



SOME FUNGAL PARASITES OF FRESH WATER FISHES FROM PARBHANI DISTRICT.

Ishrat Parveen
Mohammed Bari

Department of Zoology, Dyanopasak College, Parbhani

ABSTRACT The present investigation was conducted on fungal diseases of fresh water catfishes. Total 95 fish specimens were observed. Different parts of body of fishes were found infected and showed clinical signs. The clinical signs are variable on different fish species. The fungi isolated from infected areas on the fishes were cultured on different media including Malt Extract Agar (MEA), Sabouraud Dextrose Agar (SDA) and Potato Dextrose Agar (PDA) was prepared. The agar plates were incubated at 28-30°C and fungal growth was observed after 4-7 days. The fungal colonies of white, grey, black, brown, green and orange colours were observed. The slides were prepared and stained with Lacto phenol cotton blue.

Three different genera of fungi were identified as *Aspergillus*, *Penicillium* and *Saprolegnia*. *Aspergillus* and *penicillium* were isolated from *Clarius batrachus* and *Wallago attu* and *Saprolegnia* was isolated from both *Clarius batrachus* and *Mystus seenghala*. All three species of catfishes shows incidence of fungal parasites, *Clarius batrachus* shows (57.89%) which was highest, followed by *Wallago attu* (52.94%) and *Mystus seenghala* was found less affected (43.47%).

KEYWORDS : Fungal parasites, Incidence, Catfishes, Masooli Reservoir

INTRODUCTION:-

Diseases in fresh water fishes are great threat to achieve optimum production and become a limiting factor to economic success of aquaculture. The fresh water fishes are affected by number of fungal and bacterial parasites and suffering from different septicaemia, tail and fin rot disease, gill rot disease, etc. However, fungi can become a problem if fishes are stressed by poor nutrition, pressure of population and overexploitation of fishes. Fungal infections are common of fresh water fishes and distributed worldwide. Fungal diseases are easily recognized by colony of fluffy growth on the skin and gills of fishes.

The saprolegniaceae are responsible for significant infections, involving both living and dead fish and their eggs, particularly in aquaculture. Oomycetes are saprophytic opportunists multiplying on fish that are physically injured, stressed or infected (Pickering and Willoughby, 1982). Members of this group are generally considered as agents of secondary infections arising from conditions such as bacterial infection, poor husbandry practices, and infestations by parasites and social interactions. However, there are several reports of Oomycetes as infectious agents of fish and their eggs (Scott and O'Bier, 1961; Bhargava et al., 1971; Willoughby, 1978; Srivastava, 1980; Sati and Khulbe, 1983; Sati, 1991; Walse and Phelps, 1993; Hatai and Hoshiai, 1993; Khulbe et al., 1994; 1995; Kitancharoen et al., 1995; Qureshi et al., 1995; Kitancharoen and Hatai, 1996; Bisht et al., 1996; Rajender and Khulbe, 1998; Qureshi et al., 1999; Vikas et al., 2005; Ramaiah, 2006; Mastan, 2008; and Vinay 2008; Refai et al., 2010; Rekha and Qureshi, 2012, 2013; Hatai, 2012; Vickie et al., 2013; Zafar Iqbal and Reshma, 2013).

Therefore the present study has been aimed to isolate, identify and determined the pathogenicity of the catfishes from Masooli Reservoir, Parbhani.

MATERIALS AND METHODS:-

During present investigation period catfishes (*Clarius batrachus*, *Wallago attu* and *Mystus seenghala*) were collected from Masooli reservoir of Parbhani district with the help of local fisherman.

For identification of fungal and bacterial parasites fishes were brought to the laboratory in sterile polythene bags in aerated pond water and kept in glass aquaria with continuous air supply at ambient temperature for further examination. For culturing of fungal specimens, three different types of media including Malt Extract Agar (MEA), Sabouraud Dextrose Agar (SDA) and Potato Dextrose Agar (PDA) were prepared. The fungal isolates were collected from infected organs of fish with sterile needle and inoculated on malt extract (Oxide, UK), sabouraud dextrose (Oxide, UK) and potato dextrose (M096-India) agars. The agar plates were incubated at 28-30°C and fungal growth was observed after 4-7 days. The fungal colonies of grey and green colours were observed in the agar plates. For microscopic examination, slides were prepared from each colony and stained with

lactophenol cotton blue. The fungi were identified with the help of available fungal identification keys of Raper and Fennew, 1965, Nelson et al. 1983 and Shrivastava, 2009.

There is also recorded the infected and non-infected host fishes. This data was obtained throughout the study period of one year (2011-2012). This was processed and analysed to know the incidence of fungal parasites.

The infected fishes were identified by the symptoms of fishes such as loss of normal glaze; spot having haemorrhagic lesions on their body, excess mucus secretions, discoloration of gill filament and damage of gill. Clinical symptoms of *Clarius batrachus* showed that caudal fins covered with white edges; scales were eroded near caudal peduncle, tip of dorsal fin edges becomes colourless, similarly, anal fin edges shows disintegration. Abdominal part shows eroded scales likewise haemorrhages and lesion were present all over the body surface of *Wallago attu*, *Mystus seenghala* and *Clarius batrachus* fishes with whitish edges which had fungal hyphae.

The incidence of fungal parasites was determined by using following formula

$$\text{Incidence (\%)} = \frac{\text{Infected host} \times 100}{\text{Total host examined}}$$

Table no.1 shows fungal infection in different host

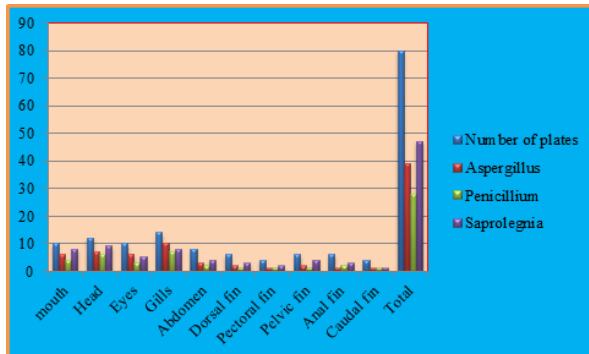
Sr. No	Host fish species	Number of Observed fish	Number of Infected fish	Incidence (%)	Site of infection
1	<i>Clarius batrachus</i>	38	26	57.89	Head, eyes, gills, abdomen, caudal fin
2	<i>Wallago attu</i>	34	22	52.94	Eyes, gills, abdomen, caudal fin
3	<i>Mystus seenghala</i>	23	18	43.47	Mouth, head, eyes, gills, abdomen and caudal fin
Total	95	66	69.47		

Table no.2 shows isolated fungi *Saprolegnia* from different organs of *Clarius batrachus* fish

Fish organ	Number of plates	<i>Aspergillus</i>	<i>Penicillium</i>	<i>Saprolegnia</i>
Mouth	10	06	04	08
Head	12	07	06	09
Eyes	10	06	03	05
Gills	14	10	07	08
Abdomen	08	03	02	04
Dorsal fin	06	02	01	03

Pectoral fin	04	01	01	02
Pelvic fin	06	02	01	04
Anal fin	06	01	02	03
Caudal fin	04	01	01	01
Total	80	39	28	47

Graph shows isolated fungi *Saprolegnia* from different organs of *Clarius batrachus* fish



RESULT AND DISCUSSION:-

During present study fresh water catfishes were collected from different areas of Masooli Reservoir with the help of fisherman. Total 95 fishes were collected in number. The *clarius batrachus* fish belongs to the family clariidae, *Wallago attu* belongs to family Siluridae and *Mystus seenghala* belongs to Bagridae family.

These different varieties of fishes are different in their habitat and habit. The fishes were collected, dissected and examined for fungal infections. Out of these 66 catfish specimen shows fungal infection from different sites of body like mouth, head, eyes, gills, abdomen and all the fins (Table no.1).

Although the present investigation was carried out in all three seasons i.e summer, monsoon and winter season, so the incidence of infection and intensity were also shows variations in all different species of fresh water fishes. During summer season it is higher, in monsoon it is less and moderate in winter.

The fungal infection is primary infection to fishes and it spreads rapidly on all the surface of fish body because the mucus on the fish's body is a significant barrier to disease organisms. This mucus is a glycoprotein substance which can eliminate many pathogens. Scales and skin below the mucus layer considered as secondary barriers to invasion by pathogens, parasites and toxins. Capture, netting and shipping disrupts the integrity of these important barriers facilitating invasion by opportunistic parasites. Internal barriers to pathogens also exist at the cellular level.

Infections of fishes were frequently associated with wounds or clinical lesions and the damage due to the handling of fishes invites the infection.

The comparative study shows that *Clarius batrachus* found more affected than *Wallago attu* followed by *Mystus seenghala*. The incidence of fungal infection is different in these three species of catfishes. The *Clarius batrachus* shows 57.89% fungal infection which is higher as compare to *Wallago attu* (52.94%) and the less percentage was found in *Mystus seenghala* (43.47%) which was reported from different body parts. (As shown in Table no.1)

The detail study of isolated fungi from all three species of catfishes was also recorded. One example was briefly described in Table no.2, according to which the abundance of *Saprolegnia* was found higher than the remaining two species of fungi.

The above mentioned data of one year shows that fresh water fishes of Masooli Reservoir suffer from three types of fungal infection and they are identified as *Saprolegnia*, *Aspergillus* and *Penicillium*. This study is almost similar with Alam et al (2003) who found that *C. mrigala* and *C. straitus* were most severely infected fishes. The types of ulcers produced in fishes from India and Pakistan have been associated with pathogenic fungus *saprolegnia spp.* (Anonymous, 1992 and Rab et al, 2001). Jewel and Affan (2003) found that *Aphanomyces* and

Saprolegnia spp were common pathogens in *L. rohita*, *Catla-catla*, *P.gonionotus* and *C.punctatus*. Burno and Wood (1994) stated that *Saprolegnia spp.* has great impact on aquaculture especially it can infect carp and Tilapia which strongly supports the present study. It was found that *Saprolegnia sp.* is recovered from affected areas of gills, which cause the gill rot disease.

Robert et al (1993) stated that gill rot disease is primary problem in many fresh water carp fishes and it was found when fish suffering from an environmental stress. Barua (1994) reported that *Saprolegnia sp.* can grow at temperature ranging from 32°F to 95°F where poor water qualities such as low circulation, low D.O, or high ammonia are associated with *Saprolegnia sp.* Infections.

In present study examination of infected fishes revealed that the presence of species of *Saprolegnia* found to be virulent for fishes. All species of fresh water fishes shows wide range of infections of fungus. The same is also reported by Chauhan and Qureshi (1994). Qureshi et al. (2000) have conducted pathogenicity studies with various species of *Saprolegnia* on different species of fishes of central India.

CONCLUSION:-

From above investigation, it comes to conclude that catfishes shows more infections and the incidence of fungal infection, high in summer, less in winter and moderate in monsoon i.e. it varies widely from host to host, species to species and season to season.

ACKNOWLEDGEMENT:-

The author gratefully acknowledges the Principal, DSM College, Parbhani for providing necessary laboratory facilities during this work.

REFERENCES

- Alam, M.Z., Ahmed, G.U., Alam, M.S. and Alam, M.T. 2003. Studies on fish diseases and limnological factors in Raktadaha Beel, Bogra. J. Bio-Sci. 11: 93-98.
- Anonymous, 1992. Enigma of EUS. Consultation of EUS vis-a-vis the environment and the people, 25-26 May 1992. Summary of proceedings, International Collective in Support of Fish Workers, 27 C College Road, Madras 600006, India.
- Arderon W (1748) The Substance of a letter from Mr. William Arderon, F.R.S., Phil. Trans. Res. Soc. 45 (487): 321-323.
- Barua, G. 1994. The status of epizootic ulcerative syndrome of fish3, Viral, Bacterial and Fungal Infections. Edited by P.T.K. Wood and D.W. Bruno. CABI publishing Wallingford, Oxon, United Kingdom. 599-659 pp.
- Bhargava K.S, Swarup K, Singh CS (1971) Fungi parasites on certain fresh water fishes of Gorakhpur. Indian Biol.3: 65-69
- Bruno, D. W. and Wood, B. P. 1994. *Saprolegnia* and other Oomycetes. In Fish Diseases and Disorder, Volume Chinabut, S. 1994. Environmental factors in relation to the epizootiology of EUS in Thailand. Proceedings of the ODA Regional Seminar on Epizootic Ulcerative Syndrome. Aquatic Animal Health Research Institute, Bangkok, Thailand, 25-27 January 1994 (eds. R.J. Roberts, B. Chambell and I.H. MacRae). 143146 pp.
- Chauhan R, Qureshi TA (1994). Host range studies of *Saprolegnia ferax* and *Saprolegnia hypoglycana*. J. Inland Fish. Soc. India 26(2):99-106.
- Hatai K (2012) Diseases of fish and shellfish caused by marine fungi, (ed. By C. Raghukumar) Biology of marine fungi, pp 15-49
- Jewel, M.A.S. and Affan, M.A. 2003. Epizootic Ulcerative Syndrome (EUS) in fishes of small-scale farmers' ponds in Bogra district of Bangladesh. Univ. J. Zool. Rajshahi Univ., 22: 11-18.
- Khulbe RD, Bisht, GS Chandra Joshi (1994) Epizootic infection due to *Achlya debaryana* in a catfish. Mycoses 37: 61-63
- Mastan SA (2008) Incidences of Dermatomycosis in fishes of Larpur reservoir, Bhopal, (M.P.) J Herbal Med. Toxicol. 2(1):37-40.
- Qureshi, TA, Prasad Y, Mastan SA, Chauhan R (2000). Involvement of fungal and bacterial pathogens in EUS affected fishes. Biotech consortium India Limited, pp. 125-139.
- Ramaiah N (2006) Areview on fungal diseases of algae, marine fishes, shrimps and corals. Indian J Mar. Sci. 35 (4): 380-387
- Rafai MK, Laila A, Mohamed, Amawy M, Kenawy, Shimma El-S-MM (2010) The assessment of mycotic settlement of fresh water fishes in Egypt. J. Am. Sci 6 (11): 21-23
- Rekha C. Qureshi T (2012) fungal infection of fishes: Parasitic fungi and its role in fish disease. Lap Lambert Academic Publishing, P-184
- Rekha C. Qureshi T (2013): Studies on conidial fungi isolated from some fresh water fishes. Int. J. Advance Life Sci (4): 227-281
- Scott WW, O Bier, AH (1961) Aquatic fungi associated with diseased fish and fish egg. Prog. Fish cult. 24: 3-15
- Shrivastav RC (1980) Study in fish mycopathology, a review. Mycoses 23: 325-332
- Sati SC (1982). Aquatic fungi of Kumaun in relation to fish infection, Ph.D. Thesis, Kumaun University, Nainital, India, pp. 1-189.
- Vikie, B, Scott P, Edward P (2013) Fish health fungal infection and pflisteria. The role of the U.S Geological Survey Fact Sheet, 114-128
- Vikas S, Mastan SA, Qureshi TA (2005) incidence of *Saprolegnia* in fishes of Hataikhada reservoir, Bhopal, Indian J. Fish. 52 (3): 367-370
- Vinay V (2008) Fungal disease in fish, diagnosis and treatment. Vet. World 2: 12-15
- Willoughby LG (1978) Saprolegniasis of salmonid fish in windermere, a critical analysis. J.Fish Dis. 1:51-67
- Zafar I, Reshma S (2013) Some pathogenic fungi parasitizing two exotic tropical ornamental fishes. Int. J. Agric. Sci. Bio. 15 (3): 595-98