EXTRACTION OF SECONDARY METABOLITE IN *TETRASELMIS SUECICA* USING DIFFERENT SOLVENT POLARITY

MUHAMMAD ALIF FAIZ BIN MOHD DIN

UNIVERSITI SAINS MALAYSIA

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PUSAT PENGAJIAN TEKNOLOGI
INDUSTRI UNIVERSITI SAINS
MALAYSIA

BORANG PENYERAHAN DISERTASI
MUTAKHIR SATU (1) NASKAH

Nama penyelia: Dr. Mohamad Hafizi Abu Bakar

Bahagian: Teknologi Bioproses

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Encik Muhammad Alif Faiz bin Mohd Din

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DR. MOHAMAD HAFIZI ABU BAKAR
SENIOR LECTURER
SCHOOL OF INDUSTRIAL TECHNOLOGY
UNIVERSITI SAINS MALAYSIA

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Tarikh

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by

MUHAMMAD ALIF FAIZ BIN MOHD DIN

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DECLARATION BY AUTHOR

This dissertation is composed of my original work, and contains no material previously published or written by another person except where due reference has been made in the text. The content of my dissertation is the result of work I have carried out since the commencement of my research project and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution.

MUHAMMAD ALIF FAIZ BIN MOHD DIN

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LIST OF SYMBOLS

Symbol	Definition
° C	Degree Celcius
+	Plus
V	Volume
%	Percentage

LIST OF ABBREVIATIONS

Abbreviation	Definition
CO_2	Carbon Dioxide
FID	Flame ionization detector
PUFA	Polyunsaturated Fatty Acid
GC	Gas Chromatography
mL	Millimeter
rpm	Rotation speed
g	Gram
min	Minute
nm	Nanometer
C10	Methyl Decanoate
C12	Methyl Dodecanoate
C14	Methyl-Cis-9-Tetradecanoate

EKSTRAK METABOLIT SEKUNDER DALAM *TETRASELMIS SUECICA* MENGGUNAKAN POLARITI PELARUT YANG BERBEZA

ABSTRAK

Baru-baru ini, terdapat banyak minat terhadap metabolit sekunder yang diekstraks dari sumber semula jadi termasuk mikroalga untuk industri makanan serta sektor farmaseutikal, kosmetik, dan nutraseutikal. Minat ini semakin meningkat dalam kalangan penyelidik sekarang ini. Oleh itu, penyelidikan ini dilakukan untuk menganalisis metabolit sekunder dari *Tetraselmis suecica* yang merupakan mikroalga laut. Secara ringkas, *T. suecica* telah dikultur dalam keadaan normal dalam medium F/2. Selama 15 hari pemantauan pertumbuhan sel, bacaan serapan pada 680 nm direkodkan. Kemudian, biojisimnya telah diekstrak dengan menggunakan kaedah pengekstrakan pelarut. Selanjutnya, ekstrak telah diperoleh menggunakan polariti pelarut yang berbeza iaitu heksana, etil asetat, dan metanol. Hasil ekstrak telah dikira dan dinyatakan bahawa pengekstrakan menggunakan heksana sebagai pelarut yang terbaik di antara ketiga pelarut tersebut. Ekstrak yang dihasilkan menggunakan polariti pelarut yang berbeza telah dianalisakan lebih lanjut menggunakan GC-FID. Terdapat beberapa puncak dalam kromatogram ekstrak menggunakan pelarut yang diuji, namun tidak ada puncak dalam kromatogram ekstrak menggunakan metanol. Ini dapat disimpulkan bahawa terdapat sebatian iaitu C10 (Methyl Decanoate) dalam kromatogram ekstrak menggunakan heksana dan beberapa sebatian dalam kromatogram ekstrak menggunakan etil asetat seperti C10 (Methyl Decanoate), C12 (Methyl Dodecanoate) dan C14 (Methyl- Cis-9-Tetradecanoate).

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ABSTRACT

Recently, there has been much interest in secondary metabolites extracted from natural sources including microalgae for the food industry as well as pharmaceutical, cosmetic, and nutraceutical sectors. These interests have been increasing among researchers nowadays. Therefore, the present investigation was undertaken to analyse the secondary metabolite from *Tetraselmis suecica* which is a marine microalga. Briefly, *T. suecica* was cultured in normal conditions in the F/2 medium. During 15 days of monitoring of the cell growth, the absorbance reading at 680 nm was recorded. Then, its biomass was further extract by using solvent extraction method. Further, the extract was obtained using different solvent polarity which are hexane, ethyl acetate, and methanol. The yield extract was calculated and was revealed that extraction using hexane as solvent was the best among those three solvents. The resulted extract using different solvent polarities was further analyse using GC-FID. There were several peaks present in the chromatogram of extract using the solvents tested, however, there is no peak in the chromatogram of extract using methanol. This can be concluded that there was a compound which is C10 (Methyl Decanoate) in the chromatogram of extract using hexane and several compounds in the chromatogram of extract using ethyl acetate such as C10 (Methyl Decanoate), C12 (Methyl Dodecanoate) and C14 (Methyl-Cis-9-Tetradecanoate)