# Comparison of TaqMan-based PCR assays for Translucent Postlarvae Disease (TPD) detection in *Penaeus vannamei*

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## ABSTRACT

- Translucent Post Larvae Disease (TPD): a critical disease affecting shrimp hatcheries in Asian countries.
- Causative agent: *Vibrio parahaemolyticus* carrying Tc-like toxin genes (i.e., *vhvp-1, -2*, and *-3*).
- Three sets of primers/probes targeting *vhvp-1, -2, -3* were designed and tested using TPD infected *P. vannamei* shrimp.
- The newly developed primer sets were compared with a published method of TPD detection for analytical sensitivity, specificity, and diagnostic accuracy. The results showed that all tested primers/probes specifically detected VpTPD down to 10 copies of the virulence genes. The Diagnostic sensitivity (DSe) and Diagnostic specificity (DSp) values were 100% for all tested primers/probes.

## INTRODUCTION

Translucent postlarvae disease (TPD) can cause 100% mortality in *Penaeus vannamei* larvae in the hatchery, displaying pale hepatopancreas and digestive tract, hence the name glass postlarvae disease (GPD).

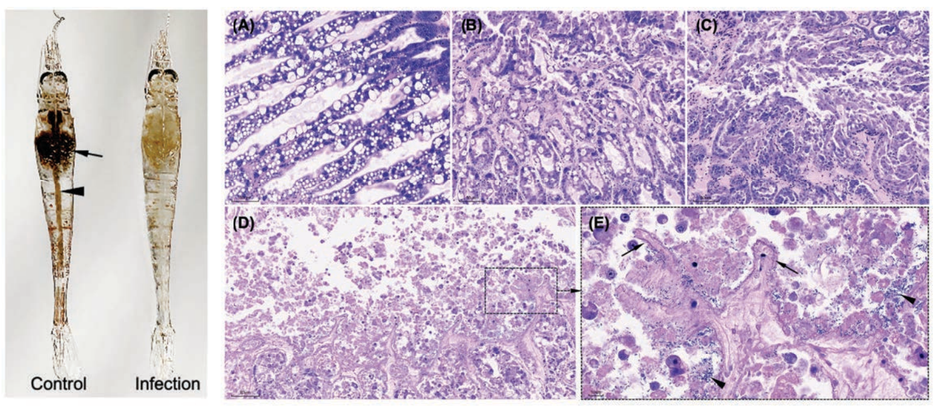


**FIG. 1. Clinical signs of TPD (left panel) and histopathological manifestation of TPD (right panel)**

## METHODOLOGY




## RESULTS

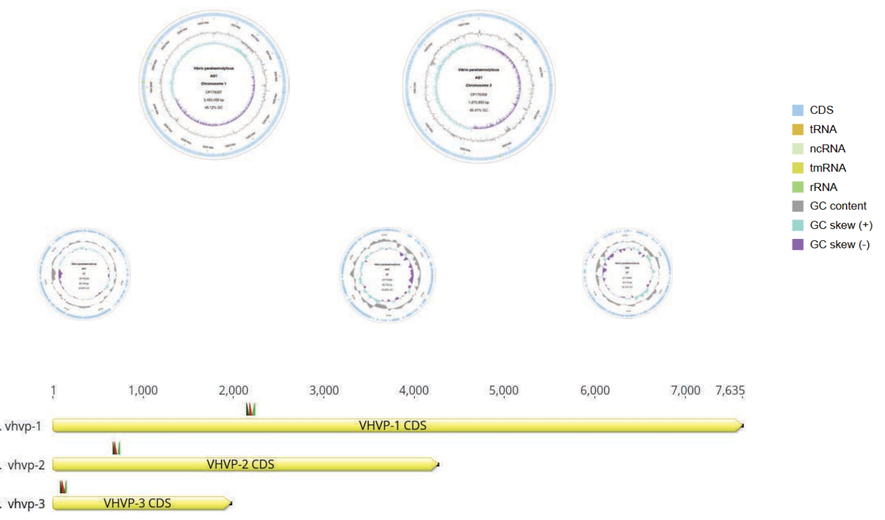


**FIG. 2. The *Vp*$_{TPD}$ genome sequence and locations of primers/ probes for using in TaqMan assay**

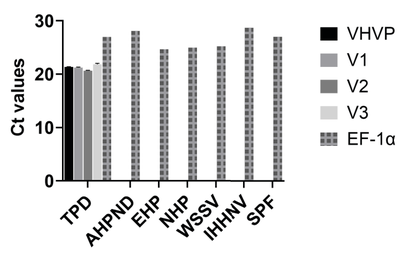


**FIG. 3. Analytical specificity (ASp) test**

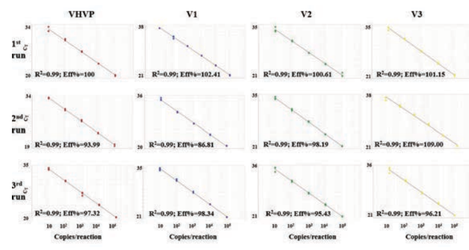


**FIG. 4. Analytical sensitivity (ASe) test**

**Table 1. TaqMan real-time PCR assays in detecting TPD using a blind panel of *P. vannamei* infected with TPD**

| | V1 | V2 | V3 | VHVP |
|---|---|---|---|---|
| **Diagnostic sensitivity (DSe%)** | 100 (90.3-100) | 100 (90.3-100) | 100 (90.3-100) | 100 (90.3-100) |
| **Diagnostic specificity (DSp%)** | 100 (85.2-100) | 100 (85.2-100) | 100 (85.2-100) | 100 (85.2-100) |

## SUMMARY

**Three new TaqMan real-time PCR assays were developed for *Vp*$_{TPD}$ detection. Compared to existing methods, the newly developed techniques have similar levels of specificity, sensitivity, and diagnostic accuracy. The diagnostic methods would be useful in screening broodstock and postlarvae in shrimp hatchery and will enable to prevent the spread of TPD worldwide.**

## ACKNOWLEDGEMENT

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