

ABSTRAK

KARAKTERISTIK KERTAS DARI CAMPURAN GANGGANG HIJAU (*Cladophora Sp.*) DAN LIMBAH BULU AYAM (*Gallus-Gallus Domesticus*) DENGAN VARIASI KONSENTRASI PELARUT DAN WAKTU PEMASAKAN MENGGUNAKAN METODE SODA

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Produksi ayam pedaging yang tinggi di Sumatera Selatan menghasilkan limbah bulu ayam dalam jumlah besar yang belum dimanfaatkan secara optimal dan berpotensi mencemari lingkungan. Di sisi lain, perairan Indonesia kaya akan ganggang hijau (*Cladophora sp.*) yang memiliki kandungan selulosa tinggi, menjadikannya bahan alternatif potensial dalam pembuatan kertas. Penelitian ini bertujuan untuk mengkaji karakteristik kertas berbahan dasar campuran limbah bulu ayam dan ganggang hijau dengan penambahan zat aditif tepung tapioka serta pewarna alami bunga telang, menggunakan metode soda. Variasi konsentrasi larutan NaOH (10–50%) dan waktu pemasakan (60 dan 90 menit) digunakan pada tahap pemasakan pulp. Karakteristik kertas yang dihasilkan dievaluasi melalui uji gramatur, kadar air, dan daya tarik sesuai SNI 7274:2008. Hasil penelitian menunjukkan bahwa variasi waktu pemasakan dan konsentrasi pelarut NaOH berpengaruh pada kandungan yang ada didalam *pulp* mulai dari kadar *alpha selulosa*, *beta selulosa*, *gamma selulosa*, serta kadar lignin. Semakin tinggi konsentrasi pelarut dan semakin lama waktu pemasakan maka, semakin tinggi kadar selulosanya dan semakin turun kadar ligninnya. Kombinasi waktu pemasakan 90 menit dan konsentrasi NaOH 50% memberikan hasil terbaik dari seluruh sampel. Secara umum semua sampel kertas sudah memenuhi persyaratan mutu SNI 7274:2008. Seluruh sampel kertas memiliki gramatur diatas 50 g/m² dan daya tarik diatas 2 kN/m. Selain itu, kadar air pada hampir semua sampel berada di rentang 4,5-6% kecuali pada konsentrasi 10% waktu pemasakan 60 menit.

Kata kunci: kertas, bulu ayam, ganggang hijau, soda, karakteristik

ABSTRACT

CHARACTERISTICS OF PAPER FROM A MIXTURE OF GREEN ALGAE (*Cladophora Sp.*) AND CHICKENFEATHER WASTE (*Gallus-Gallus Domesticus*) WITH VARIATIONS IN SOLVENT CONCENTRATION AND COOKING TIME USING THE SODA METHOD

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*The high production of broiler chickens in South Sumatra generates a large amount of chicken feather waste, which remains underutilized and potentially pollutes the environment. Meanwhile, Indonesian waters are rich in green algae (*Cladophora sp.*) with high cellulose content, making it a promising alternative raw material for papermaking. This study aimed to examine the characteristics of paper made from a mixture of chicken feather waste and green algae, with the addition of tapioca starch as an additive and butterfly pea (*Clitoria ternatea*) as a natural dye, using the soda process. The pulping stage employed variations of NaOH concentration (10–50%) and cooking time (60 and 90 minutes). The resulting paper was evaluated based on grammage, moisture content, and tensile strength according to SNI 7274:2008. The research results show that variations in cooking time and the concentration of NaOH solvent have an effect on the content within the pulp, starting from the levels of alpha cellulose, beta cellulose, gamma cellulose, as well as the lignin content. The higher the solvent concentration and the longer the cooking time, the higher the cellulose content and the lower the lignin content. A combination of a cooking time of 90 minutes and a NaOH concentration of 50% provides the best results among all samples. In general, all paper samples meet the quality standards of SNI 7274:2008. All paper samples have a grammage above 50 g/m² and a tensile strength above 2 kN/m. In addition, the moisture content in almost all samples is in the range of 4.5-6%, except for the 10% concentration with a cooking time of 60 minutes.*

Keywords: paper, chicken feathers, green algae, soda process, characteristics