

Infectious Diseases of Cultured Finfish in Bangladesh: Challenges and Future Directions

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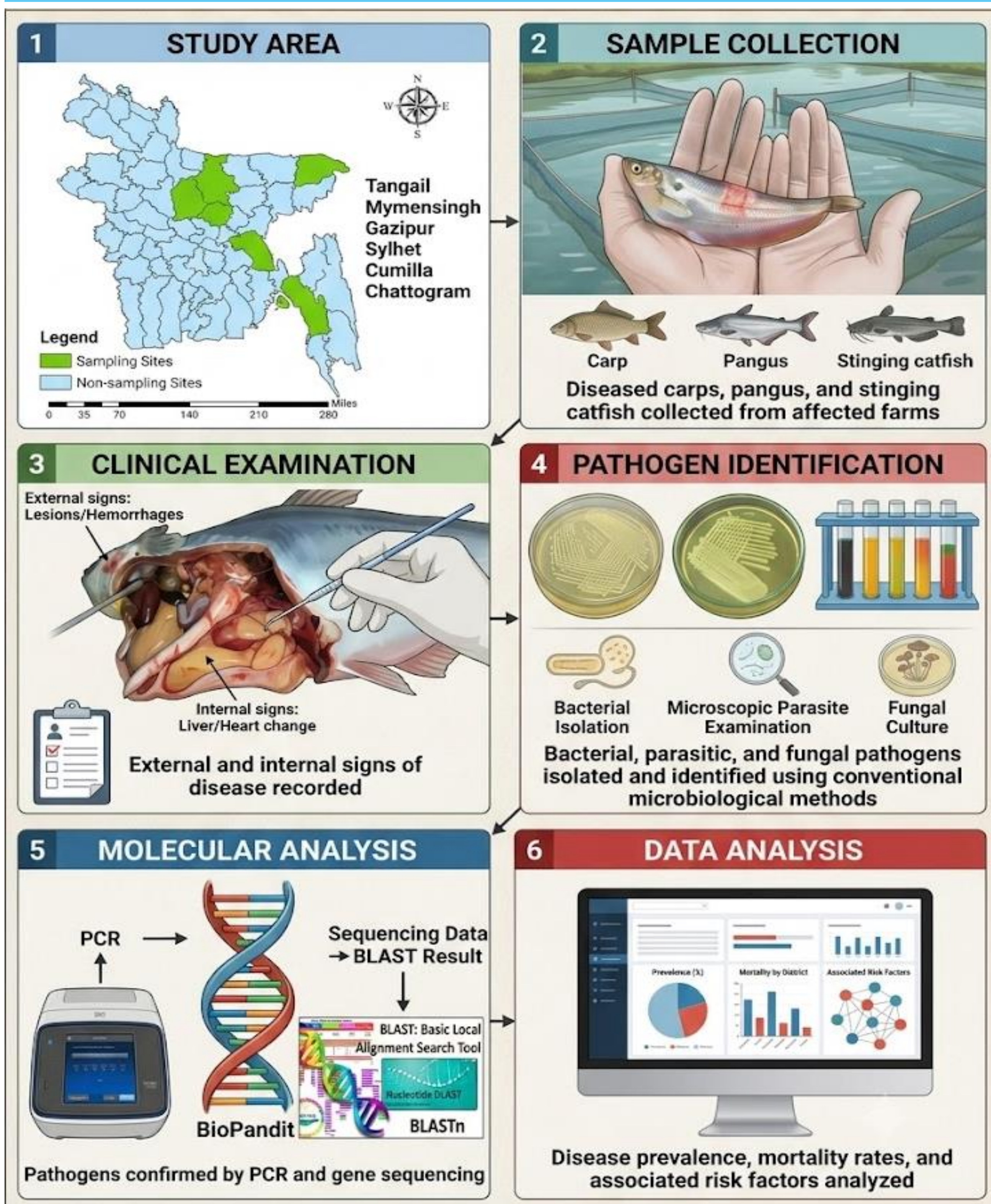
Abstract

This study reviews the occurrence and impacts of infectious diseases in cultured finfish in Bangladesh, with particular emphasis on Carps, Pangasius, Tilapia and Stinging Catfish. Information was collected through field surveys, laboratory investigations. The findings indicate that bacterial diseases, particularly Motile Aeromonad Septicemia is the most prevalent diseases affecting cultured finfish. Emerging disease outbreaks, antimicrobial resistance, and inadequate biosecurity practices further threaten the sustainability of aquaculture. Strengthening disease surveillance, improving diagnostic facilities, and developing effective vaccines and preventive strategies are essential for future disease management.

Introduction

Finfish aquaculture is vital for Bangladesh's food security, but rapid intensification has triggered disease outbreaks affecting 70% of operations (Ahmed et al., 2025). Pathogens like MAS, EUS, and TiLV threaten species, driving farmers to misuse antibiotics and escalate environmental antimicrobial resistance (AMR) risks. Safeguarding the sector requires national disease/AMR surveillance, rapid molecular diagnostics, and standardized biosecurity protocols. Ultimately, transitioning to eco-friendly alternatives like probiotics and phyto-therapeutics is essential to establish climate-resilient systems and protect rural livelihoods (Debnath et al., 2024; Ahmed et al., 2025).

Materials & Method



References

- Ahmed, F., Luyten, W., & Paeshuyse, J. (2025). Disease management and biosecurity adoption status in finfish aquaculture: insights from Bangladesh. *Aquaculture International*, 33(3), 184.
- Debnath, P. P., Dinh-Hung, N., Taengphu, S., Nguyen, V. V., Delamare-Deboutteville, J., Senapin, S., Vishnumurthy Mohan, C., Dong, H. T., & Rodkhum, C. (2022). Tilapia Lake Virus was not detected in non-tilapia species within tilapia polyculture systems of Bangladesh. *Journal of Fish Diseases*, 45(1), 77–87.

Results

3.1: Clinical Signs and Symptoms

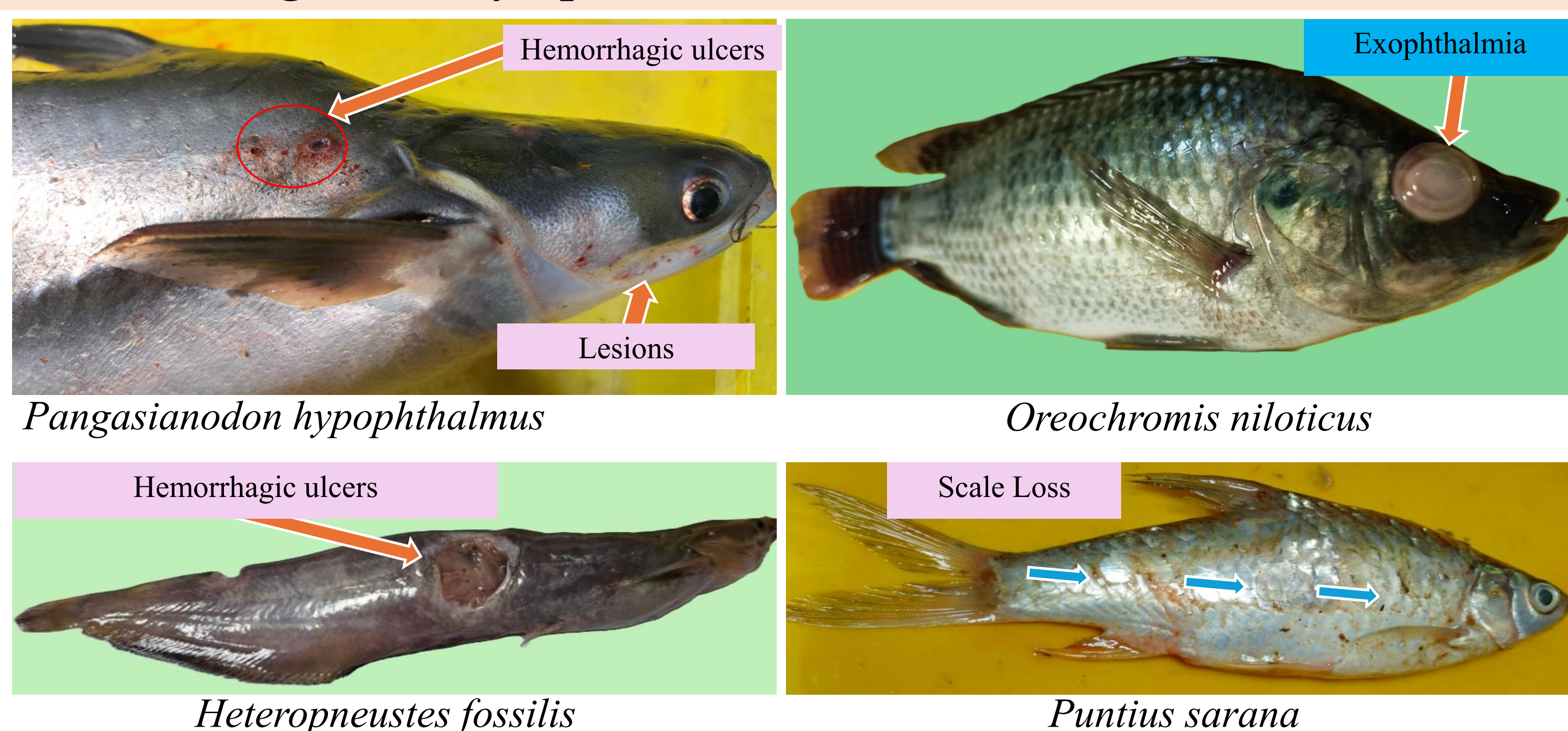


Fig. 1: Clinical signs & symptoms of infectious diseased fish: hemorrhage; ulcers; lesions; scale loss

3.2: Prevalence of Different Disease Types, Economic loss & AMR

In this study, it was found that bacterial infections overwhelmingly dominate all species, peaking in Pangasius (72.125%) and hitting a low in Stinging Catfish (65.43%). Variations in secondary threats were observed across populations: the highest fungal (13.32%) and other infections were recorded in Stinging Catfish, while the highest parasitic infection rate (10.67%) was observed in Carps. Overall, bacteria remain the primary aquaculture health threat. Carps were mainly affected by motile aeromonad septicemia and epizootic ulcerative syndrome. Pangasius was mainly affected by *A. hydrophila* and *A. veronii*. Stinging catfish was highly susceptible to bacterial and parasitic infections. Tilapia is mainly affected by *Streptococcus* sp.

Disease outbreaks caused significant mortality and economic losses in commercial and farms. It causes $18.81 \pm 2.66\%$ of total expected production.

Emerging antimicrobial resistance among bacterial pathogens poses a serious future challenge. Most the second-generation antibiotics were found less sensitive or resistant to bacterial strains.

3.3: Molecular Detection

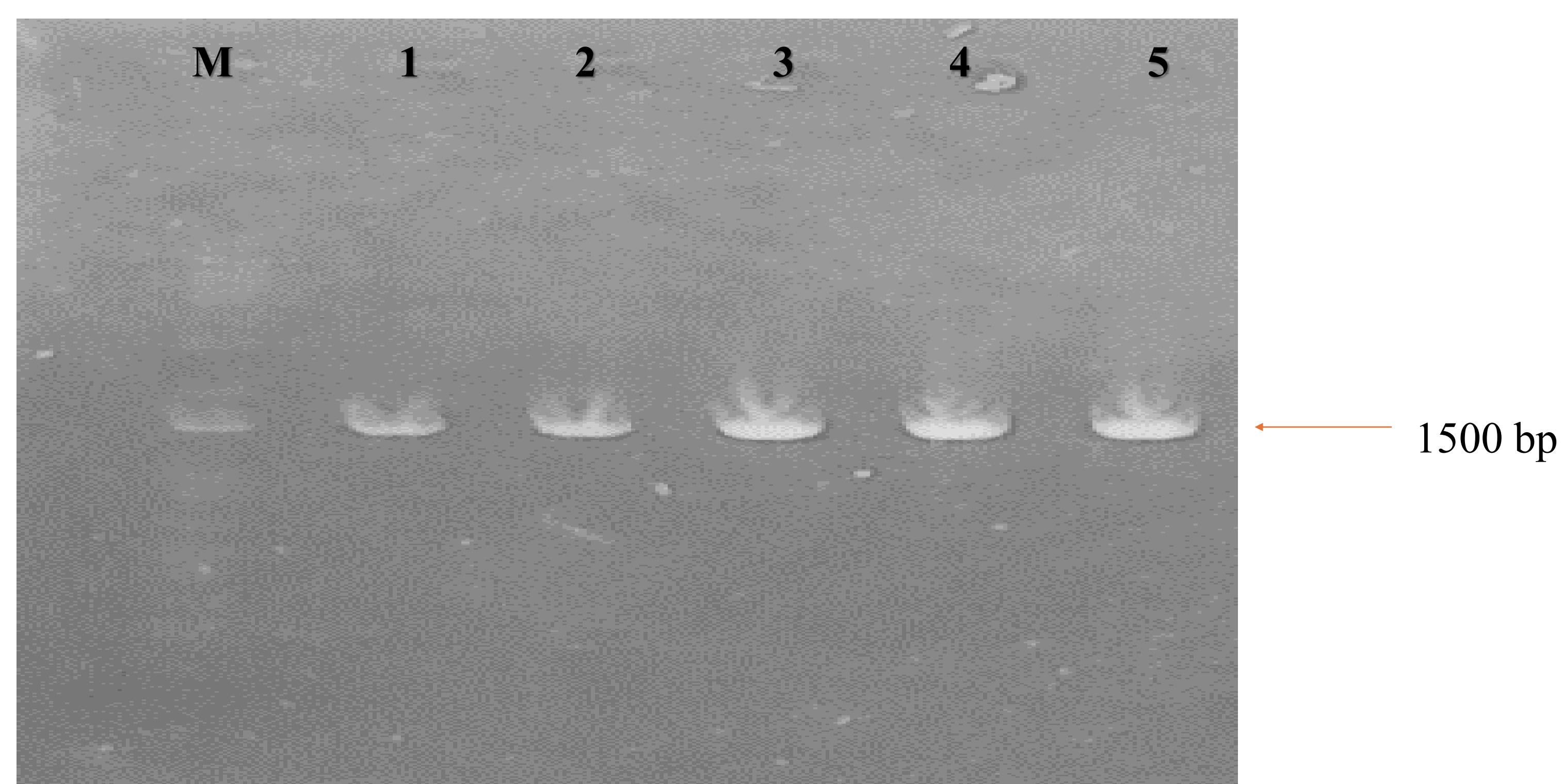


Fig 2. Agarose gel electrophoresis of PCR amplification generated by isolated bacteria at ~1500 bp. Lanes: (M) 1 kbp DNA marker; (1-5) positive samples from field.

Conclusion

Infectious diseases remain one of the principal constraints to sustainable aquaculture development in Bangladesh. Improved disease surveillance, rapid diagnostic methods, strengthened biosecurity measures, and the development of locally effective vaccines are urgently needed. Integrated disease management approaches and collaborative research efforts will play a crucial role in reducing disease-related losses and ensuring sustainable finfish production in Bangladesh.

Acknowledgement & Fundings

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