Foods 2024 Conference

The 5th International Electronic Conference on Foods

28–30 October 2024 | Online

MDPI

PREVALENCE AND ANTIBIOTIC RESISTANCE PROFILE OF *Vibrio vulnificus* IN WHITELEG SHRIMP (*Litopenaeus vannamei*)

Noor Azira Abdul Mutalib[1,2], Nor Adeline Sheena Faizal[1], Epeng Lee[2]

[1]Faculty of Food Science and Technology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

[2]Institute of Tropical Agriculture and Food Security, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

INTRODUCTION & AIM

Shrimp aquaculture in Malaysia has expanded to meet the increasing demand for food commodities, mainly focusing on whiteleg shrimp (*Litopenaeus vannamei*).

The shift towards intensive farming systems has been adopted to enhance productivity. However, these high-density farming practices elevate the risk of disease outbreaks, including contamination by pathogenic bacteria such as *Vibrio vulnificus*.

This Gram-negative bacterium is associated with serious health issues, including gastroenteritis, which can lead to severe wound infections or fatality. It also poses a substantial public health risk due to the emergence of multidrug resistance (Letchumanan et al., 2015).

Objectives:

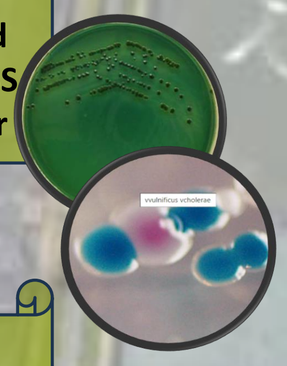
1. To determine the prevalence rate and quantify the presence of *Vibrio vulnificus* in a whiteleg shrimp.
2. To examine antibiotic resistance profile of isolated *Vibrio vulnificus*.

METHOD

Sample collection

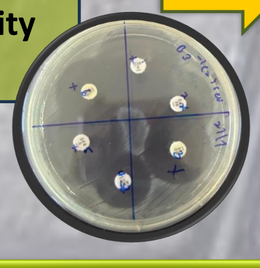
Enumeration (Most probable number)

Enrichment and isolation on TCBS and Chrom agar



PCR

Antibiotic susceptibility test



Data analysis (Excel and Minitab20)

RESULTS & DISCUSSION

Table 1: Prevalence of *V. vulnificus* in wet market and hypermarket

Location of samples	Total of samples collected	Positive samples with V. vulnificus	Percentage of positive samples
Wet market	34	14	51.85%
Hypermarket	33	13	48.15%
Total	67	27	40.30%

Table 2: Most probable number of *V. vulnificus*

Location of samples	Mean MPN/g of *V. vulnificus*	SD	*P*-value
Wet market	1.4×10^4	2.1×10^4	0.432
Hypermarket	8.2×10^3	1.7×10^4	

No. significant difference in MPN between wet market and hypermarket

Table 3: Antibiotic susceptibility test *V. vulnificus*

Antibiotic	Disk content (µg)	Number of Isolates in Zone Diameter Breakpoints (%)					
		Susceptible	(%)	Intermediate	(%)	Resistant	(%)
Ciprofloxacin	5	2	20	3	30	5	50
Ceftazidime	30	4	40	3	30	3	30
Doxycycline	30	6	60	2	20	2	20
Ampicilin	10	2	20	0	0	8	80
Ofloxacin	5	1	10	6	60	3	30
Tetracycline	30	3	30	4	40	3	30
Chloramphenicol	30	0	0	8	80	2	20
Gentamicin	10	0	0	3	30	7	70
Levofloxacin	5	0	0	7	70	3	30
Penicilin	10	0	0	2	20	8	80
Amikacin	30	2	20	5	50	3	30
Amoxycillin	20	0	0	0	0	10	100
Imipenem	10	2	20	0	0	8	80
Meropenem	10	0	0	6	60	4	40
Azithromycin	15	0	0	4	40	6	60
Cefepime	30	1	10	3	30	6	60
Cefuroxime	30	3	30	1	10	6	60
Piperacillin- Tazobactam	100/10	3	30	2	20	5	50

High concern about *V. vulnificus* that shows resistance to ampicillin, penicillin, amoxycillin and imipenem. Aligns with the findings by Amalina et al. (2019)

Table 4: Antibiotic susceptibility test *V. vulnificus*

Antibiotics	No. and percentage of isolates that were resistance	Multiple Antibiotic Resistance (MAR) index
Amoxycillin	10 (100%)	0.2
Ampicillin	8 (80%)	
Penicillin	8 (80%)	
Imipenem	8 (80%)	

MAR Index 0.2 shows low to moderate resistance → need for careful monitoring and intervention to prevent the further spread of resistance

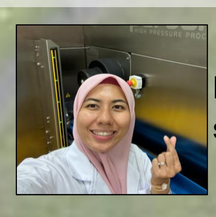
CONCLUSION

- 40.30% of the samples were contaminated with *V. vulnificus* and there was no significant difference in MPN between the wet market and hypermarket.
- 40% of *V. vulnificus* were highly resistant to ampicillin, penicillin, amoxicillin, and imipenem and the MAR index showed a value of 0.2.
- The results highlighted concerns regarding bacterial contamination levels in wet and hypermarkets, which lead to a potential health risk. Continued monitoring of the presence and antimicrobial resistance profile of *Vibrio Vulnificus* in various aquatic sources is necessary to ensure the seafood safety.

REFERENCES

- Amalina, N.Z., Santha, S., Zulperi, D., (2019). Prevalence, antimicrobial susceptibility and plasmid profiling of *Vibrio* spp. isolated from cultured groupers in Peninsular Malaysia. BMC Microbiol,19, 251.
- Letchumanan, V., Pusparajah, P., Tan, L.T.H., Yin, W.F., Lee, L.H., Chan, K.G. (2015). Occurrence and antibiotic resistance of *Vibrio parahaemolyticus* from shellfish in Selangor, Malaysia. Front. Microbiol. 6, 1417.

Dr. Noor Azira Abdul Mutalib
n_azira@upm.edu.my



Nor Adeline Sheena Faizal
sheena_zadel@yahoo.com

Lee Epeng
3epeng93@gmail.com