

**ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES OF LEAVES  
OF *Murraya koenigii***

**SITI NOOR AZIELA BINTI JOHARI**

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

**JANUARY 2017**

Final Year Project Report entitled “**Antioxidant and Antimicrobial Activities of Leaves of *Murraya Koenigii***” was submitted by Siti Noor Aziela Johari, partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by

---

Shamsul On  
Supervisor  
B. Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah  
Negeri Sembilan

---

Dr. Tuan Sheikh Ahmad  
Izaddin Sheikh Mohd Ghazali  
Project Coordinator  
B. Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah  
Negeri Sembilan

---

Mazni Musa  
Head of Programme  
B. Sc. (Hons.) Chemistry  
Faculty of Applied Sciences  
Universiti Teknologi MARA  
72000 Kuala Pilah  
Negeri sembilan

Date: \_\_\_\_\_

## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENT</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>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 General Introduction	1
1.2 <i>Murraya Koenigii</i>	2
1.3 Uses of <i>Murraya Koenigii</i>	3
1.4 Problem Statement	4
1.5 Significance of Study	5
1.6 Objectives of the Study	6
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Phytochemical Studies of <i>Murraya koenigii</i>	7
2.2 Bioactivities of <i>Murraya koenigii</i>	11
2.2.1 Antibacterial	11
2.2.2 Antioxidant	12
2.2.3 Anti-inflammatory	12
2.2.4 Anti-diabetic	13
2.2.5 Anti-cancer	14
2.2.6 Anti-obesity	15
2.2.7 Anti-tumor	15
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Plant Material	17
3.2 Chemicals	17
3.3 Apparatus	17
3.4 Extraction of Leaves of <i>Murraya Koenigii</i>	18
3.5 Thin Layer Chromatography (TLC) Analysis	18
3.6 Antioxidant Assay	19
3.7 Antibacterial Assay	20
3.7.1 Preparation of Nutrient Agar Medium	20
3.7.2 Preparation of Nutrient Broth Medium	20
3.7.3 Disc Diffusion Method	21
3.7.4 Control Test	21

<b>CHAPTER 4 RESULTS AND DISCUSSION</b>	
4.1 Extraction of <i>Murraya Koenigii</i>	22
4.2 Thin Layer Chromatography (TLC) Analysis	24
4.3 DPPH Scavenging Assay	26
4.4 Disc Diffusion Method	29
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATION</b>	34
<b>CITED REFERENCES</b>	36
<b>APPENDICES</b>	39
<b><i>CURRICULUM VITAE</i></b>	49

## ABSTRACT

### ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES OF LEAVES OF *Murraya koenigii*

*Murraya koenigii* is well known as curry leaf come from the family of Rutaceae. Presence of alkaloid and flavonoid from this plant are effective source of antioxidant and antimicrobial on development of newer therapeutics treatment. In this study, three different solvent with different polarity which is petroleum ether, dichloromethane and methanol had been used to extract *M. koenigii* leaves using soxhlet extractor. Methanol extraction had shown the highest percentage yield with 8.1 % compared to dichloromethane and petroleum ether with 5.2 % and 4.7 % respectively. The extracts also used to measure their antioxidant and antimicrobial activity by using DPPH scavenging assay and Disc diffusion methods. The highest percentage of inhibition in antioxidant at 1000 µg/ml was showed by methanol extract with 85.3 % when compared with standard ascorbic acid followed by dichloromethane, 82.5% and petroleum ether, 84.9 %. Besides, IC<sub>50</sub> value of methanol extract was 110.0 µg/ml in antioxidant activity of *M. koenigii*. Dichloromethane and petroleum ether extracts showed strong antibacterial activity against *S. thypi* with 20.0 and 23.0 mm inhibition zone respectively.