



Comparative Study on Prevalence of *Adenoscolex oreini* and *Bothriocephalus acheilognathi* in *Schizothorax plagiostomus* and *S. niger*

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ABSTRACT

The incidence of cestode parasites of *Schizothorax* species was carried out from October 2016 to November 2017 from river Veshaw of Kulgam district in Jammu and Kashmir, India. A total of 234 fishes collected belonging to 2 species viz. *S. plagiostomus*, *S. niger* equally throughout the year. The cestode species identified included *Bothriocephalus acheilognathi* and *Adenoscolex oreini*. Out of 234 fishes collected 32 were found infected and a total of 295 parasites were recovered from *S. plagiostomus* and *S. niger*. The fishes were found infected with 199 *Adenoscolex oreini* and 96 *Bothriocephalus acheilognathi* showing overall prevalence of 14.64% and 11.68% in *S. plagiostomus* and *S. niger* respectively.

Keywords: *Adenoscolex Oreini*, *Bothriocephalus Acheilognathi*, *Schizothorax Niger*, *S. Plagiostomus*.

I INTRODUCTION

Parasitism is one of the major problems faced by aquaculture which leads to deterioration of fish production both qualitatively as well as quantitatively. Among the parasites that infect fishes, helminths signify the largest and important groups as some of them are known to be the agents of serious fish diseases. Parasites are small and often hidden from view, often ignored, and however, they play vital roles in ecosystems and considered in their own right, pose unique problems in hosts. Parasites in fishes diminish and deteriorate their nutrient composition and worsen the health or even cause mortalities in them. During study focus was on two cestodes identified as *Adenoscolex* sp. and *Bothriocephalus* sp. and it was noticed that attachment behavior of cestodes can cause blockage of gut, tissue damage. Majority of freshwater fishes are subjected to parasitic infection, damaging the quality of fish food. *Adenoscolex oreini* was discovered as new genus and new species from *Orius sinuatus* by

Fotedar (1) for the first time. Scott and Grizzle, (2) reported that bothrio of *B. acheilognathi* caused focal pressure necrosis, increased mucus production, lymphocyte infiltration and haemorrhage. Rai, (3) reported that the pathogenicity of parasitism cause extensive damage to the host leading to the lower production of the fish. Bookmer *et al.*, (4) found that the parasite has been to be responsible for the death of the host. Hoole and Nisan, (5) reported *Bothriocephalus acheilognathi* Yamaguti, (6) to cause pathogenicity and have worldwide distribution, however little is known about its relationship between fish immune response and *B. acheilognathi* infections, although inflammation occurs in infected intestines and leukocytes have been seen on surface of the parasite. Jahan, *et al.*, (7) studied the parasites of *Schizothorax* species and *Cyprinus carpio* from River Jhelum and recorded the presence of a cestode *Bothriocephalus*. Cave, *et al.*, (8) compared the helminth parasite communities in eel from lagoons of Adriatic coast and Tyrrhenian coast. It was proved that there is similarity in composition and structure of helminths communities in eels from coastal lagoons throughout Europe. Wani and Magray, (9) reported highest occurrence of *Adenoscolex* throughout spring and winter seasons in River Jhelum and in winter in Anchar lake. Scholz *et al.*, (10) reported that the most common infection from fish consumption is caused by *D. latum*, with *D. pacificum*, *D. dalliae*, *D. dendriticum* and *D. nikonkaiense* also causing disease in many parts of the world. Irshadullah and Mustafa (11) reported that with the infection of *Adenoscolex oreini*, the aggregation of worms and increased mucus secretion was noted in infected intestines. The pathology induced by this worm in the gut caused mucosal damage at the site of attachment and the compression of villi adjacent to the strobila.

II MATERIALS AND METHODS

2.1 Study Area

The collection of fish hosts was done from different reference points of river Veshaw in Kulgam district of Kashmir valley, with the help of local experienced fishermen. After random collection at different sites, the fish hosts were brought to the parasitology Research lab, Dept. of Zoology, in containers for identification and subsequent collection of cestode parasites.

2.2 Collection and Identification of Parasites

For parasitic observation, the fish's dissected midventrally and the body cavities were scanned for the endoparasites. The parasites collected were transferred to normal saline, counted in the living state. The isolated parasites were fixed in carnoys fixative, stained in acetocarmine processed and identified with the help of keys provided by Cheng (12) and Yamaguti (13). The prevalence and mean intensity of the cestode parasites were calculated in accordance with that of Margolis *et al.* (14).



Photograph showing heavy infection of Cestodes which caused obstruction in fish gut

III RESULTS

Out of 234 fishes collected 32 were found infected and a total of 295 parasites were recovered from two *Schizothorax* sp. *S. plagiostomus* and *S. niger* were found infected with 199 *Adenoscolex oreini* and 96 *Bothriocephalus acheilognathi*. The cestodes isolated from *Schizothorax* species included *Adenoscolex oreini*, *Bothriocephalus acheilognathi* with former predominating over the latter. The prevalence, mean intensity and mean abundance is shown in table 1, 2 and 3.

Table 1. Showing overall Incidence of *Adenoscolex oreini* and *Bothriocephalus acheilognathi* in two observed hosts

Fish species	No. of Fishes Examined	No. of Infected fishes	<i>Adenoscolex oreini</i>	<i>Bothriocephalus acheilognathi</i>	Total no. of Parasites	Prevalence	Mean abundance	Mean intensity
<i>S. plagiostomus</i>	157	23	151	77	228	14.64	1.45	9.91
<i>S. niger</i>	77	9	48	19	67	11.68	0.87	7.44
Total	234	32	199	96	295	13.67	1.26	9.21

Table 2. Showing Incidence of *Adenoscolex oreini* two observed hosts

<i>Fish species</i>	<i>No. of Fishes Examined</i>	<i>No. of Infected fishes</i>	<i>Adenoscolex oreini</i>	<i>Mean abundance</i>	<i>Mean intensity</i>
<i>S. plagiostomus</i>	157	23	151	0.96	6.56
<i>S. niger</i>	77	9	48	0.63	5.3

Table 3. Showing mean abundance and mean intensity of *Bothriocephalus acheilognathi* in two examined hosts

<i>Fish species</i>	<i>No. of Fishes Examined</i>	<i>No. of Infected fishes</i>	<i>Bothriocephalus acheilognathi</i>	<i>Mean abundance</i>	<i>Mean intensity</i>
<i>S. plagiostomus</i>	157	23	77	0.49	3.34
<i>S. niger</i>	77	9	19	0.24	2.1

IV DISCUSSION

During the entire period of study, the highest prevalence of *Adenoscolex* and *Bothriocephalus* was observed in *S. Plagiostomus* was observed in case of *Schizothorax species* which is conformity with the earlier findings, Amin, (15), Chishti and Peerzada, (16) and can be linked with many ecological factors including feeding behavior, diet of the host and water temperature (Tedla and Fernando, 17).

As reported earlier (Sures, 18), the incidence of the cestode parasites observed present a review in monitoring water pollution of these water bodies. Thus, it can be proposed that the parasites are indicators of health of host and their environment that they live in.

Since the present investigation is not sufficient to determine the possible cause of decline of the native fish by comparing the prevalence of parasitic infection in the two different hosts of *Schizothorax* sps. It needs comprehensive physiological and immunological studies. Therefore, authors suggest a comprehensive research in the identification of other factors being responsible for parasitism and decline of economically important native fish of the Kashmir Valley.

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