# ABSTRAK


**PENGARUH KONSENTRASI GLISEROL DAN *CARBOXYMETHYL CELLULOSE* DALAM PEMBUATAN BIOPLASTIK BERBASIS BIJI MANGGA (*Mangifera indica*) DAN AMPAS TEBU (*Saccharum officinarum*)**

**Salwa Raulien Amelia, 2026, 53 Halaman, 10 Tabel, 16 Gambar, 4 Lampiran**

Limbah plastik konvensional menjadi salah satu penyebab pencemaran lingkungan karena sulit terdegradasi secara alami. Salah satu alternatif yang dapat dikembangkan adalah bioplastik berbahan dasar pati biji mangga dan ampas tebu yang lebih ramah lingkungan. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan gliserol dan carboxymethyl cellulose (CMC) terhadap karakteristik bioplastik berdasarkan uji kuat tarik, elongasi, ketahanan air, dan biodegradabilitas. Variasi yang digunakan meliputi gliserol 1 mL dan 2 mL serta CMC 0; 0,25; 0,5; 0,75; dan 1 g. Bioplastik dibuat melalui proses pencampuran, pemanasan hingga homogen, pencetakan, dan pengeringan. Hasil penelitian menunjukkan bahwa penambahan gliserol meningkatkan elongasi dan biodegradabilitas, tetapi cenderung menurunkan kuat tarik dan ketahanan air, sedangkan penambahan CMC meningkatkan kuat tarik namun menurunkan elongasi. Bioplastik yang dihasilkan memiliki kuat tarik 3,678–6,540 MPa, elongasi 5–13%, ketahanan air 31,25–45%, dan biodegradabilitas 50–75%. Kuat tarik tertinggi sebesar 6,540 MPa diperoleh pada komposisi 1 mL gliserol dan 0,75 g CMC, elongasi tertinggi sebesar 13% pada komposisi 2 mL gliserol dan 0,5 g CMC, ketahanan air tertinggi sebesar 45% pada komposisi 1 mL gliserol dengan 0 dan 0,25 g CMC, serta biodegradabilitas tertinggi sebesar 75,00% pada komposisi 2 mL gliserol dan 1 g CMC. Seluruh sampel memenuhi standar kuat tarik SNI 7188.7:2016 (1–10 MPa), sedangkan biodegradabilitas di atas 60% hanya dicapai oleh sebagian sampel dan nilai elongasi memenuhi standar JIS K7162-2 (>5%). Variasi gliserol dan CMC berpengaruh terhadap sifat mekanik, ketahanan air, dan biodegradabilitas bioplastik sehingga berpotensi dikembangkan sebagai alternatif kemasan ramah lingkungan.



Kata kunci: Bioplastik, gliserol, CMC, biji mangga, ampas tebu

## *ABSTRACT*

***THE EFFECT OF GLYCEROL AND CARBOXYMETHYL CELLULOSE CONCENTRATIONS ON THE PRODUCTION OF BIOPLASTIC BASED ON MANGO STARCH (Mangifera indica) AND SUGARCANE BAGASSE (Saccharum officinarum)***

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*Conventional plastic waste is one of the major causes of environmental pollution due to its resistance to natural degradation. One environmentally friendly alternative is bioplastic produced from mango seed starch and sugarcane bagasse. This study aimed to determine the effect of glycerol and carboxymethyl cellulose (CMC) addition on the characteristics of bioplastics based on tensile strength, elongation, water resistance, and biodegradability. The formulations consisted of 1 mL and 2 mL of glycerol combined with 0, 0.25, 0.5, 0.75, and 1 g of CMC. Bioplastics were prepared through material mixing, heating until homogeneous, casting, and drying. The results showed that increasing the glycerol content enhanced elongation and biodegradability but tended to reduce tensile strength and water resistance. In contrast, the addition of CMC increased tensile strength but decreased elongation. The resulting bioplastics exhibited tensile strength values ranging from 3.678 to 6.540 MPa, elongation of 5–13%, water resistance of 31.25–45%, and biodegradability of 50–75%. The highest tensile strength (6.540 MPa) was obtained from the formulation containing 1 mL glycerol and 0.75 g CMC, the highest elongation (13%) was achieved with 2 mL glycerol and 0.5 g CMC, the highest water resistance (45%) was obtained with 1 mL glycerol and 0 and 0.25 g CMC, while the highest biodegradability (75.00%) was achieved with 2 mL glycerol and 1 g CMC. All bioplastic samples met the Indonesian National Standard* 7188.7:2016 *(SNI) requirement for tensile strength (1–10 MPa), whereas the biodegradability criterion (>60%) were achieved only by some formulations and the Japanese Industrial Standard* K7162-2 *(JIS) requirement for elongation (>5%). The variation of glycerol and CMC significantly affected the mechanical properties, water resistance, and biodegradability of the bioplastics, indicating their potential as an environmentally friendly alternative packaging material.*



*Keywords: Bioplastic, glycerol, CMC, mango seed, sugarcane bagasse*