

THE EFFECT OF VARIATIONS OF SUCROSE-AMMONIUM DIHYDROGEN PHOSPHATE ADHESIVE COMPOSITION AND PRESSING TIME ON PROPERTIES OF COMPOSITE BOARD MADE FROM SALACCA FROND (*Salacca sp.*)

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ABSTRACT

Salacca frond which has high lignoselulosic content is expected to be a raw material for composite board. The use of natural binders such as sucrose is expected to replace formaldehyde-based adhesive. The properties of sucrose can be improved by the addition of ammonium dihydrogen phosphate (ADP). The addition of ADP as a catalyst in sucrose is expected to reduce the pressing time. This study aims to determine the effects of variations of sucrose:ADP composition and pressing time on the properties of salacca composite board.

This study used a completely randomized design (CRD) with two factors, i.e. variations of sucrose:ADP composition (95:5 and 90:10) and pressing time (5 min, 7.5 min, and 10 min). The dimension of composite boards was 25 cm x 25 cm x 1 cm with the target density of 0.8 g/cm³ and the pressing temperature was used 180°C. The standard test was used Japanese Industrial Standard (JIS) A 5908. Data result was analysed using Analysis of Variance (ANOVA) and further tested using Honestly Significant Difference (HSD).

The results showed that the interaction between variations of sucrose:ADP composition and pressing time significantly affected on internal bond strength. The modulus of rupture, modulus of elasticity and internal bond strength was significantly affected by pressing temperature. While the modulus of elasticity was significantly affected by variations of sucrose:ADP composition. The composite board that used variations of sucrose:ADP composition (95:5) and pressed for 7.5 min, met JIS A 5908 type 18 requirement, i.e. density of 0.72 g/cm³, moisture content of 8.29%, thickness swelling of 9.25%, water absorption of 37.89%, modulus of rupture of 69.33 MPa, modulus of elasticity of 14.03 GPa, dan internal bond strength of 0.72 MPa.

Keywords: *sucrose, ammonium dihydrogen phosphate, pressing time, composite board, salacca frond.*

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PENGARUH VARIASI KOMPOSISI PEREKAT SUKROSA-AMONIUM DIHIDROGEN FOSFAT DAN LAMA WAKTU KEMPA TERHADAP SIFAT PAPAN KOMPOSIT PELEPAH SALAK (*Salacca sp.*)

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INTISARI

Pelepah salak yang memiliki kandungan lignoselulosa yang tinggi diduga dapat menjadi bahan baku papan komposit. Penggunaan bahan pengikat alami seperti sukrosa diharapkan dapat menggantikan perekat berbasis formaldehida. Sifat sukrosa dapat diperbaiki dengan penambahan amonium dihidrogen fosfat (ADF). Penambahan ADF sebagai katalis dalam sukrosa diduga dapat menurunkan waktu pengempaan. Penelitian ini bertujuan untuk mengetahui pengaruh variasi komposisi sukrosa:ADF dan lama waktu kempa terhadap sifat papan komposit pelepah salak.

Penelitian ini menggunakan rancangan acak lengkap (RAL) dengan dua faktor yaitu, variasi komposisi sukrosa:ADF (95:5 dan 90:10) dan lama waktu kempa (5 menit, 7,5 menit, dan 10 menit). Papan komposit dibuat dengan ukuran 25 cm x 25 cm x 1 cm dengan target kerapatan 0,80 g/cm³ dan suhu pengempaan 180°C. Standar pengujian yang digunakan mengacu *Japanese Industrial Standard* (JIS) A 5908. Data hasil pengujian dianalisis menggunakan analisis varians (ANOVA) dan pengujian lanjut *Honestly Significant Difference* (HSD).

Hasil penelitian menunjukkan faktor interaksi variasi komposisi sukrosa:ADF dan lama waktu kempa memberikan pengaruh yang signifikan terhadap nilai keteguhan rekat internal. Variasi komposisi sukrosa:ADF memberikan pengaruh yang signifikan terhadap nilai modulus patah sedangkan lama waktu kempa memberikan pengaruh yang signifikan terhadap nilai modulus patah, modulus elastisitas dan keteguhan rekat internal. Perlakuan variasi komposisi sukrosa:ADF (95:5) dan lama waktu kempa 7,5 menit menghasilkan sifat papan komposit pelepah salak yang memenuhi standar JIS A 5908 tipe 18 dengan nilai kerapatan 0,72 g/cm³, kadar air 8,29%, pengembangan tebal 9,25%, penyerapan air 37,89%, modulus patah 69,33 MPa, modulus elastisitas 14,03 GPa, dan keteguhan rekat internal 0,72 MPa.

Kata Kunci: sukrosa, amonium dihidrogen fosfat, waktu kempa, papan komposit, pelepah salak.

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