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Translucent Post-Larval Disease: An Emerging Threat to Shrimp Aquaculture

J.S. Akash[1*] and Ashpel Mano M.R.[2]

[1]*St. Devasahayam Institute of Fisheries Science and Technology, Kanyakumari, Tamil Nadu (629 193), India*

[2]*ICAR-Central Institute of Fisheries Education, Mumbai, Maharashtra (400 061), India*

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Corresponding Author

J.S. Akash

: akash.difstedu@gmail.com

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Abstract

Translucent Post-Larval Disease (TPD) is a lethal bacterial disease. It is also called the Glass Post-Larvae Disease. It was first reported in China in the year 2019 and affects *Penaeus vannamei* post-larvae (PL4-PL7). The disease causes very High mortality, upto 90% mortality occurring in 24 to 72 hours. The disease is caused by the bacterium *Vibrio parahaemolyticus.* It contains virulence-associated proteins called VHVP-1 and VHVP-2. When the post-larvae get infected, they become transparent, their gut becomes empty and the hepatopancreas changes color. The TPD affect the hatchery production, which affects the coastal livelihood. In India so far there have not been any outbreaks reported. To prevent the Translucent Post-Larval Disease and to manage it, measures such as, strict biosecurity, disease early detection, microbial control and developing specific pathogen-resistant stocks that can resist the TPD should be taken.

Keywords: Crustacean disease, *Penaeus vannamei*, Post-larval loss, Shrimp hatchery mortality

Introduction

Shrimp farming plays an important role in generating income, employment and export earnings in many coastal countries. However, the expansion of intensive farming has increased the frequency of disease outbreaks, especially in hatcheries. One of the newest diseases attracting global attention is Translucent Post-Larval Disease (TPD), also referred to as Glass Post-Larvae Disease. The disease was first described in China during 2019 (Yang *et al.*, 2022). It mainly affects *Penaeus vannamei* post-larvae between PL4 and PL7 (Jia *et al.*, 2024). Because hatcheries supply seed to grow-out farms, heavy mortality at this stage can disrupt the entire production chain. Understanding the disease, its cause and practical preventive measures is therefore important for the sustainable development of shrimp aquaculture.

Disease Symptoms

Infected larvae lose their normal opaque appearance, become almost transparent, develop a pale hepatopancreas and usually show an empty digestive tract before dying within two to three days (Yang *et al.*, 2022) (Figure 1-3).

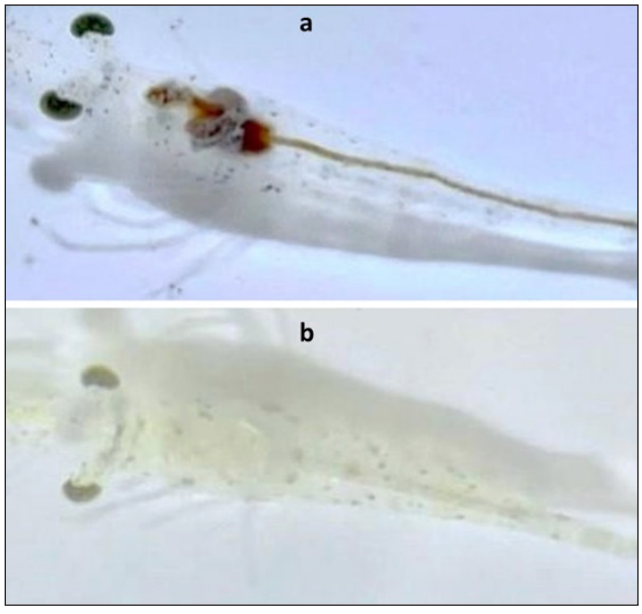

Figure 1: a) Healthy shrimp; b) Shrimp displaying symptoms of TPD

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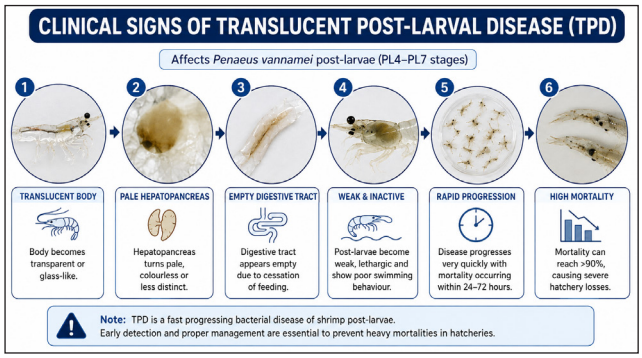

Figure 2: Characteristic clinical symptoms of Translucent Post-Larval Disease (TPD) in *Penaeus vannamei* post-larvae (Image created using Google Notebook LM)

Outbreak and Spread

The first outbreak of TPD occurred in China in 2019. The disease spread rapidly. By the end of 2020, TPD had affected approximately 70% to 80% of the nurseries in the affected regions. Epidemiological surveillance confirmed the presence of the disease in almost all the central shrimp-producing provinces in China (Yang *et al.*, 2022). TPD was also reported in another Southeast Asian country outside China in 2025 (Dinh-Hung *et al.*, 2025). No reports have been found from other countries so far. India, a major contributor to the international shrimp export market, has intensified surveillance and monitoring in response to initial alarms. However, large-scale outbreaks have not been reported officially in India.

Figure 3: Post-larvae of Vp TPD-infected shrimp

Causative Agent and Disease

Research has shown that TPD is caused by a highly virulent strain of *Vibrio parahaemolyticus*. Although this bacterial species is already known as the causative agent of Acute Hepatopancreatic Necrosis Disease (AHPND), the TPD-associated strain possesses distinct virulence characteristics. According to Koch's postulates, this new strain, termed Vp TPD (specifically Vp-JS20200428004-2), had been isolated and tested positively in challenge experiments. The AG1 genome (~5.5 Mb) consists of two chromosomes and three plasmids, one of which carries the vhvp-1, vhvp-2 and vhvp-3 virulence genes. These genes encode a Tc-like toxin complex, distinguishing TPD from Acute Hepatopancreatic Necrosis Disease (AHPND), which is caused by different toxins. Pathological evidence in infected larvae includes extensive necrosis and sloughing of epithelial tissue in both the hepatopancreas and the midgut. AG1 caused 100% mortality in shrimp post-larvae within 72 hours. Infected shrimp exhibited characteristic clinical signs, including a pale hepatopancreas, empty gut and translucent body. Histopathological examination revealed severe hepatopancreatic damage and haemocytic enteritis, identifying the intestine as an additional target organ affected by TPD (Zou *et al.*, 2020).

Molecular Basis of Virulence

Molecular studies on the mechanisms driving this increased virulence identified a novel plasmid in Vp TPD strains. This plasmid encodes two genes that were previously unrecognized and are now designated Vibrio High Virulent Protein 1 (VHVP-1) and Vibrio High Virulent Protein 2 (VHVP-2). In vivo experiments have shown that VHVP-2 is an important virulence factor behind the disease phenotype (Yang *et al.*, 2022).

Economic Impact

The economic consequences of TPD are difficult to overemphasize. Because the disease attacks the hatchery phase, which produces juvenile shrimp for grow-out farms, any obstacle at this stage jeopardizes the production chain. The immediate effects include significant financial losses for hatchery producers, shortages of seed for farms, delays or shortages in shrimp exports and lost revenues for farm workers. At the broader scale, it has affected coastal livelihoods by affecting their employment in aquaculture production, which in turn has affected their income.

Prevention and Treatment Measures

Some of the antibiotics have shown positive results against Vp TPD in lab tests. However, the shift of the aquaculture industry towards an antibiotic-free production discourages the use of antibiotics globally. Therefore, there is a need to identify non-antibiotic remedies which are sustainable to control TPD. This mostly means carrying out strict biosecurity procedures such as improving hatchery cleanliness, quarantining new brood stocks and using cleaned or managed water resources. Early detection is the only way to limit TPD outbreaks. The shrimp can be sampled and the bacterial isolates obtained can be screened for the VHVP-1 and VHVP-2 genes using molecular diagnostic tools such as TaqMan qPCR. An early indicator can also be obtained by routinely looking for transparency indicators in larvae under a microscope. Microbial control is crucial for prevention in addition to diagnostics. The use of probiotics and microbial ecosystem modulators to manage opportunistic infections in rearing environments is growing. Research on selective breeding plans to create shrimp stocks more resistant to Vp TPD is growing. Additional safeguards may be provided by

future technological development, such as gene editing and immunostimulants.

Conclusion

Translucent Post-Larval Disease is a severely vulnerable and very lethal disease in the shrimp aquaculture industry. The change of the larvae from being opaque to a transparent, glass-like nature is the most distinctive sign. A very high mortality rate of up to 10% within 24-72 hours signifies the importance of early detection and points out the need for early detection tools, intense surveillance and international cooperation because of the increase in the demand for shrimp production globally. Also, there should be strict biosecurity measures, preparedness and research in all the leading shrimp-producing countries, including India, to prevent the widespread devastation which occurred in China.

References

Dinh-Hung, N., Mai, H.N., Matthews, M., Wright, H., Dhar, A.K., 2025. Isolation, characterization and pathogenicity of a *Vibrio parahaemolyticus* strain causing translucent post-larvae disease in *Penaeus vannamei* outside China. *Plos one* 20(9), e0331862. DOI: https://doi.org/10.1371/journal.pone.0331862.

Jia, T., Liu, S., Yu, X., Xu, T., Xia, J., Zhao, W., Wang, W., Kong, J., Zhang, Q., 2024. Prevalence investigation of translucent post-larvae disease (TPD) in China. *Aquaculture* 578, 740583. DOI: https://doi.org/10.1016/j.aquaculture.2024.740583.

Yang, F., Xu, L., Huang, W., Li, F., 2022. Highly lethal *Vibrio parahaemolyticus* strains cause acute mortality in *Penaeus vannamei* post-larvae. *Aquaculture* 549(Part 1), 737774. DOI: https://doi.org/10.1016/j.aquaculture.2021.737605.

Zou, Y., Xie, G., Jia, T., Xu, T., Wang, C., Wan, X., Li, Y., Luo, K., Bian, X., Wang, X., Kong, J., Zhang, Q., 2020. Determination of the infectious agent of translucent post-larva disease (TPD) in *Penaeus vannamei*. *Pathogens* 9(9), 741. DOI: https://doi.org/10.3390/pathogens9090741.