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Demography of helminth parasites in relation to biometic characteristics of *Mastacembalus armatus*

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Abstract: The study was conducted to collect and identify helminth parasites of *Mastacembalus armatus* and also to determine the prevalence intensity and abundance of parasitic infection. 118 *M. armatus*, obtained from different sampling stations of Yamuna river between March 2008 to February 2009 were examined for endoparasitic helminth infections. Of these only 31 fishes were found infected. Four helminth species including one nematode (*Ascaridia ganpatii)*, two cestodes (*Polyonchobothrium armatii, Senga nayari*) and one trematode (*Eucreadium pandeyi*) were found in host fish. The over all monthly infestation of prevalence (0.29), intensity (3.28) and abundance (1.13) were recorded. The maximum infection was recorded in middle size range while very small and larger fishes showed lesser susceptibility to helminth parasites.

Keywords: Abundance, Biometic of fish, Helminth parasites, Intensity, *Mastacembalus armatus*, Prevalence

INTRODUCTION

Fish is a cheap and important source of protein. It contains lipids, minerals, oils and vitamins. Majority of fishes carry heavy infection of parasites, which cause deterioration in the food value of fish and may even result in their mortality. Besides, there are a number of 'helminth parasites' which are transmitted to men only through fish. Mastacembalid species are found at high altitude as well as low land in both still and running water (Woo, 1995). A wide range of parasitic infections of fresh water fishes have been studied from various parts of India. The influence of parasitic infections in relation to the length of fish has been described by Fagerholm, 1982; Zaman *et al*., 1986; Jha and Sinha, 1990; Tasawar *et al.*, 2007; Ayanda, 2008; Alam *et al*., 2010. In recent past, the prevalence, intensity and abundance of helminth parasites in fishes have been observed by Khan *et al.* 2003; Singh and Malik, 2004; Ozer and Ozturk, 2004; Shomorendra *et al*., 2005, 2007; Singh, 2006; Akter *et al*., 2007 and Moyo *et al*., 2009 but such work is lacking on *Mastacembalus armatus* in the Yamuna river. So the present investigation was aimed at to study the parasitic community, prevalence, intensity and abundance of helminth parasites in *M. armatus*.

MATERIALS AND METHODS

The fish *M. armatus* were collected by using gill net during March 2008 to February 2009 from the Yamuna river**.** A total of 118 *M. armatus* were examined, out of which only 31 were found infected with 116 helminth parasites. The fishes were identified and grouped according to length keeping in difference of 50 mm. Length was measured with the help of thread and scale. Trematodes and cestodes were stretched over a clean slide, fixed in alcoholic Bouin's and stained in Aceto-Alum-Carmine. Nematodes were preserved in glycerin alcohol (70% alcohol 90 part and glycerin 10 parts). They were cleaned and mounted in lactophenol without staining. Identification of the helminth parasites were done according to Yamaguti (1959, 1961,1971) and available references. Demography of helminth parasites were carried out using the formula given by Margolis *et al.* (1982)

RESULTS

During the study period total 118 fishes were examined, of these 31 fishes were found infected with helminth parasites and a total of 116 parasites were recovered. One species of nematode, *Ascaridia ganpatii* and two species of cestode, *Polyonchobothrium armatii, Senga nayari* and one trematode species *Eucreadium pandeyi* were found in *M. armatus*. Prevalence, intensity and abundance of infestation was highest in *A. ganpatii* (0.093, 4.9 and 0.46 respectively) and it was lowest in *E. pandeyi* (0.042, 2.4 and 0.13 respectively). In case of cestodes species, hightest prevalence (0.068) was found in *P. armatii* and highest intensity (4.0) and abundance (0.24) was recorded in *S. nayari* (Table 1).

As far as monthly infestation is concerned, higher prevalence (0.56), intensity (5.8) and abundance (3.2) were observed in May. The Lowest prevalence (0.09) was recorded in July while the lowest intensity (1.0) and abundance (0.1) were observed in the month of August

Table 1. Prevalance, intensity and abundance of parasites in *M. armatus* during the year 2008-2009.

Name of parasites	No. of fish infected	No. of parasites collected	Prevalence	Intensity	Abundance
A. ganpatii	11	54	0.093	4.9	0.46
P. armatii	8	22	0.068	2.8	0.16
S. nayari	7	28	0.059	4.0	0.24
E. pandeyi	5	12	0.042	2.4	0.13
Total	31	116	0.262	14.1	0.99

(Table 2). The over all prevalence (2.97), intensity (32.8) and abundance (11.3) were also calculated and presented in Table 2.

Table 3 shows the prevalence, intensity and abundance of helminth parasites in five length group of the host fish *M. armatus*. The highest prevalence, intensity and abundance was recorded in length group 140- 190 while it was lowest in length group 38-88.

DISCUSSION

Maximum parasitic infection was observed in *Ascaridia ganpatii* (nematode) followed by *Polyonchobothrium armatii* (cestode) while it was minimum in *Eucreadium pandeyi* (trematode) in *M. armatus.* Similar observation has been observed by Malhotra and Chauhan (1984) in seven species of hill stream fishes *viz. Barilius bendelisis, B. bola, Labeo dero, L. rohita, M. armatus, M. pancalus, Schizothorax richardsonii and S. plagiostomus.*

The prevalence of parasitic infestation in *M. armatus* was 2.97, intensity 32.8 and abundance 11.3. The Maximum prevalence, intensity and abundance of infection was observed in May and ,minimum in August I, obviously indicated that maximum number of fishes harbored infection during summer period than other seasons of the year. Similar findings have been reported earlier by Reimchen (1982) in *Gastrostius aculeatus* by *Cyathoccphalus truncates* and *Schistocephalus solidus* infections; Rand and Burt (1985) in the fall fish *Semotilus* by *Allocreadium lobatum* infection; Timmons *et al.* (1992) in cat fish *Ictalurus punctatus* by *Acetodextra amiuri* infection; Cone and Roth (1993) in *Oligocottus maculosus* by *Gyrodactylus maculesi* infection and Khanum *et al.* (2008) in *Rita rita* by *Phyllodistomum folium, Opigaster gomti, Horatrema pristipomatis, Pseudophyllidae* and *Cucullanus dogieli.* In Himalayan region Malhotra and Chauhan (1980) observed maximum cestode infection during summer months and minimum during rainy months in thirteen species of hill stream fishes *viz. Barilius barana, B. bola, B. vagra, B. bendelisis, Garra gotyla gotyla, Glyptothorax telchitta, Heteropneustes fossilis, Labeo calbasu, L. dyocheilus, L. rohita, Schizothorax plagiostomus* and *S. richardsonii*. Further, Malhotra *et al.* (1981) observed maximum nematode infection in summer and minimum in rainy months in twelve species of fishes *viz. Barbus tor, B. putitora, Channa punctatus, C. striatus, Cirrhina mrigala, Garra gotyla gotyla, Glyptothorax telchitta, Heteropneustes fossilis, Mastacembalus armatus, M. pancalus, Mystus seenghala* and *Wallago attu.*

The maximum infection was recorded in middle size range while very small and larger fishes showed lesser susceptibility to helminth parasites in the present study. This infection pattern may be due to the difference of composition of food and age immunity. The present findings supported by the observation of Singh and Malik (2004) who observed the maximum parasitic

Table 2. Monthwise prevalence, intensity and abundance of parasites in *M. armatus* during the year 2008-2009.

Months	Total no. of fish		No. of parasite collected	Prevalence	Intensity	Abundance
	Examined	Infected				
March	10	4	15	0.40	3.8	1.5
April	14	6	24	0.43	4.0	1.7
May	9	5	29	0.56	5.8	3.2
June	13	3	11	0.23	3.7	0.9
July	11	1	2	0.09	2.0	0.2
August	7	1	1	0.14	1.0	0.1
September	10	2	7	0.20	3.5	0.7
October	9	3	11	0.33	3.7	1.2
November	14	3	5	0.21	1.7	0.4
December	8	-	-	-	-	-
January	5	-	-	-	-	-
February	8	3	11	0.38	3.6	1.4
Total	118	31	116	2.97	32.8	11.3

Table 3. Prevalence, intensity and abundance of helminth parasites in different length groups of *M. armetus* during the year 2008-2009.

Length (mm)	Host Examined	Host infected	No. of Parasites	Prevalence	Intensity	Abundance
38-88	15	1	1	0.067	1.0	0.07
89-139	24	6	16	0.25	2.5	0.63
140-190	33	12	55	0.36	4.6	1.67
191-241	27	9	37	0.33	4.1	1.37
242-284	19	3	8	0.16	2.7	0.42

infection in middle size range of *Catla catla*, *Ophiocephalus striatus, Clarias batrachus, H. fossilis* and *Trichogaster fasciatus.* Similar observation has also been reported by Shomorendra *et al.* (2007) in different length groups of *C. gachua, C. striatus, Clarias batrachus* and *Anabus testudientus.* In the present study it is inferred that decreased infection in larger sized hosts may be due to strong resistance developed by the fishes

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