PHENOLIC COMPOUND FROM HEXANE EXTRACT OF ROOT BARK OF GARCINIA MANGOSTANA

MUHAMMAD HAFIZUDIN BIN ABDULLAH

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

ABSTRACT

PHENOLIC COMPOUND FROM HEXANE EXTRACT OF ROOT BARK OF GARCINIA MANGOSTANA

Extensive work on the isolating of secondary metabolites from Malaysian flora, root barks *Garcinia mangostana* was chosen for further phytochemical analysis. This plant was going for detail separation work which involves extraction and isolation of chemical component using a various techniques of analysis. Xanthones was found as a major component from the isolation of this plant. Detail work on the hexane extract of *Garcinia mangostana* has afforded two known xanthones, α-mangostin and osajaxanthone. These pure compounds were elucidated by using numerous spectroscopic analysis, such as 1D and 2D NMR, MS, IR, UV and also by comparison with the previous data.

TABLE OF CONTENTS

ACKN TABL LIST (LIST (ABST) ABST	PAGE ii iii v vi vii ix x	
СНАР	TER 1 INTRODUCTION	
1.1	Background of Study	1
1.2	Botanical aspect of Garcinia mangostana L	1
	1.2.1 Family of Guttiferae	1
	1.2.2 The The genus Garcinia	2
	1.2.3 The species Garcinia mangostana L	3
1.3	Problem Statement	4
1.3	Significance of Study	4
1.4	Objectives of the Study	5
СНАР	TER 2 LITERATURE REVIEW	
2.1	Chemical components in Garcinia mangostana L.	6
СНАР	TER 3 METHODOLOGY	
3.1	Plant Materials	15
3.2	Instruments	15
	3.2.1 Gas Chromatography Mass Spectra	15
	3.2.2 Infrared Spectroscopy	15
	3.2.3 Melting point	15
	3.2.4 Nuclear Magnetic Resonance	16
	3.2.5 Ultra Violet Spectroscopy	16
3.3	Chromatographic method	16
	3.3.1 Thin Layer Chromatography	16
	3.3.2 Dyeing reagent for TLC	17
	3.3.3 Column Chromatography	17
3.4	Extraction and isolation of phenolic compound	17
	3.4.1 Isolation of α-mangostin	18

3.4.2 Isolation of osajaxanthone	19
CHAPTER 4 RESULT AND DISCUSSION	21
 4.1 Isolation of chemical constituent from root bark of Garcinia mangostana L 4.1.1 Characterization of α-mangostin 4.1.2 Characterization of osajaxanthone 	21 22 29
CHAPTER 5 CONCLUSION AND RECOMMENDATION	41
CITED REFERENCES	42 45

LIST OF FIGURES

Figure	Caption	Page
1.1	G. mangostana fruit and leaves	4
1.2	G. mangostana tree	4
4.1.1	Compounds obtained from root barks of Garcinia mangostana	21
4.1.2	EIMS spectrum of α-mangostin (4)	25
4.1.3	IR spectrum of α-mangostin (4)	26
4.1.4	¹ H NMR spectrum of α-mangostin (4) (400 MHz, CDCl ₃)	27
4.1.5	¹³ C NMR spectrum of α-mangostin (4) (100 MHz, CDCl ₃)	28
4.2.1	EIMS spectrum of osajaxanthone (43)	32
4.2.2	IR spectrum of osajaxanthone (43)	33
4.2.3	¹ H NMR spectrum of osajaxanthone (43) (500 MHz, CDCl ₃)	34
4.2.4	¹³ C NMR spectrum of osajaxanthone (43) (125 MHz, CDCl ₃)	35
4.2.5	COSY spectrum of osajaxanthone (43) (125 MHz, CDCl ₃)	36
4.2.6	DEPT spectrum of osajaxanthone (43) (125 MHz, CDCl ₃)	37
4.2.7	HMQC spectrum of osajaxanthone (43)	38
4.2.8	HMBC spectrum of osajaxanthone (43)	39
4.2.9	Expansion HMBC spectrum of osajaxanthone (43)	40