

IDENTIFICATION AND DISTRIBUTION OF SEAWEEDS IN
ROCKY AREAS OF BAYU BUSA, BAYU RAKIT
AND BAYU BUNUK IN TERENGGANU

JENNIFER SAMBUN

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY MALAYSIA

2025

01/2005

1100034580

LP 13 FST 3 2005



1100034580

Identification and distribution of seaweed in rocky area of Batu Rusa, Batu rakit and Batu Buruk in Terengganu / Jenifer Sambun.



PERPUSTAKAAN
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
21030 KUALA TERENGGANU

1100034580

Lihat sebelah

**HAK MILIK
PERPUSTAKAAN KUSTEM**

**IDENTIFICATION AND DISTRIBUTION OF SEAWEEDS IN ROCKY AREAS OF
BATU RUSA, BATU RAKIT AND BATU BURUK IN TERENGGANU**

By

Jenifer Sambun

**Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Marine Science)**

Department of Marine Science

Faculty of Science and Technology

KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA

2005

This project report should be cited as:

Jenifer, S. 2005. Identification and distributions of seaweeds in Rocky areas of Batu Rusa, Batu Rakit and Batu Buruk in Terengganu. Undergraduate thesis, Bachelor of Science (Marine Science), Faculty of Science and Technology Malaysia, University College of Science and Technology Malaysia, Terengganu. 75p.

No part of this project report may be reproduced by any mechanical, photographic, or electronic process, or in the form of phonographic recording, nor may it be stored in a retrieval system, transmitted, or otherwise copied for public or private use, without written permission from the author and the supervisor of the project.

1100034580



JABATAN SAINS SAMUDERA
FAKULTI SAINS DAN TEKNOLOGI
KOLEJ SAINS DAN TEKNOLOGI MALAYSIA

**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Identification and distribution of seaweeds in Rocky areas of Batu Rusa, Batu Rakit and Batu Buruk in Terengganu

Oleh **Jenifer Sambun**, No. Matrik **UK 7438** telah diperiksa dan semua pembedaan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh **Ijazah Sarjana Muda – Sains Samudera**, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

.....
Penyelia Utama

Nama:

Cop Rasmi:

Tarikh:

.....
Ketua Jabatan Sains Samudera

Nama:

Cop Rasmi:

Tarikh:

ACKNOWLEDGEMENTS

First of all I would like to thank GOD for his guidance and blessings. To my supervisor, Dr. Siti Aishah Abdullah @ Christine A. Orosco, thank you for your guidance and support in completion of this project. Appreciation also goes to Gan Ming Herng for his tremendous help in my identification process.

I would also like to thank to En. Fadhil, Mat Teh, Mat Zan, Willie, Chon, Pacai and Radax for helping during my sampling process.

My very great appreciation goes to my beloved parents (Mr. Charles Sambun and Mdm. Stella Laidi), Beat, David, Didie, Kidak and Kibon for your loves and monetary supports during my study process. Mommy, Daddy, mommy finally I've made it! To my lovely and wacky housemate; Ying and Mel thanks for being such a wonderful and fun friends. My Thanks also goes to my very special friend, Fnd. Thanks for the advice and memories that you give me for two years. Not forgetting to all my coursemate (Marine Science 2002) especially Pika and all Armon friends (Kolobo, Nick, Clen, Nana, Eddy, Giluk, Andrew, Beat, Slaizx, Steven and Audrey)... all of you are such a wonderful friends! I'll cherish all the moments that we have shared together this 3 years in KUSTEM, Terengganu.

Loves you all and GOD BLESSES YOU ALL!!

TABLE OF CONTENTS

TITLE	PAGE
TITLE PAGE	i
APPROVAL FORM	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	x
ABSTRAK	xi
ABSTRACT	xii
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 LITERATURE REVIEW	5
2.1 Seaweed	5
2.2 Seaweed Resources	6
2.3 Importance of Seaweed	7
2.3.1 Economical Importance	7
2.3.2 Ecological Importance	8
2.4 Distribution and Physical Environment of Seaweed	10
2.5 Seaweed in Terengganu	11
CHAPTER 3 MATERIALS AND METHODS	12
3.1 Study Area	12
3.2 Seaweeds Collection	16
3.3 Seaweed Preservation	16
3.3.1 Wet sample	16
3.3.2 Dry sample	17
3.4 Identification	18
3.5 Distribution	18

CHAPTER 4 RESULTS	19
4.1 Taxonomy	19
4.2 Description of Seaweed Species	24
4.2.1 Division Cyanophyta	24
4.2.2 Key to Genera of Division Chlorophyta	26
4.2.2.1 Division Chlorophyta	27
4.2.3 Key to Genera of Division Rhodophyta	33
4.2.3.1 Division Rhodophyta	34
4.2.4 Key to Genera of Division Heterokontophyta	54
4.2.4.1 Division Heterokontophyta	55
4.3 Distribution	60
CHAPTER 5 DISCUSSION	65
5.1 Taxonomy	65
5.2 Distribution	67
CHAPTER 6 CONCLUSION	69
LITERATURE CITED	71

LIST OF TABLES

Table No.	Title	Page
Table 3.1	Station position and date of sampling	15
Table 4.1	Taxonomic list of seaweeds identified from the coast of Terengganu and distribution of seaweeds at different stations.	22
Table 4.2	The distribution of seaweeds at different stations in Terengganu.	63

LIST OF FIGURES

Figure No.	Title	Page
Figure 3.1	Map showing study area in Terengganu	13
Figure 3.2	Map showing study area in Batu Rusa	14
Figure 3.3	Map showing study area in Batu Rakit	14
Figure 3.4	Map showing study area in Batu Buruk	14
Figure 4.1	The percentage of Cyanophyta, Chlorophyta, Heterokontophyta, Rhodophyta and unidentified alga found in the coast of Terengganu	21
Figure 4.2	Close-up of unidentified Blue-Green alga (1) where attached to other alga	24
Figure 4.3	Close-up of unidentified Blue-Green alga (2)	25
Figure 4.4(a-b)	<i>Bryopsis pennata</i> (a) Habit, (b) portion of frond tips	27
Figure 4.5	<i>Caulerpa sp.</i> Featherlike fronds	28
Figure 4.6	Close-up of <i>Cladophora sp. 1</i>	29
Figure 4.7	Close-up of <i>Cladophora sp. 2</i>	30
Figure 4.8	Close-up of <i>Boodlea composita</i>	31
Figure 4.9(a-b)	<i>Struvea anastomosans</i> (a) close-up of the thallus (b) habit	32
Figure 4.10	Close-up of <i>Ceramium sp.</i>	34
Figure 4.11(a-b)	<i>Griffithsia sp.</i> (a) portion of tips (b) attached to other alga	35
Figure 4.12(a-b)	<i>Acanthophora sp.</i> (a) habit of portion of branch, (b) upper portion of branch	36

Figure No.	Title	Page
Figure 4.13(a-b)	<i>Herposiphonia sp.</i> (a) habit, (b) close-up of apex	37
Figure 4.14(a-b)	<i>Leveillea jungermannoides</i> (a) habit, (b) portion of branch	38
Figure 4.15(a-b)	<i>Polysiphonia decussata</i> (a) Reproductive structure (b) portion of tips	39
Figure 4.16	<i>Polysiphonia sp.</i> Habit.	40
Figure 4.17	<i>Tolypiocladia glomerulata</i> , portion of spinous branchlets	41
Figure 4.18	<i>Amphiroa fragilissima</i> , habit	42
Figure 4.19(a-b)	<i>Jania sp.</i> (a) attached to other seaweed, (b) portion of tips	43
Figure 4.20	<i>Gelidiella acerosa</i> , habit	44
Figure 4.21(a-b)	Unknown young Gelidiales sp.1, (a) attached to substrate (b) close-up of the thallus	45
Figure 4.22	Unknown young Gelidiales sp.2, habit	46
Figure 4.23	<i>Champia sp.</i> , attached to other seaweeds	47
Figure 4.24(a-b)	Red alga sp.1, (a) attached to other seaweeds, (b) Close-up of the fronds	48
Figure 4.25	Red alga sp.2, portion of branch	49
Figure 4.26	Red alga sp.3, portion of the branch	50
Figure 4.27	Red alga sp.4, portion of the branch	51
Figure 4.28	Red alga sp.5, portion of branch	52
Figure 4.29	Red alga sp. 6, portion of branch	53
Figure 4.30	<i>Dictyota sp.1</i> , herbarium specimen	55

Figure No.	Title	Page
Figure 4.31	<i>Dictyota sp.2</i> , portion of thallus	56
Figure 4.32	<i>Lobophora variegata</i> , habit	57
Figure 4.33	<i>Padina sp.</i> , herbarium specimen	58
Figure 4.34	<i>Sargassum sp.</i> , habit	59
Figure 4.35	The percentage of seaweeds identified in 3 different locations.	62
Figure 4.36	The number of seaweeds from the unidentified alga, division Rhodophyta, Heterokontophyta, Chlorophyta and Cyanophyta in three different stations; Batu Rusa, Batu Rakit and Batu Buruk.	62

LIST OF ABBREVIATIONS

Symbol		Meaning
%	-	Percent
‰	-	Salinity
°E	-	Degree of East
°N	-	Degree of North
°C	-	Degree of Celsius
cm	-	Centimeter
mm	-	Millimeter
km	-	Kilometer
km ²	-	Square Kilometer
No.	-	Number
sp.	-	Species
BRS	-	Batu Rusa
BRK	-	Batu Rakit
BBK	-	Batu Buruk
CN	-	Cyanophyta
CP	-	Chlorophyta
HP	-	Heterokontophyta
RP	-	Rhodophyta
(h)	-	Herbarium specimen
(w)	-	Wet specimen

ABSTRAK

TAJUK: PENGENALPASTIAN DAN TABURAN SPESIES RUMPAI LAUT YANG TERDAPAT DI KAWASAN PANTAI BERBATU; BATU RUSA, BATU RAKIT DAN BATU BURUK DI SEPANJANG PANTAI TERENGGANU

Kajian ini dijalankan di beberapa kawasan terpilih iaitu kawasan pantai berbatu; Batu Rusa, Batu Rakit dan Batu Buruk di Sepanjang pantai Terengganu di mana ia bertujuan untuk mengenalpasti spesies rumpai laut serta mengetahui taburannya di kawasan tersebut. Rumpai laut daripada 3 stesen memperolehi keputusan sebanyak 36 taksa: 2 spesies yang ditemui adalah dari Divisi Cynophyta, 5 sampel dari Divisi Chlorophyta merangkumi 3 order, 4 famili dan 5 genera; 5 sampel dari Divisi Heterokontophyta merangkumi 2 order, 2 famili dan 4 genera dan 22 sampel adalah dari Divisi Rhodophyta merangkumi 4 order, 5 famili dan 13 genera. Jumlah spesies tertinggi (25 sampel) telah dikenalpasti pada stesen di Batu Rusa diikuti oleh stesen Batu Rakit dengan jumlah spesies sebanyak 18 sampel dan 5 sampel dari stesen Batu Buruk. Walau bagaimanapun, sebanyak 22 sampel hanya dapat dikenalpasti sehingga genus kerana sampel tersebut sukar untuk dikenalpasti. Pengenalpastian adalah berdasarkan kepada karekter morfologi setiap sampel.

ABSTRACT

This study was done in three Rocky areas, Batu Rusa, Batu Rakit and Batu Buruk along the coast of Terengganu with the main objectives of identifying and recording the distribution of its seaweed species. The seaweed species in the 3 areas belonged to 36 taxa: 2 species from Division Cyanophyta, 5 samples from Division Chlorophyta with 3 orders, 4 families and 5 genera; 5 samples in Division Heterokontophyta with 2 orders, 2 families and 4 genera and 22 sample from Division Rhodophyta with 4 orders, 5 families and 13 genera. The most species (25 specimens) were identified in Batu Rusa followed by Batu Rakit with 18 specimens and 5 specimens in Batu Buruk were identified. However 22 samples were identified to genus level only because of their variability. Identification is based on the morphological characteristics of samples.