INTISARI

Penyebab kesulitan bahan baku kayu pada suatu i11dustri pengolahan kayu diantaranya adalah penggunaan kayu yang sesuai rnakin berkurang. Kesesuaian suatu jenis kayu dengan penggunaannya bisa dilihat dari sifat dasar kayu. Penelitian ini bertujuan untuk mengetahui variasi struktur anatomi, sifat kimia, fisika-mekanika kayu johar (Cassia siamea Lamk).

Rancangan yang digunakan dalam penelitian ini adalah rancangan acak lengkap yang disusun secara faktorial. Faktor perlakuan ada dua yaitu faktor letak batang pada arah aksial (pangkal, tengah, ujung) dan arah radial (dekat hati, antara hati-kulit dan dekat kulit)

Hasil penelitian menunjukkan bahwa pada sifat struktur anatomi, interaksi arah aksial dan radial berpengaruh nyata pada panjang serat dengan kisaran nilai 1,09 - 1,33 mm dan diameter lumen (4,35 - 8,31µ). Faktor arah aksial berpengaruh terhadap proporsi sel pembuluh dengan nilai dari pangkal, tengah, ujung berturut-turut adalah 8,55%; 10,89%; 11,62%, panjang serat (1,11 mm: 1,18 mm: 1,23 mm), diameter lumen (5,28µ : 6,1µ : 6,84 µ) dan tebal dinding sel (3,56 t; 3,63 t; 3,03 I). Faktor arah radial berpengaruh terhadap panjang serat dengan nilai dari dekat hati, antara hati-kulit,dekat kulit adalah 1, 15 mm: 1, 19 mm; 1,23 mm, diameter lumen (6,25 µ: 6,76 µ: 5,21 µ), tebal dinding serat (3,24 µ: 2,97µ: 4,01µ).

Pada sifat kimia kayu johar, interaksi kedua faktor berpengaruh terhadap ekstraktif larut air dingin dengan kisaran nilai 4,44 - 7,41%, ekstrakrtif larut air panas (6,16% - 12,74%), holoselulosa (70,25% - 80,98%). Faktor arah aksial berpengarnh terhadap ekstraktif larut air dingin (6,58%; 6,37% ; 5,31%), ekstraktif larut air panas (10,66%; 10,13% ; 8,49%), ekstraktif larut alkohol benzen (8,05% ; 6,91% ; 5,55%). Faktor arah radial berpengaruh terhadap ekstraktif larut air dingin (6,1% ; 6,73% ; 5,34%), ekstraktif larut air panas (10,9%; 11,82%; 6,56%), ekstraktif larut alkohol benzen (8,05% ; 8,81% ; 3,65%), holoselulosa (72,52%; 74,36% ; 78,2%), alfaselulosa (45,95%; 45,98%; 39,86%), lignin (33,74% : 36,69% ; 31,34%).

Pada sifat fisika kayu johar, interaksi kedua faktor berpengaruh terhadap kadar air kering angin dengan kisaran nilai 10,89% - 12,82% , BJ segar (0,62 - 0,79), penyusutan radial dari kondisi segar ke kondisi kering angin (1,87 % - 4,73%), penyusutan radial dari kondisi segar ke kondisi kering tanur (4,08% - 6,83 %). Faktor arah radial berpengaruh terhadap kadar air segar (81,47%; 62,17% ; 65,94%), kadar air kering angin (11,31% ; 10,88% ; 12,6%), BJ segar (0,66; 0,76: 0,70), BJ kering angin (0,71: 0,80; 0,72), BJ kering tanur (0,77; 0,86 ; 0,78), penyusutan tangensial dari kondisi segar ke kering angin (6,64% ; 4,69%: 4,55%), penyusutan tangensial dari kondisi segar ke kering tanur (9,71 %; 8,59% ; 8,67%)

Pada sifat mekanika kayu johar, interaksi kedua faJ„1or berpengaruh terhadap keteguhan tekan tegak lurus serat dengan kisaran nilai 243, 15 kg/cm² - 346,0 kg/cm² dan keteguhan geser sejajar serat (113,56 kg/cm² - 193,46 kg/cm²). Faktor arah aksial berpengaruh terhadap keteguhan tekan tegak lurus serat (281,23 kg/cm\ 319,6 kg/cm²; 283,73 kg/cm²). Faktor arah radial berpengaruh terhadap MoE (118400 kg/cl1 12; 123600 kg/cm²: 109603 kg/cm²), keteguhan lengkung pada batas proporsi (899 kg/cm : 791,63 kg/cm²; 612,24 kg/cm²), keteguhan tekan tegak lurus serat (279,22 kg/cm²; 330,13 kg/cm²; 275,21 kg/cm²), keteguhan tekan sejajar serat (691,05 kg/cm²; 791,63 kg/crn²; 612,24 kg/crn²), dan kekerasan kayu (645,52 kg/cm²: 743,45 kg/cm²; 606,77 kg/cm²).

Kata kunci : stuktur anatorni, sifat kimia, sifat l'isika-rnekanika, kayu _iohar

ABSTRACT

One of the problem in wood industry that the availability of wood suitable for end-use is decreasing. The suitability of wood for its end-use could be judged from its basic properties. This study had the objectives to know the variation in anatomical structure, chemical and physico-mechanical properties of johar wood (Cassia siamea Lamk). This study applied a completely randomised desi!:,m arranged in a factorial experiment.

Results of the study showed that in terms of its anatomical structure, interaction between axial and radial direction had a si$_{gn}$ificant effect on fiber length (ranging from 1,09 - 1,33 mm) and lumen diamter (4,35-8,31 µm). The axial direction factor had an effect on values for basic, mid and top portion, i.e. proportion of vessels 8.55%, 10.89%, and 11.62% respectively; fiber length (1.11 mm; 1.18 mm; 1.23mm), lumen diameter (5.28µm; 6.1 µm ; 6.84µm) and fiber wall thickness (3.56 trn ; 3.63µrn; 3.03 trn). The radial direction factor had an effect on values i.e. from near the pith, between the pith and the bark: fiber length (1.15 µm, 1.19 µm, 1.23 µm), lumen diameter (6.25 µrn, 6.76µm, 5.21 trn), cell wall thickness (3.24µm 2.97µm, 4.01µm).

With respect to chemical properties, interaction of both factors had an effect on extractive content soluble in cool water and hot water with a value of 4.44 - 7.41 % and 6.16 - 12.74% and holocellulose (70.25 - 80.98%) respectively. The axial direction factor had an effect on values for basic, mid and top portion, i.e.' extractive content soluble in cool water (6.58%, 6.37%, 5.31%), in hot water (10.66%, 10.13%, 8.49%), and in alcohol benzene (8.05%, 6.91%, 5.55%). The radial direction factor had an effect on extractive content soluble in cool water (6.1%, 6.73%, 5.34%), in hot water (10.9%, 11.82%, 6.56%), in alcohol benzene (8.05%, 8.81%, 3.65%), holocel1ulose (72.52%, 74.36%, 78.2%), alfacellulose (45.95%, 45.98%, 39.86%), li$_{gn}$in (33.74%, 36.69%, 31.34%).

With respect to physical properties of johar wood, interaction of both factors had an effect on air dry moisture content with a value of 10.89 - 12.82%, specific gravity (green moisture content) (0.62 - 0.79), radial shrinkage from !:;Teen to air dry condition (1.87 - 4.73%), and from green to ovendry (4.08 - 6.83%). The radial direction factor had an effect on green moisture content (81.47%; 62.17%; 65.94%), airdry moisture content (11.31%; 10.88%; 12.6%), specific gravity (brreen) (0.66, 0.76, 0.70), specific gravity (airdry) (0.71, 0.80, 0.72), specific gravity (ovendry) (0.77, 0.86, 0.78), the tangential shrinkage from green to air dry (6.64%, 4.69%, 4.55%).

With respect to mechanical properties, interaction of both factors had an effect on the compression perpend.iculer to grain (243.15 kg/cm^2 - 346.0 kg/cm^2) and shear paralel to grain (113.56 kg/cm^2 - 193.46 kg/cm^2). %). The axial direction factor had an effect on values for basic, mid and top portion, i.e. on the compression perpendiculer to grain (281.23 kg/cm^2; 319.6 kg/cm"; 283.73 kg/crn^2). The radial direction factors had an effect on modulus or elasticity (118400 kg/cm"; 123600 kg/crn^2; 109603 kg/cm^2), fiber stress at proportional limit (899 kg/cm^2; 791.63 kg/cm^2; 612.24 kg/cm^2), compression perpendiculer to grain (279.22 kg/cm^2; 330.13 kg/cm\ 275.21 kg/cm^2), compression paralel to grain (691.05 kg/cm^2; 791.63 kg/cm\ 612;24 kg/cm^2), and hardness of wood (645.52 kg/cm^2; 743.45 kg/cm"; 606.77 kg/cm^2).

Keywords anatomical st'ucture, chemical properties, physico-mechanical properties. johar wood.