BEST: International Journal of Humanities, Arts, Medicine and Sciences (BEST: IJHAMS)
ISSN (P): 2348–0521, ISSN (E): 2454–4728
Vol. 9, Issue 1, Jun 2021, 57–62

OCCURRENCE OF PATHOGENIC MYXOSPOREA IN FRESH WATER FISH *(Catla catla)*, WEST-GODAVARI DISTRICT, A.P, INDIA.

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ABSTRACT

Protozoans display an amazing variety of inter specific relationships among which parasitism is the most common and well documented in the class myxosporea of phylum myxospora. Fishes infected with myxosporean parasites become weak or paralyzed and their food intake reduces to great extent. The infection results in massive destruction of muscle tissues which results in white opaque, multiple cells hypertrophied tumour like structure. The pathogencity of the parasite on the host tissue has been studied using histochemical technique. The host fishes were obtained from the culture ponds around westgodavari. They were aintained in culture tanks in the laboratory and were exposed to infective spores periodically. The host fishes were regularly sacrificed after initial incubation of 15 days, to study the developmental stages and to understand the life cycle. The experimental infection studies coupled with the examination of fishes have shown that there is no secondary host. However it was noted that the infective spores need certain amount of ageing in an invertebrate which is the food of the fishes and known species of myxosporidean parasite of *Catla catla* were found in the tissues of gills and intestine viz., *Myxobolus sp* at two diverse habitats along the East coast of India namely Fresh water fish ponds from Pydichinthapadu and Chinakapavaram, West-Godavari District, Andhra Pradesh, India during Feb 2019 to Feb 2020.

KEYWORDS: Protozoan, Myxobolus Sps, Catla Catla

INTRODUCTION

Diseases of fishes are important factors in reducing the fish populations and significant information has been emerging in the past half a century on this aspect of fishery science. The role played by parasites in causing several diseases is well demonstrated and need not be overemphasized. Could be easier than providing expensive treatment for the growing larvae. This has been the main concern. A perusal of works carried out in this context revealed that while extensive investigations have been undertaken on the diseases of sub-adults and adult Penaeid shrimp, very little is known on post-larvae, albeit heavy losses due to disease.

Spores in valvular view ellipsoidal, ovoid or rounded, in sutural view biconvex. Shell valves as a rule smooth. Two polar capsules mostly pyriform, sometimes unequal, exceptionally one seems to be missing. The sutural ridge may extend posteriorly onto a crescentic ledge. Sporoplasm binucleate, often with an iodinophilous vacuole. Trophozoites as a rule large, with formation of numerous pansporoblasts and appear in the tissue-like cysts. Generally histozoic in freshwater fishes. About 30 species live in marine (mostly estuarine).

In India, although studies on Myxospodians have lagged behind comparatively, some excellent faunistic studies were made by South well and Prashad (1918), Chakravarty (1939,43), Ganapathi (1941), Tripathi (1948,1952), Qadri and associates (1962 ,70), Lalitha-Kumari (1965,1969), Seenappa and Manohar (1980 a, 1990 b,1981), Sandeep (1982), Haldar and associates (1981,87), Jayasri *et al.* (1981), Sarkar *et al* (1982), Jayasri and Hoffman (1982), Sarkar (198,87),

Kundu (1985), Guptha and Khera (1988 a, 1988 b), and Yatindra and Mathur (1988) Basu and Haldar (2003,2004); Benerjee *et. al* (2011) Kaur and Singh (2012), Thounaojam *et al.* (2013). Their work contributed a lot on myxosporean parasites of the tropical and subtropical countries. Data on myxosporean infection were also presented from different counries. Kalavathi and Nandi (2007) reported the distribution of one hundred myxosporea species infecting freshwater as well as marine fish from India. It is significant that despite growing concern, freshwater fish farming by private and governmental organizations in this country occasionally reports of diseases and even mortality among fish populations.

MATERIALS AND METHODS

During the study, Carp fish were collected at regular monthly intervals for a period of One years during February 2019 to February 2020 at two selected locations i.e., Fish culture ponds from Pydichinthapadu and Chinakapavaram, West-Godavri district. Host specimens were randomly sampled from the ponds and brought alive to the laboratory or in moribund condition.

In *Catla catla* clinical signs of infection were evident with certain conformity of diagnostic significance .The fish after collection were immediately examined with the aid of a hand lens to detect any external indications of infection. Fish suspected to have infection were taken to the laboratory and examined under a binocular microscope to detect infection. When infection was not detected externally, the fish were dissected out and the different internal organs such as gills, intestine and muscle were examined to detect infection. When infection was present it was evident in the form spores.

Myxobolus sps parasite in the gill, intestine and muscle of fish were chosen for a detailed study. Histochemical observations were carried out by fixing bits of infected tissues showing spores in different fixing fluids such as aqueous Bouin's fluid, alcoholic Bouin's fluid, Carnoy's fluid, Klein’s silver, 10% formalin, cold absolute alcohol or formal calcium, sectioned at 8µm thickness and stained them with appropriate stains. For the cytochemical observations on the spores, smears were prepared in the usual manner, fixed in various fixatives as mentioned above and stained suitably. All the methods were followed from Pearse (1968) unless otherwise mentioned.

OBSERVATIONS AND DESCRIPTION

Myxobolus sps

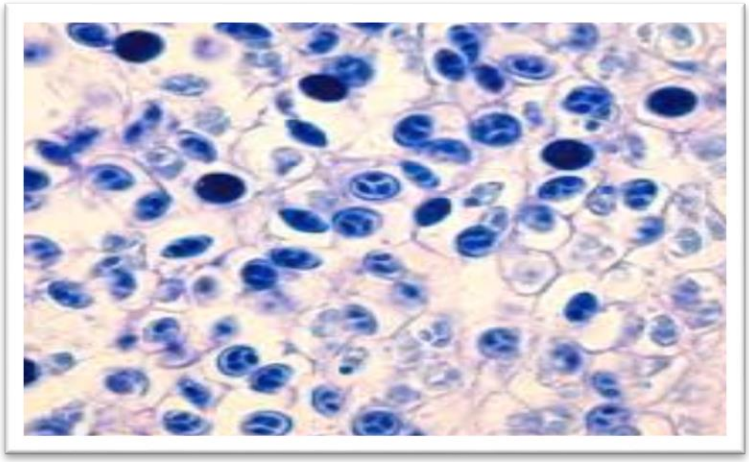
The myxosporean parasite of *Catla catla* that caused damage to the gills by dense infestation which resulted in respiratory problems and caused locomotory disturbances. Fish were swimming near the surface with distended operculum, trail for jumping outside the water and mortality due to heavy cardiac infection. It spread and it is found to occur in most of Europe (including Russia), the United States, South Africa and other countries

In the laboratory the fish were examined with naked eyes. The following organs were taken and examined; gills, intestines, kidney, liver. Nodule Found were crushed between two clean slides to release milky fluid from these nodules to make smears. The smears were air dried, fixed with absolute methyl alcohol and stained with Giemsa stain. Their content was identified with the objective of the microscope 100 X

Catla catla ranging in size from 6.0 – 7.5 inches which were collected from Fresh water fish ponds from Westgodavari districs were found to be infected with *Myxobolus sp*. Opaque white cysts ranging in diameter from 0.4 – 1.0 mm were either superficially attached to the gill. The cyst wall was thin and single. Cellular hypertrophy associated with vacuolation of the cytoplasm was observed in the adjacent tissue cells. In some of the cells the nucleus also showed

hypertrophy but there was no rupture of the cell.

Fresh spores were either rounded or oval measuring 4.0 - 5.8 µm in length (Mean 5.02 µm) 4.7–6.45µm in width (Mean 5.8 µm). The spore walls were symmetrical and meet along the thickened sutural ridge. Two oval polar capsules of equal size measuring 4.0 – 5.37 µm (Mean 3.15 µm) 1.3–2.20 µm in width (Mean 1.42 µm); (n =50) were present, one on either side of the median line and they open independently to the outside. A prominent cushion-like thickening which was strongly basophilic was present at the opening. The polar filaments showed 8 coils in each of the polar capsules and they were coiled in an anticlock-wise direction. The polar filaments were uniformly thin and when fully averted measured 45 – 50 µm in length. An oval iodinophilous vacuole measuring 3.6 – 4.5 µm which was stained with Lugol's iodine, positive to PAS and Best's carmine and negative to PAS after saliva digestion was present at the posterior pole. The sporoplasm was binucleate and extended like a rim round the iodine vacuole. Two widely separated vesicular nuclei were present in the sporoplasm. In immature spores 2 capsulogenous nuclei at the posterior end below the iodine vacuole were usually present in addition to the 2 sporoplasmic nuclei situated on either side of the iodinophilous vacuole.



Stained Myxobolus Spores with Giemsa

CONCLUSIONS

The prevalence and intensity of myxosporidian parasites of the *Myxobolus sp*. were outstanding among two selected study locations. These species of myxosporidian were identified in the *Catla catla* gills, muscle, intestine and gall bladder during study period and it was observed that highest prevalence of myxosporidian and ciliate occurred during end of the dry season (June to November). The best food source getting in the world is from the aquaculture and Fisheries, rich proteins very useful to the human health. it should economically development of countries through the aquaculture it's the source to many people get employment of the fisheries sectors and more important sustainable development, good management system to need for the economically develops. Any water body like natural ponds, lakes, canals, rivers, oceans and culture ponds these are mostly effected due to physico-chemical parameters (temparature, pH, dissolved oxygen, salinity and alkalinity). Through the environmental conditions changes due to the seasonally should take care in aquaculture system from the diseases. These studies will contribute significantly to predict the disease outbreak, disease surveillance, disease prevention and health management of fry, fingerlings and adults in order to improve the fish health and narrow down the mortality rate and economic loss.

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