

UNIVERSITI TEKNOLOGI MARA

**PROXIMATE ANALYSIS, TOTAL
PHENOLIC AND FLAVONOID
COMPOUNDS OF SELECTED
MANGROVE SPECIES IN SELAT
PULAU TUBA, LANGKAWI, KEDAH**

SARAH AFIQAH BINTI A. RAHIM

Thesis submitted in fulfilment of the requirements for the
degree of
Bachelor of Science (Honours) Biology

Faculty of Applied Sciences

July 2019

AUTHOR 'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Undergraduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student : Sarah Afiqah Binti A. Rahim

Student I.D No. : 2016596133

Programme : Bachelor Science (Hons.) Biology –
AS201

Faculty : Applied Sciences

Thesis Tittle : Proximate analysis, total phenolic and
flavonoind compounds of selected
mangrove species in Selat Pulau Tuba,
Langkawi, Kedah.

Signature of Student :

Date : July 2019

ABSTRACT

The objective of this study was to compare the nutrition composition, phenolic and flavonoid compounds found in selected mangrove species in Selat Pulau Tuba. In this study, the nutritional composition, phenolic and flavonoid compounds of *Rhizophora mucronata*, *Rhizophora apiculata*, *Ceriops tagal* and *Xylocarpus rumphii* were investigated over a range parameter such as moisture, ash, crude fiber, crude protein, crude fat, total phenolic contents (TPC) and total flavonoid contents (TFC). The results of moisture contents was varied at 23 – 57%, ash contents was varied at 10.13 – 17.05%, crude fiber was varied at 18.56 – 27.56%, crude protein was varied at 4.48 – 9.28%, crude fat was varied at 2.43 – 4.81%, TPC was varied at 24.79 – 28.43 mgGAE/g and TFC was varied at 13.33 – 17.95 mgQE/g for each of the analysed mangrove species. Proximate analysis was used to checks the nutritional composition while Folin Ciocalteu method and aluminum chloride colorimetric method was used to identify the TPC and TFC of the selected mangrove species in Selat PulauTuba. From this study, each of the selected mangrove species do have high contents of nutritional composition and antioxidant composition as all of the selected mangrove species shown the presence of the high phenolic and flavonoid contents. The results gained from this study, could give advantages towards community lived around Selat Pulau Tuba as they could use it for medical purpose, animal feeds and plant-based nutrients.

TABLE OF CONTENT

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ABSTRAK	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF SYMBOLS	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study	1
1.1.1 The Benefits of Mangrove	2
1.2 Problem Statements	4
1.3 Significance of Study	4
1.4 Objective of Study	5
CHAPTER TWO: LITERATURE REVIEW	6
2.1 Area of Study	6
2.1.1 Mangrove Forest of the Pulau Langkawi	7
2.2 Overview of the Use of Mangrove as Traditional Medication	9
2.3 Antioxidant and Nutritional Composition of Mangrove Plants	10
2.4 Dominant Mangrove Species in Pulau Langkawi	13

2.4.1 <i>Rhizophora apiculata</i>	14
2.4.2 <i>Rhizophora mucronata</i>	15
2.4.3 <i>Ceriops tagal</i>	15
2.4.4 <i>Xylocarpus rhumpii</i>	16
2.5 Measuring Nutritional Composition by Using Proximate Analysis	16
CHAPTER THREE: RESEARCH METHODOLOGY	18
3.1 Sampling Area	18
3.2 Apparatus	19
3.3 Chemicals	19
3.4 Instruments	19
3.5 Procedure	19
3.5.1 Sample collection and preparation	19
3.5.2 Proximate analysis	20
3.5.3 Moisture determination	20
3.5.4 Ash determination	21
3.5.5 Fat determination	21
3.5.6 Fiber determination	21
3.5.7 Protein determination	22
3.6 Extraction of plants	23
3.7 Total Phenolic Contents	24
3.8 Total Flavonoid Contents	24
3.9 Statistical Analysis	25
CHAPTER FOUR: RESULT AND DISCUSSION	26
4.1 Species Identification	26
4.2 Proximate analysis	29
4.3 Total Phenolic Content (TPC)	39
4.4 Total Flavonoid Content (TFC)	42