

Prevalence of ectoparasites of carp fingerlings at Santaher, Bogra

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Abstract: The research work was conducted to find out the seasonal prevalence of ectoparasites of carp fingerlings. Seven species of parasites viz. *Trichodina domerguei*, *Trichodina reticulata*, *Chilodonella cyprini*, *Myxobolus koi*, *Dactylogyroides tripathi*, *Dactylogyrus extensus* and *Dactylogyrus catlarius* were recovered from 640 fingerlings of Silver carp (*Hypophthalmichthys molitrix*), Bighead carp (*Ctenopharyngodon idella*), Common carp (*Cyprinus carpio*), Thai punti (*Puntius gonionotus*), Catla (*Catla catla*), Rui (*Labeo rohita*) and Mrigal (*Cirrhina mrigala*) from different nursery ponds of Bogra district during June 2005 to May 2006. The highest prevalence (95%) was in *Trichodina domerguei* and lowest (10%) in *Dactylogyrus catlarius* during winter season. Average prevalence of protozoan and monogenean parasite was 37.16 in rainy season, 40.08 in winter season and 30.25 in summer season. Winter is the most disease occurring season of the year.

Key words: Ectoparasite, infestation, prevalence, fingerling, nursery pond

Introduction

The most important prerequisite of fish production is the availability of healthy fish fingerlings. One of the reasons often quoted, as constraint for aquaculture development in Bangladesh is the shortage of fish seed and one of the ways to meet this demand is to maximize production of fingerlings from available nursery and rearing ponds. High stocking density is being maintained during carp nursery operations, and this density induces bio-ecological stress to fry (Passino, 1984) and make the fry more susceptible to the parasitic infection (Sneisko, 1974). It is evident from the available literature that parasitic diseases caused significant damage in nursery systems of carp, catfish and shellfish of Srilanka (Subashinghe, 1992), Malaysia (Leong, 1992), Indonesia (Angka, *et al.*, 1982), Taiwan (Song *et al.*, 1980) and India (Gopalkrishnan, 1961). The parasite community of fish shows considerable variation with the environmental conditions in which fish live.

It was observed that the prevalence of the disease was more in the winter season (Ahmed *et al.*, 1991) and that again occurs in the same season every year. The present study was designed to investigate the prevalence, host specificity, infestation of ectoparasite in carp fingerlings of Bogra districts, Bangladesh.

Materials and Methods

The carp fingerlings of *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella*, *Cyprinus carpio*, *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala* and *Puntius gonionotus* were used as host fishes for the collection of ectoparasites and their identification. The study was conducted from June 2005 to May 2006 in Bogra district and a total of 640 carp fingerlings was observed for ectoparasites. In order to observe seasonal changes, the infected fishes were collected seasonally and immersed in 5% neutral formalin for preservation. The parasites were fixed according to the method suggested by Cable (1958). Monogenean parasites were identified following

Yamaguti (1963). For identification of protozoan parasites Lom (1960), Lucky (1971) and Kabata (1985) were followed. The prevalence was calculated as number of infested fish divided by number of observed fish multiplied by hundred. The water quality parameters viz., water temperature, alkalinity, ammonia, free CO₂, dissolved oxygen, P^H and total hardness were measured seasonally with the help of kit box. All recorded data were analyzed to calculate the prevalence of ectoparasites. The effect of locality and seasons were analyzed in terms of the percentage of parasites present.

Results and Discussion

The percentage of infection of fishes by protozoan parasites such as *Trichodina domerguei*, *Trichodina reticulata*, *Chilodonella cyprini*, *Myxobolus koi* and monogenean parasites such as *Dactylogyrus catlarius*, *Dactylogyrus extensus*, *Dactylogyroides tripathi* were 62, 50, 30, 22, 40, 35, 25 in rainy season, 95, 67, 40, 52, 10, 25, 15 in winter and 85, 20, 24, 37, 25, 18, 14 in summer respectively (Table 1). The seasonal prevalence of protozoan and monogenean parasites were 41.00 and 33.33, 63.50 and 16.67, 41.50 and 19.00 during rainy season, winter season and summer season respectively. The average prevalence of protozoan and monogenean parasite was 37.16 in rainy season, 40.08 in winter season and 30.25 in summer season (Table 2). The seasonal data revealed that the out break of diseases found in the winter season for particular species leads to a conclusion that a biological factor of the host as well as the water quality may play an important role in that period. The parasitic infestation fluctuated seasonally in all observed fishes (Table 1). Usually the parasites cause diseases to fishes and as the fingerlings are delicate, they are more susceptible to diseases. So they die very quickly. As the water quality parameters fluctuate very quickly during winter and summer season, fish becomes affected

with diseases in these two seasons. The water temperature, alkalinity, ammonia, free CO₂, DO, P^H & total hardness measured were 30.57°C, 137.50ppm, 2.75ppm, 10.97ppm, 5.80ppm, 6.52 and 142.50ppm in rainy season, 21.12°C, 126.25ppm, 1.37ppm, 8.62ppm, 8.67ppm, 7.0, and 113.75ppm in winter season and

27.75°C, 108.75ppm, 1.6ppm, 9.77ppm, 7.02ppm, 8.15ppm and 121.25ppm in summer season respectively. Their Mean and ±SD value were 25.48±3.892, 124.17±11.819, 1.91±0.603, 9.78±0.959, 7.16±1.176, 7.22±0.684 and 125.83±12.176ppm respectively (Table 3).

Table 1. Prevalence of individual ectoparasites in carp fingerlings in different seasons of the year.

Parasites	Rainy season (%)	Winter season (%)	Summer season (%)	Mean
<i>Trichodina domerguei</i>	62	95	85	80.67
<i>Trichodina reticulata</i>	50	67	20	45.67
<i>Chilodonella cyprini</i>	30	40	24	31.33
<i>Myxobolus koi</i>	22	52	37	37.0
<i>Dactylogyrus catlarius</i>	40	10	25	25.0
<i>Dactylogyrus extensus</i>	35	25	18	26.0
<i>Dactylogyroides tripathi</i>	25	15	14	18.0

Note: Rainy season= June-September, winter season= October-January, summer season= February-May

Table 2. Seasonal prevalence of ectoparasites in carp fingerlings.

Parasites	Rainy season (%)	Winter season (%)	Summer season (%)
Protozoan parasite	41.00	63.50	41.50
Monogenean parasite	33.33	16.67	19.00
Average	37.16	40.08	30.25

Table 3. Seasonal fluctuations of water quality parameters in nursery pond.

Season	Water temp. (°C)	Alkalinity (ppm)	Ammonia (ppm)	Free CO ₂ (ppm)	DO (ppm)	P ^H	Total hardness (ppm)
Rainy	30.57	137.5	2.75	10.97	5.8	6.52	142.5
Winter	21.12	126.25	1.37	8.62	8.67	7.0	113.75
Summer	24.75	108.75	1.6	9.77	7.02	8.15	121.25
Mean	25.48	124.17	1.91	9.78	7.16	7.22	125.83
±SD	±3.592	±11.819	±0.603	±0.959	±1.176	±0.684	± 12.176

Fish fingerlings become more susceptible to pathogen because of their immature immune system (Anderson, 1974), which support the present findings. Kabata (1985) reported that shallow ponds and stagnant water favours the multiplicity of ciliate like *Trichodina*. In Philippines Lumanlan *et al.* (1992) reported *Trichodina* as the most prevalent ectoparasite followed by *Dactylogyrus*. The prevalence of *Trichodina domerguei* and *Dactylogyrus catlarius* were found highest. These findings of the present study agreed with the findings of Subasinghe (1992). Sharif and Vijarungam (1986) reported these two parasites were the most common and caused mass mortality of fish during their study in the carp fish nursery operation system in Malaysia.

The fingerlings required more O₂. During winter the water volume of fish habitat become reduced and water quality parameters deteriorates during this period (Table 3). So fingerlings become suffocated due to lack of O₂ in water. Often the density of fingerlings remains higher in nursery pond. As a result water become polluted. So variety of diseases appear in nursery pond caused by ectoparasites. The value of water quality should be maintained properly to avoid the appearance of parasites in nursery pond.

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