

ABSTRAK

PENGARUH PENAMBAHAN GLISEROL DAN *CARBOXY METHYL CELLULOSE* (CMC) TERHADAP KARAKTERISTIK *BIODEGRADABLE FILM* BERBASIS SELULOSA TANDAN KOSONG KELAPA SAWIT

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Biodegradable film sebagai alternatif kemasan ramah lingkungan dapat dibuat dari bahan baku selulosa. Serat tandan kosong kelapa sawit memiliki kandungan selulosa sebesar 45,95% yang dapat dimanfaatkan dalam pembuatan *biodegradable film*. Penelitian ini bertujuan untuk mengetahui adanya pengaruh dari penambahan konsentrasi gliserol dan *Carboxy Methyl Cellulose* (CMC) serta interaksi antar keduanya terhadap karakteristik *biodegradable film* yang dihasilkan. Penelitian ini menggunakan metode perhitungan Rancangan Acak Kelompok Lengkap (RAKL) secara faktorial yang terdiri dari dua faktor dan tiga ulangan. Faktor pertama adalah gliserol dengan kode (G) yang terdiri dari tiga konsentrasi yaitu 0,8% (G1), 1% (G2), dan 1,2% (G3) dan faktor kedua adalah *Carboxy Methyl Cellulose* (CMC) dengan kode (C) yang terdiri dari tiga konsentrasi yaitu 1,5 (C1), 2,5% (C2), dan 3,5% (C3). Data hasil pengamatan kuat tarik, persen pemanjangan, ketebalan, dan laju transmisi uap air diolah menggunakan analisis sidik ragam kemudian dilakukan uji lanjut dengan uji Beda Nyata Terkecil (BNT) pada taraf 5%. Hasil penelitian menunjukkan adanya pengaruh yang berbeda nyata terhadap karakteristik *biodegradable film* berbasis selulosa tandan kosong kelapa sawit. Perlakuan terbaik dengan total nilai rata-rata perhitungan prioritas sebesar 0,352 terdapat pada perlakuan gliserol 0,8% dan CMC 2,5% bernilai kuat tarik 2,053 MPa, persen pemanjangan 12,659%, ketebalan 0,189 mm, dan laju transmisi uap air 4,140 gr/m²/24 jam. Selain itu, *biodegradable film* ini memiliki masa ketahanan suhu ruang selama 21 hari dan masa terurai pada biodegradabilitas selama 28 hari.

Kata kunci : selulosa, tandan kosong kelapa sawit, *biodegradable film*, gliserol, *Carboxy Methyl Cellulose* (CMC)

ABSTRACT

THE EFFECT OF GLYCEROL AND CARBOXY METHYL CELLULOSE (CMC) ADDITION ON BIODEGRADABLE FILM CHARACTERISTICS BASED ON OIL PALM EMPTY FRUIT BUNCH CELLULOSE

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Biodegradable film as an alternative to environmentally friendly packaging can be made of cellulose raw materials. Oil palm empty fruit bunch fiber has a cellulose content of 45.95% which can be utilized in making biodegradable films. This study aims to determine the effect of the addition of glycerol and Carboxy Methyl Cellulose (CMC) concentrations and the interaction between the two on the characteristics of the biodegradable film produced. This study used a factorial Completely Randomized Block Design (CRBD) calculation method consisting of two factors and three replicates. The first factor was glycerol with code (G) consisting of three concentrations, namely 0.8% (G1), 1% (G2), and 1.2% (G3) and the second factor was Carboxy Methyl Cellulose (CMC) with code (C) consisting of three concentrations, namely 1.5 (C1), 2.5% (C2), and 3.5% (C3). Data from the observation of tensile strength, percent elongation, thickness, and water vapor transmission rate were processed using analysis of variance and then further tested with the Least Significant Difference (LSD) test at the 5% level. The results showed a significantly different effect on the characteristics of biodegradable film based on oil palm empty fruit bunch cellulose. The results showed a significantly different effect on the characteristics of biodegradable film based on palm oil empty fruit bunch cellulose. The best treatment with a total average value of priority calculation of 0.352 is in the glycerol 0.8% and CMC 2.5% treatment with a tensile strength of 2.053 MPa, percent elongation of 12.659%, thickness of 0.189 mm, and water vapor transmission rate of 4.140 gr/m²/24 hours. In addition, this biodegradable film has a room temperature resistance period of 21 days and a biodegradability period of 28 days.

Keywords : cellulose, oil palm empty fruit bunch, biodegradable film, glycerol, Carboxy Methyl Cellulose (CMC)