RINGKASAN

Peningkatan penggunaan plastik konvensional yang sulit terurai mendorong pengembangan bioplastik sebagai alternatif material ramah lingkungan. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan sorbitol sebagai *plasticizer* dan serat nanoselulosa sebagai bahan penguat terhadap sifat fisik, mekanik, dan biodegradabilitas bioplastik berbasis polivinil alkohol (PVA) dan pati sagu.

Penelitian menggunakan Rancangan Acak Lengkap (RAL) dua faktor, yaitu konsentrasi sorbitol (0%, 1%, dan 2%) dan serat nanoselulosa (0%, 2%, dan 4%). Parameter yang diuji meliputi ketebalan, laju transmisi uap air (WVTR), transparansi, biodegradabilitas, kuat tarik, dan elongasi, dengan analisis data menggunakan ANOVA dua arah dan uji DMRT pada taraf 95%.

Hasil penelitian menunjukkan bahwa konsentrasi sorbitol berpengaruh nyata dalam meningkatkan ketebalan, WVTR, dan elongasi, serta menurunkan kuat tarik bioplastik. Konsentrasi serat nanoselulosa berpengaruh nyata dalam meningkatkan ketebalan dan kuat tarik, serta menurunkan transparansi bioplastik. Interaksi antara sorbitol dan serat nanoselulosa berpengaruh nyata terhadap ketebalan dan kuat tarik, tetapi tidak berpengaruh nyata terhadap WVTR dan elongasi. Uji biodegradasi menunjukkan bahwa seluruh sampel bioplastik mengalami degradasi secara visual selama proses penguburan tanah, sehingga bioplastik berbasis PVA dan pati sagu berpotensi dikembangkan sebagai material kemasan yang ramah lingkungan.

.

SUMMARY

The increased use of conventional plastics that are difficult to decompose has driven the development of bioplastics as an environmentally friendly material alternative. This study aims to determine the effect of adding sorbitol as a plasticizer and nanocellulose fibers as reinforcing material on the physical, mechanical, and biodegradability properties of sago starch and polyvinyl alcohol (PVA)-based bioplastics.

The study used a two-factor Completely Randomized Design (CRD), namely the concentration of sorbitol (0%, 1%, and 2%) and nanocellulose fibers (0%, 2%, and 4%). The parameters tested include thickness, water vapor transmission rate (WVTR), transparency, biodegradability, tensile strength, and elongation, with data analysis using two-way ANOVA and DMRT test at a 95% confidence level.

The research results indicate that the concentration of sorbitol significantly affects the increase in thickness, WVTR, and elongation, while decreasing the tensile strength of the bioplastic. The concentration of nanocellulose fibers has a significant effect on increasing thickness and tensile strength, while reducing the transparency of the bioplastic. The interaction between sorbitol and nanocellulose fibers significantly affects thickness and tensile strength, but does not significantly affect WVTR and elongation. Biodegradation tests show that all bioplastic samples undergo visual degradation during the soil burial process, suggesting that PVA- and sago starch-based bioplastics have the potential to be developed as environmentally friendly packaging materials.