

**THE CHEMICAL COMPOSITION OF *ALOE VERA* PEEL**

**NURUL IZZATI BINTI MOHAMED**

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

**JANUARY 2016**

## **ACKNOWLEDGEMENT**

First of all, I do like to thank Allah S.W.T and His messenger, Prophet Muhammad S.A.W because with His permission, I have finished my final year project successfully. I owe a great many thanks to a great many people who helped and supported me during doing this thesis especially my parents and family for their love and encouragement.

My deepest thanks to my supervisor, Mr. Shaari bin Daud. I am extremely grateful and indebted to him for his sincere and valuable guidance and encouragement extended to me. I would also like to thank the lab assistants of Faculty of Applied Sciences especially to Mr. Mohd Fauzi Bin Idrus and Hj Nik Mohd Zamani bin Nik Ismail for their help and encouragement. I would also like to thank my friends Mashitah Binti Mustaffa Al-Adlan for accompany me wherever I go and who directly and indirectly supported me during my project work, without the help of them this project would have been possible.

Last but not least, this thesis will never be done without the guidance from the project coordinator, Dr. Aiza Binti Harun and other lecturers for their comments and tips. Thanks for your cooperation. Hope Allah S.W.T will bless all of you.

## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENTS</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	ix
<b>ABSTRAK</b>	x
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Background	1
1.1.1 Overview of Aloe vera	
1.2 Problem Statement	4
1.3 Significance of Study	5
1.4 Objective	5
<b>CHAPTER 2 LITRETURE REVIEW</b>	
2.1 Previous Studies on Chemical Composition	
2.1.1 Different Temperature	6
2.1.2 Different Extraction Solvent	7
2.2 Previous Study of Biological Activities	
2.2.1 Anti-inflammatory activities	10
2.2.2 Antimicrobial Activities	11
2.2.3 Hypocholesterolemic activity	12
2.2.4 Antioxidant effect	12
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Material	
3.1.1 Sample	13
3.1.2 Chemical	13
3.1.3 Apparatus	13
3.1.4 Instruments	13
3.2 Methods	
3.2.1 Collection and Preparation of Plant Material	14
3.2.2 Extraction of Active Compound from the Aloe vera peel	14

3.2.2.1 Room Temperature	14
3.2.2.2 Hot Temperature	14
3.3.3 Gas chromatography and mass spectroscopy (GC-MS)	15
3.3.4 Identification of phytocomponents	16
3.3.5 Fourier Transform Infrared Spectrophotometer-FTIR-8400S	16

## **CHAPTER 4 RESULT AND DISCUSSION**

4.1 Chemical Composition of Aloe vera using Gas Chromatography-Mass Spectroscopy	17
4.2 FTIR Analysis	30

## **CHAPTER 5 CONCLUSION AND RECOMMENDATIONS**

5.1 Conclusion	34
5.2 Recommendation	35

<b>CITED REFERENCES</b>	36
<b>APPENDICES</b>	39
<b><i>CURRICULUM VITAE</i></b>	48

**ABSTRACT**  
**THE CHEMICAL COMPOSITION OF ALOE VERA PEEL**

*Aloe vera* is one of the plant that gave many benefits to human health. *Aloe vera* peel is a part of *Aloe vera* which has chemical composition and biological activities such as antimicrobial, antioxidant, anticancer and anti-inflammatory. The ethanol and hexane extracts of *Aloe vera* peel was characterized and analyzed by using GC-MS and FTIR. Different conditions and solvents (ethanol and hexane) were used to analyze the chemical composition of *Aloe vera* peel. Compounds that were found in both conditions in ethanol extract of *Aloe vera* were consists of 1,2-Benzenedicarboxylic acid, phytol, and Dodecyl cis-9,10-epoxyoctadecanoate. In hexane extract, phytol remains as the major chemical composition that acts as antimicrobial, anticancer and anti-inflammatory. The best condition for the extraction of *Aloe vera* peel is at room temperature compared to heat at 60°C at 60 minutes due to high temperature might damage the biological activities of chemical composition. The FTIR analysis shows that the functional compounds in the *Aloe vera* peel were aromatic acid halide, aliphatic acid halide, ester, carboxylic acid and methyl -CH<sub>3</sub>. The basic study is focused to determine the chemical compounds from *Aloe vera* peel using Gas Chromatography – Mass Spectrometry (GCMS) and to differentiate the compounds present from *Aloe vera* peel at different conditions and solvents.