

Properties of nano-particle TiO₂ treated natural fibre exposed to estuarine environment

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A preliminary study was conducted to quantify absorption and mechanical properties of manila rope treated with nano-particle TiO₂ and exposed to marine environment for 14 days. Importance parameters such as break force (kN), break strain (%), break displacement (mm) were recorded using Universal Testing Machine (UTM). A peaked absorption of 1.48 at 319 nm and 1.15 at 309nm wavelengths was observed for 0.03% and 0.05%. Manila rope treated with 0.05% recorded maximum break force of 139.54kN with breaking strain at 14.99%. Samples were treated with 0.03% TiO₂. The maximum and minimum break force ranging from 135.20- 142.1kN was evaluated. Study results observed decrease in break force corresponding to increase in TiO₂ concentrations. Break force of manila rope treated with 0.01% TiO₂ also yield greater tensile property ranging between 158.98-193.74kN. Properties of break force, break strain and break displacement, ranges from 152.47-207.15kN, 15.54-18.19%, 155.44-181.96mm. Break strain and break displacement had lowest values of mechanical properties at 0.03% concentration. Present study was an attempt to find replacement probability of synthetic fibre with natural fibre to combat the critical problems of current marine environments.

Ecosystem changes and its influence on the component and abundance of marine litter in the beaches of Mangaluru, Dakshina Kannada

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Rapid urbanization and generation of solid waste has led to the need for scientific management of ecosystem challenges. Marine litter studies the types, distribution and abundance of litter that is washed ashore as well as other land sources. One objective was to examine the effect of current community marine debris cleanup programmes carried out by various government and non-governmental organizations. Under the Swacch Mangaluru Abhiyan programme thousands of volunteers, students, youth and general public participated in cleanliness drive in different parts of the city. The beach being the interface of both land and sea was one of the important areas chosen for cleanliness drive. Three major beaches of the city were studied from 2011 to 2016 on a monthly basis. The change in abundance and composition of litter was depicted on a GIS platform. The number of marine litter varied from 899 nos/m² in 2011 to 155.08 nos/m² in 2016. While the weight varied from 7985.5 g/m² in 2011 to 1768.06 g/ m² in 2016. The number (91.5 nos/m²) and weight (587.8 g/m²) of component 'B' consisting of nylon and plastic rope was found to be highest in 2016. Station wise ANOVA showed significant difference (p<0.05) for the same. Year wise significant difference (p<0.01) was