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Identification of *Vibrio parahaemolyticus* isolates by PCR targeted to the *toxR* gene and detection of virulence genes

¹Zulkifli, Y., ^{1*}Alitheen, N. B., ²Son, R., ¹Yeap, S. K., ³Lesley, M. B. and ¹Raha, A. R.

¹Department of Cell and Molecular Biology, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

²Centre of Excellence for Food Safety Research, Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

³Department of Molecular Biology, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

Abstract: *Vibrio parahaemolyticus* is a gram negative bacterium and causes gastrointestinal illness in humans. In this study, twenty five out of fifty cockle samples from Padang, Indonesia produced purple colonies when they were grown on selective medium, CHROMagar™ *Vibrio*. Specific-PCR for *toxR* gene detection gave positive results in which a band with 368 base pairs size appeared on the gel for all the isolates that confirmed the presence of *V. parahaemolyticus*. In the virulence properties test, all the isolates showed negative results for *tdh* and *trh* genes detection. The results indicate that the isolates under this study do not contain virulence properties that correlate to the ability of infection and diseases, which means that they are non-pathogenic.

Keywords: *Vibrio parahaemolyticus*, *toxR* gene, PCR, *trh* gene, *tdh* gene

Introduction

V. parahaemolyticus is a bacterium in the same family as those that cause cholera. It lives in brackish saltwater and causes gastrointestinal illness in humans. It is a halophile, or salt-requiring organism. Most people become infected by eating raw or undercooked shellfish, particularly oyster and cockles. At least 12 *Vibrio* spp. are classified as pathogenic strains and become major factor for foodborne diseases. *V. parahaemolyticus* caused about 25% of total foodborne diseases in comparison to other vibrio species (Feldhusen, 2000). Three species of vibrio (from 28 species) that are often associated with *V. parahaemolyticus* in

aquatic environmental and seafood are *V. vulnificus*, *V. alginolyticus* and *V. cholerae*.

V. parahaemolyticus is a major cause of foodborne illness such as gastroenteritis in human through consumption of undercooked seafood or wounds exposed to marine animals or warm coastal waters especially in Southeast Asian (Wong *et al.*, 2000). This is because a short warm period (temperature range from 10°C-43°C, optimum is 37°C) is sufficient for *V. parahaemolyticus* which has short generation time (8-9 minutes) to grow until infectious levels (10⁶ organisms) (Daniels *et al.*, 2000).

There are many methods used in the detection of *V. parahaemolyticus*. The

*Corresponding author.
Email: noorjahan@biotech.upm.edu.my