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RESEARCH ARTICLE

A checklist of parasites collected from the zig-zag eel (*Mastacembelus armatus* Lacepede) from Bairaj, Bijnor, Uttar Pradesh, India

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Abstract

The present study belongs to the parasites that infect freshwater fish in the district of Bijnor, Uttar Pradesh, India in order to evaluate the biodiversity of parasitic fauna of zig - zag eel, *Mastacembelus armatus* Lacepede, 1800. Here, a list of parasites that we have collected during the study along with information about their host's species, infected organs and geographical locations. This research adds to our knowledge about the diversity of helminth parasites infected *M. armatus* collected from river Ganga, Bairaj, Bijnor in Uttar Pradesh and fulfill the gap in the area of fish parasitology in India.

Keywords: Helminthes, Parasite, Ganga River, Bijnor, Uttar Pradesh, India.

Introduction

Fishes encounter helminth parasites more frequently than microbial infections in the natural culture system (Madavi, 2003). In every type of water body, helminth parasites are hazardous to piscine health. Parasites affect nutrition, metabolism and excretory function of the alimentary canal and use to damage even the nervous system (Markov, 1961). In pathogenic fish disease, pathogenic agents may also be protozoans, helminths, viruses and bacteria etc. Out of these, helminths are the true obligatory parasites that cause disease. Further, among helminths, the trematode leads parasitic life on fish host and completes its life cycle on this host. Besides this, cestodes, acanthocephalans and nematodes are also found vulnerable to fish health. Parasite diseases reduce fish production and nutritional value by affecting the normal physiology of notably fish. Their proteins are endowed with many physico-chemical and functional characteristics as a food source, making them suitable for various food applications such as condensate, emulsifiers, etc. The functional properties of proteins make major contributions to food applications and are greatly affected by their structure in food systems (Ramachandran *et al.*, 2009). Mastacembeleformes consist of a group of eel-shaped fishes. They live in freshwater rivers and have great economic value, mainly in the inland regions of India (Talwar and Jhingran,1991). In the Ganga River, family Mastacembelidae comprises two genera viz; *Macrognathus* Lacepede, 1800 and *Mastacembelus* Gronovinus,1763. These two genera species commonly found in the Ganga river are: *Macrognathus aculeatus* Bloch 1787, *Mastacembelus armatus* Lacepede, 1800 and *Mastacembelus pancalus* Ham.1822. A variety of parasites like trematodes, cestodes, nematodes and acanthocephalans are found frequently and cause severe pathological conditions (Khanum *et al.*, 2011; Khatun and Mohammad, 2018). Thus, in the present work, parasites were collected from *M. armatus* and a checklist is provided to add significantly to the knowledge about the parasites of freshwater mastacembeleformes species of the Ganga River.

Materials and Methods

The present study was carried in Bairaj, Bijnot, Uttar Pradesh, India. Fish host were collected and transported live to the Laboratory of Molecular Taxonomy, Department of Zoology, Chaudhary Charan Singh University, Meerut (U.P.), India. The host was dissected and various organs like gills, liver, body cavity and intestine were examined under a microscope

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Table 1: Species of helminths collected during the present study

Phylum	*Class*	*Order*	*Family*	*Genus*	*Species*
Nematoda	Nematoda	Rhabditida	Physalopteridae	*Heliconema*	*Heliconema alatum*
Platyhelminthes	Monogenea	Dactylogyridea	Ancyrocephalidae	*Mastacembelocleidus*	*Mastacembelocleidus heteranchorus*
	Trematoda	Diplostomida	Diplostomatidae	*Diplostomum*	*Diplostomum sp.*
				Tylodelphys	*Tylodelphys sp.*
	Cestoda	Bothriocephalidea	Bothriocephalidae	*Senga*	*Senga sp.*

for the presence of parasites. For the morphological study, methods related to the species described by various workers were followed (Caffam *et al*., 2013, Verma *et al*., 2017; Amin *et al*., 2022, Moravec *et al*., 2022). The data for each helminth species is ordered alphabetically in the Table 1 presented in the results section.

Results and Discussion

A two-year duration survey was conducted in the study area for freshwater fish parasites of *M. armatus*. In the Ganga River Bairaj, Bijnor districts (U.P) we have collected six species of monogenea, nematodes, trematoda, and cestoda parasites. These findings demonstrated that by enhancing screening in the Ganga river Bairaj Bijnor, additional helminth species can be obtained to ascertain the true level of helminth species diversity.

Furthermore, this study strongly predicts that helminth species that are found will be subjected to molecular techniques to clarify their evolutionary relationships with other taxa from different geographical regions as well as for any taxonomic ambiguities. Only such research can provide a thorough insight of the helminth fauna of the Ganga river, Bairaj.

This study, thus, highlights on the details of therefore is, the only one that has given some details on the endoparasitic organisms infecting freshwater fish species. Due to seasonal variation, generally, parasite infections, variation in the intensity of infection, variation in the host's parasite fauna, and variation in infection with the habitat type was also measured.

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