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RESEARCH ARTICLE

HELMINTH FAUNA ASSOCIATED WITH FRESHWATER FISHES OF IMPHAL WEST DISTRICT OF MANIPUR

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ABSTRACT

This study presents results from a survey of helminth parasites of fishes in Manipur. The present investigation was undertaken between April, 2015 and September, 2015 with an aim to study the helminth parasites associated with different freshwater fishes in Imphal west district of Manipur. During study period total nine species of helminth parasites were identified belonging to four diverse groups comprising 4 species of nematodes, 3 species of trematodes, 1 species of cestodes and 1 species of acanthocephala. Out of thirty three freshwater fish species examined only nine species were found to infect with parasites.

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INTRODUCTION

Parasites depend upon other organisms for food and shelter. Soota (1983), Yamaguti (1971), Shomorendra and Jha 2003, Srivastava et al. (2004), Gambhir et al. (2006) Bhattacharjee (2007) contributed on fish helminth parasites. In addition to fungi, bacteria, protozoan and crustaceans, helminths have important agents for parasitic infection. Helminthes parasite victimizes fishes. Certain endohelminth parasites casues even internal injury to internal organs. The nature of parasitisation of fish population in any confined body of water is affected by a variety of factors. Some of the biotic factors are host species, age and size of the host, condition of host, spawning period of the host, host sex, life history of host, diet or feeding behavior of host, availability of infected intermediate host as food, site of infection, host hormone level etc.

Some of the abiotic factors are temperature, pH, oxygen content, salinity, and pollution of water. Season and location (Latitude/Longitude) of water body are also important abiotic factors. Water plays a major role in the maintenance of many types of parasite fauna. During the breeding season of fish lesser number of parasites invade the host because of the presence of the oestrogen (Rahman and Jahan 2002). Parasites in wild fish are frequently only remarked upon when they are so obvious as to lead to rejection of fish by fishermen or consumers. In recent times, there has been increasing interest in fish helminth. Severe infection of helminth parasites may decrease the nutrient content of fish. Their infections not only deteriorate the muscle quality, stunt growth but even sometimes prove damage as a result of internal injury. However, very little is known about the parasitic fauna of freshwater fishes of Manipur which have a vast potential of water in the form of ponds, lakes, rivers etc. The present study aims to determine helminth fauna of some freshwater fishes of Imphal west district of Manipur.

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METHODOLOGY

The present investigation was undertaken between April, 2015 and September, 2015. Fishes were brought in fresh or preserved condition to the laboratory from different locality of Imphal west district of Manipur. Small fishes were killed by pithing and somewhat larger specimens by blow on the top of the cranium. Fishes were identified following, Jayaram (2010) and Vishwanath (2002).

The external body surfaces as well as the internal body organs were thoroughly examined for the parasites. The parasites collected, upon being fully relaxed, were fixed in the fixatives prescribed for different helminthic groups following Bylund *et al.* (1980). The trematodes were fixed in AFA (alcohol-formalin-acetic-acid) solution and stored in 70% alcohol, acanthocephala fixed and preserved in AFA, cestodes in 5% formalin and nematodes after immersing in warm 70% alcohol were finally stored in 70% alcohol.

Table 1. List of the fishes examined for parasites

Sl. No.	Name of the fish species	Order	Family
1.	<i>Labeo rohita</i> (Ham-Buch)	Cypriniformes	Cyprinidae
2.	<i>Labeo gonius</i> (Ham-Buch)	-do-	-do-
3.	<i>Cyprinus carpio</i> (Linnaeus)	-do-	-do-
4.	<i>Cirrhinus mrigala</i> (Ham-Buch)	-do-	-do-
5.	<i>Hypophthalmichthys molitrix</i> (Valenciennes)	-do-	-do-
6.	<i>Ctenopharyngodon idella</i> (Valenciennes)	-do-	-do-
7.	<i>Catla catla</i> (Hamilton)	-do-	-do-
8.	<i>Amblypharyngodon mola</i> (Ham-Buch)	-do-	-do-
9.	<i>Esomus danricus</i> (Ham-Buch)	-do-	-do-
10.	<i>Puntius chola</i> (Ham-Buch)	-do-	-do-
11.	<i>Puntius sophore</i> (Ham-Buch)	-do-	-do-
12.	<i>Puntius sarana sarana</i> (Ham-Buch)	-do-	-do-
13.	<i>Puntius manipurensis</i> (Menon, Rema & Vishwanath)	-do-	-do-
14.	<i>Puntius ticto</i> (Ham-Buch)	-do-	-do-
15.	<i>Puntius stoliczkanus</i> (Day)	-do-	-do-
16.	<i>Lepidocephalus guntea</i> (Hamilton-Buchanan)	-do-	Cobitidae
17.	<i>Lepidocephalus berdmorei</i> (Blyth)	-do-	-do-
18.	<i>Anabas testudineus</i> (Bloch)	Perciformes	Anabantidae
19.	<i>Chanda nama</i> (Ham-Buch)	-do-	Chandidae
20.	<i>Colisa fasciatus</i> (Schneider)	-do-	Belontiidae
21.	<i>Colisa labiosus</i> (Schneider)	-do-	-do-
22.	<i>Glossogobius giuris</i> (Ham-Buch)	-do-	Gobiidae
23.	<i>Oreochromis mossambica</i> (Peters)	-do-	Cichlidae
24.	<i>Channa punctatus</i> (Bloch)	-do-	Channidae
25.	<i>C. striatus</i> (Bloch)	-do-	-do-
26.	<i>C. orientalis</i> (Bloch & Schneider)	-do-	-do-
27.	<i>Notopterus notopterus</i> (Ham-Buch)	Osteoglossiformes	Notopteridae
28.	<i>Clarias batrachus</i> (Linnaeus)	Siluriformes	Clariidae
29.	<i>Heteropneustes fossilis</i> (Bloch)	-do-	Heteropneutidae
30.	<i>Ompok bimaculatus</i> (Bloch)	-do-	Siluridae
31.	<i>Mystus bleekeri</i> (Day)	-do-	Bagridae
32.	<i>Mystus cavasius</i> (Ham-Buch)	-do-	-do-
33.	<i>Monopterus ulbus</i> (Zuiew)	Synbranchiformes	Synbranchidae

Table 2. List of helminth parasites, site of infection with their respective fish host

Parasites	Host	Site of infection
<i>Camallanus anabantis</i> Pearse, 1933	<i>Anabas testudineus</i> (Bloch)	Intestine
	<i>C. orientalis</i> (Bloch & Schnieder)	Intestine
<i>Paraquimperia manipurensis</i> Shomorendra & Jha, 2003	<i>Anabas testudineus</i> (Bloch)	Intestine
<i>Procamallanus (Procamallanus) succobranchi</i> Karve, 1952	<i>Heteropneustes fossilis</i> (Bloch)	Intestine, stomach wall
<i>Cosmoxyneoides colisi</i> Gambhir <i>et al.</i> , 2006	<i>Trichogaster fasciata</i> (Bloch & Schnieder)	Intestine
	<i>T. labiosa</i> (Day)	Intestine
<i>Genarchopsis goppo</i> Ozaki, 1925	<i>Channa punctata</i> (Bloch)	Intestine
<i>Allocreadium fasciatusi</i> Kakaji, 1969	<i>C. orientalis</i> (Bloch & Schnieder)	Body cavity
	<i>Lepidocephalus guntea</i> (Hamilton-Buchanan)	Intestine
<i>Clinostomum complanatum</i> Rudolphi, 1819	<i>Trichogaster fasciata</i> (Bloch & Schnieder)	Body cavity
	<i>T. labiosa</i> (Day)	
<i>Lytocestus indicus</i> Moghe, 1925	<i>Heteropneustes fossilis</i> (Bloch)	Intestine
	<i>Clarias batrachus</i> (Linnaeus)	Intestine
<i>Pallisentis ophiocephali</i> (Thaapar, 1930) Baylis, 1933	<i>Channa punctata</i> (Bloch)	Intestine
	<i>C. striata</i> (Bloch)	Intestine

To facilitate identification of the worms the trematodes and cestodes were stained in alum carmine and mounted in Canada balsam while in case of nematode and acanthocephala, the worms were cleared in lactophenol and mounted in glycerine jelly. The collected parasites were identified following Yamaguti (1959, 1961, 1963, 1971), Soota (1983) and Bhattacharya (2007).

RESULTS AND DISCUSSION

In the course of routine examination 33 fish species belonging to 22 genera, 5 orders, 14 families found in different localities of Imphal west district of Manipur were studied for helminth parasites. Out of which only nine species of fish were found to infect with parasites. During the study period nine (9) species of helminth parasites were collected belonging to four diverse groups comprising 4 species of nematodes, 3 species of trematodes, 1 species of cestodes and 1 species of acanthocephala. Four species of nematodes identified are *Camallanus anabantis*, *Paraquimperia manipurensis*, *Cosmoxynemoides colisi* and *Procamallanus (Procamallanus) succobranchi*. *C. anabantis* was collected from the intestine of *Anabas testudineus* and *C. orientalis*.

The worm *C. colisi* was collected from the intestine of *T. fasciata* and *T. labiosa*. *P. succobranchi* was collected from the intestine and stomach wall of *H. fossilis*. Three species of trematodes were collected from different fish hosts. *G. goppo* was collected from the intestine of *C. punctata*, *A. fasciatusi* from the body cavity of *C. orientalis* and intestine of *L. guntea* and *C. complanatum* from the body cavity of *T. fasciata* and *T. labiosa*.

The cestode *L. indicus* was collected from the intestine of *H. fossilis* and *C. batrachus*.

The worm *P. ophiocephali* was collected from the intestine of *C. punctata* and *C. striata*.

In the present study most of the parasites were found in the intestine of the host. Some parasites were infected in stomach wall and body cavity of the host. In the present study concurrent infection was found in some fishes by two or more helminth parasites. The numbers of parasites necessary to cause harm to a fish varies considerably with the species and size of the host and its health status. Many parasite species are host specific to at least some degree and are capable of infecting one or only a limited number of host species. Individual parasite species may have widely differing effects on different host species.

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