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The Abudance and diversity of phytoplankton in selected mangrove areas in Kustem / Hasnul Khatimah Abdul Manaf.

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Kolej Universiti Sains Dan Teknologi Malaysia (KUSTEM)

THE ABUNDANCE AND DIVERSITY OF PHYTOPLANKTON IN SELECTED MANGROVE AREAS IN KUSTEM

By
Hasnul Khatimah Binti Abdul Manaf

Reseach Report submitted in partial fulfillment of
The requirements for the degree of
Bachelor of Science (Marine Biology)

Department of Marine Science
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
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KUSTEM

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PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:
The Diversity and Abundance of Phytoplankton in Selected Mangrove Areas in KUSTEM oleh Hasnul Khatimah Binti Abdul Manaf No. Matrik UK 7947 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

Disahkan oleh:

Penyelia Utama
Nama: DR. SITI AISHAH ABDULLAH @ CHRISTINE A. OROSCO
Cop Rasmi: Pensyarah, Jabatan Sains Samudera, Fakulti Sains dan Teknologi Malaysia (KUSTEM), 21030 Kuala Terengganu.

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LIST OF ABBREVIATIONS/ SYMBOLS

%	-	Percent
<	-	Less than
>	-	More than
×	-	Multiplication
≈	-	Approximately
°C	-	Celcius
µm	-	Micrometer
$C_6H_{12}O_6$	-	Glucose molecule
CO_2	-	Carbon dioxide
g	-	Gram
H_2O	-	Water molecule
L	-	Liter
m	-	Meter
M	-	Molar
m^2	-	Square Meter
m^3	-	Cubic meter
mg	-	Milligram
mg/L	-	Milligram per Liter
Ml	-	Milliliter
mm	-	Millimeter
No./Ml	-	Number per milliliter
ppm	-	Part per million
ppt	-	Part per thousand
r	-	Correlation
R^2	-	R square
v/v	-	Volume per volume
w/v	-	Weight per volume
α	-	Alpha
Σ	-	Total

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ABSTRACT

Phytoplankton abundance and diversity in selected mangrove areas in KUSTEM were examined before monsoon (August) and during monsoon (November) 2005. Sampling was conducted at three stations four times; at high tide and low tide before monsoon and during monsoon season. The water parameters; temperature, salinity, conductivity, total dissolved solids (TDS), dissolved oxygen (DO) and pH for each station were recorded. Water samples collected (40 L) were filtered serially by plankton nets of 60 – 40 – 20 µm mesh size. Samples were preserved with Lugol's Iodine in opaque glass bottles. Water samples (500 mL) for nutrient analyses also collected and nutrients (total ammonium, nitrate, nitrite and ortho-phosphate) were analyzed. Phytoplankton identification and counting were done by Lackey drop method. Phytoplankton abundance was expressed as number of phytoplankton per mL, number per Liter and number of phytoplankton per cubic meter. There were 99 genera of phytoplankton identified; 80 genera before monsoon and 76 genera during monsoon season. Diatoms dominated this area followed by green algae and dinoflagellates. Diversity and Evenness Index of phytoplankton were higher before monsoon than during monsoon and higher at high tide than at low tide. *Peridinium* appeared to bloom before monsoon (135 704 750 cells per cubic meter). From the statistical analysis, there was no correlation between phytoplankton diversity and salinity except for 20-40 µm phytoplankton group before monsoon. There was correlation only between phytoplankton diversity and total ammonium concentration during monsoon season and a correlation between diversity of phytoplankton smaller than 60 µm with nitrate and ortho-phosphate concentration before monsoon season.

ABSTRAK

Kepadatan dan kepelbagaian fitoplankton di kawasan paya bakau KUSTEM dikaji sebelum musim tengkujuh (Ogos) dan ketika musim tengkujuh (November) 2005. Penyampelan dilakukan pada tiga stesen sebanyak empat kali; ketika air pasang dan air surut sebelum dan ketika musim tengkujuh. Parameter air; suhu, salinity, koduktiviti, jumlah jisim terlarut, oksigen terlarut dan pH pada setiap stesen direkodkan. Sampel air (40 L) ditapis bersiri menggunakan jaring fitoplankton bersaiz 60 – 40 – 20 µm. Sampel diawet menggunakan Lugol's Iodine di dalam botol kaca legap. Sampel air (500 mL) juga diambil untuk analisis nutrien (Ammonium, Nitrat, Nitrit, dan Orto-fosfat). Pengenalpastian dan kiraan fitoplankton dilakukan menggunakan kaedah 'Lackey drop'. Kepadatan fitoplankton dinyatakan dalam bentuk bilangan fitoplankton per mL, bilangan per Liter dan bilangan fitoplankton per meter padu.. Terdapat 99 genera fitoplankton telah dikenalpasti di mana; 80 genera sebelum musim tengkujuh dan 76 genera ketika musim tengkujuh. Diatom mendominasi kawasan ini, diikuti alga hijau dan dinoflagelat. Indeks Kepelbagaian dan Indeks Evenness fitoplankton kawasan ini tinggi ketika sebelum musim tengkujuh berbanding di dalam musim dan juga tinggi ketika air pasang berbanding ketika air surut. *Peridinium* seperti mengalami 'bloom' sebelum musim tengkujuh (135 704 750 sel per meter persegi). Dari analisa statistik, tiada hubungan antara salinity dan kepelbagaian fitoplanton kecuali pada kumpulan 20-40 µm sebelum musim tengkujuh. Terdapat hubungan antara kepekatan Ammonium dan kepelbagaian fitoplankton sebelum musim tengkujuh dan hubungan antara kepelbagaian fitoplankton kecil dari 60 µm dengan kepekatan Nitrat dan Orto-fosfat ketika musim tengkujuh.