ANTIBACTERIAL ACTIVITY OF COMPOUNDS ISOLATED FROM HORSESHOE CRABS, *TACHYPLEUS GIGAS*-ASSOCIATED BACTERIA

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MASTER OF SCIENCE
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Thesis Submitted in Fulfilment of the Requirement for the Degree of Master of Science in
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This thesis is dedicated to:

My beloved parents, siblings, friends

and lastly, my laboratory mates

for supporting me all the way!

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfilment of the requirements for the degree of Master of Science

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Institute : Institute of Marine Biotechnology

Abstract

Interest in the relationship between bacteria and marine organisms is growing these days due to its potential in pharmaceutical industries. As one of the superior invertebrates in an entropic environment, it is crucial to identify marine bacteria associated with horseshoe crabs and the compound produced which is believed to have antibacterial agents. A total of 62 bacterial isolates were successfully isolated from *T. gigas* collected in Pahang, Malaysia and identified. The marine bacteria were isolated and selected potential bacteria which show antibacterial activity against test strains *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis* and *Salmonella thypimurium* were observed. The potential bacteria S1, S3, S14 and S18 which showed consistent antibacterial activity were tested against the test strains by Disk

Diffusion Test and Well Diffusion Test. The potential bacteria were identified by 16s rDNA sequencing. The bacterial isolates were observed to form consortia in Air Membrane Surface culture based on the type of strains, production of antibacterial compounds, and strength of antibacterial activity. Chemical profiles from the crude extract of S14, S18 and consortia, C3 were identified by Gas Chromatography-Mass Spectrometry (GC-MS). Results showed a 61.3% domination of Gram-negative bacteria. 17.7% of the total isolates showed antibacterial activities. The potential antibacterial producer S1 and S14 was identified as *Vibrio* sp. whereas S3, and S18 was identified as *Pseudoalteromonas* sp.. The combination of bacteria to form bacteria consortia, C3 gives a better result than a single colony, with a broad-range antibacterial activity. The antibacterial components were identified as 2-Aminobenzoxazole, stearic acid, and palmitic acid. The recovery of strains with antibacterial activity suggested that *T. gigas* represent an ecological niche which shelters microbial diversity that enhanced the production of antibacterial compounds. A new approach should be incorporated into bacteria consortium culture technique in future research for novel antibiotics.