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Prevalence of Copepod Ectoparasites of Grass Carp *Ctenopharyngodon idella*

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Abstract

One hundred and twenty grass carp, *Ctenopharyngodon idella*, were examined over a period of one year from March 1998 to February 1999 at Government Fish Hatchery, Mian Channu, Punjab, Pakistan. Four species of copepod ectoparasites recovered were *Lernaea* (L.) *polymorpha* (Yu, 1938), *L. cyprinacea* (Linnaeus, 1761), *L. lophiara* (Harding, 1950) and *L. ctenopharyngodonis*. The parasitic infestation was low during the summer months when temperature ranged between 30-32°C and highest in winter months when temperature was between 13-23°C.

Introduction

Copepod parasites of the family Lernaeidae often infest several species of cultivated fish including common carp, trout and Chinese carps. The parasitic crustacea of epizootical interest are all water-loving species with optimal temperatures above 20°C. No intermediate host(s) have been reported to be involve in their development and multiply in the ponds when the temperature is favorable and the fish are overcrowded (Rawson, 1977). The best known among them are the *Lernaea* spp. *Lernaea* have not been reported to be host or site specific on fish and can be found on all external body surfaces. The members of this genus are very sensitive to salinity and cannot survive even low salt concentrations. The species of epizootic importance are *Lernaea* (L.) *cyprinacea* and *L. ctenopharyngodonis*.

Males did not advance beyond the fifth copepod stage and thus not become permanent parasites; females do so only after copulation, which occurs during the fifth copepod stage. After copulation males disappear; females penetrate the skin of fish. Depending on the temperature between two to eleven generations have been observed in one year (Naseem, 1998).

Crustacean parasites are important debilitating pests in fish culture. The copepod, *Lernaea* spp. are particularly deleterious ectoparasites on young grass carp and attach to the body surface, musculature and gills. They penetrate the skin of the host and reaching the muscles. Deep ulcers, abscesses or fistulas are formed at the site of attachment that also results in the formation of parasitic fibrous nodules. Secondary infections may also occur. Although the mortality rate is very low but reduction in weight and poor production performance due to parasitic infestation may read to severe economic losses (Kabata, 1985). The present paper reports the prevalence of copepod ectoparasites of *Ctenopharyngodon idella* in Govt. Fish Hatchery, Main Channu, District Khanewal, Pakistan.

Materials and Methods

One hundred and twenty grass carp, *Ctenopharyngodon idella*, from Govt. Fish Hatchery, Mian Channu, were examined for the presence of copepod ecto-parasites. Ten

specimen of fish were examined each month from March, 1998 to February, 1999. The parasites were removed with the help of fine forceps and were fixed in 5 percent formalin. The temperature of pond water was also noted.

The parasites thus collected were brought to the Parasitology laboratory, Institute of Pure and Applied Biology, Bahaudin Zakria University, Multan and permanent mounts were prepared (Cable, 1985). The parasites were identified according to the keys given by Kabata (1985).

Results and Discussion

A total of 217 copepod ectoparasites were recovered from 120 grass carp, *Ctenopharyngodon idella* from Govt. Fish Hatchery Mian Channu. District Khanewal during March, 1998 to February, 1999. Four species of copepod ectoparasites viz; *Lernaea* (L.) *polymorpha* (Yu, 1938), *L. cyprinacea* (Linnaeus, 1761), *L. lophiara* (Harding, 1950) and *L. ctenopharyngodonis* were recovered. Different species of ectoparasites had been reported in different countries of the world. The *Lernaea* species recovered in the present studies are different from the copepod ectoparasites reported by Gnanamuthu (1951), Fryer (1956) and Noga (1986). This wide variation could be due to the different prevailing geoclimatic conditions and hosts examined.

The prevalence of *L. polymorpha* was highest (38.33%) followed by *L. cyprinacea*, (9.16%), *L. ctenopharyngodonis* (4.16%) and *L. lophiara* (3.33%).

The prevalence of *L. polymorpha* was maximum in the month of January and February (100%) and minimum in June (zero percent). In March and April, the prevalence was 20 percent. This decreased to 10 percent in May, July, August and September. It increased to 40, 50 and 90 percent in October, November and December, respectively (Table 1).

The prevalence of *Lernaea cyprinacea* was maximum in February (50%) and nil in May, June, July, August, September and December. In March and April it was 10 percent. In October and November prevalence was 10 percent. It increased to 30 percent in January.

Table 1: Seasonal prevalence of copepod ectoparasites of *Ctenopharyngodon idella*

	Percent prevalence			
	<i>L. polymorpha</i>	<i>L. cyprinacea</i>	<i>L. lophiara</i>	<i>L. ctenopharyngodon</i>
March	20	10	0	0
April	20	10	0	0
May	10	0	0	0
June	0	0	0	0
July	10	0	0	0
August	10	0	0	0
September	10	0	0	0
October	40	10	0	10
November	50	10	0	10
December	90	0	0	0
January	100	30	40	30
February	100	50	0	0

The prevalence of *L. lophiara* was 40 percent in January. No infestation with *L. lophiara* was recorded in other months of the year. The prevalence of *L. ctenopharyngodonis* was 30 percent in January and no infestation with *L. ctenopharyngodonis* was found in the month of March, April, May, June, July, August, September, December and January. While in October and November, the prevalence of *L. ctenopharyngodonis* was 10 percent.

In the present studies, highest parasitic infestation on the grass carp was recorded during the month of January and February when the temperature of pond water ranged from 13°C-19°C and decreased as the temperature increased from 23°C-32°C. From the results it could be concluded that temperature is the most important single abiotic factor influencing seasonalities; and certain monogenean parasites hatch and complete their development under optimum water temperatures (Chubb, 1977).

In the present studies, 27 out of 120 fish were infested only with *L. polymorpha*. Mixed infestation was also recorded with different combinations. Double infestation was in 3 combinations viz; 11 fish were infested with *L. polymorpha* + *L. cyprinacea*, 2 fish were infested with *L. polymorpha* + *L. lophiara* and 4 fish were infested with *L. polymorpha* + *L. ctenopharyngodonis*. Triple infestation was in 2 combinations viz; 1 fish was infested with *L. polymorpha* - 1 *L. lophiara* + *L. cyprinacea* and 1 fish was infested with *L. polymorpha* + *L. lophiara* + *L. cyprinacea* and 1 fish was infested with *L. polymorpha* + *L. lophiara* + *L. ctenopharyngodonis*.

The parasite burden per grass carp was maximum for *L. polymorpha* (3.69 %) followed by *L. cyprinacea* (3.18%), *L. lophiara* (1.2 %) and *L. ctenopharyngodonis* (1.2%).

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