

ABSTRAK

PEMBUATAN *BIODEGRADABLE FOAM* BERBASIS LIMBAH TONGKOL JAGUNG (*ZEA MAYS L.*) DAN PATI KULIT PISANG KEPOK (*MUSA PARADISIACA L.*) MENGGUNAKAN METODE BAKING PROSES

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Biodegradable Foam merupakan bahan kemasan ramah lingkungan yang berpotensi menggantikan styrofoam konvensional karena dapat terdegradasi secara alami. Penelitian ini bertujuan untuk menganalisis pengaruh Variasi massa pati kulit pisang kepok (*Musa paradisiaca L.*) dan selulosa tongkol jagung (*Zea mays L.*) serta konsentrasi polivinil alkohol (PVA) terhadap karakteristik *Biodegradable Foam*, serta menentukan formulasi terbaik yang dihasilkan. Selulosa diisolasi dari tongkol jagung melalui proses delignifikasi dan bleaching, kemudian dikarakterisasi menggunakan *Fourier Transform Infrared* (FTIR). *Biodegradable Foam* dibuat dengan metode baking process menggunakan variasi Variasi massa pati kulit pisang kepok dan selulosa tongkol jagung serta konsentrasi PVA. Karakteristik yang dianalisis meliputi daya serap air, kuat tarik, biodegradabilitas, dan densitas. Hasil analisis FTIR menunjukkan adanya gugus fungsi khas selulosa yang mengonfirmasi keberhasilan proses isolasi dengan kadar α -selulosa sebesar 82,0256%. Hasil penelitian menunjukkan bahwa Variasi massa pati kulit pisang kepok, selulosa tongkol jagung, dan konsentrasi PVA berpengaruh terhadap karakteristik *Biodegradable Foam* yang dihasilkan. Nilai daya serap air yang diperoleh berkisar antara 14,03–17,86%, kuat tarik sebesar 0,0003–0,0025 MPa, biodegradabilitas sebesar 9,23–22,41%, dan waktu degradasi sempurna selama 26–50 hari. Seluruh formulasi telah memenuhi standar untuk parameter daya serap air dan biodegradabilitas, namun belum memenuhi standar kuat tarik minimum. Formulasi terbaik diperoleh pada Variasi massa pati kulit pisang kepok : selulosa tongkol jagung sebesar 95% : 5% dengan konsentrasi PVA 15%, yang menghasilkan nilai biodegradabilitas tertinggi sebesar 22,4051% dan waktu degradasi tercepat selama 26 hari. Hasil penelitian menunjukkan bahwa pati kulit pisang kepok dan selulosa tongkol jagung berpotensi dimanfaatkan sebagai bahan baku *Biodegradable Foam* yang ramah lingkungan, namun masih memerlukan pengembangan lebih lanjut untuk meningkatkan sifat mekaniknya.

Kata kunci: *Biodegradable Foam* (*Biodegradable Foam*), Pati Kulit Pisang Kepok, Selulosa Tongkol Jagung, Polivinil Alkohol (PVA), Baking Process.

ABSTRACT

MANUFACTURE OF BIODEGRADABLE FOAM BASED ON CORN COB WASTE (ZEA MAYS L) AND KEPOK BANANA PEEL STARCH (MUSA PARADISIACA L) USING THE BAKING PROCESS METHOD

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Biodegradable Foam is an environmentally friendly packaging material that has the potential to replace conventional styrofoam because it can be degraded naturally. This study aims to analyze the effect of the mass ratio of kepok banana peel starch (Musa paradisiaca L.) and corncob cellulose (Zea mays L.) and the concentration of polyvinyl alcohol (PVA) on the characteristics of Biodegradable Foam, and to determine the best formulation produced. Cellulose was isolated from corncobs through delignification and bleaching processes, then characterized using Fourier Transform Infrared (FTIR). Biodegradable Foam was made by the baking process method using variations in the mass ratio of kepok banana peel starch and corncob cellulose and PVA concentration. The characteristics analyzed included water absorption, tensile strength, biodegradability, and density. The results of the FTIR analysis showed the presence of typical cellulose functional groups confirming the success of the isolation process with an α -cellulose content of 82.0256%. The results showed that the mass ratio of kepok banana peel starch, corn cob cellulose, and PVA concentration affected the characteristics of the Biodegradable Foam produced. The water absorption values obtained ranged from 14.03–17.86%, tensile strength of 0.0003–0.0025 MPa, biodegradability of 9.23–22.41%, and perfect degradation time of 26–50 days. All formulations have met the standards for water absorption and biodegradability parameters, but have not met the minimum tensile strength standard. The best formulation was obtained at a mass ratio of kepok banana peel starch: corn cob cellulose of 95%: 5% with a PVA concentration of 15%, which produced the highest biodegradability value of 22.4051% and the fastest degradation time of 26 days. The research results indicate that Kepok banana peel starch and corncob cellulose have the potential to be used as environmentally friendly raw materials for Biodegradable Foam, but further development is needed to improve their mechanical properties.

Keywords: *Biodegradable Foam (Biodegradable Foam), Kepok Banana Peel Starch, Corncob Cellulose, Polyvinyl Alcohol (PVA), Baking Process.*