

International Journal of Research in Biosciences
Vol. 5 Issue 1, pp. (39-42), January 2016
Available online at <http://www.ijrbs.in>
ISSN 2319-2844

Research Paper

Histopathological study of fresh water fishes infected with ptychobothridean tapeworms parasite from godavri basin M.S. (India)

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(Received January 02, 2015, Accepted November 09, 2015)

Abstract

The histological characteristic of the intestine and the ultra structure of its mucosa were studied in *Channa marulius* (Hamilton 1822). The histological characterization revealed that the wall of the intestine is composed of the mucosa, submucosa, muscularis, serosa and intestinal villi. For the study of histopathology of *Channa marulius* collected from Godavari Basin during the period of June 2009 and after the dissection their intestinal passage was examined for tapeworm parasites. The tapeworm *Circumoncobothrium govindii* Sp. have been studied to find the pathological changes and extent damage of the intestinal layer of *Channa marulius*.

Keywords: Histopathology, *Circumoncobothrium govindii* Sp., *Channa marulius*, Intestinal villi, Godavari basin.

Introduction

Histopathology refers to the microscopic examination of tissue affected by diseases. The procedures adopted for the preparation of material for such studies are known as histopathological studies. Fish diseases and histopathology, with a broad range of causes, are increasingly being used as indicators of environmental stress since they provide a definite biological end point of histological exposure, it is a mechanism which can provide an indication of fish health by determining early injury to cells and can therefore be considered an important tool to determine the effect of parasites on fish tissue.

The environment factors are important in the recruitment, transmission, colonization, fecundity and survival of both the adult and larval parasites^[1]. The tapeworm *circumoncobothrium* sp. is one of the tapeworm which cause the severe damage to *M. armatus* which result in to the anemia, weight loss and decreased production. The extensive study on the host parasite relation has been carried out by *Amoebotaenia Indiana*^[2], *Hymenolepis nana*^[3]. Host response to implanted adult *H. nana* as studied by Coleman and Sa L.M.^[4] and experimental immunization of dog against *E. granulosus* was first observed^[5]. Histopathology of *Acanthobothrium uncinatum* was observed from a fish *Rhynchobatus ajeddensis*^[6]. They have studied the histopathology of intestine of fish caused due to cestodes^[7] and *caryophyllaeidiasis* in fish hosts^[8].

Pathogenic effects of cestode are due to attachment of the adult parasite in the gastrointestinal tract and also to the encapsulation of larval stages in the tissues. Cestode live in a very hazardous environment as on there is continuous movement of the gut lining, food gut surface and the nature of its related glands. The parasites can find their suitable host, some thoughts on these inscription of host parasite integration was studied by Mecinnis 1976.

The host parasitic relationship in cestodes is complex one involving inter actions between at least two and some times more genital system namely those of the parasites it's intermediate and its definitive

host. Thus a cestode if it has to survive must be suitably adapted to the morphology, physiology, biochemistry immunology and ecology of its hosts. Review on the pathogenesis of adult cestodes has been made by Rees G in 1967^[9]. There is also an extensive literature on the pathogenesis of larval cestodes in fishes.

Material and Methods

For the histopathological study, freshwater fishes were dissected to observe the rate of infection. Some fishes were found to be infected and some normal. Both infected and normal hosts intestine were dissected and 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 and slides were stained in Eosin Haematoxylin double staining method. Best slides or sections were selected and observed under the microscope for histopathological study. These slides were identified by using keys "systema Helminthum" (Yamaguti, 1956) (10).

Results and Discussions

Parasitism of cestodes with their respective hosts is shown in the histopathological studies. Healthy intestine shown, healthy villi and all layers are clearly observed, where as infected intestine has been observed that the worm attached to the mucosal layer of intestine and slowly invades to the deeper layers of the host tissue.

Plate – I: The host parasite relationship between *Mastacembelus armatus* and *Senga mastacembelusae* Sp. Nov.

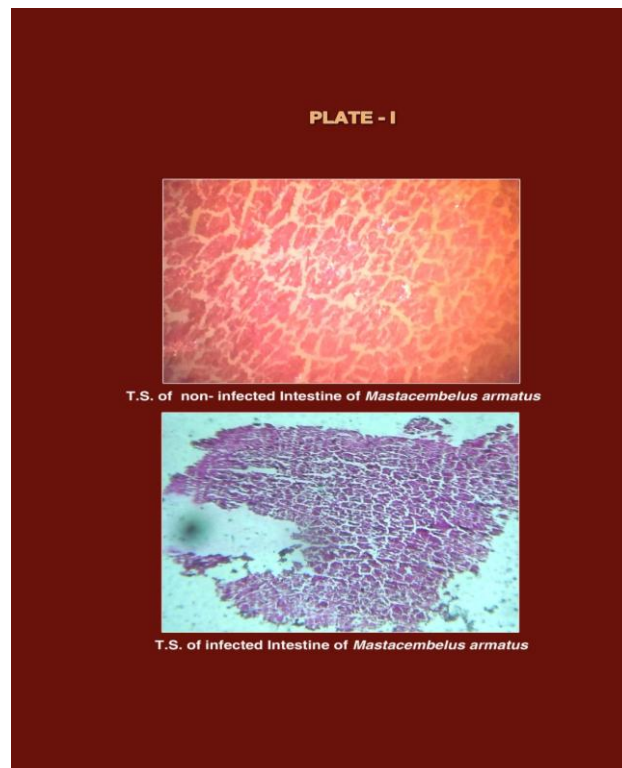


Figure 1: The host parasite relationship between *Mastacembelus armatus* and *Senga mastacembelusae* Sp. Nov.

- a) T.S. of non infected Intestine of *Mastacembelus armatus*
- b) T.S. of infected Intestine of *Mastacembelus armatus*

In T.S. of intestine of *Mastacembelus armatus* it had observed that the cestode is having penetrative type of scolex and there is no doubt that they causes heavy mechanical tissue damage to their host. Scolex of worm deeply penetrated through layers causing heavy mechanical injury to mucosa, submucosa, come to lie near the muscularis mucosa. The intestinal villi encircle the scolex of worm and intestinal architecture get distructed and also it forms cyst like structure, pad formation took place.

Plate – II: The host parasite relationship between *Channa marulius* and *Circumoncobothrum govindii* Sp. Nov.

a) T.S. of non-infected Intestine of *Channa marulius*

b) T.S. of infected Intestine of *Channa marulius*

In T.S. of intestine of *Channa marulius* it had observed that the anterior end of cestode parasite *C. govindii* sp. was approaching the intestinal villi. The worm is not only successful to enter in to 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 induced stress in host. The parasitic infection in turn disturbed the metabolic pathways (Esch G. W et.al., 1977). (1)

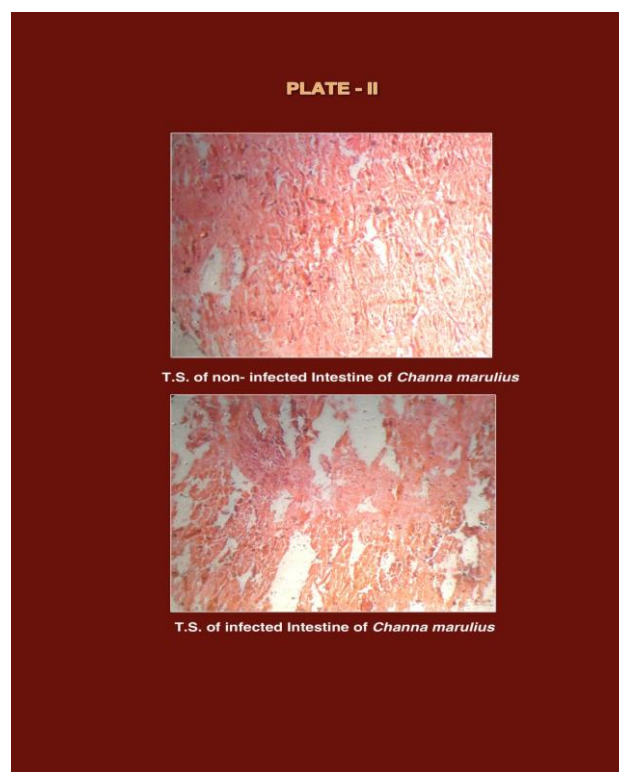


Figure 2: The host parasite relationship between *Channa marulius* and *Circumoncobothrum govindii* Sp. Nov.

Conclusion

Parasite affect the productivity of the fish in the systems through mortalities by decreasing growth rate reducing the quality of flesh and making the hosts more susceptible to more pathogens. From the above histopathological discussion it can be concluded that cestode parasites like *Senga mastacembelusae* Sp. Nov. and *Circumoncobothrium govindii* Sp. Nov. are finds nutritive material from the intestine of hosts *Mastacembelus armatus* and *Channa marulius*, which is essential for their nourishment and growth.

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