

SHEVARI – A NEW SOURCE OF VEGETABLE DYE FOR COTTON

¹Dr. Anjali.S. Deshmukh, ²Sandhya. B. Shinde,

¹Head and Associate Prof. Department of Home science (Textile and Clothing), GVISH, Amravati

²Assist Prof., Women's college of Home Science and BCA Loni

Abstract: Today importance of natural dyes is more relevant all over the world. It is because of increasing environment related awareness. Most of the natural dyes are eco-friendly, non-toxic, less polluting, non-carcinogenic, bio-degradable in nature as compared to synthetic dyes, hence people are attracted towards use of natural dyes. The present study focused on the dyeing of cotton fabric with natural dye extracted from leaves of Shevari (*Sesbania sesban* linn). Total 18 samples were dyed from which 9 are of experimental group and 9 of controlled group by using different mordant combinations and proportions. Wash and sunlight fastness was noted very good to excellent for both group.

Keywords: Cotton, Shevari leaf extract, Dyeing, sunlight & Wash fastness.

I. INTRODUCTION

Sesbania sesban is a small perennial tree with woody stems, yellow flowers and linear pods belongs to the family Fab-aciai. *Sesbania* is an erect, branched, stout, shrubby plant, 2 to 3 meters in height. Leaves are 10 to 20 centimetres long, with 9 to 20 pairs of leaflets. Leaflets are oblong, 2 to 3 centimetres long. (Pandhare et.al. 2011). Mythili and Ravindharan 2012 reported that flavonoides are present in the leaves of *sesbania sesban* linn. in aqueous condition.



1. Materials and methods

2.1 Materials:-

2.1.1 Dye Source: - Leaves of *Sesbania sesban*: Linn (Shevari)

2.1.2. Textile substrate: - Cotton fabric.

2.1.3. Mordants: - Ferrous Sulphate (*Iron*), Stannous Chloride (*Tin*), Alum (*Aluminum Potassium Sulphate*), Harda Fruit (*Terminalia chebulia* linn.)

2.2 METHODS:-

2.2.1. Scouring:- The grey cotton fabric was scored

2.2.2. Preparation of dye extract for Shevari leaves: The fresh leaves of Shevari (*Sesbania sesban*) plant were collected in the month of October and washed to remove dirt and other residue present on it and wiped off. Leaves of *Sesbania sesban* were cut into small pieces. The extraction was carried out with 60% dye material (owf) with 1:50 M: L ratio for 45 mins at boiling temperature. The water level was maintained during the extraction time.

2.2.3. Mordanting: - mordanting bath was prepared with 10% mordant (owf) with 1:50 m: l ratio alum was used a single mordant and in combination with two metal i.e. iron and tin mordants with 9:1, 7:3 and 5:5 mordant proportion. all the samples of control (without tannin treatment) and experimental (tannin treatment) were mordanted with 10% alum and alum in combination with tin and iron for each proportion. Sample was extracted into the mordanting bath at 40⁰c and slowly temperature was raised at boiling, sample was treated for 45 minutes with constant stirring, procedure was repeated for each sample of control and experimental group.

2.2.4. Dyeing: - Pre mordanted sample were dyed in previously prepared leaf extract of Shevari (*Sesbania sesban* linn.) in separate dye bath for different mordant combination. Dyeing was carried out for 60 minutes with adequate movement of dye liquor. Initially the temperature of the dye bath 50 + 1⁰C then it was raised up to 90⁰ C during dyeing time. The dye bath was allowed to cool at room temperature for 15 minutes, the dye samples were removed from the dye bath.

2.2.5. Soaping: - Soaping of the dyed samples was done with non-ionic detergent (0.5gpl) at 60⁰c for 20 minutes.

2.2.6. Rinsing:-Samples were rinsed thoroughly and dried in the shade.

2.2.7. Assessment of fastness properties:- Washing and sunlight fastness properties of Dyed samples were evaluated according to standard methods laid down by-

Wash fastness was determined using ISO Test2 on paramount launder-o-meter (IS: 3361- 1979). Sunlight fastness was determined using (IS: 686-1985).

IV. RESULTS AND DISCUSSION

II. 3. RESULTS AND DISCUSSION

Cotton is the natural cellulose fiber which is widely used in the textile and apparel industries for various purposes. Cotton fiber is biodegradable in nature. To see the growing ecological awareness and consumer demand towards value added products. The present study was aimed to explore a dye from Shevri (*Sesbania sesban* linn.) for dyeing of cotton. The dyed samples have been evaluated to see the visual effect of dye extracted from Shevri leaves in dyeing. The attempt was also made to see the fastness properties of the selected dye.

When alum was used in combination with Tin having 9:1 proportion the dyed sample of control group rated 4.5 as very good fastness where as wash fastness was improved with tannin treatment. Which rated 5 with excellent fastness, (A+T) mordant combination with 7:3 and 5:5 mordant proportions shows excellent wash fastness of dyed samples of both control and experimental group. Similarly (A + I) mordant combination with 9:1 and 7:3 mordant proportion exhibited very good wash fastness towards the samples of control group and it was found excellent when treated with harda tannin, whereas 5:5 mordant proportions gave excellent wash fastness when treated with harda tannin.

Overall results states that tannin treatment found significant in dyeing of cotton with *Sesbania sesban* leaf extract.

III. Table 3.1 Washing fastness of cotton fabric dyed with Shevri (*sesbania sesban* linn.) leaf extract.

Mordant	Mordant Concentration	Rating N T		Rating T T	
		Cc	Cs	Cc	cs
	% (OWF)				
Alum	10	5	5	5	5
Iron	5	4.5	5	4.5	5
Tin	5	4.5	5	5	5
Alum + Iron	9:1%	4.5	5	5	5
Alum+ Iron	7:3%	4.5	5	5	5
Alum+ Iron	5:5%	4.5	5	4.5	5
Alum+ Iron	9:1%	4.5	5	5	5
Alum+ Iron	7:3%	4.5	5	5	5
Alum+ Iron	5:5%	4.5	5	4.5	5

During the study total 18 samples were divided into control and experimental group. Samples were given harda treatment (tannin treatment) prior to mordanting. Table 3.1 represents the rating given to samples of control and experimental group dyed with leaf extract of *Sesbania sesban* linn. When sample was treated with 10% alum as single mordant excellent was fastness was rated i.e. 5 for both samples of control & experimental group. Similarly sample was mordanted with 5% Iron as a single mordant very good fastness was noted which rated 4:5 on gray scale for control group, samples pretreated with 5% tin showed very good wash fastness for control group noted as 4.5 and excellent for experimental group which was noted as 5.

When alum was used in combination with tin with 9:1 proportion, dyed sample of control group rated 4.5 as very good fastness where as wash fastness was improved with tannin treatment which rated 5 with excellent fastness. (A+T) mordant combination with 7:3 and 5:5 mordant proportions showed excellent wash fastness towards dyed sample of both control and experimental group.

Similarly (A+I) mordant combination with 9:1 and 7:3 mordant proportion exhibited very good wash fastness towards the samples of control group and it was found excellent when treated with harda tannin; whereas 5:5 mordant proportions gave excellent wash fastness, when treated with harda tannin.

Overall results states that tannin treatment found significant in dyeing of cotton with *Sesbania sesban* leaf extract.

IV. Table 3.2 Sunlight fastness of cotton fabric dyed with *Sesbania sesban* (Shevri). Leaf extract.

Mordant	Mordant Concentration	Rating	Pretreated samples with harda
	%(OWF)	Cc	Cc
Alum	10	3	4.5
Iron	5	3	4
Tin	5	4.5	5
Alum + Iron	9:1%	3	4.5
Alum + Iron	7:3%	3	3.5
Alum + Iron	5:5%	3	3.5
Alum + Tin	9:1%	4.5	5
Alum + Tin	7:3%	4	5
Alum + Tin	5:5%	4.5	5

During the study total 18 samples were divided in to control and experimental group. Samples were given harda treatment (tannin treatment) prior to mordanting.

Table 3.2 represents the ratings of sunlight fastness of samples dyed with *Sesbania sesban* linn.

When sample was treated with 10% alum as a single mordant moderate sunlight fastness was rated i.e.3 for control group & very good i.e. 4.5 for experimental group. Similarly when sample was mordanted with 5% Tin as a single mordant sunlight fastness was rated 3 (moderate) for control group & 4 (good) for experimental group

Tin showed (4.5) very good sunlight fastness for control group & excellent for experimental group

When Alum used in combination with Iron using 9:1 proportion, it showed moderate sunlight fastnesses which rated 3 on grey scale for control group & very good (4:5) for experimental group. Alum & Iron combination 7:3 & 5:5 showed moderate (3) sunlight fastness toward control group & fairly good (3:5) for experimental group.

When alum was used in combination with Tin with 9:1 & 5:5 proportion where dyed sample of control group rated very good (4:5) Sunlight fastness whereas tannin treated sample showed excellent fastness. Alum & Tin mordant in combination with proportion 7:3 showed (4) good sunlight fastness towards control group & excellent towards experimental group that is samples of tannin treated group.

V. ACKNOWLEDGMENT

The present study was undertaken to explore *sesbania sesban* Linn leaf extract as a source of natural dye for dyeing of cotton. *Sesbania sesban* exhibited a range of yellow on cotton where tannin treated cotton showed increase in depth of colour. Assessment of fastness showed very good to excellent fastness towards washing sunlight fastness was noted as fair to excellent dyed cotton samples. Tannin treatment showed increase in fastness properties. To see the above results it can be said that *sesbania sesban* can be explored as a good source of natural dye for dyeing of cotton. Further dyed cotton can be used for the variety of end users.

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