

PENGARUH VARIASI KOMPOSISI PEREKAT GAMBIR – SUKROSA DAN SUHU KEMPA TERHADAP SIFAT PAPAN PARTIKEL BAMBU BETUNG (*Dendrocalamus asper*)

Diana Ernawati¹ dan Ragil Widyorini²

INTISARI

Gambir (*Uncaria gambir* (Hunter) Roxb) adalah tanaman hasil hutan bukan kayu yang berpotensi sebagai bahan baku perekat berbasis tanin. Sukrosa merupakan polimer disakarida yang bersifat reaktif terhadap bahan lainnya. Kombinasi gambir dan sukrosa diduga dapat membentuk ikatan yang diaplikasikan sebagai perekat pada papan partikel. Komposisi perekat gambir-sukrosa diduga dapat mempengaruhi suhu pengempaan untuk dapat menghasilkan kekuatan papan partikel yang optimal. Penelitian ini bertujuan untuk mengetahui interaksi faktor komposisi perekat gambir-sukrosa dan suhu pengempaan terhadap sifat fisika dan mekanika papan partikel bambu betung.

Penelitian ini menggunakan partikel limbah bambu betung lolos 10 mesh, gambir (katekin 91,30%) dan sukrosa. Penelitian dengan rancangan acak lengkap (RAL) terdiri dua faktor, yaitu komposisi perekat gambir-sukrosa (75:25, 50:50, dan 25:75) dan suhu kempa (180°C, 200°C, dan 220°C). Papan partikel berdimensi 25 cm x 25 cm x 1 cm dan target kerapatan 0,8 g/cm³. Jumlah perekat gambir-sukrosa yaitu 20% dengan metode pengempaan siklus tiga tahap selama 10 menit dan tekanan kempa sebesar 3 MPa. Standar penelitian dan pengujian mengacu pada *Japan Industrial Standard A 5908* (2003) serta *FAO* (1996). Analisis data penelitian menggunakan analisis varian (ANOVA) dua arah dan *Honestly Significant Difference* (HSD).

Hasil penelitian menunjukkan interaksi antara faktor komposisi perekat dan suhu pengempaan tidak berpengaruh nyata, sedangkan faktor komposisi perekat berpengaruh nyata terhadap sifat mekanika papan, dan faktor suhu pengempaan berpengaruh nyata terhadap sifat fisika papan partikel. Sifat papan partikel bambu betung terbaik diperoleh pada komposisi perekat gambir-sukrosa (25:75) dengan suhu kempa 180°C. Nilai sifat fisika dan mekanika yang dihasilkan yaitu kerapatan 0,69 g/cm³, kadar air 6,03%, pengembangan tebal 4,56%, penyerapan air 43,09%, keteguhan rekat internal 0,36 MPa, modulus patah 8,13 MPa, dan modulus elastisitas 2,32 GPa.

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

¹Mahasiswa Fakultas Kehutanan UGM

²Dosen Fakultas Kehutanan UGM

THE EFFECTS OF GAMBIER – SUCROSE COMPOSITION AND PRESSING TEMPERATURES ON THE PROPERTIES OF BAMBOO BETUNG PARTICLEBOARDS (*Dendrocalamus asper*)

Diana Ernawati¹ dan Ragil Widyorini²

ABSTRACT

Gambier (*Uncaria gambir* (Hunter) Roxb) is a non-wood forest product that has potential application as a tannin-based adhesive. Sucrose is a disaccharide polymer that is reactive to other resources. The combination of gambier and sucrose is thought to form a bond that can be applied as an adhesive to particleboard. Gambier-sucrose adhesive composition is thought to affect the pressing temperature which can produce the optimal particleboard strength. This research aims to determine the interaction from the gambier-sucrose adhesive composition factor and pressing temperature on the physical and mechanical properties of bamboo betung particleboard.

This research used bamboo betung particles that passed 10 mesh, gambier (91.30% catechins) and sucrose. The research design used completely randomized design (CRD) consisting with two factors, i.e gambier-sucrose adhesive composition (75:25, 50:50, and 25:75) and pressing temperature (180°C, 200°C, and 220°C). The particleboard dimensions were 25 cm x 25 cm x 1 cm and a target density was 0.8 g/cm³. The amount of gambier-sucrose adhesive was 20wt% with a three-step cycle pressing method for 10 minutes and a pressure is 3 MPa. The physical and mechanical testing standards referred to Japan Industrial Standard A 5908 (2003) and FAO (1996). Research data analysis used two-way analysis variance (ANOVA) and Honestly Significant Difference (HSD).

The results showed that the interaction from adhesive composition factor and the pressing temperature had no significant effect, while the adhesive composition factor had a significant effect on the mechanical properties, and the pressing temperature factor had a significant effect on the physical properties of the particleboard. The best properties of bamboo betung particleboard were obtained from the gambier-sucrose adhesive composition (25:75) with a pressing temperature is 180°C. The physical and mechanical properties values were density 0.69 g/cm³, moisture content 6.03%, thickness swelling 4.56%, water absorption 43.09%, internal bonding strength 0.36 MPa, modulus of rupture 8.13 MPa, and the modulus of elasticity is 2.32 GPa.

Keywords: particleboard, gambier, sucrose, adhesive composition, compression temperature.

¹Student of Faculty of Forestry UGM

²Lecturer of Faculty of Forestry UGM