

ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES
OF *Piper betle*

NORSYAHIDA BINTI YASIR

**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 2017

This Final Year Project entitled “**Antioxidant and Antimicrobial Activities of *Piper betle***” was submitted by Norsyahida binti Yasir, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the faculty of Applied Sciences, and was approved by

Shamsul Bin On
Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA
Kuala Pilah Campus
72000 Kuala Pilah
Negeri Sembilan

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

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

Date : _____

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 General introduction	1
1.2 <i>Piper betle</i>	2
1.3 Importance of <i>Piper betle</i>	4
1.4 Significant of study	5
1.5 Problem statement	5
1.6 Objective of study	6
CHAPTER 2 LITERATURE REVIEW	
2.1 Phytochemical studies of <i>Piper betle</i>	7
2.2 Bioactivities of <i>Piper betle</i>	13
2.2.1 Bioactivity studies on isolated compound of <i>Piper betle</i>	14
CHAPTER 3 METHODOLOGY	
3.1 Materials	16
3.1.1 Raw materials	16
3.1.2 Chemicals	16
3.1.3 Apparatus	16
3.2 General experiment procedure	17
3.3 Plant materials	17
3.4 Soxhlet extraction	18
3.5 Thin Layer Chromatography (TLC) analysis	18
3.6 Antimicrobial activity	18
3.6.1 Disc diffusion method	19
3.7 Antioxidant activity	20
3.7.1 DPPH radical scavenging activity	20

CHAPTER 4 RESULTS AND DISCUSSION	
4.1 Soxhlet extraction	22
4.2 Thin Layer Chromatography (TLC) analysis	23
4.3 Antimicrobial activity	26
4.4 Antioxidant activity	28
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	31
CITED REFERENCES	33
APPENDICES	37
<i>CURRICULUM VITAE</i>	42

ABSTRACT

ANTIOXIDANT AND ANTIMICROBIAL ACTIVITIES

OF *Piper betle*

Piper betle leaves was extracted by soxhlet extraction method with hexane, chloroform and methanol solvent. The yield of crude extraction of hexane, chloroform and methanol is 9.53%, 13.47% and 7.86% respectively. All three types of crude extraction was undergo Thin Layer Chromatography (TLC) analysis to observed the presence of chemical constituent for each crude. Hexane crude was used dichloromethane;chloroform (3:2) as solvent system. Chloroform crude was used hexane;choroform with ratio 2:3 as a solvent system that produced several spot of chemical constituent of the TLC plate. Methanol crude was used solvent system of hexane;ethylacetate (4.5:0.5). All crude extracts was undergo microbial activity with gram positive bacteria *Staphylococcus aureus*, *Bacillus subtilis* and gram negative bacteria *Escherichia coli* and *Salmonella enterica*. The crude has shown significant activity against bacteria *Salmonella sp.* with larger inhibition, followed by *Bacillus subtilis*, *Staphylococcus aureus*, and *Escherichia coli*. The crude also tested for antioxidant activity by DPPH Radical Scavenging method. The methanol crude extract gave highest percentage of inhibition of antioxidant rather than chloroform and hexane because the presence of phenolic compound.