

ANTIBACTERIA AND ANTIBIOFILM ACTIVITIES OF GRAM  
POSITIVE BACTERIA ISOLATED FROM INTESTINE OF SEA  
CUCUMBER (*Stichopus horrens*)

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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT  
UNIVERSITI MALAYSIA TERENGGANU

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**Antibacteria and Antibiofilm Activities of Gram Positive Bacteria Isolated from  
Intestine of Sea Cucumber (*Stichopus horrens*)**

**By**

**Zazafareena bt Roslan**

**Research Report submitted in partial fulfillment of  
the requirements for the degree of  
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SCHOOL OF MARINE SCIENCE AND ENVIRONMENT  
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## DECLARATION AND VERIFICATION REPORT

### FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled Antibacteria and Antbiofilm Activities of Gram Positive Bacteria Isolated from Intestine of Sea Cucumber (*Stichopus horrens*) by Zazafareena bt Roslan. Matric No. UK24838 have been examined and all errors identified have been corrected. This report is submitted to the School of Marine Science and Environment as partial fulfillment towards obtaining the Degree of Marine Biology School of Marine Science and Environment, Universiti Malaysia Terengganu.

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## LIST OF ABBREVIATIONS

abs	-	absorbance
g	-	gram
nm	-	nanometer
mm	-	millimeter
$\mu$ l	-	micro liter
$^{\circ}$ C	-	degree celsius
%	-	percentage
mg	-	milligram
rpm	-	revolution per minute
min	-	minute

## ABSTRACT

There was 10 Gram positive bacteria were isolated from this study (SC1, SC2, SC3, SC4, SC5, SC6, SC7, SC8 SC9 and SC10). In primary antibacterial assay bacteria SC1 exhibited moderate activity against all Gram negative targets used with range of inhibition zone between 11-14mm. While the other sample also showed activity against some of Gram negative and positive bacteria with range of inhibition zone between 9-15mm. Based on primary screening bacteria SC1, SC3 and SC9 were selected for second screening in attempt to obtain the minimal inhibition concentration (MIC) . There were no MIC values obtained from the second screening. This probably due to the insufficient of the active component in bacteria crude extract used for the assay. For the antibiofilm activities, bacteria SC2, SC3, SC4, SC5, SC6, SC7, SC8 and SC10 showed antibiofilm activities with  $IC_{50}$  in range between 36  $\mu$ l to 70 $\mu$ l. All the bacteria were identified via 16S rRNA and only 5 bacteria that showed clear band. They were bacteria SC2, SC3, SC4, SC5 and SC6; and were identified as *Bacillus cereus* strain CAB1-1 with 99% similarity, *B.cereus* strain ROK1 with 99% similarity, *Bacillus baekryungensis* strain HNS89 with 99% similarity, *B.cereus* strain VCRC B540 with 100% similarity and *B.cereus* strain VN2 with 99% similarity, accordingly .

**Antibakteria dan Antibiofilm aktiviti daripada pengasingan Bakteria Gram  
Positive dari Usus Gamat (*Stichopus horrens*)**

**ABSTRAK**

Terdapat 10 bakteria Gram Positif yang telah diasingkan daripada kajian ini (SC1, SC2, SC3, SC4, SC5, SC6, SC7, SC8, SC9 dan SC 10). Di saringan pertama ujian antibakteria SC1 menunjukkan aktiviti sederhana terhadap semua sasaran negatif Gram yang digunakan dengan pelbagai zon perencatan antara 11 -14mm . Sampel yang lain juga menunjukkan rencatan untuk bakteria Gram negatif dan positif tertentu dengan pelbagai zon perencatan antara 9-15mm. Dalam pemeriksaan pertama , bakteria SC1 , SC3 dan SC9 dipilih berdasarkan kepada aktiviti-aktiviti mereka dan meneruskan pemeriksaan sekunder bagi memperoleh kepekatan perencatan minimum. Tiada sebarang aktiviti anti-bakteria untuk pemeriksaan sekunder. Bagi aktiviti antibiofilm , sampel bakteria daripada SC2 , SC3 , SC4 , SC5 , SC6 , SC7 , SC8 dan SC10 menunjukkan aktiviti antibiofilm dengan pelbagai IC<sub>50</sub> dalam julat antara 36 µl sehingga 70µl . Semua bakteria telah dikenal pasti menggunakan 16S rRNA assay dan hanya 5 bakteria yang menunjukkan band yang jelas. Bakteria berlabel SC2 telah dikenal pasti sebagai *Bacillus cereus* CAB1 -1 dengan 99 % persamaan, bakteria berlabelkan SC3 telah dikenalpasti sebagai *B.cereus* ROK1 dengan 99 % persamaan, bakteria yang berlabel SC4 telah dikenal pasti sebagai *Bacillus baekryungensis* HNS89 dengan 99 % persamaan, bacteria berlabel SC5 telah dikenal pasti sebagai *B.cereus* VCRC B540 dengan 100 % persamaan dan bacteria berlabel SC6 adalah dikenal pasti sebagai *B.cereus* VN2 dengan 99 % persamaan.