

BIOPLASTIK DARI PATI BIJI NANGKA DENGAN PENAMBAHAN SELULOSA ECENG GONDOK DAN POLY VINYL ALKOHOL (PVA)

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ABSTRAK

Permasalahan limbah plastik yang sulit terurai mendorong pengembangan bioplastik berbahan dasar sumber hayati. Penelitian ini memanfaatkan pati biji nangka sebagai polimer utama dengan penambahan selulosa eceng gondok dan Poly Vinyl Alcohol (PVA) untuk meningkatkan sifat mekanik dan fungsional bioplastik. Penelitian dilakukan dalam dua tahap, yaitu variasi konsentrasi selulosa (0–40%) dan variasi PVA (10–50%) dengan variabel tetap berupa pati biji nangka 3 gram, gliserol 3%, aquadest 100 gram, suhu 70°C, dan waktu pencampuran 35 menit. Karakteristik bioplastik diuji meliputi tensile strength, elongation, dan ketahanan air. Hasil penelitian menunjukkan bahwa peningkatan selulosa cenderung meningkatkan kuat tarik hingga nilai tertinggi pada konsentrasi 40%, namun menurunkan nilai elongation. Ketahanan air terbaik diperoleh pada konsentrasi selulosa 20%. Penambahan PVA memberikan pola berbeda, di mana konsentrasi 10% menghasilkan kuat tarik tertinggi, elongation meningkat pada konsentrasi 50%, dan ketahanan air optimal dicapai pada konsentrasi 30%. Secara keseluruhan, kombinasi pati biji nangka dengan selulosa eceng gondok dan PVA mampu menghasilkan bioplastik dengan karakteristik yang bervariasi sesuai komposisi bahan.

Kata kunci: bioplastik, pati biji nangka, PVA, selulosa eceng gondok.

ABSTRACT

The problem of plastic waste that is difficult to decompose encourages the development of bioplastics based on biological sources. This study utilizes jackfruit seed starch as the main polymer with the addition of water hyacinth cellulose and Poly Vinyl Alcohol (PVA) to improve the mechanical and functional properties of bioplastics. The study was conducted in two stages, namely variations in cellulose concentration (0–40%) and variations in PVA (10–50%) with fixed variables in the form of 3 grams of jackfruit seed starch, 3% glycerol, 100 grams of distilled water, a temperature of 70°C, and a mixing time of 35 minutes. The characteristics of the bioplastics tested include tensile strength, elongation, and water resistance. The results showed that increasing cellulose tended to increase tensile strength to the highest value at a concentration of 40%, but decreased the elongation value. The best water resistance was obtained at a cellulose concentration of 20%. The addition of PVA gave a different pattern, where a concentration of 10% produced the highest tensile strength, elongation increased at a concentration of 50%, and optimal water resistance was achieved at a concentration of 30%. Overall, the combination of jackfruit seed starch with water hyacinth cellulose and PVA is able to produce bioplastics with varying characteristics depending on the composition of the materials.

Keywords: *bioplastic, jackfruit seed starch, PVA, water hyacinth cellulose.*