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# Occurrence of parasites in *Labeo rohita* (Hamilton) from Rajshahi

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**Abstract:** An investigation was made on the parasitic infestation of an indigenous major carp, *Labeo rohita* collected from different water bodies of Rajshahi district during April 2006 to January 2007. A total of 70 host fishes were examined during the study period of which 55 fishes were found infected by numerous protozoan and metazoan parasites. In all 2348 parasites belonging to eight genera were recorded from the surveyed hosts. Among them six were ectoparasites (*Trichodina, Myxobolus Chilodonella, Dactylogyrus, Gyrodactylus* and *Argulus*) and two were endoparasite (*Eucreadium* and *Camallanus*). The infestation exhibited monthly or seasonal fluctuation, the maximum abundance of parasites was recorded in the month of December and the minimum in July. It was observed that the infection was the maximum in pre-winter to winter and the minimum in the rainy season. Prevalence, intensity and abundance of the infestation were also found to be related to different length group of the hosts, the medium sized fishes were more infested and the larger size fishes were less infested while the smaller size fishes showed medium infestation.

**Key words:** Parasite, *L. rohita*, prevalence, intensity, abundance

## Introduction

Diseases affect the normal health conditions and cause reduction in growth, abnormal metabolic activities and even resulting in great economic loss. Health of any population depends on the control of disease and maintenance of a healthy relationship between living creatures and their environment (Snieszko, 1983).

Diseases are the most serious limiting factors in aquaculture, because of increased density of fish in restricted water where the fish pathogens can easily transmit from one fish to another. Much of economic loss is however, preventable with proper fish health management (Kabata, 1985).

The fish parasites may cause fish mortality in culture fishes where the entire fishes population of pond may be killed, resulting in loss of potential food and economic loss to the culturists. The success of the implementation of various fishery development programs depends to a certain extent on the intensification of the fish parasitological research, as the improvement of fish yield can mainly be achieved from healthy fish stock (Srivastava, 1975).

*Labeo rohita* is the most commonly cultured freshwater fish in Bangladesh. It is considered to be the most of important fish of Bangladesh because it is nutritious and delicious and it has high market value, as well as its fry and fingerling are easily available for culture. As the culture of *L. rohita* has increased, there has been an increase in incidence of disease outbreak and it was found that it is more susceptible to disease in comparison to the exotic carps (Lilley *et al.*, 1992).

A number of parasitic diseases have already been reported from our water bodies. Common protozoan parasitic diseases of freshwater fishes in Bangladesh are caused due to *Trichodina, Chilodonela, Ichthyophthirius, Myxobolus* etc. Among metazoan parasites, *Dactylogyrus, Gyrodactylus, Argulus, Camallanus,* etc. are very common. *Dactylogyrus* causes damage to the gill filaments of fishes and *Gyrodactylus* mainly causes damage to skin and fin which is a potential threat to fish culture (Hoffman, 1967).

The parasitism may become so severe that mortality and morbidity of the brood fish greatly hinder preliminary breeding cycle (Kaneko *et al.*, 1988). Some parasites are serious pests in fish culture, others are probably potential threats to fish culture. On the other hand, the success of implementation of various fisheries development programs depends on the intensification of the fish parasitological researches. Studies on parasites of fishes in Bangladesh particularly in the northern region of Bangladesh are very recent and fragmentary.

Considering the above, the present study was aimed to survey the parasites of an in indigenous major carp *L. rohita.*

## Materials and Methods

*Methods of sample collection:* Seventy live or freshly dead host fishes were collected four times per month at regular intervals, from April 2006 to January 2007 and transported to the Fisheries Research Laboratory, Department of Zoology, University of Rajshahi for detailed investigation.

*Grouping of host fishes:* The host fishes were divided into three groups based on their length, smaller (<18 cm), medium (18-28 cm) and larger (>28 cm) to see whether any relationship exits between length of fish and parasitic infestation.

*Examination of host fishes and collection of parasites:* At first, the external surface of the host body including scales, fins, skin, fin base etc. were examined under a magnifying glass for ectoparasites or any kind of lesions. Then scrapping of the skin was done by an unshaped scalpel to collect the mucus in a petridish for

microscopic examination. Next, gills were removed from the branchial cavity and placed on a glass slide for microscopic examination.

To investigate the body cavity and general viscera, the body of the host fish was cut open and examined. The parietal peritonial lining of the body cavity, outer surface of the visceral organs and serous membranes were examined for encysted larva. The entire viscera was then removed from the body cavity and skept in physiological saline solution (0.75% NaCl solution). Considerable attention was given to the internal organs, viz., heart. air bladder, liver, gall bladder, spleen, urinary bladder, gonads and kidneys. After examination of the external surface, the organs were dissected to search out the internal parasites. Peritoneum and mesenteries were also observed for parasites.

Parasites were collected from the infected area for gross observation and identification. For this, lice, large nematode and cestode parasites were picked up by forceps, needles etc. and small nematodes and helminthes were collected by a hairbrush. Protozoan parasites were collected from the mucus or body fluid by pipette, dropper and needle in a slide.

*Identification of parasites:* Parasites were placed under a compound microscope and identified following the description and figures of Gupta (1959), Yamaguti (1958, 1963), Bykhovskaya-Pavlovskaya *et al*, (1962), NA in Refesencs Islam (1972), Kennedy (1975) and Hafizuddin and Shahabuddin (1996).

*Statistical analysis:* The following statistical analyses were carried out after Margolis *et al*. (1982):

**1. Prevalence(%)**

$$= \frac{\text{Number of infected host}}{\text{Total number of host examined}} \times 100$$

**2. Abundance(%)**

$$= \frac{\text{Number of parasites}}{\text{Total number of host examined}} \times 100$$

**3. Mean intensity(%)**

$$= \frac{\text{Number of parasites}}{\text{Total number of infected host}} \times 100$$

**Results and Discussion**

A total of 2348 parasites belonging to 8 genera (6 ectoparasites and 2 endoparasites) were collected from 55 fish samples out of 70,

Among the collected parasites, three were protozoan parasites (*Trichodina, Chilodonella* and *Myxobolus*), two were monogenic parasites (*Dactylogyrus* and *Gyrodactylus),* one was digenetic parasite (*Eucreadium),* one nematode, (*Camallanus)* and one was crustacean parasite (*Argulus),* (Table-1). Protozoans and monogeneans were very common on the gill, skin and fin. They were found alive and remained strongly attached to the gill, skin or fin base. Crustaceans were mostly found abundantly attached to the fin and skin. On the other hand digenean flukes and nematodes were found in the stomach and intestine.

**Table 1.** List of parasites recovered and their site of infection.

| Parasite | | | Site of infection |
|---|---|---|---|
| **Protozoa** | **:** | *Trichodina* | Gill, skin |
| | | *Chilodonella* | Gill |
| | | *Myxobolus* | Gill, skin |
| **Monogenea** | **:** | *Dactylogyrus* | Gill |
| | | *Gyrodactylus* | Skin, gill |
| **Digenea** | **:** | *Eucreadium* | Intestine |
| **Nematoda** | **:** | *Camallanus* | Intestine |
| **Crustacea** | **:** | *Argulus* | Skin, fin |

*Monthly fluctuation in prevalence, mean intensity and abundance of parasites in L. rohita :* The maximum prevalence (100%) was recorded in December while the minimum (62.5%) in July (Fig.1).

The maximum mean intensity (58.8) was recorded in September and the value of November (57.6) was nearer to the maximum value while the minimum (24.2) was recorded in July (Fig.1).

The highest abundance (48.00) was recorded in November and that of October (44.2) and December (46.43) was nearer to the highest value while the lowest (15.13) was in July the values in June (20.3) and August (23.3) were nearer to the lowest value. So it can be said that the abundance rate, was the maximum in early winter and winter minimum in while the rainy season.

*Monthly fluctuation in prevalence, mean intensity and abundance of parasites:*The prevalence, mean intensity and abundance of parasites as recorded from host fishes during the foresent study were the maximum in the month of November-December and the minimum in June-July. So, in general it can be said that the infection was the maximum in winter or pre winter and minimum in rainy season. This was probably due to the fact that decrease in water volume during the dry season caused nutritional imbalance resulting in less production of fish food organisms in one hand and on the other hand fall in water temperature during cooler mon ths reduced the immune response in fish and made them more vulnerable to disease vectors. Akhter *et al,*(1997), Banu *et al,* (1993), Chandra *et al,* (1997) and Hossain *et al*, (1994) also reported more incidence of diseases in fish during winter months.

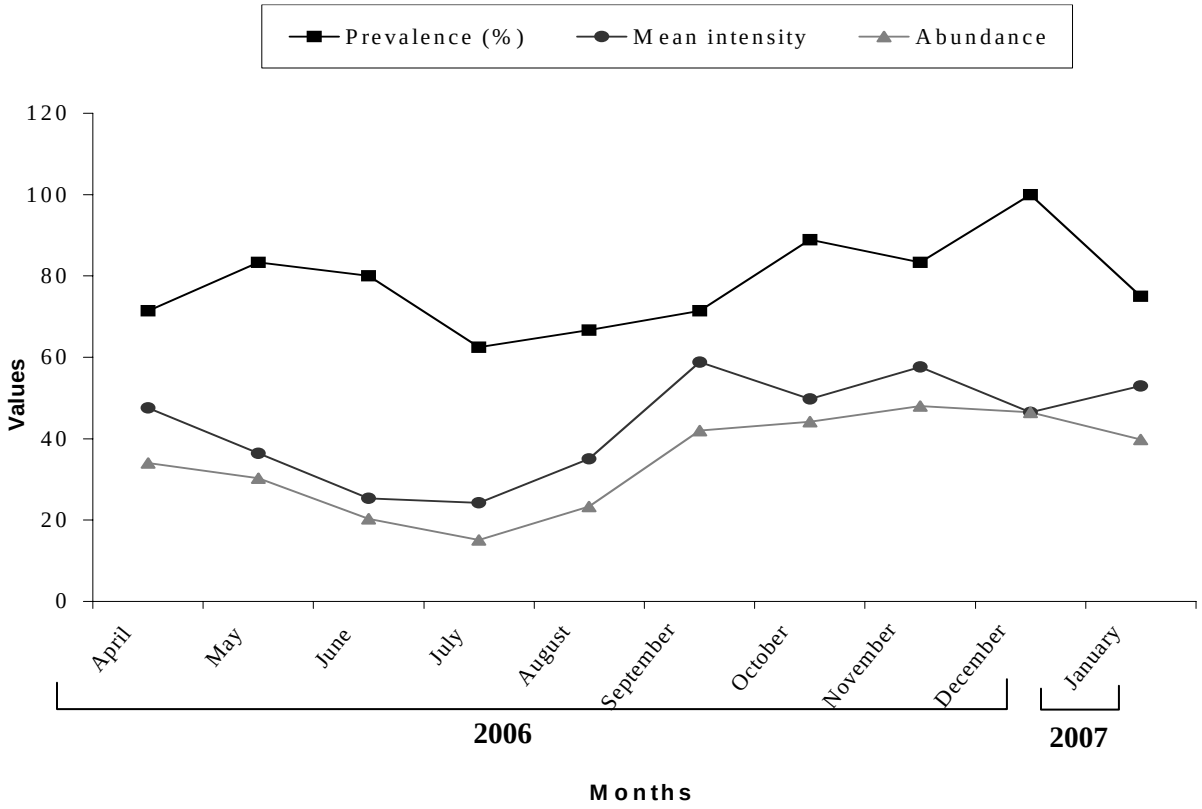


**Fig 1.** Monthly fluctuation in prevalence, mean intensity and abundance of parasites.

*Fluctuation of prevalence, mean intensity and abundance of parasites in different length group of L. rohita:* The highest prevalence of parasite (88.00%) was recorded from 22 fish samples belonging to the medium length group (18.28cm) and the lowest (71.43%) from 25 fish samples belonging to the smaller length group (<18cm). The prevalence of pasasites in the larger length group (>28cm) was 80.00% (Table 2 and Fig 2).

The highest mean intensity of parasites (47.2%) was observed in the smaller length group and the lowest (38.63%) in the medium length group while that of the larger length group was 39.75, which is closen to the lower value.

The abundance value ranged from 31.80 to 34.00%the highest value was recovded from the intermediate length group while the lowest from the larger length group (Table 2).

**Table 2.** Prevalence, mean intensity and abundance of parasitic infestation of *L. rohita* in different length groups.

| Length groups (cm) | No. of hosts | | Total No of parasites recorded | Prevalence (%) | Mean intensity unit | Abundance unit |
|---|---|---|---|---|---|---|
| | Examined | Infected | | | | |
| <18 | 35 | 25 | 1180 | 71.43 | 47.2 | 33.71 |
| 18-28 | 25 | 22 | 850 | 88.00 | 38.63 | 34.00 |
| >28 | 10 | 8 | 318 | 80.00 | 39.75 | 31.80 |
| Total | 70 | 55 | 2348 | 78.57 | 42.69 | 33.54 |

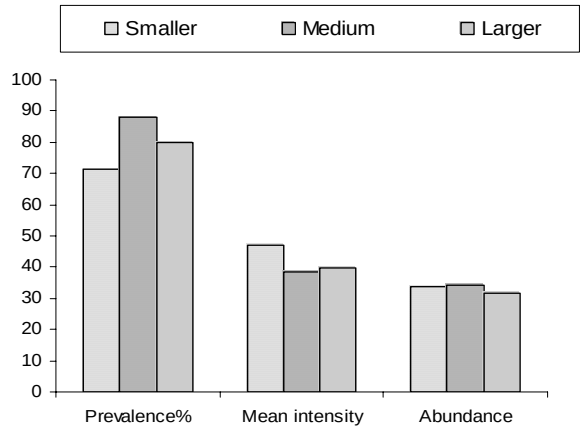


**Fig 2.** Comparative prevalence, abundance and mean intensity of parasites in different length group of *L. rohita*.

So, it was observed that among the different size groups of fishes, the maximum infestation were recorded from the medium length group than the smaller and larger length group of fishes. The rate of infestation was more smaller length group than larger, but prevalence of infestation in the medium group was more than smaller group. The present finding agree with those of Golder *et al.* (1987).

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