

- Short communication

**Comparative study of helminth parasites in *Mastacembelus armatus* (Lacepede, 1800) and *Macrognathus pancalus* (Hamilton, 1822) collected from fish market of Savar, Dhaka**

**Ashura Khatun and Md. Kamrujjaman\***

Department of Zoology, Jahangirnagar University, Savar, Dhaka-1342

**Key words:** Prevalence, intensity, helminth parasites, *Mastacembelus armatus* and *Macrognathus pancalus*.

*Mastacembelus aramtus* and *Macrognathus pancalus* are very much popular and delicious fish in Bangladesh and commonly known as salbaim and guchi baim respectively. According to IUCN Bangladesh (2015), though the *M. pancalus* is least concern but, the *M. armatus* is endangered in Bangladesh and their abundance are not satisfactory. Beyond the various biological and ecological factors, parasites of fish constitute one of the major problems to fish health. For proper culture and management of fish as well as to keep fish well in their natural habitat, it is essential to control the fish parasites.

Several works has been carried out by Khan & Yaseen (1969), Anon (1974), Ahmed & Saha (1983), Banarjee & Chandra (1993) and Khanum & Parveen (1997) on the above mentioned fish. However, the recent studies on the stated fish are very much limited. Therefore the present study was undertaken to comparative evaluation of the present status of prevalence and intensity of helminth parasite of *Mastacembalus aramtus* and *Macrognathus pancalus* with emphasis on sex, organal and length wise distribution.

A total of 160 of each *Mastacembelus armatus* and *Macrognathus pancalus* were collected from a savar bus stand fish market (23°50'57.57N and 90°15'30.08°E ) of Savar Upazila, Dhaka at each month during the October 2016 to May 2017. Collected fishes were immediately brought to the laboratory and their outer surface like skin, fins and tail were examined with the help of hand lens and dissecting microscope for parasites. Sexes were determined according to their body color, bulged-out bellies, genital pore and internal gonad. The total length of each fishes was recorded with the help of a centimeter scale.

To collect the helminth parasite, fishes were dissected and different organs of fish like gill, body cavity, liver, stomach and intestine were collected and kept in separate petridishes containing saline solution (0.75%). Thereafter, collected parasites were kept in

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\* Corresponding author. E-mail: kjaman@juniv.edu

70% ethylalcohol. Then the parasites were mounted temporarily in lactophenol to clear the cuticle of the parasites. Whole mount of parasites were carried out by passing through graded alcohol and stained in borax carmine. Thereafter, dehydrated in xylene and finally mounted in canada balsam for their microscopic study. Parasites were identified according to Yamaguti (1958, 1959, 1961 and 1963). Finally, according to Margolis *et al.* (1982), prevalence and intensity of occurrence of each species of identified helminth parasite were determined.

In present study a total of 160 *Mastacembelus armatus* and *Macrognathus pancalus* of each species were studied. It was observed that both prevalence and intensity of parasite was higher in *M. armatus* than *M. pancalus* (Table 1). Again, male of both host species showed higher prevalence (86.04% and 69.62%) compare to female (41.89% and 29.63%). However, female of both host species exhibited higher intensity than that of male (Table 1). According to Aloo *et al.* (2004), the main reason for the differences in parasitic load with sex is physiological. In this study, higher percentage of infection in male compare to female agrees with the work reported by Oniye *et al.* (2004), Khanum *et al.* (2008) and Kamrujjaman & Ferdous (2009) but disagrees with the reported work of Sultana & Salam (2015) and Ayanda (2009).

**Table 1. Prevalence and intensity of *M.armatus* and *M. pancalus* according to sex**

Host Species	Number of examined fishes		Total	NI		Total	NPC		Total	Prevalence (%) ± SD		Intensity ± SD	
	M	F		M	F		M	F		M	F	M	F
<i>M. armatus</i>	86	74	160	74	31	105	125	98	223	86.04	41.89	1.68	3.16
	(53.75%) (46.25%)												
<i>M. pancalus</i>	79	81	160	55	24	79	88	41	129	69.62	29.63	1.60	1.70
	(49.37%) (50.63%)												

NI=Number Infected, NPC=No. of parasites collected

During the study period, 5 species of trematodes (*Dactylogyrus catlaius*, *Ancyrocephalus chakrabartii*, *Clinostomum piscidum*, *Mesolecithal linearis* and *Urocleidus raipurensis*), 3 species of cestodes (*Bovienia serialis*, *Lytocestus birmanicus* and *Bothriocephalus cuspidatus*), 4 species of nematodes (*Camallanus xenentodon*, *Procamallanus spiculogobernaculus*, *Pseudoproleptus vestibules* and *Ascaridia sp.*) and 3 species of acanthocephalans (*Pallisentis gaboos*, *Acanthogyrus indicus* and *Neoechinorhynchus tylosuri*) were recorded from *M. armatus*. Whereas, 3 species of trematodes (*Urocleidus raipurensis*, *Bifurcohaptor indicus* and *Mesolecitha linearis*), 3 species of cestodes (*Lytocestus birmanicus*, *Fernandezia sp.* and *Djombangia penetrans*), 2 species of nematodes (*Falcaustra brevicaudatum* and *Spinicauda spinicauda*) and 2 species of acanthocephalans (*Acanthocystis sp.* and *Pallisentis ophiocephali*) were recorded from *M. pancalus*. Khanum & Parveen (1997) stated 5 and 6 species of helminth parasites from *Macrognathus aculeatus* and *Mastacembelus armatus* respectively. Jalali *et al.* (2008) reported 8 species of helminth fauna from *Mastacembelus mastacembelus*. Arthur &

Ahmed (2002) found 11 and 2 species of helminth parasites from *M. armatus* and *M. pancalus* respectively. Khanum *et al.* (2011) recorded 7 species of helminthes in *Macrognathus aculeatus*. On the other hand 7 species of helminth parasite was reported in *M. armatus* by Malsawmtluangi & Lalramliana (2016). So, the present finding was higher than the previous record may be due to adverse environmental factors of host species suggested to more intensive study. Again, infestation of helminth parasites was higher in *M. armatus* than the *M. pancalus*. Former was heavily infected may be due to their voracious feeding habit. This species forages at night on benthic insect larvae, worms and some submerged plant material thus making them more susceptible to helminth infections (Rainboth, 1996).

Again, trematode showed highest prevalence (28.12% and 21.25%) in both host fishes (*M. armatus* and *M. pancalus* respectively) which was followed by cestodes (15.62% and 13.12%), nematodes (11.87% and 9.37%) and acanthocephalans (10% and 5.62%) (Table 2). However, maximum intensity (2.75) was obtained from acanthocephalans in *M. armatus* which was followed by cestodes (2.24), trematode (2.00) and nematodes (1.73). But, in case of *M. pancalus* highest intensity was recorded in trematodes (1.97) followed by cestodes (1.61), acanthocephalans (1.33) and nematodes (1.06) (Table 2).

Species wise prevalence and intensity of helminth parasites in *M. armatus* and *M. pancalus* are presented in Table 2. It was observed that highest (8.13%) and lowest (1.25%) prevalence showed by *Clinostomum piscidum* and *Camallanus xenentodon* respectively in *M. armatus*. On the other hand, maximum (3.00) intensity of parasite exhibited by *Camallanus xenentodon* and *Procamallanus spiculogobernaculus* but, minimum (1.62) intensity by *Ascaridia sp.* in the same host species. Again, in case of *M. pancalus* highest prevalence (8.12%) and lowest intensity (1.33) showed by *Urocleidus raipurensis* and *Acanthocystis sp.* respectively. More interestingly *Pallisentis ophiocephali* showed maximum intensity (2.00) but low prevalence (1.87%) in same host species. Khanum *et al.* (2011) reported *Clinostomum piscidum* (prevalence 8.13% and intensity 2.5) and *Pseudoproleptus vestibules* (prevalence 9.83% and intensity 3.58) in *Macrognathus aculeatus*. Sultana & salam (2015) stated *Mesolecitha linearis*, *Neoechinorhynchus tylosuri* and *Ascaridia sp.* Showed prevalence and intensity 2.5% and 1.5; 1.25% and 1.00 and 6.25% and 1.2 respectively in *Channa punctatus*. Khanum *et al.* (2015) reported as prevalence (21.74%) and intensity (2.82) of *Bovieniaserialis* and *Djombangia penetrans* prevalence (17.39%) and intensity (1.23) in *Clarias batrachus*. The main factors determining the variety of parasite fauna as well as the intensity and incidence of infection depends on the diet, lifespan, mobility of the host throughout its life including the variety of habitats it encounters, its population density and the size attained, large hosts provide more habitats suitable for parasites than do small ones (Polanski, 1961).

**Table 2. Prevalence and intensity of different groups of helminth parasites in *M. aramtus* and *M. puncaulus***

Groups of Helminths	N E	NI		NPC		Prevalence (%)		Intensity	
		<i>M. aramtus</i>	<i>M. puncaulus</i>	<i>M. aramtus</i>	<i>M. puncaulus</i>	<i>M. aramtus</i>	<i>M. puncaulus</i>	<i>M. aramtus</i>	<i>M. puncaulus</i>
Trematodes	160	45	34	90	67	28.12	21.25	2.00	1.97
<i>Dactylogyrus catlaeus</i>		7	-	14	-	4.38	-	2.00	-
<i>Ancyrocephalus chakrabartii</i>		11	-	18	-	6.87	-	1.63	-
<i>Clinostomum piscidum</i>		13	-	23	-	8.13	-	1.76	-
<i>Mesolecitha linearis</i>		6	12	13	19	3.75	7.50	2.16	1.58
<i>Urocleidus raipurensis</i>		8	13	15	24	5.00	8.12	1.87	1.84
<i>Bifurcophator indicus</i>		-	10	-	17	-	6.25	-	1.70
Cestodes	160	25	21	56	34	15.63	13.12	2.24	1.61
<i>Bovienia serialis</i>		6	-	14	-	3.75	-	2.33	-
<i>Lytocestus birmanicus</i>		10	5	32	9	6.25	3.12	3.20	1.80
<i>Bothriocephalus cuspidatus</i>		9	-	15	-	5.62	-	1.66	-
<i>Fernandezia sp.</i>		-	8	-	11	-	5.00	-	1.37
<i>Djombangia penetrans</i>		-	7	-	13	-	4.38	-	1.85
Nematodes	160	19	15	33	16	11.87	9.38	1.73	1.06
<i>Camallanus xenentodon</i>		2	-	6	-	1.25	-	3.00	-
<i>Procamallanus spiculogobernacus</i>		3	-	9	-	1.87	-	3.00	-
<i>Pseudoproleptus vestibules</i>		6	-	15	-	3.75	-	2.50	-
<i>Ascaridia sp.</i>		8	-	13	-	5.00	-	1.62	-
<i>Falcaustra brevicaudatum</i>		-	10	-	14	-	6.25	-	1.40
<i>Spinicauda spinicauda</i>		-	5	-	8	-	3.12	-	1.60
Acanthocephalans	160	16	9	44	12	10	5.62	2.75	1.33
<i>Pallisentis gaboos</i>		7	-	16	-	4.37	-	2.28	-
<i>Acanthogyrus indicus</i>		5	-	10	-	3.12	-	2.00	-
<i>Neoechinorhynchus stylosuri</i>		4	-	10	-	2.50	-	2.50	-
<i>Acanthocystis sp.</i>		-	6	-	8	-	3.75	-	1.33
<i>Pallisentis ophiocephali</i>		-	3	-	6	-	1.87	-	2.00
Total	160	105	79	223	129	65.62	49.37	2.12	1.63

\*NE=Number Examine, NI=Number infected, NPC=Number of parasite collected.

The results showed that maximum prevalence of parasite were recorded from intestine (40.62%) and stomach (23.12%) in *M. aramtus* and *M. pancalus* respectively (Table 3). However, highest intensity was in body cavity (6.11%) and liver (3.83%) in *M. aramtus* and *M. pancalus* respectively. On the other hand, minimum prevalence (1.25%) and intensity (1.00) were observed in gill in both host fishes. Khanum *et al.* (2011); Khanum *et al.* (2015) and Sultana & Salam (2015) stated highest prevalence and intensity of parasites in the intestine followed by stomach in *Macrognathus aculeatus*, *Clarias batrachus* and *Channa punctatus* respectively. Whereas, Khanum & Parveen (1997) were found maximum in the stomach followed by intestine in *Macrognathus aculeatus* and *M. armatus*. Fish parasites like other vertebrates, feed either on the digested contents of the host in the alimentary canal or the hosts own tissues (Marcov, 1946). The intestine and stomach seems to be a favorite site for helminth parasites as because of their thick cuticular body covering of the parasites are well adapted to their hosts. Besides, they possess a complete or partially complete alimentary canal and thereby can absorb digest the undigested food materials from the stomach of the host (Khanum *et al.*, 2011).

**Table 3. Prevalence and intensity of helminth parasites in different organs of *M. aramtus* and *M. pancalus***

Groups of Helminths	NE	NI		NPC		Prevalence (%)		Intensity	
		<i>M.</i>	<i>M.</i>	<i>M.</i>	<i>M.</i>	<i>M.</i>	<i>M.</i>	<i>M.</i>	<i>M.</i>
		<i>armatus</i>	<i>pancalus</i>	<i>armatus</i>	<i>pancalus</i>	<i>armatus</i>	<i>pancalus</i>	<i>armatus</i>	<i>pancalus</i>
Gill		2	2	2	2	1.25	1.25	1.00	1.00
Body cavity		9	10	55	14	5.62	6.25	6.11	1.4
Liver	160	11	6	23	23	6.87	3.75	2.09	3.83
Stomach		18	37	48	59	11.25	23.12	2.66	1.59
Intestine		65	24	95	31	40.62	15.00	1.46	1.29
Total	160	105	79	223	129	65.62	49.37	2.12	1.63

\*NE=Number Examine, NI=Number infected, NPC=Number of parasite collected.

Prevalence and intensity of helminth parasite according to their length group of both host fishes are presented in Table 5. It is revealed from the table 5 that highest prevalences were recorded as 80% and 89.47% in 19.1 to 21cm and 13.1 to 15cm length group in case of *M. aramtus* and *M. pancalus* respectively. Again, maximum (2.40) and minimum (1.46) intensity belonged to the 12.1 to 13cm and 19.1 to 21cm length group respectively in *M. aramtus*. Whereas, in *M. pancalus* highest (1.83) and lowest (1.35) intensity were recorded from 11.1 to 13cm and 15.1 to 17cm length group respectively. Khanum & Parveen (1997) stated that prevalence and intensity were comparatively higher in larger and intermediate size-group of fishes respectively. Khanum *et al.* (2011) also reported highest prevalence and intensity in large length group (23.1-29cm) in *M. aculeatus*. But, Sultana & Salam (2015) found both the prevalence (45.23%) and mean intensity (1.52) were the highest in the intermediate length group (10.1-15.1cm) in *Clarius batrachus*. Again, Rahman & Parween (2001) reported maximum prevalence and mean intensity in intermediate size and smallest size group respectively in *Heteropneustes fossilis*, *Channa punctatus* and *Colisa fasciatus*. This later findings were also similar with the present findings. Age and habitat of the host plays vital role in the differences of prevalence (Bashirullah, 1973).

**Table 4. Prevalence and intensity of helminth parasites in different length group of *M. armatus* and *M. punctatus***

Length groups (cm)	NE		NI		NPC		Prevalence (%)		Intensity	
	<i>M. armatus</i>	<i>M. punctatus</i>	<i>M. armatus</i>	<i>M. punctatus</i>	<i>M. armatus</i>	<i>M. punctatus</i>	<i>M. armatus</i>	<i>M. punctatus</i>	<i>M. armatus</i>	<i>M. punctatus</i>
9.1-11	-	51	-	22	-	37	-	43.13	-	1.68
11.1-13	-	31	-	6	-	11	-	19.35	-	1.83
13.1-15	-	38	-	34	-	58	-	89.47	-	1.70
15.1-17	29	40	9	17	16	23	31.03	42.50	1.77	1.35
17.1-19	15	-	10	-	23	-	66.67	-	2.3	-
19.1-21	35	-	28	-	46	-	80	-	1.46	-
21.1-23	59	-	42	-	101	-	71.18	-	2.40	-
23.1-25	22	-	16	-	37	-	72.72	-	2.31	-
Total	160	160	105	79	223	129	65.62	49.37	2.12	1.63

\*NE=Number Examine, NI=Number infected, NPC=Number of parasite collected.

Present study revealed that studied fishes harbor significant number of helminth parasites more especially trematodes. To confirm the recorded species as well as biology of parasites, intermediate hosts, behavior of host and most essentially seasonal variation of parasite should be examined.

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