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Studies on the prevalence and seasonal variation of *Gangesia (Gangesia) ramkai* (Pawar, 2008) from freshwater fish, *Wallago attu* (Bleeker)

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Abstract

The present study deals with prevalence and seasonal variations of cestode parasite, *Gangesia (Gangesia) ramkai* found to infect the fresh water fish, *Wallago attu* (Bleeker) from Marathwada region of Maharashtra, during Dec. 2003 to Nov. 2005. The seasonal changes incidence (Prevalence) of infection in both the cycle prevalence of infection was high in rainy season, moderate in winter season and low in summer season. The results of present study clearly indicate that environmental factors and feeding habitat influence the seasonality of parasitic infection either directly or indirectly.

Keywords: prevalence, *Wallago attu*, cestodes parasites, Marathwada, *Gangesia (Gangesia)*

Introduction

The study of cestodes parasites population of fresh water catfishes from various places of Marathwada region and has been undertaken to investigate the phenological factors such as season, temperature, humidity and rainfall etc. The investigation of parasitocoenosis can provide data for the prediction of integrated methods to achieve the regulation of number of parasites from various genera, quantitative data are vital. While studying the abundance of parasitocoenosis, i.e. distribution of the cestode population of statistical methods and distribution of cestode parasites both at infra and supra population levels for each species of parasites in two annual cycles.

The considerable work on the population dynamics were carried out by many authors on different hosts. Dogiel *et al.* (1958, 1964) ^[10, 11], Sushella (1987) ^[32], Hopkins (1959) ^[14], Anderson (1976) ^[1], and Pennyuick (1971a) ^[27] have shown the effects of season on the geographical distribution of the cestode parasites. The other workers also studied the effect of climatic factors on the helminthes, include Kennedy (1968) ^[18], Lawrance (1970) ^[1], and Crofton (1971) ^[7] have elaborately studied the effect of seasonal variation on parasites of a fish *Gasterosteus aculeatus*. Reports on ecological studies on the helminth parasites of the alimentary tract of the host are accessible from various countries like U.S.S.R, Poland, Romania, France, Australia and India. Notable contribution were made by Odum, (1971) ^[25], Lees, (1962) ^[24], Kisielewska, K. (1970) ^[22], Thomas, R.J. (1981) ^[33], Bauer, O. N. (1959) ^[2], Ferguson (1943) ^[13], Dogioel *et al.* (1970) ^[9], Kennedy (1971,1976,1977) ^[16, 19], Esch (1977) ^[12], Hiware C. J. *et al.*, (1999, 2005, 2007) ^[4, 5, 6] and R.T. Pawar (2011, 2016) ^[29, 30] on freshwater fishes and many others. The information available in India about the effect of seasonal variation on the incidence of cestode parasites is very meager

Material and Methods

The cestode parasites infection data was collected from the freshwater catfish *Wallago attu* from ponds, reservoirs, river 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.

Cestode parasites were collected, preserved in hot 4% formalin, washed in saline and water, dehydrated in various alcoholic grades, stained with Harris haematoxylin and Borax carmine, cleared in xylene, mounted in D.P.X. Drawings were made with the aid of camera Lucida and identification by standard methods (Yamaguti, S., 1959; Wardle, R.A., Mcleod, J.A. and Radinovsky 1974; Khalil, Jones and Bray, 1994) ^[35, 20].

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.

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

Results and Discussion

The information regarding % of incidence (prevalence) of infection are given in Table no. I, mean incidence (Table no. II) and seasonal variation (Table no. III). Graphs are provided for month wise % of incidence (Figure. I), mean % of incidence (Figure. II) and seasonal changes (Figure no. III).

In 2003-2004 the prevalence of infection was high in the months is that January, May, July, August, November. It is low during March, April September and December, and during the months February, January and October was totally absent. Whereas, in 2004-2005 the prevalence of infection was high during the months, July, August, September, November and December, while low during the months February, April, May, and June and prevalence of infection was nil in the months January, March and October. Both the cycles the mean prevalence of infection is increased as compared in first year. The seasonal changes incidence (Prevalence) of infection in both the cycle prevalence of infection was high in rainy season, moderate in winter season and low in summer season.

The results of present study are in agreement with R.T.

Pawar, (2016) [29] reported the incidence, intensity is high in winter month moderate in rainy season and lowest in summer season these variations in the parasitic fauna can be related to difference in physiological characters of the environment through factors, which play an important role. environmental variables include high temperature, low rainfall, sufficient moisture, water temperature, crowding that are necessary for development of parasite. High prevalence occurs in summer followed by other seasons Sharma *et al.* (2010) [31]. Borde and Jawale, (2012) [3] reported high cestodes infection (45.33%) from *Clarias batrachus* in summer season. Factors like temperature, humidity and rainfall, feeding habits of host, availability of infective host and parasite maturation are responsible for influencing the parasitic infections (Khan, 2012). Kasar *et al.*, (2012) [21, 15] reported high prevalence of Cestode *Valipora singhii* in summer. Kennedy C.R. (1976, 1970 and 1977) [16] explained temperature; humidity and rainfall, feeding habits of host, availability of infective host and parasite maturation are responsible for influencing the parasitic infections. Pennuyick (1973), reported fishes and other animals were infected with large number of parasites in late winter to end of summer months, as environmental conditions are favorable in these months.

Table 1: Showing incidence of infection of *Gangesia (Gangesia) ramkaei* n.sp. in the population of *Wallago attu* during Dec. 2003 to Nov. 2005.

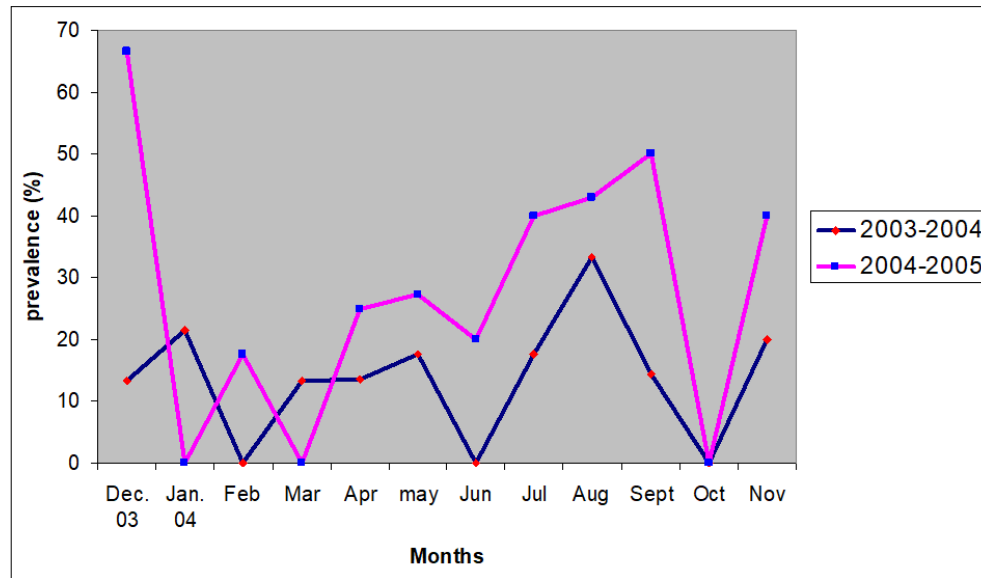
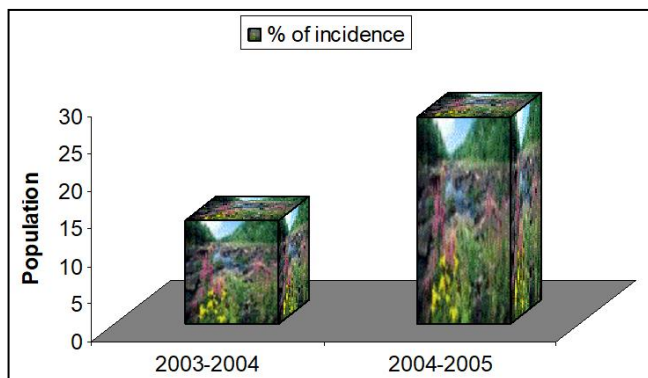
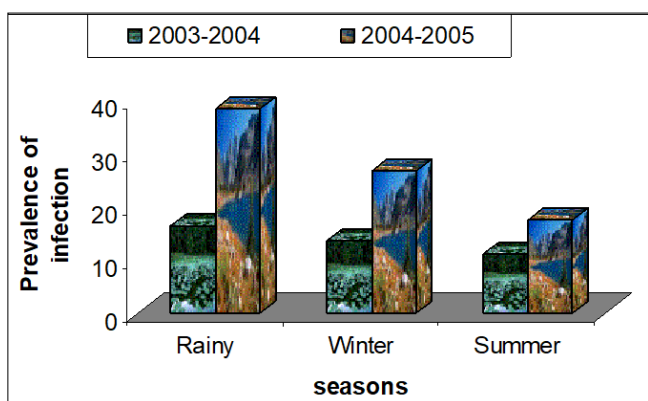
Month and year	No. of host examined	No. of host infected	No. of parasites collected	% of incidence of infection
2003-2004				
Dec. 2003	15	02	02	13.33
Jan. 2004	14	03	08	21.42
Feb. 2004	17	---	---	---
Mar. 2004	15	02	04	13.33
Apr. 2004	22	03	06	13.63
May 2004	17	03	10	17.64
Jun. 2004	16	---	---	---
Jul. 2004	17	03	10	17.64
Aug. 2004	12	04	08	33.33
Sept. 2004	07	01	02	14.28
Oct. 2004	21	---	---	---
Nov. 2004	20	04	13	20.00
Total/ Mean	193	25	63	13.71
2004-2005				
Dec. 2004	12	08	15	66.66
Jan. 2005	11	---	---	---
Feb. 2005	17	03	06	17.64
Mar. 2005	14	---	---	---
Apr. 2005	04	01	01	25.00
May 2005	11	03	07	27.27
Jun. 2005	05	01	01	20.00
Jul. 2005	05	02	05	40.00
Aug. 2005	07	03	08	42.85
Sept. 2005	12	06	12	50.00
Oct. 2005	12	---	---	---
Nov. 2005	10	04	06	40.00
Total/ Mean	120	31	61	27.45

Table 2: Showing the mean % of incidence of infection, total host examined, infected, and collected parasites of the cestode *Gangesia ramkaei* n.sp. in *Wallago attu*.

Year	Total host examined	Total host infected	Total parasites collected	Mean % of incidence
2003-2004	193	25	63	13.71
2004-2005	120	31	61	27.45

Table 3: Showing seasonal changes on the incidence of infection of the cestode *Gangesia ramkaei* n.sp. in *Wallago attu*.

Year	Rainy season	Winter season	Summer season
2003-2004	16.31	13.68	11.15
2004-2005	38.21	26.66	17.48

**Fig 1:** Monthly changes prevalence of infection in *Gangesia (Gangesia) ramkaei* n.sp. during two annual cycles 2003-2004 and 2004-2005.**Fig 2:** Mean % of prevalence of infection during two annual cycles in *Gangesia (Gangesia) ramkaei***Fig 3:** Seasonal changes on the prevalence of infection of the *Gangesia (Gangesia) ramkaei* during two annual cycles.

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