

Population dynamics of cestode parasite in *Trygon zugei* from Ratnagiri district (M.S.), India

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Abstract

The present communication deals with the population dynamics of cestode parasite in *Trygon zugei* from different places of Ratnagiri District. (M. S.) India during the period of June 2009 to May 2010. Total 212 cestode parasites were recorded from 360 fishes. The collected parasites were of one genera i.e. *Tetragonocephalum* Shipley, [6]. This report summarizes the data incidence, intensity, density and index of infection of cestode parasites with effect of environmental factor.

Keywords: Population Dynamics, cestode parasites, infection, *Trygon zugei*

INTRODUCTION

Fish is an important human food as well as the source of income of a segment of the population. India's present total annual fish production is about 5.7 million tones. Population dynamics of cestode parasite from *Trygon zugei* was undertaken to investigate the innate factor and morphological character such as season, temperature, humidity, age and sex of the host. The common parasites of fishes causing the economic losses includes the cestode parasites like *Diphylllobothrium* [5], *Uncibilocularis* [7]. The present investigation included application of the statistical method to understand the distribution of cestode parasite of population levels for three seasons i.e. rainy, winter and summer during the period of June 2009 – May 2010.

MATERIALS AND METHOD

The marine water fishes were collected from different places of Ratnagiri District during the period of June 2009 to May 2010. The intestine of marine water fishes were dissected longitudinally, parasites kept in normal saline (0.9%) solution. Then cestode were collected, flattened and preserved in 4% formalin. These cestodes

were stained by Harris haematoxyline washed in distilled water, dehydrated in ascending grades of alcohol cleared in xylene mounted in D.P.X. and drawing are made with the aid of camera lucida. Identification was made with the help of "Systema Helminthum" vol.II. "Cestode of Vertebrates" [12].

Population dynamics of cestode parasites were determined by following formulae,

- 1) Incidence of infection =
$$\frac{\text{Infected host} \times 100}{\text{Total hosts examined}}$$
- 2) Intensity of infection =
$$\frac{\text{No. of parasites collected in a sample}}{\text{No. of infected host}}$$
- 3) Density of infection =
$$\frac{\text{No. of parasites collected in a sample}}{\text{Total host examined}}$$
- 4) Index of infection parasite =
$$\frac{\text{no. of host infected} \times \text{No. of collected}}{(\text{Total hosts examined})^2}$$

Observation

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Table No- 1 Population Dynamics of Cestode Parasites In the Intestine of *Trygon Zugei*

Name of Month	No of Host Examined	No of Host Infected	Total no of Parasite Collected	Incidence %	Intensity %	Density %	Index of Infection	Locality
Jun 09	30	00	00	00	00	00	00	Mirya
July 09	30	00	00	00	00	00	00	Ganpatipule
Aug 09	30	00	00	00	00	00	00	Nandiwad
Sep 09	30	00	00	00	00	00	00	Velneshwar
Oct 09	30	09	19	30	2.11	0.63	0.19	Mirkarwada
Nov 09	30	10	24	33.3	2.4	0.8	0.26	Ratnagiri
Dec 09	30	08	26	26.6	3.25	0.86	0.62	Har ne
Jan 10	30	08	14	26.6	1.75	0.46	0.12	Bankot
Feb 10	30	12	27	40	2.25	0.9	0.36	Mirkarwada
Mar 10	30	14	31	46.6	2.21	1.03	0.48	Ratnagiri
Apr 10	30	16	35	53.3	2.18	1.16	0.62	Burondi
May 10	30	15	36	50	2.4	1.2	0.6	Nandiwad
Total	360	92	212	25.55	2.30	0.58	0.15	Ratnagiri

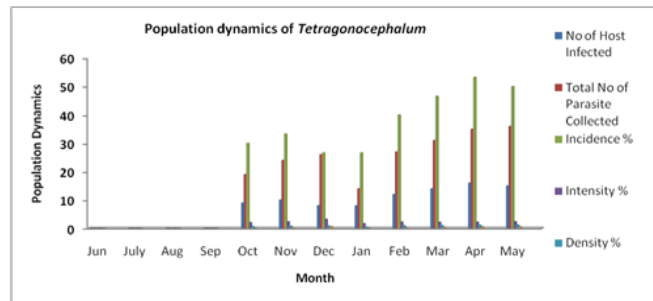
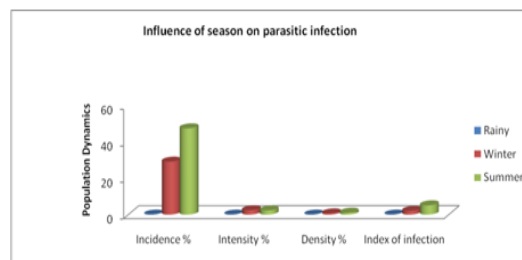


Table No 2- Influence of Season on Parasitic Infection.

Genera	Season	Incidence %	Intensity %	Density %	Index of infection
<i>Tetragonocephalum</i> Sp.	Rainy	00	00	00	00
	Winter	29.16	2.37	0.69	2.01
	Summer	47.5	2.26	1.07	5.10



RESULTS AND DISCUSSION

After all over observation out of 360 *Trygon zugei* marine fishes 92 (25.55%) fishes were infected with *Tetragonocephalum* Shipley [6] parasites from Ratnagiri District. A total 212 cestode parasites were found during the investigation one annual cycle and were belonging to one genera i.e. *Tetragonocephalum*. The value for the incidence, intensity, density and index of infection for *Tetragonocephalum* from *Trygon zugei* are shown in Table no 1 whereas the Table no 2 shows the influence of season on parasitic infection. During the present investigation degree of infection was high in summer season (47.5%), moderate in winter (29.16%) and least or Nil (00%) percentage occurs in rainy season, there is no infection in rainy season. This is may be due to the development of parasite requires high temperature, low humidity and less rainfall, which is best environment for the growth of parasite and feeding habitat. The infections of *Tetragonocephalum* are observed in *Trygon zugei* because of the host specificity. Morphological, physiological and ecological factors play important role in the host specificity. The valuable information pertaining to the influence of season on the cestode parasite was contributed by several workers like Tornquist [9] who described about the systematic method of occurrence of certain fish parasites *Camallanus lacustus* that the infective stages invade the host during summer, the growth and maturation takes place during autumn and winter release of their infective progeny occurs during summer. The growth and maturation takes place during winter and the release of their infective progeny occur during summer. Survey of seasonal infection of fish infected with cestode parasite has been done in other countries by various workers like Anderson [1] observed variation in the population dynamics of *caryophyllaceus lacticeps*. Thomas [8], Esch [2] they observed high infection in summer. Kennedy [4] and Williams [11] observed factors such as distribution and environment of the host, the diet and mode of feeding, often play important role to limit of parasite to a particular host species, as well as high prevalence occur in particular season. The habitat of *Tetragonocephalum* only observed in intestine of *Trygon zugei*. The same results of organ specificity from freshwater fishes also observed Jaywant Dhole [3]. This suggests that the worms are specific site and probably derive certain nutrients from the organs. This needs further investigation to establish the reasons for organ specificity. The subject of organ specificity among fish parasites has been reported by various researches for example, William and Jones [10] reported that host and organ specificity is determined by ecological requirements of the hosts and the parasites. Hosts when they share the same environment and have, for example, similar feeding requirements are likely to harbor parasites which are closely related taxonomically.

Thus this study implies that the population dynamics of *Trygon Zugei* infected by *Tetragonocephalum* is very high in summer followed by winter. During summer season the manifestation of cestode parasite was highest because of temperature which helps

hatching of eggs of parasites and enhances the rate of parasite where as winter season relatively shows low infection of the parasite and there is no infection in rainy season.

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