

Evaluation of cellulolytic fungi from Sri Lanka for biostone washing of denim in comparison with commercial cellulases

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Cellulases have shown their potential applications in various industries including textile. Currently, biostone washing is a popular method which uses cellulase enzymes with pumice stones. In this study, five fungal isolates, from soil were used for producing microbial cellulases and their efficiency for biostone washing of denim in comparison with commercial cellulases was evaluated. It has revealed that the efficiency of the enzymes, obtained from *Aspergillus niger* (0.0689 Abs) *Trichoderma sp.* (0.1373 Abs), *Penicillium sp.* (0.2394 Abs), *Penicillium oxalicum* (0.4735 Abs), *Aspergillus sp.* (0.5668 Abs) and commercial cellulases (1.0952 Abs) were increased in ascending order within 60 minutes. There was no significant relationship ($p > 0.05$, $R^2 < 90\%$) between time and the absorbance of denim dye released within the denim washing conducted using crude enzymes obtained from *Trichoderma sp.*, *Penicillium sp.*, *Aspergillus niger* and *Penicillium oxalicum* and a significant relationship was recorded ($p < 0.05$, $R^2 > 90\%$) from *Aspergillus sp.* and commercial cellulases. Relationship between glucose concentrations of filter paper assay and the absorbance of denim dye released within denim washing conducted using crude enzymes obtained from *Trichoderma sp.*, *Penicillium sp.*, *Aspergillus niger*, *Aspergillus sp.* and *Penicillium oxalicum* was also not significant ($p > 0.05$, $R^2 < 90\%$) except commercial cellulases. The study concluded that there is a potential to use microbial cellulases obtained from *Trichoderma sp.*, *Penicillium sp.*, *Aspergillus niger*, *Aspergillus sp.* and *Penicillium oxalicum* for biostone washing of denim with further genetic modifications to enhance the production of cellulase enzyme.

Keywords: Cellulases, Cellulolytic fungi, Denim washing