

## SIFAT PULP DAN KERTAS PROSES KRAFT DENGAN PENAMBAHAN ANTRAKINON DARI KAYU KLON HIBRID AKASIA (*Acacia mangium* × *Acacia auriculiformis*)

Narendra Aziza Putri<sup>1</sup>, Ganis Lukmandaru<sup>2</sup>, Sri Sunarti<sup>3</sup>

### INTISARI

Penelitian sifat pulp dan kertas proses *kraft* dengan penambahan antrakinon dari kayu klon hibrid akasia (*Acacia mangium* × *Acacia auriculiformis*) dilakukan dalam rangka upaya mengatasi ketersediaan bahan baku industri pulp dan kertas di Indonesia. Di lain pihak, penelitian sifat pulp dan kertas dengan bahan baku hibrid akasia dari klon masih terbatas. Tujuan penelitian ini untuk mengetahui pengaruh penambahan antrakinon pada proses *pulping* terhadap sifat pulp dan kertas kayu klon hibrid akasia.

Kayu klon hibrid akasia dipakai untuk pengujian dimensi dan turunan serat, pengujian sifat kimia, serta sifat pulp dan kertasnya. Pembuatan pulp dan kertas dilakukan menggunakan proses *kraft* dengan rasio *chip* dan larutan pemasak 1:4; alkali aktif 17%; sulfiditas 25%; antrakinon 0%; 0,05%; dan 0,1%, suhu maksimum 170°C; waktu pemasakan 2 jam pada suhu maksimum. Pulp digiling dengan *freeness* 200-300 ml CSF dan dibuat rentang gramatur berkisar 80 g/m<sup>2</sup>. Parameter yang diamati adalah rendemen total, rendemen tersaring, *reject*, bilangan kappa, konsumsi alkali, sifat fisik, dan optis kertas.

Hasil penelitian menunjukkan bahwa penambahan antrakinon dengan konsentrasi 0%; 0,05%; dan 0,1%, saat proses *pulping* berbeda signifikan pada rendemen dan bilangan kappa, namun tidak berbeda signifikan pada semua sifat fisik dan optis kertas. Penambahan antrakinon meningkatkan rendemen pulp secara berurutan sebesar 54,70%; 58,23%; dan 59,14% dan secara signifikan menurunkan bilangan kappa sebesar 24,06; 20,30; dan 16,87. Sifat fisik dan optis kertas memiliki indeks jebol berkisar 3,31-3,66 kPa.m<sup>2</sup>/g, indeks sobek berkisar 1,72-2,40 mN.m<sup>2</sup>/g, indeks tarik berkisar 49,41-50,28 Nm/g, opasitas cetak berkisar 87,38-88,44%, dan derajat kecerahan berkisar 24,18-25,78. Penambahan antrakinon dengan konsentrasi 0,05% dan 0,1% berbeda signifikan pada bilangan kappa, namun tidak berbeda signifikan pada rendemen, sifat mekanik dan optis kertas. Oleh karena itu, penambahan antrakinon dengan konsentrasi 0,05% direkomendasikan untuk kayu klon hibrid akasia.

Kata kunci: hibrid akasia, antrakinon, rendemen, sifat fisik kertas

<sup>1</sup> Mahasiswa Departemen Teknologi Hasil Hutan, Fakultas Kehutanan UGM

<sup>2</sup> Staf Pengajar Departemen Teknologi Hasil Hutan, Fakultas Kehutanan UGM

<sup>3</sup> Peneliti Badan Riset dan Inovasi Nasional

## THE PROPERTIES OF PULP AND PAPER BY PULPING KRAFT WITH ANTHRAQUINONE ADDITION FROM *Acacia hybrid* (*Acacia mangium* × *Acacia auriculiformis*) CLONAL WOOD

Narendra Aziza Putri<sup>1</sup>, Ganis Lukmandaru<sup>2</sup>, Sri Sunarti<sup>3</sup>

### ABSTRACT

Research on the properties of kraft pulp and paper process with the addition of anthraquinone from *Acacia hybrid* clone wood (*Acacia mangium* × *Acacia auriculiformis*) was carried out in an effort to overcome the demand of raw materials for the pulp and paper industry in Indonesia. However, work on the properties of pulp and paper with *Acacia hybrid* raw materials from clones is still limited. The purpose of this study was to determine the effect of anthraquinone addition on pulp and paper quality from by *Acacia hybrid* clone wood.

*Acacia hybrid* clone wood raw materials were measured fiber for its dimensi and derived values, chemical properties, as well as pulp and paper properties. Pulp and paper making was carried out using the kraft process with a ratio of chips and cooking solution of 1:4; active alkali of 17%; sulfidity of 25%; anthraquinone of 0%; 0.05%; and 0.1%, maximum temperature of 170°C; cooking time of 2 hours at maximum temperature. The pulp was beaten with a freeness of 200-300 ml CSF and the hardsheet was set a 80 g/m<sup>2</sup> grammage. The parameters observed were total yield, screened yield, reject, alkaline consumption, kappa pulp number, as well as physical and optical properties of the paper sheet.

The results showed that the addition of anthraquinone with a concentration of 0%; 0.05%; and 0.1%, during the pulping process differed significantly in yield and kappa number, but did not affect significantly in physical and optical properties of the paper. The addition of anthraquinone increased the yield by 54.70%; 58.23%; and 59.14% and significantly decreased the kappa number by 24.06; 20.30; and 16.87. The physical and optical properties of the paper had a burst index ranging from 3.31-3.66 kPa.m<sup>2</sup>/g, tear index ranging from 1.72-2.40 mN.m<sup>2</sup>/g, tensile index ranging from 49.41-50.28 Nm/g, print opacity ranging from 87.38-88.44%, and brightness degrees ranging from 24.18-25.78. The addition of anthraquinone with concentrations of 0.05% and 0.1% differed significantly in kappa number, but did not affect significantly in yield, mechanical and optical properties of the paper. Therefore, the addition of anthraquinone with a concentration 0.05% is recommended for *Acacia hybrid* clone wood.

Keywords: *Acacia hybrid*, anthraquinone, yield, physical properties of paper

<sup>1</sup> Student of Forest Products Technology Department, Faculty of Forestry UGM

<sup>2</sup> Lecturer of Forest Products Technology Department, Faculty of Forestry UGM

<sup>3</sup> Researcher of National Research and Innovation Agency