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Research Article

HISTOPATHOLOGICAL STUDIES ON LIVER OF FRESHWATER FISH INFECTED BY CESTODE *Circumoncobothrium jadhavae* N.Sp. CYST

*P.R. Pardeshi and V.K. Wahule

*Department of Zoology, S.B.E.S. College of Science, Aurangabad.
Department of Zoology, Karmaveer Ramraoji Aher Art's, Science & Commerce College, Deola, Nashik

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ABSTRACT

The present study deals with the histopathology of liver of freshwater fish, *Mastacembelus armatus* infected by cestode, *circumoncobothrium jadhavae* n.sp. cyst. Fish were collected from the Kham River. The infection of cyst in the liver and histopathological changes such as, necrosis of parenchyma cells, macrophages around the cyst, enlargement of hepatocyte, vacuolation from the wall of cestode cyst, ruptured sinusoid and blockage of bile passage were observed.

Keywords:

Histopathology, Cestode cyst,
Mastacembelus armatus, liver.

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INTRODUCTION

Parasitism is an ecological relationship between two different organisms, one of which is a parasite that lives in or on the body of host. Parasites are metabolically and physiologically dependent on their host. Heavily infected host may be killed by the parasites. Helminthes parasite infections are common in humans, domestic animals, and wildlife. Adult Cestode parasites cause disease by attaching to the gastrointestinal tract and encapsulating larval stages in tissues. Plerocercoids migrating in the visceral cavity can cause adhesions that are harmful to fish and can result in death when vital organs are severely damaged. The pathogenicity of various orders of cestode parasites (Rees G, 1967). *Acanthobothrium*, *Phyllobothrium*, and *Echinobothrium* host parasite relationships from fishes (Mevicar, 1972).

Histopathology of *Acanthobothrium uncinatum* from fish, *Rhynchobatus ajeddensis* were observed by Murlidhar and Shinde (1987). *Senga Chiangmaiensis*, a cestode parasite, was found in the liver of *Mastacembelus armatus* by Thanapon Yooyen *et al.* (2006). Reddy and Benerjee (2014) discovered in freshwater murels a dominant change in internal anatomy that leads to a change in appearance as a result of parasitic infection caused by cestode parasites. Parasites feed on nutritive material from host tissue, affecting regular growth and causing damage

in the form of lesions and atrophy to host intestinal tissue, as studied by Gaikwad *et al.* (2016).

MATERIAL AND METHODS

Freshwater fish, *Mastacembelus armatus* (Lecepede, 1800) were collected from Kham River of Aurangabad District (M.S.), India and brought to the laboratory. The fish was cut, open and the intestine, liver, heart, spleen was removed and put in the normal saline water and examined carefully for parasites. The cestodes were collected from the liver. The identified worms kept separately and wash in saline water solution, flattened by using cover glass slip and the slide was preserved in 4% formalin for taxonomical studies.

Harri's Haematoxyline stain was used to prepare the slides, which were then dehydrated in alcoholic grades, cleared in Xylene and mounted in DPX. Drawings were made with the aid of Camera Lucida and all measurements were taken in millimetres. Identification was carried out by using Systema Helminthum Vol-II (Yamaguti, 1956).

Small pieces of healthy and infected liver with cestode cysts were fixed in Bouin's fluid for histopathological studies. The fixed tissues were washed in distilled water, dehydrated in alcoholic grades, cleared in xylene, and embedded in melting point paraffin wax (58-60 °C). The blocks were cut at 8µm and the slides were stained with Haematoxyline and counter

*Corresponding author: P.R. Pardeshi

Department of Zoology, S.B.E.S. College of Science, Aurangabad.

stained with eosin. The best slides were selected, examined under the microscope and photographs were taken.

RESULT AND DISCUSSION

The transverse section of a normal (healthy) liver of *Mastacembelus armatus* (Lecepede, 1800) was clearly visible in the microscope (Fig.1), whereas cysts from the cestode *Circumoncobotrium jadhavae* n.sp. damaged the liver tissue. *Circumoncobotrium jadhavae* n.sp. cyst is attached in the middle portion of the host liver, according to histopathological examination the cyst is double-layered, with coiled larvae inside. The macrophages gathered around the cyst wall consists necrosis of parenchyma cells immediately surrounding the cyst. A large number of inflammatory cells surrounding the cyst, blockage of bile passages, enlargement of hepatocytes, liver vacuolation from the cyst and the sinusoid was ruptured and filled with blood. (Fig.2).

The changes that occur in the host livers are caused by mechanical damage due to toxins release by the parasites. The parasite not only alters the host's morphology but also interferes with nutrition and metabolism, as well as disrupting the movements and secretory functions of the alimentary canal and its associated glands. The parasite has a negative impact on the host.

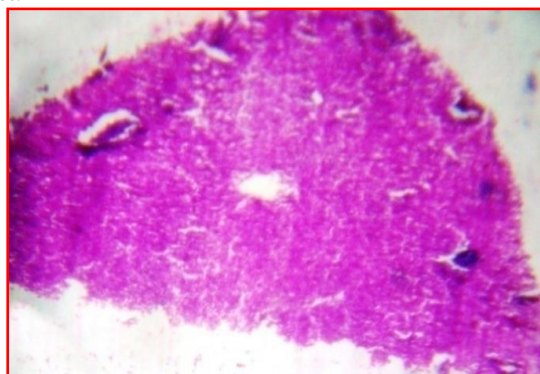


Fig. 1 Healthy liver



Fig. 2 Infected liver by cestode cyst

According to the findings of this study, the histopathology of infected liver with *Circumoncobotrium jadhavae* n.sp. cyst. These findings are consistent with the findings of Raymond C. Bowen (1969), who investigated the histopathology of plerocercoids infected with *Protocephalus* sp. in the liver of *Lepomis macrochirus*. A cellular capsule containing spindle-shaped cells with elongated nuclei surrounded each larval tapeworm. The liver cells near the capsule appeared more vacuolated than the parenchyma. The histopathological changes in the liver of the fish *Marone chrysops* infected by the larval

Trianenophorus nodulosus were studied by Paul C. Stromberg and John L. Crites (1974). A distinct cellular response in the liver, destruction of the proximal liver parenchyma, pancreatic tissue compression, squamous destruction, metaplasia, and fibrosis S. Radhakrishna *et al.* (1983) investigated the histopathology of the liver of the marine teleost fish, *Saurida tumbil* (Bloch) infected with the cestode, *Penetrocephalus ganapati* cyst. Scolex was embedded and encysted in the liver, neck connecting the scolex with the strobila and its large part lies in the viscera. The ensheathed neck separates and takes independent paths, allowing the scolices to be encysted separately inside the liver.

Ewa Dzika *et al.*, (2005) investigated the histopathology of *Rutilus rutilus* L. livers infected with *Paradilepis scolecina*, which resulted in changes in the liver, vacuolar degeneration of liver cells, dispersed foci in liver parenchyma, a large melanomacrophage center and necrosis was accompanied by focal infiltration of lymphoid cells.

CONCLUSIONS

Fishes are an important source of protein and contain lipids, minerals, oils, vitamins etc. The parasites are harmful and effects on fish population which may cause deterioration in food value, by decreasing growth rate, disturb in physiological activity, behavioral changes, reducing flesh quality, loss of proteins, loss of fish productivity as well as economically loss in fishermen and fish industry due to heavy mortality by the infection of parasites.

References

1. Ewa Dzika, Tadewez Rolkiewicz and Rudolf Walter Hoffmann (2005): Histopathological examination of liver and spleen of Roach, *Rutilus rutilus* (L.). Originating from selected lakes of Warmia and Mazury Labeland in Poland.
2. Gaikwad P.R., Sonune M.B. and Nagmote S.R. (2016): Histopathological Effects of the Cestode parasites on fishes from the Amravati region of Vidarbha (MS) India. *Int. J. of Life Sciences*, 4 (4): 602-605,
3. Mevicar AH (1972): The ultrastructure of the parasite host interface of three tetraphyllidean tapeworms of the elasmobranch, *Raji naevus*. *Parasitology*, 65 (1): 77-88.
4. Murlidhar, A. and Shinde, G.B. (1987): Histopathology of cestode, *Acanthobothrium uncinatum* (Rudoiphi, 1819) from *Rhynchobatus ajeddensis* at Kakinada, A.P. India. *Indian. J. of Parasitology* 11(1): 85-86.
5. Paul, C. Stromberg and John Crites (1974): *Trianenophoriosis* in Lake Erie white bass, *Macrone chrysops*, *Journal of wildlife Diseases* Vol. 10: 352-358.
6. Radhakrishana, S., Nair, N.B. and Balasubramanian, N.K. (1983): Adult cestode infection of the marine teleost fish, *Saurida tumbil* (Bloch.), *Acta ichthyologia et Piscatoria* Vol. XIII Fasc. 1: 75-95.
7. Raymond, C. Bowen (1969): Histology and histochemistry of the capsule of *Protocephalus* sp. (cestoda) in *Lepomis macrochirus*. *The Ohio Journal of Science*, 69 (4): 243.
8. Reddy L. B. and Benarjee, G. (2014): Histopathological changes induced by the cestode parasite in freshwater murrel. *Biolife* 2(1): 324-328.

9. Ress, G. (1967): Pathogenicity of adult cestodes. *Helminthological Abstract*, 36: 1-23.
10. ThanaponYoogen *et al.* (2006) A new record of *Clinostomum phillippinensis* (Valasquez, 1959) in *Trichogaster microlepis* (Gunther, 1861) from Bung Berapet, NaktonSawan, Thiland, *Southeast Asin J. Trop Med. Public Health*. Vol 37
11. Yamaguti, S. (1956): Systema Helminthum Vol-II. The cestode of vertebrates. *Interscience publ.* New York and London, 1-860.
