CHAPTER V

SUMMARY AND CONCLUSION

Colour is a vital and vibrant ingredient of our existence, and is one of the elements of nature that made the human living more aesthetic and fascinating in the world. An urge in human beings to experiment resulted in producing beautiful colours from certain plants and animal extracts. It is evident from the history of various civilizations that the use of natural dyes for various purposes like dyeing, printing and painting was a common practice since prehistoric period. The tradition continued till the discovery of Perkin's purple in 1856, which marked the beginning of endless synthesis of dyes. At the same time natural dyeing techniques were suffering from lack of further experimentation and openness of the persons engaged in the dyeing industry. On the other hand synthetic dyes were easier to obtain, were brighter and companies were not at all secretive about the techniques of using the dye. This inevitably resulted in steady decline of natural dyes. After independence, one of the policies of the Government of India was the revival and development of dyeing and printing with natural dyes was covered under priorities.

Natural dyes were of animal, vegetable and mineral origin. The greatest source of dyes has been the plant kingdom, notably roots, berries, barks, leaves and wood, but only a few have been used on a commercial scale. These dyes are a class of colorants extracted from vegetative matters and animal residues. Most of the natural dyes are mordant dye as they require the inclusion of one or more metallic salts or natural mordants like myrobolan (*silikha*) for ensuring reasonable fastness of the colour to

sunlight and washing. Metal ions of inorganic mordants act as electron acceptor for electron donors to form coordination bonds with the dye molecule, making them insoluble in water (Mongkholrattanasit et.al., 2011)[4]. Mode of chemical interaction of natural dye from marigold flower and organic mordant like pomegranate*(Punica granatum)* and *silikha* extract is under study.

The present study was designed in consideration of the following objectives.

1. to study the effect of natural dyes extracted from marigold flowers applied on cotton and silk fabric
2. to identify the suitable method to overcome poor colour fastness properties
3. to study the effect of combination of different natural extracts for shade variation

Considering the objectives of the study an experimental method was adopted and was conducted in the textile laboratory of the Dept. Of Home Science. Marigold flowers which were thrown after using in Pujas and marriages were collected. Aqueous extract of *(Punica granatum),* Myrobolan (*Terminatia chebula*), AR grade potassium alum and Copper sulphate were used as mordants.

The salient findings of the study are:

1. When mulberry silk and cotton fabric were dyed with the natural dye, different colour tones were obtained
2. Depending on the mordant and the process used for mordanting various shades were derived.

3. The overall observation is that the fabrics dyed with marigold flower extract gave different shades of brass with *Punica granatum*,(mordant).
4. A golden brown was observed with myrobolan as a mordant
5. A bright gold with potash alum and fern green with Copper sulphate was found.
6. It was found that mordants play very important role in imparting colour to the fabric. Better colour strengths are dependent on the metal salt used
7. It was noticed that silk samples had acquired darker shades than that of cotton. This is in full agreement with the chemical structures of these examined samples. This finding may be attributed to the high polarity of silk in comparison to cotton.
8. Moreover, the silk fabric has high porosity than that of cotton fabric.
9. The marigold dye is found to be acidic (pH 5) in nature which dyes the protein fibre silk efficiently
10. It has low affinity towards the cellulose fibre cotton. Silk protein fibres have electrostatic attractive forces between the molecules of side chains having positive charges and the dye molecules may have negative charges. Whereas in the case of cotton fibre chains the nature of attraction is through van der Waals linkages with weak hydrogen bonding. These bonds are responsible for the adsorption in cotton dyeing leading to lower dye-ability of cotton samples than silk samples at the same dye concentration.
11. Among the three methods of mordanting, the simultaneous mordanting technique gave best results.
12. Good light fastness was observed in fabrics dyed with natural marigold dyes.

13. Wash fastness of the dye is influenced by the rate of diffusion of the dye and state of the dye inside the fibre. The fabrics dyed with marigold dye showed moderate wash fastness.

CONCLUSION

The whole process of extraction and dyeing is ecologically safe. The present work emphasizes the scope of using dry marigold flowers as source of natural dyes for obtaining various colour shades. It also looks at the use of organic mordants like pomegranate and silikha extracts for eco-friendly textile dyeing. There is need for proper knowledge, documentation and assessment of dye-yielding plants as well as the dyeing techniques so as to increase the use of natural dyes.

RECOMMENDATION

1. A campaign on awareness among the masses regarding eco-friendly dyes can be conducted.
2. Training can be given for skill development to raise more and more entrepreneurs in Assam.
3. Fashionable garments can be constructed with the eco-friendly dyed fabric to raise its popularity among the new generation.
4. An attempt was made here to design stoles using different mordants on marigold dyed silk fabric.