

**Variasi Ketahanan Alami terhadap Rayap pada Kayu Jati (*Tectona grandis* L. f.)
dari Hutan Rakyat Kulon Progo**

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INTISARI

Kayu merupakan bahan baku yang memiliki manfaat besar bagi manusia. Tingginya kebutuhan dan semakin menurunnya sumber bahan kayu, mengakibatkan timbulnya alternatif pemilihan kayu dari hutan rakyat. Salah satu jenis tanaman hutan rakyat yang disukai masyarakat adalah kayu Jati (*Tectona grandis*), karena kekuatan dan keawetan alaminya yang tinggi. Yogyakarta merupakan salah satu penghasil kayu Jati hutan rakyat, khususnya Kabupaten Kulon Progo. Penelitian ini bertujuan untuk mengetahui variasi ketahanan alami, sifat kimia dan sifat warna kayu akibat pengaruh faktor arah radial dan tempat tumbuh, serta mengetahui hubungan antara sifat kimia dan sifat warna, terhadap ketahanan alami terhadap rayap pada kayu Jati Kulon Progo.

Bahan yang dipakai adalah 3 pohon Jati asal Temon, Kulon Progo (18 tahun) dan 3 pohon Jati asal Kalibawang, Kulon Progo (15 tahun). Sebagai pembandingan adalah kayu Jati dewasa Perhutani Madiun (65 tahun). Sampel disk dengan ketebalan 5 cm, yang diambil dari bagian pangkal. Penampang radial disk dibagi menjadi 3 bagian, yaitu gubal, teras luar dan teras dalam. Setiap bagian, diambil blok untuk menguji keawetan alami kayu dan serbuk 40-60 mesh untuk menguji sifat kimia. Keawetan alami ditentukan dari daya tahannya terhadap rayap tanah (*Coptotermes curvignathus*) menggunakan metode *choice feeding* dan rayap kayu kering (*Cryptotermes cynocephalus*) dengan metode *no-choice feeding*. Kadar ekstraktif etanol toluena mengacu pada ASTM D 1105-96. Kadar Lignin mengacu pada ASTM D 110 – 84. Kadar fenolat dihitung berdasarkan metode Folin-Ciocalteu. Sifat warna diukur dengan sistem CIE $L^*a^*b^*$.

Hasil penelitian menunjukkan keawetan alami terhadap rayap pada Jati Kulon Progo hampir sama dengan Jati Perhutani Madiun. Kehilangan massa karena rayap kayu kering berkisar 5,3 - 23,37mg, sedangkan terhadap rayap tanah berkisar 14,38 - 395,8 mg. Persen kematian rayap kayu kering berkisar 69,33 - 90,67%. Kadar ekstraktif etanol toluena, fenolat total dan lignin secara berurutan berkisar 3,45 - 11,43; 0,31 - 8,35 (mg/g setara asam gallat); dan 24,91 - 42,12. Sifat warna L^* (kecerahan), a^* (kemarahan), dan b^* (kekuningan) secara berurutan berkisar 37,22 - 64,42; 8,76 - 15,47; dan 20,98 - 26,5. Faktor tempat tumbuh berpengaruh nyata pada nilai kehilangan massa karena rayap tanah, L^* , a^* , dan b^* . Faktor radial berpengaruh nyata pada kehilangan massa karena rayap kayu kering dan rayap tanah, kadar ekstraktif larut etanol-toluena, L^* , dan a^* . Korelasi nyata antara kadar ekstraktif larut alkohol toluena dengan kehilangan massa karena rayap tanah pada gabungan gubal dan teras, serta rayap kayu kering pada bagian gubal berturut-turut sebesar $r = 0,78$ dan $-0,46$. Pada bagian teras, L^* dan a^* berkorelasi nyata dengan kehilangan massa karena rayap tanah sebesar $r = 0,50$ dan $r = -0,50$, secara berurutan.

Kata kunci: *Tectona grandis*, anti rayap, ekstraktif, warna, hutan rakyat, Kulon Progo

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Variation in the Natural Durability against of Termites of Teak Wood (*Tectona grandis* L. f.) from Kulon Progo Community Forests
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ABSTRACT

Wood is a raw material that has huge advantages for human being. The high demand and the decline of wood resources are forcing to find alternative choices such as gaining wood from community forests. One of the favorite timber in the society is Teak wood (*Tectona grandis*) due to the high strength and natural durability. In community forests, Yogyakarta is one of the Teak wood suppliers, especially from Kulon Progo regency. The aims of this research are to find out the variation of natural durability againts termites, chemical, and color properties of wood that were influenced by the radial direction and growth site factor, as well as, to discover the relation between chemical or color properties and the antitermitic properties in Teak wood.

The materials, used in this research were three eighteen-year old Teak from Temon, three fifteen-year old Teak trees from Kalibawang, Kulon Progo. As comparison, 65 years old Teak from Perhutani were used. The disk sample (5 cm in thickness) was taken from the base part of the trees. The radial section is divided into 3 parts which were sapwood, outer and inner heartwood. In each part, block to examine the natural durability and 40-60 mesh powder were taken for chemical examination. The natural durability properties were determined from *Coptotemes curvignathus* using choice feeding method and *Cryptotermes cynocephalus* termites attacks by using no-choice feeding method. The determination of etanol toluene extractive content is based on ASTM D 1105-96 while the lignin content refers to ASTM 110-84. Total phenolic content is determined based on Folin-Ciocalteau method. The color property is measured by using CIE L*a*b system.

The result of the research shows the natural durability againts termites in Teak Kulon Progo is almost similar with Teak from Perhutani Madiun. The mass loss due to dry wood termites is 5.3 – 23.37 mg, while that of subterranean termites ranges 14.38 – 395.8 mg. The mortality percentage of dry wood termittes is 69.33-90.67 %. Ethanol-toluene extractive, total phenolic and lignin content are 3.45–11.43%; 0.31-8.35(mg/g gallic acid equivalent); and 24.91-42.12% respectively. The color properties of L* (brightness), a*(reddish) and b* (yellowish) indexes are 37.22-64.42; 8.76-15.47; and 20.98-26.5 respectively. The growth site factor affects significantly to the mass loss due to subterranean termites, L*, a* and b* levels. Radial factor affect significantly to the mass loss due to subterranean termites, etanol-toluene extractive content, L*, and a* indexes. The significant correlation is found between the ethanol-toluene extractive content and mass loss due to subterranean termites in the combination of heartwood and sapwood data as well as dry wood termites in the sapwood $r = 0.78$ and -0.46 , respectively. In the heartwood data, L* and a* levels significantly correlated with the mass loss due to subterranean termites with the degree of $r = 0.50$ and $r = -0.50$, respectively.

Keywords :*Tectona grandis*, anti-termite, extractive, color properties, community forest, Kulon Progo.

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