Impact of Helminth Parasitism on Haematological Profile of Fishes of Murho Ponds in Madhepura District

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Abstract: The present study carried out seasonally from December 2017 to November 2018 is an attempt to study the impact of helminth parasitism on haematological profile of fishes of Murho Ponds, Madhepura district. The entire study reveals that the intensity of helminth infections is responsible for altering the haematology of fish hosts and shows the seasonal relationship of infection with the haematological alterations. It is further speculated that mechanical damage caused by *Acanthocephala* to the host intestine could cause vitamin B-12 and folic acid deficiency which are otherwise responsible for RBC maturation. The mechanical injury may also lead to side tracking of iron to affected tissues which is otherwise responsible for erythropoiesis. Increased number of TLC values may be associated with the defence mechanism and immunological responses against infectious diseases caused by helminth parasites

Keywords*: *Helminth Parasitism, Haeatologicl Changes and Fish Profile.

I. INTRODUCTION :

Murho possesses a high variety of aquatic ecosystem including a large number of springs, ponds, lakes and wetlands. Shallabugh wetland provides natural environment to the aquatic biota. In this place first time described 16 species of fishes from Madhepura district, 'Fische aus cashmier' and since then a number of workers have surveyed the icthiofauna of Madhepura bringing the number to about 16 species. The most abundant among them are indigenous Schizothorax spp. and exotic Cyprinus spp. For the last few decades, fishes have been extensively used as a protein rich diet for human consumption in Bihar and thus, contribute a lot to its economy. It is estimated that about 1 million tons of fish is required annually to meet the present day demand of fish protein in Bihar against an annual production of only 1 million tons. In India the fish management has occupied an important place especially, in the agricultural economy, when the value and usefulness of fish is a cheap source of protein-diet have been greatly realized and emphasized. According to Tatcher (1981) many parasites can live in a host, sometimes causing damage, sometimes not. Therefore, the changes associated with haematological parameters due to various parasites establish a data base and allow precise diagnosis guiding the implementations of treatment or preventive measures which are indispensable in fish farming and fish industry (Roberts, 1981). However, in India, the comparable studies on the effect of helminth parasites in relation to haematological abnormalities especially in Kashmir so far made are only few (Satpute and Agrawal, 1974; Sinha and Sircar, 1974; Dubey, 1980). All these studies indicate the macrocytic anaemia in the fishes. Keeping in view the increasing importance of fish as a cheap source of protein rich diet, helminth infections in fresh water fishes has drawn attention of the fish biologists, ichthyologists and parasitologists under Fish pathology. Therefore, the present study was designed to study the haematological abnormalities on seasonal basis in the fish fauna of Shallabugh wetland, Murho arising due to helminth infections so that necessary steps are taken to improve the health condition of these economically important fish fauna.

II. EXPERIMENTAL :

The blood from both the hosts was screened for the haematological parameters including Hb. Estimation, RBCcount and WBC count. The data on the haematological values of both infected and uninfected fish specimens is depicted in figures 1. The Hb shows –ve correlation with the prevalence of infection and decreases as the intensity of infection increases. The same results were obtained by Ivasik and Virepo (1969) in carp due to sanguinicolosis in which haemoglobin reduced by 20% in mild infection and 61% in serious cases; Evans (1974) in cut throat trout due to *Sanguisicola kiamathensis*, Skvortosva (1977) in carp infected with *Dilepis unilateralis* larvae; Natrajan and Balakrishnan (1977) in *Hemirhamphus xanthopterus* infected with *Lerncteenicus hemirhamiphi*, Kawatsu (1978) in crucian caip infected by *Diplozoon nipponicum*, Denisov (1979) in silver carp infected with *Posthodiptostormim citticola* in which haemoglobin reduced by 2.7%. Agarwal, Srivastav and Sharma (1989) in trematode infected *Rita rita* ; Saxena and Chauhan (1993) in *Heteropneusteus fossills*

infected with *Lucknowia indlca* where in haemoglobin level reduced by 8.1%, Ogawa, Kazuo and Kiyoshi (1997) in cultured tiger puffer infected with *Heterobothmim okamotei*, Sinha (2000) in *Clarias batrachus* carrying helminthic infections due to which haemoglobin reduced by 19-20 *%* and by Yoshinaga *el al.* (2001) in Japanese flounder infected with *Neoheterobothrium hirame.* These workers thus support the results of this study.

III. RESULTS AND DISCUSSION:

TLC showed a +ve correlation with the prevalence of infection. The total leucocyte count increased in all fish species depending upon the intensity of infection to combat against the pathogenicity of the parasite. An increase in neutrophil and eosinophil numbers was recorded during this study showed a positive correlation with the prevalence of infection. The same results were reported by Voznyi *et al.* (1975) in *Cyprinus* infected with helminths; increase in neutrophils and monocytes was reported by Skvortosva (1977) in *Cyprinus* infected with *Dilepis unilateralis* larva. Denisov (1979) in silver carp infected with *Posihodiplostonntm cuticola* due to which TLC rose by 44%, Saxena *el al.* (1993) in *Heteropneiisteus fossils* infected with *Lucknoma indica* due to which TLC increased by 2.77%; Wang Guitang (1998) in *Takifitgu mbripes* caused by the infection with *Heterobothrium okamoloi*, however, an increase in lymphocytes was noticed and Sinha (2000) in *Glorias batrachus* with helminthic infection which caused highly significant increase in the WBC count and well-marked higher degree of eosinophilia (> 150%) and lymphocytosis (>10%).

IV. CONCLUSION

This study was conducted on 206 live fish specimens belonging to family Schizothoracinae and Cyprinidae with both infected and uninfected hosts in equal numbers. Live fish specimens were collected from different sites of Murho and Madhepura district and were taken to the laboratory in large water containers. The fish were identified by using the key. The fish were acclimatized to standard laboratory conditions for 12 hrs and were subjected to haematological and helminth parasitic investigations. For haematological investigations, blood samples were collected from all fish hosts in glass tubes containing EDTA and were properly labeled. For estimation of haemoglobin content (Hb), routine method was employed. The RBC and WBC counting methods were based on the dilution of obtained blood with dilution fluids in RBC and WBC counting pipettes. Individual cells were then counted in the counting chamber (Haemocytometer). Giemsa's staining method was used for the differential count of WBC. The parasitic worms were collected according to the routine parasitological techniques and proper record was maintained.

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