ANTIMICROBIAL RESISTANCE PATTERNS AND VIRULENCE GENE PROFILES OF *Aeromonas* spp. IN VACCINATED AND NON-VACCINATED STRIPED CATFISH (*Pangasianodon hypophthalmus*)

Tran Thi My Duyen*[1], Bui Thi Bich Hang[1], Tran Minh Phu[1], Nguyen Thanh Phuong[1], Nguyen Ngoc Du[2], Le Hong Phuoc[2] and Anders Dalsgaard[3,4]

[1]College of Aquaculture and Fisheries, Can Tho University, Can Tho city, Vietnam;
[2]Institute for Aquaculture No.2, Ho Chi Minh city, Vietnam;
[3]International Centre for Antimicrobial Resistance Solutions, Copenhagen, Denmark;
[4]Department of Veterinary and Animal Sciences, University of Copenhagen, Frederiksberg, Denmark
Email: *ttmduyen@ctu.edu.vn*

01 Introduction

This study investigated antimicrobial resistance patterns and virulence gene profiles of *Aeromonas* spp. isolated from diseased vaccinated and non-vaccinated striped catfish (*Pangasianodon hypoththalmus*) cultured in Dong Thap and Vinh Long provinces, Vietnam

02 Methods

2.1 Sample collection

Striped catfish exposing clinical signs such as hemorrhagic septicemia and ulcers were collected from vaccinated (Alpha Ject Panga 2) and non-vaccinated ponds in Dong Thap and Vinh Long provinces, Vietnam.

2.2 Bacterial isolation and identification

Bacteria were isolated from liver, spleen & kidney samples and streaked onto Tryptone Soya & Rimler-Shotts Medium Base agar plates. Based on morphology, yellow colonies on RS agar plates and creamy colonies on TSA plates were picked and identified by specific PCR and 16S rRNA gene sequencing.

2.3 Antibiotic susceptibility test (AST)

Bacteria identified as *Aeromonas* spp. were tested for antimicrobial susceptibility using the disk diffusion method. Antibiotics included amoxicillin, cefotaxime, doxycycline, florfenicol, fosfomycin, gentamicin, levofloxacin, sulfamethoxazole/trimethoprim, tetracycline and rifampicin.

2.4 Virulence gene profiles

Virulent genes were determined by PCR i.e. *hlyA*, *aerR* (hemolysins); *act*, *alt* (enteroxins); *lip* (invasion) and *ahyB* (evasion).



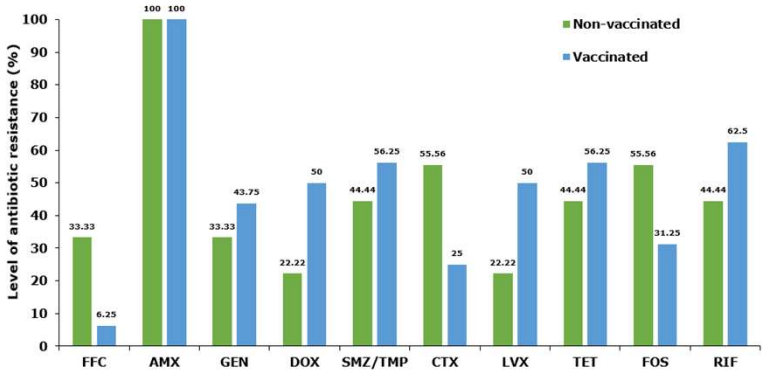
Sampling sites **Sampling analysis**

03 Results

3.1 Bacterial isolation & identification

Total of 25 *Aeromonas* spp. bacterial isolates were identified of which 16 isolates originated from vaccinated ponds and 9 isolates from non-vaccinated ponds

3.2 Antibiotic susceptibility test (AST)



High level of resistance were observed to amoxicillin (100%), followed by rifampicin (56%), sulfamethoxazole/trimethoprim & tetracycline (48%).

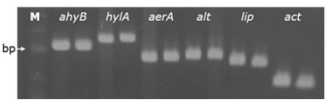
Lower level of resistance rates were detected for gentamicin, doxycycline, levofloxacin & Fosfomycin (40%), cefotaxime (32%) & florfenicol (16%).

Multidrug resistance (MAR index ≥ 0.2) was identified as 80% (20/25) of isolates from both vaccinated and non-vaccinated ponds.

Non-vaccinated	Vaccinated	Antimicrobial resistance patterns
2 strains	2 strains	AMX
	1 strain	DOX
1 strain		AMX; CTX
	1 strain	AMX; DOX
	1 strain	AMX; RIF
	2 strains	AMX; SMZ/TMP
1 strain	1 strain	AMX; DOX, SMZ/TMP
1 strain		AMX; GEN, DOX
2 strains		AMX; SMZ/TMP; TET
1 strain		DOX; TET; RIF; FOS
	1 strain	AMX; DOX; SMZ/TMP; CTX; RIF
1 strain	4 strains	AMX; GEN; DOX; SMZ/TMP; LVX; TET; RIF
	3 strains	FFC; AMX; DOX; SMZ/TMP; CTX; LVX; TET; RIF; FOS

3.3 Virulence gene profiles

High prevalence of key virulence-associated genes including alt (100%), act (93.3%), lip (93.3%), ahyB (93.3%), aerA (86.7%) & hlyA (80%), indicating considerable pathogenic potential among isolates



04 Discussion

Reduced antimicrobial susceptibility in *Aeromonas* spp. from diseased striped catfish underscores the need for updated antimicrobial treatment guidelines and increased uptake of vaccination to reduce disease and need for antimicrobial use.

05 Conclusion

Overall, *Aeromonas* spp. from both production systems exhibited widespread antimicrobial resistance - improved antimicrobial treatment practices and increased use of vaccines are needed.

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