

PENGARUH VARIASI JUMLAH PEREKAT GAMBIR-SUKROSA DAN SUHU PENGEMPAAN TERHADAP SIFAT PAPAN PARTIKEL INTI RAMI

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INTISARI

Industri pengolahan tanaman rami (*Boehmeria nivea*) menghasilkan limbah berupa inti rami melimpah dan berpotensi dijadikan sebagai papan partikel. Kombinasi serbuk ekstrak gambir (*Uncaria gambir* (Hunter) Roxb) dan sukrosa dapat menghasilkan ikatan kimia yang dapat berfungsi sebagai perekat alami. Variasi jumlah perekat gambir-sukrosa dan suhu pengempaan diduga berpengaruh terhadap kualitas papan partikel inti rami. Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh variasi kedua faktor tersebut terhadap sifat fisika dan mekanika papan partikel inti rami.

Penelitian ini menggunakan partikel inti rami (lolos 10 mesh), gambir (katekin 91,3%), dan sukrosa. Rancangan acak lengkap (RAL) digunakan dengan dua faktor, yaitu jumlah perekat gambir-sukrosa (0%, 10%, dan 20%) dan suhu pengempaan (160°C, 180°C, dan 200°C). Papan partikel dibuat menggunakan komposisi perekat gambir-sukrosa (25:75) dengan dimensi 25 cm x 25 cm x 1 cm dan target kerapatan 0,8 g/cm³. Pengempaan dilakukan dengan tekanan 3 MPa selama 10 menit menggunakan metode satu tahap. Data penelitian dianalisis menggunakan analisis varian (ANOVA) dua arah dan *Honestly Significant Difference*. Pengujian dilakukan dengan mengacu standar *Japanese Industrial Standard (JIS) A 5908* (2003) dan *FAO* (1996).

Hasil penelitian menunjukkan interaksi jumlah perekat dan suhu pengempaan berpengaruh nyata terhadap pengembangan tebal, keteguhan rekat internal, dan modulus patah. Di sisi lain, peningkatan suhu pengempaan menurunkan nilai kadar air, penyerapan air serta meningkatkan nilai kerapatan dan modulus elastisitas, sedangkan penambahan jumlah perekat menambah nilai keteguhan rekat internal. Perlakuan terbaik papan partikel diperoleh dari penambahan jumlah perekat 10% dan suhu pengempaan 180°C. Papan tersebut memenuhi standar *JIS A 5908* (2003) Tipe 8 dengan nilai kerapatan 0,776 g/cm³, kadar air 11,075%, pengembangan tebal 10,674%, penyerapan air 36,947%, keteguhan rekat internal 0,651 MPa, modulus elastisitas 2,325 GPa, modulus patah 10,584 MPa.

Kata Kunci: papan partikel, gambir, sukrosa, jumlah perekat, suhu kempa.

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THE EFFECT OF GAMBIER-SUCROSE ADHESIVE AMOUNT AND PRESSING TEMPERATURES VARIATIONS ON PROPERTIES OF RAMIE CORE PARTICLEBOARDS

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ABSTRACT

Ramie (*Boehmeria nivea*) manufacturing industry produces waste in the form of ramie core which can be used as material for particleboard. The combination of gambier powder (*Uncaria gambir* (Hunter) Roxb) and sucrose can produce a chemical link which can be used as a natural adhesive. The variation of gambier-sucrose adhesive amount and pressing temperature is predicted will affect the quality of ramie core particleboard. Therefore, this study aims to determine the effect of both factors on the physical and mechanical properties of hemp core particleboard.

This study used ramie core particles (passed 10 mesh), gambier (catechin 91.3%), and sucrose. The research design used a completely randomized design (CRD) with two factors, i.e gambier-sucrose adhesive amount (0%, 10%, and 20%) and the pressing temperature (160°C, 180°C, and 200°C). Particleboard was made using the composition of 25:75 gambier-sucrose adhesive and the dimensions were 25 cm x 25 cm x 1 cm with density target of this particleboard was 0.8 g/cm³ and the pressure was 3 MPa for 10 minutes using single step method. The research data were analyzed using two-way analysis of variance (ANOVA) and Honestly Significant Differences. The properties of particleboards were measured based on Japanese Industrial Standard A 5908 (2003) and FAO (1996).

The result showed that there was a significant interaction between the adhesive amount and the pressing temperature on thickness swelling, internal bonding, and modulus of rupture. Increasing of pressing temperature significantly affected on decreasing of moisture content, water absorption, while increasing of the density and modulus of elasticity. On the other hand, increasing the adhesive amount significantly improved the internal bonding. The best properties of the board were obtained at the addition of 10% adhesive amount with 180°C of pressing temperature. The properties of the particleboard met the standard of JIS A 5908 (2003) Type 8 i.e.: the density of 0.776 g/cm³, moisture content of 11.075%, thickness swelling of 10.674%, water absorption of 36.947%, internal bonding of 0.651 MPa, modulus of elasticity of 2.325 GPa, modulus of rupture of 10.584 MPa.

Keywords: particleboard, gambier, sucrose, adhesive amount, pressing temperature

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