

Comparison distribution of *Vibrio* species in stocking to harvesting process of shrimp at commercialize shrimp farm

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Abstract— *Vibrio* species is one of the pathogenic bacteria infecting shrimps in aquaculture farm has caused severe loss to the aquaculture farm. The aim of this research is to isolate and compare the presence of *Vibrio* spp. in commercialize shrimp farm during the stocking process and the final harvest phase of shrimp productions. Quantification and isolation were conducted and measured using Log CFU (colony forming units) counts and morphological investigation gram staining and conventional biochemical test identification. A total of sixty-four (n=64) sediment and water samples were collected from the inlet and outlet of the two selected shrimp ponds (Pond A and Pond B) in Kampung Telaga Air, Kuching, Sarawak. As a result, the bacteria count from water samples during stocking period at both shrimps ponds were 6.6 Log CFU/ml and 5.6 Log CFU/ml while during harvesting period were 5.3 Log CFU/ml and 5.8 Log CFU/ml. Meanwhile, bacteria count sediments samples during stocking period at both shrimp ponds were 5.5 Log CFU/g and 5.7 Log CFU/g whereas harvesting period at showed both shrimps pond were 5.2 Log CFU/g and 4.8 Log CFU/g. The finding showed the *Vibrio* sp. identified in sediment samples were *V. parahemolyticus* with 27%, followed by *V. alginolyticus* (22%), *V. cholerae* (16%), *V. fluvialis* (14%) and 7% of *V. fulmisi* and *V. vulnificus* and *V. mimicus*. Meanwhile, the *Vibrio* sp. identified in water samples were *V. fluvialis* with 29%, followed by *V. alginolyticus* (22%), *V. parahemolyticus* (19%) and 10 % were *V. fulmisi*, *V. mimicus* and *V. vulnificus*. The study has been carried out further by investigated the Antibiotic Susceptibility Test (AST) using erythromycin (15 ug/ml), ampicillin (10 ug/ml), and streptomycin (25 ug/ml). The positive cultures from sediment samples showed Ampicillin resistant profile was > 0.2 MAR index while fifty percent (50%) of the isolates from water samples were resistant to ampicillin. Therefore, this study has profound implications for further monitoring process from the stocking process towards the harvesting process in order to prevent any *Vibrio* sp. infection which caused shrimp's disease or food safety issue related to public consumption or of shrimps in future.

Keywords—Antibiotic-resistant profile, antibiotic susceptibility test, shrimp aquaculture farm, stocking vs. harvesting, *Vibrio* sp.

I. INTRODUCTION

Aquaculture is defined by Food and Agriculture Organization (FAO) (2013), as the farming of aquatic organisms such as fish, mollusks, crustaceans and aquatic plants [1]. Farming of the aquatics organisms implies some procedure to enhance the production. The process involves regular stocking, feeding, and protection from predators or harmful diseases. Aquatics organisms which are harvested for export purposes must go through several stages of export compliances with the local authorities prior to be marketed as it is considered the most traded food supply for the world. According to FAO (2010), aquaculture has the potential to meet the increasing global demand for nutritious seafood and to contribute in the aspect of national economies besides supporting the sustainable livelihoods of human communities [2]. According to the South East Asian Fisheries Development Center (SEAFDEC), the contribution from Malaysian aquaculture industries was 506,454 tonnes valued at MYR 3.3 billion in year 2016. Approximately 100 000 tonnes comes from freshwater products while marine products consist approximately 400 000 tonnes of the production.

Increasing demand from international market and decreasing percentages of shrimp catch lead to the blooming of commercial shrimp aquaculture in many countries including Malaysia [3]. *Penaeid* species, also known as shrimp, such as *P. vannamei* (white leg shrimp) and *P. monodon* (tiger shrimp) which are the widely used products from shrimp aquaculture were cultivated in Asian [4]. Shrimp cultivation which usually located at estuary and coastal area also provide job opportunities and better livelihood for local people.