

**PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL
ACTIVITIES OF *Annona muricata* LEAVES EXTRACT**

MOHAMAD FAIS BIN NORDIN

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

JANUARY 2017

ABSTRACT

PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITIES OF *Annona muricata* LEAVES EXTRACT

Annona muricata or which commonly known as soursop is from the family Annonaceae and it is used globally as a traditional medicine to heal small wound and disease cause by pathogens. The fruits, seeds, barks, leaves, and even roots have been used to treat external and internal infection, coughs, liver ailments, inflammation, diabetes, and extractions from the leaves have been widely used to kill pest. This study was conducted to determine the phytochemical constituent present in *Annona muricata* using methanol and hexane solvent and to determine antimicrobial property against Gram positive and Gram negative bacteria. Methanol showed the highest percentage yield of crude extract with 8.38% and for hexane only 0.26%. Phytochemical screening test was done with the methanol extract showed the presence of alkaloids, flavonoids, saponins, and tannins. Meanwhile for hexane extract showed the presence of saponins and tannins only. Methanol and hexane extracts were used against four types of bacteria species which are *Staphylococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. The antimicrobial activities were tested using four different concentrations of extracts; 25 mg/ml, 50 mg/ml, 100 mg/ml and 200 mg/ml to determine the inhibition zone of bacteria. Results showed that only methanol extract have antimicrobial property against *Staphylococcus aureus*, *Bacillus subtilis*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURE	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1: INTRODUCTION	
1.1 Background Study	1
1.2 Problem Statement	2
1.3 Significance of Study	2
1.4 Objective of Study	3
CHAPTER 2: LITERATURE REVIEW	
2.1 <i>Annona muricata</i>	4
2.2 Extraction	6
2.3 Phytochemical Screening of <i>Annona muricata</i>	7
2.3.1 Flavonoids	8
2.3.2 Saponins	9
2.3.3 Alkaloids	9
2.3.4 Terpenoids	10
2.3.5 Tannins	10
2.3.6 Standard Method of Phytochemical Screening	11
2.4 Bacteria	11
2.4.1 Gram-Positive Bacteria	12
2.4.1.1 <i>Staphylococcus aureus</i>	12
2.4.1.2 <i>Bacillus subtilis</i>	12
2.4.2 Gram-Negative Bacteria	13
2.4.2.1 <i>Klebsiella pneumoniae</i>	13
2.4.2.2 <i>Pseudomonas aeruginosa</i>	14
CHAPTER 3: METHODOLOGY	
3.1 Materials	15
3.1.1 Raw Materials	15
3.1.2 Chemicals	15
3.1.3 Apparatus	15
3.2 Methods	16

3.2.1	Extraction of Leaves	16
3.2.2	Phytochemical Screening	16
3.2.3	Media Preparation	17
3.2.3.1	Broth Nutrient Media	17
3.2.4	Preparation of Standard Inoculum	17
3.2.5	Disk Diffusion	18
3.2.6	Statistical Analysis	18
CHAPTER 4: RESULTS AND DISCUSSION		
4.1	Percentage Yields of Extract	19
4.2	Phytochemical Screening	20
4.3	Antimicrobial Activities of <i>Annona muricata</i>	23
4.4	Statistical Analysis	34
4.4.1	Calculation for Standard Error	34
4.4.2	T-test for Significance Value	36
CHAPTER 5: CONCLUSION AND RECOMMENDATIONS		39
CITED REFERENCES		41
APPENDICES		45
CURRICULUM VITAE		55

LIST OF FIGURES

FIGURE	TITLE	PAGE
2.1	<i>Annona muricata</i> Leaves and Fruits	6
4.1	Phytochemical Screening Test of Methanol Extract	22
4.2	Phytochemical Screening Test of Hexane Extract	22
4.3	Graph of Difference Bacteria Concentration vs Inhibition Zone	26
4.4	Zone of Inhibition of <i>S. aureus</i> of Methanol Extract	29
4.5	Zone of Inhibition of <i>B. subtilis</i> of Methanol Extract	30
4.6	Zone of inhibition of <i>K. pneumoniae</i> of Methanol Extract	30
4.7	Zone of inhibition of <i>P. aeruginosa</i> of Methanol Extract	31
4.8	Zone of Inhibition of <i>S. aureus</i> of Hexane Extract	31
4.9	Zone of Inhibition of <i>B. subtilis</i> of Hexane Extract	32
4.10	Zone of inhibition of <i>K. pneumoniae</i> of Hexane Extract	32
4.11	Zone of inhibition of <i>P. aeruginosa</i> of Hexane Extract	33
4.12	Zone of Inhibition of Gentamycin Against Bacteria Species	34