DEVELOPMENT OF FOOD PACKAGING WRAP USING CORN HUSK

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ABSTRACT

One of the most important issues of the twenty-first century is the dangerous effects that single-use, non-biodegradable plastics have on the environment. This study developed a sustainable thin-film material for environmentally friendly food packaging applications by combining cellulose and chitosan. High-purity cellulose was obtained from corn husks (*Zea mays*) by a series of steps that included ethanol/nitric acid delignification, H_2O_2/NaOH bleaching. A four-stage purification process was used to extract chitosan from Black Tiger shrimp (*Penaeus monodon*) shells, which are deproteinization (4% NaOH), demineralization (4% HCl), decolorization ($KMnO_4$/oxalic acid), and deacetylation (65% NaOH). The 2:1 and 10:1 cellulose to chitosan ratio was used to create the composite films, which was then plasticized using 20% (w/w) glycerol and dissolved in acetic acid to guarantee uniform mixing.

The resultant corn husk cellulose-chitosan (CHC) film will be improve promising qualities for food packaging, including biodegradation, significant antibacterial action, and tensile strength compare with low-density polyethylene (LDPE). Energy-efficient processing was made possible by the acetic acid solvent system with, boiling point: 117.9°C and the addition of glycerol matched flexibility with modest water solubility. By repurposing marine and agricultural waste, the CHC composite adheres to the ideals of the circular economy, even though it absorbs a little more moisture than synthetic films. This work addresses the functional needs for food preservation as well as environmental concerns by offering a scalable, green chemical method for biodegradable packaging. Future studies, should be examine food application features including FTIR, TGA, and SEM, as well as optimize cross-linking to improve moisture resistance while preserving biodegradability qualities of food packaging film.

Key Words: Cellulose, Chitosan, CHC, Delignification, Bleaching, Deprotenization, Demineralization, Decolorization and Deacetylation

TABLE OF CONTENTS