

Original Research Article

Histopathology of intestine of trematode helminth infected fish

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ABSTRACT

Keywords

Channa punctatus;
Genarchopsis goppo;
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Genarchopsis goppo is found infected to the intestine of fresh water murrel, *Channa punctatus*. This parasite brought about severe histopathological changes. Histopathological changes include damage of the villi, inflammation, fibrosis associated with hyperplasia and metaplasia epithelial necrosis, vacuolation of submucous cells and dilation of blood vessels. The present paper deals with histopathological changes in the intestine of murrel infected with *G. goppo* and seasonal variation

Introduction

Fresh water murrels of the family ophiocephalidae harbour a good number of helminth parasites. Fresh water murrels act as intermediate host for digenetic trematodes. The occurrence of trematode parasites found in murrels was reported by Gupta and Agarwal,(1983);Bhargavi and Krishna,(1983); Rai et al,(1984);Sinha et al,(1988);Bose and Sinha,(1979);Benarjee et al, (2006) ;Laxma Reddy and Benarjee,(2006); Benarjee and Laxma Reddy,(2006); Benarjee and Laxma Reddy,(2008). There fore, an attempt has been made to assess the histopathological changes induced by the parasite in the intestine of *Channa punctatus*.

Materials and Methods

Pieces of the infected and uninfected intestine of fresh water murrel,

C.punctatus were fixed in Bouin's ,Susa, Carnoy and Zenker's fluid for the histopathological and histochemical studies (Gurr, 1962 Pearse,1968; Bancroft,1975). They were dehydrated by graded alcohol, cleared and embedded in paraffin wax. A battery of histochemical tests were applied on the microtome cut sections of stomach gives exact localization of the parasite, the damage caused at a particular site of the tissue and the change in the chemical nature of the tissue of the organ affected.

Results and Discussion

The helminth parasites not only alter the morphology of the infected organ, but also damages the nervous system of the host, interfere with the nutrition and metabolism, disturb the movements and

secretory functions of the alimentary canal and also effects the circulatory system and glands of internal secretion. All these adverse effects influences may lead to the disease or death of the host. However, the degree of pathogenicity and the damage depend upon the attachment of the parasite to the host tissue and the secretions of the parasite with in the host. The main pathological changes in the host include, abnormal increase or decrease in layers of stomach or intestine and distruction or haemorrhage of cells of the liver.

Similarly the intestine of *Channa punctatus* revealed some interesting histopathological changes. The tissue damage is quite prominent. In the intestine wide spread epithelial necrosis occurred. The serosa layer enlarged and circular muscle layer also indicated the tendency of increasing in thickness. There is degeneration of intestinal folds. Due to the shrinkage of villi, the lumen of the intestine is widened (Fig. 1, 2 & 3) The other histopathological changes observed in the intestine are fibrosis associated with hyperplasia and metaplasia. The dilation of blood vessels, vacuolation of submucous cells and proliferative changes which lead to the degeneration of various layers of the intestine are evident. Inflammation and fibrosis associated with hyperplasia and metaplasia was observed. Mucous layer the parasite also caused the dilation of blood vessels in the submucosa results degeneration of intestinal folds, shrinkage of villi and necrosis of epithelial cells. Vacuolation and proliferation of submucous cells lead to the degeneration of various layers of the intestine. The pathological effects include an increase in the thickness and the damage to the mucosa. The decrease in the thickness of the muscular layer is a

common feature that occurs in helminth infections.

A survey of literature reveals that the nature of helminth infections in vertebrates has been studied, extensively, but information on the pathogenic effects, particularly in fresh water fishes remains completely meager. In the present investigation, a study has been under taken to ascertain the histopathological changes in the tissues of the host fish *Channa punctatus*.

Many studies have been made on the trematodes in fish, relatively few have been concerned with the histopathological changes. The histopathology of *Channa gachua* (Ham) infected by the digenetic trematode *Genarchopsis goppo* has been studied by Bose and Sinha (1979). Pathological changes in cyprinid fry infected by *Bucephallus polymorphus* and *Rhipidocotyle illensis* were found in all the organs of fish by Barbara (1980). Lester (1980) studied the host-parasite relations in some didymozoid parasites. Muzzal (1980) studied the host-parasite relation ships of a trematode *Triganodistomum attenuatum* infecting the white sucker. Chung-yui-tan (1981) studied the histopathology in the Wolfian ducts of *Hypentelium nigri* caused by a trematode *Phyllodistomum superbum*. Maqbool and Nizami (1984) studied the histochemical and histoenzymological studies on the metacercariae of *Clinostomum complanatum*. A digenetic trematode *Orienticreadium batrachii* was found to be is one of the dominant parasites infecting the host species of cat fishes reported by Zarina (1990). The pathological state of the host certainly alters the levels of various metabolites in the body in the resulting the change of metabolic activities and physiological activities of the host.

Fig.1. T.S of infected intestine

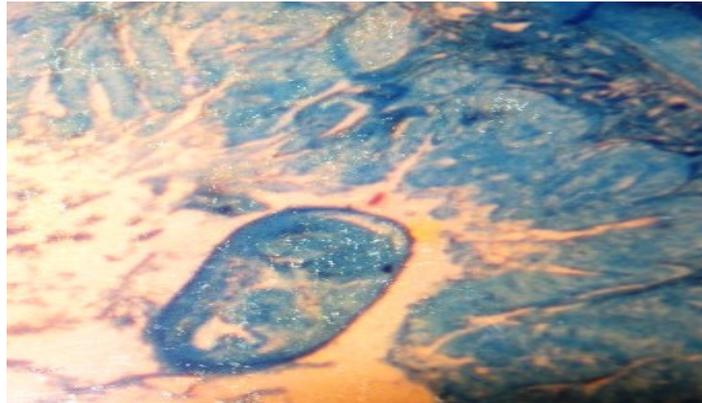


Fig.2. T.S of infected intestine showing degeneration of villi

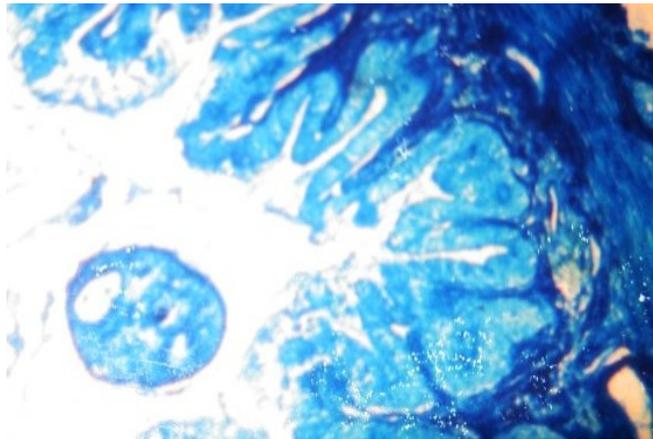


Fig.3. T.S of infected intestine shows hyperplasia



The metabolic changes can be assessed when the biochemical estimations were made on the infected fish. Parasites not only brings change in the morphology of the organ but also interfere with the nutrition, metabolism, movements and secretory efficiency of associated glands of alimentary canal which adversely influence the host. The effect of parasites on the host causes series of interactions which ultimately reduces the absorption and other metabolic process. The helminth parasites when they lodge in the inner walls of intestine with the help of their adhesive organs where they cause damage to the villi and also other layers of the intestine. Similar trend was noticed by Benarjee and Laxma Reddy, (2006); Benarjee,(2006); Laxma Reddy and Benarjee,(2006); Benarjee and Laxma Reddy,(2008).

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