

PENGARUH JUMLAH ASAM SITRAT DAN SUHU KEMPA TERHADAP  
SIFAT FISIKA DAN MEKANIKA PAPAN PARTIKEL PELEPAH DAUN  
KELAPA (*Cocos nucifera* L.)

I Putu Wiwin Nuarta<sup>1</sup> dan Ragil Widyorini<sup>2</sup>

## INTISARI

Kelapa adalah tanaman tropis yang mudah dijumpai di Indonesia. Pelepah daun kelapa adalah bagian yang belum termanfaatkan maksimal dan mengandung selulosa dan lignin. Penelitian papan partikel menggunakan pelepah daun kelapa dengan asam sitrat sebagai agen pengikat menarik untuk dilakukan. Penelitian ini bertujuan mengetahui interaksi pengaruh jumlah asam sitrat dan suhu kempa terhadap sifat fisika dan mekanika papan partikel pelepah daun kelapa.

Penelitian ini menggunakan rancangan acak lengkap dengan dua faktor yaitu jumlah perekat asam sitrat (10%, 20% dan 30%) dan suhu kempa (180°C, 200°C dan 220°C). Pembuatan papan partikel dilakukan dengan ulangan tiga kali untuk setiap kombinasi antar faktor, tekanan spesifik 3,5 MPa selama 10 menit dengan dimensi papan 25 cm x 25 cm x 1 cm dan target kerapatan 0,8 g/cm<sup>3</sup>. Sifat fisika dan mekanika papan partikel diuji berdasarkan standar JIS A 5908-2003 dan FAO. Data hasil pengujian dianalisis menggunakan SPSS dan uji lanjut HSD (*Honestly Significant Difference*).

Interaksi jumlah asam sitrat dan suhu kempa berpengaruh nyata terhadap sifat fisika papan partikel pelepah daun kelapa yaitu penyerapan air, pengembangan tebal dan kerapatan. Faktor asam sitrat berpengaruh terhadap modulus patah, modulus elastisitas, keteguhan rekat internal dan kadar air. Suhu kempa berpengaruh terhadap kadar air, modulus elastisitas dan keteguhan rekat internal. Papan partikel pelepah daun kelapa optimal pada penambahan asam sitrat 30% dan suhu kempa 180°C dengan hasil rata-rata kerapatan papan 0,67 g/cm<sup>3</sup>, kadar air papan 8,73%, penyerapan air 52,49%, pengembangan tebal 4,85%, modulus patah 8,24 MPa, modulus elastisitas 2,17 GPa dan keteguhan rekat internal 0,28 MPa.

Kata kunci: asam sitrat, papan partikel, suhu kempa, pelepah daun kelapa.

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<sup>1</sup>Mahasiswa Fakultas Kehutanan Universitas Gajah Mada, Bulaksumur, Yogyakarta

<sup>2</sup>Staf Pengajar Fakultas Kehutanan UGM, Bulaksumur, Yogyakarta

THE EFFECT OF CITRIC ACID CONTENT AND PRESSING  
TEMPERATURE ON PHYSICAL AND MECHANICAL PROPERTIES OF  
PARTICLEBOARD FROM COCONUT FROND (*Cocos nucifera* L.)

I Putu Wiwin Nuarta<sup>1</sup> dan Ragil Widyorini<sup>2</sup>

**ABSTRACT**

Coconut is a tropical plant that can be easily found in Indonesia. The coconut frond contains cellulose and lignin but underutilized so far. The research on utilization coconut frond as particleboard using citric acid as binding agent is interesting to be done. This research aimed to determine the effect of the amount of citric acid and the press temperature on the physical and mechanical properties of coconut frond particleboard.

This reaserch used a replication completely randomized design with two factors, i.e. the amount of citric acid (10%, 20% and 30%) and the pressing temperature (180°C, 200°C and 220°C). The particleboard manufacture was performed with three repetition for all combination factors with specific pressure of 3.5 MPa for 10 minutes. Dimensions of the board was 25 cm x 25 cm x 1 cm with a target density of 0.8 g / cm<sup>3</sup>. The physical and mechanical properties of particleboard were tested according to JIS A 5908-2003 and FAO standards. The test results data were analyzed using SPSS and Tukey's Test (*Honestly Significant Difference*).

The interaction between citric acid content and press temperature significantly affected thickness swelling, water absorption and density board. Citric acid content significantly affected the values of modulus of elasticity, modulus of rupture, internal bond strength and moisture content. Pressing temperature significantly affected modulus of elasticity, internal bond strength and moisture board. The coconut frond particleboard was optimum at 30% citric acid content and 180°C pressing temperature with average board density 0.67 g / cm<sup>3</sup>, moisture content 8.73%, water absorption 52.49%, thickness swelling 4.85%, modulus of rupture 8.42 MPa, modulus of elastisity 2.17 GPa and internal bond strength 0.28 MPa

Keywords: citrid acid, particleboard, press temperature, coconut frond

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<sup>1</sup>Student of Forest Product Department, Faculty of Forestry, Gadjah Mada University

<sup>2</sup>Lecturer of Forest Product Department, Faculty of Forestry, Gadjah Mada University