



Histopathological Study of Intestine of Fresh Water Fish *Channa Punctatus* (Bloch, 1793) Infected With Encysted Metacercariae from District Badin, Sindh, Pakistan.

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Abstract: This study was conducted to know the pathological changes in the intestine of fresh water fish *channa punctatus* naturally infected with encysted metacercariae. During present investigations 75 fishes (*Channa punctatus*) were examined and parasites were collected from the intestine of dissected fishes. Thereafter pieces of infected intestine were fixed in Bouin's fluid and collected cysts were preserved by using standard techniques of staining and mounting. For histopathological examinations tissues were embedded in paraffin wax and 5-7 μ thick sections prepared. The hematoxylin and eosin (H&E) staining techniques were used. Histopathology of intestine showed disintegration of villi, lamina propria and inflammatory cells. Encysted parts of parasite found attached with muscular mucosa causing damage to the intestine.

Keywords: *Channa Punctatus*, Histopathology, Intestine, Metacercariae,

1. **INTRODUCTION**

Fish *Channa punctatus* known as Murrel and locally Shakur. It is one of the most popular fish with delicious taste as well as medicinal, therapeutic value wound healing, arthritis and convalescence (Laxma Reddy and Benarjee, 2014). It is mud-loving carnivorous fish and due to feeding behavior and habitat it has greater probabilities of many helminth parasitic infections (Butt *et al.*, 2015). Various diseases like destruction in intestinal villi and necrosis, parasitic infections are major contributing production related risk factors and these factors can cause serious problems to fish culture (Shareef and Abidi, 2012). Histopathological infections in fish are extensively increasing being used as biological markers of disease progression resulting from exposure to various chemical and infectious factors (Steniford *et al.*, 2003). They may also introduce toxic metabolic by-products that lead to deprive fish from normal feeding (Amina *et al.*, 2011). The metacercariae is known to exert histopathological lesions of the viscera and cause significant tissue damage in most of the vital organs such as liver, kidney etc. (Shareef and Abidi, 2012). Metacercariae has a complex life cycle and needs at least two intermediate hosts for completing the whole cycle (Leidy, 1856; Singh, 1959). The first intermediate host is the snail and the *Channa punctatus* is the second intermediate host, in which the metacercariae move actively in its body cavity. The final host are fish eating birds and other vertebrates. Adult flukes grow up in their buccal cavity 5-6 days after being ingested. The metacercariae were also discovered in the abdominal cavity of the same fish species (Bhalerao, 1942). Subsequently, few more fish

species have been reported infected by metacercariae (Pandey and Baugh, 1969 and Khanum *et al.*, 2011).

2. **MATERIALS AND METHODS**

Experimental design and setup

Collection of host fish

Fishes were brought from district Badin and kept at hatchery of department of fresh water biology and acclimatized for 24 to 48 hours. After acclimatization fishes were transferred to the Parasitology laboratory for dissection. Intestine was retained for endoparasite and encysted parasites were collected and preserved in 10% formalin. Cysts were incised in petri dish containing 70% alcohol and observed under disectory microscope.

Histological Procedure

Bouin's fixative was used to fix the tissues of infected intestine for 24 hours to 48 hours. Fixed tissue samples were dehydrated in graded alcohol series then infiltrated in benzene. There after tissues were embedded in paraffin wax and 5-7 μ thick sections prepared by using rotary microtome. Pieces of ribbon were stretched on albumenized glass slide by placing on warm plate and kept for 24 hours on room temperature to dry. The Sections were stained in hematoxylin and eosin (H & E) then mounted in Canada balsam. Finally photomicrography was carried out with the help of digital LCD biological BLM-260 camera.

3. **RESULTS AND DISSCUSION**

During present investigation, the encysted metacercariae were found embedded in the lumen of intestine. 75 specimens of *Channa punctatus* were examined, out of which 45 (60%) were found infected

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by metacercariae. Intestine of fish is complex multifunctional organ in addition to digesting and absorbing feed stuff and also significant for water electrolyte balance (buddington *et al.*, 1997). The infected fish appeared starved with reduced growth as compared to the non infected fish though degree of Pathogenicity and damage depend on the intensity of infection and worm burden found in the host tissues in the present findings histology of intestine of control fish showing complete architecture of villi, lamina propria and muscular layer (Fig.1).

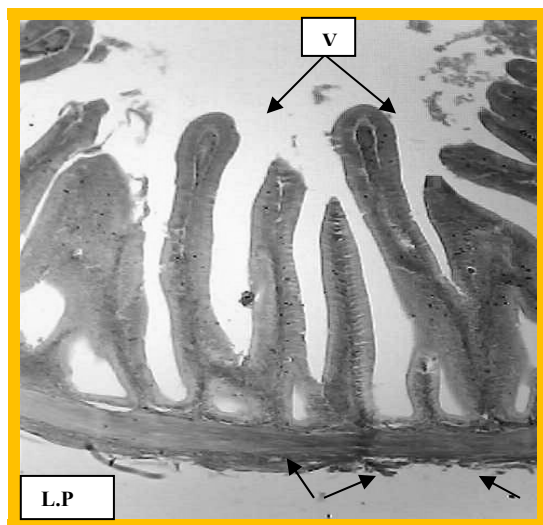


Fig.1. Histological section of normal intestine showing Muscular layer (M.L), Lamina propria (L.P) and structure of villi (V) X100.

The inner epithelium, lamina propria, stratum compactum, stratum granulosum, circular and longitudinal muscle layers and an outer serosa constitute intestinal wall in fishes whereas columnar epithelium and lamina propria compose intestinal folds (Butt *et al.*, 2015). In our findings histopathological studies revealed encysted metacercariae caused extensive damage to all layers of the intestine and architectural disintegration of villi and lamina propria. Many parts of encysted metacercariae found attached with intestine (Fig.2 3). These results are agreed with the findings by (Salah *et al.*, 2012) in the intestine of wild rabbit fish (*Siganus Rivulatus*) infected by helminth parasites who reported necrosis and hemorrhage in villi. These findings are same in accordance with (Butt *et al.*, 2012). Endoparasites in chicken attached to intestinal wall by their scolex invasion in the mucosa cause deficient intestinal absorption and metabolic process that ultimately disturbs secretory functions of glands and other organs (Laxma and Benarjee, 2011). As earlier reported that, endoparasites causes substantial destruction to host tissues (Benarjee and Laxma Reddy, 2008, Ngamniyom *et al.*, 2012, Laxma and Benarjee,

2014, Butt *et al.*, 2015). In present findings intestine of fish infected with encysted metacercariae showing destruction of villi with eroded structure and inflammatory cells (Fig. 4).

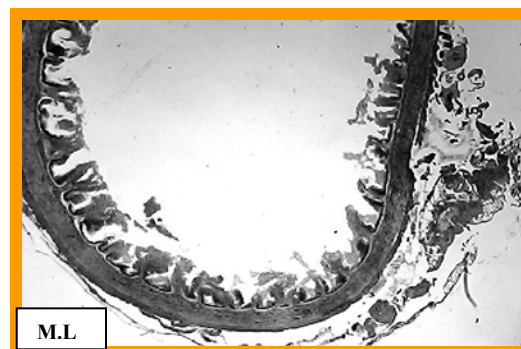


Fig.2. Section of infected intestine showing Architectural disintegration of villi and lamina propria X100.

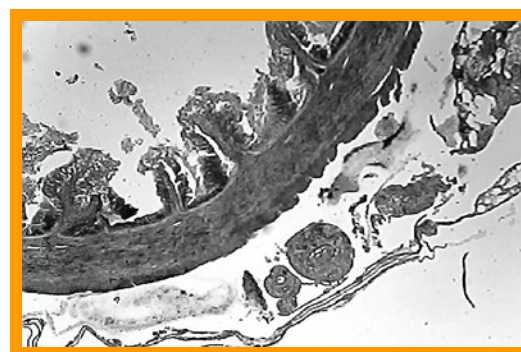


Fig.3. Section of infected intestine showing many parts of encysted metacercariae found attached with intestine X200.

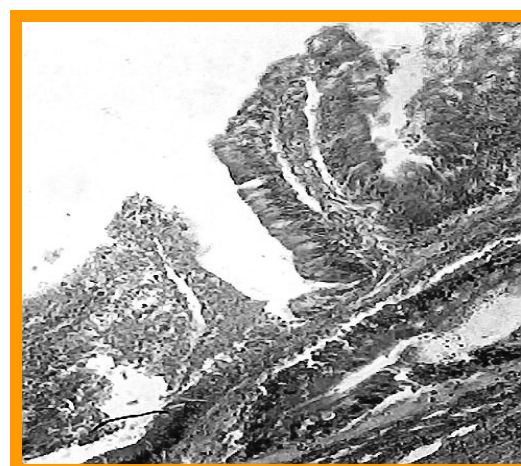


Fig.4. Section of infected intestine showing destruction of villi with eroded structure and inflammatory cells X400.

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