Arrowroot By-products into Fiber Resources

Michael V. Capiña
Marinduque State University, Philippines

Abstract

Arrowroot (Maranta arundinacea), locally known as uraro in Marinduque, is a minor crop that grows in hilly areas under coconut grooves. Almost 50% to 60% of its biomass and residues are wasted. With the foregoing expansion of production being very minimal, it cannot support the growing industry of arrowroot in the province. The study looked at the feasibility of arrowroot by-products utilization as fiber source for the production of paper, cardboard, and textile. During harvest, the stalks, leaves, and skin of rhizomes from arrowroot were collected, set aside, and measured. Results show that arrowroot biomass and residues wasted are the following: 45% rhizomes, 36% stalks, 18% leaves, and 1% skin of rhizomes. In the extraction process, recovery for starch ranged only from 13% to 20%, with 27%–35% rhizomes residues and 45%–60% water. Laboratory evaluation and analysis of stalk, leaves, skin, and rhizomes for paper and pulp was conducted by the Philippine Fiber Industry Development Authority. The analysis revealed that extracted fibers and pulp have poor formation properties, uneven thickness and surface roughness, and low bonding strength. Analysis of physical property of fiber sample also revealed that the stalk can be a potential source for fiber, showing a tensile strength of 11.37 kgf/g·m with 2.27% elongation (elasticity of fiber before rupture). The utilization of arrowroot by-products as fiber source may lead to increased cultivation of the plant and possible reduction of solid waste.

Correspondence

School of Business and Management, Marinduque State University, Tanza, Boac, Marinduque 4900, Philippines

T +63 42 332 0389
E mvc11477@yahoo.com

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