

Seasonal Variations in Diversity and Density of Helminth Parasites in Snake Headed Fishes of Gonda District of U.P., India

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Abstract- Fresh water fishes carry heavy infection of helminth parasites. Infection of these parasites may be result in poor growth, postpone sexual maturity and mortality of fishes, and cause human and animal diseases. In the present study, snake headed fish species like Channa punctatus, Channa striatus and Channa marulius were collected from natural fresh water bodies of Gonda throughout the year to assess the population dynamic of parasites helminth. The result of the present investigation shows the highest prevalence, intensity, density and index of infection of helminth parasite in summer season followed by in winter and in monsoon season. The results indicated that climatic conditions are influencing the seasonal variation of parasitic infection either directly or indirectly.

Indexed Terms- Prevalence, Intensity, Density, Cestodes, Trematods, Nematodes,

I. INTRODUCTION

Fisheries are an important sector in Indian economy. India is the third largest fish producer and second largest inland fish producer country in the world. Fish production is always under threat of attack from fish diseases caused by variety of fish parasites. Fish parasites and their infections are matter of concern since they affect the fish productivity especially inland culture fishery by decreasing their reproductive potential, market and nutritive value. Helminth group is one of the major group of fish parasites about 20,000 to 30,000 helminth species have been reported worldwide. Infection of these parasites may result in poor growth, postpone sexual maturity and mortality of fishes, and cause human and animal diseases due to weak association of host and parasites (Verma *et al.*, 2018).

The edible fishes have number of helminth parasites which cause deterioration in their health; hence their market and aesthetic value is reduced. Hence to obtain healthy and good quality fishes, it is necessary that these are free from any type of ecto- and endoparasites. Besides mortality these parasites also reduce the resistances and immune power of fish that have considerable impact on growth, development, susceptibility to predation and pave way for secondary infection (Prakash and Singh, 2020).

Many authors have carried out studies on the helminth parasites and population dynamics of those occurring in piscian hosts and work on different aspects of parasites (Sharma and Goswami, 2011). The distribution of helminth of the same host and their incidence and intensity of infestation varies from one place to another (Rahman and Saidin, 2014). Parasites of fishes are directly or indirectly related with human health. In India, due to lack of awareness or interest in reporting, several helminth parasites can be transmitted to humans and domestic animals only through fish (Chai, *et al.*, 2005). Keeping in view, importance of helminth parasitic infection to freshwater fishes, present study was designed to evaluate seasonal variation in prevalence, intensity, density and index of infection of helminth parasites in freshwater fishes found in the fresh waterbodies of Gonda district of U.P. in different seasons.

II. MATERIALS AND METHODS

Fresh water air breathing fishes *Channa punctatus*, *Channa striatus* and *Channa marulius* were collected from fresh waterbodies of Gonda. They were brought in to the laboratory and dissected out to examine and collect the helminth parasites from the skin, liver, stomach and intestine after that these parasites were cleaned and preserved in 4% formalin for the

identification under microscope with the help of standard literature (Yamaguti, 1934). Prevalence, intensity, density and index of infection were calculated by following the formula given by Margolis *et al.*, (Margolis *et al.*, 1982).

$$\text{Prevalence \%} = \frac{\text{Total no.of infected fishes}}{\text{Total no.of fish examined}} \times 100$$

$$\text{Intensity of infection} = \frac{\text{Total no.of parasites collected}}{\text{Total no.of infected fish examined}}$$

$$\text{Density of infection} = \frac{\text{Total no.of parasites collected}}{\text{Total no.of fish examined}}$$

III. RESULTS AND DISCUSSION

Table.1. Seasonal variation in parasitic infection in Snake headed fishes.

Season	No. Fishes Examined	Total No. of fish infected	Name of Parasite	Total no. of Fishes infected	Total No. of Parasite collected	Prevalence %	Intensity	Density
Rainy Season	175	115	Cestode	65	27	37.14	0.23	0.15
			Trematods	15	10	8.57	0.13	0.06
			Nematods	25	16	14.28	0.14	0.09
Winter Season	175	120	Cestode	80	32	45.71	0.26	0.18
			Trematods	17	11	9.71	0.09	0.06
			Nematods	33	20	18.85	0.16	0.11
Summer Season	175	160	Cestode	97	75	55.42	0.46	0.42
			Trematods	47	24	26.85	0.15	0.13
			Nematods	37	33	21.14	0.21	0.18

Out of 450 freshwater fishes of species, *Channa punctatus*, *Channa striatus* and *Channa marulius*, 395 fishes were infected by helminth parasites. In the present study, besides 248 parasites cystode metacercarian larvae of trematodes was also collected throughout the year (Table 1). The data of seasonal variation in Prevalence, intensity, density and index of helminth parasitic infection was presented in table1. The maximum numbers of helminth parasites from these three snake headed fishes were collected in summer season followed by winter and rainy seasons. From the above results it is clear that a considerable difference was found in the prevalence of helminth infections among different season. The highest cestode, trematode and nematode prevalence were recorded during summer season where as lowest cestode prevalence, trematode incidence and nematode prevalence in rainy season. The parasitic infection is greatly influenced by the seasonal changes in ecological factors which basically influenced the metabolic activities of the fish.

The highest seasonal variation in intensity of cestode, trematodes and nematodes of helminth parasites was in summer season while lowest in rainy season. The highest relative density and index of infection of all helminth parasites was also in summer season and lowest in rainy season which are given in table1. The high incidence/ prevalence and intensity during summer season were due to elevated temperature, organic enrichment of the water bodies caused by pollution that influences the occurrences of parasitic infection in fishes. According to Verma *et al.*, (2018), the prevalence and intensity of parasites depends on many factors such as temperature, type of parasite and host's feeding habits. Kennedy (1076) also reported that changes in climatic condition such as temperature, pH and conductivity effect on the occurrences of parasites from aquatic host. High temperature, low rainfall and humidity were necessary for development of parasite. The present study also supports the role of environmental factors like pH, temperature and

dissolved O₂ levels in controlling the parasitic fauna either directly or indirectly.

The present investigation indicates that the helminth parasite is extensively distributed in gastro-intestinal tract of edible fresh water fish. Due to the presence of these parasites, the physiological activities of the host fishes are hindered and their developmental growth is retarded which cause economic loss to the fishery industry and piscine culture. Beside this, there is always the strong possibility of their infection to the human beings by consumption of these infected fishes.

CONCLUSION

The result of present study can be concluded that the prevalence, intensity, density and index of infection of helminth parasite were highest in summer season followed by winter and rainy season. Thus, it can be concluded that environmental factors influencing the seasonality of parasitic infection either directly or indirectly. At Present, India has second position in the world in total fish production, therefore if we are not aware to the mortality caused by parasitic infection, it may cause the serious loss in fish production.

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