

Application of Natural Dye Using Eclipta Prostrate On Khadi Cotton Fabric with Fragrance Finish

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Abstract:

The dyestuff from the industries plays a major role in the discharge of waste water. The waste water will pollute the land resources, to overcome with that alternative method of eco-friendly natural dyeing was used. In the present study, *Eclipta prostrata* L., Man, is commonly known as "Safed bhangra", is considered anodyne and absorbent. The plant is used as dyeing herb in tattooing and hair coloring. It is rich source of ascorbic acid and it is used to treat a diverse number of ailments including malaria, poisonous animal or insect bites. Khadi is handmade, durable, long lasting and organic in nature so it has a worldwide appreciation in the world. It allows ample amount of air to pass over and around the body due to its weave structure. It has the capacity to absorb moisture. Thyme oil can be used to stimulate the mind, strengthen memory and concentration and calm the nerves. The aromatic finish is used to enhance the value of the product.

Keywords

Dyestuff, *Eclipta prostrata* L., Man, Eco-friendly, Khadi, Thyme oil, Aromatic finish

1. Introduction

Textiles have always played an important role in the progress of human culture by being at the forefront of both technological and artistic development. (1) The main threatening problems in the textile industrial world facing today in the form of wastewaters and atmospheric gases have been found to be polluting the neighboring area. (2). The use of non-allergic, non-toxic and eco-friendly natural dyes on textiles have become a matter of significant importance due to the increased environmental awareness in order to avoid some hazardous synthetic dyes. (3). Natural dyes produce very uncommon, soothing and soft shades as

compared to synthetic dyes. (4). Khadi Cotton has the unique property of keeping the wearer warm in winter as well as cool in summer season. It allows ample amount of air to pass over and around the body due to its weave structure. It has the capacity to absorb moisture. (5). *Eclipta prostrata* (L.) L., Mant. is commonly known as "Safed bhangra", belongs to family Asteraceae. (6). A black dye obtained from *Eclipta alba* and *Eclipta prostrata* is used for dyeing hair and tattooing refers (7) The fresh plant is considered anodyne and absorbent. The plant is used as dyeing herb in tattooing refers (6). Thyme oil can be used to stimulate the mind, strengthen memory and concentration and calm the nerves. Thyme oil can keep insects and parasites such as mosquitoes, fleas, lice, and moths away (8). Simmond siaceae is mostly a woody, evergreen, perennial shrub that produces small seeds, which contains waxy liquid very similar to spermaceti (9). It is used as a carrier or massage oil(10). In the present study, the dyes extracted and applied on the khadi cotton fabric with the natural finishing of herbal aroma oil and to evaluate their efficiency as a coloring material.

2. Materials and Methods

2.1 Selection of Fabric and Dye Extraction

The 100% khadi cotton was purchased from Padiyur Sarvodaya Sangh, Tirupur. The GSM of the fabric was 103 gm/cm² and Thickness was 33 mm. *Eclipta prostrate* (bhringraj) leaves were collected (i.e 5 kg flower peels = 600 gms of dye powder) and wash 2-3 times thoroughly with tap water to remove the dust particles. Shadow dries for two weeks at room temperature and grinds it with 7 liters of water to form a pasty condition and the substance to deposit in the bottom of the conical flask. Filter the remaining substance using ordinary and whats Mann no.1 filter paper. Then it is allow drying in the shade for one week then it is formed into flakes and grind it to form a powder.



Figure 1. Eclipta and thyme

2.2 Dyeing and Finishing of the Selected Fabric

In the present study, for the dyeing, Dye % is 1; material liquor ratio is 1:40. The rock salt was act as an electrolyte (1-gpl) temperature maintained at 90⁰c and time was 30 minutes. At last softener was used to soften the fabric with the mixing of palm oil, coconut oil, gingerly oil. Washed the fabric with cold water and dried the fabric in the shade for 24 hours. For the fragrance finish, the Material: Water ratio is 1:40, the binder is citric acid(2-3 drops), Carrier oil jojoba (50%), thyme oil(50%) and Time= 30 minutes. Immersed the fabric in the solution and continuously stir the fabric. Rinse the fabric in the cold water and allow the fabric to dry in the room temperature using the pad dry cure method.

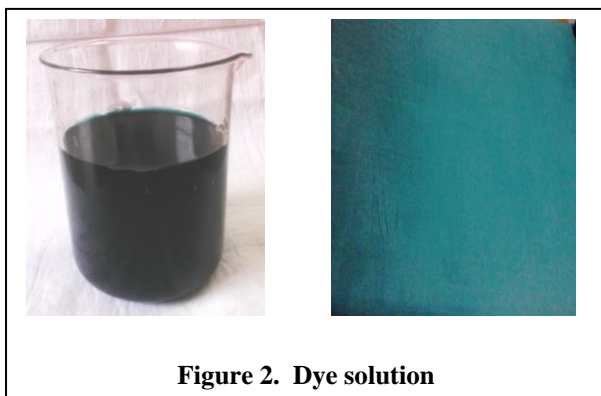


Figure 2. Dye solution

3. Result and Discussion

3.1 Evaluation of Water Permeability

If the water absorbency value is more the water will absorb slowly, the samples show that the value is higher, so the sample absorbs the water slowly.

Table 1. Drop Test.

S.No	Sample	Drop test in seconds
1	S	15

3.2 Evaluation of Spectrophotometer

The dyed sample show that the different values of L, a, b, c, h. The value “h” indicates the hue, the sample S=193.3

Table 2. Spectrophotometer.

Sample	L*	a*	b*	c*	h*
S	29.14	-12.93	-3.06	13.29	193.3

3.3 Colorfastness to Washing

Colorfastness- Grey scale rating:- change in color: 5- no change, 4- Slightly changed, 3- Noticeably changed, 2- considerably changed, 1- much changed. From the above statement, the sample S shows that the change in color is noticeably changed.

Table 3. Colorfastness to Washing

S.No	Colorfastness to washing	S
1	Change in color	3
2	Cotton range	3

3.4 Colorfastness to Crocking/Rubbing

In the dry & wet rubbing technique, the sample S shows that the staining is noticeably stained. From the above statement, the dyes are slightly and noticeably stained in the fabrics.

Table 4. Colorfastness to Rubbing

S.No	Colorfastness to rubbing	S
1	DRY	3
2	WET	3
3	Cotton range for staining	3

3.5 Colorfastness to Perspiration

From the sample S shows that the no change or slightly changed in the perspiration of acidic and alkaline.

Table 5. Colorfastness to Perspiration

S.No	Colorfastness to perspiration	S	
		Alkaline	Acidic
1	Change in color	4-5	4-5
2	Cotton range	3-4	4

3.6 Colorfastness to Light

Colorfastness- Grey scale rating:- change in color: 5- no change, 4- Slightly changed, 3- Noticeably changed, 2- considerably changed, 1- much changed. According to the sample B show that there is noticeably and considerably changes, the

samples S show that there is noticeably change in sunlight.

Table 6. Colorfastness to Light

S.No	Colorfastness to sunlight	S
1	Fading 20 hours	3

3.7 Evaluation of fragrance finish

The quality assessment was carried out with the help of 25 members who have the knowledge on fabric quality. The following results were obtained for the washing fastness of the fragrance finished samples. Colorfastness- change in smell: 5- no change, 4- Slightly changed, 3- Noticeably changed, 2- considerably changed, 1-much changed.

Table 7. Evaluation of fragrance finish

S.No	Samples	Before Wash	After 10 Washes	After 20 Washes
1	S	5	3	2

The fragrance finished sample before wash has no change in smell, after 10 washes the sample S has noticeably changed in smell. After 20 washes, the sample has S has considerably changed in smell.

4. Conclusion

The khadi fabric was representing India, it is a hand spun and hand woven fabric. The khadi adapt the climatic conditions for due to the seasons (warmer and cooler). The current research is based on the khadi fabric with the natural dyed and fragrance finish. It is also used for the promotion of the khadi fabrics for the sales and marketing. It is eco-friendly; natural based dyeing technique is applied on the fabric. The dyes have natural antibacterial and antifungal activities. It is not allergic, non-toxic to the human beings. The fragrance finish of thyme oil can keep away insects, pests and also used to keep away parasites that feed on the human body like mosquitoes, lice, bed-bugs that attack clothes like beetles and moths.

5. Acknowledgements

This work was supported in part by a grant from the south Indian textile research association for the fabric testing.

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