ABSTRACT

CHARACTERIZATION OF BIODEGRADABLE FILM BASED ON PORANG STARCH AND CMC COMPOSITE WITH GLYCEROL PLASTICIZER

By

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The porang-CMC starch formulation and glycerol concentration play an important role in the mechanical properties of the resulting biodegradable film. This research aims to determine the porang-CMC starch formulation with glycerol concentration on tensile strength, thickness, percent elongation, and water vapor transmission rate of biodegradable films, as well as determine the interaction of porang-CMC starch formulation with glycerol concentration in producing tensile strength, thickness, percent elongation, and the best water vapor transmission rate of biodegradable film. This research consists of the stages of the process of making porang starch and making biodegradable film. The research was structured in a Complete Randomized Block Design (CRBD) with two factors and three replications. The first factor is the porang starch and CMC formulation with 3 levels, namely 25%:75% (F1); 50%:50% (F2); 75%:25% (F3) and the second factor is the glycerol concentration, namely 1% (G1), 2% (G2), 3% (G3). The data obtained were analyzed for similarity of variance using the Bartlett test and additional data was tested using the Tuckey test, analysis of variance was analyzed to determine the effect between treatments followed by the Least Significant Difference (LSD) test at the 5% level. The results show that the interaction between the formulation factors of 25% porang starch and 75% CMC with a glycerol concentration of 1% produces the best porang starch-based biodegradable film by producing tensile strength values of 32.44 MPa, thickness of 0.25 mm, percent elongation of 36.50%; water vapor transmission rate 14.486 $g/m^2/24$ hours, and biodegradability for 14 days.

Keywords: biodegradable film, porang, starch, CMC, glycerol