

SCREENING OF ANTIMICROBIAL PROPERTIES FROM MARINE
BACTERIA ASSOCIATED WITH SEA CUCUMBERS
(*Stichopus chloronotus* AND *Holothuria edulis*)
IN BIDONG WATER TERENGGANU

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SCREENING OF ANTIMICROBIAL ACTIVITIES FROM MARINE
BACTERIA ASSOCIATED WITH SEA CUCUMBERS
(*Stichopus chloronotus* and *Holothuria edulis*)
IN BIDONG WATER, TERENGGANU

By

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the requirement for the degree of
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PENSKRINAN AKTIVITI ANTIMIKROBIAL BAKTERIA MARIN
DARIPADA TIMUN LAUT
(*Stichopus Chloronotus* Dan *Holothuria Edulis*)
DI PERAIRAN PULAU BIDONG, TERENGGANU.

Oleh

SHARON AGAPITUS

Laporan Penyelidikan ini diserahkan untuk memenuhi
sabahagian keperluan bagi
Ijazah Sarjana Muda Sains (Biologi Marin)

Jabatan Sains Marin
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**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

Screening of Antimicrobial Activity from Marine Bacteria Associated with Sea Cucumber in Bidong Water, Terengganu (*Stichopus chloronotus* and *Holothuria edulis*) oleh Sharon Agapitus, No.Matrik UK11870 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Marin sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Biologi Marin), Fakulti Pengajian Maritim dan Sains Marin, Universiti Malaysia Terengganu.

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TABLE OF CONTENT

| | Page |
|--|-------------|
| ACKNOWLEDGEMENT | ii |
| LIST OF TABLES | v |
| LIST OF FIGURES | vi |
| LIST OF ABBREVIATIONS | vii |
| LIST OF APPENDICES | viii |
| ABSTRACT | ix |
| ABSTRAK | xi |
| CHAPTER 1: INTRODUCTION | |
| 1.1. Introduction | 1 |
| 1.2. Significant of study | 3 |
| 1.3. Objectives | 3 |
| CHAPTER 2: LITERATURE REVIEW | |
| 2.1. The Holothurians (Sea Cucumber) | 4 |
| 2.2. Holothurians and Bacteria | 5 |
| CHAPTER 3: METHODOLOGY | |
| 3.1. Sampling Location | 9 |
| 3.2. Project Samples | 10 |
| 3.3. Isolation and Purification | 10 |
| 3.3.1. Sample Collection and Preparation In Situ | 10 |
| 3.3.2. Acclimatization | 12 |
| 3.4. Screening of Bacteria | 13 |
| 3.4.1. Preparation of Marine Bacteria Agar Disks | 14 |

| | | |
|---|---|----|
| 3.4.2. | Preparation of Target Microorganisms' Plate | 14 |
| 3.5 | Biochemical Tests and Characterization | 15 |
| 3.5.1. | Gram Staining | 15 |
| 3.5.2. | Oxidase, Catalase and NaOH Test | 17 |
| 3.5.3. | Gram Negative | 18 |
| 3.5.4 | Gram Positive Rod | 23 |
| | | |
| CHAPTER 4: RESULTS | | |
| 4.1 | Isolation and Purification | 28 |
| 4.2 | Screening of Bacteria | 28 |
| 4.3 | Biochemical Tests and Characterization | 33 |
| 4.3.1 | Gram Negative Marine Bacteria | 34 |
| 4.3.2 | Gram Positive Marine Bacteria | 39 |
| | | |
| CHAPTER 5: DISCUSSION | | |
| 4.1 | Isolation and Purification | 41 |
| 4.2 | Screening of Bacteria | 42 |
| 4.3 | Biochemical Tests and Characterization | 44 |
| | | |
| CHAPTER 6: CONCLUSION AND RECOMMENDATION | | |
| 6.1. | Conclusion | 50 |
| 6.2. | Recommendation | 51 |
| | | |
| REFERENCES | | 52 |
| | | |
| APPENDICES | | 56 |
| | | |
| CURICULUM VITAE | | 74 |

LIST OF TABLES

| Tables | Page |
|--|-------------|
| 3.1 Samples collection. | 11 |
| 4.1 List of marine bacteria isolated and chosen for screening. | 30 |
| 4.2 Distribution of types of bacteria from gram staining | 33 |
| 4.3 Primary characterization results for selected marine bacteria (Cont). | 35 |
| 4.4 Results for API kit 20E and identification of gram negative (oxidase negative) bacteria. | 35 |
| 4.5 Additional biochemical tests for gram negative – oxidase negative bacteria. | 36 |
| 4.6 Additional biochemical tests for gram negative – oxidase negative bacteria (Cont) | 36 |
| 4.7 Bacteria identification by API kit 20NE | 37 |
| 4.8 identification of gram positive bacteria by genus | 40 |

LIST OF FIGURES

| Figure | | Page |
|---------------|--|-------------|
| 3.1 | Sampling location map. | 9 |
| 3.2 | <i>Stichopus chloronotus</i> | 10 |
| 3.3 | <i>Holothuria edulis</i> | 10 |
| 3.4 | Screening Method (Modified Agar Disc Diffusion Method). | 13 |
| 4.1 | Percentage of antimicrobial property from the screened marine bacteria. | 31 |
| 4.2 | Distribution of marine bacteria with positive bioactivities by species of sea cucumbers (<i>Stichopus chloronotus</i> and <i>Holothuria edulis</i>). | 31 |
| 4.3 | Distribution of bacteria with positive antimicrobial with respect to body region for <i>Stichopus chloronotus</i> | 32 |
| 4.4 | Distribution of bacteria with positive antimicrobial with respect to body region for <i>Holothuria edulis</i> . | 32 |
| 4.5 | Percentage of gram positive and gram negative bacteria | 33 |
| 4.6 | Percentage of gram positive – oxidase positive bacteria by genus | 38 |
| 4.7 | Percentage of gram positive bacteria identified by genus. | 40 |

LIST OF ABBREVIATION

| | |
|-------------------------------|-------------------------------------|
| Hr | Hours |
| H ₂ S | Hydrogen Sulphide |
| H ₂ S | Sodium trisulphate H ₂ S |
| H ₂ O ₂ | Hydrogen Peroxide |
| KOH | Potassium hydroxide |
| NA | Nutrient Agar |
| NaCl | Sodium Chloride |
| NaOH | Sodium Hydroxide |
| OF | Oxidative-Fermentative |
| SIM | Sulphur Indole Motility |
| SWA | Sea Water Agar |
| Zn | Zinc |
| °C | Degree Celsius |
| μl | Microliter |

LIST OF APPENDICES

| Appendix | | Page |
|----------|--|------|
| A | General methodology of the project | 57 |
| B | Some of the bacteria that show positive and negative results in screening | 58 |
| C | Part of the results for biochemical tests of gram positive bacteria | 59 |
| D | Media preparation for Sea Water Agar (SWA) and Marine Nutrient Agar (MNA) | 60 |
| E | The initial Agar Disc Diffusion Method | 61 |
| F | Raw data for pure culture bacteria isolation | 62 |
| G | Raw data for screening process of bacteria. | 64 |
| H | Primary characterization results for selected marine bacteria. | 66 |
| I | Results for API kit 20NE and identification of gram negative (oxidase positive) bacteria. | 68 |
| J | Characterization and identification of gram positive bacteria by selected conventional biochemical tests | 71 |

ABSTRACT

This study was conducted in advance to isolate, screen and characterize marine bacteria from specified species of sea cucumber which possess antimicrobial properties. The source of marine bacteria in this study is from the stomach and body cavity of each sea cucumber's species which was collected in Bidong water. Four initial bacteria plates were prepared from the samples and it was maintained and cultured in SWA agar. A total of 228 pure colonies bacteria were isolated but only approximately 100 bacteria was used for further study. Only 73 bacteria were successfully maintained and transferred to MNA agar a week before screening. The method used for the screening was Modified Agar Disc Diffusion Method where the cultured bacteria were transferred onto target bacteria agar and the activity was observed in 24 hour incubation. There are six target bacteria used in this study which are *Aeromonas hydrophila*, *Bacillus subtilis*, *Candida albicans*, *Klebsiella pneumoniae*, *Streptococcus agalactia*, and *Staphylococcus aureus*. 62 bacteria show positive bioactivities but 3 were unable to be maintained for biochemical test. There were 40 gram negative bacteria with only 2 oxidase negative bacteria and the other 38 was oxidase positive. These bacteria were characterized and identified by using API 20E and API 20NE respectively. The oxidase negative gram negative bacteria were both identified as *S. maltophilia*. The oxidase positive bacteria identified comprise of *Acinetobacter* sp.(1), *Aeromonas* sp.(4), *Burkholderia* sp.(4), *Chryseobacterium* sp.(1), *Pseudomonas* sp.(2), *Stenotrophomonas* sp.(2), *Vibrio* sp.(21) and 3 unidentified species. All 19 gram positive tested were rods. From selected biochemical tests done, bacteria were identified from the *Corynebacterium* sp.(9) and *Bacillus* sp.(10).

**Penskrinan Aktiviti Antimikrobial Bakteria Marin daripada Timun Laut
(*Stichopus Chloronotus* Dan *Holothuria Edulis*) Di Perairan Pulau Bidong,
Terengganu.**

ABSTRAK

Kajian ini bertujuan untuk mengasingkan, menyaring dan menyifatkan marine bacteria daripada spesies timun laut yang dinyatakan. Sumber marine bacteria ialah daripada abdomen dan kaviti badan setiap timun laut yang disampel di perairan Pulau Bidong. Empat bacteria asal telah disediakan dan dikultur dalam agar SWA. Sejumlah 228 bacteria telah diasingkan tetapi hanya sekurang-kurangnya 100 bacteria digunakan dalam tahap seterusnya. 73 bacteria telah Berjaya dikultur dan ditukarkan ke agar MNA seminggu sebelum penyaringan. Ujian 'Modified agar disc diffusion method' telah digunakan dalam proses penyaringan dimana bacteria yang dikultur dipindahkan ke atas agar bacteria target dan keputusan diambil selepas 24 jam inkubasi. Enam bacteria target telah digunakan iaitu *Aeromonas hydrophila*, *Bacillus subtilis*, *Candida albicans*, *Klebsiella pneumoniae*, *Streptococcus agalactia*, and *Staphylococcus aureus*. 62 bacteria menunjukkan positif bioaktiviti tetapi 3 bacteria tidak berjaya dikultur untuk ujian biokimia. 40 gram negative dikenalpasti dengan hanya 2 oksida negatif dan 38 oksida positif. Bacteria-bacteria ini disifatkan dan dikenalpasti dengan menggunakan API 20E dan API 20NE. kedua-dua gram negative-oksida negative bacteria dikenalpasti sebagai *S. maltophilia*. Bacteria oksida positif yang dikenalpasti berasal daripada genus *Acinetobacter* sp.(1), *Aeromonas* sp.(4), *Burkholderia* sp.(4), *Chryseobacterium* sp.(1), *Pseudomonas* sp.(2), *Stenotrophomonas* sp.(2), *Vibrio* sp.(21) dan 3 bacteria

yang gagal dikenalpasti. Kesemua 19 bakteria gram positif adalah rod. Daripada ujian biokimia yang dipilih, bakteria dikenalpasti berasal daripada genus *Corynebacterium* sp.(9) and *Bscillus* sp.(10).