

## Antibiotic resistance of vibrio parahaemolyticus isolated from cockles and shrimp sea food marketed in Selangor, Malaysia

### ABSTRACT

**Introduction:** The main aim of this study is to determine the antibiotic profile of *V. parahaemolyticus* gastroenteritis associated with the consumption of contaminated shrimp and cockles marketed in Selangor Malaysia. *V. parahaemolyticus* is the leading cause of seafood-associated gastroenteritis in Asian Countries typically is associated with the consumption of raw shellfish and oysters specially shrimp and cockles. Rapid, sensitive and specific detection methods are needed to control *V. parahaemolyticus* infections. We describe a recognized the pathogenic *V. parahaemolyticus* in shrimp and cockles that will be the risk of gastroenteritis associated with the consumption of seafood marketed in Malaysia.

**Methods:** This study was carried out between July 2011 and August 2013 at the Center of Excellence for Food Safety Research, Faculty of Food Science and Technology, Faculty of Medicine and Health Sciences, Department of Biomedical Sciences, and Faculty of Biotechnology, Dep. of Cell and Molecular Biology, University Putra Malaysia and other centers as collaboration. The seafood samples were collected from different markets and more than 400 samples from shrimp and cockles were investigated for detection and isolation of *V. parahaemolyticus*. CHROMagar Vibrio and TCBS agar media were used for fast detection and isolation of *V. parahaemolyticus* isolates. PCR based methods targeted to *toxR* regulatory gene, *tlh* the species and family gene, *tdh* and *trh* the virulence genes were extensively used. The antibiotic susceptibility testing of 65 *V. parahaemolyticus* isolates recovered from retail shrimp and cockles seafood were determined with four types of E-test antibiotic strips.

**Results:** All the 65 isolates were positive to *toxR* and *tlh* genes. Out of 65 isolates, only eight isolates (12.31%) were positive for *tdh* virulence gene isolated from cockles and shrimp (3 isolates from shrimp and 5 isolates from cockles), whereas twenty six (40%) isolates were positive for *trh* virulence gene isolated from shrimp and cockles (9 from shrimp and 17 from cockles). This result indicates high occurrence of *tdh*<sup>+</sup> and *trh*<sup>+</sup> isolates in shrimp and cockles marketed in Malaysia. None of the isolates tested possess both virulence genes. For the antibiotic E-test susceptibility test, overall, *V. parahaemolyticus* remained susceptible to tetracycline (97%). A slight increase in the susceptibility of tetracycline is observed from 2011 to 2013. While reduced susceptibility was detected only in *V. parahaemolyticus* for ampicillin. The mean of MIC of the isolates toward ampicillin is increased from 64 µg/ml in 2011 to 128 µg/ml in year 2013. The current study demonstrates a high risk of pathogenic *V. parahaemolyticus* in the shrimp and cockles marketed in Selangor Malaysia.

**Conclusions:** The potential risk of *V. parahaemolyticus* infection due to the consumption of contaminated seafood in Malaysia should not be neglected. The increased resistance of ampicillin from our studies in Malaysia since 2004 to 2013 could be in indication of antibiotic abuse in clinical and agricultural used of ampicillin in Malaysia.

**Keyword:** *Vibrio parahaemolyticus*; Antibiotic E-test; *toxR*; *tlh*; *tdh*; *trh*; CHROMagarvibrio