Helminth Infection in Freshwater Fishes of Bangladesh

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Edible freshwater fishes common in central, northern and southern parts of Bangladesh were examined to record their helminth infection. A total of 78 taxa of helminths—1 monogenean, 28 digeneans, 8 caryophyllid cestodes, 24 nematodes and 17 acanthocephalans were recovered from 7 different organs of 37 species of freshwater fishes. Two species of trematodes (*Ophiorchis dasus* GUPTA and *Coitocaecum* sp.), eight species of caryophyllids (*Lytocestus indicus* (MOGHE) WOODLAND, *Lytocestus birmanicus* LYNSDALE, *Lytocestus parvulus* FURTADO, *Bovienia serialis* (BOVIEN) FUHRMANN, *Djombangia penetrans* BOVIEN, *Lucknowia* sp., *Capigentoides batrachii* GUPTA and *Pseudocaryophyllaeus indica* GUPTA) and twelve species of acanthocephalans (*Neoechinorhynchus topseyi* PODDER, *Neoechinorhynchus* sp., *Acanthosentis dattai* PODDER, *Acanthosentis indicus* TRIPATHI, *Acanthosentis tilapiae* BAYLIS, *Pallisentis allahabadii* AGRAWAL, *Pallisentis* sp. 2, *Pallisentis* sp. 1 *Devendrosentis garuai* SAHAY *et al.*, *Hypoechinorhynchus* sp., *Heterosentis plotosi* YAMAGUTI and *Mehrarhynchus secundum* TRIPATHI) are reported for the first time from Bangladesh.

Parasitic helminth incidence, infection intensity and distribution of the caryophyllid cestodes and acanthocephalans are also reported.

The helminth fauna of Indian subcontinent including Burma and Ceylon was first studied by SOUTHWELL (1913 & 1930) and then by BAYLIS (1923, 1936 & 1939). Later on, SRIVASTAVA (1936), GUPTA (1951, 1953, 1959, 1961 & 1976) and TRIPATHI (1954, 1956 & 1957) published a series of papers on fish helminths. In Bangladesh, BASHIRULLAH (1973) was the first to make a brief survey on the helminth fauna of fishes. He concentrated his studies mainly on the trematodes and nematodes. Recently, AHMED *et al.* (1976, 1977, 1978 & 1979) have worked on the distribution, incidence, infection pattern and pathology of fish helminths in addition to their systematic studies.

This paper presents an up-to-date checklist of the helminths so far isolated from different organs of freshwater fishes of Bangladesh with special attention to the parasitic incidence, infection intensity and distribution of caryophyllid cestodes and acanthocephalans.

Materials and Methods

The host fishes were collected at random from different fish ponds, ditches, rice fields, rivers and fish markets of central (Dacca and Tangail districts) northern (Mymensingh, Sylhet, Bogra and Rang-

pur districts) and southern parts (Noakhali, Patuakhali and Barishal districts) of Bangladesh in different seasons of the year, mainly during summer and rainy seasons of 1976 to 1980.

After external examination, body cavity of the host fishes (both live and those preserved in 5% neutral formalin) was cut open and examined. Body cavity, mesenteries, musculature, alimentary canal, heart, liver, gall-bladder, spleen, kidney, swimbladder, gonads and urinary bladder were carefully removed to separate clean petri dishes containing 0.75% physiological saline solution. The organs were slit open carefully and examined under a stereobinocular microscope. The nemas were fixed in hot glacial acetic acid and the trematodes and caryophyllid cestodes in FAA. To keep the head organs intact caryophyllids and acanthocephalans were removed with special care by scraping deeply beneath them. Live acanthocephalans were kept in tap water until the osmotic pressure made them too weak to draw in the proboscis. They were then fixed in between the slides and preserved in 70% ethyl alcohol.

The worms, excepting the caryophyllids which were cleared in xylene, were cleared and temporarily mounted in lactophenol. Nematodes were stained in aniline blue, trematodes and cestodes in Semi-

Table 1. Summary of the helminths recovered from freshwater fishes of Bangladesh

Helminths	Number helminth species	Of host species	Organel distribution (Number of helminth species)
Monogenea	1	1	Gill (1)
Digenea	28	18	Body cavity (4), muscle & liver (1), stomach (1), stomach & intestine (3), intestine only (21), swim bladder (2) and urinary bladder (2).
Caryophyllidea	8	2	Stomach (2), anterior intestine (8) and posterior intestine (5).
Nematoda	24	22	Body cavity (3), liver (1), stomach (6), stomach & intestine (1) and intestine only (23).
Acanthocephala	17	17	Liver, mesentery and intestine (2), stomach and intestine (1) and intestine only (14).

cohn's carmine, while the acanthocephalans in borax carmine and hematoxylin and mounted in Canada balsam.

YAMAGUTI's *Systema Helminthum* series (1958, 1959, 1961, 1963a & 1963b) were followed for the study.

Results and Discussion

The results are shown in two parts:

I. Checklist of the helminths so far recovered from the freshwater fishes in Bangladesh.

II. Incidence, intensity of infection and distribution of caryophyllids and acanthocephalans.

I. A total of 78 species of parasitic helminths representing 47 genera and 26 families, have been isolated from different internal organs of 37 species of freshwater fishes (Table 1).

The following helminths are reported from Bangladesh for the first time: *Ophiocorchis dasus* GUPTA, 1951, *Coitocaecum* sp., *Lytocestus indicus* (MOGHE, 1925) WOODLAND, 1926, *Lytocestus birmanicus* LYNDALE, 1956, *Lytocestus parvulus* FURTADO, 1963, *Bovienia serialis* (BOVIEN, 1926) FUHRMANN, 1931, *Djombangia penetrans* BOVIEN, 1926, *Lucknowia* sp., *Capingentoides batrachii* GUPTA, 1961, *Pseudocaryophyllaeus indica* GUPTA, 1961, *Neoechinorhynchus topseyi* PODDER, 1937, *Neoechinorhynchus* sp. *Acanthosentis dattai* PODDER, 1938, *Acanthosentis indicus* TRIPATHI, 1956, *Acanthosentis tilapiae* BAYLIS, 1948, *Pallisentis allahabadii* AGRAWAL, 1958 *Pallisentis* sp. 1, *Pallisentis* sp. 2, *Devendrosentis garuui* SAHAY et al., 1972, *Hypoechinorhynchus* sp., *Heterosentis plotosi* YAMAGUTI, 1935 and *Mehrarhynchus secundum*

TRIPATHI, 1959.

Checklist of the helminths, their host fishes and site of infection are given in table 2:

It was observed that the trematodes and nematodes were common helminth parasites of freshwater fishes. The acanthocephalans were found to infect variety of fishes whereas the caryophyllids infected only siluroid catfishes, mainly *Clarias* which hosted seven species of the caryophyllids in addition to other helminths.

Same helminth parasite infected different host species and host organs e.g. *Isoparorchis hypselobagri* infected four different host organs of four host species. On the other hand, same host species harboured a number of helminth species in them e.g. *Channa striatus* and *Channa punctatus* carried nine species of helminths each, followed by *Heteropneustes fossilis* and *Clarias batrachus* which harboured eight helminth species each.

There is a relationship between the incidence and intensity of infection to age groups of fishes (AHMED and SANALLAH, 1977). 1+ age groups of fishes specially *H. fossilis*, *C. batrachus* and *Channa* spp. were heavily infested than those of 0 age groups. Food habit, too has similar relationship to the fish infection. For example, the extent of helminth infection of the herbivorous carps were insignificant comparing those with the omnivorous, voracious and predator snakeheads and catfishes.

II a. Out of the ten species of freshwater fishes examined, eight species of caryophyllid cestodes were found to occur only in catfishes—*Clarias batrachus* and *Heteropneustes fossilis*. Percentage of infection, infection intensity and organ distribution of the caryophyllids are given in Table 3.

Table 2. Checklist of the helminths, their host fishes and site of infection

Helminth species	Hosts(s)	Organ(s) infected
Trematoda		
Monogenea CARUS, 1863		
Dactylogyridae BACHOWSKY, 1933		
<i>Dactylogyrus glossogobii</i> JAIN, 1960	<i>Glossogobius giuris</i>	Gill
Digenea Van BENDEN, 1858		
Bucephalidae POICHE, 1907		
<i>Bucephalus</i> sp.	<i>Mystus aor</i>	Intestine
<i>Neobucephalopsis aspinosiensis</i> BASHIRULLAH & HAFIZUDDIN, 1971	<i>Clupisoma garua</i>	Intestine
<i>Neobucephalopsis clupisomius</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Clupisoma murius</i>	Intestine
<i>Neobucephalopsis</i> sp.	<i>Clupisoma murius</i>	Intestine
Lecithodendriidae ODHNER, 1910		
<i>Pleurogenoides notopecteri</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Notopterus notopecterus</i>	Intestine
Opisthorchidae BRAUN, 1901		
<i>Ophisthorchis</i> sp.	<i>Rita rita</i>	Body cavity
Gorgoderidae LOOSS, 1901		
<i>Phyllodistomum folium</i> (OLTERS, 1816) BRAUN, 1899	<i>Glossogobius giuris</i>	Body cavity
	<i>Channa striatus</i>	Urinary bladder
<i>Phyllodistomum yousufzai</i> BASHIRULLAH & ISLAM, 1970	<i>Rita rita</i>	Swim bladder
<i>Phyllodistomum</i> sp.	<i>Channa marulius</i>	Urinary bladder
Maseniidae YAMAGUTI, 1954		
<i>Eumasia</i> sp.	<i>Heteropneustes fossilis</i>	Intestine
Allocreadiidae STOSSICH, 1903		
<i>Coitocaecum</i> sp.	<i>Mystus aor</i>	Stomach & intestine
<i>Opegaster beliyai</i> PANDE, 1937	<i>Glossogobius giuris</i>	Intestine
<i>Opegaster</i> sp.	<i>Glossogobius giuris</i>	Intestine
<i>Euceredium daccii</i> BASHIRULLAH & ELAHI, 1972	<i>Channa punctatus</i>	Intestine
<i>Crowcrocaecum channai</i> BASHIRULLAH & ELAHI, 1972	<i>Channa marulius</i>	Intestine
<i>Macrolecithus</i> spp.	<i>Heteropneustes fossilis</i>	Intestine
	<i>Puntius sarana</i>	Intestine
<i>Neopecoelina saharanpurensis</i> GUPTA, 1955	<i>Heteropneustes fossilis</i>	Intestine
	<i>Channa punctatus</i>	Intestine
	<i>Heteropneustes fossilis</i>	Intestine
<i>Neopecoelina</i> sp.		
Hemiuridae LUHE, 1901		
<i>Lecithocladium daccii</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Hilsa ilisha</i>	Intestine
<i>Ophiocorchis dasus</i> GUPTA, 1951	<i>Glossogobius giuris</i>	Stomach & intestine
	<i>Channa punctatus</i>	Stomach & intestine
<i>Genarchopsis lobata</i> (SRIVASTAVA) 1933	<i>Channa gachua</i>	Intestine
<i>Genarchopsis bengalensis</i> BASHIRULLAH & ELAHI, 1972	<i>Channa punctatus</i>	Intestine
<i>Genarchopsis ozaki</i> BASHIRULLAH & ELAHI, 1972	<i>Channa punctatus</i>	Stomach & intestine
Monorchidae ODHNER, 1911		
<i>Palaeorchis</i> sp.	<i>Puntius sarana</i>	Stomach
Fellodistomidae NICOLL, 1913		
<i>Steringotrema</i> sp.	<i>Puntius sophora</i>	Intestine
Ophistholebetidae FUKUI, 1929		
<i>Ophistholebes</i> sp.	<i>Puntius sophore</i>	Intestine
Isoparorchidae POICHE, 1926		
<i>Isoparorchis hypselobagri</i> (BILLET, 1898)	<i>Wallago attu</i>	Swimbladder

Table 2. Continued

Helminth species	Hosts(s)	Organ(s) infected
	<i>Channa punctatus</i>	Body cavity, liver, & muscle
	<i>Channa striatus</i>	Body cavity, liver & muscle
	<i>Channa marulius</i>	Body cavity, liver & muscle
Cestoda		
Caryophyllidea BEN. in OLSSON, 1883		
Caryophyllaeidae LEUKART, 1878		
<i>Lytocestus indicus</i> (MOGHE, 1925) WOODLAND, 1926	<i>Clarias batrachus</i>	Stomach
<i>Lytocestus birmanicus</i> LYNSDALE, 1956	<i>Clarias batrachus</i>	Intestine
<i>Lytocestus parvulus</i> FURTADO, 1963	<i>Clarias batrachus</i>	Intestine
<i>Bovienia serialis</i> (BOVIEN, 1926) FUHRMANN 1931	<i>Clarias batrachus</i>	Intestine
<i>Djombangia penetrans</i> BOVIEN, 1926	<i>Clarias batrachus</i>	Stomach
<i>Lucknowia</i> sp.	<i>Heteropneustes fossilis</i>	Intestine
<i>Capingentoides batrachii</i> GUPTA, 1961	<i>Clarias batrachus</i>	Intestine
<i>Pseudocaryophyllaeus indica</i> GUPTA, 1961	<i>Clarias batrachus</i>	Intestine
Nematoda		
Oxyuroidea WEINLAND, 1858		
Oxyuridae COBBOLD, 1864		
<i>Cosmoxynemoides</i> sp.	<i>Colisa fasciata</i>	Intestine
Ascarididea YAMAGUTI, 1961		
Ascarididae BLANCHARD, 1849		
Ascarididean larvae	<i>Mystus vittatus</i>	Intestine
	<i>Bagarius bagarius</i>	Intestine
	<i>Clarias batrachus</i>	Intestine
	<i>Heteropneustes fossilis</i>	Intestine
	<i>Ompok pabda</i>	Intestine
	<i>Ompok bimaculatus</i>	Intestine
	<i>Glossogobius giuris</i>	Body cavity
	<i>Nandus nandus</i>	Body cavity
Quimperiidae BAYLIS, 1930		
<i>Buckleyinema</i> sp.	<i>Mystus vittatus</i>	Intestine
Heterocheilidae RAILLIET & HENRY, 1951		
<i>Goezia</i> sp.	<i>Wallago attu</i>	Intestine
Spiruroidea DIESING, 1861		
Camallanidae RAILLIET and HENRY, 1915		
<i>Camallanus adamsia</i> BASHIRULLAH, 1973	<i>Channa striatus</i>	Intestine
	<i>Channa punctatus</i>	Intestine
<i>Camallanus gibsonia</i> BASHIRULLAH, 1973	<i>Channa striatus</i>	Intestine
<i>Camallanus</i> spp.	<i>Puntius sophore</i>	Intestine
	<i>Glossogobius giuris</i>	Intestine
	<i>Channa marulius</i>	Intestine
<i>Zeylanema anabantis</i> (PEARSE, 1933)	<i>Anabas testudineus</i>	Intestine
<i>Zeylanema pearsei</i> YEH, 1960	<i>Anabas testudineus</i>	Intestine
	<i>Channa gachua</i>	Intestine
<i>Zeylanema yehia</i> BASHIRULLAH, 1973	<i>Channa gachua</i>	Intestine
<i>Zeylanema tridensis</i> BASHIRULLAH, 1973	<i>Channa gachua</i>	Liver
<i>Zeylanema bidigitalis</i> BASHIRULLAH, 1973	<i>Channa gachua</i>	Intestine
<i>Spirocamallanus inglisi</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Notopterus notopterus</i>	Intestine

Table 2. Continued

Helminth species	Hosts(s)	Organ(s) infected
<i>Spirocamallanus viviparus</i> (ALI, 1956)	<i>Myctus vittatus</i>	Intestine
<i>Spirocamallanus murius</i> BASHIRULLAH & HAFIZUDDIN	<i>Clupisoma murius</i>	Stomach & intestine
<i>Spirocamallanus olsenia</i> BASHIRULLAH, 1973	<i>Channa striatus</i>	Intestine
<i>Spirocamallanus timmi</i> BASHIRULLAH, 1973	<i>Mystus vittatus</i>	Stomach
<i>Spirocamallanus</i> sp.	<i>Heteropneustes fossilis</i>	Stomach
	<i>Mystus cavasius</i>	Intestine
	<i>Clupisoma murius</i>	Stomach
<i>Procamallanus cancelus</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Xenentodon cancela</i>	Intestine
<i>Procamallanus daccai</i> GUPTA, 1959	<i>Channa striatus</i>	Intestine
<i>Procamallanus bangladeshi</i> BASHIRULLAH & HAFIZUDDIN, 1973	<i>Heteropneustes fossilis</i>	Stomach
Cucullanidae COBBOLD, 1864		
<i>Cucullanellus</i> sp.	<i>Rita rita</i>	Intestine
<i>Indocucullanus</i> sp.	<i>Mystus cavasius</i>	Body cavity
Gnathostomatidae LANE, 1923		
<i>Gnathostoma spinigerum</i> OWEN, 1836	<i>Mystus microphthalmus</i>	Stomach
	<i>Wallago attu</i>	Stomach
	<i>Channa striatus</i>	Intestine
Acanthocephala		
Neoechinorhynchidea SOUTHWELL et MACFIE, 1925		
Neoechinorhynchidae Van CLEAVE, 1919		
<i>Neoechinorhynchus topseyi</i> PODDER, 1937	<i>Polynemus paradiseus</i>	Intestine
<i>Neoechinorhynchus</i> sp.	<i>Cynoglossus lingua</i>	Intestine
	<i>Eleutheronema tetradactylum</i>	Intestine
Acanthogyridae THAPAR, 1927		
<i>Acanthogyrus acanthogyrus</i> THAPAR, 1927	<i>Catla catla</i>	Intestine
Quadrigyridae VAN CLEAVE, 1920		
<i>Acanthosentis dattai</i> PODDER, 1938	<i>Barbus stigma</i>	Intestine
<i>Acanthosentis indicus</i> TRIPATHI, 1956	<i>Setipinna phasa</i>	Intestine
<i>Acanthosentis tilapiae</i> BAYLIS, 1948	<i>Channa striatus</i>	Intestine
<i>Pallisentis nandai</i> SARKAR, 1953	<i>Nandus nandus</i>	Liver, mesentery & intestine
<i>Pallisentis gaboies</i> (MACCALLUM, 1918) Van CLEAVE, 1928	<i>Channa striatus</i>	Intestine
<i>Pallisentis allahabadii</i> AGRAWAL, 1958	<i>Channa punctatus</i>	Liver, mesentery & intestine
<i>Pallisentis nagpurensis</i> (BHALERAO, 1931) BAYLIS, 1933	<i>Channa striatus</i>	Intestine
<i>Pallisentis</i> sp. 1.	<i>Glossogobius giuris</i>	Intestine
<i>Pallisentis</i> sp. 2.	<i>Colisa fasciata</i>	Intestine
<i>Devendrosentis garuai</i> SAHAY et al., 1972	<i>Clupisoma garua</i>	Intestine
	<i>Silonia siloda</i>	Stomach
Echinorhynchidea SOUTHWELL et MACFIE, 1925		
Echinorhynchidae COBBOLD, 1879		
<i>Hypoechinorhynchus</i> sp.	<i>Mystus gulio</i>	Intestine
<i>Sachalinorhynchus</i> sp.	<i>Labeo rohita</i>	Intestine
Arhythmacantidae YAMAGUTI, 1935		
<i>Heterosentis plotosi</i> YAMAGUTI, 1935	<i>Plotosus canius</i>	Intestine
Rhadinorhynchidae TRAVASSOS, 1923		
<i>Mehrarhynchus secundum</i> TRIPATHI, 1959	<i>Tachysurus gagora</i>	Intestine

Table 3. Incidence, infection intensity and organal distribution of caryophyllid cestodes in two fish hosts

Hosts and Parasites	Extent of infection			Organs infected (%)	Infection intensity		
	Number of fish examined	% infected	% positive		Range	Mean for infected fish	Mean for total fish
<i>Clarias batrachus</i> (Linnaeus)				Attached to the walls of:			
<i>Lytocestus indicus</i> (MOGHE) WOODLAND	36	14	38.9	Stomach (3), anterior (89) & posterior (8) intestine	1-52	14.2	5.5
<i>Lytocestus brimanicus</i> LYNDALE	12	1	8.4	Anterior (100) intestine	0-3	3	0.3
<i>Lytocestus parvulus</i> FURTADO	22	7	31.8	Anterior (82) & posterior (18) intestine	1-18	9.3	3
<i>Bovienia serialis</i> (BOVIEN) FUHRMANN	28	12	42.9	Anterior (74) & posterior (26) intestine	1-17	7	3
<i>Djombangia penetrans</i> BOVIEN	35	20	57	Stomach (7), anterior (89) & posterior (4) intestine	1-31	10.3	5.9
<i>Capingentoides batrachii</i> GUPTA	12	2	16.7	Anterior intestine (100)	1-5	3	0.5
<i>Pseudocaryophyllaeus indica</i> GUPTA	12	5	41.7	Anterior (88) & posterior (12) intestine	1-17	9.6	4
<i>Heteropneustes fossilis</i> (Bloch)							
<i>Lucknowia</i> sp.	32	1	3.2	Anterior intestine (100)	0-2	2	0.1
	189	62	32.8		0-52	10.3	3.4

Geographical distribution of the cestodes, collected from Dacca, Tangail and Barisal districts are shown in Fig. 1.

The variability of infection rate is likely to be correlated with the suitability of the habitat as a feeding ground of the distinctive hosts. Caryophyllid infestation was heavy in fishes from undisturbed ponds and stagnant ditches where annelid hosts were abundant. The adult fishes were much infected.

Multiple infection of the caryophyllids was found in the intestine of *C. batrachus*. In addition, trematodes, nematodes and acanthocephalans were also found in the same habitat. The suitable temperature, rainfall and niche all over the country enhances excellent survival value and distribution of the helminths, specially the caryophyllids.

II b. 35 species of freshwater fishes including five estuarine fishes (from Khepupara, Patuakhali) were studied during May, 1979 to April, 1980 from Dacca and Patuakhali districts which are situated at a distance of about 125 miles. Of those, only 16 host species (66 specimens) were infected by 16 species of acanthocephalans representing 8 genera and 6 families (12 new record including 3 new species under 5 genera). 19 species of host fishes

including *Labeo rohita*, were found uninfected and the percentage of host infection was 45.7. *Sachalinorhynchus* sp., earlier reported by us (Ahmed and

Fig. 1. Percentage distribution of caryophyllaeids to three different districts of Bangladesh.

Table 4. Incidence, infection intensity and distribution of acanthocephalans in different host fishes collected from Patuakhali (P) and Dacca (D)

Host fishes (infected)	Occurrence			The acanthocephalans	Infection intensity		
	Number of fish examined	infected	% positive		Range	Mean for infected fish	Mean for total fish
<i>Polynemus paradiseus</i>	P 3 D 8	D 8	72.7	<i>Neoechinorhynchus topseyi</i> PODDER	1- 5	2	1.5
<i>Cynoglossus lingua</i>	P 3	P 1	33.3	<i>Neoechinorhynchus</i> sp.	0- 1	1	0.3
<i>Eleutheronema tetradactylum</i>	P 2	P 1	50	<i>Neoechinorhynchus</i> sp.	0- 1	1	0.5
<i>Catla catla</i>	P 3 D 4	D 4	57.2	<i>Acanthogyrus acanthogyrus</i> THAPAR	2-12	9.5	5.4
<i>Barbus stigma</i>	P 7 D 7	D 1	7.2	<i>Acanthosentis dattai</i> PODDER	0- 1	1	0.1
<i>Setipinna phasa</i>	P 13 D 5	P 8 D 4	66.7	<i>Acanthosentis indicus</i> TRIPATHI	1- 4	1.7	1.1
<i>Channa striatus</i>	P 4	P 1	25	<i>Acanthosentis tilapiae</i> BAYLIS	0- 1	1	0.3
<i>Nandus nandus</i>	P 6 D 18	P 3 D 10	54.2	<i>Pallisentis nandai</i> SARKAR	2- 8	2.6	1.4
<i>Channa striatus</i>	P 3 D 3	P 2 D 3	83.3	<i>Pallisentis gaboos</i> (MACCALLUM) VAN CLEAVE	4-11	6	5
<i>Channa punctatus</i>	P 3 D 5	P 3 D 4	87.5	<i>Pallisentis allahabadii</i> AGRAWAL	1- 3	2.3	2
<i>Channa striatus</i>	P 3 D 2	P 2 D 2	80	<i>Pallisentis nagpurensis</i> (BHALERAU) Baylis	2- 5	4.3	3.4
<i>Glossogobius giuris</i>	P 10 D 6	D 1	6.3	<i>Pallisentis</i> sp. 1.	0- 1	1	0.1
<i>Colisa fasciata</i>	P 8 D 4	D 1	8.4	<i>Pallisentis</i> sp. 2.	0- 1	1	0.1
<i>Clupisoma garua</i>	D 14	D 1	7.2	<i>Devendrosentis garuai</i> SAHAY et al.	0- 1	1	0.1
<i>Silonia silondia</i>	D 1	D 1	100	<i>Devendrosentis garuai</i> SAHAY et al.	1	1	1
<i>Mystus gulio</i>	P 9	P 1	11.1	<i>Hypoechinorhynchus</i> sp.	0- 1	1	0.1
<i>Labeo rohita</i>	P 5 D 12	D 4	33.3	<i>Sachalinorhynchus</i> sp.	0-13	7.3	1.7
<i>Plotosus canius</i>	P 15	P 3	20	<i>Heterosentis plotosi</i> YAMAGUTI	1- 3	1.7	0.3
<i>Tachysurus gogora</i>	P 12	P 1	8.3	<i>Mehrarhynchus secundum</i> TRIPATHI	0- 1	1	0.1
	193	70	36.3		0-13	3.1	1.1

Note: *Pallisentis nandai* infected liver, mesentery and intestine; one *Devendrosentis garuai* infected stomach while others were isolated from the intestine.

Begum, 1978) from the intestine of *Labeo rohita* in Dacca only is also included in the report. The extent of infection and intensity and distribution of the acanthocephalans are summarized in Table 4. The worms infested mainly the intestine of the hosts, though two of them were found, often in encysted condition, in the liver, mesentery and stomach.

Of the 17 species of acanthocephalans, 7 species

viz. *Neoechinorhynchus topseyi*, *Acanthogyrus acanthogyrus*, *Acanthosentis dattai*, *Pallisentis* sp. 1, *Pallisentis* sp. 2, *Devendrosentis garuai* and *Sachalinorhynchus* sp. were restricted to Dacca whereas 5 species viz. *Neoechinorhynchus* sp., *Acanthosentis tilapiae*, *Hypoechinorhynchus* sp., *Heterosentis plotosi* and *Mehrarhynchus secundum* were exclusive to Patuakhali. The rest 5 species were distributed in both the areas.

It should be mentioned here that the hosts of the five acanthocephalans, exclusive to Patuakhali, except *A. tilapiae* were generally not available in Dacca. According to YAMAGUTI (1961) they are the helminths of marine fishes. In the present study, they were however, collected from estuarine zone (Andermaniki river mouth). *Silonia silonda* was a new host record and *Channa striatus* harboured maximum species (3) of acanthocephalans while *Neoechinorhynchus* sp. and *D. garuai* occupied double hosts each. The size of the worms varied from 1.27 mm to 80 mm with a new record of 80 mm in one of the *N. topseyi*.

The acanthocephalans were abundant in summer and the intensity of host infection was higher in April, May and June. This was probably due to their breeding season then, as gravid females and juveniles were available in that season.

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