

Assessment of colour fastness of developed shades of Harsingar flower on Khadi silk yarn

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ABSTRACT

Natural dyes were used for dyeing quite a long back and its use showed a downward trend after the introduction of synthetic dyes, but in present scenario there is an increasing awareness among people towards natural dyes as these are environment friendly. Stem of Harsingar flower is used as a dyestuff for dyeing yarn and clothes. Mordants are used for fixation of dyes on the fabric or yarn and their varieties are used in dyeing. Here metallic mordants was used. Approx every natural dye need mordants for fixing with the fabric and prevent colour for either fading with exposure to light or washing out. Khadi silk yarn was used in order to obtain a better result and is totally hand made. Here yarn is made by hand spinning on Charkha which is a spinning device. When silk fibre is spun by hand then it is called khadi silk. After dyeing, the yarns colour must be considered fast under the condition in which it is used otherwise the prepared product will be worthless. So it is necessary to check the colour fastness.

Key Words : Colour fastness, Khadi silk yarn, Shades, Natural dyes

INTRODUCTION

Natural dyes are available in nature in the form of bark, root, flower, leaves, fruit cover, etc., and produces colour on the raw material like cotton, wool, silk, etc. without any chemical processing of dyes. In present day, the relevant of natural dyes whether it is relevant at all in the modern world, need to be examined carefully. In India, more 450 plants that can yield dyes. In addition to their dye yielding characteristics, some of these plants also possess medicinal value. Natural dyes are environmental friendly, example Harsingar Flower, the brightest of naturally occurring yellow shad dyes. It is used for dyeing silk and cotton so in this study this flower was used for khadi silk yarn. This flower have some medicinal property, white-orange aromatic flower on oral administration tones stomach, prevent gas formation, astringent to bowel, prevent access bile secretion by liver, cures cough.

Natural dyes can be sorted into three categories: Natural dyes obtained from plants, animals and minerals. Although some fabric such as silk and wool can be coloured simply by being dipped in the dye. Other such as, cotton require amodent. Amodent is an element which aids the chemical reaction that takes place between the dye and the fiber so that the dye is absorbed. Dyes don't interact directly with the materials, they are intended to colour. There are three types of mordant:

Metallic Mordant: metal salts of aluminum, copper, ferrous and tin are used. **Tannis:** myrobalan and sumah are commonly used in textile industry. **Oil Mordants:** these are mainly used in dyeing turkey red oil colour from madar. Natural dyes are substantive and require a mordant to fix with the fabric and to prevent the colour from either fading with exposure to light or washing out.

Natural fiber was used for dyeing which was spun by hand. Silk is a natural fiber which was spun by hand for making yarn. This type of yarn is called Khadi silk. Khadi silk can be made by cotton silk or wood. Khadi has a unique property of keeping warmer in winter and cool in summer. Khadi yarn is specially made by Charka (spinning wheel). It is a device for spinning thread or yarn from natural or synthetic fibers. Dye of Harsingar flower is good for silk so in this study khadi silk was used.

Outer appearance of the fabric is no value to the consumer unless the dye may be consider fast under the condition in which the fabric will be used. Colour must meet some tests as washing, ironing, steaming, perspiration, strong light and dry cleaning etc.

Objectives:

1. To prepare natural dyes from harsingar flower.
2. To check the various shades by using various mordants.
3. To determine the colour fastness of natural dyes.

METHODOLOGY

Materials:

Yarn: Khadi silk was used for dyeing.

Mordants: Copper sulphate and Ferrous sulphate was used as a mordants.

Dye stuff: Harsingar flower was used for dyeing.

Method:

1. Experimental method was used.
2. Pre-treatment of yarn.

Degumming of silk:

In order to remove natural gum sericine from khadi silk yarn. Degumming was carried out. Yarn was immersed in a solution of non-ionic detergent (2g/ltr of water) and water maintaining the M:L::1:50. Yarn was added in this solution and boiled for 45 minutes, then rinsed thoroughly and dried in shade.

Mordanting of khadi silk yarn :

Dyes not to interact directly with the materials. They are intended to colour. Mordanting of the fabric was done in ferrous and copper sulphate as per mordanting process with proper M:L::1:40 time and temperature.

Extraction dye from Harsingar flower :

Procedure- material liquor ratio taken from the extraction of dye was M:L::1:40. First separated the orange stem with the flower then crushed it well and then was put into water and was put on stove and the liquor was brought to simmer. After an hour it was removed from flame and extracted

colour was filtered in another pan. Enough colour was used so that the yarn to be dyed gets completely submerged and able to float freely in liquid.

Dyeing of the fabric :

Procedure : For dyeing process weight of the fabric was taken first which was 15 g and according to M:L::1:40(600ml) of dye extract (Harsingar flower) was taken. Then the fabric was put into dye extract until the desired colour was observed. Fabric was checked after every 30 min until it has achieved the preferred shades. For bolder colour pot was removed from flame after simmering 1hr, yarn was allowed to soak in dye bath over night and the very next day was taken out of it and washed under running water and dried in shade.

Colour matter	Mordant	Dyeing condition time, temp., M:L	Mordanting cond. Time and temp.
Harsingar flower	X	30min,80 ⁰ C,1:40	30min, 35 ⁰ C
Harsingar flower	Copper sulphate	30min,80 ⁰ C,1:40	30min, 35 ⁰ C
Harsingar flower	Ferrous sulphate	30min,80 ⁰ C,1:40	35min, 35 ⁰ C

Assessment to the colour fastness :

(i) Colour fastness to washing : To assess the colour fastness to samples test no. III of 150 was applied.

(ii) Colour fastness to rubbing : As per the ISO, the test of the rubbing fastness was tested using crock meter for the dyed samples. The test samples were tested for both wet and dry rubbing assessment of the colour staining on the un-dyed samples were estimated by gray scale.

RESULTS AND DISCUSSION

As the present research work was carried out on experimental basis, following results were drawn after going through testing which were done for the diet yarn. Fastness was done as per ISO standard

Table 1 shows that the washing fastness (CC) was rated on point 3 which was fair washing fastness regarding change in colour while colour staining (CS) was rated also on point 3 which was fair to washing fastness. Whereas, Rubbing fastness in dry condition of the yarn without any mordant was rated on .4 on grey scale while in wet condition it was rated also on point 3 which means rubbing fastness is more good in dry condition and fair in wet condition.

Table : 1 : Fastness grade of khadi silk yarn dyed with Harsingar flower without any mordant		
Fastness tested	Numerical ratings	Inferences
Washing fatness (CC)	3	Fair
Washing fastness (CS)	3	Fair
Rubbing fastness (dry)	4	Good
Rubbing fastness (wet)	3	Fair

Washing fastness (CC) is rated on point 4 which means good and Washing fastness (CS) rated on point 3 which means fastness was fair. Whereas, Rubbing fastness in dry condition was rated on point 4 (good) while in wet condition it was rated on point 3 which means fastness was fair (Table 2).

Table 2 : Fastness grade of <i>Khadi</i> silk was dyed with Harsingar flower and mordant with ferrous sulphate		
Fastness tested	Numerical ratings	Inferences
Washing fastness (CC)	4	Good
Washing fastness (CS)	3	Fair
Rubbing fastness (dry)	4	Good
Rubbing fastness (wet)	3	Fair

Washing fastness of the fabric mordanted with copper sulphate was found to be fair (3) in change in colour staining. Whereas, fabric mordanted with copper sulphate in rubbing fastness was found to be good (4) in dry condition and fair (3) in wet condition (Table 3).

Table 3 : Fastness grade of <i>Khadi</i> silk yarn dyed with Harsingar and mordanted with copper sulphate		
Fastness tested	Numerical ratings	Inferences
Washing fastness (CC)	3	Fair
Washing fastness (CS)	3	Fair
Rubbing fastness (dry)	4	Good
Rubbing fastness (wet)	3	Fair

Conclusion:

Awareness among people towards natural products is found increasing as per current scenario. Even natural dyes are used in day by day products. From the above finding it is concluded that the washing fastness of the yarn without dyed with Harsingar flower was fair. While the Rubbing fastness was good in dry condition and fair in wet condition. Washing fastness (CC) of the dyed sample mordanted with ferrous sulphate was good and CS was fair while rubbing fastness in dry condition was good and in wet condition was fair. Washing fastness (CC & CS) of dyed sample mordanted with copper sulphate was fair while rubbing fastness in dry condition was good and in wet condition was fair. Different shades of Harsingar flower dye with different metallic mordant were obtained. Colour such as yellow without mordant, light brown with copper sulphate and dark brown with ferrous sulphate were obtained.

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