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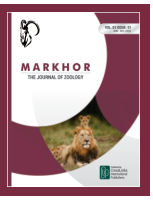

Original Article

Study of Various Ectoparasites From Sperata sarwari (Singharee) Obtained From Various Areas of Lahore, Pakistan

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ABSTRACT

Singhari *Sperata sarwari* is an Indus catfish (family Bagridae) present in Pakistan and Indus drainage system in India. **Objective:** To check the Prevalence of ectoparasites on Singhari (*Sperata sarwari*) fish. **Methods:** A sample of 30 specimens of a freshwater catfish, *Sperata sarwari* was collected from different areas of Lahore, Pakistan, during December 2017 to May 2018. Total 30 fish were examined for ectoparasites. Out of 30 fish, only 08 were diseased with *Lernaea*. **Results:** The total prevalence of *Lernaea* was 26.66%. *Lernaea* had highest prevalence (37.5%) in 1000-1200g body weight of fish group, while it was lowest (16.66%) in 100-300g body weight fish group. *Lernaea* showed highest prevalence (33.33%) in fish length group of 66-85cm, while the least prevalence (14.28%) existed in 25-45cm fish length group. It was also observed that *Lernaea* showed seasonal variations and it was maximum in winter, (33.33%) in January and minimum in spring and summer (20%) in March and (0%) in April. **Conclusions:** The results indicated that Singhari fish with more weight and long length had more prevalence of infection as compared to less weight and shorter length. This could be due to access of greater area available to parasites for anchoring and hiding on the large sized fish.

INTRODUCTION

Fishes are reflected as one of the substantial elements in aquatic ecosystem and have an important role in nation's economy as they are a very stable and even part in food of many persons [1]. Fish population in world is half of the total vertebrates[2]. They live in almost all conceivable aquatic habitats. 21,723 species of fish have been detected, out of these 8,411 species belong to freshwater category while 11,650 species belong to marine environment [3]. Physical, mental and reproductive harms in the body of fish occur due to parasites [4]. So, there was a requirement of attaining knowledge and responsiveness about numerous parasites mainly crustaceans and their communities in a particular set of fish population. *Lernaea* sp, *Argulus* sp, *Dactylogyrus* and *Monogenae* sp, are perceived as common causal agents of parasitic infection. It has been reported that fishery industry of Pakistan is facing lots of economic fatalities due to lernaeosis. Filthy water and food scarcity problems are becoming the cause of parasitic ailments [3]. Singhari fish is carnivorous in nature, it feeds on animal food, having scavenging property. Due to less bones and delicious taste Singhari fish is considered as most favourite and required to consumers [5, 6]. Protein quality of this fish is very good and also has high nutritional significance. Flesh of Singhari contains 200 units of vitamin A per gram [7]. The present study was designed to examine ectoparasites from Singharee fish and to check the prevalence of infection of ectoparasites according to body weight and length of fish and season wise also.

METHODS

The current study was conducted in Lahore by collecting fish samples from different areas of Lahore. Examination

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of fish samples was done at Department of Zoology, in Lahore College for Women University (LCWU). The period of study was six months started from December 2017 and continued until May, 2018. 30 samples of Singharee were collected. Two methods for finding ectoparasites were used during the study. 1) Direct examination of Ectoparasites 2) Examination of ectoparasites by scraping method. Direct examination of ectoparasites was done in order to observe the parasites with naked eye or with forceps. The procedure that was described by Tasawar et al., in his study [8]. According to that, fish were observed superficially close to eyes, gills, fins and tail area by means of magnifying glass. Lengths in (cm) were measured using a meter rule and a thread while the weight in (g) of each fish was measured using an electronic weighing balance. Forceps were used to separate the parasites from body of fish and were put in beakers having fixative (10% formalin). The collected parasites were then be observed in laboratory of Parasitology LCWU Lahore. Parasites were splashed away with water to get rid of fixative. For making the bodies of parasites visible and transparent, these were preserved in 10% potassium hydroxide. Then to remove this alkali (Potassium hydroxide) parasites were sprinkled with water. After washing, parasites were dehydrated for 10 minutes to 30%, 50% and 70% alcohol. Staining was done for 5 minutes on parasites and dried again for 10 minutes in 90% and 100% alcohol. The ectoparasites were attached on Cnada balsm and microscopically inspected. 2nd method was examination of ectoparasites by Scraping method. The procedure of scraping method was described. According to this procedure skin of fish was scrapped from head to tail by means of scalpel blade. The scraping was mucus plus epidermal cells and was sited in petri-dishes that contained 3ml of 0.9% saline solution and agitated by using a mounted pin. Smears of scraping were made on clean slides. Then these slides were observed under 40x magnification of a light microscope for parasitic existence and identification.

Formula given by Ekanem et al., for calculating prevalence of ectoparasites was followed [1].

$$\text{Prevalence}(\%) = \frac{(\text{Number of Diseased Fish})}{(\text{Total Fish})} \times 100$$

RESULTS

From 30 Singhari fish, 8 were infected with Lernaea and the overall prevalence was 26.66% (Figure 1).

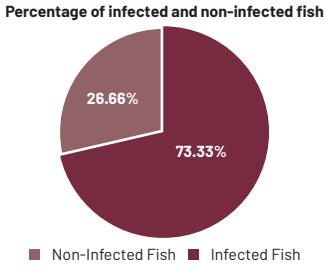

Figure 1: Percentage of infected and non-infected fish

The present investigation resulted that as the weight and length of fish increases, number of ectoparasites also increases because of greater surface area available to fish where they can keep their proper hold. The highest prevalence of lernaea (37.5%) was in 1000-1200g fish weight group while it wcwest in 100-300g (Table 1).

Weight of Fish (g)	Fish Samples Observed	Fish Infected N (%)
100-500g	6	1 (16.66)
600-1000	8	2 (25)
1100-1500	8	2 (25)
1600-2000	8	3 (37.5)

Table 1: Prevalence of lernaea ectoparasites according to body weight (g)

According to length prevalence of Lernaea was highest (33.33%) in 65-85cm and was lowest (14.28%) in 25-45cm length group of fish. So, it was concluded that parasitic load increases as length and weight of fish increases (Table 2).

Length of fish (cm)	Fish Samples Observed	Fish Infected N (%)
15-25cm	12	4 (33.33)
26-35cm	11	3 (27.3)
36-45cm	7	1 (14.28)

Table 2: Prevalence of lernaea ectoparasites according to body length (cm)

During this study it was also observed that Lernaea showed seasonal variations and it was maximum in winter, (33.33%) in January and minimum in spring and summer (20%) in March and (0%) in April. (Table 3).

Sampling Seasons	Fish Samples Observed	Fish Infected N (%)
December	7	2 (28.5)
January	9	3 (33.3)
February	7	2 (28.5)
March	5	1 (20)
April	2	0 (0)

Table 3: Monthly prevalence of Lernaea ectoparasites in Singhari

DISCUSSION

The present study on Singharee (*Sperata sarwari*) was conducted in order to examine the ectoparasites. The results revealed that from the sample of 30 fish, 8 were infected with *Lernaea* and the overall prevalence of infection was 26.66%. This percentage was close to the finding of Tassawar *et al.*, who determined 17.59%, the

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overall prevalence of ectoparasites [9]. Filthy contaminated water and deficiency of food become the cause of diseases [2, 10]. Kir *et al.*, found that during several epizootics the financial losses due to lernaeosis have increased among world's main fishes [11]. The mature *Lernaea* parasites are devastating to larger sized fish because of their wide body, mode of attaching and feeding. Eyes of fish are damaged by these *lernaea* parasites and become the source of blindness to fish. By *Lernea,* gills of fish were also retarded and lead to epithelial proliferation due to which gaseous exchange was damaged and bacterial infection also spreads. Heart and gut cavity can also be badly affected by these parasites and even lead to death of fish [12, 13]. In this study highest prevalence of *Lernaea* parasites was detected in weight group of 1000-1200g and in other weight groups there was less prevalence. Tasawar *et al.*, studied the same factors. According to their studies, parasites increase in number as the size of fish increases [14-15]. Our results were same with these studies. Our results revealed that *Lernaea* had highest prevalence (33.33%) in 65-85cm and lowest (14.28%) in 25-45cm length group of fish. It is obvious from this that number of parasites increase by the increase in length of fish. The results of present study were in match with the results of Whitaker and Schlueter [16]. The absence of parasites on small sized fish was due to less hold and settlement. In this study extreme influx of parasites was detected in larger fish. A contradicting result was found in an experiment conducted by Ta *et al.*, on the occurrence of lernaea in Grass carp (*C. idella*), 597 fishes were inspected and 105 were found to be diseased with *Lernaea*. This study showed that parasites decrease in number with the increase in weight. This was due to the reason that fish attained immunity against such infectious parasites [17-19]. Our results revealed that *Lernaea* had highest prevalence in winter months i.e., December (28%) and January (33.33%) and lowest prevalence was in spring months i.e., March (20%) and April (0%). Our results were more consistent with Binning *et al.*, who reported the occurrence of ectoparasites in Mori fish [20]. According to this study, *Lernaea* expressed seasonal variation and it was maximum in winter months viz; December (50%) and January (40%) and lowest in July (10%). Further studies on the prevalence of ectoparasites on Singharee should also be carried out in different regions of Pakistan. Overcrowding should be avoided in pond to maintain proper health of fish. Water quality should also be good and maintained. Sellers of fish should be well aware of all the health risks and diseased fish. Anti-parasitic drugs mixed in pond water like Copper sulphate, ferrous sulphate, Iodine, Potassium permanganate can be used to eradicate the parasites from fish body.3

CONCLUSIONS

It was concluded from the study that the prevalence of ectoparasites on Singharee fish depended on their size and seasonal variation also. Size is directly proportional to prevalence of ectoparasites on Singharee fish. It was also revealed from the study that large sized Singharee fish was more vulnerable to ectoparasites in winter season.

Conflicts of Interest

The authors declare no conflict of interest

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