

Assessment of Colour Fastness on Dyed Fabric Using *Parkia Speciosa* (Yongchaak): A Sustainable Approach to Textile Colouration

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Abstract: *Presently, tremendous usage of synthetic dyes would release massive amount of waste and unstable colourants sparking serious health hazard and upsetting the ecosystem. Therefore, study needs to be directed to select a potential natural dye as *Parkia speciosa* to be applied on cotton textile. Colour fastness such as light fastness and wash fastness of dyed fabric were assessed. Study revealed that bleached fabric dyed with *Parkia speciosa* had good wash fastness and light fastness than the scoured fabric, dyed with *Parkia speciosa*.*

Keywords: *Yongchaak, mordants, wash fastness, light fastness*

INTRODUCTION

Natural dyes have been used as a means to colour textiles for centuries. All the dyes until the latter half of nineteenth century were made of different parts of plants and animals. Natural dyes are deep and soft in colour shades when compared with synthetic dyes and are useful for human health because of antimicrobial, insecticidal and healthy properties.

On the other hand, synthetic colorants being synthesized from petrochemical sources through hazardous chemical processes pose threat towards its eco-friendliness. There are two main ways to limit the environmental impact of textile processing. One is to construct sufficiently large and highly effective effluent treatment plants, and the other way is to make sure that the dyes and chemicals that are environment friendly. The rich biodiversity of our country has provided us plenty of raw materials, yet sustainable linkage must be developed between cultivation, collection and use of it (Prabhabathi *et al.*, 2014)

Natural dyes can produce special aesthetic qualities, which, combined with the ethical significance of a product that is environmentally friendly, gives value addition to textile

production as craftwork and as an industry. The major advantage of natural dyes is biodegradable, non-toxic, hygienic and colors soothing to human eyes. Colour fastness is term used in dyeing textile material means resistance of colour to fading, i.e. it refers to the notion of an object having colour that retains its original hue without fading (Dhanalaxmi and Vastrad, 2013).

In addition, *Parkia speciosa* (tree bean or stinky bean) is considered as one of the highly underutilized plants with multidimensional utility and benefits (Chhikara, 2018). It is abundantly available in the state of Manipur and in North Eastern Region from November to April. Thus, the present study is designed with an aim to extract the dyes from tree bean (*Parkia speciosa*) and applied on cotton fabric for colour fastness test.

MATERIAL AND METHODS

Collection of dye source

Outer cover or skin of tree bean were removed and collected for extraction of dye, collected source were wash with water to remove impurities and dust. Thereafter it is sun dried and made into powder using blender.

Scouring

Cotton fabric was scoured using 4 per cent NaOH with 1:30 MLR at 80°C for 30 mins so that impurities contain in the fabric can be removed. Fabric samples are wash with water and further neutralize using 1gpl hydrochloric acid.

Bleaching

Scoured fabric was bleached using 2 % hydrogen peroxide, sodium silicate 1%, TRO (0.5%) with 1:30 MLR at 60°C for 30 min. After bleaching, fabric was washed with cold water and dried at room temperature.

Pre-mordanting of fabric

Cotton fabric was pre-treated with potash alum in 1:30 MLR for at 90°C for 30 minutes. After mordanting, the fabric samples were washed with cold water and dried at room temperature.

Dyeing the fabric by pre-mordanting

Thirty per cent of dye source were taken based on the weight of cotton fabric or GSM (Gram Square Metre) and was dissolved in 1:30 MLR. Fabric sample was then immersed in dye bath. After dyeing, the dyed sample were washed with cold water and dried at room temperature.

Fastness test

Dyed cotton fabrics were tested for light fastness and wash fastness. Colour fastness is usually rated either by loss of depth of colour in original or expressed by staining scale. The principle of fastness test is mainly based on AATCC method.

RESULTS AND DISCUSSION

Table 1 and Fig 1 indicated that light fastness of scoured fabric without mordanting was fair (3-4) and wash fastness was found poor (2). Light fastness of pre mordanting scoured fabric exhibited good (4) dyed fabric. It means that fabric treated with mordant was found to be good to light and wash fastness. Results also revealed that dyed fabric after bleaching without mordanting was found good (4) to light and wash fastness, however pre mordant dyed fabric after bleaching exhibited excellent light and wash fastness.



Fig 1. Yongchaak dyed fabric

Table.1 Colour fastness of dyed fabric using tree bean or stinky bean

S. No	Dyeing method	Scoured Dyed fabric		Bleached Dyed fabric	
		Light fastness grades	Wash fastness grades	Light fastness grades	Wash fastness grades
01	Without mordanting	3-4	2	4	4
02	Pre mordanting	4	3	4-5	4-5

CONCLUSION

Natural dyeing is gradually making its way in the global market and the production of naturally dyed eco-friendly textiles itself is a boon to save the environment from hazardous synthetic dyes. It is concluded from the study that, different shades of colour could be obtained using different mordants with different concentration. Further colour fastness to rubbing, perspiration could be assess for value addition and made into sustainable textile product. In future, an attempt should be carried out to develop the optimum condition for dyeing and to improve colour fastness properties by varying with different MLR, temperature, treatment time etc and dyeing on other natural fibre or fabric viz., silk wool along with screening of phytochemical present in the bio-extract or dyes. Further, the colour strength value of different natural dyes could be compared and studied

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REFERENCES

- Chhikara, N. Devi, H.R. Jaglan, S. Sharma, P. Gupta, P. and Panghal, A. (2018) Bioactive compounds, food applications and health benefits of *Parkia speciosa* (stinky beans): a review. *Agriculture and Food Security*.7:46.
- Dhanalaxmi, R.K. Vastrad, J.V (2013) Colour Fastness properties of Dyed Mesta Fibre. *Asian Journal of Home Science*. 8(2): 476-479.
- Mavilashaw V.P. Krishnamoorthy, S.V (2021) Evaluation of Colour Fastness Properties of Natural Dyes on Mulberry Silk. *Biological Forum-An International Journal*. 13(3b): 265-267.
- Prabhavathi, R. Devi, A.S. Anitha, D. (2014) Improving the Colour Fastness of the Selected Natural Dyes on Cotton (Improving the sunlight fastness and wash fastness of the eucalyptus bark dye on cotton). *Journal of Polymer and Textile Engineering*. 1(4):27-30