

# DEVELOPMENT OF NATA-BASED ANTIBACTERIAL FOOD PACKAGING

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## ABSTRACT

This study aims to determine the character of cellulose films with the addition of plasticizers glycerol or sorbitol and lemongrass oil based on mechanical tests, water resistance tests and antibacterial activities.

Cellulose membranes were prepared from fermented coconut water with the addition of various glycerol or sorbitol plasticizer, then immersed in lemongrass oil as an antibacterial material, with variations in the immersion time for 1, 3, 5, 7, and 14 days. Cellulose films synthesized were characterized using a set of tensile strength apparatus, water resistance, determination of functional groups with FTIR-ATR and anti-bacterial activities on *S aureus* and *E coli* bacteria using inhibition zone method.

The results showed that the addition of glycerol or sorbitol and lemongrass oil affected the physical and mechanical properties of cellulose films. Cellulose-plasticizer film with the largest elongation was obtained from the addition of 5% glycerol and immersion in lemongrass oil for 5 days with Young modulus 230,3917 Mpa, while cellulose film with 15% sorbitol plasticizer and immersion in citronella oil for 5 days only had Young 75 modulus of , 5271 Mpa. The highest water resistance was obtained from 5% cellulose-glycerol film with lemongrass oil immersion for 14 days and 5% cellulose-sorbitol film with immersion in lemongrass oil for 14 days as well. Antibacterial tests results showed that cellulose film with the addition of plasticizers glycerol and sorbitol with variations in the immersion time in lemongrass oil showed weak antibacterial activities.

Kata Kunci: *cellulose-glycerol, cellulose-sorbitol, fermentation, lemongrass oil*