



Research Article

STUDIES ON THE PREVALENCE AND SEASONAL VARIATION OF CESTODE PARASITES FROM FRESHWATER FISH, *CLARIAS BATRACHUS* (LINNEAUS)

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ABSTRACT

The present study deals with prevalence and seasonal variations of cestode parasite, *Lytocestus vyasaiei* (Pawar, 2011) found to infect the fresh water fish, *Clarias batrachus* from Marathwada region of Maharashtra, during Dec. 2003 to Nov. 2005. The seasonal changes on the basis of incidence (prevalence) of infection in both the cycle prevalence was totally nil in rainy season, during the winter season incidence of infection was high as compared to summer season.

Keywords: Cestode parasite, *Lytocestus vyasaiei*, *Clarias batrachus*, Incidence, Marathwada.

INTRODUCTION

Assessment of infection levels in the host as well as host population provides important information about the success of the parasite life cycle, the severity of its pathogenicity and the effectiveness of host immunity (Angali Dhar 2003). *Lytocestus vyasaiei* (Pawar, 2011) is a caryophyllaeid cestode parasite commonly occurring in stomach and intestinal duodenal junction of fresh water fishes. It is a common cestode parasite found in majority of predatory or carnivorous fresh water fishes (*Clarias batrachus*, *Channa striatus*, *Wallago attu*, *Channa punctatus*), especially in the tropics and subtropics. In the present study, this parasite was found frequently to occur in the host, *Clarias batrachus*. The occurrence of cestode parasites found in piscian hosts was reported by several investigators (Moghe, 1925 and 1931; Hopkins (1959); Satpute and Agarwal, 1974 a, b; Dogioel *et al.*, 1970, Kennedy (1968, 1971, 1975, 1976, 1977); Kadav and Agarwal, 1983; Zaman and Seng, 1990; Laxma Reddy and Benarjee, 2008, 2011; Hiware C. J. *et al.*, (1999, 2005, 2007, 2008) and R.T. Pawar (2011, 2016, 2022). Results of present study, therefore, are expected to be helpful for future research on piscian cestodes in Marathwada region. Keeping in view, the importance of these Piscian cestode parasites, present study was undertaken to investigate and

evaluate prevalence and seasonal variation of cestode parasites of freshwater catfish *Clarias batrachus*.

MATERIAL AND METHODS

The fish, *Clarias batrachus* were procured from freshwater bodies such as rivers, tanks, lakes and ponds and local fish market of different places of Marathwada region throughout the year in all months and in all seasons with more or less periodicity during the period, Dec. 2003-Nov. 2004 and Dec. 2004-Nov. 2005. The parasites collected from the infected fish were enumerated and permanent slides were prepared by preserving the fresh parasites in 4% formalin for 48 hours and later stained with Alum carmine (Pearse, 1968; Bancroft, 1975)

The influence of annual seasons on the population of cestode parasites of fishes was worked out on the basis of percentage of incidence (Prevalence) of infection by using following formula.

$$\frac{\text{Infected host} \times 100}{\text{Total hosts examined}}$$

$$\text{The \% of incidence of infection} = \frac{\text{Infected host} \times 100}{\text{Total hosts examined}}$$

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RESULTS AND DISCUSSION

The present study indicates that the prevalence and seasonal variation of cestode parasite *Lytocestus vyasaiei* (Pawar, 2011) in the population of fish *Clarias batrachus* are given in Table no 1. The mean % of incidence of

infection is shown in Table no 2. and seasonal variation for two annual cycle as shown in Table no. III. Graphs are drawn accordingly and are presented- Month wise population, mean % of incidence (Figure. 1 and 2) and seasonal changes (Figure 3).

Table 1. Showing incidence of infection of *Lytocestus vyasaiei* n.sp. In the population of *Clarias batrachus* during Dec. 2003 to Nov. 2005.

Month and Year	No. of host examined	No. of host infected	No. of parasites collected	% of incidence of infection
2003-2004				
Dec. 2003	27	07	24	25.93
Jan. 2004	14	04	17	28.57
Feb. 2004	20	02	04	10.00
Mar. 2004	13	05	14	38.46
Apr. 2004	25	---	---	---
May 2004	27	---	---	---
Jun. 2004	16	---	---	---
Jul. 2004	27	---	---	---
Aug. 2004	18	---	---	---
Sept. 2004	20	---	---	---
Oct. 2004	19	---	---	---
Nov. 2004	21	06	20	28.57
Total/Mean	247	24	79	10.96
2004-2005				
Dec. 2004	10	05	25	50.00
Jan. 2005	12	11	72	91.66
Feb. 2005	22	14	94	63.63
Mar. 2005	12	---	---	---
Apr. 2005	08	---	---	---
May 2005	14	---	---	---
Jun. 2005	18	---	---	---
Jul. 2005	05	---	---	---
Aug. 2005	17	---	---	---
Sept. 2005	08	---	---	---
Oct. 2005	04	01	03	25.00
Nov. 2005	12	04	09	33.33
Total/Mean	142	35	203	21.97

Table 2. showing the mean % incidence of infection, total host examined, infected, and collected parasites of the cestode *Lytocestus vyasaiei* n.sp. in *Clarias batrachus*.

Year	Total host examined	Total host infected	Total parasites collected	Mean % of incidence
2003-2004	247	24	79	10.96
2004-2005	142	35	203	21.97
Year	Rainy season	Winter season	Summer season	
2003-2004	----	30.76	12.11	
2004-2005	----	49.99	15.90	

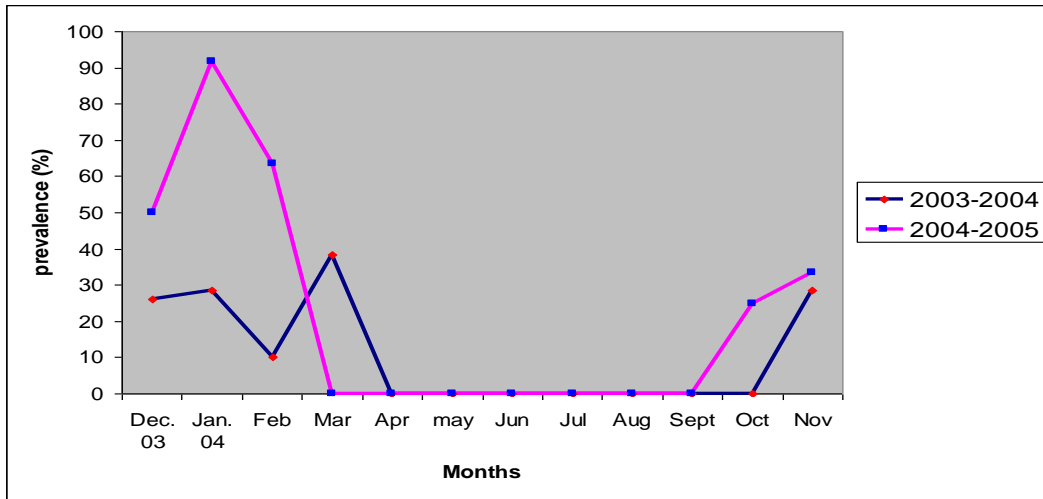


Figure 1. Monthly changes prevalence of infection in *Lytocestus vyasaiei* during two annual cycles 2003-2004 and 2004-2005.

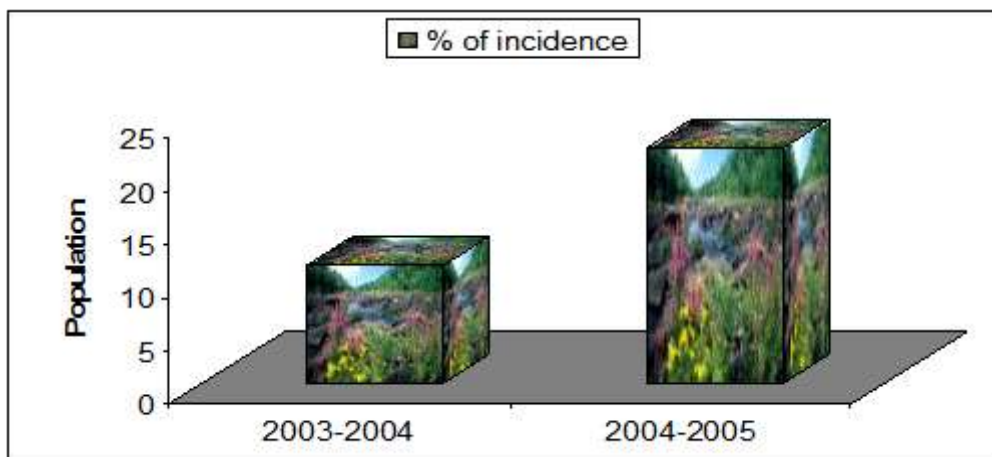


Figure 2. Mean % of prevalence of infection during two annual cycles in *Lytocestus vyasaiei*.

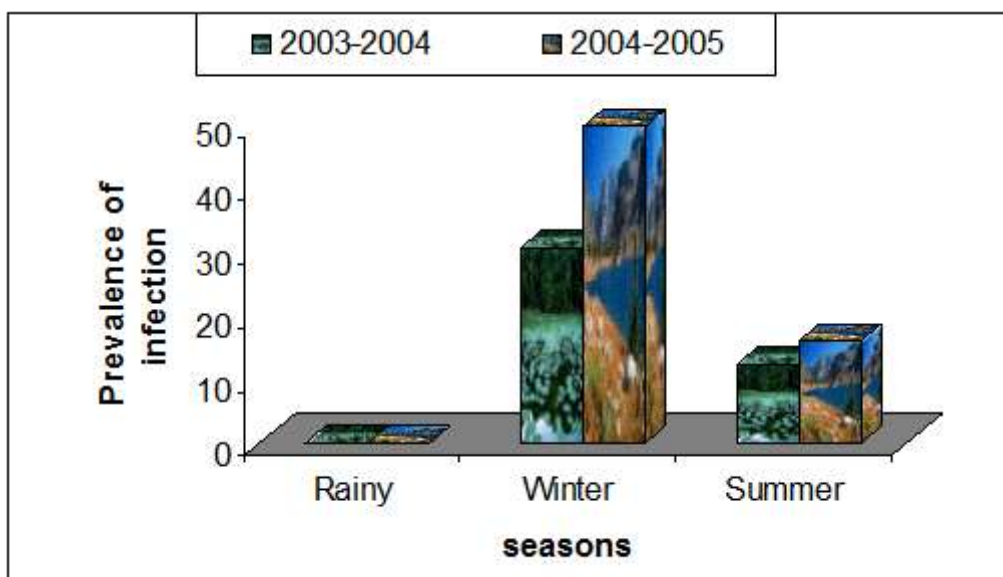


Figure 3. Seasonal changes on the prevalence of infection of the *Lytocestus vyasaiei* during two annual cycles.

In 2003-2004 the prevalence appears to be high almost for five months i.e. January, February, March, November, and December and remaining months was totally absent. Whereas, in 2004-2005 the cycle shows slight variation i.e. prevalence of infection was high January, October, November and December, and remaining months was totally absent. A comparative graphical presentation for the two years is given in Figure 1. both cycles a very good coherence in their prevalence from the data and graph. It is clear that mean prevalence of infection is high when compared to 2003-2004 (Graph). The seasonal changes on the basis of incidence (prevalence) of infection in both the cycle prevalence was totally nil in rainy season, during the winter season incidence of infection was high as compared to summer season. According to Kennedy (1971, 1975, and 1977) and Rohde (1993) the factors responsible for influencing the parasite infection are the temperature, feeding habits of host, availability of infective host and parasite maturation. Such parameters can be easily studied in freshwater fishes. Experimental studies by Kennedy (1971) have shown that the cestode *Caryophyllaeus laticeps* can establish in fish and survive for longer period at low temperature as the water temperature rose new infections were eliminated. Hence he says that the temperature is major controlling factor of seasonal periodicity of infection. Rohde (1993) also express more or less the same view that temperature controls parasitization. He says that the infections are more in warm seas than in colder ones and also with different types of species. In the present study the prevalence of infection are high during the periods of low temperature and low during the periods of high temperature. This supports the view that the temperature is influencing the seasonality of parasitic infections either directly or indirectly. Feeding activity of the host also be one of the reasons for the seasonal fluctuation of infections according to Pennuquick (1971a, 71b) the activity of stickle backs and their choice of food will affect the degree to which they become infected with cestodes.

CONCLUSION

Catfish were infected with large number of parasites in winter months, because the environmental conditions are favorable in winter months. The water is warm but not cold. At moderate temperatures the zooplankton fauna may be rich when compared to high temperature of summer months. This probably corresponds to the peak in the feeding activity of the fish together with the richness in the intermediate host fauna may be the crustaceans, smaller mollusks and fish resulting in high infections. Thus, temperature and seasons play an important role in the recruitment of parasitic fauna.

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