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Scientific Note

Prevalence of Parasites in the Indian Major Carp, *Labeo rohita* (Hamilton) in Rajshahi, Bangladesh

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Labeo rohita (Hamilton) is one of the most important species of inland fisheries of Bangladesh. The species is widely cultured in the country. The production from culture system is hampered by the infestation of various fish parasites. The importance of fish parasite is related directly to the importance of fish health that they may affect (Hoffman, 1967). The fish parasites feed either on the digested contents of the host's intestine, or host tissues. The parasites multiply rapidly under favorable conditions (Dogiel, 1956), and cause economic loss by affecting the health of fishes, often cause high mortality (Tripathi, 1959). Parasites interfere with nutrition of hosts, disrupts metabolism and secretary functions of alimentary canal and damage nervous system (Markov, 1961). Studies on the taxonomy of fish parasites had been done by Bashirullah (1973), Hafizuddin (1997), Ahmed (1981), Ahmed & Saha (1983), Hossain, (1998), Chandra *et al.* (2002) and Chowdhury (1993, 1998). In this study, we examined the prevalence of parasites found in *Labeo rohita* for understanding the relationship and mean density with the fish size.

Fish collection and parasite identification

The investigation was carried out from September 2004 to February 2005. A total of 110 fishes were collected randomly at a regular interval, from different fish farms and fish markets in Rajshahi City. The specimens were carried to the laboratory and grouped according to their length and body weight. At first, microscopic examination were done for ectoparasites from the skin, if any cysts, ulceration and scars in the skin. Then the individual fishes were dissected to find out the parasites from internal organs. The viscera and gill filaments were kept on petridishes and bathed with the physiological saline solution (0.7% Nacl solution) for searching of parasites. The organs such as stomach and intestine were opened for the examination of parasites. All the collected parasites were fixed in glycerin and identified according to Cable (1958), Kabata (1985 and Chandra (2004). To find out the prevalence, abundance and mean density the statistical analysis were carried out (Margolis *et al.*, 1982).

Parasites cause significant economic losses in fish farming. A knowledge of the mechanisms underlying their effects on hosts is an essential prerequisite for preventative procedures for the parasite problem in hatcheries. During the investigation a total 226 parasites representing 10 species were collected from the host fishes. Out of 10 species the seven were ectoparasites and the rest three were endoparasites (Table 1). Presence of parasite species in different months are puscuted in Table 2.

The highest number of parasites (102) were collected from the skin of the host fishes and lowest number (7) were recorded from the fins. Among them, second peak value (83) was from the gills (Fig. 1). The result is similar to Ahmed *et al*. (1998), Banu *et el*. (1993) and Parween & Rahman (2000).

Table 1. List of parasites isolated from the target organs of *Labeo rohita*.

Status	Name of Parasites	Site of Infestation
Ectoparasites	*Trichodina pediculatus* (Muller, 1786)	Gills & Skin
	Dactylogyrus vastator (Nybelim, 1924)	Gills
	Gyrodactylus elegans (Nordman, 1832)	Skin & Body surface
	Myxobolus rohitae (Biitschli, 1882)	Gills & Skin
	Ichthyophthirius multifilis (Fouquet, 1876)	Skin & Fins
	Argulus foliaceus (Miiller, 1785)	Body surface & Fins
	Chilodonella cyprini (Strand, 1926)	Gills & Skin
Endoparasites	*Camallanus ophiocephali* (Nicoll, 1909)	Intestine
	Fellodistomum agnotum (Pearse, 1933)	Stomach
	Eucreadium sp. (Dayal, 1950)	Intestine

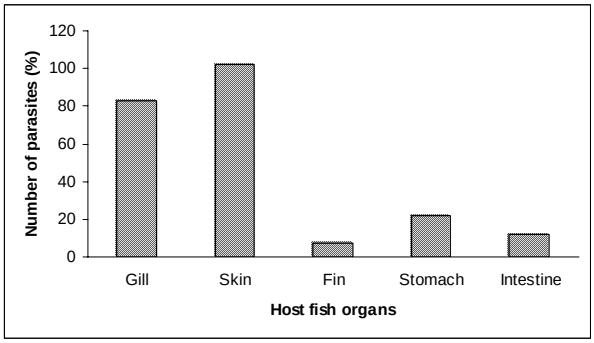

Fig.1. Number of parasite recovered from the different organs of Indian major carp, *Labeo rohita*.

Table 2. Monthly prevalence of parasites recovered from *Labeo rohita*.

Name of the parasites	Number of parasites in different months						
	Sep	Oct	Nov	Dec	Jan	Feb	Total
T. pediculatus	4	6	7	16	3	2	38
D. vastator	2	2	4	10	3	0	21
G. elegans	0	2	5	8	1	2	18
M. rohitae	1	4	2	7	4	0	20
I. multifilis	2	0	3	6	5	0	16
A. foliaceus	7	10	12	18	4	2	53
C. cyprini	0	4	4	12	2	4	26
C. ophiocephali	0	1	3	8	2	0	14
F. agnotum	2	0	2	5	1	2	12
Eucreadium sp.	0	0	1	4	2	1	8
Total	18	29	43	94	27	15	226

During the study period, the highest number of parasites (94) was collected in December and lowest (15) in February. In December, highest number (18) of the species *Argulus foliaceus* was found. The highest prevalence (75%) and mean density (10.44) of parasites were found in the month of December 2004 and lowest (20%) in the month of February 2005. The highest abundance value was ranged from 1.25 to 7.83 in February and December respectively. Only the correlation between prevalence and abundance was found significant ($r = 0.836^{*}$) at 5% level when compared among these data (Table 3, Fig. 2). According to Chubb (1977) and Bashirullah (1973) the highest number of parasites were also found in the month of December which supports the present findings.

Interestingly, the highest prevalence of total parasites found as 75% in the length group (160-180mm) and lowest as 33.34% in the length group (80-100mm). The highest abundance value of total parasites found as 1.56 in the length group (80-100mm) and lowest as 3.52 in the length group (100-120mm). The highest mean density of total parasites found as 6.09 in the length group (100-120mm) and lowest as 3.00 in the length group (160-180mm). The fishes of intermediate size groups were more infested by parasites (Golder *et al.,* 1987; Guegan *et al.,* 1992; Kennedy, 1975; Barman, 1999; Parveen *et al*., 2006). However, in this study, all size groups of fishes were found to be more or less infested by

Table 3. Monthly fluctuations of overall prevalence (%), abundance and mean density of parasites in the *Labeo rohita*.

Times (2004-2005)	No. of fishes examined	No. of Non-infected host (X)	No. of infected host (Y)	No. of parasites recovered	Preva-lence (%)	Abun-dance	Mean density
Sep-04	12	7	5	18	41.67	1.50	3.60
Oct-04	12	6	6	29	50.00	2.42	4.83
Nov-04	12	4	8	43	66.67	3.59	5.37
Dec-04	12	3	9	94	75.00	7.83	10.44
Jan -05	12	8	4	27	33.33	2.25	6.75
Feb -05	12	10	2	15	20.00	1.25	7.50

Correlation values (r): prevalence and mean density = 0.276, prevalence and abundance, $r = 0.836^{*}$, abundance and mean density = 0.742.

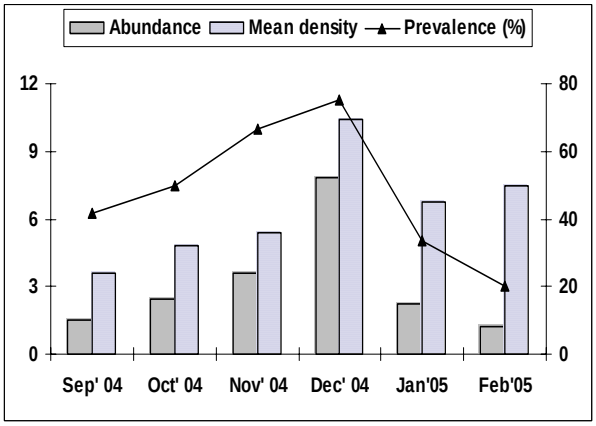

Fig.2. Monthly prevalence, abundance and mean density of parasites in the Indian major carp, *Labeo rohita*.

parasites was similar to Molnar (1971). The results of correlation co-efficient analysis showed that the relationship between prevalence and mean density (r= -0.318) was negatively correlated in the big fish size group (160-180mm), and the mean density was lowest (3.10), however, others size groups were positively correlated (Table 4).

Table 4. Number of infected fish, prevalence, abundance and mean density of total parasites in different length groups.

Length groups (mm)	No. of fishes examined	No. of non infected host (X)	No. of infected host (Y)	No. of parasites recovered	Prevalence (%)	Abundance	Mean density
80-100	9	6	3	14	33.34	1.56	4.67
100-120	19	8	11	67	57.89	3.52	6.09
120-140	30	12	18	105	60.00	3.50	5.83
140-160	10	4	6	31	60.00	3.10	5.10
160-180	4	1	3	9	75.00	2.25	3.10

Correlation values (r): prevalence and mean density = -0.318, prevalence and abundance, = 0.449, abundance and mean density = 0.702.

In conclusion, it may predicted that fish were more stressful condition in the experimental period due to parasitic infestation and further data is needed to give treatment against parasites in the Indian major carp, *Labeo rohita* where the following experiment to be addressed.

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