

IDENTIFICATION OF BACTERIA IN THE
SURROUNDING WATER AND ON SUBMERGED
POLYVINYL CHLORIDE PLATES AT KERTEH
PORT, TERENGGANU.

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Identification of Bacteria in the Surrounding Water and on
Submerged Polyvinyl Chloride Plates at Kerteh Port,
Terengganu.

By

Ain Farhana Binti Mohd Yatim

Research Report submitted in partial fulfillment
of the requirement for the degree of
Bachelor of Science (Marine Biology)

Department of Marine Science
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DEPARTMENT OF MARINE SCIENCE
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DECLARATION AND VERIFICATION REPORT
 FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

IDENTIFICATION OF BACTERIA IN THE SURROUNDING WATER AND ON
 SUBMERGED POLYVINYL CHLORIDE PLATES AT KERTEH PORT, TERENGGANU

by AIN FARHANA MOHD YATIM, Matric No. UK 22579 have
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DECLARATION

I hereby declare that this thesis entitle “**Identification of Bacteria in the Surrounding Water and on Submerged Polyvinyl Chloride Plates at Kerteh Port, Terengganu**” is my own researched except as cited in the bibliography.

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Ain Farhana binti Mohd Yatim

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LIST OF ABBREVIATIONS

PVC	Polyvinyl chloride
EPS	Extracellular polymers
JCV	John Craig Venter
GOS	Global Ocean Sampling Expedition
DNA	Deoxyribonucleic acid
NCBI	National Center for Biotechnology Information's Trace Archive
CAMERA	Cyberinfrastructure for Advanced Marine Microbial Ecology Research and Analysis
TIGR	Institute for Genomic Research
TCAG	Center for the Advancement of Genomics
IBEA	Institute for Biological Energy Alternatives
JCVI	J. Craig Venter Science Foundation
MB	Marine Broth
MA	Marine Agar
TBE	Tris-Borate EDTA
EDTA	Ethylenediaminetetraacetic acid

PCR	Polymerase Chain reaction
EtBr	Ethidium bromide
CFU	Colony Forming Unit
CPS	Components of Polysaccharide
bp	base pair
dH ₂ O	Distilled water

LIST OF SYMBOLS

%	Percentage
mm	Millimeter
M	Meter
g	Gram
L	Liter
ml	Milliliter
°C	Celcius
rpm	rotation per minute
μl	Microliter
m ³	volume
g L ⁻¹	gram per liter
pmol	pico molar
mM	mili molar
psi	Pressure standard unit

Identification of bacteria in the surrounding water and on submerged polyvinyl chloride plates at Kerteh port, Terengganu.

ABSTRACT

This study describes the important of identifying the bacteria in the surrounding water and bacteria adhering on the submerged PVC plates at Kerteh port, Terengganu. The aim and objective of this study are to identify the bacteria in the surrounding water and on submerged PVC plates. Bacteria in the ocean play an important role in biofilms formation and biofouling activities. Based on the preliminary observation on the PVC plates left for one month in the surrounding water, the biofouling activities were occurred at Kerteh port area. The bacteria identified were only limited to laboratories cultivable bacteria. Then, 16S rRNA gene sequences, PCR purification and gel electrophoresis were done for a total of 15 bacterial isolates for both samples. Based on gel electrophoresis result, the amplification of 16S rRNA region was appeared at approximately 1500 base pair and an adequate amount for identification proposed. The sequencing result showed that, the bacteria identified were belongs to same family Vibrionaceae. The bacteria were known as *Photobacterium damsalae*, *Vibrio parahaemolyticus* and *Vibrio hepatarius*. The bacteria identified indicate that, they were present in the surrounding water and adhering on the submerged polyvinyl chloride plates.

**Pengecaman bakteria di dalam air sekitar dan pada permukaan plat polyvinyl
klorida di Perlabuhan Kerteh, Terengganu.**

ABSTRAK

Kajian ini membincangkan kepentingan pengecaman bacteria di dalam air dan bacteria pada permukaan plat PVC di perlabuhan Kerteh, Terengganu. Tujuan dan objektif utama kajian ini adalah untuk mengenalpasti bacteria di dalam air sekitar dan mengenalpasti bacteria di permukaan PVC plat. Bacteria di laut memainkan peranan penting dalam proses biofilms dan aktiviti biofouling. Berdasarkan pemerhatian awal pada PVC plat yang ditinggalkan di dalam air selama satu bulan, aktiviti biofouling berlaku di Perlabuhan Kerteh. Antara faktor kawasan seperti kadar nutrien yang mencukupi dan suhu optimum akan menyebabkan proses biofilms terbentuk. Bacteria akan diperkaya dengan menggunakan nutrien terpilih dengan menggunakan pencairan bersiri. Bacteria yang melalui proses pengecaman hanya bacteria yang boleh dikultur di dalam makmal sahaja. 16S rRNA gen dan elektrophoresis gel telah dijalankan untuk 15 jenis bacteria. berdasarkan keputusan 16S rRNA gen menunjukkan bacteria yang dikenal pasti adalah kepunyaan keluarga yang sama iaitu Vibrionaceae. Bacteria yang dikenal pasti adalah '*Photobacterium damsalae*', '*Vibrio parahaemolyticus*' dan '*Vibrio hepatarius*'. Bacteria yang dikenal pasti, menunjukkan mereka boleh berada di dalam air sekitar dan permukaan PVC plat.