Imparting Eco-friendly Antibacterial and Anti-inflammatory Finishing by Microencapsulation Technique for Cotton Fabric

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Abstract:
Studies on eco-friendly antibacterial agents based on bioactive ingredients extracted from natural products for textile application is gaining worldwide interest. In the current paper, an ethanolic extract of Pelargonium hortorum (Geranium) leaves was used to impart antibacterial finishing to cotton fabric. The bioactive compounds of the extract were identified. The extract was microencapsulated using eco-friendly wall shell material such as sodium alginate or mypro gum. The microcapsules forms were examined by light and TEM microscopes whereas the shape of microcapsules on the fabric surface was identified by SEM microscope. Cotton fabrics were treated with the microencapsulated extract by the pad-dry-cure method. Cotton samples treated with microencapsulated extract were post treated with citric acid or binder to fix the microcapsules on the fabric. The microencapsulated extract treated cotton showed antibacterial efficacy against both Escherichia coli (gram negative bacteria) (−ve) and Staphylococcus aureus (gram positive bacteria) (+ve). The treated fabric also showed anti-inflammatory efficacy. Effectiveness of finishing was accessed by determined numbers of washing cycles and the treated fabric retained an effective antibacterial property after 10 washing cycles. The effect of the treatments on the physio-mechanical properties of the treated fabrics was measured.

Keywords:
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