

To Study of the Percentage Absorption of Natural Dye on Dyeing of Silk with Dry Pomegranate Rind

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Abstract

The textile industry uses much different kind of fibers as its, raw marital some of this fiber was know and use in the earlier years of civilization, as well as in modern times. Many types of fiber are available some are natural and other are synthetic. Natural fibers that occur in nature can be classified as vegetable, animals and mineral fibers. Silk is most beautiful, lustrous and a perfect fiber, it has been known and used as a textile material for thousands of year. No other fiber was so highly prized by the conquering races of the ancient world. This ancient preference is justified by the latest conclusion of science. Chemical analysis has shown silk to be mainly constitute of fibroin. From soft mucosa substances, fibroin hardens into filament shape and becomes a genius fiber, strong, bright, flexible and elastic. Minutely separable, the fibers of silk, if spun together, make a compact and even thread. These are the characteristic, which the textile worker seeks in every fiber. The ideal is actually found in silk because it is made up of filament so slender, that it can be woven into robes for consumer Because it is so tendentious and flexible, that the thread of silk combine in fabric of impenetrable density, and impervious to light ,moisture or heat. Silk is the protein us extradite ejected by the silk warm.

Keywords: Natural dye; Color; Silk fabric; Dry pomegranate rind; Mordents; Optical density; Dyeing; Dye lioure; Dying bath; Mordenting; Ferrous sulphate; Copper sulphate; Colour fastness; Auxochromes; Chromopheres; Anionic; Cationic disperse

Introduction

The appeal of color, is universal it repeatedly serves as a commune language. Consumers are usably more concerned with color, than with any other characteristics of a textile product. The textile industries are aware of the consumer's desire for appealing colors. Manufacture and retailers know that the consumer, who select and item because of its color will be extreme annoyed if the color is not maintain from the anticipated life of the product. Consequently, research by dyestuff manufactures has resulted in coloring agent that satisfies the esthetic demands of consumers and provide lasting pleasure if the color is properly apply in the fabric care-fully maintained. However, it is important to not, that there are some dyestuffs that do not produce durable colors when applied to some types of fibers. An expert who knows what dyes work with what types of fiber and how durable they will be in end use must use the dye [1].

Mainly there are two types of dyes natural dye and synthetic dye. Synthetic dye is toxic and environment unfriendly. Many drawbacks of synthetic dye have inspired environmentalists to look for eco-friendly product. Therefore, natural dyes now give more important. Many researches were undertaken for extraction of dyes from different natural coloring sources. Researcher conduct study of Dry Pomegranate Rind to prepare dye for, dyeing of silk fabric.

Material and Methods

Dry pomegranate rind

Pomegranate is a member of the berry family and belongs to the Punicaceas family. It is one of the most popular fruits, which is cultivated for food, juice, flavor and color. The name pomegranate is derived from the French words "pomegranate", which means seeded apple. The pomegranate, botanical name Punicagranatum, is a fruit-bearing deciduous shrub or small tree growing between 5 and 8 m (16 and 26 ft) tall. In the Northern Hemisphere, the fruit is typically in season from September to February, and in the Southern

Hemisphere from March to May. As intact arils or juice, pomegranates are used in cooking, baking, meal garnishes, juice blends, smoothies, and alcoholic beverages, such as cocktails and wine [2-5].

Collection and preparation of material

Dry Pomegranate Rind was collected from Indore, MP. Plain weave silk fabric was selected for the experiment, because of its even dye uptake. Among the three methods of dye extraction – Boiling method, Acidic method, boiling method was best for extraction of Dry Pomegranate Rind. The chemical mordent used for fixing color on Silk fabric (Table 1).

Optimum concentration of mordants

In order to find out, optimum concentration of mordants. 5 concentration of each mordant were used. 100 g. of silk samples were mordant under there concentration keeping factors constant weight of silk, volume of water, time of mordanting, and temperature. After that, the optimum mordant concentration was measure by optical density, and dye absorption percentage was calculated. Fresh samples

| S. No. | Dyeing variables | Trial proportion | Selected proportion |
|--------|---------------------|------------------------|---------------------|
| 1. | Extraction method | Boiling, acidic method | Boiling method |
| 2. | Dye concentration | 4,6,8,10,12 g | 10 g |
| 3. | Dye extraction time | 30,60,90,120,150 min. | 60 min. |
| 4. | Dying time | 15,30,45,60,75 min. | 30 min. |

Table 1: Various variable optimum dye proportion for dyeing of silk samples with dry pomegranate rind.

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were dye and dried in shadow. The concentration of mordant taken was as follow; for Alum and alum potassium dicromate-5, 10, 15, 20, 25 g (Table 2).

Colour fastness of silk samples to washing ironing and dry-cleaning

The results of colorfastness test indicated that colorfastness to washing for all color was fair to good, the colorfastness to Ironing and dry-cleaning for all color was excellent to good (Alum - Ochre, yellow; Alum Potassium Dichromate – red, pink) (Table 3).

Colour fastness of silk samples to sunlight

When the samples were subjected to sunlight test, the results proved that all Colors had good to fair colorfastness.

(Dye samples expose in sunlight 10 am to 5 pm) (Figure 1 and Table 4).

Cost estimation of develop colors

The cost estimation of dyeing material was calculated for dyeing per 100 g. Silk fabric material. Dyeing of silk fabric in yellow, Ochre

| S. No. | Mordanting variables / alkalis | Trial proportion | Final selected proposition |
|--------|--------------------------------|----------------------|-----------------------------------|
| 1. | Mordanting time | 30,60,90,120,150 min | 30 min |
| 2. | Alum | 5,10,15,20,25 g | 20 g |
| 3. | Alum potassium dichromate | 5,10,15,20,25 g | 15 g |
| 4. | Optical density after Dyeing | 70%, 66.8%, 58.75% | 70% (Simultaneous) dyeing process |

Table 2: Optimum concentration of mordants.

| Color fastness property | Ocher | Yellow | Red | Pink | Result |
|-------------------------|-------|--------|-----|------|-------------------|
| Washing | 3 | 4 | 3 | 4 | Good to fair |
| Ironing | 4 | 4 | 4 | 4 | Good |
| Dry-cleaning | 5 | 5 | 4 | 5 | Excellent to good |

Table 3: Colour fastness of silk samples to washing ironing and dry-cleaning.

| Days | Fading with ocher | Fading with yellow | Fading with red | Fading with pink |
|-----------|-------------------|--------------------|-----------------|------------------|
| Monday | 5 | 5 | 4 | 5.7 |
| Tuesday | 4.7 | 4.7 | 4.9 | 4.5 |
| Wednesday | 4 | 4 | 3.9 | 4 |
| Thursday | 4 | 4 | 3.9 | 4 |
| Friday | 3.7 | 3.7 | 3.9 | 3.5 |
| Saturday | 3.5 | 3.5 | 3.9 | 3.5 |
| Sunday | 3 | 3 | 3.5 | 3.5 |

Table 4: Colour fastness of silk samples to sunlight.

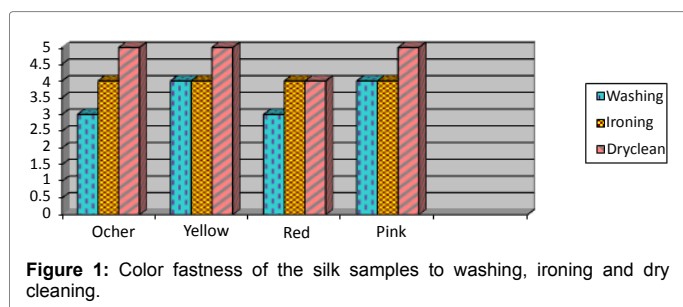
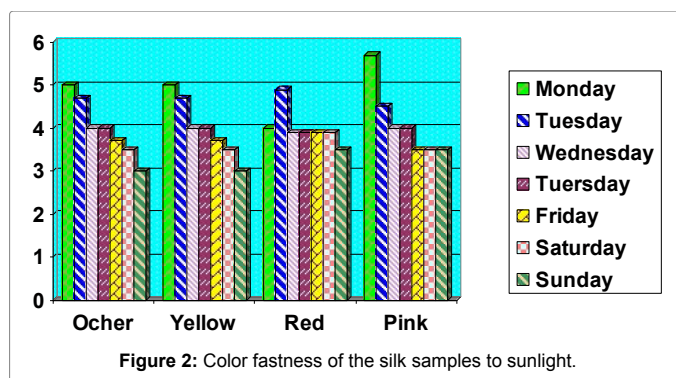


Figure 1: Color fastness of the silk samples to washing, ironing and dry cleaning.



was less expensive then Red and pink color due to the cost of Alum potassium dichromate.

Thus from the above findings, it can be concluded that dyes extracted from Tamarind leave dye have a range of bright, soft, even and lustrous colors. The range of colors of natural dyes used on silk Dry Pomegranate Rind can be use to dye silk yarn for weaving of silk saris, apparel and dyers, and craft men to increase the color range to add verity to the products can use finishing material dye. This important advantage of this dyes is, it is applicability to small scale and cottage industries for this the high technology and machinery is not necessary and easy adaptability at the procedure is possible (Figure 2).

Conclusion

It found from the experimental study that, boiling method was best from dye extraction from Dry Pomegranate Rind dye for dyeing of silk fabric. It also observed that percentage absorption of Dry Pomegranate Rind dye simultaneous mordanting method gave best (70%) absorption, and post-mordanting method was second best.

The Dry Pomegranate Rind dye extract gave best results with optimum Concentration of 10 g, in 100 mL of water per 100 g of silk sample. It found that the extraction of dye was maximum with 60 minutes boiling time. It was also observe that sample dyed for 30 minutes gave best result. It was observe, that 30 minutes of mordanting gave best results. The Dry Pomegranate Rind dye extract gave best color on 100 g. of each silk sample by using 20 g of aluminum sulphate; 15 g of aluminum potassium dichromate selected respectively. The color obtained was shades of ochre, yellow with the aluminum sulphate and, red, pink with the aluminum potassium dichromate mordants respectively.

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