



**HISTOPATHOLOGICAL DAMAGE BY TAPEWORM LYTOCESTUS
SPECIES IN THE INTESTINE OF CLARIAS BATRACHUS (LINNAEUS,
1758) FROM JALGAON DISTRICT (M.S.) INDIA**



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ABSTRACT

The freshwater fish *Clarias batrachus* (Linnaeus, 1758) collected from Jalgaon district during the period of June 2018 and after dissection their intestinal passage was examined for tapeworm parasites. The tapeworm, *Lytocestus sp.* Cohn, 1908 was recovered from intestine *Clarias batrachus*. The histopathological studies were carried out and observations clearly show that the parasites, *Lytocestus sp.* attached to the intestine of host *Clarias batrachus*. In T.S.

of intestine of *Clarias batrachus* it has been observed that the cestode attached to the intestinal layers and slowly damaged the host's intestinal villi, invaded deep and sucking the content in the region of villi. The histopathological studies of tapeworm *Lytocestus sp.* have been studied to find the pathological changes and extent of damage of the intestinal layers of *Clarias batrachus*.

KEYWORDS

Clarias batrachus, Histopathology, Intestinal villi, Jalgaon, *Lytocestus sp.*

RESEARCH PAPER

INTRODUCTION

In aquaculture the health of fish is of at most important. The health of fish can be affected by environmental factors, nutrition as well as by pathogens. The presence of large population of a particular species of fish provides ample habitats for parasites and the stress conditions associated with such crowding will also affect the health and subsequent susceptibility of the fish to parasites. Parasites are affected by both the macro and micro environments. The environmental factors are important in the recruitment, transmission, colonization, fecundity and survival of both the adult and larval parasites (Esch *et al.*, 1977). The *Lytocestus sp.* is one of the parasites which cause the severe damage to *Clarias batrachus* which results into the anemia, weight loss and decreased production. The extensive study on the host parasite relationship has been carried out by *Amoebotaenia indiana* (Mitra and Shinde). *Hymenolepis nana* (Bailey, 1951). Host response to implanted adult *H. nana* as studied by Coleman and Sa L. M, 1962 and experimental immunization of dog against *E. granulosus* was first observed (Foresk and Rukavina, 1959). Histopathology of *Acanthobothrium uncinathum* was observed from a fish *Rhynchobatus ajeddensis* (Murlidhar and Shinde, 1987). They have studied the histopathology of intestine of fish caused due to cestodes (Hayunga, 1977) and the caryophyllaeidiasis in fish hosts (Ahmed and Sanaullah, 1975). In rural area rearing of the *Clarias batrachus* is the common business for the fisherman, for this purpose the commonly used *Clarias batrachus* and other fishes where helminthes infection is the common threat to the *Clarias batrachus* population. In this first investigation we studied the histopathology of fish by tapeworm parasite *Clarias batrachus*.

MATERIAL AND METHODS

For the histopathological study, *Clarias batrachus* of freshwater fishes were collected from local fisherman of Jalgaon district during the period of June 2018. These fishes were brought to the laboratory, dissected out the intestine, examined for the cestode infections. Some fishes were found to be infected whereas few were not. Both infected and non infected hosts intestine were fixed in Bouin's fluid to study histopathological changes. The fixative inhibits the post mortem changes of the tissues. Then tissues were washed, dehydrated through alcoholic grades, cleared

in xylene and embedded in paraffin wax (58-62°C). The blocks were cut at 7 μ by rotary microtome and slides were stained in Eosin Haematoxylin double staining method and the sections were mounted in the DPX. Best slides or sections were selected and observed under the microscope for histopathological study. The photomicrographs were taken with the help of camera. These slides were identified by using keys “Systema Helminthum” (Yamaguti, 1956).

RESULTS AND DISCUSSION

From the present communication the results indicate that some of the intestines were found to be infected with cestode parasite. The (Plate No. A) Shows the healthy intestine, in which villi and all layers are clearly observed, where as in (Plate No. B) Infected intestine shows that the worm attached to the mucosal layer of intestine and slowly invades to the deeper layers of the host tissue. The worm *Lytocestus sp.* is having scolex with hooks, which are used for attachment with the intestine of host *Clarias batrachus*. In L.S. of intestine it has been observed that the *Lytocestus sp.* attached to the mucosal, sub-mucosal and muscularis mucosa of intestine and slowly damaged the host’s intestinal tissue and it destroys the intestinal epithelium of villi showing they are highly destructive to intestine of *Clarias batrachus*. On closer observations the parasites turned out to be *Lytocestus sp.*; these cestodes are found in the anterior part of the intestine. The transverse section of healthy intestine of host *Clarias batrachus* shows intact histological architecture and all layers are clearly observed, whereas in the infected intestine with cestodes parasite, *Lytocestus sp.* causing damaged the epithelium. In the longitudinal section of the cestode, *Lytocestus sp.* infected with the intestine of *Clarias batrachus* are clearly observed that the anterior end of the cestode parasite *Lytocestus sp.* was approaching the intestinal villi and damage the epithelial layer, embedded in the fibroblast, lymphocytes, plasma cells and attached to the intestinal villi, therefore, causing inflammation, vacuolation and damage the intestinal villi. The worm is not only successful to enter into the intestine forming the ulceration in the intestinal wall causing damage to the host tissue but the parasite may affect host physiology in many ways that induce stress in the host. The parasitic infection in turn disturbs the metabolic pathways. (Esch GW et al., 1977). The present study showing that, the *Lytocestus sp.* damage the epithelial layer, these results are matching in accordance with the studies carried out by (Gopal Krishnan, 1968) patterns of scolex invasion in serosa showed as previous reports. Haque and Siddiqi, (1978) have reported the infection of *F. buski* causes surface desquamation of mucosal

epithelium, infiltration of eosinophils and plasma cells. They have also observed the destruction of mucosal epithelium and villi of intestine. These findings are similar to those of Haque and Siddiqui who observed surface desquamation and damage lamina propria. It is also observed that inflammatory nodulation in the intestinal wall and increased number of goblet cells. The Atlantic salmon (*Salmo salar*) had an anisakid larva partly embedded in the wall of an intestinal caecum (Hammerschmidt, K., 2007). However, the helminth crosses majority of the intestinal layers (internal epithelium, submucosa, muscularis layer) and come to lie near serosa suggesting that, it is very dangerous and destructive parasites to the definitive host (C. J. Hiware, 2008).

OBSERVATIONS

Plate I: shows L. S. of Non infected intestine and Infected intestine of *Clarias batrachus*

CONCLUSION

Parasites affect the productivity of the fish in the systems through mortalities, by decreasing growth rate, reducing the quality of the flesh and making the hosts more susceptible to more pathogens. From above histopathological discussion it can be concluded that tapeworm parasites like *Lytocestus sp.* are found to find the nutritive material from the intestine of hosts *Clarias batrachus*, which is essential for their nourishment and growth.

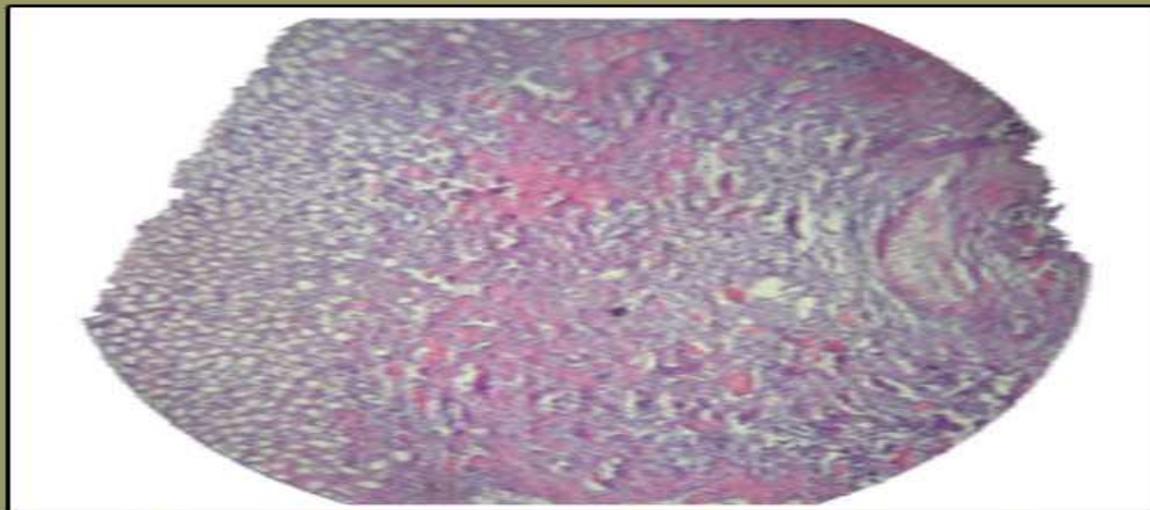
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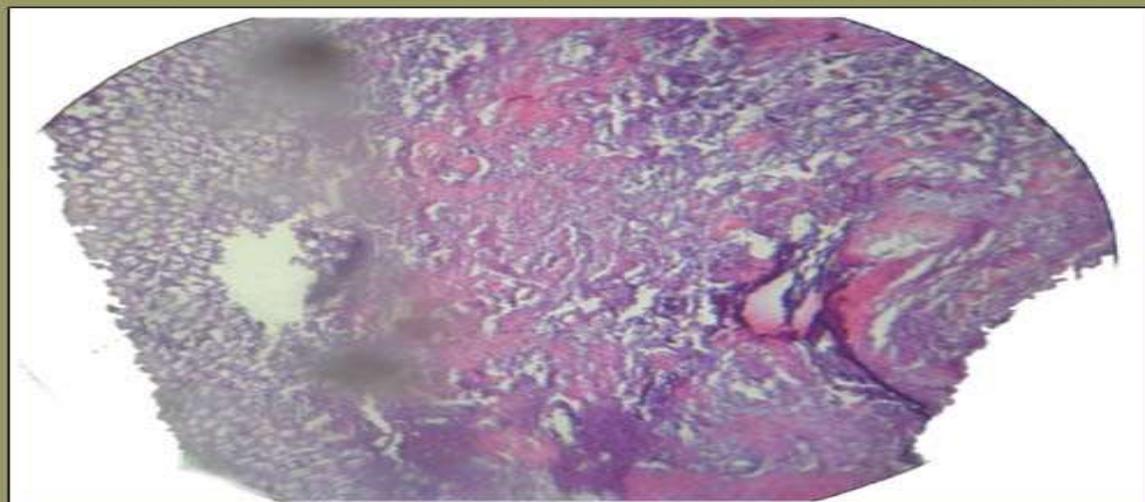
REFERENCES

- Ahmed, A.T.A. And Sanaullah, M. (1975):** Pathological observation of the intestinal lesions induced by caryophyllaeid cestodes in *Clarias batrachus* (Linnaeus). (Siluriformes: Clariidae) Fish Path. 14:1-7.
- Bailey, W.S. (1951):** Host tissue reactions to initial superimposed infection with *Hymenolepis nana* var *Fraterna*.
J. Parasit., 37: 440-444.
- C.J. Hiware et. al, (2008):** Studies on Histopathology of *Clarias batrachus* (Linnaeus) Intestine Parasited by Cestode, *Lytocestus clariasae* Jadhav and Gahvane, 1991.
Journal of Yala Rajabhat University.
- Coleman, R. M. and DE. SA, L. M. (1962):** Host response to implanted adult *Hymenolepis nana*.
J. Parasit., 50 (Suppl.):17.
- Esch GW, Hazen TC, Aho JM (1977):** Parasitism and rand K-selection In: GW Esch (ed), Regulation of parasite populations.
Academic Press New York p 9-62.
- Forsk, Z. And Rukavina, J. (1959):** Experimental immunization of dogs against *Echinococcus granulosus*. I. First observation.
Veterinaria, Saraj., 8: 479-482.
- Gopal Krishnana, V. (1968):** Diseases and parasites of fishes in warm water ponds in Asia and the Far East, fisheries. Report. FAO-UN 445: 319-343.
(Proceedings of the Foto world symposium on warm water pond fish culture).
- Hammerschmidt, K. (2007):** Establishment of tapeworms in sticklebacks- fast food or fast lane?
Experimental Parasitology. 116: 142-149.
- Haque M And Siddiqui A.H. (1978):** Histopathology of pig and man.
Indian Journal of Parasitology. 2 (2):97-98.
- Hayunga, E.G. (1977):** Comparative histology of the scolices of three caryophyllaeid tapeworms: Relationship to pathology and site selection in host intestine.
Diss. Abs. Int., 38.
- Mitra, K.B. And Shinde, G.B (1980):** Histopathology of cestode *A. indiana* (Cohn, 1900), *Gallus domesticus*, at Aurangabad, India.
Curr. Sci. Vol.49 (5): 206-207.
- Murlidhar, A. And Shinde, G.B. (1987):** Histopathology of the cestode, *Acanthobothrium uncinatum* (Rudolphi, 1819) from *Rhynchobatus ajeddensis* at Kakinada, A.P. India.
Indian. J. of Parasitology 11(1): 85-86.
- Shinde G.B. (1968):** On *Circumoncobothrium.ophiocephali* n.sp. from a freshwater fish *ophalocephalus leucopunctatus* in India.
Revista Di Parasitologia, Vol.XXIX- No.2-Giugno, pp. 111- 114.
- Yamaguti, S. (1956):** Systema Helminthum Vol-II. The cestode of vertebrates. *Interscience publ.* New York and London, 1-860.

PLATE-I



Normal intestine of *Clarias batrachus*



Infected intestine of *Clarias batrachus*