



## TREE BARKS AS A SOURCE OF NATURAL DYES FROM THE FORESTS OF MADHYA PRADESH

Ravi Upadhyay & Mahendra Singh Choudhary

Department of Botany, Government P. G. College, Pipariya district Hoshangabad, M. P.

### ABSTRACT

Natural Dyes are the coloring substance obtained from plant, animal or mineral resources. Majority of natural dyes have come from the plants. The present paper reports natural dyes obtained from various tree barks, which were fixed on cotton cloth after treating with mordents. The barks of 24 species of trees belonging to 20 genera and 17 families were found to be source of natural dyes from the forests of Madhya Pradesh.

**KEY WORDS:** Dyes, Plants, Mordents, Madhya Pradesh.

### INTRODUCTION

Color is one of the elements of nature that made the human life more aesthetic and fascinating in the world. Dye is word derived from the English word *Daeg* or *Daeh* meaning color. A dye can generally be described as a colored substance that has an affinity to the substrate to which it is being applied. Natural dyes are coloring substances obtained from natural sources like plants, animals and minerals. Trees are also one of the important sources of vegetable dyes, apart from timber. Several commercial natural dyes are obtained from trees, like red dye from Brazil wood (*Caesalpinia echinata Lam.*), brown dye from Catechu (*Acacia catechu L.*), yellow dye from Old fustic (*Malcura tinctoria (L) Steud.*) etc. The art of dyeing is as old as human civilization. From the historical records, it is learnt that natural colorants were available to people long back during Chinese and Greco-Roman periods. Dyes in Indian history appear in Vedic period in 'Atharva veda' where we find 'rang' for color and 'ranjak' for dye. The use of 'Maharanjana', 'Kampilaka', 'Haridra' as dyeing material and 'tuvari' (alum), 'tutta' (copper sulphate) and 'Kasis' (iron sulphate) as mordants (Roy, 1977). The use of natural dyeing materials is evident with the wall paintings of Ajanta, Ellora and Sithannvasal and they still demonstrate the efficacy of dyeing craft that had been inherited from ancient times in India. Natural dyes have been used since ancient times for coloring and printing fabrics. So it is a fundamental requirement that colored textile should withstand the conditions encountered during processing following coloration and

during their subsequent useful life (Gulrajani *et al.*, 2001). Dye yielding plants are matter of study in the recent past. (Gokhle *et al.*, 2004, Shiva 2007, Garg *et al.*, 2010, Choudhary and Upadhyay 2011, Saravanan *et al.*, 2012, Choudhary *et al.*, 2012). Present work is undertaken to study the dyes yielding plants of Madhya Pradesh. The present paper provides an account some forest trees as a source of dye and the color fixed on cloth after treating with mordents.

### MATERIALS & METHODS

Barks from more than 50 species of trees were collected from the forests of Vindhya and Satpura hills of Madhya Pradesh. Some information on traditional methods of dye making was gathered from the local and tribal people. The mordents traditionally used in dyeing fabric were used in the present study. The barks of the trees were collected and dried under shade. These barks were boiled in water along with various mordant like, Alum, Ferrous Sulphate, tin and Copper Sulphate. The mercerized cotton cloth was dipped in boiling dye solution and kept in it for 15 to 20 minutes. The cloth is dried and washed with the detergent to remove the unfixed color. The color fixed on cloth after repeated washing is the fixed dye. The voucher specimens of the trees were collected and deposited in the Herbarium of Botany department of Narmada College, Hoshangabad. The plants were identified using local herbarium of college and flora of Delhi, Maheshwari (1963) and the Flora of Madhya Pradesh, Verma *et al.* (1993).

**OBSERVATION**

The color of dye fixed on cloth after repeated washing were observed and shown in table no.1

**TABLE 1.** Dyes fixed on cloth from barks of trees

S.No	Botanical Name	Vernacular name	Family	Mordents	Color fixed
1	<i>Acacia leucophloea</i> (Roxb.)	Rimjha, Safed Kikar	Mimosaceae	Alum	Brown
2	<i>Acacia nilotica</i> (L.)	Babul, Kikar	Mimosaceae	Alum	Pink
3	<i>Bauhinia purpurea</i> Linn.	Kachnar	Caesalpinaceae	Alum	Red
4	<i>Buchanania lanzan</i> (Roxb.)	Achar, Chironji	Anacardiaceae	Alum	Red
5	<i>Casurina equisetifolia</i> Forst.	Pharas	Casurinaceae	Alum	Light red
6	<i>Chloroxylon swietenia</i> DC	Bhirra, Giriya	Flindersiaceae	Alum	Yellow
7	<i>Cordia dichotoma</i> forst.	Lasora	Boraginaceae	Alum	Red
8	<i>Diospyros melanoxylon</i> Roxb.	Tendu	Ebenaceae	Alum	Pink
9	<i>Ficus racemosa</i> Linn.	Gular	Moraceae	Alum	Red
10	<i>Ficus retusa</i> (Linn.)	Fefer	Moraceae	Alum	Light Pink
11	<i>Lannea coromandelica</i> (Houtt.)	Gurjan	Anacardiaceae	Tin	Light Red
12	<i>Mangifera indica</i> L.	Aam	Anacardiaceae	Alum	Light yellow
13	<i>Manilkara hexandra</i> (Roxb.)	Khirmi	Sapotaceae	Copper sulphate	Pink
14	<i>Morinda citrifolia</i> L.	Ole	Rubiaceae	Copper sulphate	Red
15	<i>Murraya koenigii</i> (Linn.)	Mitha neem	Rutaceae	Ferrous sulfate	Blue
16	<i>Pithecolobium dulce</i> (Roxb.)	Vilayati imli	Fabaceae	Calcium carbonate	Light Pink
17	<i>Pterocarpus marsupium</i> Roxb.	Beeja	Fabaceae	Alum	Red
18	<i>Randia dumetorum</i> (Roxb.)	Menhar	Rubiaceae	Alum	Pink
19	<i>Syzygium cumini</i> (L.)	Jamun	Myrtaceae	Ferrous sulfate	Brownish pink
20	<i>Syzygium heyneana</i> (Dathie) wall.	Khat-jamun	Myrtaceae	Ferrous sulfate	Dark Blue
21	<i>Terminalia arjuna</i> L	Kahua,	Combretaceae	Alum	Light brown
22	<i>Terminalia bellirica</i> (Gaertn.)	Bahera	Combretaceae	Alum	Brown
23	<i>Ventilago denticulata</i> Willd	Kevti	Rhamnaceae	Alum	Red
24	<i>Wrightia tinctoria</i> (Roxb.)	Dudhi	Apocynaceae	Copper sulphate	Pumice

**RESULT & DISCUSSION**

Madhya Pradesh is one of the floristically rich regions in Central India and has rich biodiversity. The rich diversity provides raw material for various products including natural dyes. In the present study dyes were obtained from barks of 24 tree species belonging to 20 genera and 17 families. Anacardiaceae, Combretaceae, Fabaceae, Mimosaceae, Moraceae, Myrtaceae, Rubiaceae had 2 species while other families have one species each. Some of the trees are commercially exploited for the dyes like, *Wrightia tinctoria*, *Morinda citrifolia*, *Bauhinia purpurea*, *Acacia nilotica* and *Terminalia bellerica* While the rest are not known for dyes. The barks of these trees can be a potential resource for obtaining natural dyes. Today people prefer natural dyes over synthetic dyes due to their non toxic properties low pollution and less side effect. A substance, which is resistance to light, water and soap, is a fundamental requirement that colored textile should withstand the conditions encountered during processing following coloration and during their subsequent useful life (Gulrajani *et al.*, 2001). Natural dyes work best with natural fibers such as cotton, linen, wool silk, jute, and sisal (Gulrajani *et al.*, 1992). Development of better technology for extraction of the natural dyes can help in sustainable utilization of the natural resource. Commercialization of dyes can be successful in the region with systematic and scientific approach for identification of resources, extraction, purification, chemical structure elucidation and promotion of use of dyes, thereby enhancing the economy of the local people.

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