# ECO PRINTING OF COTTON FABRIC USING COLOURANTS FROM NATURAL PLANTS

### WAN NOOR IZZATIE BINTI WAN YAHAYA

Final Year Project Report Submitted in Partial Fulfilment of the Requirements for the Degree of Bachelor of Sciences (Hons.) Textile Technology in the Faculty of Applied Sciences Universiti Teknologi MARA

#### JULY 2017

#### ACKNOWLEDGEMENTS

Upon completion of this project, I would like to express my gratitude to many parties. First and foremost, I wish to express my sincere, appreciation to my supervisor, Associate Professor Dr Khadijah Binti Omar, for her encouragement, critics and motivation. Without support and interest from her, this final research report would not have been the same as presented here.

I also would like to extend my words of appreciation to all of those who supported me in any respect during the completion of the report.

To all my friends and my course mate, thanks for helping me through the difficult time. Last but not least to my family members, I can never thank you enough for loving and supporting me throughout my study. May God bless you all, thank you again from my deepest heart.

Wan Noor Izzatie Bt Wan Yahaya

## TABLE OF CONTENTS

Contents	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES LIST OF FIGURES ABSTRACT ABSTRAK	vii
	viii
	ix
	X
CHAPTER 1 – INTRODUCTION	
1.1 Overview	1
1.2 Background of research	2
1.2 Problems statement	3
1.3 Objective of research	4
1.4 Significance of research	4
1.5 Scope and limitations	5
CHAPTER 2 – LITERATURE REVIEW	
2.1 Natural dyes	7
2.1.1 Art in the making of natural dyes history	.8
2.2 Synthetic dyes	9
2.2.1 Advantages of using synthetic dyes	10
2.2.2 Disadvantages of using synthetic dyes	11
a) Hazardous waste generation	11
b) Environmental unfriendly	11
c) Increase in cost of feedstock or energy	11
2.3 Natural colourants from plants	12
2.3.1 Red Cabbage	13

2.3.2 Hibiscus	14
2.3.3 Bougainvillea	15
2.4 Textile Printing	16
2.4.1 Conventional textile printing	16
2.4.2 Eco printing process	17
2.5 Mordants	18
2.5.1 Types of mordants	19
2.5.2 Tamarind as natural mordant	19
2.6 Cotton fabric	21
2.6.1 Printing of cotton fabric	22

## **CHAPTER 3 – METHODOLOGY**

3.1 Materials	24
3.1.1 Fabrics	24
3.1.2 Natural colourants	24
3.1.3 Mordant	25
3.1.4 Apparatus/Equipment	25
3.2 Method	26
3.2.1 Preparation of the cotton fabric	27
3.2.2 Pre-mordanting process	27
3.2.3 Eco printing process	27
3.2.4 Evaluation of eco printing process	28
a) Printing effect	28
b) Colourfastness testing	29
Colourfastness to washing	29
Colourfastness to crocking/rubbing	30
Colourfastness to perspiration	31

#### ABSTRACT

## ECO PRINTING OF COTTON FABRIC USING COLOURANTS FROM NATURAL PLANTS

Natural colourants from plants such as red cabbage, hibiscus and bougainvillea were printed on 100 % cotton fabrics. The use of natural colourants in dyeing has been highlighted in many researches. However, the potential of using natural dyes in printing has not been mainly covered. In this study, red cabbage, hibiscus and bougainvillea were selected as the natural dyes sources. The natural colourants were arranged on cotton fabrics to create designs and later steamed to impart the designs on the fabric. Different steaming times were used and the fabrics then analysed and evaluated for the printing effects and colourfastness properties. The process was repeated using different steaming time and mordanted cotton fabric. It was found that the prints obtained on the cotton fabric were unclear, with no sharp outlines and smeared. The colour of prints obtained is quite deep for un-mordanted and mordanted fabric. Incubation time has no effect on the quality of the print and colourfastness properties. Similarity addition of mordant also did not have any effect on the prints obtained and colourfastness properties. The eco printed fabric has poor colourfastness to washing, crocking and perspiration for un-mordanted and mordanted fabrics.