

## STABILITAS DIMENSI DAN SIFAT MEKANIKA KAYU RANDU (*Ceiba pentandra* (L.) Gaertn.) TERKOMPREGNASI FENOL FORMALDEHIDA

Oleh:

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### INTISARI

Kayu randu memiliki kondisi sifat fisik dan mekanis yang terbilang rendah sehingga menyebabkan kayu ini jarang dimanfaatkan, oleh karena itu diperlukan peningkatan dengan memodifikasi kayu menggunakan teknologi. Melalui perlakuan kompregnasi fenol formaldehida ini harapannya akan meningkatkan stabilitas dimensi dan mekanika kayu randu serta usaha dalam penggunaan dalam lingkup lebih luas.

Dalam penelitian ini digunakan pengambilan sampel secara acak menggunakan model rancangan percobaan pola acak lengkap (Completely Randomized Design). Konsentrasi yang digunakan sebesar: 10%,15%,20% dan waktu penekanan kompregnasi selama: 30 menit, 45 menit, 60 menit sehingga diperoleh 9 kombinasi perlakuan dengan 5 kali ulangan dengan tekanan sebesar 5 kg/cm<sup>3</sup>. Parameter yang diamanti meliputi retensi, kadar air, berat jenis, perubahan dimensi, dan mekanika kayu dengan berdasarkan standar British Standard No. 373 tahun 1957, yang kemudian dilakukan Analisis keragaman (ANOVA) dan uji lanjut HSD (tukey).

Hasil penelitian menunjukkan faktor konsentrasi fenol formaldehida berpengaruh terhadap nilai retensi rerata 79,84 kg/m<sup>3</sup>; kadar air kering udara 14,34%; berat jenis 0,33; perubahan dimensi dibandingkan dengan kontrol pada arah longitudinal mengalami penurunan sebesar 54,45%; arah tangensial 98,88%; arah radial 80,14%; rasio T/R 21,35%; rerata ASE tangensial 50,85; MOE 2003,42 kg/cm<sup>2</sup>; MOR 16,24 kg/cm<sup>2</sup>; kekerasan 67,197 kg/cm<sup>2</sup>; tekan tegak lurus serat 42,76 kg/cm<sup>2</sup>. Faktor konsentrasi PF memberikan pengaruh signifikan terhadap retensi, dan berat jenis kayu. Sedangkan konsentrasi, lama penekanan, dan interaksi antar kedua faktor tidak memberikan pengaruh signifikan pada parameter stabilitas dimensi dan mekanika kayu.

Kata kunci: Kompregnasi, fenol formaldehida, stabilitas dimensi, sifat mekanika, kayu randu (*Ceiba pentandra* (L.) Gaertn.).

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## DIMENSIONAL STABILITY AND MECHANICAL PROPERTIES OF RANDU WOOD (*Ceiba pentandra* (L.) Gaertn.) COMPREGNED PHENOL FORMALDEHYDE

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### ABSTRACT

Randu wood has low physical and mechanical properties that cause this wood to be rarely utilised, therefore improvement is needed by modifying the wood using technology. Through this phenol formaldehyde compregnation treatment, it is hoped that it will improve the dimensional stability and mechanics of randu wood as well as efforts to use it in a wider scope.

In this study, randomised sampling was used using a Completely Randomised Design model. The concentrations used were: 10%, 15%, 20% and compregnation pressing time for: 30 minutes, 45 minutes, 60 minutes so that there were 9 treatment combinations with 5 replications with a pressure of 5 kg/cm<sup>3</sup>. The parameters included retention, moisture content, specific gravity, dimensional changes, and wood mechanics based on British Standard No. 373 of 1957, which was then subjected to Analysis of Variance (ANOVA) and HSD (tukey) further test.

The results showed that the phenol formaldehyde concentration factor affected the average retention value of 79.84 kg/m<sup>3</sup>; air dry moisture content of 14.34%; specific gravity of 0.33; dimensional changes compared to the control in the longitudinal direction decreased by 54.45%; tangential direction 98.88%; radial direction 80.14%; T/R ratio 21.35%; mean tangential ASE 50.85; MOE 2003.42 kg/cm<sup>2</sup>; MOR 16.24 kg/cm<sup>2</sup>; hardness 67.197 kg/cm<sup>2</sup>; fibre perpendicular compression 42.76 kg/cm<sup>2</sup>. PF concentration factor has a significant effect on retention, and specific gravity of wood. While the concentration, pressing time, and interaction between the two factors did not have a significant effect on dimensional stability parameters and wood mechanics.

**Keywords:** Compregnation, phenol formaldehyde, dimensional stability, mechanical properties, randu wood (*Ceiba pentandra* (L.) Gaertn.).

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