

PEMBUATAN PULP DAN KERTAS DARI KAYU *Acacia crassicaarpa* DENGAN PROSES ALKALI DAN ADITIF ANTRAKINON

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INTISARI

Proses *pulping* yang tepat dalam pembuatan pulp menggunakan kayu *Acacia crassicaarpa* hasil pemuliaan sangat diperlukan supaya produktivitas produksi pulp meningkat. *Pulping* alkali dengan aditif antrakinon diketahui menghasilkan rendemen tersaring yang tinggi. Penelitian ini bertujuan untuk mengetahui pengaruh proses soda, soda-antrakinon, sulfat, sulfat-antrakinon terhadap rendemen pulp, sifat kimia pulp, sifat fisik, dan sifat optik kertas kayu *A. crassicaarpa* hasil pemuliaan sehingga diketahui proses *pulping* terbaik dari keempat proses.

Penelitian ini menggunakan ceriping kayu *A. crassicaarpa* umur 4 tahun provenans Oriomo (Papua New Guinea) dengan nomor *seedlot* 20828 yang diperoleh dari arboretum Balai Besar Pengujian Standar Instrumen Kehutanan, Purwobinangun, Yogyakarta. Ceriping sebanyak 250 g berat kering tanur diolah dengan proses soda (NaOH 17%), soda-antrakinon (NaOH 17%, antrakinon 0,1%), sulfat (NaOH 17%, sulfiditas 25%), dan sulfat-antrakinon (NaOH 17%, sulfiditas 25%, antrakinon 0,1%) selama 2 jam; suhu 170 °C; serta perbandingan kayu dan larutan pemasak 1:4. Pengolahan data pengujian kualitas pulp dan kertas menggunakan analisis varians satu arah dengan uji lanjut Tukey HSD (SPSS versi 25).

Hasil penelitian menunjukkan bahwa proses sulfat menghasilkan rendemen tersaring pulp, selektivitas delignifikasi *ratio*, dan indeks jebol lebih tinggi daripada proses soda. Aditif antrakinon 0,1% pada *pulping* alkali secara signifikan menurunkan bilangan kappa pulp serta meningkatkan rendemen tersaring pulp, indeks tarik, dan indeks jebol kertas, tetapi nilai viskositas pulp dan indeks sobek kertas tidak berbeda signifikan. Oleh karena itu, proses sulfat-antrakinon paling tepat untuk kayu *A. crassicaarpa* umur 4 tahun hasil pemuliaan karena memenuhi SNI indeks tarik 47,96 N.m/g, indeks jebol 4,63 kPa.m²/g, dan indeks sobek 5,57 mN.m²/g.

Kata kunci: *Acacia crassicaarpa*, pemuliaan pohon, alkali, aditif, antrakinon

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MANUFACTURE OF PULP AND PAPER FROM *Acacia crassicaarpa* WOOD WITH ALKALINE PROCESS AND ANTHRAQUINONE ADDITION

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ABSTRACT

A proper pulping process using *Acacia crassicaarpa* wood as a result of breeding is necessary to increase the productivity of pulp production. Alkaline pulping with anthraquinone additives is known to produce high screened yields. This study aimed to determine the effect of the soda, soda-anthraquinone, sulfat, sulfat-anthraquinone processes on pulp yield, pulp chemical properties, physical properties, and optical properties of *A. crassicaarpa* wood paper from breeding results to determine the best pulping process among the four processes.

This study used a 4-year-old *A. crassicaarpa* tree provenance Oriomo (Papua New Guinea) with seedlot number 20828 obtained from the arboretum of the Center for Standard Testing for Forestry Instruments, Purwobinangun, Yogyakarta. The wood chips (250 g oven dry weight) were processed using soda (NaOH 17%), soda-anthraquinone (NaOH 17%, anthraquinone 0.1%), sulfat (17% NaOH, 25% sulfidity), and sulfat-anthraquinone (NaOH 17%. %, sulfidity 25%, anthraquinone 0.1%) with a pulping time of 2 hours; a temperature of 170 °C; and a liquor to chips ratio 4:1. Processing of pulp and paper quality testing data used one-way analysis of variance and Honestly Significant Difference (HSD) the post-hoc test (SPSS version 25).

The results showed that the sulfat process resulted higher values in screened yields, selectivity delignification ratio, and burst index higher than the soda process. Anthraquinone 0.1% additive in alkaline pulping significantly reduced pulp kappa number and increased screened yields, tensile index, and paper burst index, but the values of pulp viscosity and paper tear index were not significantly different. Therefore, the sulfat-anthraquinone process was most appropriate for 4-year-old *A. crassicaarpa* wood as a result of breeding because it met the SNI tensile index of 47.96 N.m/g, the burst index is 4.63 kPa.m²/g, and the tear index is 5.57 mN.m²/ g.

Keywords: *Acacia crassicaarpa*, tree improvement, alkali, additive, anthraquinone

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