

Prevalence and Organ-Wise Distribution of Helminth Parasites in Three Commercially Important Catfishes of Bhopal

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Abstract: Present investigation was carried out to reveal the occurrence of helminthic infection in three commercially important Catfishes (namely *O. pabda*, *W. attu* and *A. seenghala*). *Wallago attu* showed maximum percentage of prevalence throughout the investigation period as compared to *A. seenghala*. As, maximum intensity of infection was calculated in *Ompok pabda* (2.25) against nematodal infection followed by *Wallago attu* (1.487) and *Aorichthys seenghala* (0.8). While maximum abundance for nematode, cestode, trematode parasites were observed in *Wallago attu* (0.575) followed by *Ompok pabda* (0.195) and *Aorichthys seenghala* (0.102). During present study maximum abundance of parasites was observed in the body cavity followed by intestine and liver while swim-bladder is least preference site of parasitic infection.

Keywords: Catfishes, Prevalence, Organ, Infection, Abundance

1. Introduction

Diseases are a major threat to both wild and farmed fish. Parasitic disease is the most important factor threatening the fishery industry worldwide, particularly in the tropics (Williams and Jones, 1994; Schmidt and Roberts, 2000). Diseases affect the normal health condition and cause reduction of growth, abnormal metabolic activities and even death. It also deteriorates the normal health conditions of fish and cause fish mortality and thus resulting in great economic loss to fisheries. Different pathogens attack fishes and cause different types of diseases. Heavy helminthic infections constitute a major factor in the disease and mortality of fish in India (Tripathi, 1957). The severity of disease in fish caused by helminth parasites varies with the life stage of species, number of parasites, the age and the sites of infection in fish. Parasites are commonly occurring in nature and constitute more than half of all biodiversity (Toft, 1986). Occurrence of disease conditions particularly due to parasites has become a major constraint in aquaculture (Bondad-Reantaso *et al.*, 2005). Helminth parasites usually require two or more intermediate host to complete their life cycle. Fishes are the first intermediate host, where as pigs, cattles, sheep and other mammals serve as second or final host. Sometimes human beings are also involved as final host in completing the life cycle of parasites.

Thus, the present investigation was carried out to reveal the occurrence of helminthic infection in three commercially important Catfishes (namely *O. pabda*, *W. attu* and *A. seenghala*).

2. Material and Methods

(1) Collection of the host fish: The host fishes *Wallago attu*, *Aorichthys seenghala* and *Ompok pabda* were collected from local fish market of Bhopal regions for the collection of helminth parasites. Fishes were collected twice in a week

in alive condition for examination of external and internal helminth infection.

(2) Collection of Endoparasites: The hosts cut-open by giving an incision through the body wall mid-ventrally. Before removing the viscera, the body cavity thoroughly examined for any parasite. Various organs were then removed and kept in separate petri dishes containing normal saline (0.75%). For detailed examination intestine split open and placed in saline water in a petri dish. It teased with fine needles and a camel brush and the contents allowed standing for some time to allow adhering parasites to be released from the lumen. Parasites collected, killed and fixed in Alcohol-Formalin-Acetic acid (AFA) solution for 24 hours. The parasites were dehydrated using different concentrations of alcohol: 50%, 70% alcohol, 80% alcohol, 90% alcohol, and 100% alcohol for a period of ten minutes each. After dehydration, the parasites were cleared in xylene and stained with acetocarmine. The parasites then mounted by using DPX.

(3) Ecological analysis - The ecological analysis was done by followed the formula given by Margolis *et al.* (1982).

(i) Prevalence = $\frac{\text{Total No. of Hosts Infected} \times 100}{\text{Total No. of Hosts Examined}}$

(ii) Mean Intensity = $\frac{\text{Total No. of parasites}}{\text{Total No. of Infected Hosts Examined}}$

(iii) Relative Density = $\frac{\text{Total No. of parasites}}{\text{Total No. of Hosts Examined}}$

3. Results

1. Variation in Percentage of Prevalence Among Host Fishes

Out of 55 specimens of *Wallago attu* examined, 27 were found infected with helminth parasite. The maximum prevalence (83.3%) was recorded in month of December (2013), while the minimum prevalence (16.6 %) was recorded in March (2014). Out of 60 specimens of *Aorichthys seenghala* examined, 12 were found infected

with helminth parasite. The maximum prevalence (40%) was recorded in month of December (2013) and January (2014), while the minimum prevalence (12.5%) was recorded in the March 2014.

Out of 70 specimens of *Ompok pabda* examined, eight (8) were found infected with helminth parasites. The maximum prevalence (20.0%) was recorded in month of December (2013), while the minimum prevalence (11.11%) was recorded in the June (2014).

Wallago attu showed maximum percentage of prevalence through-out the investigation period as compared to *A. seenghala* and *O. pabda*. While abrupt decrease in percentage of prevalence was observed in case of *O. pabda*, which may be due to less availability of fishes (Fig.1).

2. Variation in Intensity and Abundance Among Host Fishes

Maximum intensity of infection was calculated in *Ompok pabda* (2.25) against nematode infection followed by *Wallago attu* (1.487) and *Aorichthys seenghala* (0.8) (Fig. 2).

While maximum abundance for nematode, cestode, trematode parasites were observed in *Wallago attu* (0.575) followed by *Ompok pabda* (0.195) and *Aorichthys seenghala* (0.102) (Fig.3). Observed organ-wise distribution of helminth parasites in descending order were **Body cavity** > **Intestine** > **Liver** > **Kidneys** > **Stomach** > **Swim-bladder** (Fig. 4).

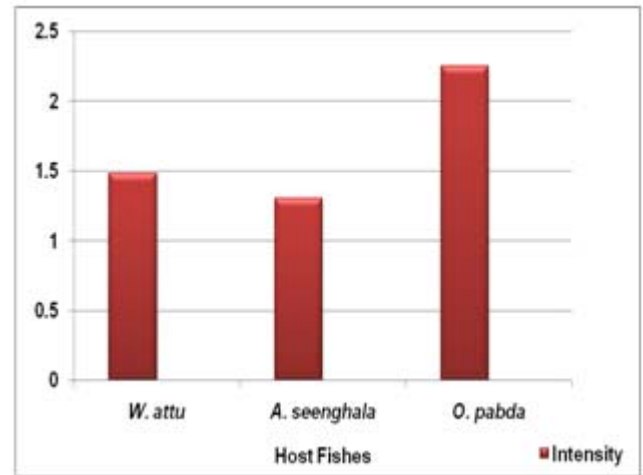


Figure 2: Showing the variation in intensity among host fishes

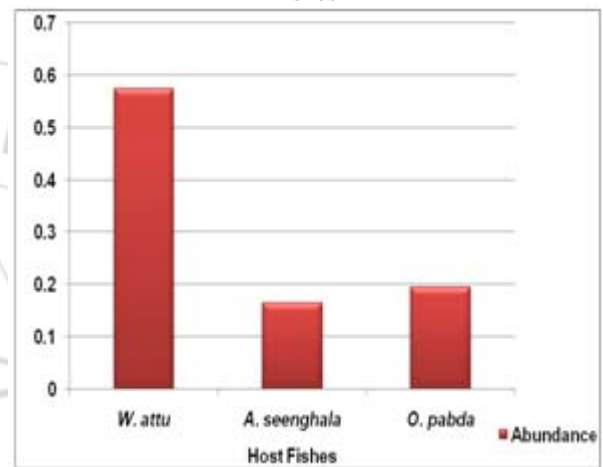


Figure 3: Showing the variation in abundance among host fishes

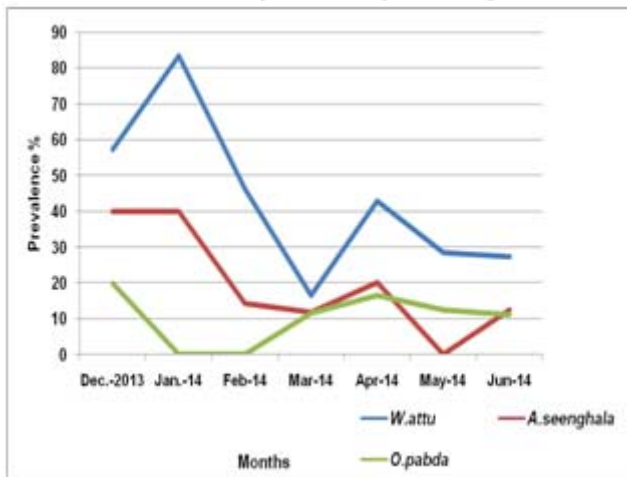


Figure 1: Showing the variation in percentage of prevalence of helminth infection among host fishes

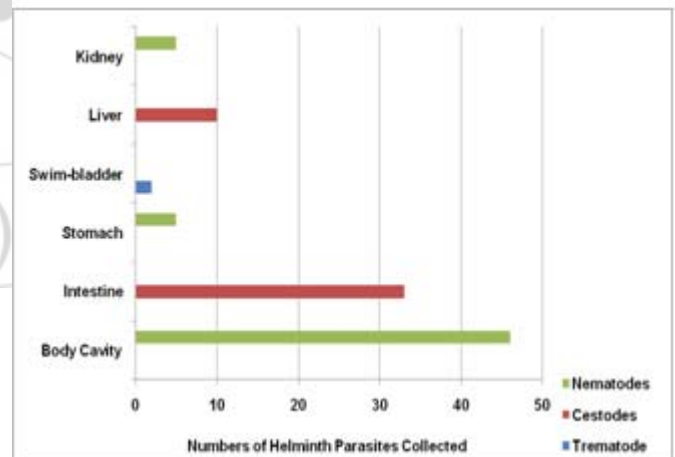


Figure 4: Showing the distribution of helminth parasites in different organs of infected host fishes

4. Discussion

During present study maximum prevalence was recorded in *Wallago attu* through-out the investigation period as compared to *A. seenghala* and *O. pabda*. Cauyan *et al.* (2013) carried out initial assessment of parasite load in *Clarias batrachus*, *Glossogobius giuris* and *Oreochromis niloticus* in Lake Taal (Philippines). Das and Goswami (2014) studied the distribution of helminth parasites in

different organs and their seasonal rate of infestation in *Anabas testudineus*, *Colisa fasciata* and *Trichogaster lalius* from three wetlands of Goalpara district, Assam and revealed 14 helminth parasites species from different digestive organs. According to Das and Goswami (2014) the intestine of host fishes is the most preferred site for helminthes infestation.

Khanum *et al.* (2011) revealed helminth parasites infection from different parts of the alimentary canal and body cavity of *Macrognathus aculeatus*. They got maximum prevalence of helminth parasites in intestine (72.25%), while in the stomach it was 25.71% and minimum 2.04% in body cavity. During present study maximum abundance was observed in the body cavity followed by intestine and liver. According to Markov (1946) fish parasites feed either on the digested contents of the host in the alimentary canal or the hosts own tissues. And the small intestine is a most favourite site for helminth parasites.

Onyedineke *et al.* (2010) studied helminth parasites of some freshwater fish and revealed that the gills, stomach and muscles are infected whereas they found no parasites infection in the liver and eye lens. They recorded the maximum abundance of nematodes followed by acanthocephalans, trematodes and cestodes. They also showed the intestine as the preferred organ for infection, no infection in the oesophagus and concluded that high number of parasites in the intestines could be associated with the fact that most digestion activity takes place in the intestine resulting in the release of parasite ova/cysts in food particles.

During present investigation a contradiction is resultant due to the maximum number of parasites were nematodal larval, which was collected from body cavity. While minimum abundance was recorded by trematodal infection in swim-bladder. Intestine was observed as second preferable site of occurrence in host fishes only for the cestodal infection.

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