

The influence of body temperature on cestode infection in freshwater fish, *Mastacembelus armatus*

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ABSTRACT

The present investigation deals with the study of cestode host relationship in a fresh water fish, *Mastacembelus armatus* (Lacepede) in relation to the body temperature of the host. The maximum prevalence, mean intensity and relative density were recorded in the host fish ranging from 26-31°C and lowest at 32- 37°C body temperature respectively . The fishes at 20-25°C body temperature had no infection of cestode parasites

Figure : 01

References : 08

Table : 01

KEY WORDS : Body temperature, Cestode, *Mastacembelus armatus*, Mean intensity, Prevalence, Relative density

Introduction

Mastacembelus armatus is a well known edible fish of river Betwa, district Jhansi (U.P.) India. To study the nature of cestode infection in the host fish, two hundred and forty fishes were examined for two successive years from July 2003 to June 2005. In each month ten fishes were sacrificed. The prevalence, mean intensity and relative density of cestode infection has been worked out, in relation to body temperature of the host.

Material and Method

Live fishes were anesthetized with the help of chloroform. The alimentary canals of hosts were removed and cut open in the normal saline water in petridishes. The cestodes, were collected and counted separately in each infection. Body (cloacal) temperature of fishes were measured with the help of physical thermometer.

Formulae⁵ of prevalence, mean intensity and relative density were followed

Prevalence : Number of individuals of the host fish infected with cestode divided by number of hosts examined.

$$\text{Prevalence} = \frac{\text{Number of hosts infected}}{\text{Number of hosts examined}}$$

Mean Intensity : Total number of cestode parasites in a sample of host fish divided by number of infected individuals of host in the sample.

$$\text{Mean intensity} = \frac{\text{Total number of parasites obtained}}{\text{Total number of hosts infected}}$$

Relative Density : Total number of individuals of

cestode parasites in a sample of host fish divided by total number of individuals of the host.

$$\text{Relative density} = \frac{\text{Total number of parasites obtained}}{\text{Total number of hosts examined}}$$

Observations

Average annual variations in the prevalence, Mean intensity and relative density of cestode infection in relation to the cloacal temperature (Table-1, Fig.-1) are given below:-

1. The maximum prevalence of cestode infection (0.23) was recorded in the host ranging from 26-31°C cloacal temperature while minimum (0) in the host cloacal temperature ranging 20-25°C.
2. The maximum mean intensity of cestode infection (1.695) was recorded in the host ranging from 26-31°C cloacal temperature while minimum (0) was recorded in the host ranging from 20-25°C.
3. The maximum relative density of cestode infection (0.39) was recorded in the host ranging from 26-31°C while minimum (0) in the host ranging from 20-25°C.

Discussion and Conclusion

The present observations of host parasite relationship, *Mastacembelus armatus* (Lacepede) shows annual prevalence, mean intensity and relative density of cestode infection highest at 26 – 31°C of cestode parasites (Table-1, Fig.-1).

The temperature affects egg production, larval development, maturation and worm survival in many fish monogeneans, thus controlling seasonal population

TABLE-1 : Average annual variations in the prevalence, Mean intensity and relative density of cestode infection in relation to the body temperature of the host

Body temperature °C	No. of hosts		Prevalence	Number of cestodes obtained	Mean intensity	Relative density
	Examined	Infected				
20-25	40	0	0	0	0	0
26-31	100	23	0.23	39	1.695	0.39
32-37	100	8	0.08	10	1.25	0.1

cycles¹. It has been reported³ that in many cestodes, temperature is the single most important factor influencing seasonal cycles, either directly, affecting recruitment and mortality as indirectly, affecting host immune responses and predator-prey interaction between final and intermediate hosts and reported that maximum activity of parasites occurred at 25-30°C. The present observation also supports the earlier interpretation⁸ that maximum growth occurred at 27°C and declined above 34°C and below 20°C. It was also reported that higher annual prevalence, mean intensity and relative density of cestodes infection in fresh water fish, *Heteropneustes fossilis* (Bl.) occurred at 25.5–29.4°C body temperature⁴. There was

maximum infection of cestode infection in first half of summer season⁷. High infection of cestode parasites occurred in summer season⁶. It was also reported that increasing environmental temperatures promote the parasite rather than the host and the host tolerance is dependent on the interaction between parasite infection and temperature. Since fish are cold blooded therefore their body temperature varies with external temperature

On the basis of above discussion it can be concluded that the body temperature ranges from 26°C to 31°C in *Mastacembelus armatus* (Lacepede), provides more favourable conditions for cestodes infection.

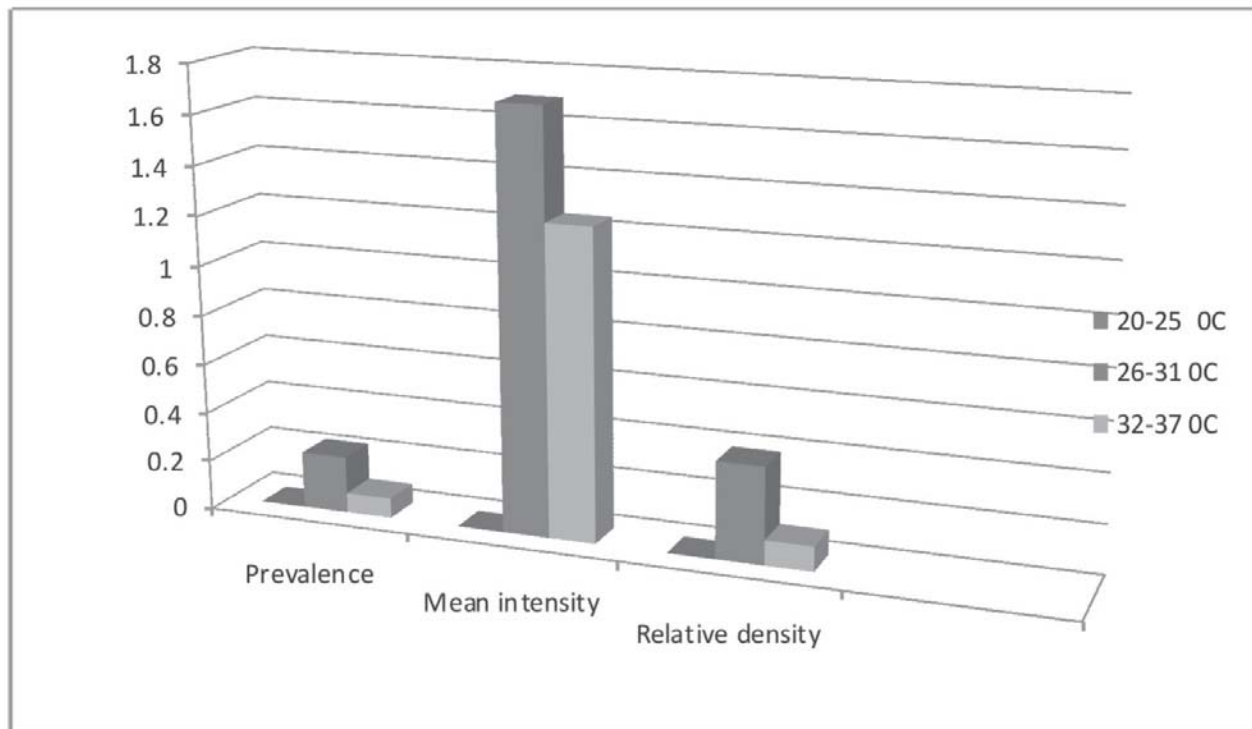


Fig. 1 : Average annual variations in the prevalence, mean intensity and relative density of cestode infection in relation to the body temperature of the host

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