ABSTRAK

SINTESIS DAN KARAKTERISASI BIOPLASTIK PATI KULIT SINGKONG DENGAN *PLASTICIZER* GLISEROL DAN PENAMBAHAN KITOSAN DARI CANGKANG RAJUNGAN (*Portunus sanguinolentus*)

Bioplastik berbahan pati memiliki kekurangan yaitu rendahnya kekuatan mekanik serta bersifat hidrofilik. Sehingga diperlukan penambahan bahan pendukung lainnya seperti *plasticizer* dan kitosan untuk perbaikan sifat fisik, sifat mekanik dan ketahanan bioplastik terhadap air. Penelitian ini bertujuan untuk menganalisis pengaruh penambahan kitosan cangkang rajungan terhadap pembuatan bioplastik berbasis pati kulit singkong dengan *plasticizer* gliserol. Penelitian ini terdiri dari isolasi serta karakterisasi pati kulit singkong dan kitosan cangkang rajungan, juga pembuatan bioplastik dengan variasi penambahan kitosan cangkang rajungan 0; 0,5; 1; dan 1,5 g. Bioplastik yang dihasilkan kemudian dilakukan karakterisasi analisis gugus fungsi dengan FTIR (*Fourier Transform Infra Red*), analisis morfologi menggunakan SEM (*Scanning Electron Microscope*), sifat fisik, sifat mekanik, dan kemampuan biodegradasi. Pengujian FTIR (*Fourier Transform Infra Red*) menunjukkan adanya pergeseran bilangan gelombang pada setiap gugus fungsi. Sedangkan pada pengujian SEM (*Scanning Electron Microscope*) menunjukkan ketidakhomogenan pada bioplastik. Hasil dari penelitian ini menunjukkan penambahan kitosan mempengaruhi karakteristik bioplastik. Semakin tinggi penambahan massa kitosan maka nilai ketebalan, ketahanan air, dan kuat tarik semakin meningkat. Namun, daya serap air, kadar air, elongasi, dan biodegradasi semakin menurun. Hasil karakterisasi bioplastik terbaik pada penelitian ini yaitu pada penambahan kitosan 1,5 g dengan hasil ketebalan 0,08 mm, daya serap air 55,27%, ketahanan air 44,72%, kadar air 8,89%, kuat tarik 16,025 MPa, elongasi 3,55%, dan terdegradasi sempurna selama 11 hari.

Kata-kata kunci: biodegradasi; bioplastik; karakterisasi; kitosan cangkang rajungan; pati kulit singkong.

ABSTRACT

SYNTHESIS AND CHARACTERIZATION OF BIOPLASTICS OF CASSAVA PEEL STARCH WITH PLASTICIZER GLISEROL AND ADDITION OF CHITOSAN FROM CRAB SHELL (Portunus sanguinolentus)

Bioplastics made from starch have disadvantages, namely low mechanical strength and hydrophilic properties. So it is necessary to add other supporting materials such as plasticizers and chitosan to improve the physical properties, mechanical properties and water resistance of bioplastics. This study aims to analyze the effect of the addition of chitosan from crab shell on the manufacture of cassava starch-based bioplastics with glycerol plasticizer. This research consisted of isolation and characterization of cassava peel starch and king shell chitosan, as well as making bioplastics with variations in the addition of 0; 0,5; 1; and 1,5 g king shell chitosan. The resulting bioplastic was then characterized by functional group analysis with FTIR (Fourier Transform Infra Red), morphological analysis using SEM (Scanning Electron Microscope), physical properties, mechanical properties, and biodegradation ability. FTIR (Fourier Transform Infra Red) testing showed a shift in wave numbers in each functional group. While SEM (Scanning Electron Microscope) testing showed inhomogeneity in bioplastics. The results of this study indicate that the addition of chitosan affects the characteristics of bioplastics. The higher the addition of chitosan mass, the thickness, water resistance, and tensile strength values increase. However, water absorption, water content, elongation, and biodegradation decrease. The best bioplastic characterization results in this study were the addition of 1,5 g of chitosan with a thickness of 0,08 mm, water absorption of 55,27%, water resistance of 44,72%, water content of 8,89%, tensile strength of 16,025 MPa, elongation of 3,55%, and completely degraded for 11 days.

Keywords : biodegradation; bioplastics; cassava peel starch; characterization; crab shell chitosan.