# CHAPTER III

# METHODOLOGY

Considering the modern trend in favour of a switch over to use natural dyestuff, it is a high time to exploit natural resources of plant material for dyeing and printing.

A combination of mordants and plant materials can go long way to serve as an effective substitute for synthetic dyestuff. The health hazard posed by using synthetic dyes and chemicals is great cause of concern. Vegetable dyes are eco-friendly in nature and more popular among various groups of people. There is heavy demand for natural dyes and growing popular interest in metropolitan cities in India and abroad.

Considering the importance and objectives the experimental procedure was designed.

## EXPERIMENTAL MATERIALS:

### A. DYE MATERIAL:

Marigold flowers are extensively used in marriages, pujas and many other auspicious occasions. The research team had collected the used flowers thrown after pujas and marriages. (Fig: 3.1).

### B. FABRIC:

Hundred percent grey cotton and natural mulberry silk being natural fibres are biodegradable

Marigold Flower

Marigold flower petals

Extracted sample of dye

**Fig: 3.1. Raw materials used in the study**

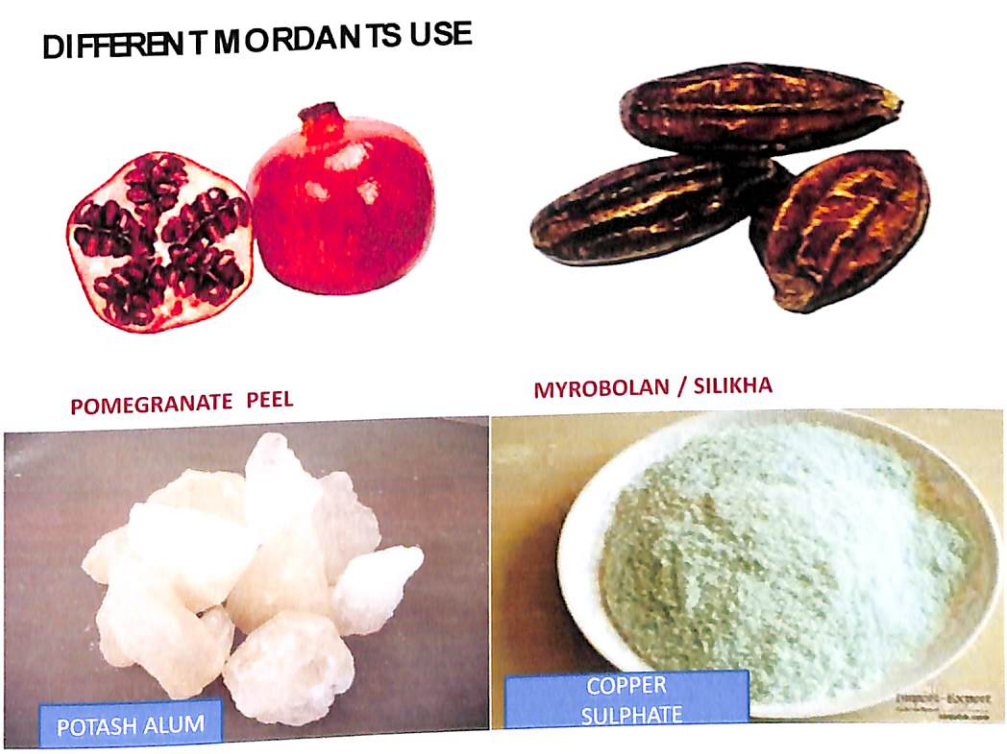


**Fig: 3.2. Different mordants**

## ii. Extraction of the dye:

At first the marigold flowers were collected and dried. Then dye was extracted from the marigold flowers by boiling 20g in 1 litre of distilled water for 1 hour.

## iii. Chemical nature of the Dye extract:

The pH of the aqueous extract was determined with a pH meter and found to be 5 which reveal acidic nature of the dye.

## iv. Dyeing and Mordanting:

The two fabrics, cotton and mulberry silk were treated with different mordants ( *Punica granatum*, myrobolan, potash alum and Copper sulphate). Three conventional processes of mordanting were used- pre-mordanting, simultaneous mordanting and post- mordanting (Fig: 3.3). After dyeing, the dyed sample were washed with distilled water and dried at room temperature ( Kulkarni et. al. 2011;Pruthi et.al., 2008; Jothi, 2008; Ghoreishian et.al. 2013)[5,6,7,8].

Dyeing on non-mordanted cotton and silk fabrics were also done to get the controlled sample for comparison of colour differences with the mordanted samples.

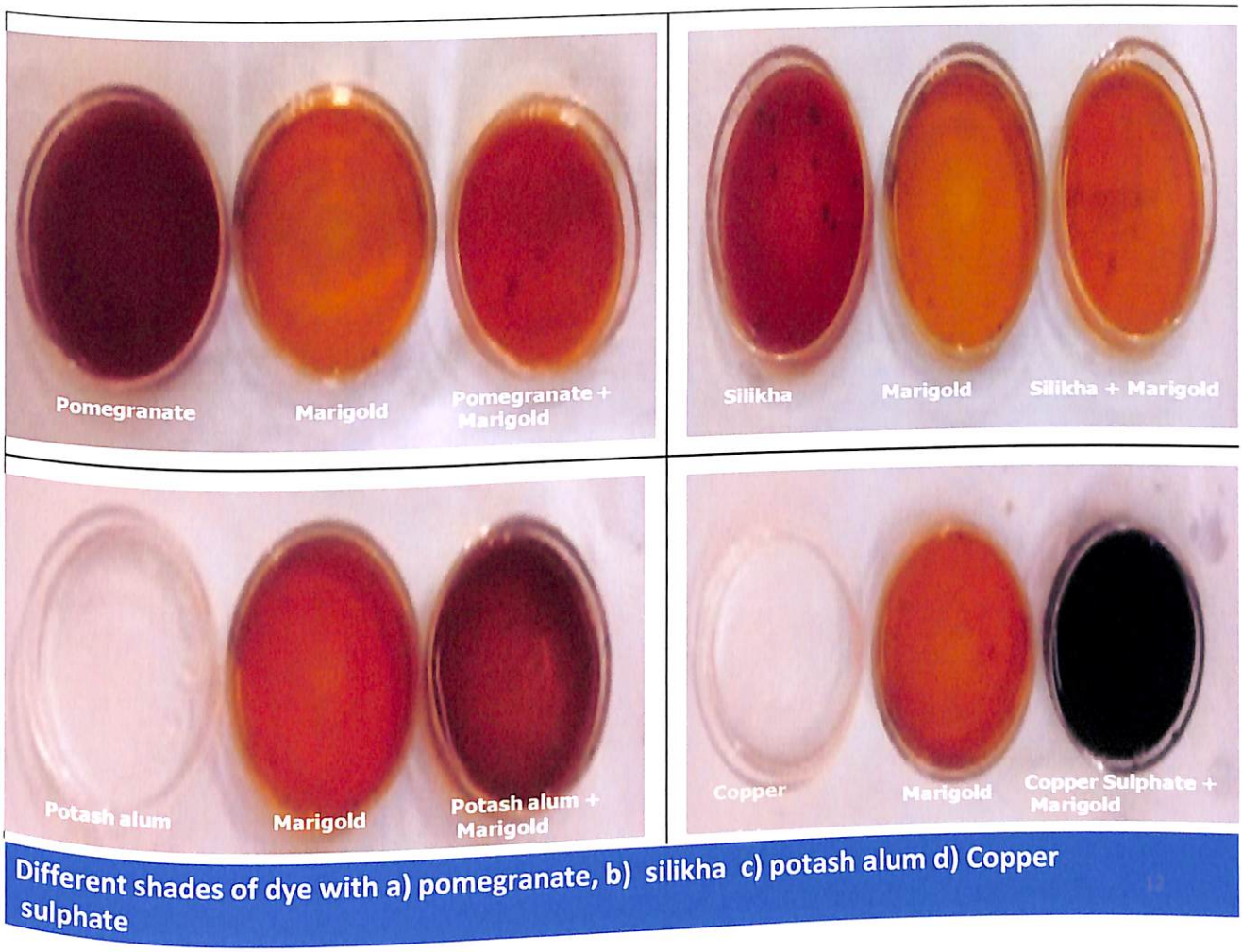


**Fig:3.3. Different shades of dyes**

## v. Fastness Testing

The dyed samples were tested for light fastness and wash fastness. Light fastness was analyzed by exposing the dyed fabric to direct sunlight for 24 hrs. The wash fastness was carried out by washing the dyed samples with non-ionic detergent (1g/lt).