



INCIDENCE OF FUNGAL INFECTION IN SOME ECONOMICALLY IMPORTANT FISHES IN PONDS OF JABALPUR

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ABSTRACT – The ability of Aquatic fungi to cause disease in fish is well known. Potentially all fresh water fishes and incubating eggs are susceptible to fungal infection. The fungal sp. of fishes are *Aspergillus* sp., *Aspergillus fumigate*, *Aspergillus niger*, *Aspergillus nidulans*, *Alternaria tenuis*, *Saprolegnia ferax*, *Allomyces anomalus*, *Rhizopus* sp, *Saprolegnia parasitica*, *Achlya proliferata*, *Neurospora* sp. *Penicillium* sp. and *Aspergillus* fungal sp. these are most common infection causing fungi.

INTRODUCTION

Fresh water fishes are an important protein source for people of many countries (Hussain *et al.*, 2011; Rubbani *et al.*, 2011). However, globally fish from freshwater and marine sources are in severe decline, driven in large part by economic and human population growth (Limburg *et al.*, 2011). Fish farming in various parts of the world has increased many folds in the last decade.

As a result, fish culture has now become commercially an important industry worldwide. The growth of fish culture has also increases issues of fish health. Bacterial hemorrhagic septicemia, lernaeciasis, saprolegniasis and anoxia are the most commonly found fish diseases in pond fishes in Punjab. Fish eggs, fry, fingerlings and adult fish are acts as a target of fungi. Fungal infections (fungal infections are called mycoses) are among the most common diseases seen in temperate fish because fungal spores are found in all fish ponds and create problems in stressed fish. Poor water quality can also lead to an increase in fungal infections in an otherwise healthy fish population. Most fungal infections invaded on external tissues and only few fungal infections affect the internal organs of fish.

Fish farmers often suffer heavy economic losses due to fish diseases. Fungi can become a problem, if fish are stressed by disease and poor environmental conditions, poor nutrition, and pressure of population and over exploitation. They can also adapt to reasonable environmental changes and in turn avoid diseases due to pathogenic infection. Fungi are heterotrophs and are mostly saprophytes. Parasitic fungi are facultative saprophytes as most saprophytic fungi are facultative parasites. However, this depends on the prevailing conditions. Fungal organisms

vary in structure from species-to-species, genus-to-genus and family-to-family. Most of the fungal diseases on freshwater fishes mainly occurred during winter season. Stressors include high stock densities, poor habitat and poor water quality. As a result fish become more susceptible to diseases (Khulbe and Bhargava, 1977; Hossain and Paul, 1993; Muniruzzaman and Chowdhury, 2008). Present study was aimed to investigate the fungal infection in pond water fishes.

MATERIAL AND METHOD

Collection of infected fish sample

Incidences of fungal infection were recorded during the research duration of June 2017 to Nov 2019 from Mahanadda, Gangasagar and Supatal pond, Jabalpur M.P. The fishes were collected with the help of fisherman in sterile polythene bags in aerated water and transported immediately to dept of zoology government M.H. College of home science and science, Jabalpur for mycological study. The fishes were kept separate in glass aquarium with continuous air supply at ambient temperature.

Isolation of fungi from infected fishes

Isolation of fungi from infected fishes was carried out by taking small pieces from muscles about 2 mm in diameter from different portions of body and washed thoroughly with distilled water. (Kumari *et.al.*, 2015, Eli *et.al.*, 2011) These tissues were then inoculated over plates containing on Potato Dextrose Agar medium for 5-7 days of incubation at a temperature ranging between 25°C to 28°C in the incubator was provided to the different isolated fungi.

Identification of isolated fungi

Identification and characterization were made by observing the colony colour and texture. The prepared slides compared with the authentic manuals of fungi. (Coker 1923; Khulbe, 1995; Bilgrami *et.al.*, 1991; Jamaludiin, 2004)

Maintenance of culture

The stock culture of fungi were maintained on PDA slant and stored at low temperature (4°C)

Determination of frequency

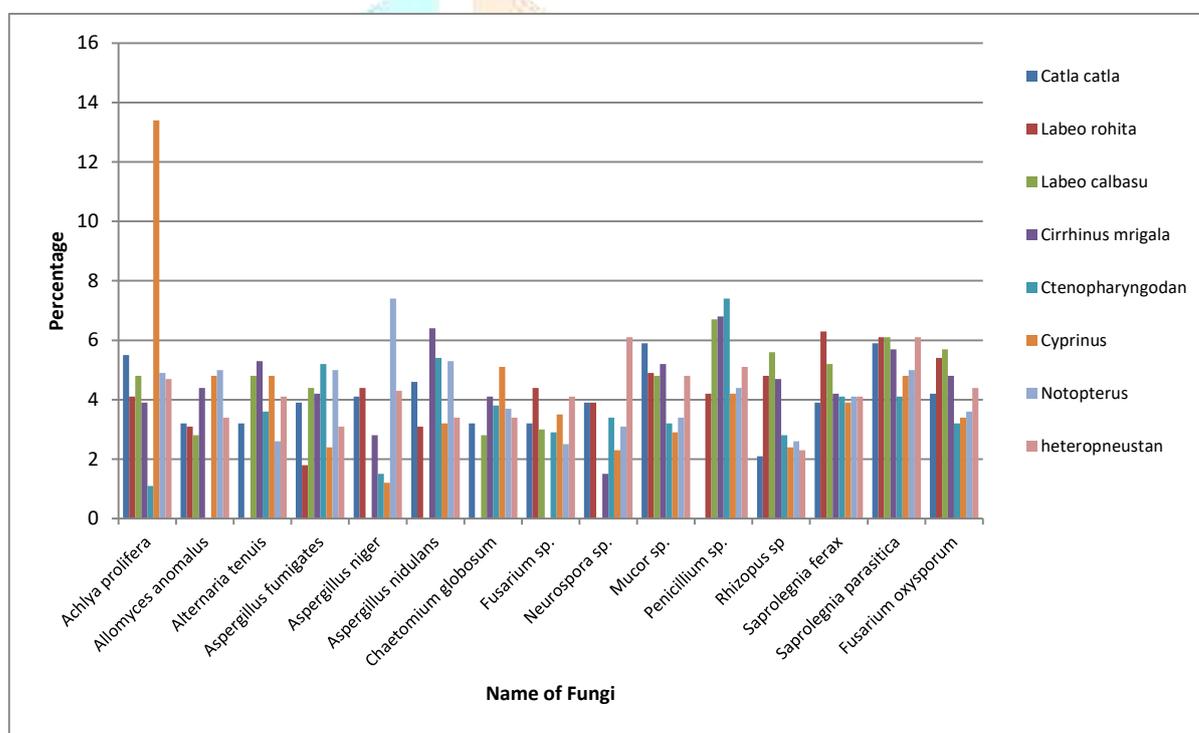
The present frequency of fungal species occurrence was calculated as follows:-

$$\% \text{ of frequency of species} = \frac{\text{Average number of total colonies of species in one plate}}{\text{Average number of total colonies of all the species in one plate}} \times 100$$

RESULT AND DISCUSSION

In the present study total 15 fishes were examined out of which 8 were to be infected with fungal diseases viz: - *Catla catla*, *Labeo rohita*, *Labeo calbasu*, *Cirrhinus mrigala*, *Ctenopharyngodan*, *Cyprinus*, *Notopterus*, *heteropneustan*. These fishes shows fungal infection with typical clinical symptoms such as de-coloration of body, de-scaling and exposure of epidermis, fungoid patches on body, lesions and ulcerations. *Aspergillus sp.* was the most prevent fungus represented by three spp. Similar symptoms have been reported by (R.D.Khulbe and S.C Sati, 1981, Hatai, K. and G.Hoshaiai 1992 and K.Hatai *et al*, 1994). Amongst the various *Aspergillus fumigate*, *Aspergillus niger* and *Aspergillus nidulans* was the most dominant sp. It was followed by *Alternaria tenuis*, *Saprolegnia ferax*, *Allomyces anomalus*, *Rhizopus sp*, *Saprolegnia parasitica*, *Achlya prolifera* and *Neurospora sp.* and minimum frequency was observed by *Penicillium sp.* (T.A.Qureshi *et al*, 2002, R.J.Roberts *et al*, 1993 and K.Hatai *et al*, 1994) Also reported pathogenecity of same on fishes.

Graph-1 Experimental infection isolate with various species of fungi from disease fishes



CONCLUSION

The present study is to investigate fungal infections in eight economically important fresh water fishes viz: *Catla catla*, *Labeo rohita*, *Labeo calbasu*, *Cirrhinus mrigala*, *Ctenopharyngodan*, *Cyprinus*, *Notopterus*, *heteropneustan* were collected from Mahanadda, Gangasagar and Supatal Pond of Jabalpur. Nearly 15 fungi were identified. Identification and characterization of the fungi were made with the help of authentic manuals of fungi. The most common among them viz; *Aspergillus sp.*, *Achlya prolifera*, *Allomyces anomalus*, *Alternaria tenuis*, *Chaetomium globosum*, *Fusarium sp.*, *Neurospora sp.*, *Mucor sp.*, *Penicillium sp.*, *Rhizopus sp.*, *Saprolegnia ferax*, *Saprolegnia parasitica*, *Fusarium oxysporum*, were isolated, identified and characterized.

The observations revealed that ponds of Jabalpur showed considerable intensity of fungal infection in fishes. It may be primary or secondary pathogen. Total 15 fungi were identified in 8 economically important fresh water

fishes. *Aspergillus* sp. was found most virulent with maximum host range and most of the fishes were of economical impotent group.

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