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

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Lihat Sebelah

ANTI-MICROBIAL AND ANTI-OXIDANT ACTIVITY OF PROTEINACEOUS EXTRACT FROM *ACANTHASTER PLANCI*

By

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Research Report submitted in partial fulfillment of

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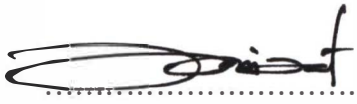
FINAL YEAR PROJECT REPORT VERIFICATION
PENGAKUAN DAN PENGESAHAN LAPORAN

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:



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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.

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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 IC50 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-oksidan 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-oksidan 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-oksidan yang kuat antara 0.17-0.30 mg/ml. Pecahan etanol bahagian badan *A. planci* mengandungi kesan anti-oksidan 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.