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EVALUATING THE POTENTIALITY OF CELLULOSE-BASED BIOPLASTIC FILM FROM GOOSE GRASS (Eleusine indica) AS AN ALTERNATIVE SUSTAINABLE PACKAGING

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ABSTRACT

This research investigates the potential of Goose Grass (Eleusine indica) cellulose-based bioplastic film as a sustainable alternative to conventional plastic packaging. The methodology involved extracting cellulose pulp from Goose Grass using a treatment process, followed by the formulation of bioplastic films incorporating cornstarch, sorbitol as a plasticizer, and acetic acid. The films were subjected testing to assess biodegradability, durability, and water solubility under varying cellulose concentrations (20 g, 30 g, and 40 g). A posttest-only true experimental design was employed, comparing the properties of the experimental bioplastic films to a control group representing conventional plastics.

Key findings revealed that all cellulose-based bioplastic films demonstrated excellent biodegradability, with full degradation occurring within a week during soil burial tests. The control group showed comparable biodegradability but fell short in terms of durability and structural integrity.

The results underline the feasibility of using Goose Grass as a sustainable raw material for bioplastic production. This study provides a potential solution to the global problem of

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plastic waste. Future recommendations include optimizing the extraction process, enhancing the mechanical properties of bioplastic films through advanced formulations, and expanding the scope of testing for industrial and food packaging applications. Overall, this research contributes to the growing body of knowledge on bioplastic innovation and underscores the vital role of renewable resources in sustainable development.