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Detection of antibiotic resistant *Vibrio parahaemolyticus* in seafood and managementVengadesh Letchumanan¹, Kok-Gan Chan¹, Bey-Hing Goh² and Learn-Han Lee²¹University of Malaya, Malaysia²Monash University Malaysia Campus, Malaysia

Statement of the Problem: The rising occurrence of antibiotic resistant foodborne pathogen in the environment is of food safety concern. Humans and animals are at greater risk of contracting gastroenteritis by ingesting of contaminated seafood. Prophylactic and therapeutic usage of antibiotics has become the mainstay of managing bacterial infections in aquaculture products however this in turn led to the emergence of multidrug resistant strains of bacteria in the environment. The occurrence of Multidrug-Resistant (MDR) bacteria to clinically used antibiotics is a major health issue and a great challenge to the worldwide drug discovery programs. This has raised awareness of the critical need for alternative non-antibiotic based methods of preventing and treating bacterial infections. The purpose of this study is to detect antibiotic resistant *Vibrio parahaemolyticus* from seafood and incorporate proper management strategies to curb the occurrence of multidrug resistance.

Methodology & Theoretical Orientation: A microbiological method and molecular detection of *Vibrio parahaemolyticus* is applied to isolate the bacteria from seafood. Further the antibiotic resistance profile is determined as well as plasmid curing in performed in order to identify the resistance mediation.

Findings: The study isolated a total of 200 *Vibrio parahaemolyticus* from seafood. Out of these 200 isolates, 6.5% (13/200) were trh-positive while none were tdh-positive. The isolates demonstrated high resistance to several antibiotics tested including second and third-line antibiotics with 88% resistant to ampicillin, 81% to amikacin, 70.5% to kanamycin, 73% to cefotaxime and 51.5% to ceftazidime. The MAR index ranged from 0.00 to 0.79 with the majority of samples having an index of 0.36 (resistant to 5 antibiotics). Among the 13 trh-positive strains, almost 70% (9/13) demonstrated resistance to 4 or more antibiotics. After plasmid curing, the plasmid containing pathogenic strains isolated in our study have chromosomally mediated ampicillin resistance while the remaining resistance phenotypes are plasmid mediated.

Conclusion & Significance: The results indicate that while the incidence of pathogenic *Vibrio parahaemolyticus* in seafood still appears to be at relatively reassuring levels, antibiotic resistance is a real concern and warrants ongoing surveillance. Management of antibiotic resistance could be achieved by utilizing non-antibiotic therapeutic.

Recent Publications

1. Heng S-P, Letchumanan V, Deng C-Y, Ab Mutalib N-S, Khan TM, Chuah L-H, Chan K-G, Goh B-H, Pusparajah P and Lee L-H (2017) *Vibrio vulnificus*: An Environmental and Clinical Burden. *Front. Microbiol*; 8: 997.
2. Letchumanan V, Chan K-G, Khan TM, Bukhari SI, Ab Mutalib N-S, Goh B-H and Lee L-H (2017) Bile Sensing: The Activation of *Vibrio parahaemolyticus* Virulence. *Front. Microbiol*; 8: 728.

Biography

Vengadesh Letchumanan has the experience in the molecular biology and microbiology. His interest is into the study and identification of various foodborne pathogens, their diversity, characteristics, multidrug resistant and management. Currently he is pursuing PhD degree on identification and characterization of antibiotic resistant *Vibrio parahaemolyticus* from seafood. He has written many journal articles and review articles on the management aspect of foodborne pathogens in the environment.

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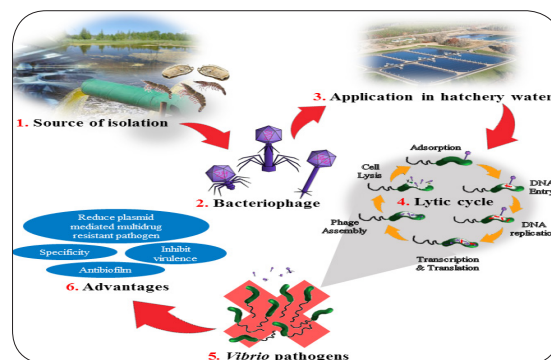


Figure-1: Illustration on bacteriophage application in the aquaculture and the advantages.