

THE EFFECT OF ULTRAVIOLET-A (UV-A) ON UMT MARINE
PHYTOPLANKTON

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THE EFFECT OF ULTRAVIOLET-A (UV-A) ON UMT MARINE
PHYTOPLANKTON

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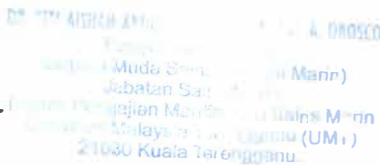


DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: THE EFFECT OF ULTRAVIOLET-A (UV-A) ON UMT MARINE PHYTOPLANKTON by Lim Peng Chia, Matric No. 17114 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Biology), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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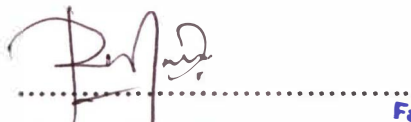
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LIST OF ABBREVIATIONS

UV-A	-	ultraviolet-A
nm	-	nanometer
m	-	meter
μm	-	micronmeter
$^{\circ}\text{C}$	-	degree Celsius
mm	-	millimeter
ml	-	milliliter
g	-	gram
$\text{W m}^{-2}\text{sr}^{-1}$	-	Radiant

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ABSTRACT

Marine phytoplankton is responsible for sequestering an estimated 104 Giga ton carbon per year which is approximately half the photosynthetic production on Earth. Phytoplankton mostly occupies the water surface or photic zone where ultraviolet-A radiation is highest. Scientific concern over ozone depletion in the upper atmosphere has prompted extensive efforts to assess the potential damage to life on Earth due to increased levels of UV radiation. Therefore, 7 species of natural phytoplankton population from University Malaysia Terengganu's beach and 2 species of monoalgal culture have been used to determine the effect of ultraviolet-A radiation on its growth rate, growth dynamic and cell division time. Results showed that there is no significant difference ($p>0.05$) in the growth dynamic except for *Gymnodinium* sp. However, there is slight effect of ultraviolet-A on their growth rate and cell division time where species exposed to ultraviolet-A have lower growth rates and higher cell division time compared to species exposed to non ultraviolet-A radiation. Overall, the results indicate that ultraviolet-A radiation does not have acute effect on natural phytoplankton population.

Kesan Ultraungu-A (UV-A) terhadap UMT marine Phytoplankton

ABSTRAK

Marin fitoplankton bertanggungjawab dalam mengasingkan anggaran 104 Giga tan karbon setahun, kira-kira setengah daripada pengeluaran fotosintesis di Bumi. Fitoplankton menduduki sebahagian besar permukaan air atau zon yg berhubung dengan cahaya di mana radiasi ultraungu-A paling banyak dijumpai. Ilmiah berprihatin atas penyingkiran ozon di atmosfera dan telah mendorong usaha-usaha untuk mengenal pasti potensi kerosakan bagi kehidupan di bumi kerana peningkatan tahap radiasi UV. Oleh kerana itu, 7 jenis fitoplankton dari pantai Universiti Malaysia Terengganu dan 2 jenis spesies kultur telah digunakan untuk mengetahui kesan radiasi ultraungu-A terhadap kadar pertumbuhan, pertumbuhan dinamik dan masa pembahagian sel. Keputusan kajian menunjukkan bahawa tidak ada perbezaan signifikansi ($p > 0.05$) dalam pertumbuhan dinamik kecuali *Gymnodinium* sp. Namun, masih ada sedikit pengaruh ultraungu-A pada kadar pertumbuhan dan masa pembahagian sel di mana spesies terdedah kepada ultraungu-A mempunyai kadar pertumbuhan yang lebih rendah dan lebih tinggi masa pembahagian sel berbanding dengan spesies tidak terdedah kepada radiasi ultrungu-A. Secara keseluruhan, kajian menunjukkan bahawa radiasi ultraungu-A tidak mempunyai kesan berbahaya terhadap fitoplankton.