



NATURAL DYES FROM TREES: AN ECO-FRIENDLY ALTERNATIVE

Manimaran V¹, K Aswitha² and K. Selvakumar³

¹Assistant Professor (Forestry), ²Assistant Professor (SS & AC) and ³Assistant Professor (Agronomy),

J.K.K.Munirajah College of Agricultural Science, T.N.Palayam, Erode, Tamil Nadu – 638 506

Corresponding Author Mail ID: manimaranfcri111@gmail.com

INTRODUCTION

India's rich biodiversity and ancient heritage in textile arts provide a unique platform for exploring natural dyes derived from trees. These natural dyes, extracted from various parts of trees such as bark, leaves, fruits, and roots, have been used for centuries in India to color fabrics. Their eco-friendliness, sustainability, and cultural significance make them a subject of renewed interest in the modern era.

HISTORICAL CONTEXT

India's history of dyeing textiles with natural dyes dates back to ancient civilizations. The traditional knowledge of extracting and using natural dyes was passed down through generations. Textiles colored with natural dyes have been discovered in archaeological sites, indicating their historical importance. The advent of synthetic dyes in the 19th century led to a decline in the use of natural dyes, but there has been resurgence in recent times due to growing environmental awareness and a preference for sustainable practices.



Figure 1. Usage of natural dyes for fabrics

CLASSIFICATION OF NATURAL DYES

Natural dyes from trees in India can be classified based on their source parts and chemical composition. The major categories include:

- Bark Dyes
- Leaf Dyes
- Fruit Dyes
- Root Dyes
- Gum and Resin Dyes

1. Bark Dyes

Bark dyes are derived from the outer covering of trees. The bark contains tannins and other pigments that impart color to textiles.

Mango (*Mangifera indica*): The bark of the mango tree produces a yellow to brown dye. It is rich in tannins and is used in combination with other mordants to achieve various shades.

Arjun (*Terminalia arjuna*): The bark of the Arjun tree yields a brown dye. It is used in traditional Ayurvedic medicines and also for dyeing cotton and silk.

2. Leaf Dyes

Leaf dyes are obtained from the leaves of trees. They often require a mordant to fix the dye to the fabric.

Indigo (*Indigofera tinctoria*): Although not a tree, indigo is worth mentioning for its significant role in Indian dyeing traditions. The

leaves of this plant produce a deep blue dye. The indigo dyeing process involves fermenting the leaves to extract the dye.

Eucalyptus (*Eucalyptus globulus*): The leaves of eucalyptus yield a range of colors from yellow to green depending on the mordant used.

3. Fruit Dyes

Fruit dyes are derived from the fruits or seeds of trees. These dyes are usually vibrant and have been used traditionally in various regions.

Harad (*Terminalia chebula*): The fruit of the Harad tree produces a yellow to black dye. It is rich in tannins and is used in both dyeing and traditional medicine.

Pomegranate (*Punica granatum*): The rind of the pomegranate fruit yields a yellow dye. It has been used in combination with iron mordants to produce darker shades.

4. Root Dyes

Root dyes are obtained from the roots of trees. These dyes often require extensive extraction processes.

Alkanet (*Alkanna tinctoria*): The roots of the alkanet tree produce a red to purple dye. It is used to dye wool and silk and is known for its vibrant color.

Madder (*Rubia cordifolia*): Madder root produces a range of red shades. It has been used since ancient times and is one of the most important natural dyes in India.

5. Gum and Resin Dyes

Gum and resin dyes are extracted from the exudates of trees. These are less common but still significant.

Frankincense (*Boswellia serrata*): The resin of frankincense can be used to produce a yellow dye. It is also valued for its aromatic properties.

Gum Arabic (*Acacia senegal*): The gum from Acacia trees can be used as a dye binder and also to produce pale yellow colors.

EXTRACTION AND DYEING PROCESS

The extraction of natural dyes from trees involves several steps, including harvesting, drying, and processing the dye source. The process varies depending on the part of the tree and the desired color.

Harvesting: The bark, leaves, fruits, roots, or gums are carefully collected from the tree. Sustainable harvesting practices ensure that the tree is not harmed.

Drying: The collected materials are dried to prevent decay and to concentrate the dye.

Processing: The dried materials are ground into powder or soaked in water to extract the dye. For some dyes, fermentation or boiling is required.

Mordanting: Fabrics are treated with mordants like alum, iron, or copper to fix the dye. Mordants also help in achieving different shades.

Dyeing: The fabric is soaked in the dye solution. The duration and temperature of dyeing vary based on the dye and fabric type.

Washing and Finishing: The dyed fabric is washed to remove excess dye and then dried. Sometimes, additional treatments are applied to enhance the color fastness.

ENVIRONMENTAL AND CULTURAL IMPACT

The use of natural dyes supports sustainable practices and reduces reliance on synthetic dyes, which often contain harmful chemicals.

Additionally, the revival of natural dyeing techniques helps preserve traditional crafts and supports local artisans.

In India, regions like Rajasthan, Gujarat, and Tamil Nadu have rich traditions of natural dyeing. Workshops and training programs are conducted to educate new generations about these techniques. The cultural heritage associated with natural dyes is celebrated through festivals, exhibitions, and fashion shows.

CONCLUSION

Natural dyes from trees in India represent a confluence of nature, tradition, and sustainable practices. They offer a viable alternative to synthetic dyes, contributing to environmental conservation and the preservation of cultural heritage. As the world moves towards more eco-friendly choices, the significance of natural dyes is likely to grow, bringing ancient wisdom into modern applications.