EFFECTS OF DIFFERENT SALINITY ON THE GROWTH & PROXIMATE COMPOSITION OF *Dunaliella* sp. AT DIFFERENT GROWIH PHASE

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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled **Effects of Different Salinity on the Growth & Proximate Composition of *Dunaliella* sp. at Different Growth Phase** by **Noorazilah Binti Haris** Matric No. **UK25930** have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining **the Degree of Bachelor of Science (Marine Biology)** School of Marine Science and Environment, Universiti Malaysia Terengganu.

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°C	-	degree celcius
g	-	gram
M	-	molarity
ml	-	milliliter
mg/L	-	milligram/liter
N	-	normality
nm	-	nanometer
ppt	-	part per thousand
rpm	-	revolutions per minute

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ABSTRACT

Dunaliella sp. can tolerate different degree of salt stress and can be used in large scale cultivation and may be applied for specific uses. Thus in this study, the effect of different salt treatment (10, 30 and 50 ppt) on the growth and biochemical composition of *Dunaliella* sp. at different growth phase was investigated. Results showed that *Dunaliella* sp. growth in term of cell density and optical density was significantly higher at 10 ppt (9.39×10^6 cells ml^{-1}) compared to 30 ppt (7.59×10^6 cells ml^{-1}) and 50 ppt (9.18×10^6 cells ml^{-1}). In addition, *Dunaliella* sp. grew faster and growth phase shorten in lower salinity compared to higher salinity. The variation of salinity tested had influenced on the biochemical composition of *Dunaliella* sp.. Protein content was significantly higher ($p<0.05$) in 10 ppt (48.74 ± 0.15 % of dry weight) and 50 ppt (50.40 ± 0.18 % of dry weight) in stationary phase meanwhile for 30 ppt (36.16 ± 0.15 % of dry weight) in exponential phase. Carbohydrate content was significantly higher ($p< 0.05$) in stationary phase for all treatment where the highest is 10 ppt (29.58 ± 0.35 % of dry weight) followed by 30 ppt (23.93 ± 0.21 % of dry weight) and 50 ppt (14.55 ± 0.48 % of dry weight). Significantly higher lipids content ($p<0.05$) was recorded in 10 ppt and 50 ppt treatment. The finding of this study can be manipulated and apply for specific uses and high mass production of *Dunaliella* sp. for commercial used.

KESAN SALINITI BERBEZA TERHADAP PERTUMBUHAN DAN KOMPOSISI PROKSIMAT *Dunaliella* sp. PADA SETIAP FASA PERTUMBUHAN

ABSTRAK

Dunaliella sp. boleh mengadaptasi diri terhadap saliniti yang berbeza. Ia juga boleh diusahakan dalam skala besar dan digunakan untuk kegunaan tertentu. Dalam kajian ini, kesan perbezaan saliniti (10, 30 dan 50 ppt) terhadap pertumbuhan dan komposisi biokimia *Dunaliella* sp. pada fasa pertumbuhan berbeza telah dikaji. Berdasarkan dapatan kajian ini, pertumbuhan *Dunaliella* sp. dari segi kepadatan sel dan ketumpatan optik adalah lebih tinggi pada 10 ppt (9.39 x 10^6 sel ml^{-1}) berbanding dengan 30 ppt (7.59 x 10^6 sel ml^{-1}) dan 50 ppt (9.18 x 10^6 sel ml^{-1}). Di samping itu, *Dunaliella* sp. lebih cepat membesar dan fasa pertumbuhan adalah memendek pada rawatan saliniti yang rendah berbanding dengan saliniti yang tinggi. Rawatan saliniti berbeza mempunyai kesan terhadap komposisi biokimia *Dunaliella* sp.. Kandungan protein adalah lebih tinggi ($p<0.05$) pada 10 ppt (48.74 ± 0.15 % dari berat kering) dan 50 ppt (50.40 ± 0.18 % dari berat kering) dalam fasa pegun manakala bagi 30 ppt (36.16 ± 0.15 % dari berat kering) adalah pada fasa eksponen. Kandungan karbohidrat adalan tinggi ($p<0.05$) pada fasa pegun bagi setiap rawatan dimana rawatan saliniti pada 10 ppt mempunyai kandungan karbohidrat tertinggi (29.58 ± 0.35 % dari berat kering) dan diikuti dengan 30 ppt (23.93 ± 0.21 % dari berat kering) dan 50 ppt (14.55 ± 0.48 % dari berat kering). Manakala, kandungan lipid tertinggi ($p<0.05$) dicatatkan pada rawatan 10 ppt dan 50 ppt. Dapatan kajian ini boleh dimanipulasikan untuk kegunaan tertentu dan *Dunaliella* sp. boleh dikultur secara besar-besaran atau pada skala yang besar untuk kegunaan komersial.