Redefining Synthetic Hair: A Sustainable Banana Fiber Solution

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The 6.13-billion-dollar synthetic hair industry is a significant contributor to environmental microplastic pollution and has been linked to causing some skin cancers and irritations in its users. This project seeks to address this issue by engineering a biodegradable and renewable alternative to synthetic hair using banana fibers. The goal is to create strands that are biodegradable, durable, and environmentally friendly while maintaining the functionality required for synthetic hair applications. For banana fibers, the pseudo stem of the banana plant was cut into 15 cm sections, scraped to remove excess plant material, and processed in a solution of 300 ml sodium hydroxide and 700 ml of water to extract fibers. Approximately 50 grams of banana fibers were collected from a single pseudo stem. Strength testing on banana fibers showed they could withstand forces of up to 1.0 newton (equivalent to approximately 102 grams of weight) without breaking, indicating their potential durability. This method demonstrates a practical approach to creating biodegradable materials for reducing microplastics in the environment. With these results, the banana fibers show strong potential as a sustainable alternative to plastic-based synthetic hair, addressing both environmental and consumer needs.

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