

## Production of Bio-Composites from Cocoa Pod Husk for Use in Packaging Materials

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**Abstract :** A growing population and demand for packaging are driving up the usage of natural resources as raw materials in the pulp and paper industry. Long-term effects of environmental is disrupting people's way of life all across the planet. Finding pulp sources to replace wood pulp is therefore necessary. To produce wood pulp, various other potential plants or plant parts can be employed as substitute raw materials. For example, pulp and paper were made from agricultural residue that mainly included pulp can be used in place of wood. In this study, cocoa pod husks were an agricultural residue of the cocoa and chocolate industries. To develop composite materials to replace wood pulp in packaging materials. The paper was coated with polybutylene adipate-co-terephthalate (PBAT). By selecting and cleaning fresh cocoa pod husks, the size was reduced. And the cocoa pod husks were dried. The morphology and elemental composition of cocoa pod husks were studied. To evaluate the mechanical and physical properties, dried cocoa husks were extracted using the soda-pulping process. After selecting the best formulations, paper with a PBAT bioplastic coating was produced on a paper-forming machine Physical and mechanical properties were studied. By using the Field Emission Scanning Electron Microscope/Energy Dispersive X-Ray Spectrometer (FESEM/EDS) technique, the structure of dried cocoa pod husks showed the main components of cocoa pod husks. The appearance of porous has not been found. The fibers were firmly bound for use as a raw material for pulp manufacturing. Dry cocoa pod husks contain the major elements carbon (C) and oxygen (O). Magnesium (Mg), potassium (K), and calcium (Ca) were minor elements that were found in very small levels. After that cocoa pod husks were removed from the soda-pulping process. It found that the SAQ5 formula produced pulp yield, moisture content, and water drainage. To achieve the basis weight by TAPPI T205 sp-02 standard, cocoa pod husk pulp and modified starch were mixed. The paper was coated with bioplastic PBAT. It was produced using bioplastic resin from the blown film extrusion technique. It showed the contact angle, dispersion component and polar component. It is an effective hydrophobic material for rigid packaging applications.

**Keywords :** cocoa pod husks, agricultural residue, composite material, rigid packaging

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