

Comparative Study of Helminth Parasites in Fresh Water Fish, *Channa punctatus* of Chapra, Bihar

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Abstract: *Channa punctatus* is the most important freshwater fish with high nutritional value and market demand because of its relatively low cost and high availability in the fish market. But due to parasitic infection pose threat to fish cultivation, which is a valuable source of food and employment. In the present study, 40 fishes of *Channa punctatus* (Bloch) were collected from different fish market of Chapra District, Bihar. Live fresh specimens of *Channa punctatus* (Bloch) of all sizes and sex were collected to observe the helminth parasites. Trematodes, Cestodes, Nematodes and Acanthocephalans are a major group of helminth parasites which caused infections or diseases. Female fish were highly infected than the male. In relation to the size larger size of fish, *Channa punctatus* were highly infected.

Keywords: Fishes, Helminth Parasites, Infected, Freshwater fishes, Length

1. Introduction

Fishes are very important source of protein for human. Since human utilizes fishes as a food, it is important that they should be healthy and free of infection. India is the third largest producer of fish in the world and second in inland fish production (FAO, 2001). Fishes are most important for the Indian economy as it provides employment opportunity, is a source of earning. But due to diseases caused by parasites, fish culturing remain a high risk investment. The fish parasites have also been signified as zoonotic and biological hazard in prospective of human health (Chaia, 2005). The major group of parasites in freshwater fishes is trematodes, cestodes, nematodes and acanthocephalans which cause infection. Besides these, there are a number of parasites which are transmitted to human beings only through fish (Gupta, 1959). These parasites decrease the rate of growth as well as the reproduction rate of the fish, resulting in loss of potential food and economic loss to the culturist. Jha *et al.* (1992) studied the seasonal occurrence of a total of 11 species of helminths from 4 species of freshwater fish, i.e. *Channa punctatus*, *Heteropneustes fossilis*, *Colisa fasciatus* and *Puntius sophore* at the Sikandarpur reservoir, Muzaffarpur, Bihar, India. Alam *et al.* (2015) studied the effect of diplostomum infection on fresh water fish *Heteropneustes fossilis* in Darbhanga, Bihar, a global problem. For successful prevention and elimination of such infection, it is extremely important to achieve early and correct diagnosis of the larval stage of the parasites. Keeping in view, the present study was designed to investigate the burden and effect of helminth parasites in freshwater fishes *Channa punctatus* (Bloch) of Chapra District, Bihar.

2. Materials and Methods

1) Collection of fishes and study area:

An investigation was made on *Channa punctatus* (Bloch) from the different local fish market of Chapra District, Bihar State, India, during January –May (2017). Live host or freshly dead

specimens were randomly sampled and brought into the laboratory in a plastic bag with some amount of water.

2) Methodology

The measurement of length was done by centimeter scale and sexes were determined by the observation of gonad. Fishes were dissected in order to collect all helminth parasites. All organs were removed from the host fish and kept in a petri dish with saline. Organs were examined for parasites in a separate petri dishes by using a hand lens. The attached parasites were removed carefully with the help a brush. The collected parasites were washed in fresh water to remove any debris before making any slides. The Trematodes were fixed in hot 10% formalin, cestodes and acanthocephala were fixed in AFA solution. The parasites were stained with borax carmine, dehydrated in different grades of ethanol, cleared in xylene and after the end of staining process the parasites were mounted with DPX. Collected parasites were identified by using a compound microscope (Aloo *et al.* 2004, Yamaguchi 1963, Soota 1983). The prevalence, abundance, mean density and Index of infection of parasites were estimated according to Margolis.

3. Result and Discussion

In the present study, the obtained results are depicted in table and figure. Total no. of 40 specimens of freshwater fish, *Channa punctatus* were examined for the presence of helminth parasites.

1) Relation between host (*Channa punctatus*) sex and parasitic infection

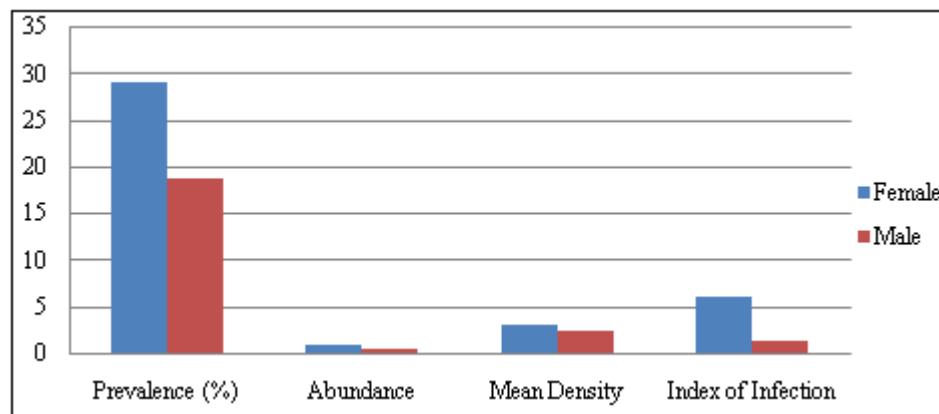
To observe parasitic infection in fish, *Channa punctatus* were collected from the local fish market of Chapra, Bihar. Out of total 40 fishes, 24 fishes were female and 16 fishes were male. The total fishes were examined, 7 were infected out of 24 females and 3 were infected out of 16 males. During this study period prevalence of the parasitic infection (%) in the female and male was (29.16%) and (18.75) respectively. Abundance,

mean density and index of infection in female was 0.8,3 and 6.1 and in male 0.4, 2.3, and 1.3 respectively (Table1 figure1). In the present study, it was observed that the female *Channa punctatus* were more infected than the male. Thomas (1964) Chandra (1985) Khanum and Parveen (1997) and Rahman and

Saidin (2011) similarly observed and concluded that it may be due to lower physiological resistance of female fishes as compared to the males. According to Aloo *et al.* (2004) the main reason for the differences in parasite load by sex is physiological.

Table 1: Prevalence, mean intensity and abundance of parasitic infestation *C. punctatus* in different sex groups

sex	No. of fish examined	No. of infected fish	No. of parasites	Prevalence (%)	Abundance	Mean density	Index of infection
Female	24	7	21	29.16	0.87	3	6.12
Male	16	3	7	18.75	0.43	2.3	1.31
Total	40	10	28	47.91	1.3	5.3	7.43

**Figure1:** Parasitic infection in *Channa punctatus* in the Relation between sex and different indices

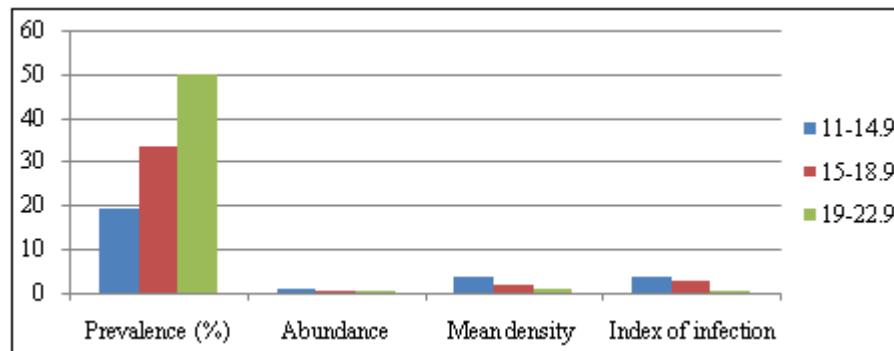
2) Relation between host (*Channa punctatus*) size (length) and parasitic infection

In this study, it was also investigated that which length of channa punctatus more infected than the others. Length groups have been divided into three groups 11-14.9, 15-18.9 and 19-22.9(cm). The Prevalence (%) of helminth parasites was highest (50%) in large size, length group (19-22.9 cm) and lowest in the small size length group (11-14.9 cm) of fishes. It observed that the larger size of *channa punctatus* was highly

infected with helminth parasites in comparison to the small size of the fish. A Similar report was also observed by Kaur *et al.* (2012) that, the large fishes were more heavily infected than the smaller fishes. Kennedy *et al.* (1986) stated that an increasing host size is linked with an increase in available niches for colonization and thus a parasite richness. Singh and Mishra (2016) stated that an increase in the size of fish host was accompanied with an increase in parasitic infection.

Table 2: Prevalence, mean intensity and abundance of parasitic infestation *C. punctatus* in different length groups

Length groups (cm)	No. of fish examined	No. of infected fish	No. of parasites	Prevalence (%)	Abundance	Mean density	Index of infection
11-14.9	26	5	19	19.3	0.73	3.8	3.6
15-18.9	12	4	8	33.3	0.66	2	2.6
19-22.9	2	1	1	50	0.5	1	0.5
Total	40	10	28	102.6	1.83	6.8	6.7

**Figure 2:** Parasitic infection in *C. punctatus* in Relation between standard length and different indices

4. Conclusion

This study describes the infection of helminth parasites in freshwater fish and it indicates that infection of helminth parasites in *Channa punctatus* varied with sex and size. The fish range 19-22.9 (cm) was highly infected with parasites. Female fishes were more infected than the male fishes. Thus, Sex of *Channa punctatus* play an important role in the number of parasites infecting the fish. It could be due to water quality, depth of water, temperature of water and other Physiochemical parameters.

5. Future Scope

Channa punctatus is a common fish with high nutritional value. It has a better economic importance because it is used as a food. The problem which caused parasites is the long duration of maturity, weight reduction and lack of palatability. Nevertheless, more study or research is needed to be carried out for the parasites of *Channa punctatus*.

5. Acknowledgement

I would like to give special thanks to Dr. Dipti Sahay, my Supervisor, Assistant Professor, P.G Department Of Zoology, J.P. University, for their helpful suggestions during the study.

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