A Study on Extracting Dye from Arjun (Terminalia Arjuna) Stem Bark and Discover Its Colour Fastness on Selected Natural Fabric

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Abstract

The present study based on experimental method to obtain natural dye from Arjun stem peel and its application on selected fabrics such as cotton, silk and wool. Arjun stem peel with different selected mordent was dyed on selected natural fabric. Dichromate, Alum, Copper sulphate, and Iron sulphate are selected as mordent for dyed. Colour fastness with washing and light effect was tested on all selected fabrics. The result found that wool fabric has highest washing fastness than other selected fabrics.

Keywords: Arjun tree, Natural dye, Wool, Chintz

Introduction: Organic compound that known as dyes are used by various industries to colour different products including textiles. Natural and synthetic dyes have entangled in our everyday life. Because synthetic dyes are toxic in nature and not biodegradable, natural dyes are sustainable option to adapt. Before invention of synthetic dyes, natural dyes are popular in textile dyeing. Recently, more interest in use of natural dyes has been growing day by day. Dyeing with natural dye was common art of dyeing in India from old ages. Das (1992), studied that until the latter half of the nineteenth century, silk in India was dyed with dyes derived from vegetables or animals. Most of these dyes must be used with mordants.

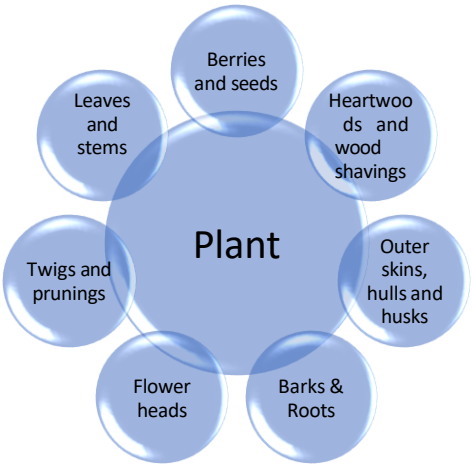


Fig. 1: plant based natural dye resources

Arjun tree scientifically known as Terminalia arjuna is also used for extraction of colour for textile dyeing. Its outflow colour easily in hot water. Arjuna tree bark contain lots of tannins and flavonoids, extracts from bark is act as natural dye even without mordent. Arjunic acid gives Earth brown colour from bark and it gives different shades on different fabric with different mordent.

Present study aimed: **"To extract dye from arjuna bark and discover its colour fastness on selected natural fabric".**

Methodology:

An experimental method of study completed in following different phases:

Phase-1: Extraction of dye:

- Taken dried arjuna tree (stem peel) bark powder.
- For dye bath, non – corrosive stainless-steel vessel was used for extraction of dye.
- 100 gm/l dye bath solution was prepared and boiled it for 30 minutes.
- After extraction of dye, solution was filtered to remove extra components and clear dye liquid used for dye.

Phase-2: Dye application on fabric:

Investigator selected cotton, silk and wool fabric and dichromate, alum, copper sulphate and iron sulphate for mordent.

- Mordent treated and non-treated fabrics were soaked in water for 15 minutes.
- Temperature of dyeing solution was maintained to 60"-80" C for 30 minutes and stirred every 5 minutes.
- After dyeing, samples rinsed with tap water, squeezed and dried in shaded area.

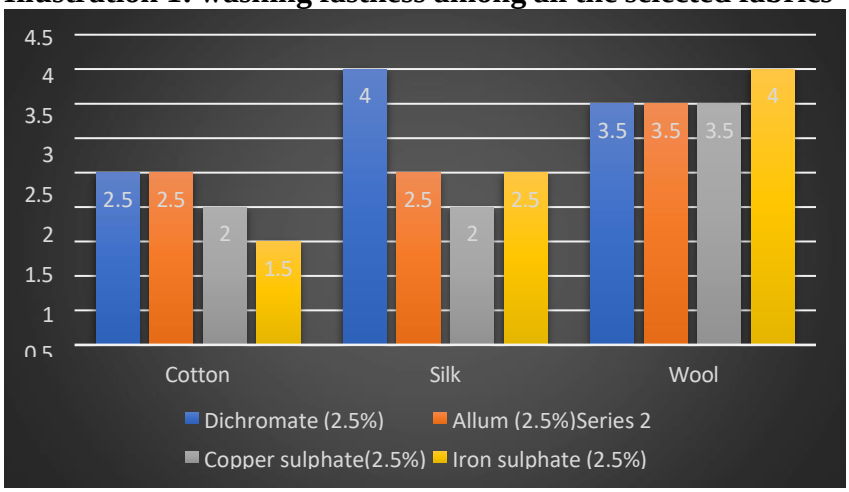
Phase-3: Colour fastness was tested of dyed fabric:

- Investigator studied colour fastness through washing and light effect in scientific way. Both tests were performed in ATIRA (Ahmedabad Textile Research Association, Ahmedabad.).
- Dyes fabric samples were treated to soap solution of different concentration and exposed to varying light intensities.

Result and discussion

Colour fastness of arjuna bark dye on selected fabrics

Illustration 1: washing fastness among all the selected fabrics



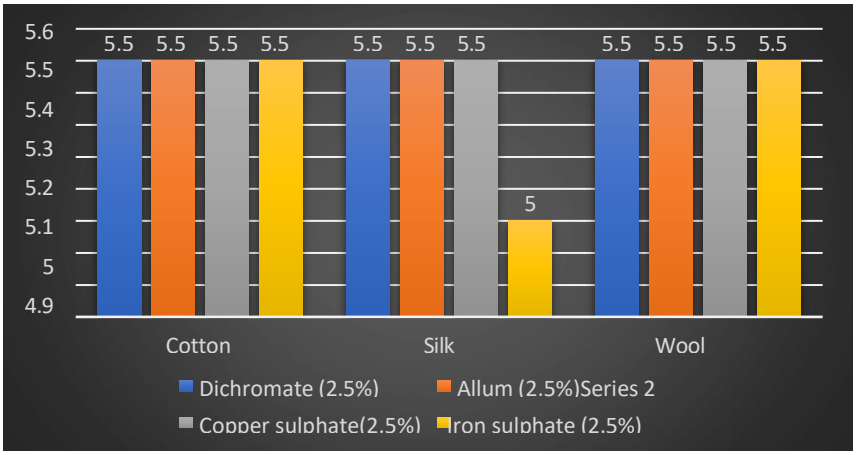


Illustration 2: light fastness among all the selected fabrics

Indication of grey scale Rating	Indication of pilling Rating
5 = Excellence	5 = No pilling
4 = Good	4 = Slight pilling
3 = Fair	3 = Moderate pilling
2 = Poor	2 = Severe pilling
1 = Very poor	1=Very Severe pilling

Illustration No. 1 and **2** indicate colour fastness on the fabric dyed with bark of Arjun stem. The textile laboratory gave rating scales to selected dyed fabrics for washing fastness and light fastness. The result revealed that washing fastness in cotton fabric was poor irrespective of the mordant used but the light fastness (pilling rating) was found to be excellent. The wool fabric showed maximum washing fastness among all other fabrics. The silk was filling under moderate rating (3 to 4), the light fastness was found to be excellent in all the fabrics treated with various mordant used.

Conclusion

A study concluded that washing colour fastness in silk and wool with dichromate and iron sulphate is very good but washing fastness in cotton is poor. The wool fabric showed maximum washing fastness among all other fabrics. Light fastness was found excellent to good in all the selected fabrics with dichromate, alum, copper sulphate and iron sulphate.

References

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