

# A Review on Tie and Dye Ayurvastra Reusable Food Wrapping Using Tea and Turmeric on Khaddar

Geeta<sup>1</sup>, Dr. Harpreet Kaur<sup>2</sup>

<sup>1</sup>Research Scholar, <sup>2</sup>Head of Department

P.G. Department of Fashion Designing, Kanya Maha Vidyalaya (Autonomous), Jalandhar, Punjab, India

## ABSTRACT

Ayurvedic dyeing is an ancient method of dyeing using plants, roots, flowers, seeds, barks, leaves and natural minerals. It uses natural mordants for fixing shades and natural gums for holding the goodness of herbs into the fabric. The focus of Ayurvedic Dyeing is to make the fabric wellness with the goodness of the herbs. The use of fabrics and garments to deliver health solutions is actually a very old concept called Ayurvastra. Ayurvastra is a Sanskrit word where 'Ayur' means health and 'Veda' means wisdom and 'Vastra' is cloth or clothing. It is totally organic, sustainable and biodegradable. Tea and Turmeric are easily available in kitchen. Both of these have natural fabric dyeing properties as well as many health benefits. This is anti-fungal, anti-bacterial and anti-viral. In the present research, this herb is used to make natural dye as this is well known for their medicinal properties. Mordants used was alum, which has antiseptic properties and is safe for skin and environment. The objective of the study was to make the technique of natural dying easy to carry out for home dyers using ingredients from the kitchen garden and to encourage the traditional sustainable practice of preparing Ayurvastra, the organic healing cloth. Reusable food wrappings were made by dyeing khaddar with tea and turmeric using tie and dye technique. Spectroscopy, colorfastness to sunlight and washing tests were done. The pH value of the water was checked before dyeing as it affects the outcome of the dyeing process. To test the market acceptability of reusable food wrappings 30 respondents were selected by random sampling.

**Keywords:** Natural Fabric Dyeing, Ayurvedic Dyeing, Ayurvastra, Tea, Turmeric, Tie and Dye.

## I. INTRODUCTION

### 1.1. What is Natural Dyeing

Natural dyes are obtained from natural sources. Most are of plant origin and extracted from roots, wood, bark, berries, lichens, leaves, flowers, nuts, and seeds. Others come from insects, shellfish, and mineral compounds. Natural dyes were the only source of color for textiles, leather, basketry, and other materials until synthetic dyes were developed in the latter half of the nineteenth century. Of the thousands of natural color substances, very few became significant commercially. (Sara J. Kadolph, n.d.)

### 1.2. Classification of Natural Dyes

**Part of the Plants Dyestuffs** (Gulrajani & Gupta, 1992)

Table-1.2. c.

Root	Turmeric, Madder (Manjistha), Onions, Beet-root
Bark/Leaves	Turmeric, Madder (Manjistha), Onions, Beet-root
Leaf	Indigo, Henna, Eucalyptus, Tea, Cardamon, Coral Jasmine, Lemon Grass
Flowers (Petals)	Marigold, Dahlia, Tesu, Kusum

### 1.3. Mordants

Mordants (from Latin *mordere*, 'to bite', because the mordant eats away the surface of the fibre so that the dye can seep in) are chemicals in the form of metallic salts which are generally used to create an affinity between the fibre and the pigment.

### 1.4. Alum

It is well known that natural dyes do not readily adhere to cotton. Therefore, in order to set the color when using natural dyes alum is needed to play its role as a chemical agent which allows a reaction to occur between the dye and the fabric. It may be added to the dye source to influence it; however, it does not serve as a color source on its own

### 1.5. Tannin

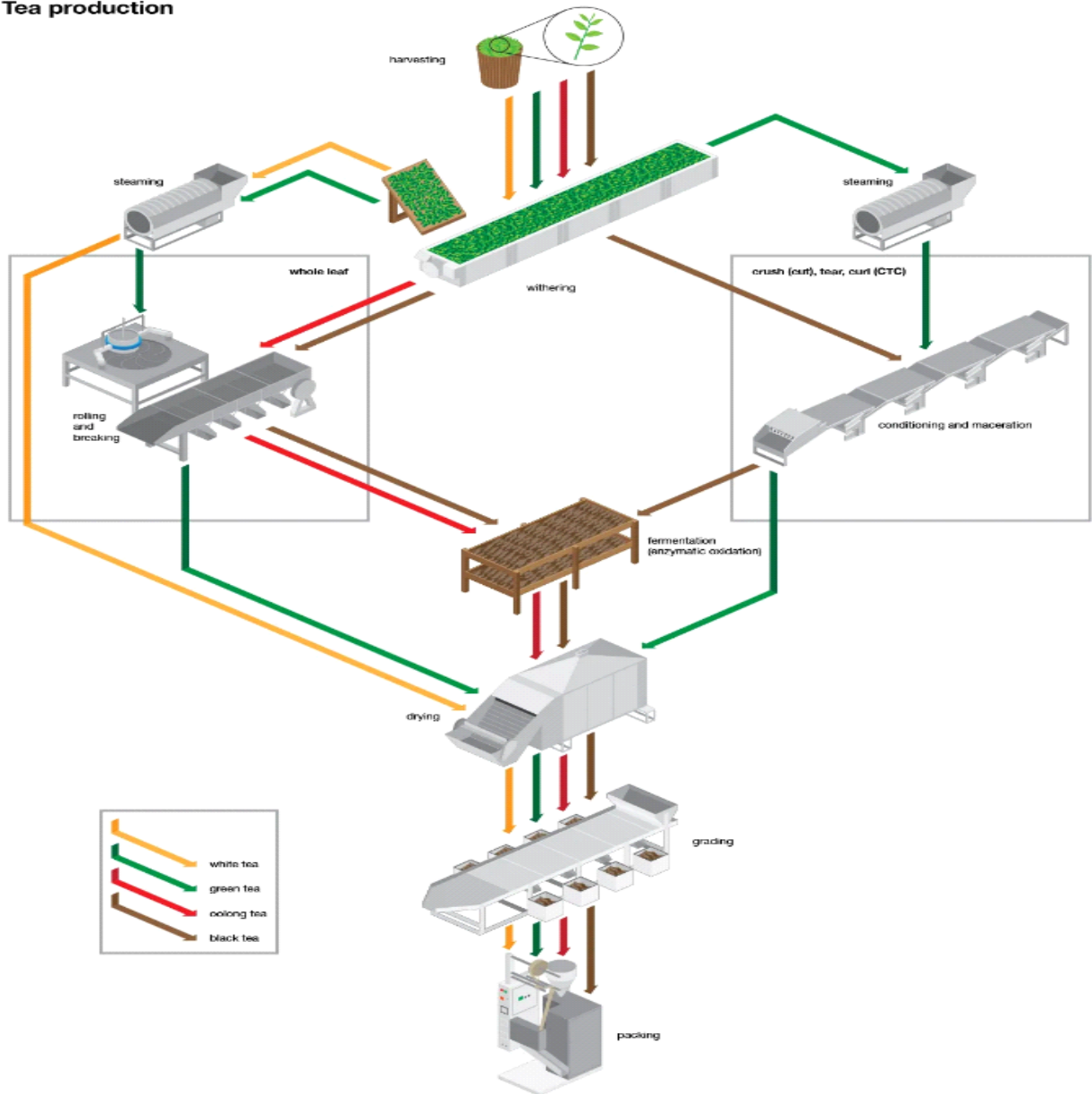
Any of a class of yellowish or brownish solid compounds found in many plants and used as tanning agents, mordants, medical astringents, etc.

### 1.6. Tea- *Camellia sinensis*

1.6.a. Tea, beverage produced by steeping in freshly boiled water the young leaves and leaf buds of the tea plant, *Camellia sinensis*. Two principal varieties are used, the small-leaved China plant (*C. sinensis* variety *sinensis*) and the large-leaved Assam plant (*C. sinensis* variety *assamica*).



**Tea production**



**1.7. Turmeric**

A natural dye is extracted from turmeric and used to dye cotton at different dyeing conditions. Then the fastness properties of the dyeing with different dyeing techniques are compared. The dye is found to have good saturation and rubbing fastness, but poor washing and light fastness properties on cotton, when applied without any mordant. When dyeing is implemented with mordants, washing and light fastness properties show improvement while rubbing fastness exhibits deterioration. (Saima, et.al., 2008)



Turmeric plant



Raw rhizome



Dry rhizome



Turmeric powder

### **Aims and Objectives of the Study**

The study has been carried out with the following aims and objectives:

1. To provide a natural alternative to the use of synthetic dyes.
2. To make the technique of natural dyeing easy to carry out for home dyers using ingredients from the kitchen garden and one's surroundings.
3. To encourage the traditional sustainable practice of Ayurveda, the organic healing cloth.
4. To prepare reusable food wrappings with benefits of natural dyeing.
5. To test the color and light fastness of Ayurvastra fabric dyeing.
6. To test the spectroscopy and K/S of the dyed fabric.
7. To test the market acceptability of articles prepared with ayurvedic dyeing.

### **Limitations of the Study**

The work has been done under certain constraints; these are:

1. Only meta-mordanting was done.
2. Only alum was used as a mordant.
3. The focus of the study was to develop technique of natural dyeing for home dyer and not for experimental documentation.



## II. REVIEW OF LITERATURE

The review of literature is usually a highly synthesized critique of the status of knowledge on a carefully defined topic. A review of related research serves an important purpose and helps the researcher at every step of his venture as a researcher can build appropriate methodology and design keeping in view the strength and failure of previous researchers. A review of literature provides useful hints for further research.

### 2.1. Natural Dyes

As per the research of **Sonja Jordeva et al (2020)** Dyes of natural sources were re-placed by synthetic dyes because the new dyes could be mass produced with consistent shades of color.

#### 2.1.1. Natural Dyes and Textile

Natural dyes are mostly used for dyeing of the textiles from natural fibres to enhance their eco-friendly characteristics. Apart from indigo, other natural dyes are usually not used for printing directly.

#### 2.1.2. History of Antimicrobial Finishing in Textiles

The prevention of microbial attack on textiles has become increasingly important to consumers and textiles producers. Therefore, interests in antimicrobial fabric finishing have steadily increased over the last few years. Application of natural antimicrobial agents on textiles dates back to antiquity, when the ancient Egyptians used spices and herbs to preserve mummy wraps.

#### 2.1.3. Extraction of Natural Dyes

The color component present in various sources like flowers, roots, bark, animal sources, mineral sources etc. needs to be extracted so that it can be applied on the textile. Most vegetable dyes are extracted by pulverizing, grinding or soaking and boiling the herbs in water.

### 2.2. Ayurvastra

Anonymous: <https://www.ayurvastra.in/concept>

Ayurvastra is dyed using medicinally rich herbs in such a way it holds all the goodness of the herbs preserved in our Ayurvastra Technology. When a user wears Ayurvastra textile it forms the second layer of the skin. Generally, skins have pores (opening) and it also absorb and emits heat as per the environmental condition on wearing Ayurvastra clothing.

### 2.3. SWOT Analysis of Ayurvastra

#### able-2.3. a.

<p><b>Strength</b> Ayurvastra acts as healing agent and absorber through skin. Anti-microbial, anti-inflammatory properties. Herbal dyes don't pollute. Dye effluent can be used as bio-manure and compost</p>	<p><b>Weakness</b> Ayurvastra should be washed separately with bleach free detergent, gentle machine cycle, warm iron or steam iron.</p>
<p><b>Opportunities</b> Textiles dyed especially with medicinal herbs demand a huge market due to their obvious advantages. This unique technology will open up new area of entrepreneurship and employment.</p>	<p><b>Threats</b> Due to lack of availability of precise technical knowledge on the extracting and dyeing technique, it has not commercially succeeded like synthetic dyes.</p>

#### 2.4. Dyeing of cotton and jute with tea as a natural dye

Researchers **H.T. Deo and B.K. Desai (2006)** stated that, Cotton and jute fabrics were dyed with an aqueous extract of tea, containing tannins as the main colorant species. The dyeing was carried out with and without metal salts as mordants, using three different dyeing methods: pre-mordanting, meta-mordanting and post-mordanting.

#### 2.5. Natural Dyeing of Cotton Fabric Using Turmeric (*Curcuma Longa*)

According to research of **Rajan.S<sup>1</sup> & Gopinath. M (2021)** An innovative approach was made to utilize the eco-friendly dyeing using renewable sources such as TURMERIC & KADUKKAI to produce herbal medicated textile material which are free from chemicals, detergent and pollution.

##### 2.5.1. About Turmeric (*CURCUMA LONGA*)

Turmeric is the most popular natural dye in textile dyeing. Turmeric is a rich source of phenolic compounds called curcuminoids. The active coloring ingredient in turmeric rhizome is Curcumin, which is also known as Natural Yellow.

##### 2.5.2. Purpose of choosing Terminalia Chebula (*KADUKKAI*) and Turmeric (*CURCUMA LONGA*):

1. It is a strong antibacterial, non-toxic, non-allergic and antifungal element that protects the human body.
2. Balancing of internal body hormones hence prevents critical conditions such as diabetes.

#### 2.6. The Heritage of Tea Dyeing

The Traditional Tea Dyeing Technology

As per research of **Qin-ru Huang and Chun-Hua Gu (2017)** Tea dyeing makes use of dyeing properties of tea to change the color array of the textiles. Available records show that tea dyeing is development and derivation of plant dyeing, with a variation in dyeing material.

Tea dyeing technology can be divided into **three types**, according to the writer's researches.

#### 2.7. Tea, Turmeric and Tannin Acid

**Xiaocui Huang, Chen Liu** (n.d.) stated that Tea contained a variety of pigments, so many researchers had tried to extract pigment from tea as a dye for textiles. The study also found that when dyeing silk with tea pigments, the mordant was needed. Furthermore, the use of mordant could improve the color fastness of the fabric. So many kinds of metal mordant were often applied, such as aluminium ion, copper ion, and iron ion.

**2.8.** As per the research of **Eman A Bydoon, n.d.**, Some sensitive skinned people experience irritation to certain chemicals color. Such people can go for clothing colored from natural dyes, as they are extremely easy on skin and do not cause any sort of irritation.

##### 2.8.1. Materials

A commercial sample of black tea powder (Lipton) was used. Tea leaf contains more than 10,000 natural products. However, the main biochemical coloring compounds present in the tea liquor are theaflavins and thearubigins,

#### 2.9. Curcuma longa extract – Haldi: A safe, eco-friendly natural cytoplasmic stain

**Hema Suryawanshi, et.al. (2017)** stated in their research that biological stains are generally used to add color to animal and plant tissues, microbes and spores to make them optically distinct. This technique of visual labeling

is known as staining. Before synthetic dyes came into use, natural stains were already available and were used for various purposes.

### 2.9.1. Materials and Method

The present experimental study was conducted in the Department of Oral Pathology and Microbiology, Chhattisgarh Dental College and Research Institute, Rajnandgaon, Chhattisgarh.

### 2.9.2. Method of turmeric dye preparation

The rhizomes of *C. longa* were cut into small pieces and dried in hot air oven at 40°C. They were then milled to form fine powder using a normal household mixer-grinder. 10 g of this powder was weighed using an electronic weighing machine. This was dissolved in 80 ml of 50% alcohol. The prepared solution was left overnight in a tightly sealed container and was centrifuged the following day, using a centrifuge machine (REMI LAB CENTRIFUGE) at 3000 rpm for 2 min. As studies revealed that curcumin is more soluble in alcohol and when equal proportions of alcohol and water are used, the solubility of curcumin increases exponentially.

## 2.10. Application of Medicinal Dye (Turmeric and Annatto) on Silk Fabrics Using Eco- friendly Mordants

Thomas Browne, et.al. (2018) Introduction - "Nature is the art of God"-

### 2.10.1. Problem

Dyestuffs are made from synthetic organic chemicals which are made from basic chemicals which are highly carcinogenic. During manufacturing of synthetic colors and during dyeing process many carcinogenic chemicals are required. The by-products formed were discharged in to the rivers, ponds or in the atmosphere. There are more than 50 carcinogenic chemicals which are banned by most of the countries.

### 2.10.2. Methodology

Objectives: To extract the medicinal dye from Turmeric and Annatto and its application on silk fabrics using eco-friendly mordants. Preparation of shade cards and testing for colorfastness properties and Color measurements.

Materials: Silk fabrics, Turmeric roots, Annatto seeds, Garcinia indica fruit shells and Alum.

## III. REFERENCES

- [1]. Natural Dyeing, n.d.:(<https://www.lexico.com/en/definition/dye>)
- [2]. Natural Dyeing, n.d.URL: ([https://www.researchgate.net/publication/221919685\\_Dyeing\\_of\\_Textiles\\_with\\_Natural\\_Dyes](https://www.researchgate.net/publication/221919685_Dyeing_of_Textiles_with_Natural_Dyes))
- [3]. Sara J. Kadolph,( n.d.): (<https://fashion-history.lovetoknow.com/fashion-clothing-industry/natural-dyes>)
- [4]. Ashis Kumar et.al. (2011): ([https://www.researchgate.net/publication/221919685\\_Dyeing\\_of\\_Textiles\\_with\\_Natural\\_Dyes](https://www.researchgate.net/publication/221919685_Dyeing_of_Textiles_with_Natural_Dyes))DOI:10.5772/21341
- [5]. In book: Natural Dyes Ayurveda,( n.d.): 0<https://www.fibre2fashion.com/industry-article/5529/ayurvedic-medicated-application-on-textile-material>
- [6]. Ayurveda,( n.d.):<https://www.ayurveda.in/concept>
- [7]. Mordant(n.d.):<https://www.merriam-webster.com/dictionary/mordant>
- [8]. Har Bhajan Singh, Kumar Avinash Bharati, in Handbook of Natural Dyes and Pigments, (2014): <https://www.sciencedirect.com/topics/chemistry/mordant>

- [9]. Ezatollah Mozaffari and Bijan Maleki (2018).URL:  
<https://juniperpublishers.com/ctfjte/pdf/CTFJTTE.MS.ID.555619.pdf>
- [10]. Sinnathurai Sivasubramaniam(2022), <https://www.britannica.com/topic/tea-beverage>
- [11]. Tannin, (n.d): <https://www.thefreedictionary.com/tannin>
- [12]. Tannin, (n.d):<https://in.search.yahoo.com/search?fr=mcafee&type=E211IN826G0&p=tannin+definition>
- [13]. William Cole, (n.d.): <https://www.mindbodygreen.com/articles/tannins-in-tea>
- [14]. HemaSuryawanshi,et.al.,(2017)[https://www.researchgate.net/publication/302029471\\_Dyeing\\_Properties\\_of\\_Natural\\_Dyes\\_Extracted\\_from\\_Turmeric\\_and\\_their\\_Comparison\\_with\\_Reactive\\_Dyeing](https://www.researchgate.net/publication/302029471_Dyeing_Properties_of_Natural_Dyes_Extracted_from_Turmeric_and_their_Comparison_with_Reactive_Dyeing)
- [15]. Saima, et.al., (2008),: <https://www.sciencedirect.com/topics/neuroscience/turmeric>
- [16]. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5664031/>
- [17]. Sonja Jordeva et al (2020):  
[https://www.researchgate.net/publication/348286278\\_Dyeing\\_of\\_textiles\\_with\\_natural\\_dyes](https://www.researchgate.net/publication/348286278_Dyeing_of_textiles_with_natural_dyes)
- [18]. doi: 10.5937/tekstind2004012J
- [19]. Ayurvastra, n.d., <https://www.ayurvastra.in/concept>
- [20]. H.T. Deo and B.K. Desai (2006):  
[https://www.researchgate.net/publication/230126829\\_Dyeing\\_of\\_cotton\\_and\\_jute\\_with\\_tea\\_as\\_a\\_natural\\_dye](https://www.researchgate.net/publication/230126829_Dyeing_of_cotton_and_jute_with_tea_as_a_natural_dye)
- [21]. DOI:10.1111/j.1478- HYPERLINK "http://dx.doi.org/10.1111/j.1478-4408.1999.tb00360.x"4408.1999.tb00360.x  
 HYPERLINK "http://dx.doi.org/10.1111/j.1478-4408.1999.tb00360.x"00360.x
- [22]. Rajan.S1 & Gopinath. M (2021),: 5 <https://textilelearner.net/natural-dyeing-of-cotton-fabric/>
- [23]. Qin-ru Huang and Chun-Hua Gu (2017):  
<https://mail.google.com/mail/u/0/#sent/RdDgqcJHpWcvcDjPZnHtrQvClFtkvDnMTqRjLRWgRFjb?projector=1&messagePartId=0.1>
- [24]. Xiaocui Huang, Chen LiuTea(n.d.), URL:  
[https://www.researchgate.net/publication/335157365\\_Analysis\\_of\\_Natural\\_Mordant\\_to\\_B\\_mori\\_Silk\\_Fabrics\\_Dyeing\\_with\\_Tea\\_Extract](https://www.researchgate.net/publication/335157365_Analysis_of_Natural_Mordant_to_B_mori_Silk_Fabrics_Dyeing_with_Tea_Extract)
- [25]. Eman A Bydoon,n.d.,:  
[https://www.academia.edu/33545472/Extraction\\_of\\_Natural\\_Dye\\_from\\_Tea\\_Leaves\\_and\\_its\\_Application\\_on\\_Giza\\_86\\_Egyptian\\_Cotton\\_Fabric](https://www.academia.edu/33545472/Extraction_of_Natural_Dye_from_Tea_Leaves_and_its_Application_on_Giza_86_Egyptian_Cotton_Fabric)
- [26]. Hema Suryawanshi, et.al. (2017): <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5763853/>
- [27]. Thomas Browne, et.al. (2018):  
[https://www.researchgate.net/publication/329611442\\_Application\\_of\\_Medicinal\\_Dye\\_Turmeric\\_and\\_Annatto\\_on\\_Silk\\_Fabrics\\_Using\\_Eco-friendly\\_Mordants](https://www.researchgate.net/publication/329611442_Application_of_Medicinal_Dye_Turmeric_and_Annatto_on_Silk_Fabrics_Using_Eco-friendly_Mordants)
- [28]. [https://www.researchgate.net/publication/348286278\\_Dyeing\\_of\\_textiles\\_with\\_natural\\_dyes](https://www.researchgate.net/publication/348286278_Dyeing_of_textiles_with_natural_dyes)
- [29]. doi: 10.5937/tekstind2004012J