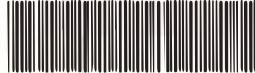


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Effect of zeatin on growth and fatty acid composition clorella sp (UMT-M1) / by Nur Fatin Ahmad.

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EFFECT OF ZEATIN ON GROWTH AND FATTY ACID COMPOSITION IN
CHLORELLA SP. (UMT-M1)

By

NUR FATIN BINTI AHMAD

A PITA report submitted in partial fulfillment of
the requirements for the award of the degree of
Bachelor of Science (Biological Sciences)

DEPARTMENT OF BIOLOGICAL SCIENCES
FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITI MALAYSIA TERENGGANU

2011



JABATAN SAINS BIOLOGI
FAKULTI SAINS DAN TEKNOLOGI
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PENGAKUAN DAN PENGESAHAN LAPORAN PITA

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **EFFECT OF ZEATIN ON GROWTH AND FATTY ACID COMPOSITION IN CHLORELLA SP. (UMT-M1)** oleh **NUR FATIN BINTI AHMAD**, no. matrik: **UK17274** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah **SARJANA MUDA SAINS (SAINS BIOLOGI)**, Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this PITA research report entitled **Effect of Zeatin on Growth and Fatty Acid Composition in *Chlorella* sp. (UMT-M1)** is the result of my own research except as cited in the references.

Signature	:	
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Date	:	16 th June 2011

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EFFECT OF ZEATIN ON GROWTH AND FATTY ACID COMPOSITION IN *CHLORELLA* SP. (UMT-M1)

ABSTRACT

Cytokinin is believed can trigger cell division in *Chlorella* sp. but for production of fatty acid remain unknown. Thus, the influence of zeatin at various concentrations; 0.7, 1.4 and 2.8mg/L were studied for their impact on growth and fatty acid composition in *Chlorella* sp. (UMT-M1) that cultured in F/2 medium with aeration. The culture conditions were maintained as follows; salinity at 30ppt, light illustration 24 hours, temperature at $25\pm1^{\circ}\text{C}$, and light intensity at $150\mu\text{mol photon m}^{-2}\text{s}^{-1}$. The growth of *Chlorella* sp. was measured every two days until day 42 in terms of number of cells according to the values of optical density (OD_{600}). At late of stationary phase on day 42, the cells were harvested for total oil extraction, and gas chromatography for determination of fatty acid composition. The cells number of *Chlorella* sp. (UMT-M1) was highest, 2.68 ± 0.06 ($\times 10^7$ cells/ml) when treated with 2.8 mg/L zeatin. The total oil content was highest, 9.96 ± 7.57 (w/w %), in 2.8mg/L zeatin. SFA was major saturation fatty acid found in *Chlorella* sp. (UMT-M1), but was inhibited when zeatin promoted in it. For MUFA and PUFA, zeatin at 1.4mg/L enhanced the most for production of these fatty acids. Collectively, these data suggest that zeatin was favorable to promote growth in *Chlorella* sp. (UMT-M1), but no significant different in fatty acid composition.

KESAN ZEATIN KE ATAS PERTUMBUHAN DAN KOMPOSISI ASID LEMAK DI DALAM *CHLORELLA* SP. (UMT-M1)

ABSTRAK

Sitokinin dipercayai mampu untuk meningkatkan pembahagian sel di dalam *Chlorella* sp. (UMT-M1), namun masih tidak diketahui untuk penghasilan asid lemak. Maka, kesan pelbagai kepekatan zeatin; 0.7, 1.4, dan 2.8mg/L dikaji ke atas pertumbuhan dan komposisi asid lemak di dalam *Chlorella* sp. (UMT-M1) yang dikultur di dalam media F/2 dengan aerasi . Kondisi kultur ditetapkan seperti berikut; paras kandungan garam 30ppt, ilustrasi cahaya 24jam, suhu pada $25\pm1^{\circ}\text{C}$, dan keamatan cahaya $150\mu\text{mol foton m}^{-2}\text{s}^{-1}$. Pertumbuhan *Chlorella* sp. diukur setiap dua hari hingga hari ke-42 iaitu bilangan sel berdasarkan nilai ketumpatan optic (OD_{600}). Sel dituai pada akhir fasa tetap iaitu pada hari ke-42 untuk penentuan komposisi asid lemak. Bilangan sel *Chlorella* sp. (UMT-M1) adalah tertinggi, $2.68\pm0.06 (\times 10^7 \text{ sel/ml})$ pada zeatin 0.7mg/l. Kandungan minyak adalah tertinggi, $9.96\pm7.57 (\text{w/w \%})$ pada zeatin 2.8mg/L. SFA merupakan asid lemak utama di dalam *Chlorella* sp. (UMT-M1). Bagi MUFA dan PUFA, zeatin pada kepekatan 1.4mg/L paling tinggi meningkatkan penghasilan kedua-dua asid lemak ini. Kesimpulannya, kehadiran zeatin dapat membantu untuk meningkatkan pertumbuhan *Chlorella* sp. (UMT-M1), namun tiada perbezaan signifikansi bagi komposisi asid lemak.