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THE PREVALENCE OF LERNAEID ECTOPARASITES IN MORI (*CIRRHINUS MRIGALA*) FISH

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ABSTRACT

During the present study, 600 fish were examined for Lernaeid ectoparasites at a commercial fish farm in Multan, Pakistan. Out of 600 fish, only 63 were infested with *Lernaea cyprinacea* and 74 were infested with *L. polymorpha*. The overall prevalence of *L. cyprinacea* and *L. polymorpha* were 10.50 and 12.33%, respectively. *L. cyprinacea* had highest prevalence (15.38%) in 2100-2500g body weight of fish group, while it was lowest (4.65%) in 100-500g body weight fish group. *L. polymorpha* had the highest prevalence (23.07%) in body weight group of 2100-2500g, while the lowest (11.56%) in 600-1000g fish weight group. *L. cyprinacea* showed highest prevalence (12.87%) in fish length group of 31-45 cm, while the lowest prevalence (0%) was in 61-75 cm fish length group. *L. polymorpha* had the prevalence of 13.0 and 0% in fish length groups of 46-60 cm and 61-75 cm, respectively.

Key words: *Cirrhinus mrigala*, body length, body weight, *L. cyprinacea*, *L. polymorpha*, prevalence.

INTRODUCTION

The ectoparasites of fish constitute one of the most important problems associated with pond fish culture. Lernaeidae is a major family of cyclopoid copepod parasitic groups associated with freshwater fish. Some of them are among the most harmful parasites of cultured fishes; consequently, they have become species of interest (Yin, *et al.*, 1963; Kabata, 1985; Tasawar *et al*., 2007). Losses resulting from these parasites under crowded and uncultured conditions can reach catastrophic proportions. *Lernaea* spp. are important fresh water parasites, having worldwide distribution. The economic importance of the lernaeid ectoparasites has increased due to numerous epizootics occurring among the most important farmed fish in various parts of the world, Therefore, the present project was designed to investigate the overall prevalence of lernaeide etoparasites and its relationship with age and body weight of *Cirrhinus miragala*.

MATERIALS AND METHODS

Fish were collected with the help of a drag net (100/month) from July to December, 2004 from a commercial fish farm in Multan, Pakistan. The fish were identified and kept alive in a water container and examined for the presence of *Lernaea* spp. The parasites were removed with the help of fine forceps and placed in vials containing 5% formalin. Body weight and body length of fish were recorded. The collected parasites were brought to the Parasitology Research Laboratory of Bahauddin Zakariya University, Multan and permanent mounts of the parasites were prepared according to Cable (1985). For this purpose, the parasites were washed with distilled water to remove the fixative. The washed specimens were kept in 10% potassium hydroxide until their bodies became transparent. Then the parasites were washed to remove the alkali. After washing, the *Lermaea* species were dehydrated through a graded series viz. 30, 50 and 70% of alcohol for 10-20 minutes. Parasites were stained with Semichons Carmine for 5-7 minutes and dehydrated in 70, 90 and 100% alcohol for 10-15 minutes. Following dehydration, the *Lermaea* species were cleared in xylene and mounted in Canda balsam. The mounted specimens were examined under microscope for their identification. Results are expressed in percentages and the values between various body weight and body length groups were compared by Chi square test.

RESULTS AND DISCUSSION

The overall prevalence

The overall prevalence of lernaeid ectoparasites was calculated and according to these results *L. cyprinacea* and *L. polymorpha* had the overall prevalence of 10.50 and 12.33%, respectively (Table 1). The difference in prevalence of both Lernaea spp. was

Table 1: The overall prevalence of lernaeid ectoparasites in Mori (*Cirrhinus miragala*) fish

Name of parasite	No. of hosts examined	No. of hosts infested	Prevalence (%)
L. cyprinacea	600	63	10.50
L. polymorpha	600	74	12.33

not significant (P>0.05). Ho and Kim (1997) reported 10 species of lernaeid copepods from freshwater fish of Thailand. Studies have also been conducted on the overall prevalence of *Lernaea* spp. in fresh water fish in Pakistan. In hybrids, the prevalence of *L. cyprinacea* was the highest (21.66%), followed by that of *L. polymorpha* (15.18%), *L. lophiara* (4.16%) and *L. oryzophila* (Tasawar *et al.*, 2007). *Catla catla* had the maximum prevalence of *L. cyprinacea* (26.67%), followed by that of *L. polymorpha* (25.83%), *L. oryzophila* (4.17%) and *L. lophiara* (2.50%). On *H. molitrix*, the prevalence of *L. cyprinacea* has been recorded as 9.16%, followed by that of *L. polymorpha* (6.66%), *L. lophiara* (3.33%), *L. ctenopharyngodonis* (2.5%) and *L. areuata* (1.6%) (Tasawar and Shahzad, 2001). In case of *Ctenopharyngodonis idella*, 597 fish were examined and the overall prevalence of *L. cyprinacea* was 6.53%, that of *L. polymorpha* 7.53%, for *L. oryzophila* it was 0.67%, while the *L. lophiara* had the prevalence of 0.65% (Tasawar and Naeem, 1999). In case of *C. catla*, 400 fish were examined and the overall prevalence of *L. cyprinacea* was 43.75%, for *L. polymorpha* it was 8.50%, for *L. oryzophila* it was 0.75% and for *Learnaea* spp. it was 2.75% (Tasawar *et al.*, 1999b).

Relationship between body weight and lernaeid ectoparasites

The present investigation showed that *L. cyprinacea* had highest prevalence (15.38%) in 2100-2500g fish weight group, while the same was the lowest (4.65%) in 100-500g fish group. *L. polymorpha* had the highest prevalence (23.07%) in 2100-2500g fish group, while the lowest was 11.56% in 600-1000g group (Table 2). The differences in prevalence among fish weight groups were significant (P<0.01). The same parameter has been studied by Tasawar *et al*. (2001) and Tasawar *et al*. (2007). According to all these investigations, either the parasites were not present on small sized fish or the minimum number of parasite were found on the smallest fish and in addition to that it was also observed that as the body weight of the fish increased, the parasite number increased concomitantly. The present study showed that the small fish were more resistant to *Lernaea* spp. compared to large fish. This resistance could be due to scale structure in small fish.

Relationship between body length and lernaeid ectoparasites

The present results showed that *L. cyprinacea* had highest prevalence (12.87%) on 31-45cm and lower prevalence (0%) on 61-75cm length groups (Table 3). *L. polymorpha* had highest prevalence (13.0%) in group of 46-60cm and lowest prevalence (0%) in 61-75 cm. length group. The difference was statistically significant (P<0.05).

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Table 2: Relationship between fish body weight and lernaeid ectoparasites

Name of parasite	No. of hosts examined	Body weight(g) groups				
		100-500	600-1000	1100-1500	1600-2000	2100-2500
		(n=43)	(n=346)	(n=162)	(n=36)	(n=13)
L. cyprinacea	600	2(4.65%)	42(12.13%)	14(8.64%)	3(8.33%)	2(15.38%)
L. polymorpha	600	6(13.95%)	40(11.56%)	20(12.34%)	5(13.88%)	3(23.07%)

Table 3: Relationship between fish body length and lernaeid ectoparasites

Name of parasite	No. of hosts examined	Body length (cm) groups			
		16-30	31-45	46-60	61-75
		(n=23)	(n=404)	(n=169)	(n=4)
L. cyprinacea	600	2(8.69%)	52(12.87%)	9(5.32%)	0(0%)
L. polymorpha	600	2(8.69%)	50(12.37%)	22(13.0%)	0(0%)

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