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Population dynamics of trematode parasites in freshwater fishes from Osmanabad district (M.S.) India

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Abstract

The present study was carried out with an objective to asses the population dynamics of trematode in fish *Mastacembelus armatus* (Lecepede, 1800) An extensive survey for digenetic trematode parasite of fresh water fish *Mastacembelus armatus* (Lecepede, 1800) was conducted in Osmanabad district (M.S.) India for the period of June 2018 to May 2019 for collection of parasites visceral organ of fishes were taken out and dissected separately in petridishes with saline water, near about 120 fishes were dissected, out of which 38 were found infected and 76 trematode were collected from the various organ such as the gall bladder, intestine, liver of the fish for present study.

The population dynamics includes incidence, intensity, density and index of infection. The infection rate was in the order of rainy, winter followed by summer respectively. The study indicate that environmental factors and feeding habitat, intermediate hosts influence the parasitic infection.

Keywords: population dynamics, trematode, *Mastacembelus armatus*

Introduction

Fishes are consumed by many peoples as source of food due to their nutritive valve and delicious flesh. *Mastacembelus armatus* is very much popular and nutritive fish in India .

A majority of fishes carry heavy health concern especially in Asia, as they can be transmitted to human and domestic animals. Behind the various biological ecological factors parasites of fishes constitute one of the major problem to fish health for proper culture and management of fish as well as keep fish well in their natural habitat, it is essential to control the fish parasites

Many worker have been investigated the trematode parasite from fishes in India as well as other part of world. In India such Rajeshwar Rao, Ramkrishna G.V. Veena devi and Agarawal, Gupta S.P. working on population dynamics, incidence, intensity density and index of infection of trematode parasites from fishes.

Material and Method

The freshwater fishes were collected from different places of Osmanabad district throughout one year 2018-19. Intestine of the host collected and brought for collection and identification of parasites. The parasites were preserved in 4% formalin, also recorded the infected and non infected intestines for further studies. Collected the data month wise and calculated the incidences of infection, intensity of infection, density of infection and index of infection seasonally i.e. rainy, winter and summer of one year.

Population dynamics of Helminth parasites were determined by following formulae.

1. incidence of infection = $\frac{\text{Infected host x 100}}{\text{Total hosts examined}}$
2. intensity of infection= $\frac{\text{No. of parasites collected in a sample}}{\text{No. of infected host}}$
3. density of infection= $\frac{\text{No. of parasites collected in a sample}}{\text{Total hosts examined}}$
4. index of infection= $\frac{\text{No. hosts infected x No. of parasites collected}}{(\text{Total hosts examined})^2}$

Population dynamics of trematode parasites in freshwater fishes from Osmanabad district during 2018-19

Month	No. of hosts examined	No. of hosts infected	Total no. of parasites collected	Incidence	Intensity	Density	Index
Jun.	30	10	15	50	1.5	0.5	0.16
July	30	08	10	26.66	1	0.33	0.09
Aug.	30	10	12	33.33	1.25	0.40	0.13
Sept.	30	06	08	20	1.2	0.26	0.05
Oct.	30	06	08	20	1.3	0.26	0.05
Nov.	30	06	08	20	1.3	0.26	0.05
Dec.	30	05	06	16.66	1.2	0.20	0.033
Jan.	30	05	06	16.66	1.2	0.20	0.033
Feb.	30	03	04	10	1.3	0.13	0.013
Mar.	30	04	05	13.33	1.25	0.16	0.022
Apr.	30	04	05	13.33	1.25	0.16	0.22
May	30	03	03	10	1	0.10	0.01
Total	**360**	**70**	**90**				

Result and Discussion

In the present study total 360 specimens of *Mastacembelus armatus* (Lecepede,1800) were examined and only 70 were found infected by trematode parasites . Highest trematode infection was found in month of June 15 and Aug 10 while minimum infection in month of October, March and May.

The present study of population indicate that the total 360 host *Mastacembelus armatus* (Lecepede,1800) collected from the different local fish market of Osmanabad district, Maharashtra India during June 2018- May 2019 .

Population of trematode was also carried out and it revealed that the maximum infection (54%) of trematode was found in rainy seasons modrate in winter (26.4%) and minimum (16%) in summer seasons. Aishwaria kumari et.al (2019) reported that seasonal variations of trematode from *channa puctatus* shows the higher prevalence which occurs in winter fallows by summer. While Bhure et. al., 2010 reported high incidence (51.78%), intensity (1.18%) and density (0.613%) of *Rhabdocona sp*. in summer followed by winter and rainy season. Bhure and Nanware, 2014 recorded high incidence of infection of *Senga sp., Gangesia sp., Proteocephalus sp.* infected to *Channa sp.* was in summer (76.66 %, 73.33 % & 70.00 %) followed by winter (65.21 %, 52.17% & 56.52%) whereas infection was low in monsoon (36.84%, 26.31% & 31.57%). Bhure and Nanware, 2014 reported high incidence of infection of *Cotugnia dignopora*, *Cotugnia diamarae* and *Raillietina (R.) domestica* in summer (75%, 67.85 % & 71.42%) followed by winter (60%, 52 % & 48%) whereas low infections in monsoon season (38.09%, 33.33% & 38.09%).Bhure et.al.,2018 reported incidence of infection of *Gangesia marathwadensis* from *Wallago attu* in Summer (75.00 %) followed by Winter (46.25 %) whereas infection was low in monsoon (22.50%).

Low infection was occurs due to environmental factors. The feeding habitat also influences of seasonality of parasitic infection either directly and indirectly this result shows the ecological factors affect the occurrence of trematodes in the host.

Parasites showed seasonal alterations concerned with climatic changes. Degree of maximum morbidness due to trematode. The infection was recorded during monsoon seasons fallowed by winter and minimum in summer. Chawdhary and Hossain (2015) also observed in their report that parasitic infection has harmful influence for fish health affecting the normal growth of the fishes in seasonal variation resulting morbidness effect of the host in terms of loss of body weight.

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