

## **NATIONAL FAIR WINNER, BEST TEAM PROJECT – MUMBAI NATIONAL FAIR**

### **Application of Eco-Friendly Natural Dyes on Natural Fibres**

Shraddha Mangesh Teli & Srushti Mukesh Shah.

J.B. Vachha High School, Mumbai

There is need to substitute hazardous and carcinogenic synthetic dyes by Eco-friendly natural dyes so that the garments made of these fabrics are acceptable by domestic or international consumers. India has a lot of natural resources.

In the present work an attempt is made to substitute banned hazardous synthetic dyes by eco-friendly natural dyes such as Madder, Turmeric, Indigo, Lac, Myrobolan, Catechu, Henna, etc in dyeing of Natural fibres. The age old tedious and very slow process taking around a week is replaced by more scientific and faster method capable of these dyes using organic and metallic mordants.

The aqueous extracts of above mentioned natural dyes and waste materials were applied using Harda (Myrobolan), Tannic Acid,  $\text{CuSO}_4$ ,  $\text{Fe SO}_4$ , Potash Alum mordants and dyeing methods was highly simplified and shortened (2 hours per lot).

Increase in concentration of mordants as well as dye, enhanced depth of dyeing (K/S values) and their performance properties such as fastness to washing, rubbing, perspiration and light were quite satisfactory. In general cellulosic fibres (cotton and jute) gave lighter shades than proteinic fibres (wool and silk). Wool gave deepest shade of all the fibres.

Normally wool and silk are prone to attack by microorganism  $\text{CuSO}_4$  that is used as a preservative in gums initiated to us test wool samples dyed using  $\text{SO}_4$  as mordant for anti-bacterial properties. The same was found to be present in it.

Knitted cotton gave higher depth than woven cottons. Final hue and depth of dyeing depended on dye-mordant-fibre system. Problem of lot-to-lot variation of shades was successfully tackled by using calibration curves based on optical density of dye extract.

Help yourself natural dyeing kit and leaflets were also prepared to create awareness among the rural masses to initiate self-employment among them. This simple technology has very good application potential in strengthening rural economy.