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Seasonality and Parasitic Infection of Cestodes, Hexacanalis to Their Host Trygon Zugei from West Coast of India (MS)

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Abstract:

The present study was undertaken to determine the incidence of helminth parasites in fishes in different locality of Arabian sea in Ratnagiri district of Maharashtra ,fish and their parasites were collected during different seasons from various sites of seashore like Bhagwati,Mirkarwada,Bhatye,Bankot,Mirkadwada etc for three year period and processed. Fish species namely Trygon zugei from these water bodies. In the presented study ,a three year survey has been performed total 10 species of fishes were examined .A total 258 cestodes were collected .The prevalence and mean abdunce of Hexacanalis is peak in summer and low in winter. These variations may be attributed to various environmental and biological factors including parasite life cycle and immune level of host.

Keywords :fish, cestode, prevalence biological factor,parasites

Introduction:

The work on the population dynamics were carried out by many workers on different hosts Dogiel et al (1958), (1964), Susheela (1987), Mittal (1980), Hopkins (1959), Anderson (1976), Pennyuick (1971). Gorder and kates (1950) have shown the effects of seasons on the geographical distribution of the cestode parasites. The other workers also studied the effect of climatic factors on the helminths, include Kennedy (1968-1969), Lawrence (1970), Crofton (1971), Patrick and Esch (1977) have elaborately studied the effect of seasonal variations on parasites of a fish, *Gasterosteus acileatus*.

The study of Cestode parasite population of marine water fishes of different regions of Ratnagiri district has been undertaken to investigate the phonological and innate factors such as season, habit and habitat. The investigation of parasitoeoenosis 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 and related to other parameters.

Material An Methodology :

The present study include application of statistical methods to understand and distribution of cestode parasites both at infra and supra population levels for each species of parasites in three annual cycles January 2002 – December 2004.

Identification of parasites :

The parasitological examination of fishes was carried as per methodology. The parasites were processed and identified with the help of key.The prevalence mean intensity and relative density of helminth parasites were calculatedin accordance with .The data collected was statically analyzed using SPSS version 20 softwere.data was exoposed by mean +SD and significant correlation and chi square test.

The present study include application of statistical methods to understand and distribution of cestode parasites both at infra and supra population levels for each species of parasites in three annual cycles January 2002 – December 2004.A careful elucidation was given from the observed data of changes in incidence, intensity density and index if infection of the parasites. Population investigations can provide data for the prediction of integrated methods to achieve the regulation of numbers of harmful parasites according to Kennedy (1975,1978).A careful elucidation was given from the observed data of changes in incidence, intensity density and index if infection of the parasites. Population investigations can provide data for the prediction of integrated methods to achieve the regulation of numbers of harmful parasites according to Kennedy (1975,1978).

Index of infection of host by parasite is calculated by formula

$$\text{Index of Infection} = \frac{\text{No.of infected host X no of parasites collected}}{\text{Total no. of Host Examined}}$$

Result And Discussion :

An Indispensable study was made by author on different cestode parasites from marine fishes of Ratnagiri district and are namely *Clarias batrachus* (Jerdon, 1849), *Mastacembellus armatus* (Lacepede, 1800), *Trygon sephen* (Cuvier, 1871), *Carcharias acutus* (Muller and Henle, 1906), and *Trygon zugei* (Muller and Henle, 1841).

The quantitative analysis of helminths and structural grouping was studied during three annual cycles i.e. January 2002 – December 2004.

It revealed that the cestode population was potentially dynamic with more or less durability, regularity and cyclic periodicity in the hosts under investigation. Each annual cycle comprises of

1} Rainy Season (June to September).2} Winter Season (October to January).

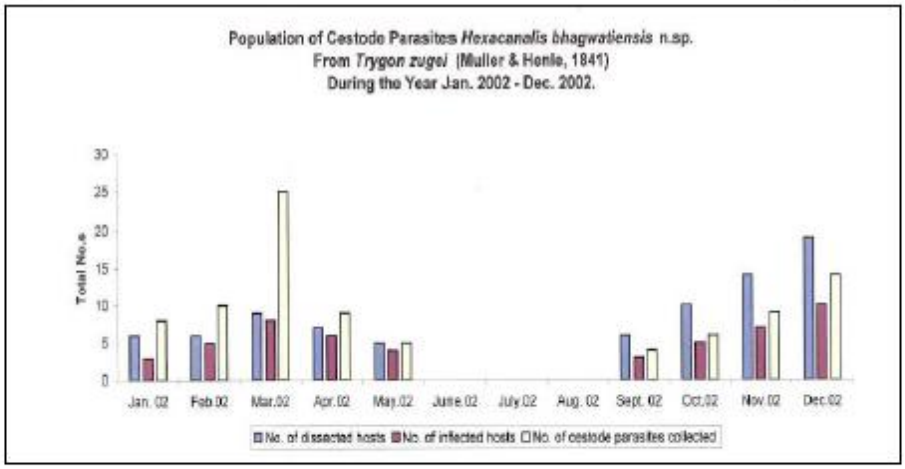
3} Summer Season (February to May).

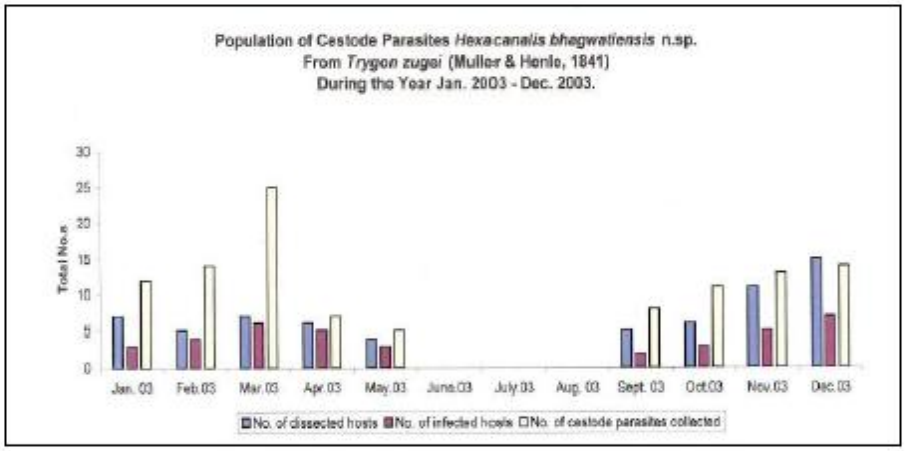
Report on ecological studies on helminth parasites of alimentary tract of the fishes are available from various countries like – U.S.S.R., Poland, Bulgaria, Romania, France, Australia and Hungary. Notable contributions were made by Elton, C. S. (1927), Ferguson (1943), Cole (1954), Less (1962), Thomas (1963), Dogioel et al (1969), Kennedy (1967), (1971) (1972), (1974), Kisielewska (1970), Odum (1971), Whitlock (1972), Boxshall (1974), Esch (1977), Raghvender Rao (1978), and Rajeshrao Rao (1981) etc. Bykhovski (1929) studied the importance of influence of infection in annual seasons about trematodes in the Volga district U.S.S.R.Since much of work is not undertaken to study the nature of helminths population in certain marine water fishes of various places of Ratnagiri district, (M. S.) India.

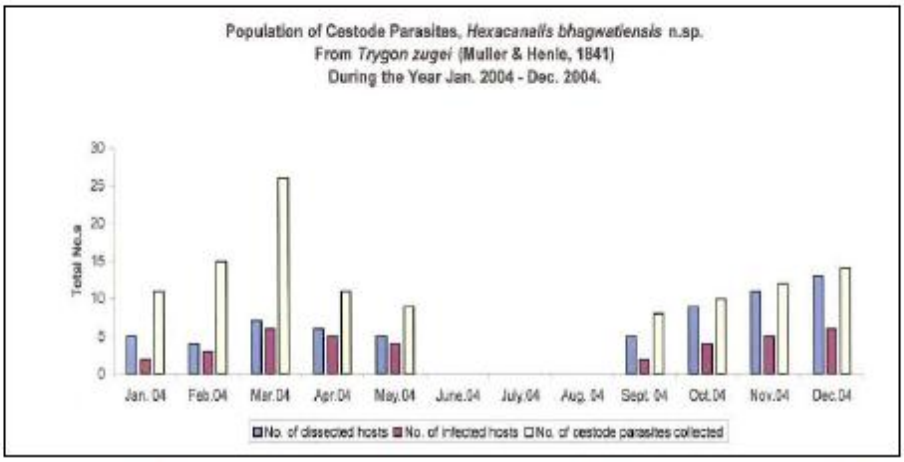
An attempt was made on the suggestions of Dr. B. V. Jadhav to study the population dynamic of cestode parasites.Hiware CJ(1994) Identify a new species of genus Benden from marine fish.Marcogliese (2001) shows implication of climate change for parasites. Only statistical study of cestode parasite infection was made by the author. The data are shown in the tables further with month and year wise with their different hosts during study period January 2002 – December 2004.During this period total 587 fishes were examined, out of which 364 fishes were infective,from these fishes 315 cestodes of Hexacanalis and 282 cestoces were Tylocephalum type and pecetage of infection of parasites to host was 59%..

Population of Cestode Parasites From Trygon zugei (Muller & Henle, 1841) During the Year Jan. 2002 - Dec. 2002.

Sr. No	Month & Year	No. of dissected hosts	No. of infected hosts	cestode parasites collected	Genera	Locality	Index of Infection	Incidence %
1	Jan. 02	6	3	8	*Hexacanalis*	Bhatye	4	50 %
2	Feb.02	6	5	10	*Hexacanalis*	Bhagawati	8.33	83%
3	Mar.02	9	8	25	*Hexacanalis*	Mirkarwada	22.22	88%
4	Apr.02	7	6	9	*Hexacanalis*	Bankot	7.71	85%
5	May.02	5	4	5	*Hexacanalis*	Bhatye	4	80%
6	June.02	0	0	0	*0*	----	0	0%
7	July.02	0	0	0	*0*	----	0	0%
8	Aug. 02	0	0	0	0	----	0	0%
9	Sept. 02	6	3	4	*Hexacanalis*	Bankot	2	50%
10	Oct.02	10	5	6	*Hexacanalis*	Mirya	5.4	50%
11	Nov.02	14	7	9	*Hexacanalis*	Bankot	4.5	50%
12	Dec.02	19	10	14	*Hexacanalis*	Mirkarwada	7.8	100%
13	Jan. 03	7	3	12	*Hexacanalis*	Harne	5.14	43%
14	Feb.03	5	4	14	*Hexacanalis*	Bhatye	11.2	80%
15	Mar.03	7	6	25	*Hexacanalis*	Bankot	5.8	85%
16	Apr.03	6	5	7	*Hexacanalis*	Bhagawati	3.75	83%
17	May.03	4	3	5	*Hexacanalis*	Mirya	3.40	75%
18	June.03	0	0	0	*0*	----	0	0%
19	July.03	0	0	0	*0*	----	0	0%
20	Aug. 03	0	0	0	0	----	0	0%
21	Sept. 03	5	2	8	*Hexacanalis*	Bhagawati	3.2	40%
22	Oct.03	6	3	11	*Hexacanalis*	Mirkarwada	5.5	50%
23	Nov.03	11	5	13	*Hexacanalis*	Bhatye	5.9	45%
24	Dec.03	15	7	14	*Hexacanalis*	Harne	5	45%
24	Jan. 04	5	2	11	*Hexacanalis*	Bankot	4.4	90%
26	Feb.04	4	3	15	*Hexacanalis*	Mirya	11.5	95%
27	Mar.04	7	6	26	*Hexacanalis*	Mirkarwada	22	96%
28	Apr.04	6	5	11	*Hexacanalis*	Bhagawati	9.1	83%
29	May.04	5	4	9	*Hexacanalis*	Bankot	7.2	80%
30	June.04	0	0	0	*0*	----	0	0%
31	July.04	0	0	0	*0*	----	0	0%
32	Aug. 04	0	0	0	0	----	0	0 %
33	Sept. 04	5	2	8	*Hexacanalis*	Bankot	3.2	40%
34	Oct.04	9	4	10	*Hexacanalis*	Bhatye	4.4	45%
35	Nov.04	11	5	12	*Hexacanalis*	Bhagawati	5.45	45%
36	Dec.04	13	6	14	*Hexacanalis*	Mirya	6.46	60%
	TOTAL	213	126	315			186	59%

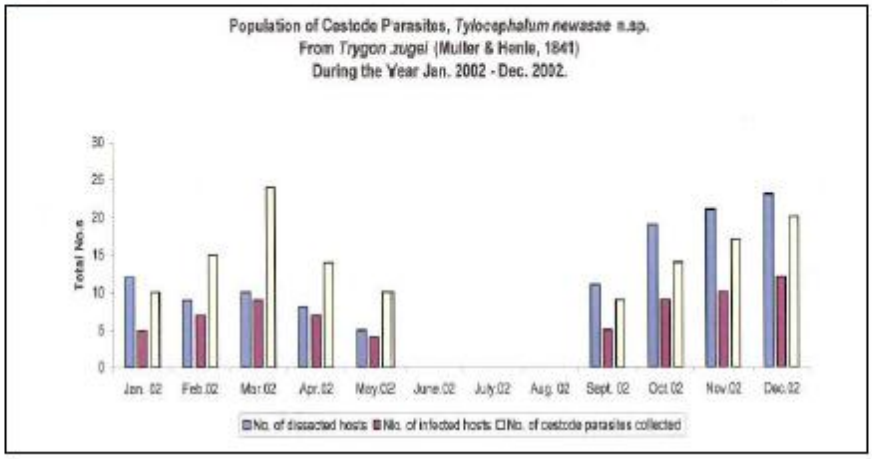

Population of Cestode Parasites Hexacanalis bhagwatiensis n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2002 - Dec. 2002.
Total No.s
30
25
20
15
10
5
0
Jan. 02
Feb.02
Mar.02
Apr.02
May.02
June.02
July.02
Aug. 02
Sept. 02
Oct.02
Nov.02
Dec.02
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected

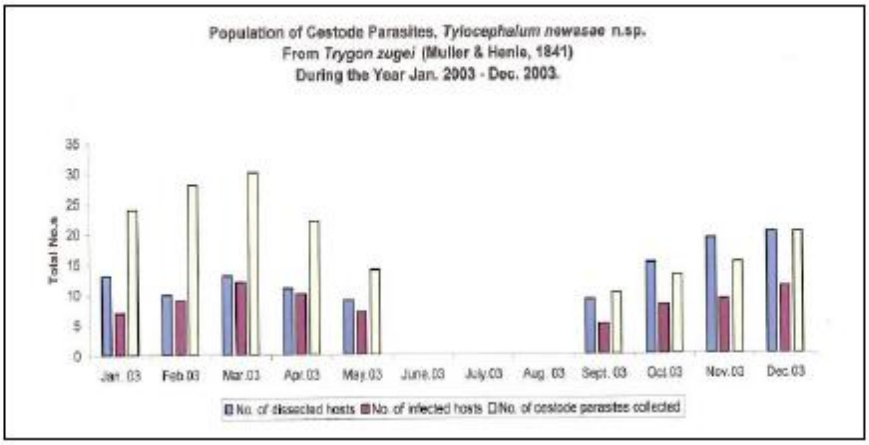

Population of Cestode Parasites Hexacanalis bhagwatiensis n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2003 - Dec. 2003.
Total No.s
30
25
20
15
10
5
0
Jan. 03
Feb.03
Mar.03
Apr.03
May.03
June.03
July.03
Aug. 03
Sept. 03
Oct.03
Nov.03
Dec.03
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected

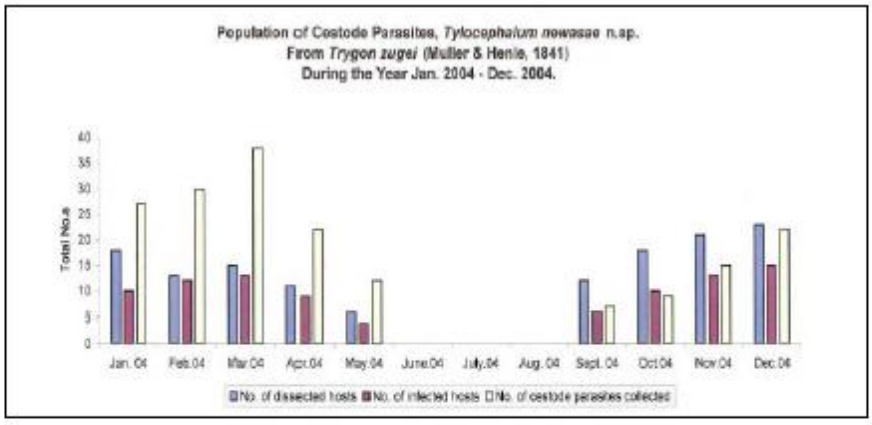

Population of Cestode Parasites, Hexacanalis bhagwatiensis n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2004 - Dec. 2004.
Total No.s
30
25
20
15
10
5
0
Jan. 04
Feb.04
Mar.04
Apr.04
May.04
June.04
July.04
Aug. 04
Sept. 04
Oct.04
Nov.04
Dec.04
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected

Population of Cestode Parasites From Trygon zugei (Muller & Henle, 1841) During the Year Jan. 2002 - Dec. 2002.

Sr. No	Month & Year	No. of dissected hosts	No. of infected hosts	No. of cestode parasites collected	Genera	Locality	Index of Infection	Incidence %
1	Jan. 02	12	5	10	*Tylocephalum*	Bhatye	4.1	41.66%
2	Feb.02	9	7	15	*Tylocephalum*	Mirya	11.66	77%
3	Mar.02	10	9	24	*Tylocephalum*	Mirkarwada	21.6	90%
4	Apr.02	8	7	14	*Tylocephalum*	Harne	12.25	87%
5	May.02	5	4	10	*Tylocephalum*	Bhagawati	8	80%
6	June.02	0	0	0	*0*	----	0	0%
7	July.02	0	0	0	*0*	----	0	0%
8	Aug. 02	0	0	0	0	----	0	0 %
9	Sept. 02	11	5	9	*Tylocephalum*	Bhatye	4	45%
10	Oct.02	19	9	14	*Tylocephalum*	Mirya	6.63	47%
11	Nov.02	21	10	17	*Tylocephalum*	Bhagwati	8	48%
12	Dec.02	23	12	20	*Tylocephalum*	Mirkarwada	12.92	53%
13	Jan. 03	13	7	24	*Tylocephalum*	Mirya	12	53%
14	Feb.03	10	9	28	*Tylocephalum*	Mirkarwada	25.2	90%
15	Mar.03	13	12	30	*Tylocephalum*	Harne	27	92%
16	Apr.03	11	10	22	*Tylocephalum*	Bhatye	20	90%
17	May.03	9	7	14	*Tylocephalum*	Bhagawati	10	77%
18	June.03	0	0	0	*0*	----	0	0%
19	July.03	0	0	0	*0*	----	0	0%
20	Aug. 03	0	0	0	0	----	0	0%
21	Sept. 03	9	5	10	*Tylocephalum*	Harne	5.5	55%
22	Oct.03	15	8	13	*Tylocephalum*	Bankot	6.9	53%
23	Nov.03	19	9	15	*Tylocephalum*	Mirya	7.1	47%
24	Dec.03	20	11	20	*Tylocephalum*	Bhagwati	11	55%
25	Jan. 04	18	10	27	*Tylocephalum*	Harne	15	55%
26	Feb.04	13	12	30	*Tylocephalum*	Mirya	27	92%
27	Mar.04	15	13	38	*Tylocephalum*	Mirkarwada	32	86%
28	Apr.04	11	9	22	*Tylocephalum*	Bhatye	18	81%
29	May.04	6	4	12	*Tylocephalum*	Bhagwati	8	66%
30	June.04	0	0	0	*0*	----	0	0%
31	July.04	0	0	0	*0*	----	0	0%
32	Aug. 04	0	0	0	0	----	0	0%
33	Sept. 04	12	6	7	*Tylocephalum*	Bhatye	3.5	50%
35	Nov.04	21	13	15	*Tylocephalum*	Mirkarwada	9.2	61%
36	Dec.04	23	15	22	*Tylocephalum*	Mirya	14	65%
	TOTAL	374	238	491			316	64%


Population of Cestode Parasites, Tylocephalum newasae n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2002 - Dec. 2002.
Total No.s
Jan. 02
Feb.02
Mar.02
Apr.02
May.02
June.02
July.02
Aug. 02
Sept. 02
Oct.02
Nov.02
Dec.02
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected


Population of Cestode Parasites, Tylocephalum newasae n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2003 - Dec. 2003.
Total No.s
Jan. 03
Feb.03
Mar.03
Apr.03
May.03
June.03
July.03
Aug. 03
Sept. 03
Oct.03
Nov.03
Dec.03
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected


Population of Cestode Parasites, Tylocephalum newasae n.sp.
From Trygon zugei (Muller & Henle, 1841)
During the Year Jan. 2004 - Dec. 2004.
Total No.s
Jan. 04
Feb.04
Mar.04
Apr.04
May.04
June.04
July.04
Aug. 04
Sept. 04
Oct.04
Nov.04
Dec.04
No. of dissected hosts
No. of infected hosts
No. of cestode parasites collected

Conclusion :

On the basis of incidence of the infection the influence of annual season on the population of cestode parasites of Fishes was carried out. It was observed that the incidence of infection by helminth parasites increased with host age. The infection levels were low in young hosts and showed remarkable infection rise in adults.

Infection pattern of *Tylocephalum* and *Hexcanalis* were greatly influenced by marine ,fish species Mainly *Trygon zugei* .It was seen that overall prevalence of *Tylocephalum* and *Hexcanalis* was low during winter at Bhatye and Mirya Arabian sea beach and maximum infection level during summer months., sea beach is highly polluted at Bankot and Mirkarwada during summer .hence cestodes showed seasonal alterations associated with environmental changes. The abrupt increase in cestode duration of life of the infective larva and has been reported to assist in the transfer of health infection like *Tylocephalum* and *Hexcanalis* It is also observe that male host had significantly higher parasite intensity than female.

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