



INTISARI

Sifat Kimia Kayu Jati Juvenil (*Tectona grandis* Linn. fil.)

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Kayu sebagai komponen bangunan yang berasal dari hutan alam pasokannya semakin menurun sejalan dengan degradasi hutan dan kenaikan kebutuhan akan kayu. Salah satu jenis kayu yang banyak digunakan adalah kayu jati (*Tectona grandis* Linn. fil.) karena kayu ini memiliki keunggulan berupa kelas kuat dan kelas awetnya yang tinggi. Kayu-kayu yang diperoleh dari hutan Wanagama dan PT Sari Bumi Kusuma Kalimantan Tengah sebagian besar masih juvenil. Pustaka mengenai kayu jati juvenil masih sangat sedikit, sedangkan penggunaan kayu juvenil sekarang ini semakin banyak. Keadaan ini menimbulkan keingintahuan untuk meneliti sifat kimia penyusun kayu jati yang masih juvenil tersebut berdasarkan arah radial dan tempat tumbuhnya.

Bahan penelitian yang digunakan adalah pohon jati yang berumur 5 tahun yang tumbuh di Hutan Pendidikan Wanagama, kabupaten Gunungkidul sebanyak 8 pohon dan kayu jati dari Kalimantan yang berumur 7 tahun yang berasal dari pohon yang ditanam oleh PT. Sari Bumi Kusuma, Kalimantan Tengah sebanyak 3 pohon. Kesebelas disk kayu juvenil ini berasal dari masing-masing pohon yang dipotong searah radial pada ketinggian 1,3 meter dan diuji pada 2 arah radial (gubal dan teras). Adapun sifat kimia yang akan diuji adalah kadar ekstraktif larut air panas dan larut etanol-toluena (ASTM D 1107-96 dan ASTM D 1110-84), kadar holoselulosa (Browning, 1967), kadar alfa selulosa (ASTM D 1103-60), kadar lignin (ASTM D 1106-96), kadar abu (ASTM D 1102-84), kadar abu tak larut asam (TAPPI T 244 om-88), kelarutan dalam NaOH 1% (ASTM D 1109-84), dan keasaman kayu. Sebagai kontrol digunakan pohon Jati dari Perhutani KPH Madiun, yang berumur 65 tahun sebanyak 3 pohon

Kisaran nilai kimia dari jati juvenil adalah kadar holoselulosa 79,31-80,43%, alfa selulosa 45,09-48,98%, lignin 28,40-29,69%, kelarutan dalam NaOH 1% 10,80-15,02%, ekstraktif total 3,35-8,00%, abu 0,65-0,81%, abu tak larut asam 1537-2300 ppm, dan nilai pH 5,68-6,69. Kadar holoselulosa dan lignin kayu jati juvenil pada bagian gubal dan teras hampir sama, sedangkan kadar selulose, kadar abu, dan nilai pH sedikit lebih tinggi pada bagian gubal. Kadar kelarutan kayu jati juvenil dalam NaOH 1%, kadar ekstraktif total dan kadar abu tak larut asam pada sedikit lebih tinggi bagian teras. Rata-rata kadar lignin, kelarutan dalam NaOH 1%, kadar ekstraktif, kadar abu, kadar abu tak larut asam pada kayu jati dewasa lebih tinggi dibandingkan kayu jati juvenil. Sedangkan kadar holoselulosa, kadar alfa selulosa, dan nilai pH kayu jati dewasa lebih rendah dari pada kayu jati juvenil. Dari analisis Korelasi Pearson, didapatkan korelasi sangat nyata antara diameter dengan variasi kadar abu pada bagian gubal ($r = 0,75$). Dari analisis korelasi ini juga didapatkan korelasi yang nyata antara diameter dengan variasi kadar alfa selulosa pada bagian teras ($r = -0,65$), kadar abu tak larut asam pada bagian gubal ($r = 0,61$), kadar alfa selulose ($r = -0,48$) dan kadar abu ($r = 0,45$) pada bagian teras dan gubal

Kata kunci: *Tectona grandis*, juvenil, sifat kimia, diameter pohon, arah radial

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ABSTRACT

The Chemical Properties of Juvenile Teak (*Tectona grandis* Linn. fil.)

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The availability of timber from natural forests is decreasing as forest degradation and demand for construction materials increases. Due to its strength and high durability, one of the most commonly used species is teak (*Tectona grandis* Linn. Fil). The number of literatures with regard to juvenile teak wood is limited despite the increasing of its frequent using. Therefore, the research on chemical properties of young teak, based on its radial direction and growth site is an interesting subject of study.

The samples used in this research were 5-year-old teak trees grown in Wanagama Education Forest, Gunungkidul (8 individuals) and 7-year-old teak trees planted by PT. Sari Bumi Kusuma, Central Kalimantan (3 individuals). Eleven disks of juvenile wood were cut in radial direction at a height of 1.3 meters and each disk was divided into sapwood and heartwood. The chemical properties tested were the content of the hot water ethanol-toluene soluble extractives (ASTM D 1107-96 and ASTM D 1110-84), the content of holocellulose (Browning, 1967), alpha cellulose content (ASTM D 1103-60), lignin content (ASTM D 1106-96), ash content (ASTM D 1102-84), the content of acid insoluble ash (TAPPI T 244 om-88), solubility in NaOH 1% (ASTM D 1109-84), and the acidity of wood. Three 65-year-old teak trees from Perhutani KPH Madiun were used as a control.

The chemical properties of the juvenile teak wood were: holocellulose content 79.31-80.43%, alpha cellulose 45.09-48.98%, lignin 28.40-29.69%, solubility in NaOH 1% 10.80-15.02 %, total extractives 3.35-8.00%, ash 0.65-0.81%, acid insoluble ash 1537-2300 ppm, and pH values 5.68-6.69. The levels of holocellulose and lignin content of juvenile teak wood in the sapwood and the heartwood were almost similar. In contrast, the cellulose content, ash content, and pH values were slightly higher in the sapwood. The levels of solubility in NaOH 1%, total extractive and acid insoluble ash contents were slightly higher in the heartwood. The average levels of lignin, solubility in 1% NaOH, total extractive, ash and acid insoluble ash contents in mature teak are higher than those of juvenile teak. The levels of holocellulose, alpha cellulose contents, and the pH value of mature teak wood were lower than those of juvenile teak. From Pearson's correlation analysis, it can be observed that there is a highly significant correlation between the tree diameter and the variation of ash content in the sapwood ($r = 0.75$). There is also a significant correlation between the diameter and alpha cellulose content in the heartwood ($r = -0.65$), acid insoluble ash content in the sapwood ($r = 0.61$) as well as the correlation between diameter and the alpha cellulose content ($r = -0.48$) and ash content ($r = 0.45$) in the heartwood and the sapwood.

Key words: *Tectona grandis*, juvenile, chemical properties, tree diameter, radial direction