



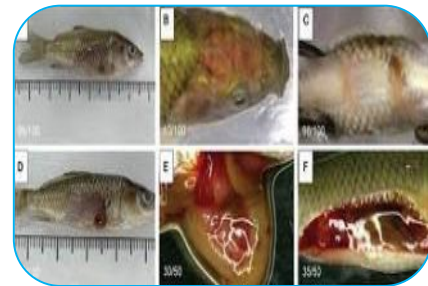
“STUDY OF BACTERIAL DISEASES IN FISHES : A REVIEW”

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ABSTRACT:

*Bacterial diseases are a major concern in the aquaculture industry, causing significant economic losses worldwide. This review article aims to provide an overview of the most common bacterial diseases affecting fish species and their impact on the aquaculture industry. The article discusses the etiology, clinical signs, pathology, diagnosis, and treatment of various bacterial diseases, including *Aeromonas hydrophila*, *Vibrio* spp., *Edwardsiella tarda*, and *Streptococcus iniae*. Additionally, the article highlights the importance of disease prevention strategies, such as biosecurity measures, vaccination, and proper management practices, in reducing the occurrence and impact of bacterial diseases in fish populations. Overall, this review article serves as a comprehensive resource for researchers, veterinarians, and aquaculture professionals interested in the study of bacterial diseases in fishes.*



KEYWORDS: Bacterial diseases, Fishes and Aquaculture.

INTRODUCTION

Fisheries and aquaculture play a vital role in the global economy, providing a significant source of protein and income for millions of people worldwide. However, bacterial diseases pose a significant threat to the health and welfare of fish populations in the aquaculture industry, causing significant economic losses. The study of bacterial diseases in fishes is essential for developing effective prevention and control strategies to reduce the impact of these diseases on the industry. This review article provides an overview of the most common bacterial diseases affecting fish species, their etiology, clinical signs, pathology, diagnosis, and treatment. Additionally, the article highlights the importance of disease prevention strategies, such as biosecurity measures, vaccination, and proper management practices, in reducing the occurrence and impact of bacterial diseases in fish populations. The article aims to provide a comprehensive resource for researchers, veterinarians, and aquaculture professionals interested in the study of bacterial diseases in fishes. The information provided in this review can help improve our understanding of bacterial diseases in fishes and contribute to the development of more effective and sustainable disease prevention and control strategies.

Fishes not only play an important role in the demand of food for humans but they have also emerged as major model organisms for different biomedical researches. With increasing numbers of synthetic chemicals introduced into the environment each year, concerns remain regarding our understanding of the linkages between exposure to toxic agents and potential disease. Chemical contaminants of aquatic environments is of significant concern because although it is understood that aquatic systems serve as major conduits for distribution and deposition of many toxic agents, relatively

few methods are available which provide sufficient sensitivity, accuracy and practicality necessary for assessment of chemical toxicity. As a consequence, new approaches are needed to improve the assessment of health risks associated with exposure to chemical contaminants in the aquatic environments (Madhuri S. et al., 2012).

DISCUSSION:

The study of bacterial diseases in fishes is of significant importance in the aquaculture industry. The impact of bacterial diseases on fish populations can be devastating, leading to substantial economic losses for the aquaculture industry. This review article has provided a comprehensive overview of the most common bacterial diseases affecting fish species and their impact on the industry. One of the main findings of this review is that bacterial diseases affecting fish are caused by a variety of pathogens, including *Aeromonas hydrophila*, *Vibrio* spp., *Edwardsiella tarda*, and *Streptococcus iniae*. These pathogens are responsible for a wide range of clinical signs, such as skin ulcers, fin rot, hemorrhaging, and systemic infections. Effective disease prevention strategies are critical to reducing the impact of bacterial diseases on fish populations. Biosecurity measures, such as controlling the movement of people, equipment, and animals, can prevent the introduction of pathogens into fish farms. Vaccination programs and proper management practices, such as maintaining good water quality and providing adequate nutrition, can also help prevent the occurrence of bacterial diseases.

Diagnosis and treatment of bacterial diseases in fish can be challenging, as many pathogens share similar clinical signs. However, various diagnostic techniques, including bacterial culture, molecular methods, and histopathology, can help identify the causative agent. Treatment options include the use of antibiotics and other antimicrobial agents, but their use should be judicious to prevent the development of antibiotic resistance.

Fish can suffer from various types of protozoan, fungal, bacterial, viral, crustacean and helminth diseases, etc. Bacterial diseases have been noticed nine types of bacterial diseases shows on freshwater fish's body. They are discussed in below:

a) Columnaris- It is a bacterial disease-caused by *Flexibacter Columnaris*. The clinical symptom is raised white plaques often with reddish peripheral zone leading to hemorrhagic ulcers.

b) General Septicemia- It is caused by *Aeromonas Hydrophila*. This type of bacteria found in fish blood. This disease affected on Catla, Rohu, Mrigala, Cat Fish. This disease shows ulceration of skin, distended abdomen and inflamed fins and fins bases.

c) Ragged Fins and Tail- These diseases affected both adults and young fishes. It is caused by *Pseudomonas* Bacteria. This infection during its early stage appears as a white line on the margin of the fin. Fin rays become brittle and start breaking.

d) Furunculosis- This is a highly contagious disease that effects fish of all ages. It is caused by *Aeromonas Salmonicida*. Generally common carp, tilapia are effected. Sudden death, fish may also show swimming just below the surface, loss of appetite can be observed. Pathological and microscopic pathological signs are body discharge from vent, stomach filled with mucus, blood and sloughed epithelial cells, fusion of gill lamellae, bacterial colonies in many tissue.

e) Enlarged eye (Exophthalmos) - This is an epidemic eye disease which effects medium-sized and large sized catla fish. It is caused by *Aeromonas Punctata*. Cornea of eye becomes vascularized and later becomes opaque, eyeballs gets decayed.

f) Dropsy- It is not an actual disease, but a physical manifestation of kidney failure in fish, where the fish body balloons outward from excess water and its scales stick out like a pine cone. But dropsy disease can possible through thebacterial infection. A fresh water fishes exists in a hypotonic

environment. That is freshwater is made up of a higher concentration of water and lower concentration of solutes, like salt. This result in water similar enough to the water in the fish body so that the water moves freely into the fish's skin and other tissues. The water also needs to leave its body, otherwise the fish absorbs fatal amount of water. The kidneys are responsible for removing the excess water, pushing it out of the body and back into the environment through the gills and urinary tract. However if the kidney are not working correctly, the excess water can be build up internally, leading to the bloated appearance referred to as dropsy. Sign of excess water retention may be from a slight rounding of the belly to a very swollen belly.

g) Bacterial Kidney Disease (BKD) - It is a bacterial disease caused by *Renibacterium salmoninarum*. It is a gram positive bacteria. This disease can be transmitted through the eggs and also fish can be infected by oral route and also via skin erosions. The source of infection can be contaminated feed and water. Clinical signs of BKD is darkness of the skin, gills are pale in colour, swelling of the kidney.

h) Cold water Disease (CWD) - Cold water disease caused by *Flavobacterium psychrophilia*. In infected fish, the caudal peduncle darkness and as the disease progresses, the caudal fin becomes frayed and eroded. According to Wood (1979), the transmission of the disease is associated with the presence of carrier fish, vertical transmission of the disease to the offspring may also be a possibility.

i) Mycobacteriosis- Mycobacteriosis is a bacterial disease of fresh water fish. It is also called fish tuberculosis. It is caused by *Mycobacteria chelonian*. These disease symptoms are mainly shows in summer session. The most common symptoms are poor body condition, skin ulcers, scales loss.

TREATMENT AND CONTROL OF BACTERIAL DISEASES:

For fin and tail rot fin diseases, one minute dip in 1:3,000 solution of copper sulphate should be given (Gopalakrishnan V., 1963). Painting the site of infection with concentrated copper sulphate solution also helps to cure the disease (Pal RN and Ghose AK, 1975). In ulcer disease, the badly infected fish should be destroyed and the pond water should be disinfected with a 0.5 ppm solution of $KMnO_4$. Dip treatment for one minute in 1:2,000 copper sulphate solution for 3 to 4 days in case of fish showing early stage of infection is required. Addition of chloromycetin at 5 to 10 ppm to pond water and/or addition of the antibiotic oxytetracycline to feed @ 75 mg/kg of fish/day is done (Jhingran VG, 1991). In dropsy, thorough disinfection is done with 1 ppm potassium permanganate solution or dip treatment in 5 ppm of the same chemical for 2 minutes can be given (Gopalakrishnan V., 1963). In eye disease, during the initial stage of infection, chloromycetin (8-10 mg/L) bath for one hour should be given for 2 to 3 days. Disinfection of pond with 1 ppm potassium permanganate, improvement of sanitary conditions and resorting to artificial feeding to fishes (in case plankton population is not sufficient) should be done (Gopalakrishnan V, 1961).

CONCLUSION:

In conclusion, bacterial diseases pose a significant threat to the health and welfare of fish populations in the aquaculture industry. Effective prevention and control of these diseases are critical to ensuring sustainable and profitable fish production. This review article has provided an overview of the most common bacterial diseases affecting fish, their clinical signs, diagnosis, and treatment options. It has also highlighted the importance of disease prevention strategies such as biosecurity measures, vaccination, and proper management practices. Further research is needed to develop more effective and sustainable prevention and control strategies to combat bacterial diseases in the aquaculture industry.

REFERENCES :

- Gopalakrishnan V. Controlling pest and diseases of cultured fishes. Indian Livestock 1963; 1 (1):51-54.
- Gopalakrishnan V. Observation on a new epidermal eye disease affecting the Indian carps *Catla catla* (Hamilton Buchanan.) Ind J Fish 1961; 8:222- 232.
- Jhingran VG. Fish and Fisheries of India. Delhi: Hindustan Publishing Corporation (INDIA); 1991.
- Madhuri S, Mandloi AK, Pandey Govind, Shrivastav AB. Transgenic fish model in environmental toxicology. Int Res J Pharm 2012; 3(5):37-40.
- Pal RN, Ghose AK. An effective method of controlling tail and fin rot in Indian major carps. J Inland Fish Soc 1975; 7:98-99.



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