

Isolation and Characterization of Infectious *Vibrio* Species from the Whiteleg Shrimp: *Litopenaeus vannamei* †

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† Presented at International e-Conference on Bioengineering for Health and Environment (ICBHE 2020)

Received: 5.07.2020; Revised: 10.07.2020; Accepted: 12.07.2020; Published: 15.07.2020

Abstract: Aquaculture shrimp farming has serious problems with diseases caused by viruses and bacteria, which lead to severe economic loss. The genus *Vibrio* is a group of facultative anaerobic microbes, most frequently found in aquatic environments and marine hosts. The Gram-negative genus *Vibrio* is one of the most important classes of bacterial pathogens in aquaculture systems and is a key cause of high mortality. The isolation, identification, and molecular characterization of *Vibrio* spp are studied from infected shrimp *Litopenaeus vannamei*. The microorganisms were isolated from the tissues of a white gut infected shrimp collected from diseased aquaculture ponds. After subculturing, microbial isolates were obtained using TCBS agar plates for *vibrio* selection, and the biochemical key was developed. Meanwhile, 11 isolates of bacteria belonging to the Vibrionaceae family have been identified in this study. For these, six *Vibrio* species-related isolates are responsible for vibriosis in the shrimp. These included *Vibrio harveyi*, *Vibrio campbellii*, *Vibrio parahaemolyticus*, *Vibrio owensii*, *Vibrio rotiferianus*, and *Vibrio alginolyticus*. The extraction of DNA was carried out with a QIAamp DNA Mini Kit (QIAGEN). The extracted DNA was analyzed using an electrophoresis of 1 % agarose gel, the consistency and quantity of *Vibrio* spp's gDNA. NanoDrop™ 2000 spectrophotometer (Thermo Scientific) was used for determination. In addition, the Agilent 2100 Bioanalyzer (Agilent Technologies) has been used to verify the gDNA libraries' validity, purity, concentration, and scale. In addition, *Vibrio* spp, a phylogenetic tree focused on maximum likelihood and bootstrapping, was performed using the MEGA version to examine the evolutionary phylogenetic relationship between the strains. This study's main objective would be useful in integrating strain variation in predicting microbiology and microbial risk assessment and may provide scientific guidelines for major *Vibrio* strains that may be responsible for vibriosis infection in the management of shrimp aquaculture disease.

Keywords: Aquaculture; Shrimp farming; Vibriosis; *Litopenaeus vannamei*; DNA extraction.

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Funding

This research received no external funding.

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.

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