ABSTRACT

OPTIMIZATION OF BIODEGRADABLE FILM PRODUCTION BASED ON ARECA NUT (*Areca catechu L.*) PEEL WITH THE ADDITION OF POTATO (*Solanum tuberosum L.*) PEEL STARCH AND CHITOSAN

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Areca nut peel contains 34.18% cellulose which can be used as raw material in making biodegradable film. The purpose of this research is to determine the effect of addition of potato peel starch and chitosan, as well as their interaction to optimize the characteristics of biodegradable areca nut peel films. This research was arranged in a Complete Randomized Block Design with three replications. This research used two factors, the first factor is the concentration of potato peel starch of 1% (P1), 2% (P2), and 3% (P3), and the second factor is the concentration of chitosan of 0.5% (P1), 1% (P2), and 1.5% (P3). The data of tensile strength test, percent elongation, thickness, and water vapor transmission rate were analyzed using analysis of variance to determine the effect between treatments and the data were further processed using an Honestly Significant Difference Test at the 5% level. The data of biodegradability test and room temperature resistance test are presented in the form of images and discussed descriptively. The results of the research showed that there was an interaction between the addition of potato peel starch and chitosan, and had a significant effect on the results of tensile strength, percent elongation, thickness, and water vapor transmission rate. The addition of 3% (P3) potato peel starch and 0.5% (K1) chitosan produced a tensile strength value of 16.124 MPa, percent elongation value of 16.039%, thickness value of 0.25 mm, water vapor transmission rate value of 0.001689 g/m^2/day. Biodegradable films can withstand room temperature for 8 weeks without growing any mold and decomposes in 2 weeks.

Key words: biodegradable film, areca nut peel cellulose, potato peel starch, chitosan

ABSTRAK

OPTIMALISASI PEMBUATAN *BIODEGRADABLE FILM* BERBASIS KULIT PINANG (*Areca catechu L.*) DENGAN PENAMBAHAN PATI KULIT KENTANG (*Solanum tuberosum L.*) DAN KITOSAN

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Kulit pinang mengandung selulosa sebesar 34,18% yang dapat dimanfaatkan sebagai bahan baku dalam pembuatan *biodegradable film*. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan pati kulit kentang dan kitosan, serta interaksi keduanya untuk mengoptimalisasi karakteristik *biodegradable film* kulit pinang. Penelitian ini disusun dalam Rancangan Acak Kelompok Lengkap (RAKL) dengan tiga kali ulangan. Penelitian ini menggunakan dua faktor, faktor pertama yaitu konsentrasi pati kulit kentang sebanyak 1% (P1), 2% (P2), dan 3% (P3), serta faktor kedua yaitu konsentrasi kitosan sebanyak 0,5% (P1), 1% (P2), dan 1,5% (P3). Data nilai kuat tarik, persen pemanjangan, ketebalan, dan transmisi uap air di analisis sidik ragam untuk mengetahui pengaruh antar perlakuan dan diolah lebih lanjut dengan Uji Beda Nyata Jujur (BNJ) pada taraf 5%. Data pengujian biodegradabilitas dan ketahanan suhu ruang disajikan dalam bentuk gambar dan dibahas secara deskriptif. Hasil dari penelitian menunjukkan bahwa adanya interaksi antara penambahan pati kulit kentang dan kitosan, serta berpengaruh nyata terhadap hasil kuat tarik, persen pemanjangan, ketebalan, dan laju transmisi uap air. Penambahan pati kulit kentang sebanyak 3% (P3) dan kitosan 0,5% (K1) menghasilkan nilai kuat tarik 16,124 MPa, nilai persen pemanjangan 16,039%, nilai ketebalan 0,25 mm, nilai laju transmisi uap air 0,001689 g/m^2/hari. *Biodegradable film* dapat bertahan selama 8 minggu tanpa ditumbuhi jamur dan terurai dalam 2 minggu.

Kata kunci: *biodegradable film*, selulosa kulit pinang, pati kulit kentang, kitosan