

ISOLATION OF FATTY ACID FROM SEA CUCUMBER,
Stichopus sp.

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ISOLATION OF FATTY ACID FROM SEA CUCUMBER, *Stichopus* sp.

By

Nor Nabilah Binti Hamsa

**Research Report submitted in partial fulfilment of
the requirement for the degree of
Bachelor of Science (Biology Marin)**

**Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITI MALAYSIA TERENGGANU**

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**DEPARTMENT OF MARINE SCIENCE
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**DECLARATION AND VERIFICATION REPORT
FINAL YEAR RESEARCH PROJECT**

It is hereby declared and verified that this research report entitled:

Isolation of fatty acid from sea cucumbers, Stichopus sp......

by *Nor. Nabiah binti Hamsa*....., Matric No. *UK22454*.....

have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfilment towards obtaining the Degree *B.A. Bachelor of Science (Biology marin)*....., Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

FAME	-	Fatty Acid Methyl Ester
PUFA	-	Polyunsaturated Fatty Acids
MUFA	-	Monounsaturated Fatty Acids
SAFA	-	Saturated Fatty Acids
PBS	-	Phosphate Buffer Saline
SCUBA	-	Self Contained Underwater Breathing apparatus
SD	-	Standard Deviations
GC-MS	-	Gas chromatography–mass spectrometry
ANOVA	-	Analysis of variance
COOH	-	Carboxyl group
BF ₃	-	Boron-trifluoride
H ₂ O	-	Water
sp.	-	Species
mg	-	Milligram
g	-	Grams
ml	-	Millilitre
µm	-	Micrometer
rpm	-	Revolutions per minute
%	-	Percentage
C16:0	-	Caproic acid
C12:0	-	Lauric acid
C14:0	-	Myristic acid
C15:0	-	Pentadecanoic acid
C16:0	-	Palmitic acid
C17:0	-	Heptadecanoic acid
C18:0	-	Stearic acid
C20:0	-	Arachidic acid
C21:0	-	Heneicosanoic acid
C22:0	-	Behenic acid
C23:0	-	Tricosanoic acid
C24:0	-	Tetracosanoate
C14:1n9c	-	Myristoleic acid

C15:1n10c	-	cis-10-Pentadecanoic acid
C16:1n9c	-	Palmitoleic acid
C17:1n10c	-	cis-10-Heptadecenoic acid
C18:1n9c	-	Oleic acid
C18:1n9t	-	Erucic acid
C20:1n11c	-	cis-11-Eicosenoic acid
C24:1n15c	-	Nervonic acid
C18:2n6c	-	Linoleic acid
C20:3n6c	-	cis-8,11,14-Eicosenoic acid
C20:4n6	-	Arachidonic
C20:5n3c	-	cis-5,8,11,14,17-Eicosapentaenoic

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ABSTRACT

This study was conducted at Bidong Island, Terengganu. Sea cucumber has emerged world widely as an important economic commodity due to their significance as nutritional supplement product, medicine and also food. Scientific study was done to prove those importances of sea cucumber by studying fatty acids contain in the body wall of *Stichopus* sp. The lipids from the fresh sea cucumber were obtained by the solvent extraction and the fatty acids methyl ester (FAME) was obtained from one-step method. There are four different extractions in one-step method, that were hexane extract, chloroform extract, ethyl acetate extract and dry sample of the sea cucumber. The concentration and percentage of fatty acids obtain were compared with the four extractions. The result shown that hexane extract contain high concentration and number of fatty acids from the isolation of the sea cucumber. *Stichopus* sp. contains high concentration of saturated fatty acids (SAFA) and least of polyunsaturated fatty acids (PUFA). The most dominant fatty acids found from *Stichopus* sp. were Palmitic acid (C16:0), Stearic acid (C18:0), Palmitoleic (C16:1n9c), Erucic acid (C18:1n9t), *cis*-11-Eicosenoic acid (C20:1n11c), Arachidonic (AA, C20:4n6) and *cis*-5,8,11,14,17-Eicosapentaenoic acid (EPA, C20:5n3).

Pengasingan Asid Lemak dari Gamat, genus *Stichopus*

ABSTRAK

Kajian ini telah dijalankan di Pulau Bidong, Terengganu. Gamat telah muncul di dunia secara meluas sebagai komoditi ekonomi penting kerana kepentingan mereka sebagai produk pemakanan tambahan, ubat-ubatan dan juga sebagai makanan. Kajian saintifik telah dilakukan untuk membuktikan kepentingan gamat dengan mengkaji asid lemak yang terkandung di dalam kulit badan *Stichopus* sp. Lipid dari gamat segar diperolehi oleh pengekstrakan pelarut dan asid lemak metil ester (FAME) telah diperolehi daripada kaedah “one-step”. Terdapat empat pengekstrakan yang berbeza dalam kaedah “one-step”, iaitu ekstrak heksana, ekstrak kloroform, ekstrak etil asetat dan sampel kering timun laut. Kepekatan dan peratusan asid lemak yang diperolehi dibandingkan dengan empat pengekstrakan tersebut. Dari keputusan yang diperolehi didapati bahawa ekstrak heksana mempunyai kepekatan yang tinggi dengan jumlah asid lemak yang paling banyak. *Stichopus* sp. mengandungi kepekatan tinggi asid lemak tepu (SAFA) dan sekurang-kurangnya asid lemak politaktepu (PUFA). Asid lemak yang paling dominan didapati dari *Stichopus* sp. adalah asid palmitik (C16:0), asid stearik (C18:0), asid palmitolik (C16: 1n9c), Asid erucic (C18:1n9t), asid “cis-11-Eicosenoic” (C20:1n11c), arakidonik asid (AA, C20:4n6) dan “cis-5 asid, 8,11,14,17-Eicosapentaenoic” (EPA, C20:5n3).