Studi Keawetan Alami Terhadap Rayap Dihubungkan dengan Komposisi Ekstraktif Kayu Jati dari Hutan Rakyat Kulon Progo

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INTISARI

Kebutuhan akan kayu sebagai bahan konstruksi terus mengalami peningkatan. Salah satu spesies yang diminati oleh masyarakat adalah kayu Jati (*Tectona grandis*) karena kekuatan dan keawetan alami yang tinggi. Saat ini pemanfaatan kayu Jati dari hutan rakyat semakin meningkat. Khususnya di Kulon Progo, hutan rakyat Jati tersebar di daerah-daerah dengan karakteristik berbeda. Kayu hutan rakyat diketahui didominasi oleh kayu juvenil dan gubal. Dalam pemanfaatan, keberadaan kayu tersebut kurang disukai karena sifatnya yang kurang baik. Oleh karena itu dilakukan penelitian tentang keawetan alami terhadap rayap, kadar ekstraktif, komposisi ekstraktif dan kadar fenolat 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 pembanding 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 : 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 (*Coptotemes curvignathus)* menggunakan metode *choice* dan rayap kayu kering *(Cryptotermes cynocephalus)* menggunakan metode *no-choice*. Kadar ekstraktif etanol toluena mengacu pada ASTM D 1105-96. Komposisi ekstraktif ditentukan dengan fraksinasi bertingkat dari ekstrak etanol-toluena dengan 3 pelarut berbeda (eter, etil asetat dan metanol). Kadar fenolat total dihitung berdasarkan metode Folin-Ciocalteau.

Hasil penelitian menunjukkan keawetan alami terhadap rayap Jati Kulon Progo hampir sama dengan Jati Perhutani Madiun. Kehilangan massa terhadap rayap tanah berkisar 2,30–18,03%. Kehilangan massa dan persen kehidupan terhadap rayap kayu kering berkisar 0,36–2,12% dan 9,33–24,67%, berturutan. Kadar ekstraktif etanol toluena dan kadar fenolat berkisar 4,59–9,05% dan 0-8,69%, berturutan. Ekstraktif Jati Kulon Progo didominasi oleh fraksi terlarut eter. Adanya korelasi nyata antara kehilangan massa rayap tanah dengan fraksi terlarut metanol (r = 0,43). Pada kayu teras, korelasi nyata tertinggi didapatkan antara kehilangan massa rayap kayu kering dengan fraksi terlarut metanol (r = 0,82) pada gubal dan berkorelasi nyata dengan fraksi residu (r = 0,62). Persen kehidupan dan kadar fenolat tidak berkorelasi dengan sifat kimia. Faktor tempat tumbuh berpengaruh nyata pada kehilangan massa rayap kayu kering. Faktor radial berpengaruh nyata pada kehilangan masssa rayap tanah dan kadar ekstraktif larut etanol-toluena.

Kata kunci: *Tectona grandis*, keawetan alami, komposisi ekstraktif, anti rayap, Kulon Progo

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Study of Natural Durability Againts Termite in Relation to Extractive Composition of Teak Forest Community in Kulon Progo

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ABSTRACT

The need for wood as the material construction continues to increase. One of the species which is interested by the consumers is teak (*Tectona grandis*) because of its strength and high natural durability. Currently, the use of teak timber from community forest has been increasing. Particularly in Kulonprogo, teak community forests are scattered with different characteristics. Such kind of timber is known to be dominated by juvenile wood and sapwood. The utilization of those wood is less preferred due to inferior properties. Therefore, the research on the natural durability to termites related to extractives and phenolic content of teakwood from Kulon Progo was conducted.

Teak material which is used were three trees from Temon, Kulon Progo (18 years old) and three trees from Kalibawang (15 years old). For comparison trees, Perhutani Madiun (65 years old) were felled. The sample disks (5 cm in thickness) taken from the base parts of the trees. The disk in radial cross section was divided into 3 parts: sapwood, outer heartwood and inner heartwood. From each section, the wood blocks were taken for termite tests as well as wood powder (40-60 mesh) for chemical properties evaluation. Natural durability was determined from its resistance against subterranean termites (*Coptotemes curvignathus*) by choice feeding method and dry wood termites (*Cryptotermes cynocephalus*) by no-choice feeding method. Extractive content of ethanol-toluene referred to ASTM D 1105-96. Extractive composition was determined by successive fractionation of the ethanol toluene extract in 3 different solvent (ether, ethyl acetate and methanol). Total phenolic content was calculated by Folin-Ciocalteau method.

The results showed that natural durability to termites of Teak from Kulonprogo is almost similar to Teak from Perhutani Madiun. The mass loss toward subterranean termites approximately 2.30 to 18,03%. Mass loss and survival percentage of dry wood termites approximately 0.36 to 2.12% and 9.33 to 24.67%, respectively. Extractives content of ethanol-toluene and total phenolic content approximately 4.59 to 9.05% and 0 to 8.69 mg/g GAE, respectively. Extractive composition of Teak from Kulonprogo is dominated by ether soluble fraction. There was a significant correlation between the mass loss subterranean termites values with methanol soluble fraction (r = 0,43). The highest degree of correlation was observed between the mass loss of dry wood termites and methanol soluble fraction levels(r = 0.82) in the sapwood. In the heartwood highest correlation was found between the mass loss of dry wood termites and residue fraction levels(r = 0.62). Survival rate and total phenolic content levels did not correlate with the values of chemical properties. Site growth significantly affected the mass loss of dry wood termites. Radial factor significantly affected the mass los subterranean termites as well as ethanol-toluene extractive content.

Key Word: *Tectona grandis*, natural durability, extractive composition, anti termite, Kulon Progo

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