British Standard 373 (1957). This study used two factors, namely radial position (near the pith, middle, and near the bark) and cardinal direction (north, east, west, and south). Parameters measured included moisture content, specific gravity, dimensional changes (shrinkage and swelling) and testing of extractive content (ethanol-toluene soluble and hot water soluble) on the heartwood and sapwood.

The results showed that the average of hot water soluble extractive and extractive ethanol-toluene content were 7.62-9.16% (10.28% in heartwood and 6.67% in sapwood) and 8.55-11.01% (13.79% in heartwood and 6.40% in sapwood). The average of green and air-dry moisture content, green, air-dry and oven-dry specific gravity were 58.62% (53.10-66.76%), 13.44% (13.10-13.61%), 0.57 (0.47-0.62), 0.59 (0.51-0.66) and 0.62 (0.54-0.71) respectively. The shrinkage values from green to air-dry condition of radial, tangential and longitudinal were 1.11% (0.65-1.29%), 1.95% (1.45-2.44%) and 0.43% (0.24-0.65%), then value of T/R ratio was 2.09 (1.29-2.95). The shrinkage from green to oven-dry condition of radial, tangential and longitudinal were 3.06% (2.62-3.34%), 4.98% (3.55-5.59%) and 0.60% (0.46-0.85%), then value of T/R ratio was 1.66 (1.14-1.88). Swelling values from oven-dry to wet condition of radial, tangential and longitudinal were 2.86% (2.53-3.20%), 4.93% (3.67-5.73%) and 0.45% (0.29-0.60%), then value of T/R was 1.75 (1.28-2.06). Radial position variation showed significant effect on green moisture content, green specific gravity, air-dry specific gravity, oven-dry specific gravity, and longitudinal swelling. While, cardinal direction and interaction between factors didn't affect significantly to all of physical properties.

**Keywords:** mahogany, physical properties, extractive content, young tree, Gamping-Sleman

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