



PREVALENCE OF PISCAN CESTODE, *MYSTOIDES CHHAVIENSIS* IN FRESHWATER FISH FROM BUNDELKHAND REGION OF UTTAR PRADESH, INDIA

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Abstract: The present investigation deals with the preliminary study of Piscian cestode parasites *viz. Mystoides chhaviensis* collected from the intestine of a freshwater fish, *Channa punctatus* (Bloch). The experiment was conducted between February 2018 and January 2020 and the samples were collected from different sites of Bundelkhand region of Uttar Pradesh during all the three seasons *namely* summer, monsoon and winter. The prevalence of infection was recorded maximum during winter season (0.180%), moderate in monsoon (0.129%) and lowest in summer (0.046%). The intensity of parasites varies as 1.256%, 1.107% and 1.10% during winter, monsoon and summer seasons respectively. Parasites showed a high degree of specialization and reproduced at a faster rate than their hosts. The parasitic worms are a crucial part of biodiversity on earth.

Keywords: Biodiversity, Freshwater fish, *Mystoides chhaviensis*, Piscian cestode, Prevalence.

INTRODUCTION

India is one of the 17 mega-diverse countries in the world and occupying ninth position in freshwater biodiversity (Morgolis *et al.*, 1982; UNEP-WCMC, 2014). In India it is estimated that about 10 million tons of fishes are required to meet the annual demand of fish proteins as compared to an actual annual production of only 3.5 million tons (Srivastav *et al.*, 2007). These edible fishes are known to harbour a number of helminth parasites which cause deterioration in their health thereby affecting their commercial and nutritive value. Fishes are the important source of protein for human (Verma, 2007) and also play an important role in national economy as it provides employment opportunity. They get infection from various kinds of parasites frequently (Peddinti *et al.*, 2021). Diseases affect

the normal health conditions and cause reduction of growth, abnormal metabolic activities and even death. With increasing interests in aquaculture, fish parasites and their infections are matter of concern since they affect productivity especially inland culture fishery by decreasing their reproductive potential, market and nutritive value (Prakash and Singh, 2020).

A parasitic disease reduces the fish production and profitability, because of increased stocking density of fishes in fishery ponds, fish pathogens can easily transmit from one fish to another (Prakash, 2021). The parasites may cause mortality and morbidity in cultivable fishes resulting in great loss in fish production as well as economic loss to be culturists (Prakash *et al.*, 2011; Prakash and Verma, 2017). Parasitic

diseases are the limiting factors in fish culture, because of increased density of fish in lentic water bodies where the fish pathogens can easily transmit from one fish to another. These pathogens may cause fish mortality in cultured fishes where the entire fish population of waterbody may be killed, resulting the great economic loss of fish farmers (Prakash and Verma, 2020).

Parasites of fishes are one of the major problems to fish health. A number of literatures are available regarding cestode parasites (Verma *et al.*, 2006, 2007) and population dynamics of helminth parasites across the globe but as far as cestode parasite in catfishes of Bundelkhand region is concerned, is not well documented. Keeping in view, importance of helminth parasitic infection in freshwater fishes, present study was designed to evaluate seasonal prevalence of helminth infestation in freshwater fishes. The experiment was performed from February 2018 to January 2020 and the samples were collected from different sites of Bundelkhand region of Uttar Pradesh, India during three different seasons *i.e.*, summer, monsoon and winter.

MATERIALS AND METHODS

In this study, intestine of *Channa punctatus* (Bloch) was examined for cestode infection. For this purpose, fish was collected from different localities of Bundelkhand Region of U.P., India. Cestodes were collected, preserved in 5% formalin, dehydrated in various alcoholic grades, stained with aqueous aceto-carmin solution as described by Khalil (1991) and mounted in Canada balsam. These cestodes were identified by standard methods (Schmidt, 1986). Incidence or Prevalence (%) and Mean Intensity (%) of cestode parasites were determined by using the formula proposed by Margolis *et al.* (1982).

$$\text{Prevalence (\%)} = \frac{\text{Total No. of infected fish (host)}}{\text{Total No. of fish (host) examined}} \times 100$$

$$\text{Intensity of Infection (\%)} = \frac{\text{Total No. of Parasites collected}}{\text{Total No. of infected fish (host)}} \times 100$$

RESULTS AND DISCUSSION

Prevalence and intensity of infection of *Mystoides chhaviensis* in *Channa punctatus* (Bloch) was given in the Table 1. In this study, the prevalence of infection was recorded maximum in winter season (0.180%), moderate in monsoon season (0.129%) and low in summer season (0.046%). The intensity of infection in winter, monsoon and summer seasons were 1.256%, 1.107% and 1.10% respectively.

Authors found that the population dynamics of fish parasites depends on variation in environmental conditions and host population. Feeding activity of the host is basic cause for seasonal fluctuation of infections. Almost similar type of seasonal variations in prevalence and intensity of fish parasites was also observed by Narayan and Yadav (2019).

Farhaduzzaman *et al.* (2010) reported high prevalence (75%) of parasites in the Indian Major Carp, *Labeo rohita* (Ham.) in the month of December and lowest (20%) in the month of February. During summer, highest incidence of infection of *Senga sp.*, *Gangesia sp.* and *Proteocephalus sp.* in *Channa sp.* were observed as 76.66%, 73.33% and 70.00%, respectively. This is followed by winter as 65.21%, 52.17% and 56.52% and lowest in monsoon as 36.84%, 26.31% and 31.57% (Bhure and Nanware, 2014). The incidence of infection of *Senga microrostellata* was recorded 80.00% in summer season followed by winter (52.50%) and monsoon (37.50%) (Dhanraj *et al.*, 2014). Yamaguti (1959) reported highest prevalence during summer season and lowest in rainy season. Narayan and Srivastav (2016) reported high incidence of infection in summer season (21.66%) followed by winter (28.33%) and monsoon (26.66%). They reported high incidence of infection in summer season (73.75%), followed by winter (51.25%) and low in monsoon season (48.75%). The higher prevalence and mean intensities of interspecific parasites in fishes signifies the body texture and composition of host (Peddinti *et al.*, 2021).

On the basis of above results and discussion, it can be concluded that due to the change in

Table1: Seasonal Prevalence and Intensity of *Mystoides chhaviensis* in *Channa punctatus* (Bloch) during Feb. 2018 to January 2020.

Sl. No.	Season	Number of hosts examined	Number of hosts infected & their Prevalence	Number of parasites collected & their mean intensity	Habitat
1.	Summer	432	20 (0.046%)	22 (1.10%)	Matatila dam, Govindsager dam-Lalitpur Parichha dam, Betwa river, Pahuj river-Jhansi Yamuna river-Hamirpur, Kalpi
2.	Monsoon	432	56 (0.129%)	62 (1.107%)	Matatila dam, Govindsager dam-Lalitpur Parichha dam, Betwa river, Pahuj river-Jhansi Yamuna river-Hamirpur, Kalpi
3.	Winter	432	78 (0.180%)	98 (1.256%)	Matatila dam, Govindsager dam-Lalitpur Parichha dam, Betwa river, Pahuj river-Jhansi Yamuna river-Hamirpur, Kalpi

seasonal variations, prevalence of infection of cestode, *Mystoides chhaviensis* in *Channa punctatus* (Bloch) varies in different parts of Bundelkhand region of (U.P.) India.

Seasonal environmental changes of water such as temperature, pH and conductivity effect on the occurrence of parasites from aquatic hosts. Outcome of present study is expected to be helpful for the future research on helminth parasites in freshwater fishes in this area of Bundlkhand.

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