# PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY OF Neobalanocarpus heimii ROOT

## NURAIN NAJWA BT MOHD ZAWAI

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

### **ACKNOWLEDGEMENTS**

First of all, I would like to thank Almighty God, Allah SWT who has blessed and guided me by giving me strength, peace of my mind and good health in order to successfully finish this research project.

In this very special occasion, I would like to express my deepest gratitude and appreciation to my respected supervisor, Puan Syarifah Faezah bt Syed Mohamad for her help and guidance over the years which is unmeasurable and without it, I would not be where I am today. Learning opportunities that she provided had encouraged me to go beyond my limits and to dreams for the best.

I must acknowledge as well to all of the team of research project, Dr Mohd Zahari Abdullah@Rafie, Cik Siti Suhaila bt Harith and Puan Sarina bt Hashim for their support and encouragement to finish this research project.

My completion of this project could not have been accomplished without the help from the lab staff especially En Suhairi, En Hafidzan, En Azman and Puan Zairus. Their support, assistance and advices during my project and writing efforts over the years had encouraged me to make this completion possible. They also provide the best facilities during my research period.

My heartfelt thanks to my lab partners during this research period, Nur Amirah bt Abdul Hamid, Syahira Ilyani bt Yusoff and Muhd Syazwan Yassin bin Md Som. It was a great pleasure working with them. These acknowledgement would not be complete without mentioning all of my classmates and friends who really give me their supports and don't ask something in exchange, thanks a lot.

To my family, I won't be this stronger without you as my inspiration. My special thanks go to my parents, En Mohd Zawai bin Ismail and Puan Rohana bt Abd Manap. The countless times you helped me through my journey during my study and I promised that all your efforts will gain something great in near future. Your encouragement when the times get rough are much appreciated and duly noted. It was great comfort and relief to know that you were willing to provide everything you can give even though I know that you have struggled a lot.

(NURAIN NAJWA BT MOHD ZAWAI)

# TABLE OF CONTENTS

ACKNOWLEDGEMENTS TABLE OF CONTENTS LIST OF TABLES LIST OF FIGURES LIST OF ABBREVIATIONS ABSTRACT ABSTRAK		
CHA	APTER 1 : INTRODUCTION	
1.1	Background Study	1
1.2	Problem Statement	
1.3	Significance of the Study	2 3 3
1.4	Objectives of the Study	3
CHA	APTER 2 : LITERATURE REVIEW	
2.1	Neobalanocarpus heimii	4
2.2	Phytochemical of N.heimii	6
	2.2.1 Flavonoid	7
	2.2.2 Tannins	9
	2.2.3 Saponins	10
	2.2.4 Terpenoids	11
	2.2.5 Alkaloids	12
	2.2.6 Anthraquinones	13
	2.2.7 Reducing Sugar	14
2.3	Antimicrobial Activity	15
	2.3.1 Antimicrobial activity of <i>N. heimii</i>	17
CHA	APTER 3: METHODOLOGY	
3.1	Materials	18
	3.1.1 Raw Materials	18
	3.1.2 Chemicals	18
	3.1.3 Apparatus	18
3.2	Methods	19
	3.2.1 Sample Collection	19
	3.2.2 Plant Extraction	19
	3.2.3 Phytochemical Screening	20

		3.2.3.1 Test for Reducing Sugar	20	
		3.2.3.2 Test for Anthraquinones	20	
		3.2.3.3 Test for Flavonoid	21	
		3.2.3.4 Test for Terpenoids	21	
		3.2.3.5 Test for Saponins	21	
		3.2.3.6 Test for Tannins	22	
		3.2.3.7 Test for Alkaloids	22	
	3.2.4	Preparation of Standard Culture Inoculum of Test Microorganism	is 23	
	3.2.5	Disk-Diffusion Method	23	
3.3	Statist	ical Analysis	24	
CHAPTER 4: RESULTS AND DISCUSSION 4.1 Phytochemical Screening 4.2 Antimicrobial Activity			25 31	
СНА	PTER 5	S: CONCLUSIONS AND RECOMMENDATIONS	41	
		ERENCES	43 49	
	APPENDICES			
CURRICULUM VITAE				

#### **ABSTRACT**

## PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY OF Neobalanocarpus heimii ROOT

Neobalanocarpus heimii are usually used for durable heavy constructions but not in medicinal and other purpose. Objective of this research are to screen the phytochemical contents of methanol extracts of N. heimii roots and to evaluate the antimicrobial activity of these extracts against three species of microorganisms. The powdered roots of N. heimii were extracted with methanol and the extracts were subjected to preliminary phytochemical screening by standard biochemical tests. Phytochemical screening has revealed the presence of alkaloids, flavonoid, saponin, tannins and terpernoid. Both reducing sugar and anthraquinones were completely absent. The antimicrobial activity of the methanol extracts was evaluated against bacterial species, Pseudomonas aeruginosa, Salmonella Staphylococcus aureus by using disc diffusion method. Methanolic root extracts of N. heimii exhibited the highest antimicrobial activity against S. typhi compared to S. aureus and P. aeruginosa with  $20.7 \pm 0.33$  mm of inhibition zone. The result from the preliminary phytochemical screening of the root extracts of N. heimii in present research revealed the potentials for the plants to be used as an alternatives in traditional medicine by developing antimicrobial pharmaceutical substances from them.