

# HEALTHCARE TEXTILE DYED NATURAL SOCKS

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## ABSTRACT:

The knowledge and use of colour on textiles is one of the most important of fabric development and utilisation. The invention of synthetic dyes have replaced natural dye and nearly stopped the use of natural dyes and colouring matters. In recent years, concern for the environment has created a deep interest in natural dyes. The present series on 'Dyeing with Natural Dyes' will highlight dyeing behaviour of some selected natural dyes. Textiles are an integral part of everyone's life associated with him from cradle to grave. It is used to cover human body, thus encompassing and protecting it from dust, sunlight, wind and other foreign matter present in the external environment that may be harmful to him. It consists of textiles used in operative and post-operative tasks in and around the patient and the medical practitioners. These products are produced either by weaving, knitting, braiding or other nonwoven techniques. Medical textiles are broadly classified as non-implantable materials, implantable materials, extra corporeal devices, and hygiene products, protective and health care textiles. The use of such products helps to reduce the opportunity for contamination by biological toxins and infectious pathogens. A hygiene and health care textile consists of absorbent disposable products, such as shocks, dresses, materials, etc. which are mostly single use items. A Progress of Herbal finish (50 % Aloe Vera & 50% Neem) and the natural dye finish turmeric and beetroot in socks Wears, it creates the favourable conditions for the growth of microbes which will result in the occurrence of rashes. Also the cellulosic material used in shocks wears is easily degraded by microorganisms which in turn affects to the sensitive skin of human. Bacterial growth is one of the biggest fallout of non-hygienic atmosphere. Further microorganisms such as bacteria, mould and fungi also cause deterioration of textiles. Plants and plant product are traditionally used for healing of wounds, burn injuries, anti fungal, anti viral, anti bacterial and anti microbial activity against skin infections. Herbal and natural plant extract for antimicrobial finishing in textiles because of the excellent antimicrobial and eco friendly properties exhibited by them. Since these natural antibacterial agents are less toxic, less irritant and biodegradable they can be used as an antibacterial finish for socks wears. This Herbal finish (50 % Aloe Vera & 50% Neem) and the natural finish can be used in turmeric and beetroot in shocks Wears is subjected to the peoples Survey.

An innovative approach was made to utilize the eco-friendly dyeing using renewable sources such as KADUKKAI and TURMERIC to produce herbal medicated textile material which are free from chemicals, detergent and pollution. In this project eco-friendly Garments, inner wears, Child clothing's & home Furnishing materials were developed by dyeing cotton fabric with herbs like TERMINALIA CHEBULA (KADUKKAI) and TURMERIC (CURCUMA LONGA). These herbs are extensively used to heal chronic fever, skin and eye diseases, allergies, Asthma, rheumatic, body ache, diabetes, skin infections and allergies. In contact with clothing, the skin absorbs the medicinal qualities of the herbs. Compared to the synthetic dyed cotton fabric, the above dyed fabrics showed excellent results in terms of fastness properties. Herbal Textile is finished entirely with herbal extractions, without using any chemicals. These herbs are applied directly to the fabric with the help of natural ingredients, so that the medicinal value of the herbs can be kept intact. No chemical process is adopted while finishing process. Herbal treated cloth has the ability to protect us from various skin diseases, provides relief from viral infected disease and mental depressions since the herbal finished clothes or garments come in prolonged contact with the human body. The medical properties of herbs are known to cause no damage to the human body.

**Keywords:** Health care textiles, shocks wears, Terminalia Chebula, Turmeric, Fastness., beetroot, antimicrobial finish and Aloe Vera & Neem survey.

## 1 INTRODUCTION

Textile materials (Natural or Synthetic) used to be colour for value addition, look and desire of the customers. Anciently, this purpose of colouring textile was initiated using colours of natural source, until synthetic colours/dyes were invented and commercialized. For ready availability of pure synthetic dyes of different types/classes and its cost advantages, most of textile dyers/ manufacturers shifted towards use of synthetic colorant. Almost all the synthetic colorants being synthesized from petrochemical sources through hazardous chemical processes pose threat towards its eco-friendliness. Hence, worldwide, growing consciousness about organic value of eco-friendly products has generated renewed interest of consumers towards use of textiles (preferably natural fibre product) dyed with eco-friendly natural dyes. Hence technical textiles have established to offer a strong potential to the revival of the industry. The fields of application of technical textiles are unlimited and the ideas are often revolutionary. Hygiene and health care textiles (SOCKS) consist of absorbent disposable products, such as, shocks, foot wears, tampons, incontinence products, panty shields and wipes which are mostly single use items designed to receive, absorb and retain body fluids and solid wastages. As it is a commonly accepted principle, prevention is better than cure and hence maintaining a better hygienic environment will obviate the need for curative measures.

## About herbal dyes

Joy of life, natural healing garments has been developed after years of through research of colour therapy & crystal therapy principles in regards to all human beings irrespective of their sex, color or origin. The prime idea behind these eco friendly garments is to utilize the maximum benefits, which the 'Mother Nature' has in store for the entire mankind i.e. Natural fibres (organic cotton), Natural dyes (Herbal dyes with medicinal properties)& natural antimicrobial agents.

## Using herbal dyes

Currently, application of natural dye incorporates new technology not only to exploit traditional techniques but also to improve the rate, cost and consistency production. It therefore, requires some special measurement to ensure evenness in dyeing. The processes of natural dyes for textile dyeing are as follows.

### Extraction

Efficient extraction of the dyes from plant material is very important for standardization and optimization of vegetable dyes, utilizing a) soxhlet b) supercritical fluid extraction c) subcritical water extraction and d) sonicator method.

### Mordanting

In the actual dyeing process, there are four ways of using mordant [3, 10] as follows:

- (a) Mordanting before dyeing, or pre-mordanting;
- (b) Mordanting and dyeing at the same time, called stuffing or simultaneous;
- (c) Mordanting after dyeing, or after-mordanting or post-mordanting;
- (d) A combination of pre-mordanting and after-mordanting

### Early origins of knitting

Knitting is a technique of production fabric form a stand of yarn or thread. Unlike weaving, knitting does not require a loom or other large equipment, making it a valuable technique for nomadic and non-agrarian peoples. The oldest artifact with a knitting appearance is a type of sock. It is believed that socks and stockings were that first pieces produced using techniques similar to knitting. These stocks were worked in nalebinding, a technique of making fabric by creating multiple knots or loops with a single needle and thread .many of these existing clothing items employed nalebinding techniques; some of them look very similar to true knitting. For Example, 3<sup>rd</sup>-5<sup>th</sup> Century ad Romano - Egyptian toe-socks. Several pieces, done in now obscure techniques, have been mistaken for knitting or crocheting.

### Aloe Vera



Fig1- Aloe Vera

Aloe Vera (*L*), a member of the family Liliaceae, is a popular perennial succulent plant that is cactus like in its characteristics (Tyler, 1993). The plant has a long history as a multipurpose folk remedy (Reynolds and Dweck, 1999), and has been associated with myth, magic and medicine since pre-biblical times (Balter, 1992). Essentially two products can be extracted from Aloe Vera leaves; the clear gel that forms naturally in the leaf's hollow interior is used to treat skin irritation, and it is an active ingredient in hundreds of skin lotions and soaps (Grindlay and Reynolds, 1986; Kemper and Chiou, 1999; Foster, 2004; Moody et al., 2004). The resin canal cells found in thick leaf epidermis produce a yellow juice (latex) that is used as a laxative and disinfectant (Tyler, 1993; Foster, 2004) and in experimental 16 and folklore medicine for liver complaints, piles, emetic, anti-pyretic, enlarged spleen, cooling agent, skin diseases, tuberculosis and fungal diseases.

### *Azadirachta indica* (Neem)



Fig-2 - Neem

In antiviral assay conducted by Galhardi et al. (2012), ethanolic extract of *Azadirachta indica* resulted in potent antiviral activity against FMDV at concentration (6-25 µg/ml) as CSP was above 50% at this range. *Azadirachta indica* showed anti-FMDV activity at concentration range of 12 – 100 µg / ml and 50 – 200 µg / ml respectively. Ethanolic AI leaves extract contains polysaccharides as active antiviral against poliovirus type-1. In another study Saha et al. (2010) reported that pecticabinogalactan is a component derivative in Neem plant responsible for antiviral potential against bovine herpes type-1 virus. *Moringa oleifera* alcoholic leaves extract had significant antiviral activity against Equine Herpes virus type 1 (Meenakshi and Garg, 2005).

### TURMERIC:

Turmeric is known as a fugitive dye: with exposure to sun and washing, the color will fade from bright yellow to lighter, less saturated shades. Some of the easiest natural dyes for the beginning dyer to work with are in your kitchen cabinet. They are fun, nontoxic natural dye materials to get you started with the world of color. It was applied on the cotton shocks. **Turmeric** is a tropical plant that yields an orange-yellow spice from its dried, ground root. Turmeric dye creates a bright yellow. You can use the ground turmeric root available in powdered form in the spice section of your market. Or if you live in a tropical area, you can easily grow the turmeric plant for dye material; using freshly grown turmeric root will create an even stronger dye color. There's something magical about transforming a familiar object into something stunning and new with a dramatic color change. Examples could be a piece of cotton shocks that you turn into a vibrant yellow color, an old white shocks that is freshened with a bright yellow hue and you want to make more colorful. Turmeric powder can be found in your kitchen or market, and makes a beautiful yellow dye



### Turmeric Dye

The root of the turmeric plant (*Curcuma longa*) creates strong colors, from bright yellow with no mordant to dark green with an iron modifier. Cold water works well for turmeric; for darker and more orange shades, heat can be applied. Turmeric is a great dye for beginners as it works especially well on animal- or plant-based fibers with or without a mordant. Add the turmeric solution and stir to mix. Add your cotton shocks to the dye bath. Put the dye pot on a burner, and bring the water to a simmer, 180°F (82°C). Simmer the shocks for 20 to 30 minutes, occasionally stirring gently so the fiber absorbs the dye evenly. When your shocks has reached the desired shade, remove it, wash it thoroughly with pH-neutral soap, and rinse thoroughly until the water runs clear. Hang to dry. Turmeric dye without a mordant is nontoxic and safe to place your hands in, since it is a food. Just watch for your hands turning yellow as well.

### BEETROOT DYES:

There is a certain beauty to natural dyes that you just can't get with regular shocks dyes. Although the results aren't quite as color-fast as store-bought dyes, they are gorgeous in their own way. The process is simple, and once you know how to do it with beets, you can try using other natural products, such as red cabbage or turmeric. Preparing the Dye and shocks



**Red Beet:** You can either use chopped beets, beet juice or beet root powder to dye natural fabric to a dusty pink. Bring water to a boil with beets. Reduce heat and simmer 20 minutes. Strain and transfer only liquid back to pot. Add damp fabric and simmer 10–20 minutes. Rinse, or leave in bath overnight and rinse with hot water until water runs clear. Dry. Heat set by ironing for 5 minutes.

### SOCKS WEARS:

SOCKS wears are the garments for kids, teenage, adults and the all peoples; especially it refers hygienic people they are to be more clean and neat. These are usually preemie for a kids, teenagers, adults and all the peoples through there is a no industry

standard definition for those sizes. Most retailers provide sizing charts based on a human weight, height, and the height percentile may also be used for properly sizing clothing for the peoples.

## OBJECTIVES

1. To produce herbal people wears by using natural extracted from Turmeric, Beetroot, Aloe Vera and Neem essence.
2. To incenses the medical sense towards socks wear.
3. To test the Colour fastness retains ability.

## 2. REVIEW OF LITERATURE

### 2.1 TECHNICAL TEXTILES

#### NATURAL DYE – AN OVERVIEW:

Natural dyes are dyes or colorants derived from plants, invertebrates, or minerals. The majority of natural dyes are vegetable dyes from plant sources roots, berries, bark, leaves, and wood and other organic sources such as fungi and lichens.

#### IMPORTANT USES OF NATURAL DYES:

Nature is full of fascinating colours without which life would have been dull and monotonous. Until the 19th century natural dyes were the main colorants for textiles. Artificial dyes were then introduced. The latter are easier to apply than the natural dyes. Besides a wide range of available colours, higher reproducibility and improved quality of dyeing could be achieved at lower specific cost. Natural dyes cost have to be lowered considerably and the quality level of the dyeing needs substantial improvement. According to Pan et al (2003) the concept for production of natural dyes with lowered specific cost involves use of cheap by-products from other agricultural activities, like bark from the timber industry or leaves from abundantly available plants as deodar, jackfruit and eucalyptus. Synthetic dyes are non-biodegradable. There is a quest of replacing these with natural dyes in textile coloration addressing issues to do with environmental awareness, ecology, pollution control and sustainability. Natural dyes are neither toxic nor polluting. Considerable research has been done around the world to discover new sources of natural colouring agents and especially those with lower costs in order to make these textile products as popular as possible. Most of the natural dyed textiles are imported from Third World Countries and India is still a major producer of natural dyes.

#### SOCKS WEARS:

A **sock** is an item of clothing worn on the feet and often covering the ankle or some part of the calf. Some type of shoe or boot is typically worn over socks. In ancient times, socks were made from leather or matted animal hair. In the late 16th century, machine-knit socks were first produced. Until 1800 both hand knitting and machine knitting were used to produce socks, but after 1800, machine knitting became the predominant method. One of the roles of socks is absorbing perspiration. The foot is among the heaviest producers of sweat in the body, as it can produce over 0.25 US pints (0.12 l) of perspiration per day. socks help to absorb this sweat and draw it to areas where air can evaporate the perspiration. In cold environments, socks made from wool insulate the foot and decrease the risk of frostbite. Socks are worn with sport shoes (typically white-coloured socks) and dress shoes (typically dark-coloured socks). In addition to the numerous practical roles played by socks, they are also a fashion item, and they are available in myriad colours and patterns.

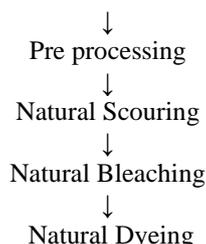
## 3. METHODOLOGY

### Selection of Sample, Area, Process, Methods, Materials and Tools

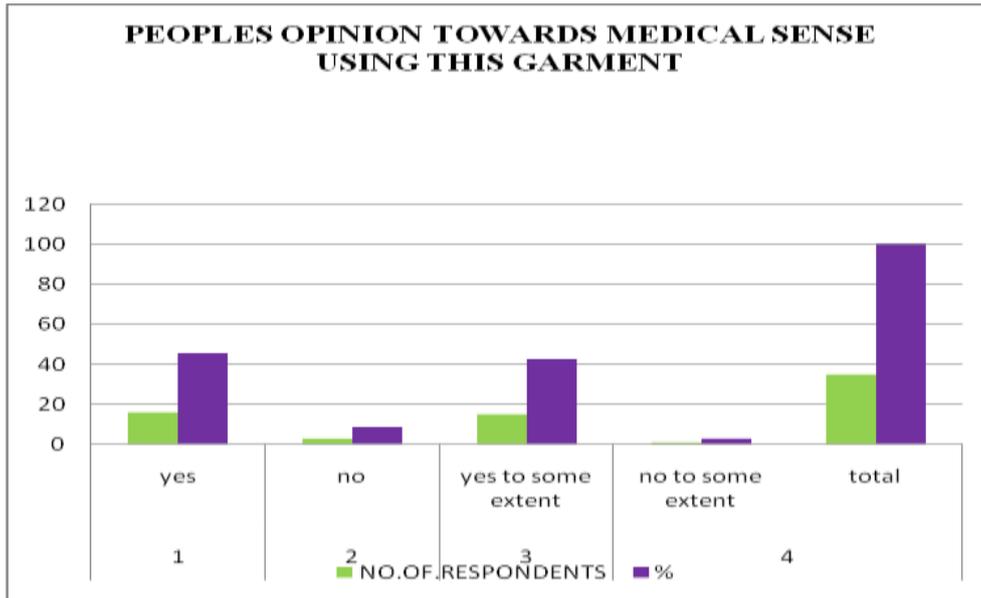
#### Materials

- Cotton-single /jersey knitted socks
- Natural shocks wears
- Natural dyes extracted from Aloe Vera and Neem leaves
- Turmeric and beetroot natural dyes.
- Herbal dyes of 50% aloe Vera and 50% Neem smell and medical sense
- Survey on shocks wears in people viewpoint

Selection of socks material



**PEOPLES OPINION TOWARDS MEDICAL SENSE USING THIS GARMENT**



**4 RESULTS AND DISCUSSIONS**

**Analysis of the Survey 35 peoples with 35 set of questions**

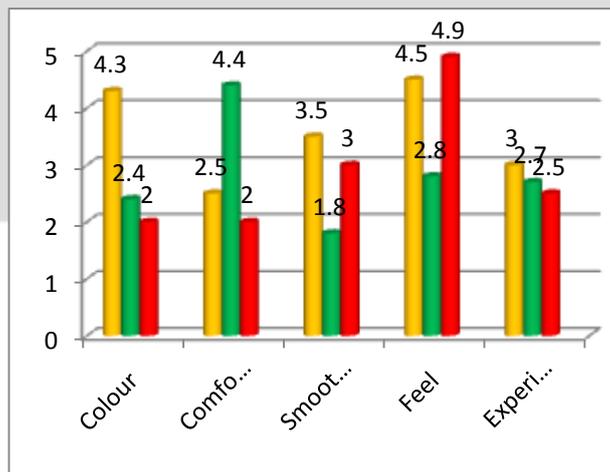
X-axis – Aesthetic properties

Y-axis – Grade points

**Grade Points**

- 1- Fair
- 2- Average
- 3- Good
- 4- Very good
- 5- Excellent.

**Analysis of the Survey**



Note: Feel of the natural dyed product ranges high ratings then compared to others.

**5 ANALYSIS OF THE SURVEY**

The survey is taken towards the peoples towards this product can be based on questionnaires,

(iv) Peoples Survey Study

❖ **Colour**

An attribute of things that results from the light they reflect, transmit or emit in so far as light causes a visual sensation that depends on the wave length the product while is used to carry the baby.

❖ **Comfortness**

A state or situation in which you are relaxed and do not have any physically unpleasant feelings caused by pain, heat, cold, etc. a state or feeling of being less worried, upset, frightened, etc., during a time of trouble or emotional pain is comfortness. Implies that the subject is in state of pain, suffering or affliction and comfort in carrying. One can provide physical comfort to someone who is not in a position to be uncomfortable.

❖ **Smoothness**

This fabric gives smoothness and softness because it is made of natural fibres and the smell gives the pleasant odour.

❖ **Feel**

The person who drives at very first time will not feel much comfortable when they use this often they feel better.

❖ **Experience**

Experiencing will not be the correct method for survey the herbal garment but the collective opinion regarding the comfortable for the baby who uses this comfort covers at very first time. It takes time for them to make themselves comfortable while carrying the baby.

**Product Sample:****6. SUMMARY AND CONCLUSIONS**

Based upon the result of colour fastness on wet rubbing and dry rubbing, light fastness and wash fastness, this dye can be applied for home furnishing and kids garments, fabrics such as screen cloth, bed covers, pillow covers and curtains. Based upon the tone produced, this dye stuff can be used for dyeing spiritualist fabrics. The process is eco-friendly and not harmful and it obeys ISO 14000 certification. The Method of producing and handing is easy. The cost of the dye is cheaper. The natural source for the dye is easy to cultivate the recommended to apply this dye stuff and procedures followed in the results of this research can be a right solution for this inner feeling and production of modern health and hygiene care products. Then the colour fastness rating is also quite in good value of Average of 4 ratings.

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