

**PENGARUH PENAMBAHAN SORBITOL DAN SELULOSA ECENG
GONDOK (*Eichornia crassipes*) TERHADAP KARAKTERISTIK
PLASTIK BIODEGRADABEL PATI TAPIOKA**

APRILIA HANDAYANI
18/433813/PPA/05628

INTISARI

Plastik biodegradabel merupakan salah satu produk alternatif untuk menangani limbah plastik di muka bumi. Pembuatan plastik biodegradabel dikembangkan karena bersifat ramah lingkungan dan terbarukan. Tujuan penelitian ini untuk mengetahui pengaruh penambahan variasi sorbitol dan selulosa eceng gondok terhadap karakteristik plastik biodegradabel yang dihasilkan.

Penelitian ini diawali dengan isolasi dan karakterisasi selulosa dari batang eceng gondok sebagai bahan penguat plastik biodegradabel pati tapioka. Plastik biodegradabel disintesis dengan penambahan variasi konsentrasi sorbitol dan selulosa eceng gondok. Variasi konsentrasi sorbitol yang ditambahkan adalah 25, 50, dan 75% berat pati. Variasi konsentrasi selulosa eceng gondok sebesar 10, 30, dan 50% berat pati. Beberapa uji yang dilakukan diantaranya uji mekanik (kuat tarik dan elongasi), uji ketahanan air dan uji biodegradasi. Karakterisasi plastik biodegradabel dilakukan dengan menggunakan FTIR dan SEM.

Hasil analisis menunjukkan bahwa plastik biodegradabel pati sorbitol terbaik terdapat pada penambahan konsentrasi sorbitol 50% berat pati, dengan nilai kuat tarik 2,1 MPa, elongasi sebesar 29,31% dan modulus elastisitas 7,16 MPa. Pada penambahan variasi selulosa eceng gondok diperoleh plastik biodegradabel terbaik yaitu pada penambahan variasi selulosa eceng gondok 30% berat pati dengan nilai kuat tarik 5,55 MPa, elongasi 29,99%, persen penyerapan air 22% dan persen degradasi sebesar 80,75%.

Kata kunci: Pati, sorbitol, selulosa, eceng gondok, plastik biodegradabel

THE EFFECT ADDITION OF SORBITOL AND WATER HYACINTH'S (*Eichornia crassipes*) CELLULOSE ON THE TAPIOCA STARCH BIODEGRADABLE PLASTIC CHARACTERISTICS

APRILIA HANDAYANI
18/433813/PPA/05628

ABSTRACT

Biodegradable plastic is an alternative product for handling plastic waste on the earth. The manufacture of biodegradable plastics is developed because it was environmentally friendly and renewable. The purpose of this study was to determine the effect of adding variations of sorbitol and cellulose water hyacinth to the characteristics of the resulting biodegradable plastic.

This research began with the isolation and the characterization of cellulose from water hyacinth stems as a filler material for biodegradable tapioca starch. Biodegradable plastics were synthesized by adding various concentrations of sorbitol and cellulose water hyacinth. The variations in the concentration of sorbitol added were 25, 50, and 75% w/w. The variations in the concentration of water hyacinth cellulose were 10, 30, and 50% w/w. Some of the tests carried out included mechanical tests (tensile strength and elongation), water resistance tests and biodegradation tests. Characterization of biodegradable plastics was carried out using FTIR and SEM.

The analysis showed that the best biodegradable plastic for sorbitol starch was found in the addition of the sorbitol concentration of 50% by weight of starch, with a tensile strength value of 2.1 MPa, elongation of 29.31% and an elastic modulus of 7.16 MPa. In the addition of variations of water hyacinth cellulose, the best biodegradable plastic was obtained, namely the addition of 30% water hyacinth cellulose by weight of starch with a tensile strength value of 5.55 MPa, 29.99% elongation, 22% water absorption and 80.75% degradation percent.

Key words: Starch, sorbitol, cellulose, water hyacinth, biodegradable plastic