

Intensity of *Echinorhynchus Veli* (George and Nadakal) Infection in Relation to the Sex of the Host *Synaptura Orientalis* (Bloch and Schneider)

Sheema S.H.

¹Lecturer, Department of Zoology, Mar Ivanios College, Nalanchira, Thiruvananthapuram, India

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Abstract- Intensity of *Echinorhynchusveli* infection is more common in the fish. This study was conducted in department of Zoology, Mar Ivanios College, Nalanchira, Thiruvananthapuram, Kerala, India during the period of 2011-13. The fish samples were collected regular sampling of fish from Veli on the south-west coast of Kerala. In this state the winter season includes the months of January and February, followed by summer months of March, April and May. The rest of the year is the rainy season, which is divided into the South West Monsoon (June, July, August and September) and the North East Monsoon (October, November and December). The samples were collected and studied. In male and female the intensity of infection was high during the Monsoon season in the two annual cycles and low in summer and SW monsoon respectively. *Echinorhynchusveli* infection is more common in the rainy season.

Keywords: Intensity, *Echinorhynchusveli*, *Synapturaorientalis*, *Veli*,

I. INTRODUCTION

Parasites affected fish health, growth, behaviour, fecundity and mortality and also regulate host population dynamics and their community structure. Parasite development, parasite intensity and their consequences on host phenotype alteration should be studied simultaneously, as has been done in a few cases [1]. *Echinorhynchusveli* is an acanthocephalid worm, infecting the brackish water flat fish *Synapturaorientalis*, first reported from the Research Division, Department of Zoology, Mar Ivanios College, Thiruvananthapuram, Kerala [2]. The present study attributes towards the rate of infestation in fish and their intensity in different seasons. Extensive damage caused by acanthocephalan parasites on fish indirectly effect its growth, development and reproduction and thus, may leads to further decline in the population of the host fish. Heavy infestation of endoparasites interrupts the normal growth of fish. Kerala, experiences clear cut seasonal variations and host animals are available in all seasons of the year. A lot of studies were carried out on the intensity of Acanthocephala and other helminths. Prevalence and intensity of parasitic helminths of thicklip grey mullet *Chelonlabrosus* in hosts in Beymelek Lagoon Lake in Antalya, Turkey, according to season, host size, age, and sex of the host [3]. The effects of parasite age and intensity on variability in acanthocephalan induced behavioural manipulation [4].

II. MATERIALS AND METHODS

The study was conducted at Veli lake of Trivandrum district in Kerala. The flat fish

Synapturaorientalis were collected from the fishermen of the locality during specific and definite intervals. The specimens were cut open to examine the intestines for the presence of the parasite, *E. veli*. The intestine of the host fish is placed in physiological saline for extraction of the parasite and for counting. ANOVA was used for statistical analysis.

III. RESULTS

In Kerala, the winter season includes the months of January and February. This is followed by summer months of March, April and May. The rest of the year is the rainy season, which is divided into the South West Monsoon (SW) (June, July, August and September) and the North East Monsoon (NE) (October, November and December). In male hosts, the mean and the seasonal intensity for the two annual cycles were NE monsoon 24.40, SW Monsoon 24.80, Summer 14.5 and Winter 14.10 (Table-2 and Figure-1). The highest intensity was observed in SW Monsoon months of June, July, August and September in both annual cycles and comparatively low in summer and winter (Table-1). Statistical analysis showed significance at 5% level indicating a seasonal effect. A more or less similar pattern was noted in female hosts; higher intensity in North East Monsoon with 22.82. It was 19.18 in Summer; 19.06 in Winter and 17.18 in South West Monsoon (Table-3&4 and Figure-2). Statistically there was no significant difference.

IV. DISCUSSION

In the present study, a total of 664 host fish were examined in a span of two years on a seasonal basis. During

the first year 304 fish were examined and the second year, 360. Out of 664, 448 were infected. In this study was to assess the intensity of infection of male and female hosts. In males, the highest intensity was observed in monsoon and the lowest in summer. In females the highest was in NE monsoon and lowest in winter. In a study the parasites in edible fish species, they reported a mean intensity of 3.8 parasites/fish. The highest mean intensity (9.5) was recorded in April and zero intensity in May. In the present study the lowest male and female intensity was recorded in May (9.48 & 10.58). The higher male and female intensity observed in the two monsoon seasons [5]. In the present study strengthens the view that feeding behaviour influences the intensity or the density of parasite population in the host fish. In the study reported higher helminth infection in female than in male host, *Channapunctatus* [6]. Highest mean intensity of infection (1270±942) in female horses [7]. The odds for males being infected with intestinal parasites were 2.8 higher than for females ($P < 0.0001$) [8]. Female guineafowls had a mean of 151.9 (CI 128.4–177.8) nematodes per host which was significantly more than the males that had a mean of 79.6 (CI 66.8–94) [9]. The present study revealed that seasons play a vital role in the intensity of *E. veli* infecting the host fish, *S. orientalis*.

V. CONCLUSION AND FUTURE SCOPE

The main conclusion of the study is rain session is the most common period for infection. Less number of samples was studied that is the major limitation of the study. There is a requirement of future histological studies for better results.

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Table-1: Month wise and season wise data on intensity of infection in male *S. orientalis*

Months and Seasons	2011-2012			2012-2013		
	Total Parasites	Total Infected Male Hosts	Intensity	Total Parasites	Total Infected Male Hosts	Intensity
March	302	26	11.62	235	17	13.82
April	223	14	15.93	222	18	12.33
May	107	6	17.83	275	29	9.48
Summer	632	36	17.56	732	64	11.44
June	35	5	7.00	218	5	43.60
July	99	4	24.75	376	12	31.33
August	231	7	33.00	116	6	19.33
September	124	8	15.50	108	5	21.60
SW Monsoon	489	24	20.38	818	28	29.21
October	194	9	21.56	179	13	13.77
November	341	11	31.00	183	7	26.14
December	172	3	57.33	35	2	17.50

NE Monsoon	707	23	30.74	397	22	18.05
January	107	7	15.29	49	3	16.33
February	72	6	12.00	124	9	13.78
Winter	179	13	13.77	173	12	14.42
Total	2007	96	20.91	2120	126	16.83

Table-2: ANOVA of season wise data on intensity of infection in male *S. orientalis*

Season	2011-2012 (Monthly mean)	2012-2013 (Monthly mean)	Mean (Seasonal)
Summer	17.56	11.44	14.5
SW Monsoon	20.38	29.21	24.80
NE Monsoon	30.74	18.05	24.40
Winter	13.77	14.42	14.10
α	F	P-value	F crit
0.05	2.0456475 NS*	0.250137086	6.591382117
0.01	2.0456475 NS*	0.250137086	16.69437

(NS*– Not Significant)

Figure-1: Graphical representation of season wise data on intensity of infection in male *S. orientalis*

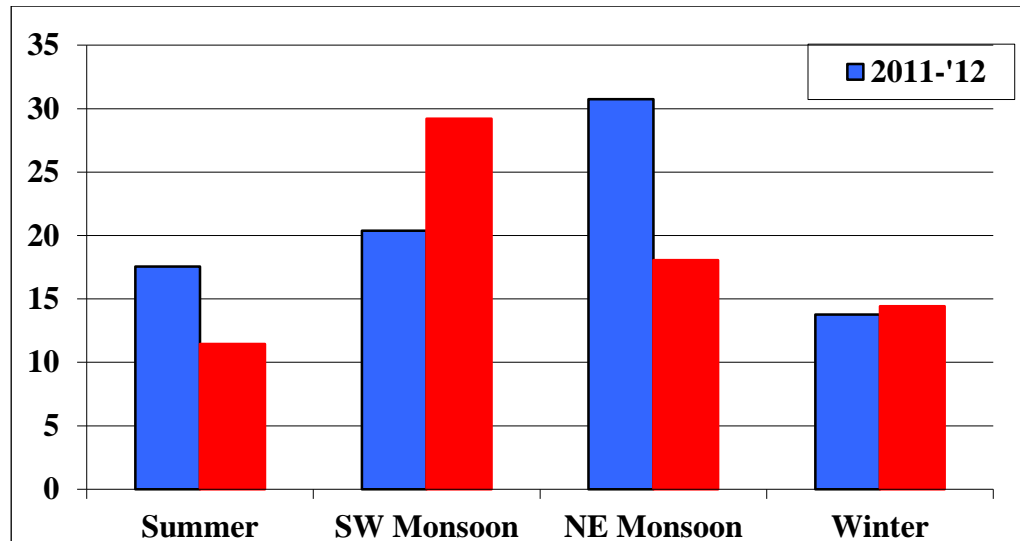


Table-3: Month wise and season wise data on intensity of infection of *E. veli* in female *S.orientalis*

Months and Seasons	2011-2012			2012-2013		
	Total Parasites	Total Infected Female Hosts	Intensity	Total Parasites	Total Infected Female Hosts	Intensity
March	302	11	27.45	235	11	21.36
April	223	9	24.78	222	19	11.68
May	107	5	21.40	275	26	10.58
Summer	632	25	25.28	732	56	13.07
June	35	8	4.38	218	8	27.25
July	99	7	14.14	376	19	19.79
August	231	9	25.67	116	8	14.50
September	124	7	17.71	108	9	12.00
SW Monsoon	489	31	15.77	818	44	18.59
October	194	10	19.40	179	6	29.83
November	341	13	26.23	183	9	20.33

December	172	7	24.57	35	3	11.67
NE Monsoon	707	30	23.57	397	18	22.06
January	107	5	21.40	49	1	49.00
February	72	3	24.00	124	10	12.40
Winter	179	8	22.38	173	11	15.73
Total	2007	94	21.35	2120	129	16.43

Table-4: ANOVA of season wise data on intensity of infection of *E. veli* in female *S. orientalis*

Season	2011-2012 (Monthly mean)	2012-2013 (Monthly mean)	Mean (Seasonal)
Summer	25.28	13.07	19.18
SW Monsoon	15.77	18.59	17.18
NE Monsoon	23.57	22.06	22.82
Winter	22.38	15.73	19.06
α	F	P-value	F crit
0.05	0.43661046 NS*	0.739037928	6.591382117
0.01	0.43661046 NS*	0.739037928	16.69437

(NS* – Not Significant)

Figure-2: Graphical representation of season wise data on intensity of infection of *E. veli* in female *S. Orientalis*

