

DYEING OF SILK FABRICS USING ORCHID DENDROBIUM SONIA “ERASKUL”

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ABSTRACT:

Dyeing is the method of colouring which imparts colour to a substrate such as cloth, paper and leather. Dyeing the fabric with natural dye requires plant extract and a mordant to make a permanent colour. Natural dyeing and pigments are a class of colorant extracted from vegetative and animal matter with no or very little chemical processing. Use of natural dyes alone does not qualify to be environment friendly, as some of the mordents and chemicals like aluminium and iron although help in the production of some pleasing colours the tend to affect the environment, so now more research is being carried out to find eco-friendly mordents.

Silk is the most beautiful and natural protein fibre. No other textile fibres possess such a fine properties of natural lustre, softness as well as unique feel, comfort and wearables. Present research focuses on extraction of eco-friendly dye from Orchid Dendrobium Sonia Eraskul (shethalay) which are obtained by flower discarded after functions from the entertainment industry.

A survey was conducted in different venues to check the quantum of waste flower generated from the entertainment industry. Based on this information from the survey experiment research was done on application of Orchid Dendrobium Sonia Eraskul (Shethalay) extraction as dye for silk fabrics.

The study aims at the application of Orchid Dendrobium Sonia Eraskul (Shethalay) extraction as dye for silk fabrics. This experiment conclude that since protein fibres were used for the experiment, this dye has affinity to protein fibres and reacts less to acid as compared to alkaline medium and Also the dry cleaning solvents seem to have very little effect on the dye, hence the colour distortion is very little when the sample are dry cleaned.

Keywords: *Dye, fastness, Mordent, Orchid flower,*

I. INTRODUCTION

Nature is the source of all the riches on this planet and is full of fascinating colours without which life would have been dull and monotonous. Colours have fascinated man right from the pre-historic times. Man has tried to use colours in whichever way possible in human life. Colour is one of the elements of Nature and forms an

integral part of one's life. The uses of colours have been undergoing a process of evolution. Textile materials are usually coloured to make them attractive.

Dyeing is the method of colouring the fibre, yarns, warp beam and fabric dipping in the coloured solution, the dye, at estimated percentage, concentration, time and temperature. Dyes are soluble substance which penetrate into fibre and are fixed by chemical action, heat or other treatment.

Eco friendly Environment needs Safe Natural products, in the textile field also. The Eco friendly textiles are those textile products that do not contain any hazardous or toxic substances and are biologically degradable, so that they do not cause any damage to the environment. A systematic scientific approach to achieve eco-friendliness involves identifying and avoiding harmful chemicals, minimizing the quantities of restricted of chemicals and recycling wherever possible. Discussed that Eco friendly dyes have gained much importance in dyeing of textiles.

Natural dyes are the class of colorants extracted from vegetative and animal matter with no or very little chemical processing. A mordant is a separate chemical that combines with the dye in such a way as to attach the colouring matter to the fibre by increasing affinity and strengthens interactions in some cases via a lasting chemical bond.

Silk is a natural luxurious textile fibres available in a continuous filament form. Silk has a graceful texture and unique appearance, which makes it "Queen of Textile fibres".

Orchids are a long-lasting and particularly elegant type of flower, making them the perfect gift for many occasions. Their graceful appearance draws immediate attention and their reputation as an exotic and unusual flower evokes a sense of refinement and innocence. With many orchid varieties to choose from and the meanings of orchids being so special, you are sure to find one that can express the right message, whether it be Thank You, Happy Anniversary, Congrats on Your Promotion, or anything in between. With an estimated 25,000 different types existing naturally and more being discovered each year, orchids are of the largest flowering plant families. Orchids can impart a wide variety of messages, but historically the meanings of orchids have included wealth, love, and beauty. To the ancient Greeks, orchids suggested virility, and after the rise in popularity of orchid collections in Victorian England, the meaning of orchids moved towards being symbolic of luxury. Orchids have also been believed to carry various healing and protective properties, allowing them to ward off disease. The Aztecs were said to drink a mixture of the vanilla orchid and chocolate to give them power and strength, and the Chinese believe orchids can help cure lung illnesses and coughs.

Orchids are generally regarded as a symbolic of rare and delicate beauty. Orchids are the most popular houseplant, a top honour they share with the peace lily. Their charm and mystique delight those who receive them, for few other flowers have the ability to impress their recipient in the same way that the orchid can. Among the many different types of flowers available, the orchid holds a special place as one of the most alluring and captivating, making them a special choice for the treasured people in your life.

The need for eco-friendly dyes is emphasized, considering environmental scenario. Hence present study is on the use of natural dye, which is eco-friendly to nature and waste management. The natural colours are the subset of synthetic dyes and are used in many ways. But far no one used orchid Dendrobium Sonia "Erasakul" colour as a textile dye for dyeing the textiles. Hence due to inquisitiveness the study is carried out to know the effect of using nature flower colour for dyeing the silk fabrics.

II. METHODOLOGY

AIM :To extract a new eco-friendly dye from waste.

OBJECTIVES :

- To find out the availability of the natural dyes.
- To extract the dyes from Orchid Dendrobium Sonia "Erasakul"
- To find out the density and Ph value of extracted dye solution.
- To dye the silk fabric with extracted of Orchid Dendrobium Sonia "Erasakul"
- To study the significance of 2 different mordent's using for a natural dye.

III. SCOPE OF THE STUDY :

The purpose of the study is to explore the possibilities of waste utilization, eco-friendly and sustainability of dye. It is found that natural dyes with Orchid Dendrobium Sonia "Erasakul" for silk fabric.

MATERIALS :

- Dye: Orchid flowers (waste management)
- Silk fabric : 1mts with the weight of 60 GSM.
- Mordents : Alum and Harada

METHODS:

- Phase1 : Collection of Orchid Flowers from function hall (waste)
- Phase2 : Extraction of dyes from orchid flower.
- Phase3 :Mordant and Equipment's.
- Phase4 : Fabric preparation and dyeing method.
- Phase5: To find out Test Results.

Phase1 : Collection of Orchid Flowers from function hall (waste management)

The dyes were taken out from Orchid Dendrobium Sonia “Erasakul”. The dye materials were collected from function halls.

Phase2 : Extraction of dyes from orchid flower.

From Orchid Dendrobium Sonia “Erasakul”, the dyes components were extracted. The flower were taken and it was boiled in a distilled water 1g: 50ml ratio at 80°C for 90 minutes in the presence of 1% OWM. The solution was filtered and cooled.

Phase3 : Mordant and Equipment’s.

Mordant: Natural mordents were used for the experiments. They are-Potassium Aluminium Sulphate (ALUM), and Harada it is a (Mirobelan).

Equipment’s: The equipment’s used for the experiments were as follows:

Water bath, electric stove, weighing balance, steel vats and containers, measuring jars and beakers, stirrers. Spoons, funnels, mesh filters, tumblers, drying rods, thermometers, Ph. papers, laundrometer perspire meter, crock meter, gray scale, and spectrometers.

Phase4 : Fabric preparation and dyeing method.

Fabric preparation: The silk fabric were degummed by boiling method using soap solution (20-30% OWM) and bleached by using hydrogen peroxide (0.5% OWM). Washed thoroughly in cold water and dried.

Dyeing Method:

Procedure for the application of dye.

- Dye: Orchid flowers (waste management)
- Silk fabric : 1mts with the weight of 60 GSM.
- Mordents: Alum and Harada
- Time : 90 minutes

Using Orchid Dendrobium Sonia “Erasakul” the dye was extracted. The extracted dye solution was used for dyeing of silk fabric by using 3 techniques with alum (10%) and harada (10%)

Phase5: To find out Test Results

➤ **COLOUR FASTNESS TO SUNLIGHT:**

Colour fastness measures the resistance of the textiles when they are exposed in sunlight. The grey scale employed for colour fastness test is 1-5 grade. From the colour fastness to sunlight testing result found that 3 grade from grey scale.

➤ **COLOUR FASTNESS TO WASHING**

As per ISO: 687: 1979. MLR-1:100, Temperature-40 C, Soap Solution-5g/litre,

The fastness of the dyed fabrics for fastness to colour change and staining was done by using Laundry meter instrument. From the colour fastness to washing testing result found that 2-3 grade from grey scale.

IV. SUMMARY AND CONCLUSION

From the survey conducted the dye was seen to have good affinity for protein fibre. Looking at the result obtained from the various test conducted, we can summarised that a Orchid Dendrobium Sonia "Erasakul" produces good colour which is dependent on the mordant used for untested original dyed samples at 75% dye concentrate both the harada and alum pre-mordant fabrics gave good colour, as the dye concentrate reduces it is seen that the depth of colour also reduces.

Sunlight affected the colour fastness of all the samples irrespective of mordant or dye concentrate and reduced the fastness to range of 1. Wash fastness also showed a prominent amount of staining for all samples and is graded at 2-3.

Eco-friendly process has been followed through out the research i.e in use of silk fabrics dye evaluation and dyeing process, hence understanding the properties of the dye obtained from orchid dendrobium Sonia "Erasakul" plant through this research will help popularize the application of natural dye.

Looking at the data obtain the various experiments conducted to analysis the property of orchid dendrobium Sonia "Erasakul" it is seen that good colour is obtained on silk fabric when using alum and harada ha a mordant but colour of sample is something that would to be stabilised by other method. A all sample reacted to a large extent and reduced in there colour graded when tested for sunlight and washing for dry cleaning the colour change was very little and from that we can inform that this dye could be use to make a product which would not be exposed for long sunlight and to washing. Rather for maintenance of the fabric dry cleaning is the best option, as colour fastness is retained.

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V. Dyed Samples

Orchid dyed samples in different concentration of dye 25%, 50%, 75% with Alum and Harada mordant

Sample : 1 ALUM Sample : 2 HARADA

25% 50% 75% 25% 50% 75%



