

Developing A Packaging Material From "Maana" Plant

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Sustainability-enhancing solutions for prevailing products have become more popular nowadays. Among these, cosmetic packaging around the world has three or four sustainable solutions, but they are not dispersed globally. Our research is to introduce biodegradable, sustainable packaging using the "Maana plant" with the scientific name, *Pennisetum purpureum* which is widespread in Sri Lanka. A pulp was made using the Maana leaves and a binder and pressed in a mold to get the shape of a cup. For making the leave pulp, 10g of sodium hydroxide (NaOH) is added to 200g of chopped Maana into 2-4 cm pieces. After that, it is heated to 90°C for 1.5 hours with water. 30 ml of H₂O₂ (1:1.5% w/v ratio) is added to the solution where the biomass removal has taken place and heated between 70°C-80°C minutes stirring for 45 minutes. Binder and urea formaldehyde are taken to make the mixture. According to the data obtained by varying the ratio of binder and urea-formaldehyde separately, it can be concluded that the water absorption and moisture content of urea-formaldehyde is low. After adding urea formaldehyde and binder, the moisture content is 1.192% and 8.061%, respectively, and the water absorption is 185.95% and 241.62%, respectively. Universal Testing Machine was tested on both specimens. However, the tensile strength of the samples exceeds the limit of the Universal Testing Machine. We expect to improve this by finding a better binding agent and producing the best result of biodegradable, sustainable packaging in the "Manna plant."

Keywords: Bio-degradable; *Pennisetum purpureum*; Sustainable solutions; Cosmetic packaging; Water absorption