

**BIODEGRADABLE MULCH FILM FROM WATER HYACINTH
CELLULOSE AND SHRIMP SHELL CHITOSAN FOR
SUSTAINABLE AGRICULTURE**

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ABSTRACT

This research explored the development of biodegradable mulch films utilizing cellulose extracted from water hyacinth and chitosan derived from shrimp shells. Traditional plastic mulch films, primarily made from polyethylene, pose a significant environmental threat, contributing to soil pollution and microplastic accumulation, while water hyacinth's rapid growth disrupts aquatic ecosystems. This study aimed to address these issues by creating an eco-friendly alternative to conventional plastic mulches, utilizing an abundant and problematic resource to mitigate plastic waste and promote sustainable agricultural practices. The methodology involved extracting cellulose and chitosan, preparing films, and outlining a plan for evaluating their mechanical, physical, and biodegradation properties in future work.

The process included the extraction of cellulose from water hyacinth through bleaching and alkali treatments, and chitosan from shrimp shells. Film preparation involved incorporating varying chitosan ratios to analyze their effects on film properties. The resulting films were produced, and a plan was established to subject them to characterization, including assessments of their mechanical, physical, and biodegradation properties, which will be carried out in future studies.

The intended findings of this research support the potential of these biodegradable mulch films as a sustainable alternative for agricultural practices, offering a way to reduce plastic pollution and utilize an abundant, underutilized resource. In conclusion, this study contributes to the advancement of sustainable agriculture by providing a biodegradable solution to mitigate plastic pollution and promote the utilization of renewable resources, with the full evaluation of the films' properties to be completed in future work.

Keywords: Biodegradable mulch film, water hyacinth, chitosan, mechanical properties, biodegradation, sustainable agriculture.

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