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POPULATION DYNAMICS OF GASTROINTESTNAL HELMINTH PARASITES OF SOME FRESHWATER FISHESFROM LATUR DISTRICT, (M.S.) INDIA

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ABSTRACT

The present study deals with the survey of freshwater fishes from Latur District (M. S.) India. This study summarizes the data of freshwater fishes associated with helminth parasites from February 2011 to January 2012. Fish samples were collected from different localities of Latur District. All fishes were examined for the presence of internal helminth parasites in the digestive tract. The hosts of different feeding habits were examined. During the study *Catla catla, Labeo rohita, Cirrihinus mrigala, Mastacembelus armatus* and *Wallago attu* were examined. The results indicate that the parasite intensity is quite high. It may be due to the presence of physical factors that favors the completion of life cycles of these parasites.

KEYWORDS: Survey, Freshwater fishes, fish helminth, parasite intensity, prevalence

INTRODUCTION

There are many freshwater ponds which are used to culture fishes in the area of District Latur (M.S) India. *Mastacembelus armatus* and *Wallago attu* are carnivorous fishes commonly found in these small ponds receiving mainly rainwater. These ponds are managed by local people for fish rising. Fishes being very important source of protein for human are consumed as white meat. Since humans utilize these fishes, it is important that they should be healthy and free of infection.

Infections which are caused by viruses, bacteria and parasites among fishes in natural and manmade culture systems are harmful for fish health and growth. The parasitic infections are sometimes very fatal and can cause high mortalities (Ahmed, 1994) when intermediate hosts support their lifecycles. Among freshwater fishes, there are 1211 species of differentparasites representing 5 phyla and 11 classes of invertebrates (Bykovskaya*et al.,* 1964). The major parasitic groups found in freshwater fishes aretrematodes, cestodes, acanthocephalans and nematodes that complete their life cycles through intermediate hosts like piscivorous birds (Schmidt,1990). The need to assess the parasitic infection arises because the fish suffering from parasitic infection or disease result into severe damage to fisheries industry. For successful prevention and elimination of such infections, it is extremely important to achieve early and correct diagnosis of the larval stages of the parasites for which fish constitute the final host.

MATERIALS AND METHODS

Selection of freshwater fishes for helminth parasitic investigations:

Catlacatla, Labeo rohita, Cirrihinus mrigala, Mastacembelus armatus and *Wallago attu* are the selected commercially important fishes which are abundantly available throughout the year f(February 2011 to January 2012, to avoid the unavailability of host during the study period; the selection is carefully done. The selected fishes were observed for helminth parasites restricted to gastrointestinal region only.

Collection of host fish species:

The freshwater fishes were collected from different localities of Latur district. The hosts were caught randomly for every month, usually during daytime and some at night and noted down their taxonomic data properly. Some of them were also obtained from local animal suppliers. From them, relevant information were also obtained with respect to the host's locality, date of collection, etc. and then brought to the laboratory. The meristic and morphometric characters of fishes were measured and fishes were identified up to species level using standard keys and books. The prevalence, mean intensity and relative density of helminth parasites were calculated in accordance with that of Margolis *et al.*, (1982).

Examination of fish for collection of parasites:

Examination of intestinal parasites was carried out by using the method described by Hassan *et al.*, (2010). After the separating and counting the population of different helminth parasites from different freshwater fishes the parasites were preserved in separate bottles. Some of these were used for the taxonomic study.Infection of each group of parasites was treated as follows:

Killing and fixation of cestodes:

Collected cestodes were first relaxed and then fixed in hot 4% formalin and stained using Harris haematoxylin. Stained parasites were washed in distilled water, dehydrated in ascending grades of alcohol, cleared in xylene, mounted in D.P.X. Nematodes were fixed in hot 10% Glycerol and cleared in lacto phenol. The identification is made with the help of "Systema Helminthum" by Yamaguti (1958, 1961).

Killing and fixation of nematodes:

The content of the alimentary canal and other parts of body for examination were removed in 0.7% normal saline solution in petridish or watch glasses and observed under stereoscopic binocular microscope. The nematodes were mainly found harbouring in the lungs, stomach, intestine, rectum and body cavity. They were carefully collected with the help of hair brush or picking needles or forceps. The recovered nematodes were processed for killing and fixation. The nematodes collected were washed thoroughly in normal saline solution in test tube with 2 or 3 changes to cleanse unwanted debris. Long stem droppers were used to remove the debris without disturbing the nematodes. This identification was confirmed by the description of the same or similar parasites (Zaidi and Khan,1976)

RESULTS

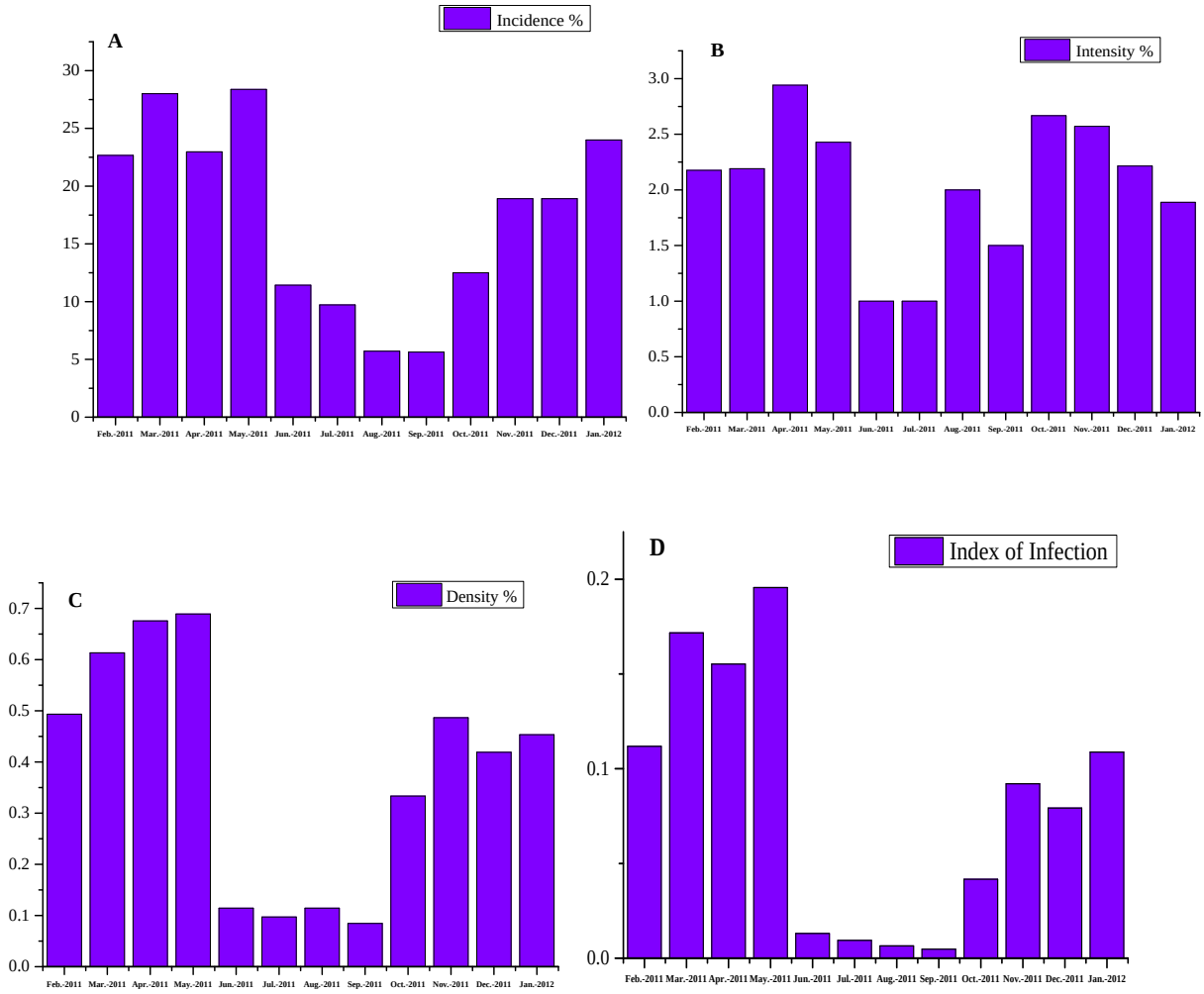
The local available and selected five species of freshwater fishes from different parts of Latur District, Maharashtra State, India were examined for helminth parasites. The hosts of different feeding habits were examined. During the study *Catla catla, Labeo rohita, Cirrihinus mrigala, Mastacembelus armatus* and *Wallago attu* were examined.

Total 876 fishes were examined for one year, only 154 hosts were found infected. The species of parasites obtained from different localities were recorded as cestode species are *Senga sp., Circumoncobothrium sp.* and one nematode species *Procamallanus sp.* from *Mastacembelus armatus*. Whereas *Wallago attu*is infected with cestode species *Gangesia* sp. Trematodes were not observed during the present study. The most important freshwater cultural fishes of

India are the major Indian carps like *Catlacatla*, *Labeorohita* and *Cirrhinus mrigala* were found to be not infected whereas *Wallago attu* and *Mastacembelus armatus* were found heavily infected. The results are shown in Table 1 and 2 and Figure 1.

Table 1. Collection of helminth parasites in relation with its geographical area and host species

Sr. No	Name of species Cestodes/ nematodes	Total no. of parasite collected	Name of the host	Locality (Taluka wise)
1.	*Senga sp.*	188	*Mastacembelusarmatus*	Ausa, Latur
2.	*Circumoncobothrium sp.*	207	*Mastacembelusarmatus*	Nilanga, Udgir
3.	*Procamallasnus sp.*	417	*Mastacembelusarmatus*	Chakur , Latur
4.	*Gangesia sp.*	104	*Wallagoattu*	Ausa, Udgir



Graph 1. Showing the overall values of incidence, intensity, density and index of infection for helminth parasites (February 2011 to January 2012). A. Incidence B. Intensity C. Density D. Index of infection

Table 2. Overall freshwater fishes examined for population dynamics of helminth parasites (February 2011 to January 2012)

Month and Year	No. of Host Examined	No. of Host Infected	Parasites collected	Incidence %	Intensity %	Density %	Index of Infection
Feb. 11	75	17	37	22.67	2.18	0.49	0.11
Mar. 11	75	21	46	28.00	2.19	0.61	0.17
Apr. 11	74	17	50	22.97	2.94	0.68	0.16
May. 11	74	21	51	28.38	2.43	0.69	0.20
Jun. 11	70	8	8	11.43	1.00	0.11	0.01
Jul. 11	72	7	7	9.72	1.00	0.10	0.01
Aug. 11	70	4	8	5.71	2.00	0.11	0.01
Sep. 11	71	4	6	5.63	1.50	0.08	0.00
Oct. 11	72	9	24	12.50	2.67	0.33	0.04
Nov. 11	74	14	36	18.92	2.57	0.49	0.09
Dec. 11	74	14	31	18.92	2.21	0.42	0.08
Jan. 12	75	18	34	24.00	1.89	0.45	0.11
Total	876	154	338	208.85	24.58	4.57	0.99

DISCUSSION

Fish helminth parasites are generally found in all freshwater fishes. The parasite prevalence and intensity depend on many factors like parasite and its life cycle, host and its feeding habits and the physical factors ofwater body where the fish inhabit. It also depends upon the presence of intermediate host such as piscivorous birds for the spread of cestodes infection (Zaidi and Khan, 1976). The hygienic conditions are also very important for the healthy environment where fish are raised. The studyareas are small ponds, which are generally receiving rainwater. The amount of water is always variable depending on the rainfall. It also changes the water quality significantly particularly when water level is low and animal from the neighboring villages used to visit these ponds. When life cycle of any parasite is completed its prevalence and intensity increase significantly. The present study revealed that nematode infection was highest in *Mastacembelus armatus*. It reflects that the piscivorous birds after ingesting the infected fish remain hovering on these ponds and adding their feces with nematode larvae in the water that then ingested by crustacean and small fishes. These crustaceans and small fishes then become food for large fishes living in the bottom of the pond. *Mastacembelus armatus* is bottom feeder and feeding mainly on other smaller fishes, aquatic insects and crustaceans which are mostly infected with nematode larvae. These copepods play major role in the spread of nematode, *Procamallanus sp.* infection in *Mastacembelus armatus.*

The present study revealed that helminth parasites have specific community structure as *Catla catla, Labeo rohita, Cirrhinus mrigala, Mastacembelus armatus, Wallago attu* were examined for helminth parasitic infection, whereas only *Mastacembelus armatus and Wallago attu* found infected with cestodes and nematodes. In fishes, the mechanism of parasites establishment varies from species to species and it also depend on the stage of parasite, host tissue and environmental conditions. *Senga sp* were found in *Mastacembalus armatus* and genus *Gangesia* were collected from *Wallago attu.* While the low prevalence of cestodes infection may be due to discontinuity of the pond itself. Since these ponds are not permanent one that is; they get dry very often when rain water is not available, the life cycle for cestodes

get disturbed or blocked (Zaidi and Khan, 1976). That is why the onwards transmission of parasites stopped resulting into low prevalence and parasite intensity.

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