

Study on Diagnosis Precaution and Treatment of Common Diseases in Aquatic Fish Species

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Abstract: Disease is a disorder in structure or function exhibited by host organisms through specific sign and symptom. Deteriorated environmental conditions and infectious microorganisms are the main cause of disease outbreak in farmed aquatic organisms. Reduced growth rate, any damage in the body surfaces and death of the organism may show disease in cultivable species. The major outcome of disease occurrence could be the major cause of fish, loss of productivity and it will not be suitable for public consumption. Persistent of disease occurrence could be the major cause of collapse of aquaculture production and it will hamper the sustainability of the industry as altogether. Henceforward it is necessary for fish farmer to have basic theoretical expertise regarding the common fish diseases and their control measures to treat the fish diseases and increase fish production.

Keywords: Fish diseases, Symptoms, Microorganism, Treatment

1. Introduction

Like other animals fish also get ill and is affected by different types of diseases. Diseases are more frequently caused due to different types of microorganisms such as bacteria, parasites and fungi in the commercial fish culture. Fish diseases, in various forms have been tormenting the aqua culturists ever since man learned the art of fish husbandry. The stability of a fish population in particular habit is very often disrupted by various factors viz., disease, habitat destruction, depletion of resources or other application of environmental stressors. Fish is in a State of equilibrium with the environment and a change in the environment parameters beyond the tolerance limit disturbs the equilibrium resulting in stress response in fish and making it valuable to fish disease. Fish diseases also cause enormous economic loss to the fish farmers. Most of the diseases are contagious and therefore specific precaution, treatment and control measures are required to prevent them.

It should be understood that fish suffer from many diseases, of which from causative point of view they are follows:-

Bacterial Diseases in Fishes

Bacteria are responsible for many fatal diseases in fishes like furunculosis, columnaris, fin and tail rot, vibriosis, dropsy, cotton mouth disease and tuberculosis.

a) Furunculosis Disease:

Furunculosis disease is caused by *Aeromonas salmonicida* in salmon fishes. It is a non-motile, gram-negative bacterium. This disease frequently appears to infect fishes living in the dirty waters containing a large amount of decaying matter. The first symptoms of this disease are appearance of boil like lesions. Others symptoms are blood-shot fins, blood discharge from the vent, haemorrhages in muscles and other tissues and necrosis of the kidney. Bursting of boils allow the spread of this disease among other fishes and also offer suitable areas for fungus growth. Fishes severely infected

with the bacteria die in good number.

Precaution

Remove the severely infected fishes from the pond

Treatment

Supply food containing antibiotics like sulphonamides or nitrofurans. Sulfonamides like sulfadiazine or sulfaguanidine are given orally with food at the rate of 22 g / 100 kg of fish / day. Other antibiotics like chloromycetin and tetracycline are most effective at a dose of 5-7.5g / 100 kg of fish / day. Disinfect the eggs with 0.015% solution of methiolate or 0.185% acriflavin.

b) Columnaris Disease:

Columnaris disease is caused by *Chondroccus columnaris* and *Cytophaga columnaris* in many freshwater aquarium fish. It is a long, thin, flexible, gram-negative slime bacterium (myxobacteriales). This disease is often associated with low oxygen level. Initially it is marked by appearance of grayish-white or yellowish-white patches on the body. The skin lesions change to ulcerations and fins may become frayed. Gill filaments are destroyed and eventually lead to the death of the fish.

Treatment

- Addition of 1 ppm copper sulphate in the pond to control this disease is effective.
- Tetracycline administered orally with food at a rate of 3 g / 100 pounds of fish / day for 10 days is very effective.
- Dip treatment in malachite green (1:15000) for 10-30 seconds and one hour bath in 1 ppm furanase is very effective to control this disease.

c) Fin and Tail Rot Disease:

Fin and Tail Rot disease is caused by *Aeromonas salmonicida* and *A. liquefaciens*. However, protozoans and fungi may also be involved. It is characterized by appearance of white lines along the margins of fins, the

opacity usually progresses towards the base eroding them and causing haemorrhage. The fin rays become brittle first and later break leading to the complete destruction of the fins. The infection may also spread on the body surface. Fin and tail rot are associated with poor sanitary conditions in fish ponds and with water pollution in nature.

Treatment

The Fin and tail rot may be checked at an early stage by keeping fishes in 0.5% copper sulphate solution for 2 minutes. Control may be achieved with 10-50 ppm tetracycline and 1-2 ppm of benzalkonium chloride. In severe infections the affected parts are surgically removed and the fishes are then kept in 0.04% potassium dichromate.

d) Vibriosis Disease:

Vibrio bacteria are the causative agents of vibriosis disease in salmon and many other fishes. This disease may occur in waters with low oxygen. These bacteria are small gram-negative bacilli, characteristically curved. Diseased fishes show large, bright coloured, bloody lesions in the skin and muscles, haemorrhages in eyes, gills may bleed with slight pressure, and inflammation of the intestinal tract.

Treatment

Sulfamethazine at a rate of 2 g / 100 pounds of fish / day gives good results. 3 – 4 g / 100 pounds of fish / day for 10 days of tetracycline also give satisfactory results.

e) Dropsy Disease:

Pseudomonas punctata is the causative agent of this disease. It is characterized by accumulation of yellow coloured fluid inside the body cavity, protruding scales and pronounced exophthalmic conditions. This is known as “Intestinal Dropsy”. In case of ulcerative dropsy, ulcers appear on the skin, deformation of back bone takes place and show abnormal jumping. This is a fatal disease in culture systems. Removal and destruction of fishes, followed by draining, drying and disinfecting the pond with lime are preventive measures to control the disease.

Treatment

The infected fishes may be cured with 5 ppm potassium permanganate for 2 minutes dip bath. Streptomycin and oxytetracycline give good results.

f) Cotton Mouth Disease

The filamentous bacteria, Flexi bacteria are the causative agent of this disease. The main symptom is appearance of fungus like tuft around the mouth.

Treatment

This can be treated with antibiotics like 10 ppm chloramphenicol for 2-5 days and 0.3 ppm furazolidone for long term bath.

g) Tuberculosis Disease

Mycobacterium is a disease causing agent which is difficult to diagnose without pathological examinations. The symptoms are ulcers on body, nodules in internal organs, fin and tail rot, loss of appetite and loss of weight of fish.

Treatment

This can be cured with dip treatment in 1:2000 copper sulphate for 1 minute for 3-4 days. Antibiotics are not successful. The fishes should be destroyed and potassium permanganate or lime used in the pond.

h) Bacterial Gill Disease:

- This disease is caused by *Myxobacteria* in salmon fish.
- Many bacteria are found in swollen gill lamellae which show proliferation of the epithelium, and symptoms are lack of appetite.
- This disease is transmitted through water from infected fish. It can be treated with 1-2 ppm timsan or 1 ppm copper sulphate.

Parasitic Diseases

1) Argulosis

Causative agent: *Argulus* (Fish louse)

Species affected: Indian Major Carps, Catfishes and Tilapia

Symptoms: The fish rub against hard objects. The large size argulus of 1/4 inch in diameter are clearly seen on the surface of the fish body.

Tiny red spots are present on the skin and presence of open wounds on the dorsal side of host body. Fish move widely throughout the water because of irritation of fish lice. The firmly attachment site of the argulus exhibits signs of the ulcerations which causes secondary bacterial infection in the fish body

Treatment: Fishes having light infestation with argulus that can be easily removed by the help of forceps. 1% NaCl for 3 days is useful to primary treatment against argulus. Short bath around 30 minutes with potassium permanganate with a dose of 10 mg/l is effective to clear the argulus. Long bath around 24 hours with Trichlorophan 0.2 mg/l is very effective to eradicate the parasites.

2) Dactylogyrosis and Gyrodactylosis

Causative agent: Gyrodactylus (Skin fluke) and Dactylogyrus (Gill fluke)

Species affected: Indian Major Carps, Catfishes and Tilapia

Symptoms: Fish gills are infected by dactylogyrus and skin by gyrodactylus. These are ectoparasitic flat worms. They attached on gills, fins and skin of the fish body. The infested fish have pale colour skin and mucus production increased in the gill. These parasites are attached to the skin and gills by the help of anchors which shows the sign of wounds which causes secondary pathogenic microbial infection in the fish body

Treatment: Alternate bath in 1:2000 acetic acid solution followed by bath in 2% sodium chloride solution has been found effective. Optimum stocking density should be maintained. 5% salt solution given for 5 minutes which is

very helpful in the initial infestation of these parasites. 100 ppm formalin bath for 1 h for 3 days or 150 ppm hydrogen peroxide for 30 min are very much helpful to eradicate the parasites

Fungal Diseases

1) Saprolegniosis or Fish mould Causative agent:

Saprolegnia parasitica

Species affected: Indian Major Carps, Tilapia and Gold fish

Symptoms: Cotton wool like growth on affected fish or fish eggs. Fishes become lethargic and listless and less responsive to external stimuli. The infection is initiated on the surface and gradually spread and penetrates deep in the tissue.

Treatment: Maintain optimum water quality, stock optimum density of fish, feed fishes with nutritious feed, treat pond with 1 mg/l potassium permanganate. Potassium permanganate bath treatment for adult fish @ 160 mg/l for 5 days. Potassium dichromate (Swab treatment to small fishes) @ 100 mg/l for 7 days. Malachite green for fish @ 1-2 mg/l for half an hour.

EUS (Epizootic Ulcerative Syndrome):

Causative agent: *Aphanomyces invadans* (Fungus), *Aeromonas hydrophilla* (Bacteria), *Rhabdovirus* (virus)

Species affected: Indian Major Carps, Snakehead and Catfishes

Symptoms: Infection starts as a red spot in the skin then it eventually becomes an ulcer. As it progresses, the ulcerative area gets eroded. In infected *Channa striatus* swim with disintegrated caudal peduncle and eroded head due to the high general resistance to infections. The smaller freshwater fishes such as minnows die much before the infection can erode any organs.

Treatment: In the initial stage application of sodium chloride treatment is effective. CIFA produced a CIFAX, for controlling of EUS. Prevent entry of wild fishes and birds. Maintain water temperature during winter season and water exchange.

2. Conclusion

Disease issue has become a prime constraint for the sustainable aquaculture. The fish farmers are having little or no expertise in aquaculture health management strategies. So knowing the causes of fish diseases, their significance, and how to control the fish diseases in aquaculture will provide a lot of information towards disease problems and better health management strategies in freshwater aquaculture production. This article could improve disease management skills of fish farmers in aquaculture practices.

References

[1] Academic Press, San Diego, U.S.A.

- [2] C.R. Lavilla-Pitogo and R.P. Subasinghe (eds.), p. 155-184. SEAFDEC Aquaculture Department, Iloilo, Philippines.
- [3] Cruz-Lacierda, E.R., de la Peña, L.D. and Lumanlan-Mayo, S. 2000. The use of chemicals in aquaculture in the Philippines. *In: Use of Chemicals in Aquaculture in Asia*, J.R. Arthur,
- [4] Das B.K and Mishra S.S. 2014. *Diseases in Freshwater aquaculture*, In: Training Manual on Model training course on Preventive health management practices in freshwater aquaculture. ICAR-Central Institute of Freshwater aquaculture, Bhubaneswar, Odisha, India.
- [5] Holt, J.G. (ed.) 1984. *Bergey's Manual of Systematic Bacteriology*, Vol. 1. Williams and Wilkins, Baltimore, U.S.A. 964 p.
- [6] Holt, J.G. (ed.) 1994. *Bergey's Manual of Determinative Bacteriology*, 9th Edition. Williams and Wilkins, Baltimore, U.S.A. 816 p.
- [7] Kanchanakhan, S. 1996. Diseases of cultured grouper. *AAHRI Newsletter* 5(2): 3-4.
- [8] Kasornchandra, J. 2002. Major viral and bacterial diseases of cultured seabass and groupers in Southeast Asia. *In: Diseases in Asian Aquaculture IV*, C.R. Lavilla-Pitogo and E.R. Cruz-Lacierda (eds.), p. 205-212. Fish Health Section, Asian Fisheries Society, Manila, Philippines.
- [9] Koesharyani, I., Roza, D., Mahardika, K., Johnny, F., Zafran and Yuasa, K. 2001. *Manual for Fish Disease Diagnosis-II. Marine Fish and Crustacean Diseases in Indonesia*. Gondol Research Institute for Fisheries of Indonesia and Japan International Cooperation Agency, Indonesia. 49 p.
- [10] Kumar P., Khar S., Dwivedi S., Sharma S.K and Himabindu S. 2015. An Overview of Fisheries and Aquaculture in India. *AgroEconomist* 2: 1-6.
- [11] Lavilla-Pitogo, C.R., Castillo, A.R. and de la Cruz, M.C. 1992. Occurrence of *Vibrio* sp. infection in grouper, *Epinephelus suillus*. *J. Appl. Ichthyol.* 8: 175-179.
- [12] Lee, K.K., Liu, P.C. and Chuang, W.H. 2002. Pathogenesis of gastroenteritis caused by *Vibrio carchariae* in cultured marine fish. *Mar. Biotechnol.* 4: 267-277.
- [13] Lee, K.K., Yang, T.I., Liu, P.C., Wu, J.L. and Hsu, Y.L. 1999. Dual challenges of infectious pancreatic necrosis virus and *Vibrio carchariae* in the grouper, *Epinephelus* sp. *Virus Res.* 63: 131-134.
- [14] Leong, T.S. 1992. Diseases of brackishwater and marine fish cultured in some Asian countries. *In: Diseases in Asian Aquaculture I*, M. Shariff, R.P. Subasinghe and J.R. Arthur (eds.), p. 223-236. Fish Health Section, Asian Fisheries Society, Manila, Philippines.
- [15] Leong, T.S. 1998. Grouper culture. *In: Tropical Mariculture*, S.S. de Silva (ed.), p. 423-448.
- [16] *Lolitkanta Newsletter* No. 9: 1-2.
- [17] Mishra S.S., Das R., Dhiman M., Choudhary P and Debbarma J. 2017. Present Status of Fish Disease Management in Freshwater Aquaculture in India: State-of-the-Art-Review. *J. Aquac. Fisheries*, 1: 003.

- [18] Ong, B. 1988. Characteristics of bacteria isolated from diseased groupers, *Epinephelus salmoides*. *Aquaculture* 73: 7-17.
- [19] Saeed, M.O. 1995. Association of *Vibrio harveyi* with mortalities in cultured marine fishes in Kuwait. *Aquaculture* 136: 21-29.
- [20] Sandeep P., Chamundeswari D.B and Kumar K.P. 2016. Present status of Parasitic and Bacterial diseases in Fresh Water Fish Seed Farms in East Godavari District, Andhra Pradesh. *International Journal of Applied and Pure Science and Agriculture* 2: 117-121.
- [21] Yui, K.C. Yang, T.I. and Lee, K.K. 1997. Isolation and characterization of *Vibrio carchariae*, a causative agent of gastroenteritis in the grouper, *Epinephelus coioides*. *Curr. Microbiol.* 35: 109-115.
- [22] Zafran. 1998. *Flexibacter maritimus* infection in humpback grouper, *Cromileptes altivelis*.