



COMPARATIVE STUDY OF DYEING OF SOYA SILK AND LINEN WITH NATURAL DYE EXTRACTED FROM *CLITORIA TERNATEA*

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Abstract : Natural dyes are environment friendly, non-hazardous to nature, sustainable and a renewable resource. The use of chemical mordants in dyeing could make the application of natural dye unsustainable, since they cause high pollution and hazardous to nature. Natural dyes are colorants and pigments derived from nature resources. It is derived from plants, animals, and micro-organisms. Production of natural dye is an art. Hence sustainable dyeing could be achieved with natural mordanting assistant such as cow urine, Myrobalan and Alum that does not cause any impact on nature. The main aim of this study is to determine the affinity of the natural dye extracted from the *Clitoria Ternatea* flower towards Soya Silk and Linen.

Keywords: Sustainable, Natural dye, *Clitoria Ternatea*, eco-friendly, renewable resource.

I. INTRODUCTION

Textile dyeing is a creative work where science lies behind. It has been practiced since the human civilization. The dyes and pigments were derived from natural substances since ancient times. Due to sufficient availability of plant resources for natural dye the researchers show high interest of natural dye extract. Regularly natural dyes are used for natural fibers and fabrics like wool, cotton and silk but researchers have also used natural dyes for dyeing synthetic fibers and fabrics like polyester, nylon and acrylic.

The flower originated from tropical Asia and later was distributed widely in south and Central America East and West Indies India and China where it became naturalized. It is a Vigorous and summer growing plant. The flower Comprises 60 different varieties. The plant enriches the soil by fixing nitrogen and also suitable as a green manure and cover crop. The juice of the flower is used in skin diseases and insect bites. The root of the plant is used in treating asthma and pulmonary diseases. The extraction of dye is very simple when compared to other natural dyes. The colour looks very bright. The process is done at very short time. It is easily degradable.

Qualitative and quantitative analysis of the flower extract of blue butterfly pea confirmed the presence of anthocyanins which are the compounds of antioxidants and anthocyanin compounds called tannins that is

responsible for its unique vibrant color. Root, seeds and leaves are plant parts used from ancient times. Pharmacological studies have confirmed that the flower has wide range of biological effects. The chemical screening of the plant material found in India shows a good range of dye yielding plant species.

II. METHODOLOGY

The present study was conducted to dye Soya silk and linen fabric with natural dye extract from flower the different methodological procedures follow has been explain as under the following headings.

2.1. COLLECTION OF RAW MATERIAL

The selection includes the textile material, dye and mordants used for the present study.

2.2. TEXTILE MATERIAL

Commercially available ready to dye soya silk fabric and linen fabric purchased from Coimbatore market were used for the study.

2.3. CLITORIA TERNATEA FLOWER SELECTED FOR DYEING

The flower *Clitoria Ternatea* was collected from Kovaipudur in Coimbatore Tamilnadu India.

Plate – 1: *Clitoria Ternatea* flower



Table – 1: Scientific classification of *Clitoria Ternatea* used for dyeing Soya Silk and Linen

Kingdom	Plantae
Family Name	Fabaceae
Subfamily	Faboideae
Common Name	Blue butterfly pea
Botanical Name	<i>Clitoria Ternatea</i>
Genus	Clitoria
Species	C. ternatea
Part used	Flower

The detail of *Clitoria Ternatea* with its kingdom, family name, subfamily, common name, botanical name, genus, species and part used for dyeing are shown in the above table.

2.4. MORDANTS

Myrobalan and Alum the natural mordants that have been chosen for the study.

Plate – 2: Myrobalan



Table – 2: Mordant – 1 Myrobalan used for dyeing Soya Silk and Linen

Kingdom	Plantae
Family	Phyllanthaceae
Common Name	Amla
Botanical Name	<i>Phyllanthus emblica</i>
Genus	Phyllanthus
Species	P. emblica

The detail of Myrobalan with its kingdom, family name, common name, botanical name, genus and species mordant 1 selected for dyeing is shown in the above table.

Plate – 3: Alum



Table – 3: Mordant – 2 Alum used for dyeing Soya Silk and Linen

S.NO	Name	Molecular Formula
1.	Alum	$A_{12}SO_4$

The molecular formula of mordant 2 Alum selected for dyeing is shown in the above table.

2.5. METHODS

2.5.1. DETERMINATION OF PRELIMINARY DATA OF THE FABRIC

Weight Per Unit area, Thickness, Yarn Count

2.5.2. PREPARATORY PROCESS OF THE FABRIC

Scouring and Bleaching was done to prepare the fabric for dyeing.

2.5.3. DYE EXTRACTION

The collected flowers were dried in Sun shade for one week. Then the dye was extracted by boiling 1 gm of *Clitoria Ternatea* in 100 ml of water. The liquor was strained through two layers of scoured muslin fabric. The clear filtrate was used for dyeing.

Plate – 4: *Clitoria Ternatea* flower (dried)



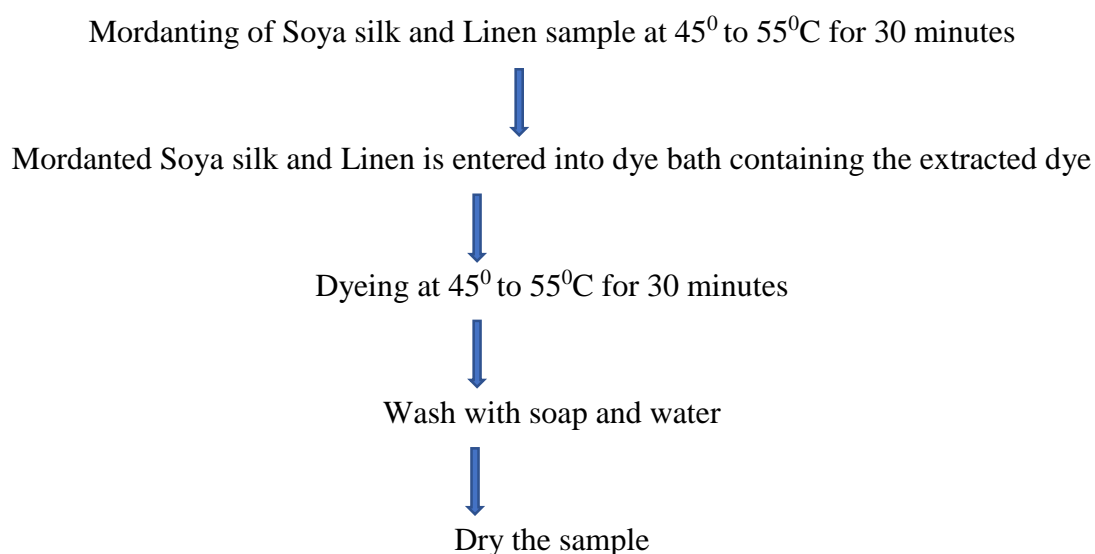
2.5.4. MORDANTING METHOD

Pre mordanting was carried out using 25 grams/litre concentration of mordants. Both soya silk and Linen are treated with mordants. The fabric is treated with two mordants namely Myrobalan and Alum.

2.5.5. DYEING METHOD

General flow diagram for dyeing of Soya silk and Linen sample is given below.

Figure – 1: Dyeing method



III. RESULT AND DISCUSSION

Colours obtained after dyeing are given below.

3.1. Colour obtained in Soya Silk

Myrobalan: PANTONE 17 – 3930 TPX Jacaranda





Alum: PANTONE 16 – 3929 TPX Grape mist

3.2. Colour obtained in Linen

Myrobalan: PANTONE 17 – 4041 TPX Marina

Alum: PANTONE 16 – 4031 TPG Cornflower Blue

Plate – 5: Colours obtained after dyeing

Fabric/ Mordant	Myrobalan + <i>Clitoria Ternatea</i>	Alum + <i>Clitoria Ternatea</i>
Soya Silk		
Linen		

It is clear from the table that the results are good. The study was tested with two different fabrics with one dye and two different mordants. The soya silk fabric and linen fabric dyed with myrobalan mordant showed a bright colour than the fabric dyed with alum. The mordant suitable for soya silk and linen to dye *Clitoria Ternatea* flower dye is Myrobalan.

IV. CONCLUSION

A detail study on the *Clitoria Ternatea* flower for the material concentration of Soya Silk and Linen. *Clitoria Ternatea* flower which is available in all seasons can be exploited as a good source of natural dye for Soya silk and Linen depending upon the choice of the mordant. The properties of two different mordants related with possible chemical interactions on dyeing of soya silk and linen we were able to get good shades of colours.

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