

# Herbal Textiles: Green Business, Green Earth!!!



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### Abstract

The expansion of textile production and consumption has contributed to increasing pollution, water shortages, fossil fuel and raw material depletion, and climate change. Production of polyester fibre, the most widely used man-made fibre, consumes non-renewable resources and high energy levels, and generates atmospheric emissions. Modern automated textile plants consume large amounts of energy. Textile finishing consumes large amounts of water and energy and often produces harmful effluent. Apparel production is more environmentally friendly, but sourcing from low cost countries consumes more fuel for transportation. Among consumers, the trend towards fast fashion and cheaper clothing has led to a throw-away mentality. Although recycling activity remains at a low level—for economic and quality reasons. Some retailers are also voluntarily attaching “eco-labels” to garments to provide environmental information. Although these have met with varying levels of success in the marketplace, they can encourage “best practice” in manufacturing. Some labeling schemes, such as the EU Eco-label Scheme and its associated flower logo, adopt a full life cycle or “cradle to grave” approach while others, such as Öko-Tex, focus on a single aspect of an item such as its environmental attributes, social attributes, or individual phases of its life cycle. Other initiatives include REACH (Registration, Evaluation and Authorization and Restriction of Chemicals) legislation which aims to encourage safe and eco-friendly chemical production. [1]



The Sanskrit word ‘Ayur’ means life and Vastra means dress. Ayurveda is the garment that ensures better health and long life. Normal fabrics like organically grown cotton yarn, jute fibre, silk, wool etc. are used to make Ayurveda by dyeing them with the desired herbs in a controlled temperature and environment. Ayurveda cloth is completely free of synthetic chemicals and toxic irritants and is totally organic, sustainable and biodegradable. The color of the Ayurveda is gained from the medicinal preparation only and no other colorants are used. Resultantly, its property will last as long as the colour is there. The roots, flowers, leaves, seeds and barks of around 200 herbs are used to make the dyes. Since the natural herbs are generally found in very beautiful shades, Ayurveda is also becoming very popular for its colour properties. It has been proved that certain synthetic dyes used in garments are harmful to the human body. So garments carrying herbal property will be beneficial to the human body. [2]

### Introduction

#### What’s Organic...?

Organic Cotton says no to synthetic chemical fertilizers, insecticides and pesticides & yes to natural fertilizers, compost and innovative farming techniques.

#### Why Organic...?

- Less than 3% of the world's arable land is planted with cotton. 24% of the world's insecticides & 10% of the world's pesticides are used for cotton cultivation. So, every year at least three million people get poisoned and 20-40,000 people get killed.  
So, millions of water creatures get killed unintentionally each year. So, enormous soil pollution.
- Pests build up resistance to chemicals, farmer borrows money to buy more chemicals than before, farmer gets less profit from crop, this repeats until farmer is destitute.
- One acre of organic cotton instead of an acre of conventional cotton reduces CO<sub>2</sub> release by two tones a year. [2]

### **What's Natural dyeing?**

Natural dyes refers to the dyes that are used to dye/print the fabric. They are flowers/roots of plants like Turmeric, onion, pomegranate, myraballams, manure, Brazil wood etc... (Table No.:- 4)

### **Why natural dyeing?**

- Natural dyeing is a practice of a society in tune with nature. Dyeing is an art; the moment science dominates it, it is an art no longer, and the craftsman must go back to the time before science touched it, and begin all over again
- No petrochemical dyes only plant extracts used as dyes so no water pollution, instead the waste after dyeing can be used as manure.
- Medicinal properties may be acquired by fabric as many dyes have medicinally rich properties. So no to allergies, septic, cancer and bad transpiration

### **What are herbal Clothes and how did it come to existence???**

Herbal clothes, is an ancient technique of dyeing textiles in medicinal herbs. Organic clothing has been in India for over the last 5000 years. This came into existence from when Ayurveda or the uses of herbs have been practiced in India. When exposed to skin, the herbs are absorbed into the body and may function as a means of providing Ayurveda treatment for a broad range of diseases including diabetes, skin infections, asthma, arthritis, and hypertension. It is also known to strengthen the immune system. Organic garments are 100 percent organic, completely free of synthetic chemicals and toxic irritants, and biodegradable.

These herbals are used traditionally in Ayurvedic treatment and many medical applications. When this fabric is worn, the medicinal property of the fabric is then transferred to the skin, which is against the fabric.

It is now suspected that many of the synthetic dyes are carcinogenic in nature and have in life systems. Colourful dye can be extracted from flowers for dyeing textile fibre. These herbal dyes are not toxic, no allergic to human health, easily available and more economical.

Herbal cloth is a value added cotton and linen fabric, which has been approved for patent. In herbal cloth products, herbal extractions are used instead of synthetic dyes. No chemicals have been used in any of the steps of manufacturing of herbal cloth product. Herbal cloth promises positive benefits.

Since time immemorial, ayurveda uses herbs like haridra, rakta chandana, and shweta Chandana, kumkuma etc (as shown in fig.no.1) for protecting the skin from harmful rays of sun and to keep it healthy. The herbal molecules act with the melanocytes cell present in the skin and control its function. It blocks the UV rays from penetrating deep into the skin.

[3]

**Table-1**

<b>Colour</b>	<b>Botanical name</b>	<b>Parts used</b>	<b>Mordant</b>
<b><u>Red dye</u></b> Safflower Caesalpinia Madder	Carthamus tinctorius L. Caesalpinia sappan L. Rubia tinctorium L.	Flower Wood Wood	- Alum Alum
<b><u>Yellow dye</u></b> Golden rod Teak Marigold	Solidago grandis DC. Tectona grandis L.f. Marigold Tagetes sp	Flower Leaf Flower	Alum Alum Chrome
<b><u>Blue dye</u></b> Indigo Woad Sunt berry. Pivet	Indigofera tinctoria L Isatis tinctoria L Acacia nilotica (L.) Ligustrum vulgare L.	Leaf Leaf Seed Fruit	Alum - - Alum and iron
<b><u>Black dye</u></b> Alder Gaertn. Rofblamala. Custard apple.	Alnus glutinosa (L.) Loranthus pentapetalus Roxb Anona reticulata	Bark Leaf Fruit	Ferrous sulphate Ferrous sulphate -
Orange dye Annota Dhalia Lily	Bixa orellena L Dhalia sp. Convallaria majalis L.	seed Flower Leaf	Alum Alum Ferrous sulphate

### About the herbal cloth



Ayurveda, the 4000 years old Indian system of medicine is now a globally accepted science because it is the world's most eco-friendly system of medicine, since it does not use any material unfriendly to the ecosystem. During the Vedic period itself we have got references mentioning the properties of several herbal based dyestuff used centuries ago. There are references in different texts of ayurveda quoting examples of wearing pure cotton clothes processed with herbs like chandana, haridra usheera, manjista, nimba aragwadha etc to

protect the body from different climates and to keep the body healthy.

They kept the clothes clean with herbal products like soap-nut, lime etc even before soaps and detergents were discovered. These methods kept them healthy and their clothes were strong and everlasting. When the cotton cloths are processed with the medicinal herbs instead of synthetic dyes and chemicals, the cloth imparts anti-bacterial, anti-inflammatory, anti-puritic and anti-oxidant properties of the drugs into the body. By 18th century synthetic dyes and chemicals were introduced, as a result of which there was a decline in the use of natural herbal dyestuff. [4]

### How does the herbal clothing differ from other fabrics?

The below are some of the tangible and intangible properties of herbal clothing which differentiate it from conventional clothing:

- Organic/Herbal is soft in feel
- Organic cotton/Herbal fabrics will have more strength then conventional in comparison
- It would have typical smell of herbs used for processing the same
- Lime discharges on herbal textiles since the strongest source of Acid in nature
- Colors are more earthly, not compatible to pantones
- Got biodegradability and bio compost tendency
- The colors may changes with the other physical/chemical and external environmental changes
- They are extremely therapeutic to eyes and mind
- Herbal dyed colors are created from plants and minerals. All of the herbs have therapeutic uses as botanicals (herbs), or as homeopathic (diluted), or as nutritional supplements (minerals)
- Colors are extremely therapeutic to eye, mind and body
- It is extra smooth and good for transpiration
- The colors are unique and cannot be duplicated with any dyes, thus new shades

### Wet processing- Herbal Vs Chemical [5]

**Table-2**

Process	Herbal Dying Process	Chemical/Natural/Low Impact/Vegetable Dyeing Process
Bleaching	Cow Dung, Minerals	Chemicals
Sourcing	Sea Salts, Sunlight	Caustic, Soda
Mercerizing	Minerals, Oils	Chemicals
Dyeing	Medicinal Herbs	Chemicals
Dye Fixing	Natural Oils	Formaldehyde Etc
Finishing	Rolls, Sugar, Oils	Chemicals
Washing	Rita, Khar, Natural Soaps	Detergent
Innovation	No chemicals; only herbs & natural resources used. Natural medicinal properties are imbibed on cloth	Approx 8000 chemicals used. No medicinal properties claimed or imbibed

## Dye sources

Many natural dyestuff and stains were obtained mainly from plants and dominated as sources of natural dyes, producing different colours like red, yellow, blue, black, brown and a combination of these (Table No.1). Almost all parts of the plants like root, bark, leaf, fruit, wood, seed, flower, etc.(as shown in fig. no.2) produce dyes. It is interesting to note that over 2000 pigments are synthesized by various parts of plants, of which only about 150 have been commercially exploited. Nearly 450 taxa are known to yield dyes in India alone<sup>9</sup>, of which 50 are considered to be the most important; ten of these are from roots, four from barks, five from leaves, seven from flowers, seven from fruits, three from seeds, eight from wood and three from gums and resins.

## Dyeing

**Table-3**

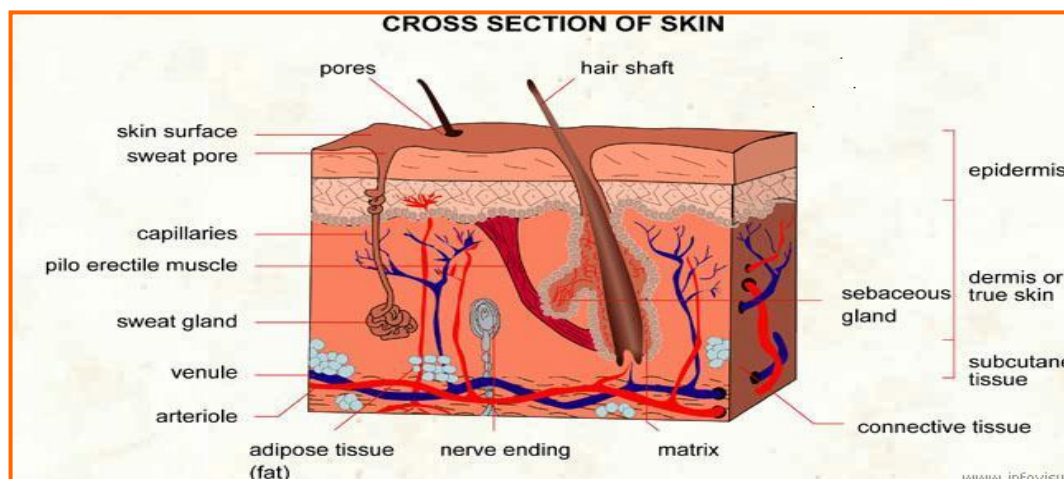
Sr. No.	Shades Produced	Name of Colour
1		Beet Maroon
2		Leaf Green
3		Madder Red
4		Cutch Brown
5		Sandalwood Red
6		Dark Brown
7		Ash Pink
8		Earth Black
9		Indi Blue
10		Chebula Black
11		Indi Blue Light
12		kasam olive
13		Pom Orange
14		Harda Cream
15		Myra Yellow
16		Kesu Cream

By using numerous herbs for dyeing and processing of yarn and fabric for herbal cloth production. For herbal cloth production using a particular method, extracts of selected herbs are used for dyeing and processing of Cotton / Silk / Linen, yarn and fabric. No synthetic/ chemical dyes are used in any stage of Herbal cloth production. For washing and cleaning purpose we recommend the nut or nut powder of *Sapindus Laurifolia*. [6]

The mordanted samples are immersed in dye bath for 2 hr at a temperature range of 80 °C and after completion of dyeing; samples are taken out and dried. It is allowed to be aged for a fixed time, and after that soaping is carried out with 2g/l Ritha, Natural at room temperature for 10 minutes followed by rinsing and line dyeing. Shade variation from batch to batch would be approximate 15% to 20%. (Table No. 3)

### **Mode of Action of Herbal cloth on the body**

Skin is the largest sense organ in the human body. The radiated heat activates herbal molecules of the cloth and is reflected back to the body along with the herbal molecules. Through the blood the herbal molecules enter deep into the body and show its property at different levels of the body and helps in curing other diseases like arthritis, allergic bronchitis, tension etc.



Conventional Western medicine and traditional Eastern medicine recognize the skin as being the body's largest organ. The skin can act as a barrier but also as a medium for outside substances to enter the body. Many environmental toxins and chemicals in conventional clothing are assimilated into the body through the skin. Anything which can improve the skin's natural ability to block and resist harmful chemicals and toxins from entering the body will be beneficial to health.

### **Differences between herbal cloth and chemically dyed cloth [7]**















The main difference between herbal cloth and chemical dyed cloth is that cloth dyed using synthetic dyes has no therapeutic effects. On other hand, certain synthetic dyes will cause serious damage to the human body.

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 dyed clothes / garments come in prolonged contact with the human body.

For herbal cloth production with a particular method, extracts of selected herbs are used for dyeing and processing of cotton/ Silk/ Linen yarn and fabric.

No synthetic/ chemical dyes are used in any stage of Herbal cloth production. For washing and cleaning purpose, the nut or nut powder of Sapindus Laurifolia is recommended.

**Table-4**

Turmeric	Haritaki	Madder	Pomegranate	Cutch, Catechu	Onion	Indigo
						
						

**Advantages of herbal textile [8]**

- We are avoiding the use of 1/3rd pound of lethal chemicals known to be used in making of 1 shirt.
- We breathe through our body more than, we do through nose in chemical dyed textiles with those carcinogenic amines and chemicals which are allergic and dangerous to human skin
- We have only 0.6 % surface water in world at our disposable and can be used constructively
- Because of using Medicinal Herbs, the fabrics also have a lot of therapeutic value, thus, the fabric has been found very helpful for people suffering from ailments like Skin allergies, Breathing problems, sleeping disorders, Blood pressure etc
- The colours are unique and cannot be duplicated with any dyes, thus new shades are developed every time
- Highly promoted agriculture
- Balances the Ecology cycle completely
- Waste can be used as manure
- Made Bulk production a possibility through innovative tech.



- Capacity of dyeing evenly in length of over 1000mtrs of same shade through innovative controlled machine replacing the requirement of Sun, running water etc which is a must in any such natural process.
- Versatility in process. Ability to dye on yarns, towels, knits. Fashion fabrics like voile, silk etc. Home Furnishing like Jute etc
- No heavy metals like chrome, copper etc used unlike natural /Herbal Ayurvedic dyeing
- Organic clothing can help reduce exposure to allergens and other irritants and give a comfortable feeling.
- Manual farming and organic practices have a lower carbon footprint as the entire process consumes less fuel and energy and emits fewer greenhouse gases compared to chemical textiles.
- Grown with natural rather than synthetic pesticides and fertilizers, no chemical defoliants used.
- Eco-friendly processing that does not compromise workers' health and helps reduce water and electric use and toxic runoff.
- Strict testing ensures the absence of contaminants like nickel, lead, formaldehyde, amines, pesticides and heavy metals.
- People with allergies and chemical sensitivity especially benefit from organic cotton clothing, as conventional cotton may retain harmful toxic residues. Even if you don't have sensitive skin, organic cotton will just feel better against your skin.
- Children are at greater risk for pesticide-related health problems than adults. Millions of children in the US receive up to 35% of their estimated lifetime dose of some carcinogenic pesticides by age five through food, contaminated drinking water, household use, and pesticide drift.
- Farm workers working in conventionally grown cotton fields around the world suffer from an abundance of toxic exposures and related health problems. Pesticides used on cotton cause acute poisonings and chronic illness to farm workers worldwide. Acute respiratory symptoms and other health effects in communities surrounding cotton farms are correlated with high use of defoliation chemicals.

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