

Utilization of loop-mediated isothermal amplification (LAMP) technology for detecting White Spot Syndrome Virus (WSSV) and *Vibrio* spp. in *Litopenaeus vannamei* in selected sites in the Philippines

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Shrimp disease outbreaks in the Philippines remain to be uncontrollable. This is compounded by the inaccessibility of disease diagnostics to most shrimp farmers. The loop-mediated isothermal amplification (LAMP) is a new technology that is used as a practical alternative for rapid detection of viral and bacterial pathogens. The method proves to be rapid, highly sensitive, and cost-effective compared to other detection assays. In this study, LAMP protocols for the detection of the two most common shrimp pathogens, white spot syndrome virus (WSSV) and *Vibrio* spp., in the Philippines were developed. A temperature range of 55°C to 68°C for WSSV detection and 59°C to 67°C for *Vibrio* spp., and incubation periods of 45 minutes to 1 hour, were proven to be the suitable conditions for the LAMP assay. Using

these conditions, asymptomatic *Litopenaeus vannamei* samples from selected sites (Iloilo, Batangas, Bulacan, Laoag, and Leyte) were tested for WSSV. Samples which indicated WSSV infection were from Iloilo (89.47%), Batangas (30.00%), Bulacan (43.33%), and Leyte (75.00%), while shrimps from Laoag City (0.00%) tested negative. Likewise, the occurrence of *Vibrio* spp. was determined in shrimps sampled in Pangasinan and six bacterial DNA isolates of *Vibrio* spp. were identified. Moreover, conventional PCR and microbiological methods were performed along with the LAMP reaction for comparison and further confirmation. The results showed that the LAMP assay was faster and 10 times more sensitive than polymerase chain reaction in detecting WSSV and was more efficient than the traditional microbiological method in diagnosing vibriosis. Overall, the results indicated that a LAMP protocol, which is more convenient, highly sensitive, faster, and more practical, has been effectively utilized to detect WSSV and vibriosis in selected Philippine shrimp farms.

KEYWORDS

loop-mediated isothermal amplification, polymerase chain reaction, white spot syndrome virus, *Vibrio* spp., shrimps

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