

INFLUENCE OF PISCIAN HOST DIET AND SEX ON THE RATE OF INFESTATION OF INTESTINAL HELMINTH PARASITES

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ABSTRACT

The present study deals with the various factors affecting parasite prevalence in fish hosts are presented. The survey was conducted from different sampling station to estimate the prevalence of parasitic helminths in male and female fish host. For this study 1753 freshwater fishes were randomly selected in May 2011 to April, 2012. The factors such as host size and parasites size, host specificity, host diet and host sex and their influence on the abundance and distribution of parasites are considered and highlighted and other environmental factors that may facilitate the establishment and proliferations of parasites in host populations are also highlighted.

KEYWORDS: Freshwater fishes, Helminth parasites, Host diet, Host sex

INTRODUCTION

Fish is a vital source of food for people. It is man's most important single source of high-quality protein, providing 16 % of the animal protein consumed by the world's population, according to the Food and Agriculture Organization (FAO) of the United Nations (1997). The FAO estimates that about one billion people world-wide rely on fish as their primary source of animal protein (FAO, 1997). Helminths are members of complex biota, an understanding of population structure and behavior has resulted in the emergence of population dynamics and community structure as major branches of animal helminthology. Kennedy, (1975) stated that population investigation can provide data for the predication of integrated methods to achieve the regulation of numbers of harmful parasites, because it has been stated that a single method of control have little value, whereas co-ordinated activities ameliorate the infection. Seasonal fluctuations, locality, age, size and sex of the host also determine the parasitic community diversity and burden.

The diet, life span, mode of life, population density and size of the host are the main factors which determine the variety of parasite species as well as intensity and prevalence of infection. Dogia *et al.*, (1961), stated that a seasonal environmental change of water such as temperature and pH affects the occurrence of parasites.

MATERIAL AND METHOD

Examination of fish for collection of parasites:

Examination of intestinal parasites was carried out by using the method described by Hassan *et al.*, (2010) from in May 2011 to April, 2012. 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.

Sex determination of fish:

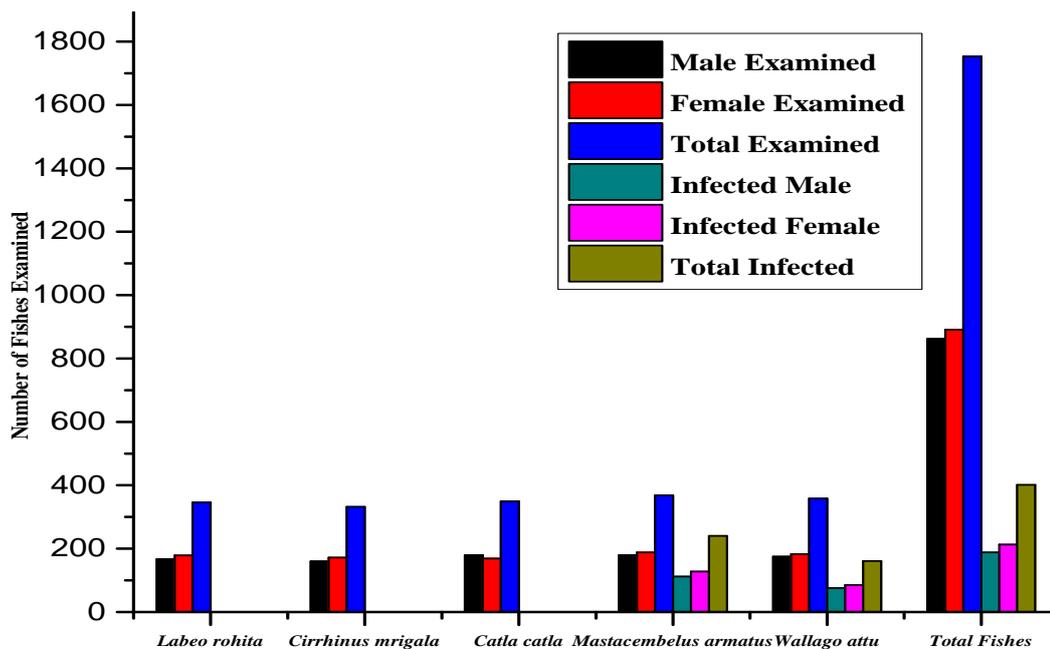
Inspection of the gonad is the most reliable means to determine the gender of a fish. In adult females, eggs are readily discernible in the ovaries. While in adult males the testes are typically smooth, whitish and non-granular in appearance. In juvenile specimens the shape of the gonad may be a guide to the gender (for example, testes have finger-like processes in many catfishes), but it is often necessary to use a dissecting microscope to determine the sex of small immature fish.

RESULT

During present study 1753 freshwater fishes were randomly selected. The present study reveals that among freshwater fish *Labeo rohita*, 346 fishes were examined for helminth parasites the result shows that there was no infection found in the intestine. In another fish *Catla catla* a total of 349 fishes examined for helminth infection result showed that there was no infection found. In *Cirrhinus mrigala* a total of 332 fishes were examined for parasitic infections the result shows that there was no infection found. In case of *Mastacembelus armatus* total 368 fishes were examined for parasitic infections 240 found infected among them 112 males and 128 females were found infected with cestodes and nematodes. Where as in case of *Wallago attu* total 358 fishes observed 76 male and 85 female found infected with cestodes. The observations were restricted to gastrointestinal region only as shown in Table-1 and Graph-1.

Table 1: Sex wise host examined for helminth parasites of freshwater fishes from Latur district

Sr. No	Fish Examined	Male Examined	Female Examined	Total Examined	Infected Male	Infected Female	Total Infected
1	<i>L. rohita</i>	167	179	346	0	0	0
2	<i>C. mrigala</i>	160	172	332	0	0	0
3	<i>C. catla</i>	180	169	349	0	0	0
4	<i>M. armatus</i>	180	188	368	112	128	240
5	<i>W. attu</i>	175	183	358	76	85	161
	Total	862	891	1753	188	213	401



Graph-1: Showing sexwise host examined for helminth parasites of freshwater fishes from Latur district, (M.S.), India.

DISCUSSION

The distributions of helminth parasites as host specific

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*.

The infection are host specific because the diet of the host, condition of the habitat, intermediate hosts and ecological factors affect the host specificity. These factors are perfect condition for parasite with its host at the site of attachment. During present work it has been investigated that no trematode were found to be infected to the freshwater fishes of Latur district (M.S.) India.

Variation in parasite fauna with the diet of the host

Feeding activity of the host also is one of the reasons for the seasonal fluctuations of infections; the fishes were infected with large number of parasites in late winter to end of summer months, because the environmental conditions are

favourable in such months. The waters are warm at that time the zooplankton fauna may be rich, this probably corresponds to the peak in the feeding activity of the fish together with the richness in the intermediate host fauna may be the crustaceans, smaller mollusks and fish resulting in high infections. The variation in prevalence and intensity may be due to host migration, change of feeding habits, availability of infective stages of parasites, and intermediate hosts (Bashirullah and Hafizuddin, 2007).

Variation in intensity of infection with sex

In the present investigation, the intensity of infection of helminth parasites in male and female fish has been analyzed to determine the dominance of parasites. Among the investigated fishes of both the sexes the intensity of infection was highest in female fish than in the male fish. Out of the total fishes examined 891 out of 213 females were found infected in comparison to 188 out of 862 males. In present study, it was revealed that female host was observed to be more infected than males. Similar reports were also observed by Khanum and Parveen (1997). They concluded that this may be due to lower physiological resistance of female fishes which are more susceptible to parasite infection during breeding season.

CONCLUSION

The survey has shown that fresh water fishes from the Latur district shows wide range of freshwater fishes. After the analysis of data the present study can be concluded that the high infection of helminth parasites (incidence, intensity, density and index of infection) were occurred more in female than male host fishes. This type of results indicated that environmental factors, feeding habitat and gender are influencing the parasitic infection either directly or indirectly. Observing the prevalence of *Procamallanus* sp. in the target host fish (*Mastacembelus armatus*) in this study, shows that the intermediate in this case, copepods, are present in the habitat. This is due to the abundant vegetation which gives rise to a more extensive habitat for the copepods therefore; fish are more exposed to greater concentrations of *Procamallanus* sp.

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