

## **RENDEMEN DAN SIFAT PULP KAYU GAYAM (*Inocarpus fagifer*) BERDASARKAN VARIASI SULFIDITAS DAN ALKALI AKTIF**

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### **INTISARI**

Gayam (*Inocarpus fagifer* (Parkinson ex Zollinger) Fosberg) merupakan pohon yang tumbuh di hutan rakyat dengan karakteristik batang yang beralur dalam. Kurangnya informasi mengenai kualitas kayu gayam, membuat kayu ini kurang dimanfaatkan oleh masyarakat. Penelitian ini bertujuan untuk mempelajari kemungkinan pemanfaatan kayu gayam sebagai bahan baku pembuatan pulp sulfat dan juga mempelajari pengaruh sulfiditas, alkali aktif, serta interaksi keduanya terhadap rendemen dan sifat pulp sulfat kayu gayam.

Penelitian dilakukan dengan menggunakan tiga pohon kayu gayam bebas cacat dengan rerata diameter 32 cm yang tumbuh di Godean, Sleman, DIY. Untuk mengetahui kualitas bahan baku dilakukan pengukuran proporsi sel, dimensi serat, serta komposisi kimia kayu. Pulp kayu gayam dipelajari rendemennya (baik rendemen total, tersaring maupun sisa), nilai bilangan kappa, sifat fisik (indeks tarik, indeks sobek, indeks jebol), serta sifat kimia (ekstraktif etanol-toluena, selulosa-alfa, lignin Klason).

Kayu gayam memiliki kandungan selulosa-alfa tinggi (58,67%), lignin rendah (23,48%), dan panjang serat 0,89 mm, sehingga berpotensi untuk digunakan sebagai bahan baku pulp sulfat. Hasil pemasakan pulp sulfat menghasilkan rendemen tersaring berkisar 42,00-49,38%, rendemen sisa berkisar 2,46-13,33%, nilai bilangan kappa berkisar 8,49-22,10, kadar ekstraktif etanol-toluena berkisar 0,94-1,42%, kadar selulosa-alfa berkisar 82,88-84,19%, kadar hemiselulosa berkisar 2,45-7,65%, dan kadar lignin Klason berkisar 2,03-4,41%. Konsentrasi alkali aktif memberikan pengaruh nyata terhadap nilai bilangan kappa, nilai rendemen sisa, kadar holoselulosa pulp, kadar hemiselulosa pulp, sedangkan sulfiditas serta interaksi alkali aktif dengan sulfiditas tidak memberikan pengaruh nyata terhadap rendemen dan sifat pulp kayu gayam. Rendemen dan sifat fisik pulp kayu gayam terbaik diperoleh pada penggunaan alkali aktif 15% dan sulfiditas 21% dengan bilangan kappa 14,61, rendemen tersaring 48,86%, indeks tarik 37,55 Nm/g, indeks sobek 2,52 mN.m<sup>2</sup>/g, indeks jebol 1,45 kPa.m<sup>2</sup>/g, kadar selulosa-alfa 83,51%, kadar ekstraktif etanol-toluena 1,05%, dan kadar lignin Klason 2,46%.

Kata kunci: kayu gayam, pulp sulfat, rendemen, sifat pulp, alkali aktif, sulfiditas

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## YIELD AND PROPERTIES PULP OF GAYAM WOOD (*Inocarpus fagifer*) BY VARIETY OF SULFIDITY AND ACTIVE ALKALI LEVELS

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### ABSTRACT

Gayam (*Inocarpus fagifer* (Parkinson ex Zollinger) Fosberg) is a tree grown in community forests with the characteristics of grooved stems. Due to the lack of information with regards to its utilisation the timber was less utilized by surrounding people. This study aimed to evaluate the possibility of utilizing gayam wood as a raw material for sulphate pulp making. The objective of this study was to assess the effect of sulfidity, active alkali, and their interactions to the yield and properties of gayam sulphate pulp.

The study performed by used three defect-free wood trees with average diameter of 32 cm grown in Godean, Sleman, DIY. To find out the quality of raw materials, cell proportion, fiber dimension, and chemical composition of wood was measured. The tested parameters of pulp gayam wood were yield (total yield, screened, and residual), kappa number, physical properties (tensile index, tearing index, bursting index), and chemical properties (extractive ethanol-toluene, alpha-cellulose, Klason lignin).

Gayam wood contained a high alpha-cellulose content (58.67%), low lignin (23.48%), and 0.89 mm of fiber length, which makes this wood had potential to be used as raw material for sulphate pulp. The cooking of sulphate pulp resulted in screened yield of 42.00-49.38%, residual yield of 2.46-13.33%, kappa number of 8.49-22.10, extractive ethanol-toluene content of 0.94-1.42%, cellulose-alpha content of 82.88-84.19%, hemicellulose content of 2.45-7.65%, and Klason lignin content was 2.03-4.41%. The active alkali concentration had significant effect on kappa number, residual yield, holocellulose content and also hemicellulose content. The sulfidity and the interaction of active alkali with sulfidity had no significant effect on the yield and properties of gayam wood pulp. The best yield and pulp properties of gayam wood pulp were obtained on 15% of active alkali and 21% of sulfidity with kappa number of 14.61, screened yield of 48.86%, tensile index of 37.55 Nm/g, tearing index of 2.52 mN.m<sup>2</sup>/g, bursting index of 1.45 kPa.m<sup>2</sup>/g, cellulose-alpha content of 83.51%, extractive ethanol-toluene content of 1.05%, and Klason lignin content of 2.46%.

Keywords: gayam wood, sulphate pulp, yield, pulp properties, active alkali, sulfidity

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