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THE PREVALENCE OF CESTODE INFECTION IN A FRESHWATER CATFISH, S*PERATA SARWARI*

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Abstract: A sample of seventy specimens of a freshwater catfish, *Sperata sarwari* was collected from Mangla Lake during February to November 2005 and their guts preserved in 5 % formalin. After the catch, sample was divided into two sub-samples as size class I (31-60 cm) and size class II (61-90 cm). The gut of each fish specimen was examined for the presence of internal helminth parasites. The study revealed that size class II has higher prevalence of infection (39.13 %) than size class I (28.85 %) infected with only one species of cestode, *Lucknowia fossilis.* While the mean intensity of infection was lower (3.67) in size class II as compared to size class I (8.73). These results indicate that the fishes found in Mangla Lake are good in general health since they are devoid of heavy parasitic load and the hygienic conditions of Mangla Lake are satisfactory.

Keywords: Freshwater catfish, fish helminth, parasite intensity, gut parasites, singhari,

INTRODUCTION

Singhari, *Sperata sarwari* (Mirza *et al.,* 1992) is an Indus catfish (Family: Bagridae) found in Pakistan and Indus drainage system in India. It is carnivorous fish, feeds mainly on animal food (Nawaz *et al.*, 1994). Due to its feeding habit, this fish can act as an intermediate or a final host for many helminth parasites. Since human as preferred white meat source is utilizing this fish, it is important that it should be healthy and free of infection.

Infections caused by various pathogens among fishes in natural and man-made culture systems are harmful for fish health, growth and fishery industry. The parasitic infections are sometimes very fatal and cause high

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mortalities when their life cycles are well supported by intermediate hosts. The helminth parasites mainly found in freshwater fishes are trematodes, cestodes, acanthocephalans and nematodes that complete their life cycles through intermediate hosts like snails and piscivorous birds (Schmidt, 1988). The need to assess the parasitic infection arises because the fish suffering from parasitic infection and/or disease result into severe damage to fishery industry. For successful prevention and elimination of such parasitic infections, it is extremely important to achieve early and correct data about the prevalence and intensity of a particular parasitic infection in specific group of fishes with well established mode of infection including the larval stages of parasite for which that fish constitute the final host.

In the present study, the prevalence and intensity of a helminth parasite (cestode) is investigated in two size classes of a freshwater catfish, *Sperata sarwari* from a freshwater reservoir, Mangla Lake.

MATERIALS AND METHODS

A sample of 75 fish of variable size was collected from Mangla Lake during February to November 2005 with the help of commercial fishermen. The length and weight of each fish were recorded using millimeter scale and electronic digital top pan balance (Chyo, Japan). Fish sample was divided into two sub-samples based on the fish size as size class I (size 31-60 cm total length) and size class II (size 61-90 cm total length). Immediately after the measurements, fish were dissected one by one exposing their visceral organs to observe the health conditions of the peritoneum. Digestive tracts (esophagus, stomach, bile duct and complete intestine) were removed carefully, preserved in 5 % formalin. The esophagus, stomach, bile duct and intestine were dissected lengthwise as to expose the inner lining (lumen). The lumen of each organ was rinsed with phosphate buffered saline (PBS) and examined under dissecting microscope. All parasites (cestodes) were removed from the mucous carefully under dissecting microscope with the help of a pair of dissecting needles. Cestodes were plunged into a small dish of PBS, heated to about 70 °C in a water bath and agitated with dissecting needle or brush to unfold the worms. On cooling of water, the parasites were transferred into 70 % alcohol in small glass vials. All parasites of each fish were kept in separate vials and labeled. Cestodes were stained with hematoxylin-eosin to make

internal structures identifiable. Staining procedure was adapted from "Essential of Parasitology" (Schmidt, 1988). Drawings of these parasites were made with the help of camera Lucida. External and internal morphological characters of each worm were recorded for species identification according to Bykovskaya *et al.* (1964). The identification was further confirmed by the description of the same or similar parasite (Zaidi and Khan, 1976; Khan and Bilqeese 1990; Khan, 1991; Habib, 1996; Nazir, 1996).

RESULTS

From the sample of 75 fish, 24 (32 %) were found to be infected with only one species of cestodes (*Lucknowia fossilis*). All these cestodes were found in the anterior, middle and posterior portion of the intestine from all fish specimens.

Table I: Total number of fish infected/examined, prevalence (%) and mean intensity of a cestode, *Lucknowia fossilis* isolated from the whole sample of singhari, *Sperata sarwari*.

Fish species	Parasite species	Number of infected fish	Total No. of parasites	Prevalence %	Abundance	Mean intensity
Sperata sarwari	*Lucknowia fossilis*	24/75	164	32 %	2.18 ± 0.67	10.25±1.60

Table II: Total number of fish infected/examined, prevalence (%) and mean intensity of a cestode, *Lucknowia fossilis* in different size classes of singhari, *Sperata sarwari*.

Fish species	Size class	Number of infected fish	Total No. of parasites	Prevalence %	Abundance	Mean intensity
Sperata sarwari	I (31-60 cm)	15/52	131	28.85 %	2.51 ± 0.98	8.73 ±1.21
	II (61-90 cm)	9/23	33	39.13 %	1.43 ± 0.29	3.67 ± 2.12

The parasite abundance from the whole sample was calculated as 2.18 and the mean intensity as 10.25 (Table 1). In size class I (52 fish) only 15 fish were found to be infected. The prevalence of infection was 28.85 %

(fig.1), parasite abundance was 2.51 and the mean intensity was 8.73 (Table 2). In size class II (23 fish), 9 fish were found to be infected. The prevalence of infection was 39.13 %, parasite abundance was calculated as 1.43 and the mean intensity as 3.67 (fig.2).

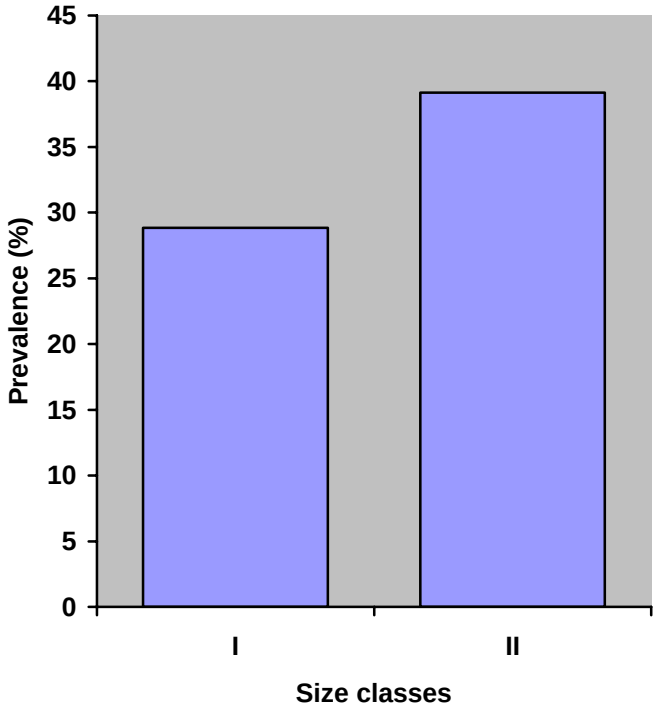

Figure 1. Prevalence (%) of a cestode (*Lucknowia fossilis*) infection in different size classes of singhari, *Sperata sarwari*

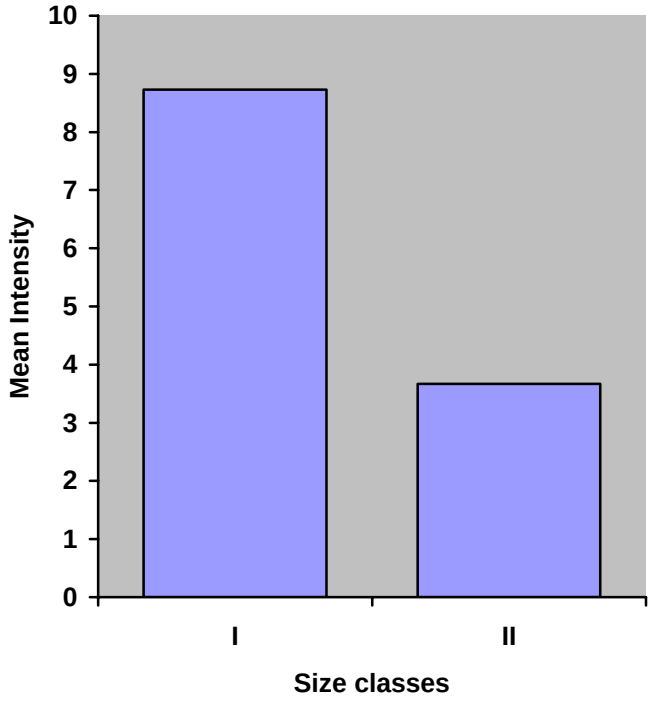

Figure 2. Mean intensity of a cestode (*Lucknowia fossilis*) infection in different size classes of singhari, *Sperata sarwari*

DISCUSSION

Fish helminthes parasites are generally found in all freshwater fishes. The parasite prevalence and intensity depend on many factors like parasite species and its life cycle, host and its feeding habits and the physical factors of water body where the fish inhabits. It also depends upon the presence of intermediate host such as snails and piscivorous birds for the onward transmission of parasites (like cestodes) infection to other hosts (Zaidi and Khan, 1976). The hygienic conditions of the water body are also very important in keeping aquatic environment free from introduction of any parasitic contamination from where fish are used for human consumption.

In the present study, it was observed that the fish were infected with only one species of cestode that prevails in singhari (*Sperata sarwari*) from Mangla Lake while other parasites appear to be absent. The low parasite prevalence and only single species of cestode infection in singhari means fish are overall healthy found in Mangla Lake. Although some sewage and industrial waste water from Mirpur city are added in the lake at few discharge points but its volume is too small as compared to the volume of water in the lake leaving no significant impact of contamination. Moreover, the water temperature drops in winter (<10 °C) inducing the delay or even disrupting the development of intermediate stages of various parasites during their life cycle. This could be one of the possible reasons of low cestode infection in singhari. Another factor to consider for low infection is that most part of the lake gets emptied in winter because of reduction in incoming water exposing larger area of sandy bottoms of the lake to sunlight which remain dry for long time. This phenomenon generally breaks the life cycle of many fish parasites. Moreover, very few piscivorous birds were found at Mangla Lake which is as well, important component for the transmission of various helminth parasites in fishes. In the larger fish (size class II), the prevalence of cestode infection (39.13 %) was found to be higher than in size class I (28.85 %). It is because the larger fish has spent longer time in that water, therefore has greater chances of cestode infestation with passage time. The mean intensity in larger fish (3.67) was lower as compared to the smaller fish (8.73) indicates that with the passage of time larger fish have developed resistance/immunity against cestode (*Lucknowia fossilis*) infection. It is for the first time record of this cestode species, *Lucknowia fossilis* from *Sperata sarwari* found in Mangla Lake. The earlier records of *L. fossilis* are from *Heteropneustus fossilis* by Gupta (1961) and Rehana and Bilqees (1979).

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