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# Influence of some Phenological Factors on the Caryophyllaeid Cestode *Lytocestus* Parasitising Freshwater Fish *Clarias batrachus* (Linnaeus)

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## Article Info

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## Abstract

The present communication deals with the study of the influence of temperature, humidity and rainfall on the incidence of infection of the cestode parasite, *Lytocestus* parasitising the air breathing freshwater predatory fish, *Clarias batrachus* (Linnaeus) and results showed pronounced impact on the cestode parasite infection collected from three districts of Marathwada Region Viz. Aurangabad, Parbhani and Nanded for the period of one year (December 2003 to November 2004).

The values for percentage of incidence, intensity, density and index of infection were also seen throughout the study period.

**Key Words:** Cestode parasites, *Clarias batrachus*, Temperature, Humidity and rainfall.

## Introduction

The infection levels of any parasites depend not only on the changes in ecological stability of the host but also on certain external factors. Among the several physical and chemical factors that influence the infection of parasites, temperature, humidity and rainfall are most significant. This is all the more true in the case of poikilothermous hosts, which are easily influenced by the variations of the climatic factors. The seasonal fluctuation plays a significant role on the helminth infection [3]. The effect of temperature upon the establishment and survival of the cestode parasite, also reported the influence of temperature and rainfall on the helminth infection in amphibian hosts [2, 4, and 5].

## Materials and Methods

From the local fish markets of three districts, Aurangabad, Parbhani and Nanded of Marathwada region, the host *Clarias batrachus* Linnaeus (1758) were procured throughout the year in all months with more or less regular periodicity, brought to laboratory, autopsied, and examined for cestode infection. The parasites were collected washed with saline solution and preserved in 4% formaline, some were processed for taxonomic study; stained with Grenacher's Alcoholic Borax carmine, dehydrated, cleared in xylene, mounted in DPX and identification was carried out with the help of Systema Helminthum [6]. The data obtained throughout the year was processed, scrutinized and analyzed to derive the various biostatistical parameters such as incidence, intensity, density and index of infection. Monthly mean temperature, humidity and rainfall were taken into account and their impact on the incidence of infection was studied.

## Results and Discussion

After taxonomic identification the parasite turned out to be the new species of the genus *Lytocestus* Viz. *L. vyasaiei* n.sp. and *L. purnensis* n.sp. occurring in *Clarias batrachus* Linnaeus (1758).

The present investigations revealed that the influence of temperature, humidity, and rainfall on the incidence, intensity, density and index of infection of the two new species of genus *Lytocestus* occurring in *Clarias batrachus* from three districts of Marathwada region. (Table I.)

The incidence of infection was highest in the month of December 2003 to March 2004 when the temperature range was low and high (25.00 – 26.92 and 27.44 – 34.00°C) respectively; humidity range was moderate and lowest (51.79 – 55.40 and 32.17 – 50.47%) and rainfall range was nil except in the month of Dec. 2003 (2.32mm Aurangabad) but from Aurangabad, Parbhani and Nanded districts (Graph 1 to 3).

The October & November month temperature was low (25.81 – 27.91°C); humidity range was moderate (50.70 – 65.64%); rainfall range it was (8.20 – 105.07mm), during the April & May month temperature was high (31.96 – 36.48°C); humidity range was (30.08 – 50.82%); rainfall range was nil and during the June, July, August & September months temperature was moderate (26.00 – 33.38); humidity range was high (68.58 – 92.05%); rainfall range was high (24.00 – 125.00mm) favored the incidence of infection was totally nil from Aurangabad, Parbhani and Nanded districts but from Parbhani district the incidence of infection was observed in the month of November 2004, during the period of low temperature, moderate humidity and rainfall it was nil.

The temperatures have a significant bearing on the stability of infection levels. Since this is a variable factor, the effect they exert on infection levels, also varies. This view is strengthened statement that development rate of the parasite increases with the increasing temperature [1].

According to Kennedy the factors responsible for influencing the parasite infection are the temperature, feeding habits of host, availability of infective intermediate hosts and parasite maturation [2].

Table-1 : The influence of temperature, humidity, and rainfall on the incidence, intensity, density and index of infection of the *Lytocestus vyasae* n.sp. and *Lytocestus purnensis* n.sp. occurring in *Clarias batrachus*, Linnaeus (1758) from three districts of Marathwada region.

Year & Month	Districts	% of incidence of infection	Intensity of infection	Density of infection	Index of infection	Temperature °C	Humidity %	Rainfall MM
2003 December	A	25.92	3.42	0.88	0.230	25.05	53.80	2.32
	P	14.28	4.00	0.57	0.081	26.32	51.79	00.00
	N	50.00	3.14	1.57	0.785	25.00	55.40	00.00
2004 January	A	28.57	4.25	1.21	0.346	25.75	54.11	00.00
	P	40.00	4.00	1.60	0.64	26.92	50.85	00.00
	N	58.33	3.85	2.25	1.312	26.47	50.49	00.00
February	A	10.00	2.00	0.20	0.020	27.44	40.53	00.00
	P	55.55	3.00	1.66	0.92	28.70	50.47	00.00
	N	35.71	7.00	2.50	0.892	28.22	35.44	00.00
March	A	38.46	2.80	1.07	0.414	33.62	32.17	00.00
	P	50.00	4.00	2.00	1.00	34.00	44.00	00.00
	N	16.16	2.00	0.33	0.055	30.81	37.35	00.00
April	A	---	---	---	---	33.84	37.79	00.00
	P	---	---	---	---	35.14	30.80	00.00
	N	---	---	---	---	31.96	39.48	00.00
May	A	---	---	---	---	33.90	57.27	00.00
	P	---	---	---	---	36.48	37.18	00.00
	N	---	---	---	---	34.92	50.02	00.00
June	A	---	---	---	---	31.71	68.58	55.00
	P	---	---	---	---	33.68	70.40	44.00
	N	---	---	---	---	31.22	69.55	71.00
July	A	---	---	---	---	29.26	77.77	75.00
	P	---	---	---	---	30.35	80.52	105.22
	N	---	---	---	---	31.01	74.32	24.00
August	A	---	---	---	---	26.76	87.59	105.00
	P	---	---	---	---	30.00	89.07	88.24
	N	---	---	---	---	30.45	88.00	27.00
Sept.	A	---	---	---	---	26.00	90.03	125.00
	P	---	---	---	---	28.64	92.06	77.25
	N	---	---	---	---	29.00	92.00	122.88
October	A	---	---	---	---	27.08	53.06	40.00
	P	---	---	---	---	27.91	65.64	25.00
	N	---	---	---	---	27.82	64.00	105.07
November	A	---	---	---	---	25.81	59.18	00.00
	P	22.22	3.00	0.66	0.148	26.82	68.67	8.20
	N	---	---	---	---	27.39	50.70	00.00

Aurangabad, P – Parbhani, and N – Nanded

A –

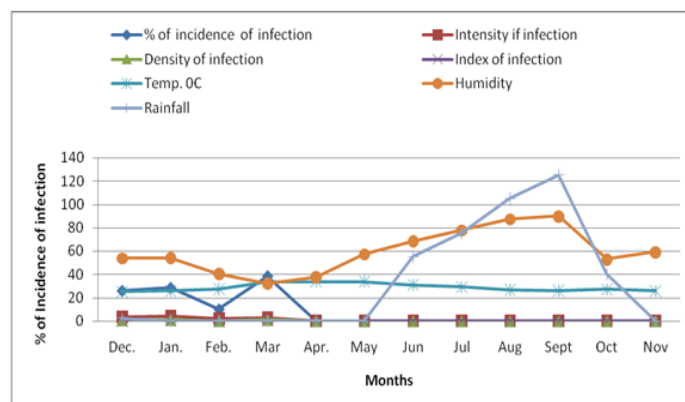


Figure 1. The influence of temperature, humidity and rainfall on the incidence, intensity, density and index of infection of the *Lytocestus vyasaei* n.sp. and *Lytocestus purnensis* n.sp. occurring in *Clarias batrachus* (L). from Aurangabad district

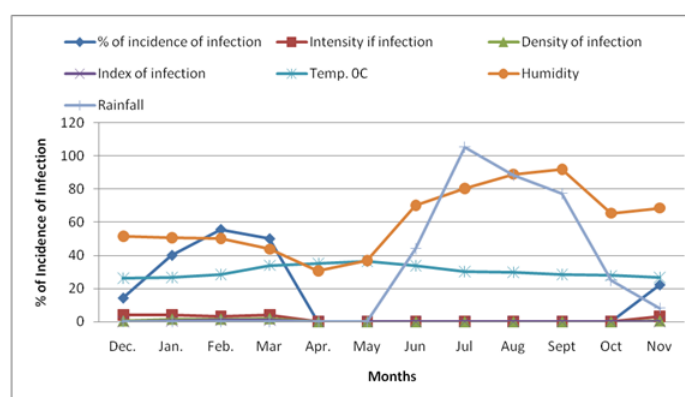


Figure 2. The influence of temperature, humidity and rainfall on the incidence, intensity, density and index of infection of the *Lytocestus vyasaei* n.sp. and *Lytocestus purnensis* n.sp. occurring in *Clarias batrachus* (L). from Parbhani district

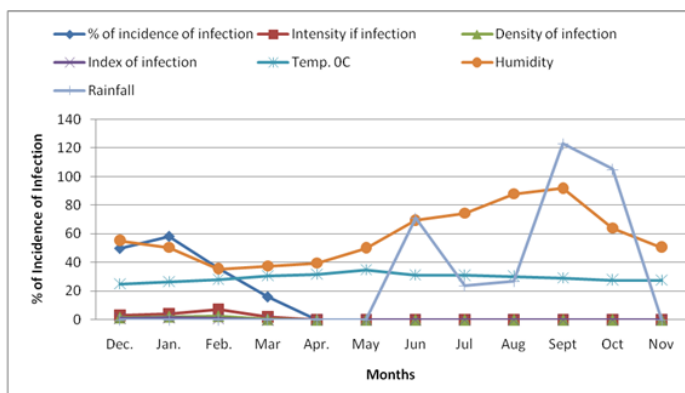


Figure 3. The influence of temperature, humidity and rainfall on the incidence, intensity, density and index of infection of the *Lytocestus vyasaei* n.sp. and *Lytocestus purnensis* n.sp. occurring in *Clarias batrachus* (L). from Nanded district.

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