

**PEMBUATAN KERTAS ANTIMIKROBA DARI ALANG-ALANG  
(*Imperata cylindrica*) TERLAPIS NANOSELULOSA ANIONIK YANG  
TERTAUT SILANG KATIONIK**

Azizatul Karimah  
15/383273/PA/16933

**INTISARI**

Pembuatan kertas antimikroba dari alang-alang (*Imperata cylindrica*) terlapis nanoselulosa anionik yang tertaut silang kationik telah dipelajari. Morfologi permukaan kertas, perubahan gugus fungsi, aktivitas antimikroba dan fisik dari kertas alang-alang terlapis nanoselulosa anionik yang tertaut silang kationik dievaluasi sehingga diperoleh kertas alang-alang terlapis nanoselulosa anionik yang tertaut silang kationik terbaik.

Kertas terlapis nanoselulosa anionik yang tertaut silang kationik dibuat dengan pencetakan suspensi pulp alang-alang dengan gramatur 60 g/m<sup>2</sup> dilanjutkan penyemprotan nanoselulosa anionik dan perendaman dalam larutan kationik. Kertas yang diperoleh dilakukan karakterisasi dengan (ATR)-FTIR, SEM dan aktivitas antimikroba. Data kuantitatif diperoleh dengan analisis total koloni mikroba, ketahanan tarik dan sobek kertas terlapis nanoselulosa anionik tertaut silang kationik.

Hasil penelitian diperoleh bahwa kertas alang-alang terlapis nanoselulosa anionik yang tertaut silang H<sup>+</sup> dan Al<sup>3+</sup> berhasil dibuat yang ditunjukkan dengan adanya puncak khas pada daerah sekitar 1600 cm<sup>-1</sup> yang tajam untuk Al<sup>3+</sup> dan kembar untuk H<sup>+</sup>. Kertas alang-alang murni terlapis nanoselulosa anionik yang tertaut silang Al<sup>3+</sup> memiliki persentase antimikroba terhadap bakteri aerobik sebesar 50% dan khamir sebesar 100%. Kertas alang-alang murni terlapis nanoselulosa anionik yang tertaut silang H<sup>+</sup> memiliki persentase antimikroba terhadap bakteri aerobik sebesar 100% dan khamir sebesar 100%. Proses pelapisan paling baik adalah kertas terlapis nanoselulosa anionik yang tertaut silang Al<sup>3+</sup> ditunjukkan dari citra SEM yang lebih halus, pada kondisi ini kertas memiliki ketahanan sobek yang paling tinggi sebesar 38,53±1,87 gf. Kertas terlapis nanoselulosa anionik yang tertaut silang Al<sup>3+</sup> berpeluang untuk dikembangkan sebagai kemasan antimikroba.

Kata kunci : antimikroba, nanoselulosa anionik, taut silang kationik,  
kemasan kertas, pelapisan

***PREPARATION OF ANTIMICROBIAL PAPER FROM REEDS  
(Imperata cylindrica) COATED CATIONIC CROSSLINKED ANIONIC  
NANOCELLULOSE***

Azizatul Karimah  
15/383273/PA/16933

**ABSTRACT**

A study on preparation of antimicrobial paper from *Imperata cylindrica* coated cationic crosslinked nanocellulose as a food packaging has been performed. Paper surface morphology, alteration of functional groups, antimicrobial and physical properties of reed paper coated cationic crosslinked anionic nanocellulose were evaluated. The antimicrobial paper was made by preparing the suspension of reeds pulp in 60 g/m<sup>2</sup> grammar followed by spraying anionic nanocellulose and immersing the paper in cationic solution. The antimicrobial paper obtained was characterized by (ATR)-FTIR, SEM and antimicrobial activity. In addition, the analysis of total microbe colonies, tensile and tear strength were also performed to evaluate the antimicrobial sheet perform.

The result showed that antimicrobial paper from reeds coated by H<sup>+</sup> dan Al<sup>3+</sup> crosslinked anionic nanocellulose was successfully prepared. It can be indicated by the presence of typical peaks at around 1600 cm<sup>-1</sup> in which Al<sup>3+</sup> peak is sharp and the twin peak of H<sup>+</sup> peak can be found. The pure reed paper coated Al<sup>3+</sup> crosslinked anionic nanocellulose has antimicrobial properties toward an aerobic bacteria for 50% and yeast for 100%. Pure reeds paper coated H<sup>+</sup> crosslinked anionic nanocellulose has antimicrobial properties toward aerobic bacteria for 100% and yeast for 100%. The best coating process is found on paper coated Al<sup>3+</sup> crosslinked anionic nanocellulose, showed by smoother and compact surface observed by SEM image. The paper coated Al<sup>3+</sup> crosslinked anionic nanocellulose has the highest tear strength, thus it has a chance to be developed as an antimicrobial packaging.

Keywords : antimicrobial activity, anionic nanocellulose, cationic crosslinked, paper packaging, coating treatment