

## Development of eco-friendly finish on cotton fabric using herbs

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■ **ABSTRACT** : The present subject was done to develop eco-friendly antimicrobial finishes using herbs. It mainly aimed at studying the effect of herbal extracts on cotton fabric. In this study, three herbs viz., neem, tulsi and clove were used for finishing of cotton fabric. Methanolic extracts of neem, tulsi and clove herbs were examined using standard antimicrobial disk diffusion method. Extracts were tested against gram-negative bacteria (*Escherisia coli*). The results related to these herbs showed that the clove and the neem extracts showed good anti bacterial property on cotton fabric. Citric acid treatment was used for post treatment of the herbs treated fabric. Among these, clove extract showed excellent antibacterial property on cotton fabric and tulsi extracts showed minimum antibacterial property.

■ **KEY WORDS** : Eco-friendly, Cotton fabric, Harb

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In the last few decades, with the increase in new antimicrobial fibre technologies and growing awareness about cleaner surroundings and healthy life style, a range of textile products based on synthetic antimicrobial agents such as triclosan, metal and their salts, organometalics, phenol and quaternary ammonium compounds, have been developed and quite a few are also available commercially. Although the synthetic antimicrobial agents are very effective against a range of microbes and give a durable effect on textiles. They are cause of concern due to the associated side effects, action on non-target micro-organisms and water pollution. Hence, there is a great demand for antimicrobial textiles based on eco friendly agents which not only help to reduce the ill effects associated due to microbial growth on textile material but also comply with the statutory requirements imposed by regulating agencies. The inherent properties of the textile fibres provide room for the growth of micro-organisms. Besides, the structure of the substrates and the chemical processes many induce the growth of microbes, humid and warm environment still aggravate the problem. Infestation by microbes cause cross infection by pathogens and development of odour where the fabrics are worn next to skin. In addition, the staining and loss of the performance properties of textile substrates are the result of microbial attack. The use of natural products such as

chitosan and natural dyes for antimicrobial finishing of textile materials has been widely reported. Other natural herbal products, such as *Aloe vera*, tea tree oil, Eucalyptus oil and Tulsi leaf (*Ocimum basilicum*) extracts, can also be used for this purpose. There is a vast source of medicinal plants with active antimicrobial ingredients. Although there are many natural products rich in antimicrobial agents, the study on their use in textiles is well documented. The relatively lower incidence of adverse reactions of herbal products as compared to modern synthetic pharmaceuticals, coupled with their reduced cost, can be exploited as an attractive eco-friendly alternative to synthetic antimicrobial agents for textile applications. Recent developments and plant based bioactive agents have opened up new avenues in this area of research (Joshi *et al.*, 2009). Antimicrobial finishes on fabrics can protect human beings against microbes (Biswas *et al.*, 2007). The application of antimicrobial textile finishes at present is confined to specialty products in the medical, technical, industrial, home furnishing and apparel categories. Though a number of commercial antimicrobial agents have been introduced in the market, their compliance with the regulations imposed by international bodies is still not proven. Recent developments on chitosan (a naturally occurring biopolymer) have open up new avenues in this area of research. The