



Therapeutic Application Of Bacteriophages Against *Aeromonas Spp.* Mediated Diseases In Aquaculture: A Critical Review

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Abstract

Aquaculture uses a variety of broad spectrum antibiotics to manage and prevent a variety of diseases, without understanding their mechanisms of action. This has led to water pollution in the modern world. The necessity for alternate control measures against bacterial illnesses in the aquaculture sector is highlighted by issues brought on by antibiotic-resistant bacteria and the dearth of effective control strategies. Bacteriophages (phages) have shown promise as therapeutic agents for the efficient management of bacterial infections in aquaculture. In the current study, a variety of investigations were conducted to determine if utilizing lytic phages to reduce *Aeromonas spp.* infection in fish aquaculture was appropriate. Motile *Aeromonas septicaemia* is a fish disease that has caused financial harm to the aquaculture sector. The best way to avoid infectious illnesses is immunisation; however there are still relatively few vaccinations that are commercially accessible in the aquaculture industry. Currently, the production of aquaculture depends significantly on antibiotics, which adds to the worldwide problem of the rise of bacteria that are resistant to medicines and resistance genes. To decrease the usage of antibiotics in aquaculture systems, it is crucial to create efficient antibiotic substitutes. A potential strategy to manage harmful microorganisms in farmed fish is bacteriophage (or phage) treatment. In order to successfully use phage treatment to reduce infection in fish caused by *Aeromonas*, further phage therapy research in aquaculture is needed, according to this study. The importance of phage as biocontrol for aquaculture is encompassed in this review.

Key word: Aquaculture, *Aeromonas*, Bacteriophage, Fish.

Date of Submission: 08-08-2023

Date of Acceptance: 18-08-2023

I. Introduction

The aquatic genus *Aeromonas*, which is frequently isolated from environmental and clinical samples and is thought to be native to such habitats. Freshwater like lakes, rivers, reservoirs and groundwater, chlorinated and untreated wastewater, brackish water, seawater, swimming pool water, reclaimed and drinking water are typical habitats for these bacteria. Aquaculture's economics is impacted by a number of illnesses that *Aeromonas spp.* may occur in marine fish species, farmed freshwater and wild species. Numerous illnesses have links to different types of water exposure, leech therapy (since they have a symbiotic connection with certain germs), or consuming tainted water or food. Epidemiological links between strains found in drinking water and episodes of human diarrhoea have lately been made. The pollutants in most environmental contamination situations impact a number of fish organs. Since they are simple to spot, non-specific lesions on the gills, skin, and fins are frequently utilized as signs of polluted surroundings¹. Particularly in agricultural settings, some farmer practises may unintentionally expose fish to toxins over short or extended periods of time, which may be extremely dangerous for both the fish and the fish consumer gave an intriguing example when he documented deaths brought on by the usage of net antifoulants that included dangerous copper compounds.² The severity of the corresponding disorders can be significantly influenced by certain biotic or abiotic causes. For instance, stressed fish often seem more vulnerable to environmental contamination³. Many authors stated that the study of those impacts is indicative of the overall quality of the environment since the effects of the majority of contaminants on fish and, generally, all aquatic creatures, appear to be non-specific. The majority of contaminants tend to have non-specific impacts on fish⁴.

Disease presents a serious hurdle to aquaculture in India, as it does in many other countries throughout the world, and a constraint on societal and economic development. The future growth of the sector has also been seriously harmed by several illnesses, which have also seriously harmed the livelihood of fish farmers. Several