



**“An eco-friendly natural dying on wool fabric by using medicinal herbs kalanchoe pinnata
(patherchatta) and sida cordifolia (bala)**

A dissertation submitted in the partial fulfillment

of the requirement for the award of

Master of technology

in

Fashion technology

(Functional Garments)

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Abstract

Since ancient times human beings have been using herbs and plants for curing various ailments and diseases due to their medicinal values and easy availability in nature. Later with advancement in technology these herbs got major importance in pharmaceutical industry due to their suitable chemical composition, abundant availability and easy access. Kalanchoe-pinnata (patharchatta) and sida-cordifolia (bala) are such type of herbs which are found in sub-tropical areas of India and abroad. These herbs are also well mentioned in ayurveda with vast application areas for Medicinal purposes. But no literature has been found regarding their colouring behavior. Present research is an attempt to explore colouring behavior of these two herbs on cotton and wool. The results of the study show that these herbs show good affinity for wool than cotton. Mordanting of the fabric was carried out using three mordanting technique i.e. pre, meta and post-mordanting using natural as well as chemical mordants i.e. goose berry powder, harda powder, orange peel extract, alum, ferrous and copper sulfate. Dyed samples were further analyzed for colour strength and fastness properties. Both herbs give a wide colour spectrum in yellow-green region with excellent fastness properties. The overall results show that both of these dyes can be successfully used and explored further for dyeing of wool with medicinal properties.

Keywords: Sida-cordifolia, kalanchoe-pinnata, natural dye, mordant, L^* , a^* , b^* values, colour fastness.

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Conclusion

It can be clearly observed from the results that natural mordants have comparable affinity to chemical ones towards woollen textile substrate with darker shades and brilliant hues. The colour fastness properties of natural mordants are also good in comparison to chemical mordants with excellent fastness ratings giving a substitute to synthetic mordants in eco-friendly dyeing process.[72,73,160]

The k/s values of sida-cordifolia and kalanchoe-pinnata dyed woollen fabric by various mordants in different mordanting methods are plotted in Figure 24 and 26. Graphical values indicate that mordanting techniques affect the colour values regarding colour strength and colour attributes. In case of chemical mordants such as copper sulphate and ferrous sulphate pre-mordanting gives maximum k/s values whereas in natural mordants dry goose berry and harda powder meta-mordanting gives maximum k/s values. In case of orange peel powder and alum mordants maximum k/s values are obtained in post-mordanting method. Overall orange peel as well as



alum mordant shows lower k/s values amongst all the six mordants evaluated for sida-cordifolia dye. In case of kalanchoe-ponnata it can be clearly examined from the graphical values that dry goose berry and harda powder can be also used as alternative to synthetic mordants with good k/s values while orange peel powder shows poor k/s values. Overall in both the natural dyes it can be analyzed that natural mordants can be also used successfully with natural dyes.[73,157,158]

It can be concluded from the study that kalanchoe-pinnata and sida-cordifolia both herbs also act as good dyeing agents for woollen textiles with a wide range of spectrum in yellow green region. Both the dyed samples with natural as well as chemical mordants give moderate to excellent fastness properties. So, whole dyeing process can be carried out in an eco-friendly manner using natural dyes as well as natural mordants. The renewable natural dyes with eco-friendly mordants i.e. natural mordants have good potential in sustainable textile wet processing. In this research following three mordanting methods pre, meta and post, in which post mordanting method have proved for best colour shade range than meta and pre. [159,160]

In comparative study of dyeing k.pinnata and sida cordifolia on wool fabric, sida cordifolia showed better performance than k.pinnata in term of highest colours strength and colour shades.[72,73,160]