

THE DIVERSITY AND ABUNDANCE OF PHYTOPLANKTON DURING A  
TIDAL CYCLE AT JETI TANJUNG KUALA, TUMPAT, KELANTAN

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2008

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The diversity and abundance of phytoplankton during a tidal cycl  
at jeti Tanjung Kuala, Tumpat, Kelantan / Daeng Siti Maimunah  
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**THE DIVERSITY AND ABUNDANCE OF PHYTOPLANKTON DURING A  
TIDAL CYCLE AT JETI TANJUNG KUALA, TUMPAT, KELANTAN**

**By**

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

**Department of Marine Science  
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UNIVERSITI MALAYSIA TERENGGANU  
2008**



**JABATAN SAINS MARIN  
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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 During a Tidal Cycle at Jeti Tanjung Kuala, Tumpat, Kelantan oleh Daeng Siti Maimunah Ishak, No.Matrik UK12666 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Biologi Marin, Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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## ACKNOWLEDGEMENT

First, I would like to thank my supervisor, Dr. Siti Aishah Abdullah, for her guidance, inspiration and advice, who never stopped giving me, her full attention and motivation to complete this task perfectly. This project means more than just completing the task but it also exposes me to new experiences and motivates me much to do my best.

I would like to thank my co - supervisor, Prof Madya Sulong Ibrahim, and his master student Mr. Mohd. Yunus Ibrahim, who always helped and advised me to fulfill this task, especially during my first visit to Tumpat, Kelantan,

Much gratitude to Puan Kartini Mohamad, Mr. Tan Wee Jen and Mr. Gan Ming Heng, for their technical support, who always offered their hand and gave advice, to finish this task.

To Siti Raudzah Mohd Zaki, Mahazan Mohammad, Mohd Raimi Mohd Nor and Mohd Amri Maslan thank you for your friendship cooperation and hard work during the sampling. Best wishes to you guys in your projects and future life.

To my mom and dad, thank you for bringing me into this world. Your love and encouragement always give me a new spirit to do my best, and complete my study with flying colors.

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## LIST OF ABBREVIATIONS

<	-	less than
>	-	more than
$\alpha$	-	alpha
%	-	percent
$^{\circ}\text{C}$	-	celcius
cell.L <sup>-1</sup>	-	cell per liter
hr	-	hour
L	-	liter
mL	-	millimeter
m	-	meter
mg/L	-	milligram per liter
No.cell/L	-	Number of cell per liter
$\mu\text{m}$	-	micrometer
ppt	-	part per thousand
r	-	correlation
R <sup>2</sup>	-	R square

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## ABSTRACT

Diversity and abundance of phytoplankton at Tanjung Kuala waterway was examined during a tidal cycle in September 2007. Water sample (42L) was collected every hour within 24 hours, and filtered through 20  $\mu\text{m}$  mesh size plankton net. Filtered water sample was concentrated to 200mL and preserved with Lugol's solution. The preserved water sample was concentrated to 10mL subsamples and kept in glass bottles in the laboratory. Identification of phytoplankton to the genus level and cell counting using Lackey's Drop method was done under light microscope. Calculation was done for density ( $\text{cell.L}^{-1}$ ), diversity index and evenness index. From the results, 80 genera were found within 24 hour observation. During high tide 71 genera were found, and 67 genera were found during low tide. Average diversity index during high tide at 3.8565, and low tide at 3.8397. Average evenness index during high tide was 0.8019, while low tide was 0.7972. Density of phytoplankton during high tide was recorded at 2206  $\text{cell.L}^{-1}$ , whereas the average density during low tide was 2859  $\text{cell.L}^{-1}$ . Bacillariophyta was a major division followed by Dinophyta, Cyanophyta, Chlorophyta and Euglenophyta. *Chaetoceros* and *Rhizosolenia*, were found abundantly at the sampling site during high tide, while the *Peridinium* and *Closterium* increased the density of phytoplankton during low tide drastically. From statistical analysis, there was no correlation between salinity and diversity index of phytoplankton at the sampling site. No significant difference were found between diversity index and evenness index with tidal cycle and day or night

## ABSTRAK

Diversiti dan kelimpahan fitoplankton di saliran Tanjung Kuala di kaji di dalam kitaran pasang surut pada September 2007. Sampel air sebanyak 42L di kumpul setiap jam sepanjang tempoh 24 jam. Air yang di kumpul, ditapis menggunakan jaring plankton 20 $\mu$ m di pekatkan kepada 200mL dan di awet dengan menggunakan larutan Lugol. Sampel air yang telah diwet, di pekatkan lagi sehingga 10mL dan disimpan di dalam botol kaca di dalam makmal. Pengenalpastian fitoplankton kepada peringkat genus dan pengiraan sel dengan kaedah Lackey Drop Method telah dijalankan dibawah mikroskop kompond. Pengiraan dijalankan bagi ketumpatan (sel per liter), indeks diversiti dan indeks kesamarataan. Daripada keputusan, 80 genera dijumpai sepanjang pemerhatian selama 24 jam. Semasa air pasang, 71 genera telah dijumpai dan 67 genera dijumpai ketika air surut. Purata indeks diversiti ketika air pasang pada 3.8565, dan air surut pada 3.8397. Purata indeks kesamarataan ketika air pasang ialah 0.8019, sementara ketika air surut ialah 0.7972. Purata kepadatan fitoplankton ketika air pasang direkodkan pada 2206 sel.L-1, manakala purata kepadatan ketika air surut ialah 2859 sel.L-1. Bacillariophyta merupakan divisi utama diikuti Dinophyta, Cyanophyta, Chlorophyta dan Euglenophyta. *Chaetoceros* dan *Rhizosolenia*, dijumpai dengan banyak di tapak kajian ketika air pasang. *Peridinium* dan *Closterium* meningkatkan kepadatan fitoplankton secara drastik ketika air surut. Daripada keputusan stastiktikal, didapati tidak ada hubungkait antara kemasinan dan indeks diversiti fitoplankton di tapak kajian. Tiada perbezaan purata signifikan diperolehi antara indek diversity dan index kesamarataan dengan kitaran pasang surut dan siang atau malam.