

**ISOLATION OF BACTERIA FROM MARINE SEDIMENT IN
BIDONG ISLAND AND ITS ANTIMICROBIAL
PROPERTIES**

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**SCHOOL OF MARINE SCIENCE AND ENVIRONMENT
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Lihat Sebelah

**ISOLATION OF BACTERIA FROM MARINE SEDIMENT
IN BIDONG ISLAND AND ITS ANTIMICROBIAL
PROPERTIES**

By

Muhammad Fahmi Bin Sha'ari

**Research Report submitted in partial fulfillment of
the requirements for the degree of
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UNIVERSITI MALAYSIA TERENGGANU**

DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled Isolation Of Bacteria From Marine Sediment In Bidong Island And Its Antimicrobial Properties by Muhammad Fahmi bin Sha'ari, Matric No. UK25773 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 Bachelor of Science (Marine Biology), School of Marine Science and Environment, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS

mm	-	milimeter
uv	-	ultraviolet
bp	-	base pair
g	-	gram
DNA	-	Deoxyribonucleic acid
rRNA	-	ribosomal ribonucleic acid
μ l	-	microliter
kb	-	kilobyte
PCR	-	Polymerase Chain Reaction
%	-	Percentage

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ABSTRACT

Purpose of this research are to isolate the bacteria from the marine sediment of Bidong Island, to study the antimicrobial properties of the bacteria and to identify the bioactive isolates by 16S rRNA sequencing. In this research, the marine sediment sample was took via scuba diving. Sampling was done at Vietnam Beach, Bidong Island and marine sediment sample were purified and cultured by using streak plate method. For the preliminary identification, gram staining procedure was applied in order to identify the morphology of the marine bacteria. Then, for the antimicrobial testing of the bacteria strain, agar diffusion method was used in preliminary screening and 6 marine bacteria strain indicated the presence of antibacterial properties against pathogenic target bacteria. In secondary screening, minimum inhibitory concentration (MIC) was applied. For the 16SrRNA molecular identification, 6 marine bacteria strain was underwent total DNA isolation , polymerase chain reaction (PCR) and electrophoresis. Eventually, 5 marine bacteria strain were selected for DNA sequencing and sent to NCBI database Basic Local Alignment Search Tool (BLAST) and MEGABLAST. In this research, there were 16 single colony marine bacteria strain successfully isolated from the marine sediment of Bidong Island. However, only 6 marine bacteria strain were selected for the secondary screening and no zone of inhibition was shown that being a signal no presence of bioactive compound. Besides, only 5 marine bacteria strain were sent for DNA sequencing and only one strain, SC4 was successfully identified which belongs to *Bacillus amyloliquefaciens*.

PENGASINGAN BAKTERIA DARIPADA SEDIMEN MARIN DI PULAU BIDONG DAN SIFAT-SIFAT ANTIMIKROBNYA

ABSTRAK

Tujuan kajian ini adalah untuk mengasingkan bakteria daripada sedimen marin di Pulau Bidong, untuk mengkaji sifat-sifat anti-mikrob bakteria dan untuk mengenal pasti bioaktif yang diasingkan oleh 16S rRNA urutan. Dalam kajian ini, sampel sedimen marin telah diambil melalui selaman skuba. Persampelan telah dilakukan di Pantai Vietnam, Pulau Bidong dan sampel sedimen marin telah dikultur dengan menggunakan kaedah plat coretan. Prosedur pewarnaan gram telah digunakan untuk mengenal pasti morfologi bakteria laut. Kemudian, untuk ujian antimicrobial bakteria, kaedah penyebaran agar digunakan dalam pemeriksaan awal dan pencegahan 6 bakteria marin menunjukkan kehadiran ciri-ciri antibakteria terhadap bakteria patogenik sasaran. Semasa pemeriksaan kedua, kepekatan pencegahan minimum (MIC) telah digunakan untuk mengenal pasti molekul 16SrRNA, 6 jenis bakteria marin menjalani pengasingan total DNA, tindak balas rantaian polimerase (PCR) dan elektroforesis. Akhirnya, 5 bakteria marin telah dipilih untuk penjujukan DNA dan dihantar ke pangkalan data NCBI (BLAST) dan MEGABLAST. Dalam kajian ini, terdapat 16 bakteria marin berjaya diasingkan daripada sedimen marin Pulau Bidong. Hanya 6 bakteria marin telah dipilih untuk pemeriksaan menengah dan zon perencatan telah menunjukkan tiada kehadiran sebatian bioaktif. Hanya 5 bakteria marin telah dihantar untuk penjujukan DNA dan hanya satu jenis iaitu SC4 telah berjaya dikenal pasti sebagai spesies *Bacillus amyloliquefaciens*.