Improving the colour fastness of the selected natural dyes on cotton Part III

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Introduction:
Natural dyeing of the textiles is an age old practice. It is the result of the quest of man for beauty of colour which made him discover the colouring matter from natural sources such as plants and animals. But the invention of synthetic dyes has limited the application of natural dyes. Natural dyes are considered to be very good for their colour experimentation, quality, excellent for their endurance and soft lustrous colouring. Even after a long period they retain great beauty and charm. They do not pollute the environment as they are applied with simple chemical reactions. The natural dye has several advantages over synthetic dyes from the point of view of health, safety and ecology. In this article we reviewed shade variations treated with different fixing agents and mordants.

Selected materials and methods given below:
Alkaline method was selected as it is suitable for extraction of dye from Eucalyptus bark. The optimum time for extraction of dye liquor from the bark was found to be 60 minutes. A dye material concentration of 4 per cent (2g./g. of fabric) was selected. The optimum time for dyeing was 45 minutes for both the dyes. Cotton fabric was pre-treated with 20 per cent myrobalan concentration to increase the tannin deposition which in-turn increased the depth of the shade obtained. Five per cent solutions of fixing agents were selected. Based on absorption values, depth of the shade and appearance, three concentrations per each mordant was selected. In case of alum 5, 10 and 10 per cent and 1, 2 and 3 per cent concentrations of stannous chloride and ferrous sulphate mordants for cotton were selected for pre-mordanting cotton fabric.

Shade variations in Eucalyptus bark dyed cotton due to post-treatment:
Eucalyptus bark dye on cotton showed different shades by varying the mordants and post-treatment with 5 percent fixing agents. All dyed samples showed difference either in depth or in hue when treated with varying eco-friendly fixing agents.

Vinegar post-treated alum mordanted samples displayed pinkish ochre creams. These shades were evenly dyed, although slight increase in depth was noticed with mordanted cottons. Light pinkish cream shade was obtained by stannous chloride. Ferrous sulphate mordanted samples showed dark grey shades than control. Three per cent ferrous sulphate mordanted samples, showed much darker grey shades than control.

Post-treatment with alum had contributed for darkening the shades obtained by mordanting with stannous chloride and ferrous sulphate. However, post-treatment with alum did not contribute in producing bright shades. Bright ochre creams were produced with stannous chloride. In this treatment samples showed good colour which was evident in all stannous chloride samples. A unique shade of grey with slight pinkish tinge was observed in all ferrous sulphated mordanted samples. As percentage of mordant increased, pinkish ochre of higher depth was obtained.
Samples post-treated with ammonia showed only light shades than control. Light cream with slight greenish tinge was observed on alum mordanted samples. The depth of greenish tinge increased with increase in mordant concentration. Light shades of cream with slight pinkish tinge were observed in stannous chloride mordanted samples. Ferrous sulphate mordanted samples produced light shades of grey with slight creamish tinge to dark grayish cream as per the increase in mordant concentration.

In general, it was observed that lime juice had contributed for brightening of the shades obtained on cotton mordanted with various mordants. In case of stannous chloride and ferrous sulphate mordanted cottons bright shade was produced compared to control. But alum mordanted samples produced only light but bright cream shades. Very slight difference was noticed with the increase in concentration of the mordant. Slight pinkish tinge was observed in stannous chloride mordanted samples. But even colour leveling was observed in all the lime juice treated samples. Ferrous mordanted samples showed cream with greenish tinge. In this sample also very slight difference was noticed in colour depth following increase in concentration of the mordant.

The eucalyptus bark dyed cotton post-treated with calcium chloride exhibited light shade than control. Alum mordanted samples exhibited light creams with slight pinkish tinge, which was darkened with the increase in mordant concentration. Light cream with dark pink was produced in stannous chloride mordanted samples after the treatment. Light to dark grey shades were produced with ferrous sulphate mordant. But 1 per cent ferrous sulphate mordanted samples showed slight pinkish tinge with grey colour.

**Conclusion:**

After mordanting with eco-friendly mordants, cotton samples were dyed in Eucalyptus bark, as per the optimized conditions to improve the colour fastness of shades developed. These dyed samples were post-treated with five fixing agents such as vinegar, alum, ammonia, lime juice and calcium chloride. Vinegar post-treated alum mordanted samples displayed pinkish ochre creams. Light pinkish cream shade was obtained by stannous chloride and dark grey shades were obtained by ferrous sulphate mordanted samples showed than control.

Post-treatment with alum had contributed for darkening the shades obtained by mordanting with stannous chloride and ferrous sulphate over control. Samples post-treated with ammonia showed only light shades than control. In general, it was observed that lime juice had contributed for brightening of the shades obtained on cotton mordanted with various mordants. In case of alum mordanted samples produced only light but bright cream shades, slight pinkish tinge was observed in stannous chloride mordanted samples and Ferrous mordanted samples showed cream with greenish tinge.

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