PHYTOPLANKTON DIVERSITY AND ABUNDANCE IN SETIU WETLANDS

HAIRIYA MUHAMMAD NOOR

FACULTY OF SCIENCE AND TECHNOLOGY
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2004

Tarikh	Waktu Pemulangan	Nombor Ahli	Tanda tangan
8/2/07		UK 10257	
5/3/07		UK 12054	
28/12/09		UK 16011	
17/2/10	9-00	UK 16071	
8/3/10	4.30	UK 18296	
24/3/10		UK 17720	

24/3/10

Lihat sebelah

PHYTOPLANKTON DIVERSITY AND ABUNDANCE IN SETIU WETLANDS

By

Hairina Muhammad Noor

Research Report submitted in partial fulfilment of
the requirements for the degree of
Bachelor of Science (Marine Biology)

Department of Marine Science
Faculty of Science and Technology
Kolej Universiti Sains dan Teknologi Malaysia
2004

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

PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:
Phytoplankton Diversity and Abundance in Setiu Wetlands
oleh Hairina Muhammad Noor, No. Matrik UK5643
telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains-Biologi Marin
Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

Christine A. Orosco

DR. SITI AISHAH ABDULLAH @
CHRISTINE A. OROSCO
Pensyarah
Jabatan Sains Samudera
Fakulti Sains dan Teknologi Malaysia
(KUSTEM)
21030 Kuala Terengganu.

Penyelia Utama

Nama: Dr. Siti Aishah Abdullah

Cop Rasmi:

Tarikh: 8/3/04

PROF. DR. LAW AH THEEM
Pensyarah
Jabatan Perikanan dan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Mengabang Telipot
Kuala Terengganu

Penyelia Kedua (jika ada)

Nama: Prof. Dr. Law Ah Theem

Cop Rasmi:

Tarikh: 10/3/04

Ketua Jabatan Sains Samudera

PROF. MADYA DR. KAMARUZZAMAN B. YUNUS
Ketua
Jabatan Sains Samudera
Fakulti Sains dan Teknologi
Kolej Universiti Sains dan Teknologi Malaysia
21030 Kuala Terengganu.

Nama: Prof. Madya Dr. Kamaruzzaman Yunus

Cop Rasmi:

Tarikh: 11/03/04

ACKNOWLEDGEMENTS

First of all, I would like to thank Allah for giving me strength to finish my final year project this year. From the bottom of my heart, I would like to thank Dr. Siti Aishah Abdullah and Prof. Dr. Law Ah Theem for their supervision and guidance from the beginning of my first term semester (2001) till the end of this semester (2004).

I would like to thank also Puan Kartini Mohamad who guided me during my final year project. Thank you for taking beautiful pictures of phytoplankton for my final year project. I want to thank you to Che Mohd Zan Husin, Abd. Jalal Wahid, Encik Sulaiman and staff from Biodiversity Lab and Oceanography lab for teaching me the use of equipment during my sampling in Setiu. I also want to thank Encik Mohd Azman Senu from Institute of Oceanography for letting me use Museum Biodiversity (lab) for my lab analysis.

I would like to thank three research assistants and master student of Dr. Siti Aishah, Gan Ming Herng, Fong Cheen Far and Chan Kian Weng for helping me during my sampling in Setiu. Thank you to my friend Fiza, Zila and Janet for helping me during my project when I' still feel unwell due to my operation and also to my course mate 3rd Year Marine Biology for support each other when needs help. I also want to thank my friend and roommate Alang, Nora and Za for helping and caring for me during my illness while my final year project was in progress.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF SYMBOLS

α	-	Alpha
$C_6H_{12}O_6$	-	Glucose
CO_2	-	Carbon dioxide
g	-	Gram
H_2S	-	Hydrogen sulphide
H_2O	-	Water molecule
km	-	Kilometre
L	-	Liter
m	-	Meter
mL	-	Millilitre
mm	-	Millimetre
mg	-	Milligram
O_2	-	Oxygen
O	-	Absent
No./mL	-	Number per millilitre
No./L	-	Number per liter
<	-	Less than
ppt	-	Parts per thousand
µm	-	Micrometer
µmol m^{-2} s^{-1}	-	Micromole per meter per second
X	-	Present

LIST OF APPENDICES

ABSTRACT

Phytoplankton is a wandering micro-organism that moved by current that functions as aquatic food chain and primary producer. A study was done in Setiu Wetlands where 12 stations were established during non-monsoon (6 September 2003), intermediate monsoon (9 October 2003) and monsoon season (3 December 2003). The water samples were obtained from approximately 0.5 – 1.0 meter deep. Water (42 L) was filtered using by a 20 µm nanoplankton net. The phytoplankton was preserved with Lugol's iodine. The total number of phytoplankton was counted and identified using Lackey's drop. All the data was calculated using Shannon diversity index, Evenness index, correlation and regression. The species richness in Station 5 was the highest during three seasons. Species richness in station 10 and station 8 during non-monsoon, intermediate monsoon and monsoon season was lower. Station 5 had the highest diversity during non-monsoon and monsoon season while station 11 was the highest during intermediate monsoon. The lowest diversity was in station 10 during non-monsoon and monsoon season. The lowest diversity during intermediate monsoon was station 3. *Chaetoceros*, *Rhizosolenia*, *Bacteriastrum* and *Peridinium* were the most dominant in Setiu Wetlands during non-monsoon while *Anabaena* was dominant during intermediate monsoon. *Cyclotella* and *Fragilaria* were the most dominant during monsoon season. The salinity (ppt) had no correlation with diversity index during the three seasons. In non-monsoon, there was a correlation between No./L of phytoplankton with salinity (ppt) while there was no correlation during intermediate and monsoon season. Other physical factors contribute or effect the growth of phytoplankton besides salinity (ppt).

ABSTRAK

Fitoplankton adalah mikroorganisma yang terampai digerakkan oleh arus. Fitoplankton berfungsi sebagai produktiviti primer dan rantaian makanan. Penyampelan dilakukan di Tanah Lembap Setiu di mana 12 stesyen diplotkan semasa musim bukan monsun (6 Sept. 2003), peralihan monsun (9 Okt. 2003) dan monsun (3 Dec. 2003). Sampel air (42 L) diambil dan ditapis menggunakan jaring nannoplankton (20 μm) sedalam 0.5-1.0 m. Lugol's iodin digunakan untuk mengawet sampel tersebut. Kaedah Lackey drop digunakan untuk bilangan dan identifikasi fitoplankton. Data dianalisis menggunakan indeks diversiti Shannon, indeks kesamarataan, korelasi dan regresi. Spesies kekayaan di Stesyen 5 menunjukkan kelimpahan yang tinggi ditiga musim. Spesies kekayaan di Stesyen 10 dan 8 menunjukkan kelimpahan yang rendah pada semua musim. Stesyen 5 menunjukkan diversiti yang tinggi semasa bukan monsun dan monsun. Sementara Stesyen 11 mempunyai diversiti yang meningkat semasa peralihan monsun. Stesyen 10 pula mempunyai diversiti yang rendah semasa bukan monsun dan musim monsun. Sementara itu, Stesyen 3 juga mempunyai kadar diversiti rendah semasa peralihan monsun. *Chaetoceros*, *Rhizosolenia*, *Bacteriastrum* dan *Peridinium* adalah dominan di Tanah Lembap Setiu semasa bukan monsun. Manakala *Anabaena* dominan semasa peralihan monsun. *Cyclotella* dan *Fragilaria* dominan semasa monsun. Daripada analisis statistik, tiada hubungkait saliniti (ppt) dengan indeks diversiti pada semua musim. Ada hubungkait semasa bukan monsun di antara saliniti dan No./L fitotoplankton. Manakala tiada hubungkait semasa peralihan monsun dan musim monsun disebabkan faktor fizikal yang lain mempengaruhi pertumbuhan fitoplankton selain saliniti (ppt).