

# Histopathological Study on *Lytocestus Indicus* (Moghe, 1925) Infecting Fresh Water Fish *Clarias Batrachus* From Ujani Reservoir Dist. Solapur (M.S) India

A. S. Raipalli, A. L. Deshmukh

Department of Zoology, Shankarrao Mohite Mahavidyalaya, Akaluj, Dist Solapur, Maharashtra, India

## ABSTRACT

In the present investigation occurrence and pathological changes caused by cestode parasites *Lytocestus indicus* (Moghe, 1925) in the intestine of freshwater fishes, *Clarias batrachus* (Linn.) from Ujani reservoir, Dist. Solapur (M.S) India are studied. Parasites were found attached to the mucus membrane of intestine characterized by excess mucus secretion which resulted in severe degeneration and necrosis in mucosal, submucosal, serosa layer and muscular layers. Histo-pathological examination of infected intestine of *C. batrachus* revealed epithelial debris and damaged connective tissue cells at the site of the penetration.

**Keywords :** Histology, Intestine, *Clarias Batrachus*, *Lytocestus Indicus*

## I. INTRODUCTION

Intestinal parasites of vertebrates can induce inflammation of the host digestive tract, resulting in altered gastrointestinal functions, such as enhanced secretion and propulsive motility of the gut (Palmer and Greenwood-Van Meerveld, 2001). At the same time, depending on their attachment mechanism, they seriously disrupt the integrity of the mucosal gut layer, inducing lesion of wide degree: from shallow erosions to deep ulcerations with haemorrhages and perforation of the gut wall. Such cases usually result in peritonitis and septicaemia with the lethal outcome, which is rarely noticed in the population, except in cases of mass mortalities. Another important factor in the pathogenesis of gastrointestinal helminthes is a reduction in the host feed intake (Mercer *et al.*, 2000) that has negative economical repercussions in the farm systems, whereas in wild population slowly but constantly weakens the fish, making the

host more susceptible to predation. Helminths infect almost all the regions of the alimentary tract of fish which causes damage to the alimentary canal and alter the physiological activities of fish (Reddy and Benarjee, 2014). The degree of pathology in the gut is closely related to the morphology of the scolex and the mode of attachment of cestode parasites (Mackiewicz *et al.*, 1972 and Hayunga, 1979). The other noteworthy workers who worked on histopathological changes that occur in fishes due to cestode infection include Satpute and Agarwal (1974), Amin (1990), Hasnain (1992), Hiware and Garad (2002), Reddy and Benarjee (2006), and Benarjee and Reddy (2006).

Therefore, an attempt has been made to assess the histopathological changes caused by cestode parasite *Lytocestus indicus* (Moghe, 1925) infected in the intestinal tissue of fresh water fish *Clarias batrachus* (Linn.).

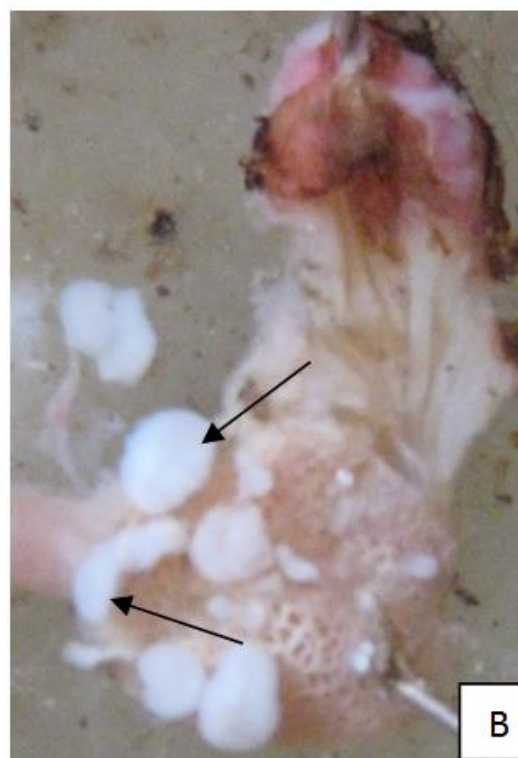
## II. METHODS AND MATERIAL

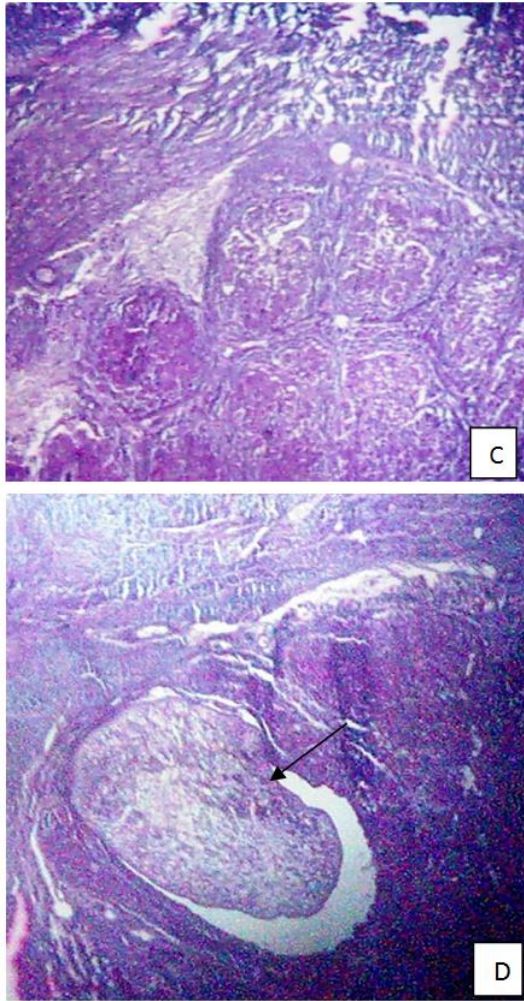
The specimens of freshwater fish *Clarias batrachus* (Linn.) (Fig. A) were collected from Ujani reservoir, Dist Solapur during March; 2017. The animals were packed in ice and brought to the laboratory for examination. During the parasitological examination, the intestines were examined under stereomicroscope to observe the degree of infection (Fig. B). The tapeworms were collected, placed in saline solution, freed from the adhering mucus by gentle shaking, flattened, processed and stained for morphological studies. They were identified as *Lytocestus indicus*. Pieces of intestinal tissues containing tapeworms were fixed in Bouin's solution for 24 hrs. The fixed materials were processed through ascending grades of alcohol, dried in a wax miscible agent and impregnated in wax (M.P 58° to 60°C). Transverse sections were taken with the help of rotary microtome at 6 µm thickness. The sections were floated on warm water at 48°C and mounted on clean slides coated with egg albumin. The mounted, unstained sections were de-waxed in three stages of xylene, 1 minute each, and stained with haematoxylin and eosin (Bullock, 1978). The stained and mounted sections were examined under light microscope. The photomicrographs were taken with the help of camera.

## III. RESULTS AND DISCUSSION

In histological section made from the foregut the non segmented strobila of the worm, section in more or less transverse direction could be seen in the gut lumen. At the site of worm penetration into the mucous membrane the damage of the epithelium was well visible (Fig. D). In areas more distant from the point of entry the gut wall was still covered by an intact epithelium. Which gradually became narrower, and at the site of the penetration only epithelial

debris and damage connective tissue cells were found. Moreover in one case the complete absence of epithelium was noticed where the worm scolex was in direct contact with the connective tissue cell and damaged capillaries of the lamina propria.





**Fig A:** Showing freshwater fish *Clarias batrachus*; **Fig B:** Showing attached *Lytocestus indicus* to the intestinal tissue of *C. batrachus*; **Fig C:** Transverse section of the intestine of non-infected fish; **Fig D:** Transverse section of the intestine of infected fish

In the present study case the damage of *Lytocestus indicus* observed is similar to the damage reported by Satpute and Agrawal (1974). We have also noticed shortening of villous processes and inflammatory response in the submucosa and serosa of *C. batrachus* infected with *Lytocestus indicus*. Karanis and Taraschewski (1993), observed in *Caryophyllaeus laticeps* infection of cyprinids the scolices of the

worms caused local compression of the host's gut epithelium at their site of attachment, where vacuolation of the epithelial cell and rupture of the brush border was observed. Satpute and Agarwal (1974a) have observed histopathological changes in the duodenum of *C. batrachus* due to the infection by a cestode parasite *Djombangia indica*, in which the effects were prominently noticed in the histopathology of the duodenum of infested fish; the muscularis layer becomes thick and the villi shorter. The present study revealed that the heavy infection is responsible for intestinal damage thus indirectly affecting the growth and quality of fish.

#### IV. Acknowledgements

The authors are thankful to the Head, Dept. of Zoology, Shankarrao Mohite Mahavidyalaya, Akaluj, Dist. Solapur (M.S) India for providing necessary laboratory and library facilities during tenure of this work.

#### V. REFERENCES

- [1]. Amin, O. M., (1990): The ecology and pathology of *Proteocephalus ambloplitis* plerocercoids in their fish intermediate hosts. J. Helminthol. Soc. Wech., 57(2): 113-119.
- [2]. Benarjee, G. and Reddy, B. L., (2006): Histopathological and histophysiological changes in the duodenum due to infestation with *Djombangia indica*. J Curr. Sci., 9(2): 647-654.
- [3]. Hasnain, M., (1992): New cestode *Senga chauhani* sp. nov. from a fish host *Channa*

- punctatus from Jamshedpoor. Indian J. Helminth., 44(2): 123-127.
- [4]. Hayunga EG. (1979): Observation on the intestinal pathology caused by three caryophyllid tapeworms of the white sucker *Catostomus commersoni* Lacepede. J. Fish. Dis. 2: 239-248
- [5]. Hiware, C. J. and Garad, V. K., (2002): Intestinal histopathology of *Clarias batrachus* (Linn.) parasitized by caryophyllaeid cestode. J. Inland Fish. Soc., 32(2): 30-35.
- [6]. Mackiewicz J.S., Cosgrove GE., Gude WD. (1972): Relationship of pathology to scolex morphology among caryophyllid cestodes. Parasitol. Res. 39: 233-246.
- [7]. Mercer J.G, Mitchell PI, Moar KM, Bissett A, Geissler S, Bruce K and Chappell LH (2000): Anorexia in rats infected with nematode, *Nippostrongylus brasiliensis*: experimental manipulations. Parasitology 120, 641-647.
- [8]. Moghe, M. A., (1925): *Caryophyllaeus indicus* n. sp. (Cestoda) from the catfish *Clarias batrachus* (L). Parasitology, 17:232-235.
- [9]. Moghe, M. A., (1931): A supplementary description of *Lytocestus indicus* sp. Moghe (Syn. *Caryophyllaeus indicus* Moghe, 1925. Cestoda). Parasitology, 23: 84-87.
- [10]. Palmer J.M and Greenwood-Van Meerveld .B (2001): Integrative neuroimmunomodulation of gastrointestinal function during enteric parasitism. Journal of Parasitology 87, 483-504. publ. New York and London, 1-860.
- [11]. Reddy L.B and Benarjee .G (2014): Histopathological changes induced by cestode parasite in fresh water murrel. Journal of biology & life sciences Vol 2 (1):324-328
- [12]. Reddy, B. L., Benarjee G. and Rajender, G., (2006): Biostatistical on the occurrence of cestode parasite, *Lytocestus indicus* infection in the freshwater catfish, *Clarias batrachus*, at the Warangal region of Andhra Pradesh. J. Natcon, 18(2): 343-348.
- [13]. Satpute LR. and Agrawal SM. (1974): Parasitic effects on its haematology and histopathology. Ind. J. Exp. Biol., 12: 584 - 586
- [14]. Yamaguti, S., (1959): Systema Helminthum. Vol. II. The Cestodes of Vertebrates. Interscience, New York, 860pp.