

**PENGARUH VARIASI KOMPOSISI PEREKAT SUKROSA-AMMONIUM  
DIHYDROGEN PHOSPHATE DAN SUHU PENGEMPAAN TERHADAP  
SIFAT FISIKA MEKANIKA PAPAN PARTIKEL PELEPAH SALAK**

Oleh:

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**INTISARI**

Pelepah salak mengandung  $\alpha$ -selulosa (43,71%), holoselulosa (75,91%), hemiselulosa (32,2%), dan lignin (26,33%) yang cukup potensial dimanfaatkan sebagai bahan baku papan partikel. Penggunaan sukrosa sebagai perekat alami diharapkan dapat menggantikan perekat konvensional berbasis formaldehida. Sifat sukrosa yang mudah menyerap air dimungkinkan diperbaiki dengan penambahan *ammonium dihydrogen phosphate* (ADP). Oleh karena itu, penelitian ini bertujuan untuk mengetahui pengaruh interaksi variasi komposisi perekat sukrosa-ADP dan suhu pengempaan terhadap sifat papan partikel pelepah salak. Faktor komposisi perekat sukrosa-ADP menggunakan 3 aras, yaitu 100:0, 95:5, dan 90:10, sedangkan faktor suhu pengempaan menggunakan 3 aras, yaitu suhu 160°C, 180°C, dan 200°C. Papan partikel dibuat dengan ukuran 25 cm x 25 cm x 1 cm dengan target kerapatan 0,80 g/cm<sup>3</sup>. Waktu pengempaan yang digunakan selama 10 menit dengan sistem 3 siklus. Pengujian sifat fisika mekanika papan partikel dilakukan berdasarkan standar *Japan Industrial Standard A 5908-2003*. Analisis data penelitian menggunakan analisis varian (ANOVA) dua arah dan *Honestly Significant Difference* (HSD). Hasil penelitian menunjukkan interaksi komposisi perekat sukrosa-ADP dan suhu pengempaan berpengaruh sangat nyata terhadap kerapatan, kadar air, pengembangan tebal, penyerapan air, modulus patah, dan modulus elastisitas. Keteguhan rekat internal dipengaruhi oleh faktor tunggal komposisi perekat dan suhu pengempaan. Perlakuan komposisi perekat sukrosa-ADP sebesar 90:10 dengan suhu pengempaan 200°C menghasilkan sifat fisika dan mekanika papan partikel pelepah salak yang memenuhi standar JIS A 5908 dengan rata-rata kerapatan 0,73 g/cm<sup>3</sup>, kadar air 5,08%, penyerapan air 51,19%, pengembangan tebal 8,28%, dan keteguhan rekat internal 0,57 MPa, modulus patah 10,85 MPa, dan modulus elastisitas 3,18 GPa.

Kata Kunci: sukrosa, suhu pengempaan, *ammonium dihydrogen phosphate*, papan partikel, pelepah salak

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**THE EFFECT OF SUCROSE-AMMONIUM DIHYDROGEN PHOSPHATE ADHESIVE COMPOSITION AND PRESSING TEMPERATURE ON THE PHYSICAL AND MECHANICAL PROPERTIES OF PARTICLE BOARD MADE FROM SALACCA FROND**

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**ABSTRACT**

Salacca frond contains  $\alpha$ -cellulose (43.71%), holocellulose (75.91%), hemicellulose (32.2%), and lignin (26.3%) which made it potential to be used as raw material for particleboard. The use of sucrose as a natural adhesive is intended to replace formaldehyde based adhesive. Sucrose is a hydrophylic material and it has high melting point, those disadvantages of sucrose might be improved with the addition of ammonium dihydrogen phosphate (ADP). The use of this adhesive for salacca frond particleboard has never been applied before. This study was aimed to determine the effect of sucrose-ADP adhesive composition and pressing temperature on the properties of the salacca frond particleboard. The sucrose-ADP adhesive composition used in this research were set as 100:0, 95:5, and 90:10, while the pressing temperatures were 160°C, 180°C, and 200°C. Target density of 0.80 g/cm<sup>3</sup> and pressing time for 10 minutes with three-step pressing cycle method were used in this research. The physical and mechanical properties of the board were evaluated based on JIS A 5908. The data on this research was analyzed using two-way analysis of variance (ANOVA) and Honestly Significant Difference (HSD). The results showed that the interaction of sucrose-ADP adhesive composition and pressing temperature significantly affected density, moisture content, thickness swelling, water absorption, modulus of rupture, and modulus of elasticity of the board. While the internal bond strength was significantly affected by adhesive composition and pressing temperature factor separately. The particleboard that used sucrose-ADP composition of 90:10 and pressed at 200 ° C had optimum properties which met JIS A 5908 requirement, i.e. density of 0.73 g / cm<sup>3</sup>, moisture content of 5.08%, water absorption of 51.19%, thickness swelling of 8.28%, modulus of rupture of 10.85 MPa, modulus of elasticity of 3.18 GPa, and internal bond strength of 0.57 MPa.

Keywords : sucrose, pressing temperature, ammonium dihydrogen phosphate, particleboard, salacca frond

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