

Dynamics of a trematode parasite *Euclinostomum laterostomum* in the fresh water fish *Catla catla* of Hyderabad Lakes

P. Anil Kumar¹, Geeta Rajlingam²

¹Lecturer in Zoology, P. R. Govt College(A) Kakinada, A.P

²Head & Professor, Dept. of Zoology, University College for Women, Osmania University, Hyderabad

Email address

zoologistanil@gmail.com(P. A. Kumar)

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Abstract

The first aim of this study was to determine the helminth parasite fauna of fresh water major carps *Catla catla* in the surrounding lakes of Osman sagar located at 17°22'28.12"N and 78°18.02.05"E and Himayat Sagar located at 17°19'59"N and 78°21'40'46"E and local tanks of Hyderabad. In the nearby lakes of Hyderabad the fish is naturally harvested where as in the coastal districts most of the carps were cultured. The other aim was to investigate the prevalence and mean intensity of parasite species on the host fish and in relation to fish size and monthly changes. In this study, the three parasite species identified on the host fish and changes in their population patterns were determined in terms of fish size and months. The study results showed that the most common parasite was *E. laterostomum*. This species has been known as a parasite of various freshwater fish, found most commonly in *Catla catla*, *Labeo rohita*, *Cyprinus carpio*. During this study, infection with *Euclinostomum laterostomum* was recorded on fish in all months with the exception of April. Mean intensity of *Euclinostomum laterostomum* varies significantly among the months ($P < 0.05$). The maximum mean intensity recorded in May (69.23 %) and minimum in June (17.64%). The infection parameters of a trematode are studied in the six size classes of fish. The distribution of infra populations of *E. laterostomum* did not vary significantly with size class of fish ($P > 0.05$). This parasite species was found on all size of host fish *Catla catla*. The parasite attained maximum level on the largest fish specimens. In the present study, the infection of *E. laterostomum* was higher in small size classes (I-III) and in the largest size classes (VI), and lower in medium size classes (IV-V).

Keywords

Trematodes, *Euclinostomum Laterostomum*, *Catla catla*, Prevalence, Maximum And Minimum Intensity, Osman Sagar, Himayat Sagar

1. Introduction

The main reason to select *Catla catla* is, it is the most cultivable and popular fish particularly in Andhra Pradesh. Every year the aqua farmers are pouring lot of money to produce healthy fish without any infestation whether it may be Bacteria, Virus, Protozoan or Helminth parasites. The first aim of this study was to determine the helminth parasite fauna of fresh water major carp *Catla catla*. The other aim was to investigate the prevalence and

mean intensity of parasite species on the host fish and in relation to fish size and monthly changes.

2. Materials and Methods

2.1. Sampling

This study was carried out between March 2011 and February 2012 (While giving the results were amalgamated carp from the same month from different years). A total of 339 fish specimens were examined and number of fish

samples is shown in Table 1. The carps were caught using net or hook by local fishermen. The specimens were placed in plastic tanks with local lake water and immediately transferred to the research laboratory where they were kept in aquarium and sacrificed within 24 hours. Fish were killed by vertebral dislocation and measured for total length to the nearest 0.5 cm. Lengths were classified into six length classes (18.0-24.0 cm; 24.1-30.0 cm; 30.1-36.0 cm; 36.1-42.0 cm; 42.1-48.0 cm and >48.0 cm). During the dissection, the gill filaments, the eyes, the fins and the skin were examined. The gill filaments were placed in separate petri dishes with 1:4000 formaldehyde. The intestine and liver were dissected and placed in separate petri dishes

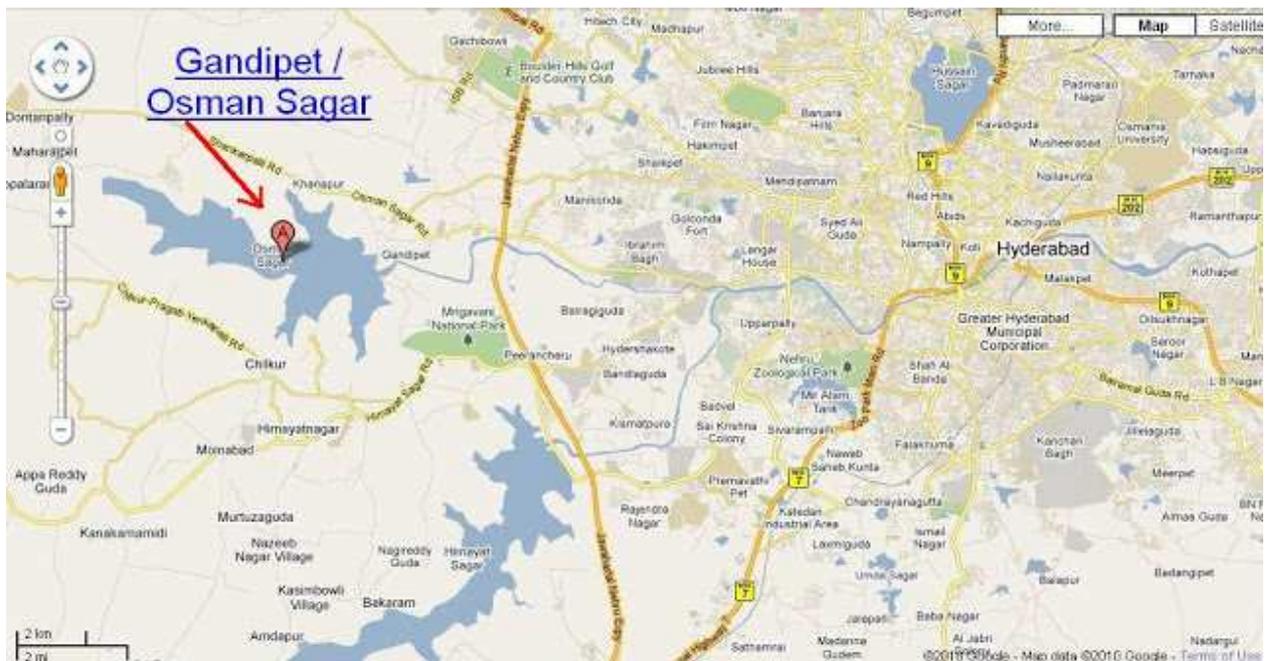
with physiological saline solution. Intestines and liver were thoroughly examined under a binocular microscope. All helminths found in each individual fish were identified and enumerated. The parasite specimens were fixed in formaldehyde, stained with acetocarmine and were mounted in Canada Balsam. During the study period, data on parasite species were categorized according to month. The environmental factors were not measured in this study. The parasite specimens were identified using the reference keys of Bykhovskaya-Pavlovskaya *et al* (1964), Reichenbach-Klinke (1966), Bauer (1987), Chubb *et al.* (1987) and Hoffman (1999).



Euclinostomus spp (Parasite)



Catla catla (Host)



The Study Area – Osman Sagar and Himayat Sagar Lakes of Hyderabad.

3. Results

Table 1. Prevalence, mean intensity and maximum intensity of helminths in *Catla catla* from surroundings of Hyderabad Lakes Osman sagar and Himayat sagar and relationships between the parasite species and months

	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb
N*	n=23	n=18	n=13	n=17	n=20	n=23	n=25	n=25	n=24	n=16	n=14	n=15
<i>Euclinostomum laterostomum</i>												
Prevalence(%) 47.82 ^b -	69.23 ^c	17.64 ^{ab}	25 ^{bc}	52.17 ^c	52.00 ^c	44.00 ^c	41.66 ^d	43.75 ^{bc} 50 ^b	33.33 ^{bc}			
Mean Inten.	11.25 -	21.60	12.66	13.40	21.66	20.41	18.45	36.20	16.71	14.57	16.00	
(SD)	(4.47)	(12.78)	(8.96)	(8.98)	(10.70)	(10.49)	(7.72)	(18.89)	(4.11)	(5.09)	(5.95)	
Max. Inten.	18	-	45	23	25	40	42	31	67	25	24	24

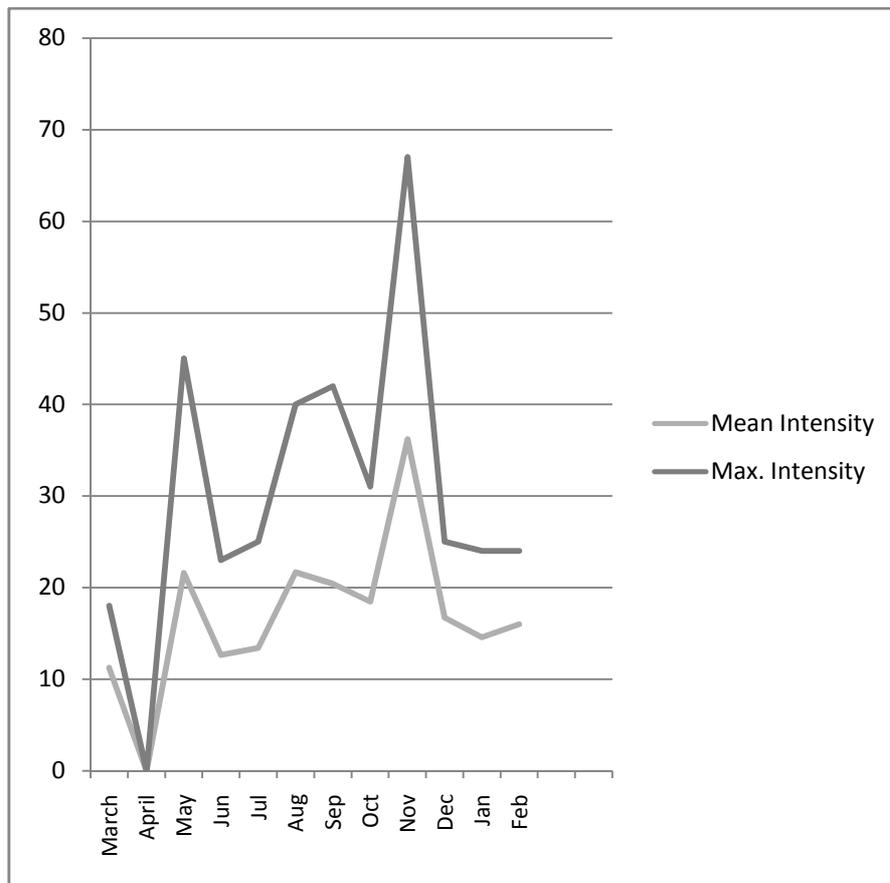


Fig 1. Mean and maximum intensity of helminths (*Euclinostomum laterostomum*) in *Catla catla* Osman sagar and Himayat sagar

Table 2. Prevalence, mean intensity and maximum intensity of helminths in the six size classes of fish studied

Size class	I	II	III	IV	V	VI
Length (cm)	18.0-24.0	24.1-30.0	30.1-36.0	36.1-42.0	42.1-48.0	>48.0
N*	n=21	n=54	n=104	n=35	n=10	n=9
<i>Euclinostomum laterostomum</i>						
Prevalence(%)	42.85 ^{a**}	42.59 ^a	41.34 ^a	28.57 ^a	30.00 ^a	44.44 ^a
Mean Intensity	22.66	14.78	21.83	17.90	18.00	22.25
(SD)	(9.69)	(7.50)	(14.55)	(9.78)	(6.24)	(8.95)
Max. Intensity	40	29	67	35	25	32

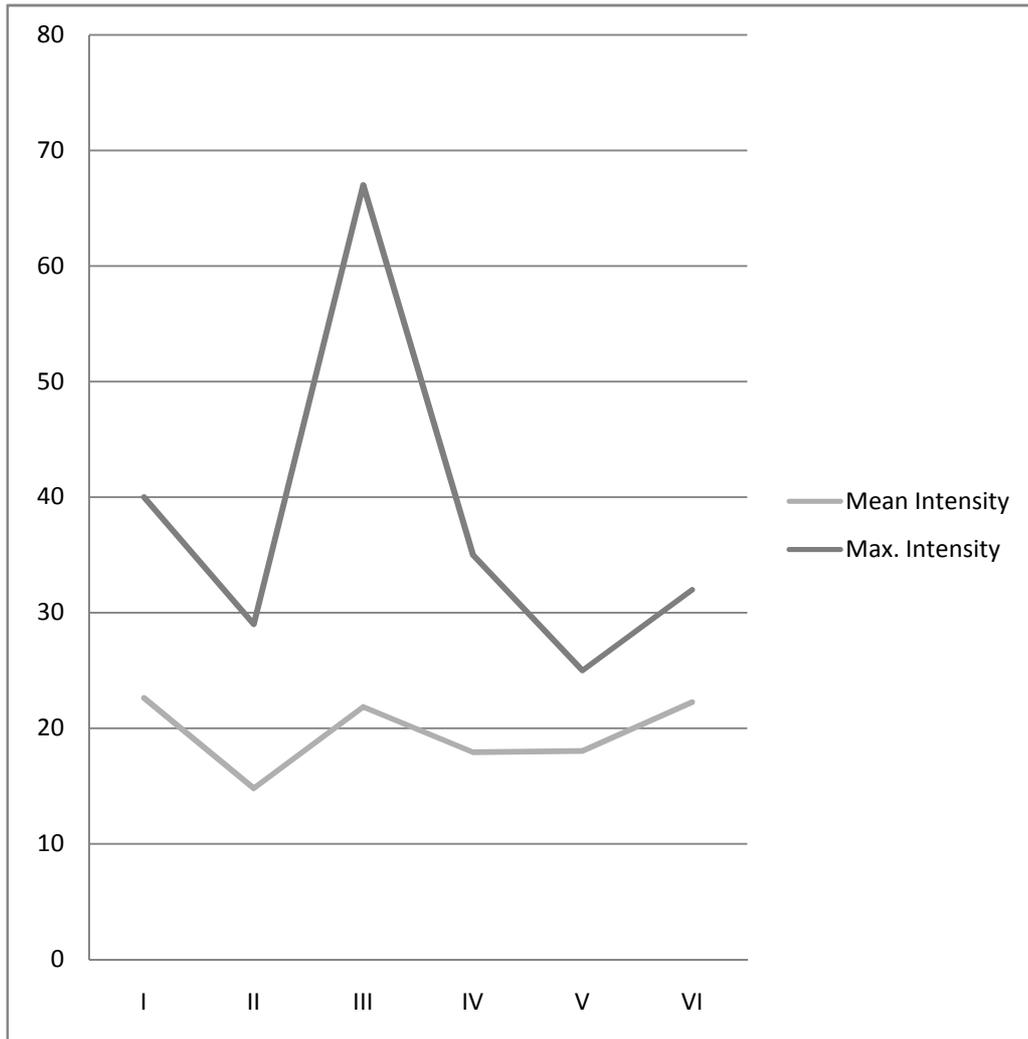


Fig.2 Mean and maximum intensity of helminths (*Euclinostomum laterostomum*) in the six size classes of fish studied

4. Discussion

A total of parasite species were found in 336 examined specimens of common carp from Osman sagar and Himayat sagar lakes and tanks from Hyderabad surroundings. These were the Trematodes, a liver parasite *Euclinostomum laterostomum* (overall prevalence 37.76%). Data on the prevalence, mean intensity, standard deviation and maximum intensity of the three helminth species in the monthly samples of *Catla catla* – in Lake Osman sagar and Himayat sagar are given in Table 1. During this study, infection with *Euclinostomum laterostomum* was recorded on fish in all months with the exception of April. Mean intensity of *Euclinostomum laterostomum* varied significantly among the months ($P < 0.05$). The maximum mean intensity recorded in May (69.23%) and minimum in June (17.64%). The infection parameters of helminths in the six size classes of fish studied are given in Table 2. The distribution of infra populations of *E. laterostomum* did not vary significantly with size class

offish ($P > 0.05$). This parasite species was found on all size of host fish. The parasite attained maximum level on the largest fish specimens.

5. Conclusion

In this study, the parasite species identified on host fish and changes in their population patterns were determined in terms of fish size and months. The study results showed that the most common parasite was *E. laterostomum*. This species has been known as a parasite of various freshwater fish, found most commonly in *Catla catla*, *Labeo rohita*, *Cyprinus carpio* and *Carassius carassius* (Aydođdu *et al.*, 2003; Kır *et al.*, 2004; Tekin-Özan and Kır, 2005). This parasite was recorded on the major carp throughout the year except for April. The infection was the highest in May and the lowest in June (Table 1). Aydođdu and Altunel (2002) pointed out that intensity of infection by this species in common carp inhabiting İznik Lake increased from August to December and they (Aydođdu and Altunel, 2002) explained this result with changes in water temperature. A

lot of studies have been published on the seasonal changes of monogenean infection in fish (Shulman, 1989; Özer and Erdem, 1999; Özer, 2002). The data from other works seem to support the link with water temperature: In some works highest infection of helminth infection is in May corresponds with high water temperature. The seasonal variations of the parasites studied are influenced by temperature, oxygen concentrations of water, size of fish host and fish maturity. In the present study, the infection of *E. laterostomum* was higher in small size classes (I-III) and in the largest size classes (VI), and lower in medium size classes (IV-V). Factors responsible for causing variations in parasite infectivity due to seasonal variations, size of the host and host sex are debatable. Thus, it can be concluded that the present work showed noticeable variations in the population dynamics of a trematode parasite in different seasons dynamics.

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