Histopathology of the liver of *Mastacembelus armatus* (Lecepede, 1800) due to trematode parasite, *Allocreadium khami* n.sp

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Abstract The trematode parasite, *Allocreadium khami* n.sp. cyst is found infected to the liver of freshwater fish, *Mastacembelus armatus* (Lecepede, 1800). Histopathological studies have been made to access the extent of damage caused by the parasite. The changes that have witnessed in the liver includes inflammation of liver, change of colour and formation of cysts. The histopathological changes include disarray in the arrangement of hepatochords, arrangement and rupture of hepatocytes.

Keywords *Allocreadium khami* n.sp. cyst · *Mastacembelus armatus* · Histopathology

Introduction

Histopathology is the microscopic study of tissues affected by disease. The procedures adopted for the preparation of material for such studies are known as histological of histopathological techniques. Fish disease/constitute one of the most important problems and challenges confronting fish culturist (Akinsanya Bamidele 2007).

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Host: *Mastacembelus armatus* (Lecepede, 1800)

Liver is one of the important digestive gland concerned with several vital functions of body. It is the chief organ for the process of detoxification. It plays an important role in the metabolism of carbohydrates, protein and lipids storage of glycogen, denaturation of fatty acids, amino acid synthesis are some of important functions carried out by the liver.

Adult fluke invade different organs such as gills, digestive tract, liver and kidney. Earlier studies have been made on the trematode parasite found in the fish (Bose and Sinha 1979; Barbara 1980; Muzzal 1980; Chung Yui-tan 1981; Alam and Nizami 1984; Bhargavi and Krishna 1993; Christina 1982; Sinha et al. 1988; Gupta and agarwal 1983).

The effect of parasite on the freshwater fishes is of considerable importance because of its wide spread occurrence and an intermediate link in the food chain. Parasite may effect host physiology in many ways that induce stress in the host.

Voltonen et al. (1994) described pathological changes due to *Raphiduscaris acus* in liver roach. Murai et al. (1997) described presence of *Paradilepis scolecina* larvae in the serous membrane of the intestine and gall bladder in beam caught in Lake Balton.

Materials and methods

For the histopathological study, the freshwater fish, *Mastacembelus armatus* (Lecepede, 1800) were collected from

the different region of Marathwada (M.S.), India, and brought to the laboratory and killed by pithing brain they were examination externally (i.e., scale, gills and fins) and later cut opened the fish and observed internally taken out the intestine, liver, heart, spleen in the normal saline water in petridish and cut opened; examination carefully for parasites. The trematode parasite were collected from the liver, identified worm were kept separately and wash in saline water solution, flattened by using coverglass and slide then preserved in 4% formalin for taxonomical studies. The slides were prepared by Harri's Haematoxyline stain, dehydrated in alcoholic grades (30, 50, 70, 90 and 100%), cleared in Xylene and mounted in DPX. Drawing were made with the aid of Camera Lucida, all measurement are taken in millimeter, identification was carries out by the using Systema Helminthum trematode Vol-I and II (1971) by Yamaguti.

The infected livers attached with the trematode parasite and were kept intact and small pieces of such liver were fixed in Bouins fluid for histopathological studied. The fixed tissues were washed in distilled water, dehydrated in alcoholic grades, cleared in xylene, embedded in paraffin wax with melting point (58–60°C).

Block was cut at 8 µm and slides were stained with Haematoxyline counter stained with eosin stain. Best slides were selected, observed under the microscope and photographs are taken.

Result and discussion

On closer observation of the transverse section of healthy liver of *M. armatus* (Lecepede, 1800), the liver cell, hepatocytes are clearly observed (Fig. 1), whereas in the infected liver with the trematode *Allocreadium khami* n.sp. cysts damage the liver tissue, vacuolization and change the shape and size of liver.

Histopathological examination of infected liver with *A. khami* n.sp. trematode shows that cysts were attached to the serosal coat of the liver and damage the liver tissue.

Fig. 1 Healthy liver

Fig. 2 Infected liver with *A. khami* n.sp

The cyst is large with parasite and filled with eggs. The macrophages scattered around the cysts, distinct shape of hepatocytes, vacuolization and damage the liver cell or necrosis is seen with (Fig. 2), sinusoid was ruptured. The infection in the liver by a parasite causes disturbances in the vital functions of the glands. These disturbances may directly affect the chemical nature of the infected tissue by lowering or increasing the important molecules which plays important role in metabolism.

The result of the present study are similar in accordance with the studies carried out Mitchell (1982) who studied the histopathology of the liver of *Fathed minnow* (*Pinephales promeles*) fish infected with *Posthodiplostomum m. minimum* trematode encysted in liver tissue causing little damage to hepatocytes, melanin-macrophage centres were diffusely scattered throughout the fibrinous, fibroblast produce containing collagenous connective tissues. Lakshma et al. (2006) have studied the histopathological in liver of freshwater fish; *Channa punctatus* infected with the *Euclinostomum heterostomum* includes enlargement of hepatocytes, vacuolation of cytoplasm, disarray of hepatochord, hypertrophy of hepatocytes and liver vacuolation. The present study is in contrast from result of Revenga et al. (2006) have studies and observation of the histopathology of the liver of *Galaxias maculatus* fish infected parasites found in the hepatic parenchyma of “puyenes”, causing hepatic parenchyma was unaltered a distance from the foci of the lesions and weak inflammatory reactions.

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