

ANTI-MICROBIAL AND ANTI-OXIDANT ACTIVITY OF  
PROTEINACEOUS EXTRACT FROM *Acanthaster planci*

CHIA LI PING

BACHELOR OF SCIENCE (MARINE SCIENCE)  
SCHOOL OF MARINE AND ENVIRONMENTAL  
SCIENCES  
UNIVERSITI MALAYSIA TERENGGANU  
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**ANTI-MICROBIAL AND ANTI-OXIDANT ACTIVITY OF  
PROTEINACEOUS EXTRACT FROM *ACANTHASTER PLANCI***

**By  
Chia Li Ping**

**Research Report submitted in partial fulfillment of  
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**FINAL YEAR PROJECT REPORT VERIFICATION  
PENGAKUAN DAN PENGESAHAN LAPORAN**

It is hereby declared and verified that this project report titled **Anti-microbial and Anti-oxidant Activity of Proteinaceous Extract from *Acanthaster planci*** by Chia Li Ping, UK 33585 have been examined and all errors identified have been corrected. This report is submitted to the School of Marine and Environmental Sciences as partial fulfillment towards obtaining the **Bachelor of Science (Marine Science)** from School of Marine and Environmental Sciences, Universiti Malaysia Terengganu.

Verified by:

Date: 29/5/2017

Main Supervisor: **JASNIZAT SAIDIN**  
 Name: Pensyarah  
 Institut Bioteknologi Marin  
 Official stamp: Universiti Malaysia Terengganu  
 21030 Kuala Terengganu



SCHOOL OF MARINE AND ENVIRONMENTAL SCIENCES  
UNIVERSITI MALAYSIA TERENGGAN

DECLARATION

I hereby declare that this dissertation **Anti-microbial and Anti-oxidant Activity of Proteinaceous Extract from *Acanthaster planci*** is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at UMT or other institutions. This report is submitted to the School of Marine and Environmental Sciences as partial fulfillment towards obtaining the **Bachelor of Science (Marine Science)** from School of Marine and Environmental Sciences, Universiti Malaysia Terengganu.

Verified by:

  
.....

Name: Chia Li Ping  
Matriculation no.: UK 33585

Date: 29.05.2017  
.....

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## LIST OF ABBREVIATIONS

%	-	percentage
× g	-	times gravity
μg	-	microgram
μl	-	microliter
C	-	celcius
cm	-	centimeter
g	-	gram
ind	-	individual
km	-	kilometer
Lat	-	latitude
Long	-	longitude
m	-	meter
M	-	molar
mg	-	milligram
ml	-	milliliter
mm	-	millimeter
mM	-	millimolar
nm	-	nanometer

## ABSTRACT

Echinoderms are known as one of the sources that able to produce large variety of novel bioactive compounds. COT starfish *Acanthaster planci* has numerous kinds of protein or peptide which can possess wide of variety of biological activities. The objectives of this study were to isolate proteinaceous extract from *A. planci* and to evaluate anti-microbial and anti-oxidants activity of isolated protein from *A. planci*. The starfish *A. planci* was collected from Pulau Bidong. Its body and spine part was extracted with phosphate buffer solution and ethanol. The anti-microbial activity was tested agaisnt pathogenic bacterial by using well-diffusion method. The anti-oxidant activity also be tested by using 2, 2-diphenyl-1-picrylhydrazyl (DPPH) scavenging assay. There was no inhibitory effect shown in the body and spine extract against tested bacteria *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*, *Bacillus subtilis*, and *Micrococcus* sp. Both extract fraction of phosphate buffer solution and ethanol showed strong anti-oxidant activity with IC<sub>50</sub> values of 0.17-0.30 mg/ml of *A. planci*. The ethanol fraction of *A. planci* body part contained the highest anti-oxidant effects (98 %) at 1.25, 2.5, 5 and 10 mg/ml compared to others phosphate buffer solution fraction. These results indicated that the anti-oxidant activities was possessed by the secondary metabolites but not the proteinaceous compounds in the *A. planci*. This research findings suggest that *A. planci* is a good source of novel anti-oxidant compounds.

## ANTI-MIKROB DAN ANTI-OKSIDAN DI DALAM EKSTRAK PROTEIN DARI ACANTHASTER PLANCI

### ABSTRAK

Echinoderms dikenali sebagai salah satu sumber yang boleh menghasilkan pelbagai kompaun bioaktif baru. Tapak sulaiman *Acanthaster planci* mempunyai banyak jenis protein atau peptida yang bertanggungjawab menghasilkan pelbagai aktiviti biologi. Objektif kajian ini adalah untuk mengasingkan ekstrak protein dari *A. planci* dan menilai aktiviti anti-mikrob dan anti-oksidaan daripada protein yang diasingkan daripada *A. planci*. Tapak sulaiman *A. planci* dikutip dari Pulau Bidong. Bahagian badan dan duri *A. planci* telah diekstrak dengan larutan penimbal fosfat dan etanol. Aktiviti anti-mikrob telah diuji terhadap bakteria patogen dengan kaedah difusi sumur. Penentuan aktiviti anti-oksidaan juga dilakukan dengan kaedah 2, 2-diphenyl-1-picrylhydrazyl (DPPH). Tiada aktiviti perencatan mikrob wujud dalam ekstrak badan dan duri terhadap bakteria *Pseudomonas aeruginosa*, *Escherichia coli*, *Klebsiella pneumoniae*, *Bacillus subtilis*, dan *Micrococcus sp.* Kedua-dua ekstrak larutan penimbal fosfat dan etanol menunjukkan aktiviti anti-oksidaan yang kuat antara 0.17-0.30 mg/ml. Pecahan etanol bahagian badan *A. planci* mengandungi kesan anti-oksidaan yang tertinggi (98 %) pada 1.25, 2.5, 5 and 10 mg/ml berbanding dengan larutan penimbal fosfat. Keputusan kajian ini menunjukkan bahawa aktiviti anti-oksida tidak dikuasai oleh protein tetapi dikuasai oleh metabolit sekunder dalam *A. planci*. Hasil penyelidikan ini telah menunjukkan bahawa *A. planci* merupakan sumber anti-oksida baru yang sesuai.