
Health and disease status of Thai pangas, *Pangasius hypophthalmus* cultured in rural ponds of Mymensingh, Bangladesh

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Abstract

Thai pangas, *Pangasius hypophthalmus* is one of the important aquaculture species in Bangladesh. Over the last few years spectacular development has been taking place in Thai pangas farming in Mymensingh district. Due to availability of easy breeding and culture techniques as well as quick return, more and more people are converting their rice fields into pangas farms overnight. The present study was carried out to examine health and disease status of Thai pangas mainly through clinical, histopathological and bacteriological techniques. In addition, for collecting primary data on disease and health status of Thai pangas and the resultant socioeconomic impacts on rural households, questionnaire interview and participatory rural appraisal tools were used with selected farming households in three upazilas of Mymensingh district. The most prevalent diseases as reported by the farmers were red spot, followed by anal protrusion, tail and fin rot, pop eye, dropsy and gill rot. Other conditions like cotton wool type lesion, ulceration and white spot were reported but with lower incidence. Four isolates of *Aeromonas hydrophila* were recovered from kidney and lesion of diseased fish. Hemorrhage over the body especially near mouth and caudal region was noticed in the fishes associated with aeromonad infection. Internally, kidney, liver and spleen became swollen and enlarged. The isolates varied with their pathogenicity. All the four isolates were sensitive to Nitrofurantoin, Cotrimoxazole and Tetracycline but were resistant to Amoxycilline. An attempt was made to treat diseased fish with extracts from neem leaf, garlic and turmeric. Recovery of infection was monitored through mortality and histopathology. General histopathological changes of different organs were also studied. Extract from neem (*Azadirachta indica*) leaf gave better result. Telangiectasis, lamellar hypertrophy and hyperplasia hemorrhage, lamellar fusion, necrosis of lamellar epithelial cells, presence of parasites and their cysts were the major pathology of gills. Hemorrhagic lesion, pyknotic nuclei and melanomacrophage centers (MMC) were found in the liver of fish. Major pathologies in kidney of fish included presence of MMC, necrotic and ruptured kidney tubules, severe haemopoietic necrosis, and hemorrhage. The economic loss due to disease in Thai pangas farming was estimated from the difference between expected production and actual production. On an average, Thai pangas farmers of Mymensingh incur a loss of Tk. 23,104/ha/cycle due to fish disease (3.6% of expected total production). The loss, however, varied with location and size of farms, type of farmers and management practices. The study also highlighted fish health management related problems and
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recommended further work for the development of user-friendly farmer-oriented fish health management packages.

Key words: Disease, Thai pangas, Pathogen, Treatments, Economic loss

Research findings

- Prevalence of various types of diseases in Thai pangas farming had negative impacts on its production.
- Economic losses due to fish diseases could be as high as Tk 23,104/ha/cycle.
- The rate of prevalence was found to vary according to farm categories and it was highest in small-scale farms.
- The most common diseases identified were the hemorrhage or red spot, anal protrusion, pop eye, tail and fin rot, ulceration and white spot (Fig. 1).
- Average disease control cost was Tk.4,285 ha/cycle.
- The diseases were more prevalent in winter season.
- A gram-negative motile bacterium, *A. hydrophila*, was found to be the major causative agent of pangas disease. The bacterium could be recovered from kidney and lesion of diseased fish.
- The isolates of *A. hydrophila* was found to be pathogenic to susceptible fish when injected intramuscularly with 1.2 x10^7 cfu/fish.
- Nitrofurantoin and cortimoxazole could be used as antibacterial therapy against *A. hydrophila* infection.
- Extracts from neem leaf could have some therapeutic value in recovering diseased fish.
- The study also highlighted fish health management related problems and recommended further work for the development of farmer-oriented fish health management.

![Fig. 1. The diseases identified in Thai pangas in Mymensingh.](image)
Policy implications

- GOs and NGOs should come forward to create awareness among pangas farmers on primary fish health management techniques.
- More effort should be directed towards the characterization of pathogens.
- The farmers and the extension agents should be trained up on simple diagnostic procedure and effective therapy.
- There should be legislation on the safe use of chemotherapeutic agents used for fish health management
- Establishment of mobile diagnostic centers and support service for pangas farmers.
- Herbal therapy especially neem leaf extracts could be a low-cost and environment friendly alternative of chemical treatment but more research is needed in this particular area.
- Regular fish health monitoring protocol should be established.

Livelihood implications

The livelihood of people associated with pangas industry like fish farmers, traders, feed manufacturers, hatchery operator etc. are in danger due to outbreak of diseases. This is negatively affecting their livelihoods through loss of production, income and asset. To secure the livelihood of the huge number of people involved in pangas industry, it is important to follow improved fish health management strategies to avoid disease outbreak.