

***IN VITRO* LIPASE INHIBITION ACTIVITY FROM DRIED
PERICARP OF *Garcinia parvifolia* (Miq.)**

SYASYA NUR IFFAH BINTI SAMSUDIN

**BACHELOR OF SCIENCE (Hons.) BIOLOGY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

JANUARY 2020

ACKNOWLEDGEMENTS

All praises to Allah S.W.T the Most Gracious for giving me strength, courage and good health to complete this Final Year Project in order to fulfill the partial requirement for my study in Bachelor of Sciences (Hons.) Biology.

I would to express my greatest gratitude to family members especially my parents for the endless support and understanding throughout my journey completing this project and eventually my study.

Also, special thanks of gratitude to my supervisor, Madam Farnidah bt Hj, Jasnie for all of her guidance, support and care. It is an honor to work under the supervision of a great lecturer.

Sincerely thank you to Mr. Ajimi Hj. Jawan, our final year project coordinator for his contribution in giving many guidance to all of us in completing our project.

Many thanks to laboratory assistants especially Miss Dg Nur Shafiqah bt Awang Bakar and Mr. Mohamad Hanafi bin Sadli for all guidance and assistance in preparation of apparatus and chemicals needed for my project.

Sincerely thank you to all lecturers of Faculty of Applied Sciences, UiTM Sabah for giving us supports and advises.

A hat tip goes to all my friends that have been really supportive in the completion of my project. Also, master students that have been giving proper guidance. Lastly thank you to everyone that involved directly or indirectly in completing my final year project.

Syasya Nur Iffah binti Samsudin.

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 Background of study	1
1.2 Problem Statement	3
1.3 Significance of Study	4
1.4 Objectives	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Genus <i>Garcinia</i>	7
2.1.1 Plant from genus <i>Garcinia</i> with anti-obesity property	8
2.2 <i>Garcinia parvifolia</i> (Miq.)	10
2.3 Lipase Inhibition as obesity treatment	12
2.3.1 Drugs used as anti-obesity	13
2.4 Chemical constituent	18
2.4.1 Alkaloid	18
2.4.2 Flavonoid	19
2.4.3 Phenol	20
2.4.4 Hydroxycitric acid (HCA)	21
2.5 Plant Extraction Solvent	23
2.5.1 Extraction for lipase inhibition activity	23
2.5.2 Extraction of Hydroxycitric acid	23
2.6 Determination of Hydroxycitric acid content	25
2.6.1 Determination of Purity by Thin Layer Chromatography	25
2.7 Determination of lipase inhibition activity	26
2.7.1 Pancreatic Lipase Inhibition Assay	26
2.7.2 Measuring Lipase Inhibitory Activity	26
CHAPTER 3 METHODOLOGY	
3.1 Sample collection	27
3.2 Chemicals	27
3.2.1 Plant Extraction	27
3.2.2 Phytochemical evaluation	27
3.2.3 Lipase inhibition activity	27

3.3	Instrumentation	28
3.4	Sample Preparation	28
	3.4.1 Fruit of <i>Garcinia parvifolia</i> (Miq.)	28
3.5	Plant Extraction	28
	3.5.1 Sample Extraction Using Different Solvent	28
	3.5.2 Isolation of Hydroxycitric Acid	29
3.6	Phytochemical Evaluation	30
	3.6.1 Detection of alkaloid	30
	3.6.2 Detection of flavonoid	30
	3.6.3 Detection of phenol	30
	3.6.4 Determination of Hydroxycitric acid purity through Thin Layer Chromatography (TLC)	31
3.7	Determination of Lipase Inhibition Activity	33
	3.7.1 Porcine Pancreatic Lipase Inhibition Assay	33
3.8	Statistical Analysis	34
 CHAPTER 4 RESULTS AND DISCUSSION		
4.1	Phytochemical Screening	35
4.2	Thin Layer Chromatography of Isolated Hydroxycitric Acid	37
4.3	Lipase Inhibition Activity in Dried Pericarp of <i>Garcinia parvifolia</i> crude methanol extract	40
4.4	Lipase Inhibition Activity in Dried Pericarp of <i>Garcinia parvifolia</i> crude aqueous extract	44
4.5	Lipase Inhibition Activity of Isolated Hydroxycitric Acid from dried pericarp of <i>Garcinia parvifolia</i>	48
 CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		52
 CITED REFERENCES		54
APPENDICES		58
<i>CURRICULUM VITAE</i>		67

ABSTRACT

IN VITRO LIPASE INHIBITION ACTIVITY FROM DRIED PERICARP OF *Garcinia parvifolia* (Miq.)

Obesity is a common disease that is caused by excess amount of fat intake by the body and it can affect human regardless of age and gender. The current drugs used for treatment have caused adverse side effects. There are many plants in the world that can be used as natural anti-obesity agent that have not been well-discovered, including *Garcinia parvifolia*. *Garcinia parvifolia* is postulated comparable to the famous *Garcinia cambogia* which has been commercialized as anti-obesity agent due to the presence of hydroxycitric acid, as both are in the same genus. In this study, phytochemical screening was undergone in order to determine the presence of flavonoids, alkaloid and phenol which are known to be bioactive compounds that have lipase inhibition activity. Two different extraction solvents were used which are methanol and aqueous. Methanol extract contains all of the target bioactive compounds while aqueous extract contains only one targeted bioactive compound which is flavonoids. Hydroxycitric acid was isolated from the aqueous extract from dried pericarp of *Garcinia parvifolia* hydroxycitric acid is known to be a polar compound. Thin layer chromatography using methanol with water mixture (6:2) was used in order to determine the purity of the isolated compound. It is determined that *Garcinia parvifolia* contains Hydroxycitric acid in its dried pericarp with R_f value of 0.78. Porcine Pancreatic Lipase assay was used to determine lipase inhibition activity. The crude methanol extract, crude aqueous extract and hydroxycitric acid showed positive lipase inhibition activity. Crude aqueous extract is seen to be the most potent lipase inhibitor as it has high inhibition at lower concentration which is 91.48% inhibition at 625 µg/mL, followed by crude methanol extract 91.18% at 1250 µg/mL and hydroxycitric acid 82.88% at 10000 µg/mL. This study is hoped to be beneficial for commercialization of *Garcinia parvifolia* as a natural anti-obesity agent.