



Impact of Vibriosis on Shrimp Aquaculture

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Introduction

India, which is well-known for its premium seafood products, is a major player in the worldwide shrimp export industry. A number of reasons, including an abundance of marine resources, have contributed to India's spectacular development in shrimp exports in recent years. The Indian shrimp export sector is distinguished by its use of contemporary aquaculture techniques. Shrimp farming has become increasingly important as a recent development in the aquaculture sector, which plays a significant role in the nation's economy and the provision of sea food. However, a number of factors, including unfavorable environmental conditions (poor soil and water quality), could cause this to vary every year. Bacterial pathogens found in soil and water are among the environmental elements that cause bacterial illnesses. The primary cause of death for farmed shrimp is probably bacterial infections, which are rather prevalent.

Vibriosis

One of the main illnesses in shellfish and finfish aquaculture, particularly in shrimp production, is vibriosis. Reactively treating diseases after they arise leads to crashes far too frequently since preemptive precautions were not taken. Worldwide, a bacterial disease called vibriosis is the cause of death for shrimp raised in culture. An estimated 80,000 illnesses and 100 fatalities are attributed to vibriosis in the US each year. Since the water is warmer from May through October, most infections happen during those time (CDC). Since 2007 (CDC), vibriosis has been a

disease that requires nationwide notification.

Vibrio

Shrimp producers face significant risks from the gram-negative, facultative, motile anaerobic bacteria *Vibrio*, which is a member of the *Vibrionaceae* family. These bacteria are facultative anaerobes, which means they can live in both aerobic and anaerobic environments. They are distinguished by their curved or comma-shaped rods.

Distribution

Numerous bacteria that live in aquatic habitats such rivers, estuaries, and oceans belong to the genus *Vibrio*. Among the chitinoclastic bacteria linked to shell illness are *Vibrio* spp., which can enter through pores or wounds in the exoskeleton. *Vibrio* species are found all around the world in cultivated environments such as ponds, rivers, estuaries, etc. An estimated 45,000 infections are caused by the most often reported species, *Vibrio parahaemolyticus*, annually in the United States. Certain coastal waters are home to *vibrio* bacteria, which are more prevalent in these environments naturally between May and October when the water is warmer. Warmer waters often have a higher prevalence of *vibrios*, particularly when the temperature rises above 17°C.

Mode of Infection

Theoretically, oral, trans-cuticular, or wound-related infections, imbalances in the in shrimp by virulent bacterial isolates. However, even in this last scenario, there is no evidence in the literature to support the possibility of infection.

Symptoms

Vibriosis-affected shrimp exhibit strange swimming patterns and float on the water's surface. They cut back on their feeding or sometimes cease it completely.



Cutting antenna, red colouration of appendages and uropod are common symptoms as well as we can observe roughness of antenna by loosely touch the antenna from upper portion to lower portion.

Shrimps with infected hepatopancreas exhibit cloudiness in the early stages of infection, followed by reddish-brown coloration.

Shrimps die when they are stressed by a variety of conditions, including low DO, high water temperature, high stocking density, inadequate water exchange, and poor water quality.

It is advised to exchange water in culture ponds and reduce stocking density by partially harvesting them if vibriosis is detected. Make use of high-grade probiotics.

Impact on culture practices

- Stress factors like high stock density and low



water quality allow these opportunistic pathogens to infect people with vibrio.

Shrimp larvae afflicted with vibriosis exhibit impaired sensation, an empty gut, chromatophores enlarging, and necrosis of appendages.

Green and Yellow Colonies of Vibrio spp

- The aquaculture shrimp business in Asia and Central America has been severely hit by this disease, which is also known as early mortality syndrome.

Control

- Common ways to manage vibriosis in aquaculture include giving antibiotics orally to groups of animals sharing tanks or cages and providing sick shrimp food laced with antibiotics. The existence of leftover antibiotics in commercialized aquaculture products is another issue brought on by the uncontrolled use of antibiotics, and it has caused allergies and toxicity in humans.

Conclusion

Shrimp aquaculture is seriously threatened by vibriosis, which can result in financial losses, decreased output, and environmental issues. For shrimp farming techniques to be sustainable and to lessen its impact, effective management strategies are necessary. These tactics include disease monitoring, appropriate nutrition, and biosecurity measures.

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