PENGARUH VARIASI JENIS PEREKAT DAN BERAT LABUR TERHADAP SIFAT FISIKA, MEKANIKA, DAN PEREKATAN LAMINASI BAMBU PETUNG (*Dendrocalamus asper*)

Anisa Nur Fadhila[1], Ragil Widyorini[2]

INTISARI

Teknologi laminasi membuka peluang pemanfaatan bambu tanpa terkendala bentuk dan sifat alaminya. Salah satu jenis bambu yang potensial dimanfaatkan sebagai bahan laminasi adalah bambu petung (*Dendrocalamus asper*) karena tebal, berdiameter besar, dan melimpah. Penggunaan perekat asam sitrat-pati dan asam sitrat-sukrosa pada laminasi bambu belum pernah dilakukan. Penelitian ini bertujuan untuk mengevaluasi pengaruh variasi jenis perekat dan berat labur terhadap sifat fisika, mekanika, dan perekatan laminasi bambu.

Penelitian dilakukan menggunakan rancangan acak lengkap yang terdiri atas dua faktor, yaitu jenis perekat (asam sitrat-pati dan asam sitrat-sukrosa) dan berat labur (130 g/m^2, 150 g/m^2, dan 170 g/m^2). Pengujian laminasi bambu meliputi kadar air, kerapatan, delaminasi, modulus elastisitas (MoE), modulus patah (MoR), keteguhan geser, dan persentase kerusakan laminasi. Data dianalisis menggunakan analisis varian (ANOVA) dua arah dan diuji lanjut menggunakan *Honestly Significant Difference* (HSD) untuk menentukan kombinasi perlakuan terbaik terhadap sifat laminasi bambu petung.

Hasil penelitian menunjukkan tidak terdapat interaksi antara jenis perekat dengan berat labur. Jenis perekat berpengaruh secara nyata terhadap nilai delaminasi, MoE, MoR, keteguhan geser, dan persentase kerusakan laminasi. Berat labur berpengaruh secara nyata terhadap nilai delaminasi dan MoR. Kombinasi terbaik diperoleh pada perekat asam sitrat-sukrosa dengan berat labur 150 g/m^2. Kombinasi tersebut menghasilkan nilai rata-rata kadar air 3,88%, kerapatan 0,90 g/cm^3, delaminasi 0%, MoE 2,56 GPa, MoR 167,57 MPa, keteguhan geser 2,31 MPa, dan persentase kerusakan laminasi 88,43%. Hasil menunjukkan bahwa perekat asam sitrat-sukrosa berpotensi sebagai perekat alternatif ramah lingkungan.

Kata Kunci: laminasi, bambu petung, asam sitrat, pati, sukrosa

[1] Mahasiswa Fakultas Kehutanan UGM
[2] Staff Pengajar Fakultas Kehutanan UGM

THE EFFECT OF VARIATIONS IN ADHESIVE TYPE AND GLUE SPREADS ON THE PHYSICAL, MECHANICAL, AND BONDING PROPERTIES OF PETUNG BAMBOO (*Dendrocalamus asper*) LAMINATES

Anisa Nur Fadhila[1], Ragil Widyorini[2]

ABSTRACT

Lamination technology enables effective utilization of bamboo without being constrained by its natural form and properties. Petung bamboo (*Dendrocalamus asper*) has potential for lamination due to its thick, large diameters, and abundance. The use of citric acid–starch and citric acid–sucrose adhesives has not been investigated. This study aims to evaluate the effect of adhesive type and glue spreads on the physical, mechanical, and bonding properties of laminated bamboo.

The study was conducted using a completely randomized design with two factors, namely adhesive type (citric acid–starch and citric acid–sucrose) and glue spreads (130 g/m², 150 g/m², and 170 g/m²). The tests on laminate bamboo included moisture content, density, delamination, modulus of elasticity (MoE), modulus of rupture (MoR), shear strength, and failure percentage. Data were analyzed using two-way analysis of variance (ANOVA) and Honestly Significant Difference (HSD) to determine the best combination for petung bamboo laminate properties.

The results showed no interaction between adhesive type and glue spread. Adhesive type had a significant effect on delamination, MoE, MoR, shear strength, and percentage of lamination failure. The glue spreads had a significant effect on delamination and MoR. The best combination was the citric acid–sucrose adhesive with a 150 g/m² glue spread, resulting in a moisture content of 3.88%, density of 0.90 g/cm³, 0% delamination, MoE of 2.56 GPa, MoR of 167.57 MPa, shear strength of 2.31 MPa, and 88.43% failure percentage. The results showed that citric acid–sucrose adhesive has potential as eco-friendly adhesive.

Keywords: lamination, petung bamboo, citric acid, starch, sucrose

[1] Student of Faculty of Forestry UGM
[2] Lecturer of Faculty of Forestry UGM