

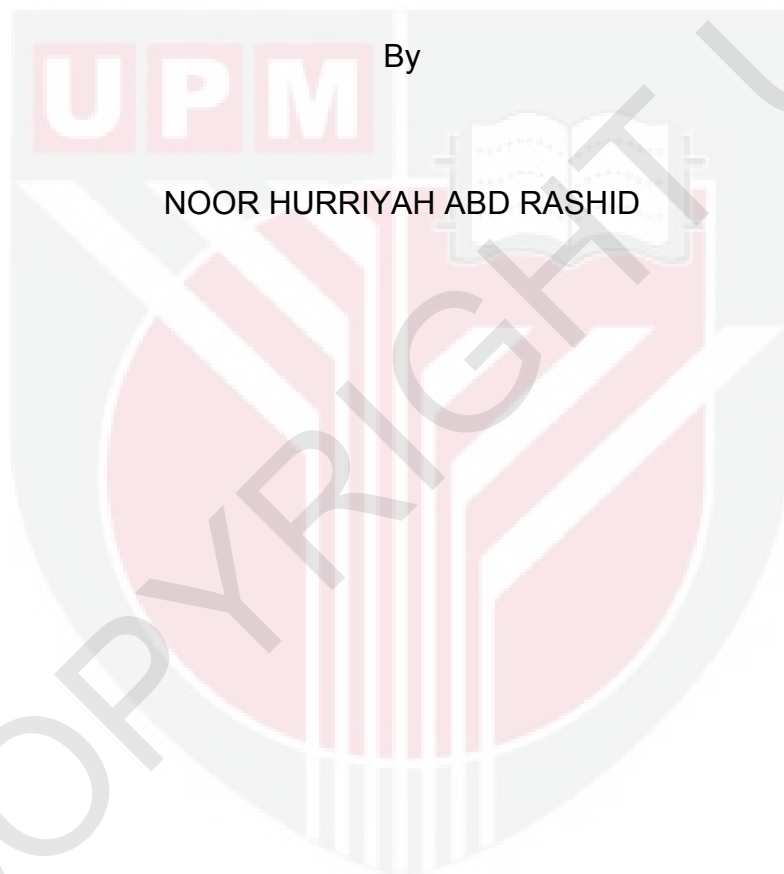


***COMPARISON OF SEDIMENT CARBON STORAGE BETWEEN SUNGAI  
TIRAM LAUT AND SUNGAI SEPETANG AT MATANG MANGROVE  
FOREST, PERAK***

**NOOR HURRIYAH ABD RASHID**

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COMPARISON OF SEDIMENT CARBON STORAGE BETWEEN SUNGAI TIRAM  
LAUT AND SUNGAI SEPETANG AT MATANG MANGROVE FOREST, PERAK



By

NOOR HURRIYAH ABD RASHID

A Project Report Submitted in Partial Fulfillment of the Requirements for the Degree  
of Bachelor of Forestry Science in the  
Faculty of Forestry  
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## DEDICATION

**For my beloved family:**

ABD RASHID JOMRI  
HALIMATON SHAMSURI

My siblings:

FADHLINA ABD RASHID  
NURUL FATURAH ABD RASHID  
MOHD DZUL IFTIDZAM ABD RASHID  
NOOR HURRAINI ABD RASHID

To my supervisor Assoc. Prof. Dr. Seca Gandaseca

To all my friends,

Thank you for your encouragements supports

And the helpful.

Thank you for everything. May Allah Bless All of us.

## ABSTRACT

Mangroves are woody plants that grow at the interface between land and sea in tropical and subtropical latitudes where they exist in conditions of high salinity, extreme tides, strong winds, high temperature, and muddy anaerobic soils. The objective of this study was to examine the of sediment properties and compared the sediment carbon storage between Sungai Tiram Laut and Sungai Sepetang at Matang Mangrove Forest, Perak. Selected sediment was defined physical properties (soil texture) and chemical properties (soil pH, soil electrical conductivity, total organic matter, soil organic matter, nitrogen and phosphorus. Data obtained were analyzed using Statistical Analysis System (SAS) version 9.4. The results showed that the sediment was in class sandy loam. Carbon storage of sediment was influenced by many factors, including soil pH and soil electrical conductivity. The total of organic (TOC) in Sungai Sepetang detect too little compared to Sungai Tiram Laut. There element total of organic (TOC) analyzed using a simple and swift method dry combustion method (Loss of ignition method). The finding of the study showed that Sungai Tiram Laut was more efficient in storing carbon. Therefore, it been proved that the carbon stored in mangrove with different amount at different locations. Carbon storage of sediment in the river, because of industrial activities, agriculture, oil palm area and shrimp pool in Sungai Sepetang.

## ABSTRAK

Hutan bakau adalah tumbuhan berkayu yang tumbuh di antara muka bumi dan laut di latitud tropika dan subtropika di mana mereka wujud dalam keadaan saliniti yang tinggi, pasang surut ekstrem, angin kencang, suhu tinggi, dan tanah anaerobik berlumpur. Objektif kajian dibuat untuk memberikan maklumat asas bagi sifat-sifat sedimen dan membandingkan penyimpanan karbon sedimen antara Sungai Tiram Laut dan Sungai Sepetang di Hutan Bakau Matang, Perak. Sedimen terpilih telah ditakrifkan sebagai sifat fizikal (tekstur tanah) dan sifat kimia (pH tanah, kekonduksian elektrik tanah, jumlah bahan organik, jumlah organik, nitrogen dan fosforus). Data yang diperolehi dianalisis menggunakan Sistem Analisis Statistik (SAS) versi 9.4. Hasil yang diperolehi menunjukkan bahawa sedimen berada di dalam kelas lapisan pasir. Penimbunan karbon sedimen dipengaruhi pelbagai faktor, termasuk pH tanah dan kekonduksian elektrik tanah. Jumlah Organik (TOC) di Sungai Sepetang tidak dapat mengesan terlalu banyak. Jumlah unsur organik (TOC) dianalisis dengan menggunakan kaedah mudah dan cepat iaitu kaedah pembakaran kering (kerugian pada kaedah pencucuhan). Penemuan kajian menunjukkan bahawa Sungai Tiram Laut lebih cekap dalam menyimpan karbon. Peratusan karbon yang tersimpan di Sungai Tiram Laut tidak berbeza, ia telah terbukti bahawa karbon yang disimpan adalah jumlah yang berlainan di lokasi yang berbeza. Penyimpanan karbon sedimen di sungai disebabkan kegiatan perindustrian, pertanian, kawasan kelapa sawit dusun udang di Sungai Sepetang

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Thank you.

## APPROVAL SHEET

I certify that this research project entitle of “Comparison of Sediment Carbon Storage Between Sungai Tiram Laut and Sungai Sepetang at Matang Mangrove Forest, Perak” by Noor Hurriyah Abd Rashid has been examined and approved as a fulfillment of the requirements for the degree of Bachelor of Forestry Science in the Faculty of Forestry, Universiti Putra Malaysia.

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## TABLE OF CONTENTS

	Page
DEDICATION	i
ABSTRACT	ii
ABSTRAK	iii
ACKNOWLEDGEMENT	iv
APPROVAL SHEET	v
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	x
<b>CHAPTER</b>	
<b>1 INTRODUCTION</b>	
1.1 Background	1
1.2 Problem Statement	2
1.3 Objectives	3
<b>2 LITERATURE REVIEW</b>	
2.1 Matang Mangrove	4
2.2 Differences Soil and Sediment	4
2.2.1 Soil	4
2.2.2 Sediment	4
2.3 Differences between Carbon, Carbon Content & Carbon Storage	5
2.3.1 Carbon	5
2.3.2 Carbon content	5
2.3.3 Carbon storage	6
2.4 Factor of Carbon	6
2.4.1 Water	6
2.4.2 Nutrients	6
2.4.3 Temperature	7
2.4.4 Age	7
2.5 The Importance of Carbon Storage	7
2.5.1 Soil organic matter (SOM)	7
2.6 The Benefits of Carbon Storage	8
2.6.1 Soil fertility	8
2.7 Effects of Carbon Storage	9
2.7.1 In sediment	9
2.7.2 In community	9
2.7.3 In environment	9
2.8 Soil Properties	10
2.8.1 Soil physical properties	10
2.8.2 Soil chemical properties	10



3	METHODOLOGY	
3.1	Study Site	11
3.2	Experimental Design	13
3.3	Sediment Sampling and Preparation	14
3.4	Sediment Analysis	14
3.4.1	Physical properties	14
3.4.1.1	Sediment texture	14
3.4.2	Chemical properties analysis	14
3.4.2.1	Soil pH in water and 1 M KCl	16
3.4.2.1.1	Soil pH in water	17
3.4.2.1.2	Soil pH in 1 M KCl solution	17
3.4.2.2	Electrical conductivity (EC)	17
3.4.2.3	Total organic calculation (TOC) and organic matter (OM)	18
3.4.2.4	Total Nitrogen (N)	19
3.4.2.5	Total Phosphorus (P)	22
3.5	Data Analysis	23
4	RESULTS AND DISCUSSION	
4.1	Introduction	24
4.2	Soil Physical Properties	24
4.3	Soil Chemical Properties	26
4.4	The Comparison of Texture Sand, Clay and Silt between Sungai Sepetang and Sungai Tiram Laut.	30
4.5	The comparison of soil pH water and pH 1 M KCl between Sungai Sepetang and Sungai Tiram Laut.	31
4.6	The comparison of electrical conductivity (EC) between Sungai Sepetang and Sungai Tiram Laut.	32
4.7	The comparison of Soil Organic Matter (SOM) and Total Organic Carbon (TOC) between Sungai Sepetang and Sungai Tiram Laut.	33
4.8	The comparison of Total Nitrogen (N) between Sungai Sepetang and Sungai Tiram Laut.	34
4.9	The comparison of Total Phosphorus (P) between Sungai Sepetang and Sungai Tiram Laut.	35
4.10	The comparison of ratio Carbon Nitrogen (C/N) and ratio Carbon Phosphorus (C/P) between Sungai Sepetang and Sungai Tiram Laut.	36
5	CONCLUSION AND RECOMMENDATIONS	
5.1	Conclusion	38
5.2	Recommendation	39
	REFERENCES	40
	APPENDICES	45

## LIST OF FIGURES

FIGURE		Page
1.1	Carbon Cycle in Mangrove	2
3.1	Sungai Tiram Laut	11
3.2	Sungai Sepetang	11
3.3	Map of Malaysia	11
3.4	The sampling of study site	13
3.5	USDA soil textural pyramid	16
4.1	The comparison of texture sand, silt and clay percentage between Sungai Sepetang and Sungai Tiram Laut.	30
4.2	The comparison of soil pH water and pH KCL between Sungai Sepetang and Sungai Tiram Laut	31
4.3	The comparison of electrical conductivity (EC) between Sungai Sepetang and Sungai Tiram Laut	32
4.4	The comparison of soil organic matter (SOM) and Total Organic Matter (TOC) between Sungai Sepetang and Sungai Tiram Laut.	33
4.5	The comparison of Total Nitrogen (N) between Sungai Sepetang and Sungai Tiram Laut.	34
4.6	The comparison of Total Phosphorus (P) between Sungai Sepetang and Sungai Tiram Laut.	35
4.7	The comparison of Ratio Carbon Nitrogen (C/N) between Sungai Sepetang and Sungai Tiram Laut	36

## LIST OF TABLES

TABLE		Page
4.1	Selected physical properties between Sungai Sepetang and Sungai Tiram Laut by sediment depths	25
4.2	Selected chemical properties between Sungai Sepetang and Sungai Tiram Laut by sediment depths	27



## LIST OF ABBREVIATIONS

N	Nitrogen
P	Phosphorus
C	Carbon
TOC	Total organic carbon
SOM	Soil organic matter
SD	Sand
Si	Silt
CL	Clay
EC	Electrical conductivity
SAS	Statistical Analysis System

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Mangroves have been defined by Hamilton and Snedaker (1984) as salt tolerant ecosystems of the intertidal regions along coastlines. Mangroves generally grow in loose, wet soils, salt water and are periodically submerged by tidal flows along sheltered coastal, estuarine and riverine areas in tropical and subtropical latitudes (Kasawani *et al.*, 2007).

Their proximity to the coastline make them efficient water filters, improving water quality and protecting habitats, such as coral reefs, from siltation, whilst also protecting coastlines from erosion, providing soil stabilization and storm protection (Murray, 2011).

The ability of mangroves to sequester and store huge amounts of carbon plays an important role in global carbon budgets and in the process of mitigating climate change (Herr, D., Pidgeon, E. & Laffoley, D, 2012).

Mangroves are recognized as one of the three key 'blue carbon' habitats and are among the most carbon-rich forests in the tropics. They are able to sequester 6 to 8 tones of carbon dioxide equivalent per hectare per year (Murray, 2011). These rates are about two to four times greater than rates observed in mature tropical forests (Wilkie, 2003). Some of the mangrove ecosystem organic rich sediment of several meter depth has been found (Twilley *et al.*, 1992; Lallier verges *et al.*, 1998). The sources of organic carbon stocks in mangrove sediment have rarely been studied in details.

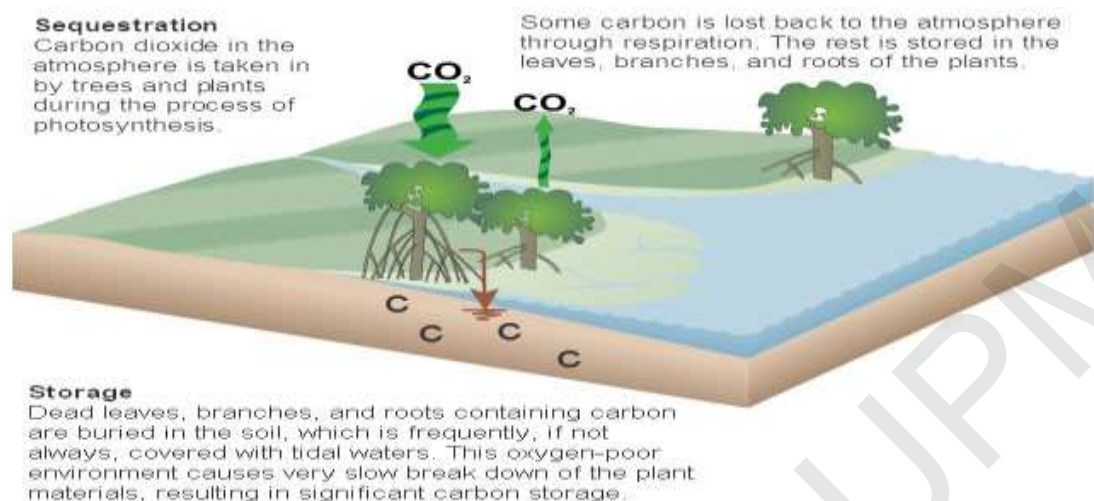


Figure 1.1: Carbon cycle in mangrove

## 1.2 Problem Statement

Matang Mangrove Forest Reserved, Perak is comprised of several rivers which also involved the selected study site, Sungai Sepetang and Sungai Tiram Laut by Alongi DM (2008). The surrounding along the river of the Sungai Sepetang can be described as more vegetated and exploited from human activities daily live such as agricultural, industrial and villager activities that may affect the condition of the sediment meanwhile Sungai Tiram Laut can be described as a less vegetated and exploited from the human activities (Saenger *et al.*, 1983, Fortes 1988, Marshall 1994, Primavera 1995, Twilley 1998). In fact, the exploitation activities are different at each rivers. As Matang Mangrove is known to be a hotspot for numerous researches, this condition might give useful information and provide with of better explanation on the impact of human exploitation towards the soil organic carbon (SOC) content.

This study can clarify the impacts of human activities towards soil carbon storage in sediments of Sungai Sepetang and Sungai Tiram Laut at different depths. Thus, this study can be imperative and beneficial to the mangrove associates and the communities.

### **1.3 Objectives**

The objectives of this study were:

1. To determine the sediment carbon storage at Sungai Tiram Laut and Sungai Sepetang at Matang Mangrove Forest, Perak.
2. To compare the sediment carbon storage at Sungai Sepetang and Sungai Tiram Laut.

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