



INFLUENCE OF TEMPERATURE AND RAINFALL ON THE HELMINTH INFECTION IN AMPHIBIAN HOSTS

D. T. Tangade and P. J. Misal

Department of Zoology, Siddharth Arts, Commerce and Science College Jafrabad-431206

Abstract:

The temperature affected the Helminth population and incidence of infection varied with the species. The high rainfall had an adverse effect on the incidence of infection and low rainfall always favored the increase of infection level in the three amphibian hosts *Rana tigrina*, *R. cynaphlyctis* and *Bufo melanostictus*

Introduction

The infection level of any parasite depend not only on the changes in ecological stability of the hosts but also on certain external factors such as temperature and rainfall. This is all the more true in case of the poikilotherms hosts which are easily influenced by the variations of the climatic factors. Temperature bring about a change in the hosts behavior which indirectly affects the recruitment and flow of the parasites (Kennedy, 1975). This communication deals with the observation on the effects of temperature and rainfall on the three amphibian hosts *viz.* *Rana tigrina*, *R. cynaphlyctis* and *Bufo melanostictus* during two annual cycles 2013-14 and 2014-15.

Materials and Methods

The amphibian hosts *Rana tigrina*, *R. cynaphlyctis* and *Bufo melanostictus* werw procured from various region of the Jalna district from July 2013 to june 2015. The hosts were dissected emmediatly after they were brought to the laboratory. The different groups of the helminthes *viz.* trematodes, cestodes and nematodes were identified, separated and counted. For the study of the influence of temperature and rainfall on the helminth infection, monthly mean temperature and rainfall were taken into account for 2013-14 and 2014-15 and their effect on the incidence of infection was studied.

Results and Discussion

The correlation between the temperature and the incidence of infections showed that there was an inverse relationship. During the period of low temperature (20.1°C), the incidence of infection was high (72.72%) and during the period of high temperature (32°C), the incidence of infection as very low (29.41%

table -2). This was the general principle one could make when the correlation between total incidence of infection and influence of temperature was taken into account.

However, there were marginal deviation from the above generalization when the individual incidence of infection of each helminth component In a host was taken into account (Rao, 1981). The influence of temperature seems to be operating differently on the different taxonomical, biological and topical groups due to different patterns of life cycles.

Therefore, the others contend that the temperature in addition to other seasonal factors, plays its due role in the stability, regulation and periodicity of the helminth parasite of *Rana tigrina*, *R. cynaphlyctis* and *Bufo melanostictus*. The influence of temperature was different in biohelminths and geohelminths.

The relationships between the total incidence of helminth infection o three amphibian hosts and the rainfall in millimeters recorded for each months during 2013-14 and 2014-15, was worked out and the analysis thus obtaintained showed that there was no uniform and consistent effect of rainfall on the infection levels (tables 1&2). It was generally observed that the incidence of infection was high when the rainfall was low, as was evidenced by the fact that the unprecedented rains in August and September, have reduced the infection levels and in the other months there was less or no rain, the incidence levels were fairly high.

Table 1: Influence of temperature and rainfall on the total helminthic infection in *Rana tigrina*, *R. cynophlyctis* and *Bufo melanostictus* during the annual cycle 2013-14.

Month & Year	% of incidence of infectin in . <i>R. tigrina</i>	% of incidence of infectin in . <i>R. cynophlyctis</i>	% of incidence of infectin in . <i>B. melanostictus</i>	Mean temperature in °C	Rainfall in mm
July 2013	30.00	33.76	42.00	26.7	191.8
Aug 2013	19.93	22.25	52.01	26.8	335.1
Sept. 2013	7.94	4.31	24.32	26.9	165.2
Octo. 2013	22.24	3.62	59.37	26.7	48.3
Nov. 2013	39.11	28.61	54.92	25.4	34.5
Dec. 2013	45.22	38.12	81.00	22.65	Trace
Jan. 2014	32.23	17.76	61.87	24.5	-
Feb. 2014	29.50	12.65	45.00	25.5	26.5
Mar. 2014	31.00	20.98	25.10	28.75	-
Apr. 2014	22.51	17.65	45.16	32.45	16.2
May 2014	37.91	22.94	33.34	32.40	47.0
Jun 2014	34.73	24.85	39.78	30.12	79.50

Table 2: Influence of temperature and rainfall on the total helminthic infection in *Rana tigrina*, *R. cynophlyctis* and *Bufo melanostictus* during the annual cycle 2014-15.

Month & Year	% of incidence of infectin in . <i>R. tigrina</i>	% of incidence of infectin in . <i>R. cynophlyctis</i>	% of incidence of infectin in . <i>B. melanostictus</i>	Mean temperature in °C	Rainfall in mm
July 2014	28.56	32.12	43.32	28.3	127.0
Aug 2014	17.25	23.16	52.64	28.4	139.7
Sept. 2014	5.38	2.37	27.00	26.7	177.5
Octo. 2014	24.35	3.22	59.53	25.4	127.3
Nov. 2014	35.37	14.99	52.72	24.5	53.9
Dec. 2014	39.36	34.32	72.72	20.5	3.5
Jan. 2015	37.50	22.24	63.51	23.5	7.3
Feb. 2015	32.25	19.41	39.29	25.5	23.7
Mar. 2015	31.45	22.74	22.74	27.9	3.5
Apr. 2015	22.50	19.27	45.76	31.45	41.00
May 2015	37.25	27.45	29.35	32.45	49.5
Jun 2015	37.75	32.12	37.54	29.67	99.3

References:

KENNEDY C.R. (1975): Ecological animal parasitology :- Scientific Publication, Oxford London, Edinburgh.

RAJESHWAR RAO, V. (1981): Ecological studies on helminthes parasites of Amphibians. Ph.D. Thesis Osmania University Hyderabad