ELUCIDATION VARIOUS BIODEGRADABILITY TEST OF THE BIOPLASTIC FROM BANANA PEEL WASTE

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ABSTRACT

ELUCIDATION VARIOUS BIODEGRADABILITY TEST OF THE BIOPLASTIC FROM BANANA PEEL WASTE

Plastics that are biodegradable can break down into water, carbon dioxide, and biomass when living things typically microbes get involved. Biodegradable plastics which derived from fruit and vegetable waste have been innovating to overcome the pollution problems because of biodegradable plastics can be decomposed by microorganisms such as bacteria, fungi and actinomycetes in the soil ecosystems. Banana peels can be recommended as an ideal alternative for the production of biodegradable plastics. The SBT approach has a few disadvantages when it comes to biodegradability studies. The outcomes of this method are only dependent on the data and the sample weight loss value (quantitative analysis); no additional qualitative method or analysis, such as the dip hanging method, has been used to support it. Using Fourier Transform Infrared Spectrometry (FTIR) analysis and optical microscopy, describe the functional groups and morphological structure of Banana Peel Waste (BPW) bioplastic prior to biodegradation research soil burial test. The aims of the research was to examine the BPW bioplastic's biodegradability behavior using the weight loss value as a percentage and to assess the impact of two distinct biodegradability studies on the weight loss of BPW bioplastic (SBT and Dip Hanging Method). The research employs FTIR function to analyze biodegradable plastics, identifying functional groups and defining their chemical structure and content. The degradation rate of plastic film from BPW was compared to the plastic film from soluble starch (SS). The soil burial test revealed that 100% banana starch (BS) bioplastic lost the highest weight (73.33%), demonstrating rapid biodegradation in natural environments. The dip hanging approach, which suspends the biodegradable plastic in a solution containing Bacillus. *subtilis* (B. *subtilis*) bacteria, resulted in a lower weight loss for the sample 0 % BS while for 100% BS resulted 26.68% indicating the effective microbial activity on the sample. The improved performance of bioplastic in SBT illustrates its potential for sustainable end-of-life management, but the dip hanging test reveals its vulnerability to certain microbes. Weight loss of the sample can be occurred effectively in the SBT and also dip-hanging methods due to the environment which encouraged the biodegradable plastic to degrade.

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