Lihat sebelah

A STUDY OF DIVERSITY AND ABUNDANCE OF PHYTOPLANKTON IN MENGABANG, KUSTEM

By
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JABATAN SAINS SAMUDERA
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PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: A Study of Diversity and Abundance of Phytoplankton in Mengabang, oleh Siti Aidah @ Siti Hajar Abd. Hamed, No. Matrik, UK 7961 telah diperiksa dan semua pembetulan disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Saujana Sains (Biologi Marin), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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LIST OF ABBREVIATIONS / SYMBOLS

α	-	Alpha
NH_4Cl	-	Ammonium chloride
$(NH_4)\ 6MO_7O_{24}.\ 4H_2O$	-	Ammonium molyblate solution
$(NH_4)_2SO_4$	-	Ammonium sulfate
$C_6H_{12}O_6$	-	Carbonate ion
^{o}C	-	Celcius
$CuSO_4.\ 5H_2O$	-	Copper sulfate
C_2H_5OH	-	Ethanol
g	-	Gram
HCl	-	Hydrochloric acid
<	-	Less than
µ	-	Micron
µg	-	Microgram
µM	-	Micro Mole
mL	-	milliliter
mm	-	millimeter
>	-	more than
$C_{12}H_{14}N_2.\ 2HCl$	-	N-(1-naphtyl)-ethylenediamine dihydrocloride
No./ L	-	Number per liter
No./mL	-	Number per millimeter
ppm	-	Part per million

ppt	-	Part per thousand
%	-	Percent
C_6H_6O	-	Phenol
$K(SbO)C_4H_6O_6$	-	Potassium antimonyl tartrate
KH_2PO_4	-	Potassium Dihydrogen Phosphate/ Potassium Phosphate Monobasic
$C_6H_5Na_2O_7$	-	Sodium Citrate
NaOH	-	Sodium Hydroxide
$NaNO_2$	-	Sodium Nitrite
$Na[Fe(CN)_5NO].2H_2O$	-	Sodium nitropruside
$NH_2.C_6H_4.SO_2.NH_2$	-	Sulfanilamide
$5NH_2SO_4$	-	Sulfuric acid
H_2O	-	Water Molecule

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ABSTRACT

Diversity and abundance of phytoplankton in Mengabang, KUSTEM was exanimated before monsoon season (September) and during monsoon season (November) in 2005. Water samples were collected at 5 stations along Mengabang and collected water was filtered serially through plankton nets of mesh size 60, 40 and 20 µm and preserved in Lugol's solution. The preserved water samples were concentrated in 10 mL sub samples and kept in glass bottles in the laboratory. Phytoplankton identification and cell counting was done using Lacky's Drop Method. Counts were expressed as number of cells per liter, diversity index and evenness index. Nutrient content of water (nitrite, nitrate, ortho-phosphate and ammonium) was also determined. Ammonium showed highest concentration in all sampling stations during both high and low tides before monsoon and within monsoon seasons, followed by nitrate, nitrite and ortho-phosphate. Before monsoon season, 36 genera of phytoplankton were found during high tide and 21 genera of phytoplankton during low tide. Average diversity index was 1.20 to 3.29 for 20µ, 1.97 to 3.17 for 40µ and 1.68 to 3.26 for 60µ during high tide and 0.40 to 2.33 for 20µ, 1.15 to 2.24 for 40µ and 0.41 to 2.97 for 60µ during low tide. Evenness index average was 0.40 to 0.74 for 20 micron, 0.32 to 0.73 for 40 micron and 0.51 to 0.74 for 60 micron during high tide and 0.17 to 0.67 for 20 micron, 0.36 to 0.60 for 40 micron and 0.15 to 0.80 for 60 micron during low tide. During monsoon season, 22 genera of phytoplankton were found during high tide and 21 genera of phytoplankton during low tide. Average diversity index was 0.48 to 1.79 for 20µ, 0.20 to 1.42 for 40µ and 0.20 to 1.46 for 60µ during high tide and 0.32 to 1.44 for

20µ, 0.26 to 1.11 for 40µ and 0.28 to 1.18 for 60µ during low tide. Evenness average dropped during monsoon, which was 0.16 to 0.50 for 20 micron, 0.08 to 0.41 for 40 micron and 0.07 to 0.39 for 60 micron during high tide and 0.02 to 0.41 for 20 micron, 0.11 to 0.35 for 40 micron and 0.12 to 0.33 during low tide. From the statistical analysis, there was no correlation between nutrient concentration and index diversity for 20, 40 and 60 µm mesh size during high tide and low tide, before monsoon and within monsoon at sampling sites.

ABSTRAK

Taburan dan kelimpahan fitoplankton di Mengabang, KUSTEM telah dikaji semasa sebelum musim tengkujuh (September) dan semasa musim tengkujuh (November) pada tahun 2005. Sampel air yang telah dikumpulkan bagi 5 stesen sepanjang Mengabang ditapis dengan jaring plankton yang bersiri 60, 40 dan 20µm dan diawet dengan menggunakan sebatian Lugol. Sampel yang diawet kemudian dipekatkan sehingga 10 mL dan disimpan dalam botol kaca di dalam makmal. Pengenalpastian dan pengiraan sel fitoplankton dengan menggunakan kaedah "Lacky Drop Method". Pengiraan telah dijalankan bagi bilangan sel fitoplankton per liter, index diversiti, index kesamarataan. Analisa kandungan nutrien dalam sampel air (nitrit, nitrat, ortho-phosphat dan ammonia) turut dijalankan. Kandungan ammonia mencatatkan kandungan nutrien yang tinggi di semua stesen semasa air pasang dan air surut serta sebelum musim tengkujuh dan semasa musim tengkujuh, diikuti oleh kandungan nitrat, nitrit dan ortho-phosphat. Sebelum musim tengkujuh 36 genera fitoplankton dijumpai semasa air pasang dan 21 genera fitoplankton semasa air pasang. Purata bagi index diversiti adalah 1.20 hingga 3.29 bagi 20µ, 1.97 hingga 3.17 bagi 40µ dan 1.68 to 3.26 bagi 60µ semasa air pasang dan 0.40 hingga 2.33 bagi 20µ, 1.15 hingga 2.24 bagi 40µ dan 0.41 hingga 2.97 60µ semasa air surut. Purata index kesamarataan adalah 0.40 hingga 0.74 bagi 20µ, 0.32 hingga 0.73 bagi 40µ, dan 0.51 hingga 0.74 bagi 60µ semasa air pasang dan 0.17 hingga 0.67 bagi 20µ, 0.36 hingga 0.60 bagi 40µ, dan 0.15 hingga 0.80 bagi 60µ semasa air surut. Semasa musim tengkujuh, 22 genera fitoplankton dijumpai semasa air pasang dan 21 genera fitoplankton semasa air pasang. Purata bagi index diversiti adalah 0.48 hingga 1.79 bagi

20μ, 0.20 hingga 1.42 bagi 40μ dan 0.20 hingga 1.46 bagi 60μ semasa air pasang dan 0.32 hingga 1.44 bagi 20μ, 0.26 hingga 1.11 bagi 40μ dan 0.28 hingga 1.18 60μ semasa air surut. Purata index kesamarataan menurun semasa musim tengkujuh,iaitu 0.16 hingga 0.50 bagi 20μ, 0.08 hingga 0.41 bagi 40μ, dan 0.07 hingga 0.39 bagi 60μ semasa air pasang dan 0.02 hingga 0.41 bagi 20μ, 0.11 hingga 0.35 bagi 40μ, dan 0.12 hingga 0.33 bagi 60μ semasa air surut. Daripada keputusan analisa statistik, didapati tiada hubungkait di antara kandungan nutrien dengan index diversiti fitoplankton semasa air pasang dan air surut mahupun sebelum musim tengkujuh dan semasa musim tengkujuh.