Dyeing, Fastness, and Deodorizing Properties of Cotton, Silk, and Wool Fabrics Dyed with Sappan Wood, Black Tea, Peony, and Clove Extracts

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1. INTRODUCTION

The dyeing of textiles, wood, leather and other natural commodities using colorants from plants and animals is receiving increasing attention. What attracts people to textiles coloured with natural dyes may be one or a combination of factors, including a preference for naturalness, environmental friendliness, lower toxicity, antibacterial/anti-allergic/deodorizing/ anti-cancer properties, harmonising natural shades or just the novelty[1)]. There were many studies on the dyeing and fastness properties of various fabrics using various natural dyes with various mordants. However, studies on the functions using natural colorants can be hardly found. In recent years, concern for health and hygiene is constantly rising. People are extremely sensitive to smells, and deodorizing is becoming an entrenched social need[2)]. The main objective of this study is to investigate the improvement of deodorization performance of various fabrics dyed with various natural colorants. In this study, the influences of natural colorant extracts (sapppan wood, black tea, peony, and clove)on dyeing, fastness(light, water, and perspiration fastness), and deodorizing properties of fabrics (cotton, silk, and wool) were investigated.

2. EXPERIMENTAL

Materials: Cotton, silk and wool fabrics (Standard Adjacent Fabrics for Staining of Fastness Test: KS K 0905) were used.

Extraction: Four kinds of dying solutions were extracted from sappan wood, black tea, peony, and clove using water as extracting solvent at 90℃ for 90 min.

Mordanting: Fabrics were pre-mordanted at 40℃ for 60 min using 3% o.w.f. mordant

solutions (except aluminium sulfate hydrate 10% o.w.f) with bath ratio 1: 50.

Dyeing: All dyeings were carried out using a 1:100 bath ratio at 80℃ for 60 min by exhaustion method.

Characterization: Gas detecting tube method was used to measure ammonia gas concentration.

3. RESULTS

The deodorization performance% of mordanted fabrics using mordants, ($CuSO_4$,nSO_4, $Al_2(SO_4)_3$, $FeSO_4$, $NiSO_4$, $CoSO_4$, $MnSO_4$ and $SnSO_4$) was in the range of 62- 99%. The deodorizing performance% of cotton, silk, and wool fabrics dyed with various natural colorant extracts without treatment of mordants are given Fig.1. The deodorizing performance% of dyed fabrics was in the range of 56 - 99%. The deodorizing performance% increased in the order of peony< black tea < sappan wood < clove.

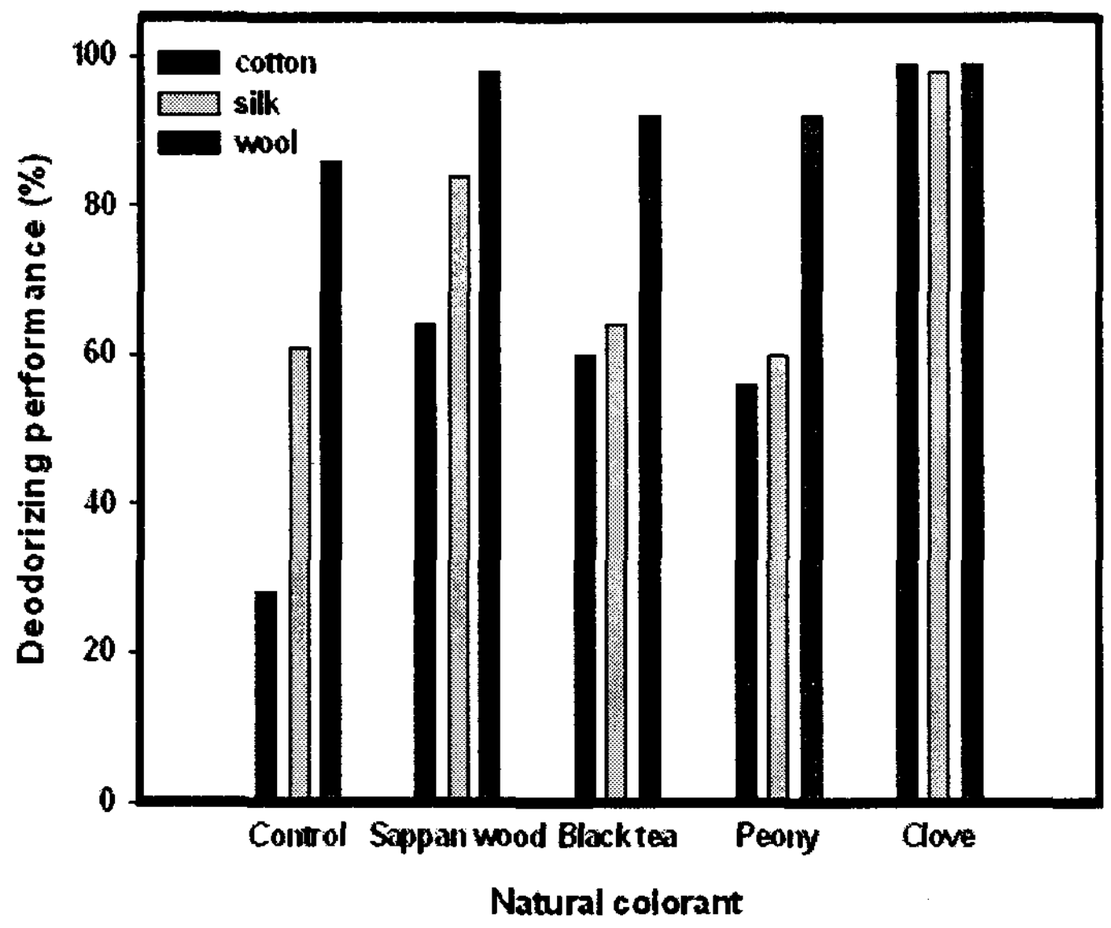

Fig. 1. Comparison of deodorizing performance (%) of undyed fabrics [(cotton, silk, and wool): control] and dyed fabrics using sappan wood, black tea, peony, and clove.

REFERENCES

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