



Determination of pathogenicity of *Aeromonas hydrophila* isolated from bacterial septicemia in cultured carp by genotypic and phenotypic methods

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Abstract:

Aeromonas hydrophila is a widely distributed pathogenic bacteria especially in warm water throughout the world. This motile facultative anaerobe bacterium is an important pathogen causing primary or secondary infectious disease in warm water farmed fish. The stress condition have critical role in Aeromonad infections in fish. *Aeromonas hydrophila* is the causative agent of MAS (motile Aeromonas septicemia). The pathogenesis of *Aeromonas hydrophila* infection is multi-factorial A number of putative virulence factors (*aerolysin*, *hemolysin*, *cytolytic enterotoxin*, DNases, Proteolytic activity) that may play an important role in the development of disease Traditional methods for the detection of the virulence properties in *Aeromonas hydrophila* are based on biological assays in vitro and in vivo, using animal models, However, these only reveal the phenotypic characteristics of the strains, while the expression of the putative virulence-associated factors in *Aeromonas* appears to be affected by environmental conditions. For this reason, these methods could in some instances fail to



indicate the potential pathogenicity of isolates. this study aims to determine the of virulence genes and phenotypic factors in isolates. For this purpose, 31 isolates of *Aeromonas hydrophila* were isolated from cultured carp with Septicemia signs, which were detected using 16srRNA and lipase genes. To determine pathogenesis, virulence genes (*aerolysin*, *hemolysin*, *cytolytic enterotoxin*) and phenotypic properties (Hemolytic activity, Dnases, Proteolytic activity, Congo red dye uptake) were detected in isolates, and finally the LD50 test in screened isolates was performed. The results showed that 5 isolates had all three virulence genes and phenotypic factors and the lowest lethal dose in 50% of fish was calculated to be $10^{8.5}$ CFU/fish. The results of the present study showed that *Aeromonas hydrophila* isolates with all virulence factors did not appear very acute in challenge tests, and the stress condition in farms cause *aeromonas hydrophila* pathogenicity.

Keywords: *Aeromonas hydrophila*, virulence genes, phenotypic factors, pathogenicity