SUSTAINABLE PHARMACOLOGICAL SHIRT

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Abstract

We done with our Project Without Chemical Use focused on eco friendly natural dyes. The best in eco-friendly fabrics, "Organic cotton" was selected for the study. Extracted natural dyes from the selected natural resource(Neem leaf, Achras Zapota Leaves and Nyctanthes Arbortristis Flowers) were applied onto organic cotton Fabric with no using of chemicals & mordents. The colorfastness properties of natural dyed organic cotton fabric were observed and concluded.

Keywords: *Achras Zapot*: *Nyctanthes Arbortristis*:Neem Leaves

Introduction

Sustainable Pharmacological shirt are mainly used in summer time.It protect to affect the disease for humans. Our project work deals with the development of medical scrubs made up of organic cotton using natural dyes.

Environmental issues are becoming more crucial all over world. Textile processing industry is characterized not only by the large volume of water required for various unit operations but also by the variety of chemicals used for various processes.

Organic cotton fabrics are generally understood as cotton that is grown from plants without chemical fertilizers or pesticides which are not genetically modified, though organic cotton has less environmental impact than conventional cotton and it costs more for its production.Natural dyes can exhibit better biodegradability and generally have a higher compatibility with the environment. Natural dyes are obtained from substances such as flowers, trees, shrubs, buries, lichens, shellfish, leaves, insects and minerals.

COMMON PROPERTIES OF NEEM LEAF, NYCTANTHES ARBORTRISTIS FLOWERS AND ACHRAS ZAPOTA LEAF

The three common properties are listed below

- Anti viral
- Anti fungal
- Anti oxidant

MATERIALS AND METHODOLOGY

Organic cotton was purchased in fabric stage from the fabric dealer, Erode, Tamil Nadu which is of 80s count since the end use is going to be used for baby wear.

Selection of fabric :

The count of the fabric is 30s and it manufacturers by power loom. It's picks per inch is 68 and Ends per inches 76. It's a plain weave.

Selection of dye

Achras Zapota leaves,Nyctanthes Arbortristis and Neem leaves

Neem leaf,Achras zapota leaves and Nyctanthes Arbortristis flowers have been collected from local area and it is used as natural eco friendly dyeing agent. The specified three (Neem leaves, Achras Zapota leaves and Nyctanthes Arbortristis flowers) herbs were selected. These three herbs were selected because of the following aspects as per the literature review, Neem leaves are antiviral an anti bacterial in nature, Zapota leaves demonstrated character of antioxidant activity and Nyctanthes Arbortristis flowers has antiviral and antifungal activities in vitro. Main active principle constituents of Neem leaves are coumestans such as wedelolactone and demethylwedelolactone, polypeptides, polyacetylenes, thiophene derivatives, steroids, triterpenes and flavonoids, Structure of wedelolactone and the structure of Zapota leaves.

Figure 1a : Nyctanthes Arbortristas

Figure 1b:Achras zapota Leaves

Extraction of natural dye solution from Achras Zapota Leaves

Achras Zapota fresh leaves were boiled in 1 litre of water for about 2-3 hours. Then it is filtered using nylon cloth. We have take 0.5% of dye in this Achras zapota leaves.(Figure 1b)

Extraction natural dye solution from Nyctanthes Arbortristis

Nyctanthes Arbortristis fresh flowers were boiled in 1 litre of water for about 2-3 hours. Then the extracted dye solution is filtered using nylon cloth. We have take 1.5% of dye in this Nyctanthes Arbortristis(Figure 1a)

Extraction natural dye solution from Neem Leaves

Neem leaves are shadow dried and ground well to fine powder. 1 liter of boiling water was added to the finely powdered dried Neem leaves for about 2-3 hours. Then it is filtered using nylon cloth. The Neem Leaf is used to treated with dyeing fabric.

Application of Natural Dyes on Organic Cotton fabric

The dyeing of organic cotton fabric was done in the bath with liquor ratio 1:20 with 10 gpl of dye solution using Laboratory winch dyeing machine. The yarn was loaded into bath at 900°C to 1200°C for 2-3 hours.The dyed fabric was washed thoroughly in cold water and then squeezed and shade dried.

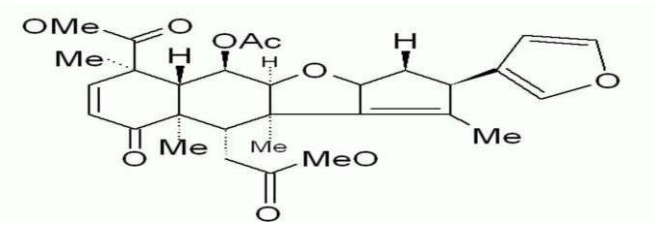

Figure 1: The Cheical Structure of Neem Leaves

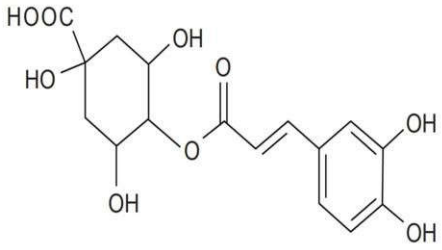

Figure 2: The Chemical Structure of Zapota leaves

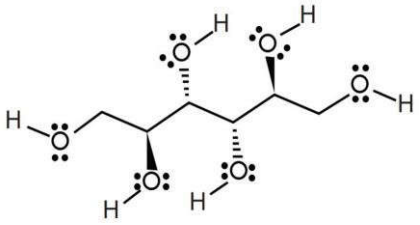

Figure 3: Chemical Structure of Nyctanthes Arbor-Tristis Flower

Figure 2a :Neem Leaves

Figure 2b : AchrasZapota leaf.

Figure 2c : Nyctanthes Arbortristis flowers.

Figure 3a: Color Fastness to Washing

Figure 3b: Color fastness to Rubbing

Evaluation of color fastness

Colorfastness to washing: Wash fastness of all dyed samples was measured by the ISO 3 testing method. Dyed samples were taken,stitched with one of the shorter side and was put to the bath containing 5 gpl of soap, 3 gpl of sodium carbonate and 1:50 MLR ratio at 60°C for 30 minutes. Then the specimen was washed with hot water and then it was dried.(**Figure 3a)**

Colorfastness to rubbing: Rubbing fastness of all dyed samples was measured by dry and wet rubbing method. The dyed sample was fastened to the flat base of the crock meter and we can take 5 cm×5 cm was mounted on the rubbing finger.Then the handle was rotated to ten complete turns at the rate of one turn per second to slide the covered finger back and forth twenty times..**(Figure 3b)**

Colorfastness to sunlight: Sunlight fastnesses of all dyed samples were exposed to sun for a period of time. We can take 10cm x 10cm organic dyed fabric. Fold the cloth in half of the cover of the cloth and remaining half cloth for the 12 hours in sun light..**(Figure 3c)**

Results and Discussion

Colour fastness to washing

Colour fastness to washing of *Achras Zapota,Nyctanthes Arbortristis* and Treatment of Neem Leaves dyed organic cotton fabric is shown in the Table.It is found that the dyed sample shows good colour fastness

Color Fastness to Washing	Change in Color	Staining
Neem Leaves	4	4
Archras Zapota	4	4
Nyctanthes Arbortristis	4	3

NOTE: 1-Very poor, 2-Poor, 3-Medium, 4-Good, 5-Excellent

Colour fastness to Rubbing

Colour fastness to rubbing of *Achras Zapota,Nyctanthes Arbortristis* and Treatment of Neem Leaves dyed organic cotton fabric is shown in Table.It is found that the dyed sample shows good colour fastness.

Color Fastness to Rubbing	Dry	Wet
Neem Leaves	4	4
Archras Zapota	4	4
Nyctanthes Arbortristis	3	4

NOTE: 1-Very poor, 2-Poor, 3-Medium, 4-Good, 5-Excellent

Colour fastness to sun light

Colour fastness to Sunlight of *Achras Zapota,Nyctanthes Arbortristis* and Treatment of Neem Leaves dyed Organic cotton fabric is shown in Table . It is found that the colour fastness to sunlight of dyed *Achras Zapota,Nyctanthes Arbortristis* and Neem Leaves performed to bebest.

Color Fastness to Sun Light	Change in Color	Staining
Neem Leaves	4	4
Archras Zapota	4	4
Nyctanthes Arbortristis	4	4

NOTE: 1-Very poor, 2-Poor, 3-Medium, 4-Good, 5-Excellent

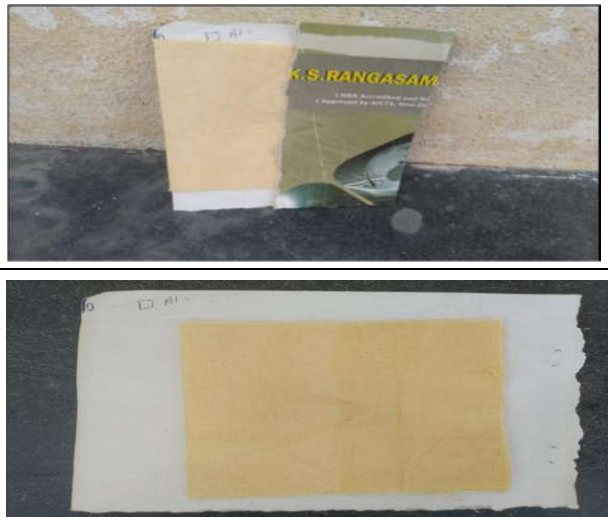

Figure 3c :Color Fastness to Sunlight

Conclusion

Organic cotton fabric is an eco-friendly fabric that suits for children wear. Natural dyed organic cotton fabric are treated for Neem leaves. so, the natural dyed organic cotton fabric eliminate the harmful effects of the skin from allergies and and rashes. It is found that the natural dyed organic cotton fabric shows good in color fastness to Washing, Rubbing and Sunlight.

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