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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