ABSTRAK

PENGARUH PENAMBAHAN VARIASI GLISEROL DAN *CARBOXYMETHYL CELLULOSE* (CMC) PADA BIOPLASTIK DARI AMPAS TEBU (*Saccharum officinarum)* DAN AMPAS TAHU (*Glycine max (L.))*

Meira Zalsabila, 2025, 56 Halaman, 25 Tabel, 25 Gambar, 4 Lampiran

Sampah plastik yang digunakan akan memicu masalah lingkungan karena sulit untuk terurai. Oleh karena itu, dilakukan pengembangan alternatif berupa bioplastik yang mudah terurai oleh mikroorganisme di lingkungan, dengan memanfaatkan potensi ampas tahu dan ampas tebu yang kaya akan pati dan selulosa. Pati dan selulosa digunakan sebagai bahan baku, gliserol sebagai *plasticizer,* dan *carboxymethyl cellulose* (CMC) sebagai pengental dan penstabil. Penelitian ini bertujuan untuk menentukan pengaruh penambahan gliserol dan *carboxymethyl cellulose* (CMC) terhadap sifat bioplastik serta menentukan karakteristik bioplastik berdasarkan uji biodegradasi, uji ketahanan air, uji kuat tarik dan elongasi. Metode penelitian menggunakan variasi gliserol (1 mL, 1,5 mL, 2 mL) dan CMC (0,5 gr; 1 gr; 1,5 gr; 2 gr). Proses di awali dengan homogenisasi semua bahan secara perlahan dengan suhu yang dijaga pada 80℃ kemudian dilakukan proses pencetakan lalu dilakukan proses dehidrasi di bawah sinar matahari hingga diperoleh lembaran bioplastik. Hasil penelitian menunjukan bahwa gliserol meningkatkan elongasi dan biodegradasi tetapi menurunkan kuat tarik dan ketahanan air, sementara CMC meningkatkan kuat tarik dan biodegradasi tetapi menurunkan elongasi dan ketahanan air. Bioplastik yang dihasilkan berwarna kekuningan, lentur, dengan kuat tarik 1,268 Mpa-5,133 Mpa dan elongasi 5 % - 27 %. Ketahanan airnya rendah sekitar 26,26 % - 59,13 % namun menunjukan biodegradasi yang baik mencapai nilai degradasi antara 50,07 % - 75,94 % dalam waktu satu minggu karena sifat hidrofilik bahan dan gugus fungsi yang dikenali mikroorganisme.

Kata kunci : Bioplastik, Gliserol, Kitosan, Pati Ampas Tahu, Selulosa Ampas Tebu.

ABSTRACT

EFFECT OF ADDITION OF GLYCEROL AND CARBOXYMETHYL CELLULOSE (CMC) VARIATIONS ON BIOPLASTICS FROM CANE BAGASSE (Saccharum officinarum) AND TOFU PULP (Glycine max (L.))

Meira Zalsabila, 2025, 56 Pages, 25 Tables, 25 Figures, 4 Appendices

Plastic waste poses significant environmental problems due to its slow degradation. Therefore, an alternative in the form of bioplastics, which are easily degradable by microorganisms in the environment, has been developed by utilizing the potential of tofu dregs and sugarcane bagasse, which are rich in starch and cellulose. Starch and cellulose are used as raw materials, glycerol as a plasticizer, and carboxymethyl cellulose (CMC) as a thickener and stabilizer. This research aims to determine the effect of glycerol and carboxymethyl cellulose (CMC) addition on bioplastic properties, and to characterize the bioplastics based on biodegradation, water resistance, tensile strength, and elongation tests. The research method involved variations in glycerol (1 mL, 1.5 mL, 2 mL) and CMC (0.5 g; 1 g; 1.5 g; 2 g). The formulation process began with the slow homogenization of all ingredients at a controlled temperature of 80°C, followed by molding and dehydration under sunlight until bioplastic sheets were obtained. The results showed that glycerol increased elongation and biodegradation but decreased tensile strength and water resistance, while CMC increased tensile strength and biodegradation but decreased elongation and water resistance. The resulting bioplastics were yellowish, flexible, with a tensile strength ranging from 1.268 MPa to 5.133 MPa and elongation from 5% to 27%. Their water resistance was low, approximately 26.26% to 59.13%, but they showed good biodegradation, achieving degradation values between 50.07% and 75.94% within one week due to the hydrophilic nature of the materials and the functional groups recognized by microorganisms.

***Keywords**: Bioplastic, Glycerol, Chitosan, Soybean Curd Residue Starch, Sugarcane Bagasse Cellulose.*