

Papainor: A Novel Eco-Friendly Organic Fabric Softener

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Water pollution is one of the major problems in this world. Nearly 15% of water pollutants come from domestic laundry effluents namely, detergents and chemical softeners. Traditionally, papaya leaves are used to tenderize meat. Literature review also showed that papain, an enzyme from papaya (*Carica papaya*) can soften wool and silk. The aim of this study was to investigate whether papain affects cotton fabric. We investigated the effect of soaking-time and treatment with different concentrations of papain on the tensile strength of cotton-cloth strips. We also compared the softening effect by two commercial softeners. Papain was harvested from the raw papaya fruit. Firstly, we measured the tensile strength of untreated cotton-cloth strips. Then, we soaked cotton-cloth strips in papain for different time intervals. After rinsing, the cotton-cloth strips were dried and the tensile test was performed. Next, we soaked cotton-cloth strips in different concentrations of papain solution. Our results showed that the optimum soaking-time in papain was 10 minutes. By statistical analysis, there was a significant difference of tensile strengths between papain-treated and untreated cotton-cloth strips ($p < .05$). The higher the concentration of papain, the lower the tensile strength of cotton-cloth strips. Treatment with 10 g/l and 30 g/l of papain was comparable to the softening effect of commercial fabric softeners, A and B respectively. In conclusion, it is viable to utilize papain as an alternative organic fabric softener. This eco-friendly product has a great marketing potential besides helping to reduce water pollution for a sustainable society.

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