CHAPTER 1

INTRODUCTION

1.1 GENERAL

Natural dyes have been used as a means of coloring textiles for centuries. For thousands of years natural colors have been derived from stems, leaves, barks, woods, berries and flowers of various plants and trees as well as from certain insects and shell fish natural colors have been derived. Most of the natural dyes are less substantive which means that they have limited coloring capacity by themselves and require the aid of mordants to penetrate (Lokhande et al 1998).

Before the sixteenth century, dyers were largely dependent on dyestuff, which could be grown in, or were indigenous to Europe and similar temperate regions. Between 1550 and 1850 only the so called natural dyestuffs were available (Jill Goodwin 1982).

There is a significant trend towards quality and longer lasting products. Another very significant and lasting trend in the market for textile in many countries is the increasing environment and health concerns of a fast growing number of consumers (Glover 1993).

In recent years a considerable amount of interest has been generated for the use of natural dyes (Jill Goodwin 1982). The world is becoming increasingly aware of environmental issues, such as Green house effect, Ozone layer depletion, Water pollution and Waste disposal problems.
This has led to the desire to turn to a traditional and more natural way of life with a belief that “All natural things are good for life on the earth”. In this trend, there is now an ever increasing lobby for using natural coloring matters for textile substrates both natural and synthetic (Klus Schatz 2001).

The continuing population explosion and the worsening environmental pollution makes it necessary for the health and hygiene qualities of consumer products. The problems caused by pathogenic microorganisms of bacteria, mold and fungi cause infection, lung-related disease and degradation of textile substrate. The synthetic dyes which produce a wide variety of colors also produce toxic wastes which are hazardous to mankind (Deo 2003, Leian 2003).

The environment friendly natural dyes are enjoying resurgence in popularity as a result of concerns with the carcinogenic, mutagenic and sensitizing characteristics of synthetic dyes (Paul et al 2003). Growing awareness about risk to health and damages to the environment has been noticed in the last few years and particularly in past one decade all over the world. This has necessitated eco-friendly approaches in production of articles in use in day-to-day life. Environmental considerations are now becoming vital factors during the selection of consumer goods including textiles all over the world. India’s textile industries have shown a remarkable dynamism in terms of growth and export performance of natural dyes (Cautisicos 2006).

Generally the properties of natural dyed materials can be improved by the application of dyes and assisting agents with prior modifications as pre, post and simultaneous mordanting techniques with suitable chemicals / natural sources / enzymes. Many treatments have been developed as after treatments too over the years for natural dyeing techniques in order to increase its efficiency. However the literature review revealed a void in research in natural dyes particularly from fruit sources and their application
techniques to improve the natural dyeing properties. It is believed that if proper pre and post treatments for the application method are given, then the properties and their functional effects will be improved, which is the main purpose of this doctoral thesis.

In agreement with the objectives defined for the present thesis, the first part contains the general introduction corresponding to textile wet processing field with reference to eco-friendly natural dyeing. The second part contains a brief bibliographic revision of the topics related to natural dyeing and use of pre, post and simultaneous treatments for the improvement of shades and functional property of natural dyes and dyeing materials. The experimental plan for carrying out the research work comes as the third chapter next to literature survey. The last chapter presents the major results attained in the scope of this thesis with a general discussion and the major conclusion.

Thus, the organization of this thesis comprehends five major parts:

First part – Introduction: This part contains about general introduction to natural dyes and the aim of the work – Chapter 1.

Second part – Literature review: This chapter contains the main theme of the thesis with the literature survey and reported experimental techniques – Chapter 2.

Third part – Experimental plan: This chapter contains the experimental procedure of the main thesis work – Chapter 3.

Fourth part – Results and Discussions: This chapter contains the results obtained and the respective discussions – Chapter 4.
Fifth part – Conclusions – This chapter states the final conclusions arrived from the previous chapters – Chapter 5.

1.2 OBJECTIVES OF THE WORK

The research work was proposed for the following objectives.

- To study the effect of natural dyes extracted from fruit waste applied on cotton, silk and wool fabrics.
- To identify the suitable method that overcomes poor color fastness properties and to improve the color depth.
- To study the effect of combination regarding shade variation.
- To impart functional property such as antimicrobial property by combining few other natural sources.
- To standardize the suitable application method and the procedure of natural dyeing on cotton, silk and wool fabrics.