

**CHEMICAL COMPOSITION OF VOLATILE COMPONENT FROM
CITRUS SPECIES**

NURUL HAKIMAH BINTI ISMAIL

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

JULY 2016

ABSTRACT

CHEMICAL COMPOSITION OF VOLATILE COMPONENT FROM CITRUS SPECIES

This study was carried out to determine the chemical composition of the volatile component from the kaffir lime (*Citrus hystrix*), calamondin (*Citrus microcarpa*), pomelo (*Citrus maxima*). These three sample leaves were extracted with hexane by using hydrodistillation method. All the volatile oils were identifying by using GC-MS and comparison by previous work. The major component for volatile oil from the leaf *Citrus hystrix* were Hexatoporphyrin (62.9%), oxime (82.3%), linalool (80.2%), terpine 4-ol (60.0%), and α - tripenol (55.6%). On the other hand, oxime (88.2%), (1s, 2R, 5R)-2-(-hydroxypropan-2-yl)-5-methyl chyclohexanol (20.4%) and p- methane-3, 8-diol, cis-1, 3, trans-1, 4 (69.4%) were found to be major chemical constituent in *Citrus microcarpa*. Finally, identification on the volatile oil of *Citrus* have afforded oxime (86.5%) (9), Terpinen-4-ol (64.8%), 2, 6- octadienal (56.6%), and (1R, 4Ar, 7r, 8aR)-7-(2- hydropropan-2-yl)-1 (80.5 %), respectively.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABELS	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	ix
CHAPTER 1 INTRODUCTION	
1.1 Background of study	1
1.1.1 <i>Citrus Hystrix</i>	1
1.1.2 <i>Citrus Microcarpa</i>	2
1.1.3 <i>Citrus maxima</i>	3
1.2 Significance of study	6
1.3 Objectives of study	7
CHAPTER 2 LITERATURE REVIEW	
2.1 The genus of <i>Citrus</i>	8
2.2 Essential oil	14
2.3 hydrodistillation	17
CHAPTER 3 METHODOLOGY	
3.1 Material	20
3.1.1 Raw materials	20
3.1.2 Chemicals and reagent	20
3.1.3 apparatus and glassware	20
3.2 sample collection	21
3.3 Sample Preparation and Extraction	21

CHAPTER 4 RESULT AND DISCUSSION

4.1	Extraction	22
4.2	<i>Citrus microcarpa</i>	23
4.3	<i>Citrus hystrix</i>	26
4.4	<i>Citrus maxima</i>	30

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

CITE REFERENCES	35
APPENDICES	38
CURRICULUM VITAE	39

LIST OF TABELS

Table	Caption	Page
2.0	species origin of <i>Citrus</i> species	8
2.1	The comparison (%) of <i>Citrus copticum</i> oils obtained by SFE and hydrodistillation	18
4.0	The operating GC-MS	23
4.1	The essential oil content (%) of leaves <i>Citrus microcarpa</i> and their main constituent	25
4.2	The essential oil content (%) of leaves <i>Citrus hystrix</i> and their main constituent	28
4.3	The essential oil content (%) of leaves <i>Citrus maxima</i> and their main conctituent	31