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REVIEW ARTICLE.....!!!

## NATURAL DYES: TRADITIONAL INDIGENOUS KNOWLEDGE FROM MAHARASHTRA, INDIA

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### ABSTRACT

Traditional use of natural dyes in India is known since ages. Natural dyes find use in the coloring of textiles, food, drugs, cosmetics, etc. In India, there are several plants which can yield dyes. In addition to their dye yielding distinctiveness, some of these plants also possess medicinal value. Although indigenous knowledge system has been practiced over the years in the past, the use of natural dyes has diminished over generations due to lack of documentation. Also there is not much information available on databases of either dye yielding plants or their products. In the present communication 47 plants or parts of them which are utilized as a natural colorant have been recorded from Maharashtra. Of these, the families which show maximum species possess colors are, Fabaceae and Caesalpiniaceae are found to be most dominant with (6 species each) followed by Asteraceae, Mimosaceae and Anacardiaceae (4 species each). While families Malvaceae, Lythraceae and Rubiaceae (3 species each) two species of Euphorbiaceae are used and remaining families have one species in dye preparation.

**INTRODUCTION:**

Natural dyes are colorants obtained from natural resources, used in textiles industries, for colouring of crafts, in cosmetics, etc. A variety of attractive natural colours ranging from yellow to black exists in the nature. These colours are exhibited by various organic and inorganic molecules and their combinations become visible due to the absorption of light in the visible region of 400-800 nm (Chengaiyah, 2010). Plants can be looked upon as ideal sources of safe dyes. They have an edge over synthetic dyes, which are harmful in many respects. Synthetic dyes, though used extensively in the modern era, have carcinogenic and allergenic effects. Likewise they remain in the environment for a long time and are not easily degradable. While majority of the natural dyes are eco-friendly and have no hazardous effect on the biosphere. Such natural dyes are being utilized for generation in crude forms. The pure dye, once isolated can find many applications, in food, cosmetics, textile, drug, paper/pulp and many other industries which need non-allergenic and biodegradable dyes.

Use of plants for different purposes like food, medicine, cosmetics, etc. is known in India since 'Vedic' times. Indian sub-continent is one of the richest sources of biodiversity. It is rich in biodiversity as regards to the health of biosphere in general and to agriculture, animal husbandry, fisheries, forestry and pharmaceutical industry in particular. It is supported by equally rich cultural diversity, indigenous systems of medicines and knowledge and wisdom of indigenous people, and is backed by reasonably sound scientific and technological base. Use of colorants obtained from natural resources is known since ages. For sake of example, since the ancient times in India, traditionally 'Holi' was played with flowers petals or with natural colors obtained from different plant parts, (Dubey, 2007). This vast treasure of vegetation and knowledge needs to be reinvestigated with the help of modern scientific method. In the present era, when developed countries are again returning back to nature to obtain various products, natural dyes have potential significances as they are used in many form by the society. The study can reveal many consequences to create several colour shades. However, in spite of the very rich biodiversity in country, plants remained largely unexplored from the point of utilizing natural dyes for value added products in the food, cosmetic, textile, drug and many other industries.

Some noteworthy works throughout the world on natural food colorants, dye stuff, natural cosmetic colours have been done by Wright, (1963); Anonymous,(1948-76); Baryanyovits, (1978); Schweppe, & Roosen-Runge, (1979); Lloyd, (1980); McLaren, (1983); Watt, (1889-1893); Marmion, (1984); Nishizawa, *et al.* (1985); Wouters, (1985); Schwing & Wechsler, (1986); Kashino, (1986); Sinha (1987); Kashino, *et al.* (1990); Verhecken, (1990); Ziderman, (1990); Francis, (1992); Henry, (1992); Yamada, (1993); Devi (1995); Ghosh (2003); Sampath Kumar & Rao (2003). Mohanta, &

Tiwari, (2005) ; Sharma *et al.*, (2005); Siva, (2007); Dubey, (2007); Das & Mondal, (2008); Das, *et al.* (2011); Das and Mondal. (2012).

**METHODS OF SURVEY:** For documentation of ethnobotanical information several tours were undertaken during the period 2009 - 2013. Data presented here is based on personal observations and interviews with the knowledgeable people and for collection and processing of plants Plant identification was done by using the flora (Singh *et al* 2000 & 2001).

#### ENUMERATION:

The present ethnobotanical explorations conducted in different parts of Maharashtra and resulted in the traditional plant uses of 47 plants species belonging to 21 families. Following Table includes botanical name of species, family, plant part used, colour of the dye obtained and possible applications.

SR. NO.	PLANT NAME	FAMILY	PART USED	COLOUR	REMARKS
1.	<i>Acacia catechu</i> (L.f.) Willd.	Mimosaceae	Bk	Brown/black	Dying ropes, fishing nets
2.	<i>Acacia nilotica</i> (L.) Willd. ex Del. Ssp <i>indica</i> (Bth.) Brenan	Mimosaceae	Bk, pod without sd	Brown/black	Dying silk, cotton and as inks
3.	<i>Adenantha pavonina</i> L.	Mimosaceae	Red heartwood, kernels	Pale yellow, reddish	Dying fabrics
4.	<i>Aegle marmelos</i> (L.) Corr.	Rutaceae	Fr rind	Yellow	Varnish for pictures
5.	<i>Albizia lebbeck</i> (L.) Bth.	Mimosaceae	Bk	Brown/black	Colouring fishing nets
6.	<i>Anacardium occidentale</i> L.	Anacardiaceae	Nuts	Black	Confectionaries
7.	<i>Bauhinia vahli</i> Wight & Arn.	Caesalpiniaceae	Bk	Brown/black	Colouring ropes
8.	<i>Bidens biternata</i> (Lour.) Merr. & Sherff.	Asteraceae	St&Fl	Yellow-orange	Wool, cotton
9.	<i>Bixa orellana</i> L.	Bixaceae	Sd, Bk	Yellow, orange, reddish	Dying silk, cotton Food colour
10.	<i>Buchanania cochinchinensis</i>	Anacardiaceae	Gum	Brown/Bl	Dying

	(Lour.) Almeida			ack	
11.	<i>Butea monosperma</i> (Lam.) Taub.	Fabaceae	Flower, Tree, Gum	Yellow, yellowish orange	Textile, food industry for colouring
12.	<i>Caesalpinia sappan</i> L.	Caesalpiniaceae	Heartwood, Bk, Pods	Red	Colouring of ropes, dyeing fishing nets, textile, paper industry
13.	<i>Capsicum annum</i> L.	Solanaceae	Fr	Red-orange	Food industry
14.	<i>Carthamus tinctorius</i> L.	Asteraceae	Dried floret	Yellow, crimson red.	Colouring Food, textile.
15.	<i>Cassia fistula</i> L.	Caesalpiniaceae	Bk	Reddish	Tanning
16.	<i>Cassia tora</i> L.	Caesalpiniaceae	Seed	Blue	Fabrics Silk
17.	<i>Cassine glauca</i> (Rottb.) O. Ktze.	Celastraceae	Bk	Red	Cloth dyeing
18.	<i>Catunaregam spinosa</i> (Thunb.) Tirveng.	Rubiaceae	Fr	Yellow	In calico printing
19.	<i>Clitoria ternatea</i> L.	Fabaceae	Petals	Blue	
20.	<i>Cocos nucifera</i> L.	Arecaceae	Coir	Dark brown	Dyeing ropes
21.	<i>Crocus sativus</i> L.	Iridaceae	Dried stigmas, styles, petals	Yellow	Colouring Food, medicine
22.	<i>Curcuma longa</i> L.	Zingiberaceae	Rhizomes	Yellow	Colouring Food
23.	<i>Dalbergia latifolia</i> Roxb.	Fabaceae	Bk	Brown/Black	Dyeing & calico printing
24.	<i>Delonix regia</i> (Boj. ex Hook.) Raf.	Caesalpiniaceae	Gum	Black/Brown	Food industry
25.	<i>Eclipta prostrata</i> (L.) L.	Asteraceae	Sd, Lf	Black	Hair dyeing

26.	<i>Emblica officinalis</i> Gaertn.	Euphorbiaceae	Fr, Bk	Grey, Brown, Black	Inks, dying cotton
27.	<i>Hedyotis puberula</i> (G. Don) Arn.	Rubiaceae	Rt, Lf	Red	Textile dyeing
28.	<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Fl	Black	To blacken shoes, hair & eyebrows
29.	<i>Indigofera tinctoria</i> L.	Fabaceae	Lf, Twigs	Blue	Dyeing wood, silk, cotton, in pharmaceutical industry
30.	<i>Lagerstroemia parviflora</i> Roxb.	Lythraceae	Lf, Stem, Bk	Golden brown to black	--
31.	<i>Lawsonia inermis</i> L.	Lythraceae	Bk, Lf	Brown	Colouring palms of hands, soles, nails, dye for hair
32.	<i>Mallotus philippinensis</i> (Lam.) Muell.-Arg.	Euphorbiaceae	Sd, Fr hair	Yellow, orange, red	Food colourant, paints, varnishes, hair fixers
33.	<i>Mangifera indica</i> L.	Anacardiaceae	Bark, Lf	Yellow, brown	Colouring pottery
34.	<i>Medicago sativa</i> L.	Fabaceae	Sd	Yellow	Silk, cotton, wool
35.	<i>Morinda citrifolia</i> L.	Rubiaceae	Bk, sap	Black	Dyeing cotton, yarn, cloth
36.	<i>Nyctanthes arbor-tristis</i> L.	Oleaceae	Fl	Yellow	In medicine
37.	<i>Peltophorum pterocarpum</i> (DC.) Baker ex K. Heyne	Caesalpiniaceae	Bk, wood, Lf	Brown/black	For batik
38.	<i>Pongamia pinnata</i> (L.) Pierre	Fabaceae	Sd, Fl	Brown	For dressing leathers
39.	<i>Semecarpus anacardium</i> L. f.	Anacardiaceae	Bk	Grey, Black	--

40.	<i>Shorea robusta</i> Roxb. ex Gaertn f.	Dipterocarpaceae	Bk	Red/black	Tanning leather,paper
41.	<i>Tagetes erecta</i> L.	Asteraceae	Fl	Yellow	Food colourant
42.	<i>Terminalia bellirica</i> (Gaertn.) Roxb.	Combretaceae	Fr	Yellow-brown,khaki	Dying,matting
43.	<i>Terminalia catappa</i> L.	Combretaceae	Bk, Lf	Yellow,brown,grey	For matting
44.	<i>Terminalia chebula</i> Retz.	Combretaceae	Fr, Bk	Yellow-brown,grey, black	Inks
45.	<i>Trema orientalis</i> (L.) Bl.	Ulmaceae	Bk	Brown	Dying fishing nets
46.	<i>Woodfordia fruticosa</i> (L.) Kurz.	Lythraceae	Fl, Bk,Lf	Pink-red, brown	Tanning leathers
47.	<i>Wrightia tinctoria</i> R. Br.	Apocynaceae	Lf, Twigs	Blue	Substitute for indigo

### CONCLUSION:

Indigenous people possess knowledge of natural colorants and it has been developed through trial and error. Unfortunately, the wealth of this knowledge is vanishing fast due to the availability of cheap chemically dye. The indigenous knowledge regarding natural colorants is particularly connected with extraction and processing of natural dyes from plants.

Dyes are produced from plant parts like, root, rhizome, stem, bark, leaf, fruit, flower, seed or whole plant, even in few cases resin or gum. 47 species belonging to 21 families have been recorded in the present work. Fabaceae and Caesalpiniaceae are found to be most dominant with six species each followed by Asteraceae, Mimosaceae and Anacardiaceae with threes pecies each. While families Malvaceae, Lythraceae and Rubiaceae three species each. Two species of Euphorbiaceae are used and remaining families have one species in dye preparation.

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