

## EFFECT OF SELECTED MORDANTS ON THE APPLICATION OF NATURAL DYE FROM POMEGRANATE PEEL ON COTTON CLOTHS

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Because of their low cost, availability in different types and classes, synthetic dyes have been used for long time. But, they have limitations such as most of the dyes, especially the azo-based dyes are found to be carcinogenic and non-biodegradable, etc. Therefore, the textile processing industries have been shifted towards natural dyes mainly due to their biodegradable, non-allergic and non-toxic nature. Natural dyes have been extracted from various plants such as onion skin, saffron and henna, etc. However, these natural dyes have no substantively; hence the application needs the assistance of mordants. Therefore, this research was focusing on to extract a natural dye from pomegranate peel, to identify one or few appropriate mordant(s) and mordanting technique(s) by characterizing the properties of washing fastness upon apply it on cotton cloth using UV-Visible Spectrophotometer. A yellow colour natural dye was extracted from pomegranate peel by aqueous extraction method at the optimum conditions, the temperature (90 °C), time (45 min.), material to liquor ratio (1:20) and pH (11). Pre-, simultaneous, and post-mordanting methods were used to apply the dye on cotton cloth, with various selected natural (lemon juice and aloe vera gel) and chemical/synthetic (ferrous sulphate, copper sulphate and potassium dichromate) mordants. The dyed cotton samples were allowed to age for a week, before they were washed. The wash-offs of each sample was analyzed with the UV-visible spectrophotometer to assess the dye fastness to determine the degree of dye bleeding from the fabric. The strength of the wash off, in terms of K/S, was calculated for each case. The K/S value for the blank was found to be 0.19. Any value higher than 0.19 was considered the higher degree of dye bleeding (or colour fastness of the dye to the fabric is less). It was concluded that the natural yellow dye, extracted from pomegranate peel applied with lemon, aloe vera and iron sulphate by post-mordanting method have better color fastness than other mordants, while lemon and iron sulphate exhibited satisfactory color fastness with simultaneous-mordanting method. Even though the other mordants tested didn't give desired results, we may not be omitted without subjected to further experiments as they gave different shades of colors.

**Keywords:** Natural dye, Mordant, Dye fastness, Degree of dye bleeding