

## RESEARCH ARTICLE

# The ecological impact of invasive Trematode Parasites of Common toad (*Bufo melanostictus*) found in bank of Saryu River along Chapra town and effect of flanking population

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Manuscript details:	ABSTRACT
<p>Received: 08.02.2016 Accepted: 08.03.2016 Published : 11.04.2016</p> <p><b>Editor: Dr. Arvind Chavhan</b></p> <p><b>Cite this article as:</b> Seema Kumari, Vishwranjan and Prashant Kumar (2016) The ecological impact of invasive Trematode Parasites of Common toad (<i>Bufo melanostictus</i>) found in bank of Saryu River along Chapra town and effect of flanking population, <i>International J. of Life Sciences</i>, 4(1): 129-132.</p> <p><b>Copyright:</b> © 2016   Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>Incidence of Trematode Parasites of Common toad (<i>Bufo melanostictus</i>) has been studied in bank of Saryu River along Chapra town during 2010-2013. Chapra is the District Head quarter of Saran. This study shows the Trematodes found in common toad of this area and this is worse condition of the population situated near the bank of Saryu River. Trematodes can be found anywhere where untreated water and human waste is spread out. A simple food chain and contamination of food and water is follows the infectious route. Out of total 1328 Toades (<i>Bufo melanostictus</i>) collected and examined, trematodes were 450 (57.3 per cent). The rate of infection of trematodes was higher in sex-wise female's 256 (34.5 per cent) males 194 (33.1 per cent). Pollution due to sewage and excreta waste of town increase the infection of toad and flanking population.</p> <p><b>Keywords:</b> <i>Bufo melanostictus</i>, Trematode, Saryu River, Bufotoxins</p>
	<h2>INTRODUCTION</h2> <p>Ecological Parasitology according to Dogiel (1964), deal with the study of relationship between the parasitic fauna of the host taken as a unit and the changes in the environmental and physiological conditions of the host. However, much work has been done on the general incidence of helminth parasites of vertebrates, taken as groups, viz., exploring the helminth fauna of fishes, amphibians, reptiles, birds and mammals, together with their ecological variations. The helminthologists of the country in general and the state of Bihar in particular have not yet reported the parasites fauna of the host and its impact on human population. Though some studies in this direction have been undertaken in recent past by various workers. It is, therefore intended to carry on this type of work, viz., ecological parasitology of selected vertebrate host, viz., Toad (<i>Bufo melanostictus</i>), commonly available in bank of Saryu River along Chapra town and effect of flanking population.</p>

## MATERIALS AND METHODS

Toads (*Bufo melanostictus*) were collected from near the houses, drainages, River bank of Saryu, playing boys in and around Chapra town, Bihar during the period of three year May 2010 to May 2013.

The toads were immediately transferred to the laboratory, sacrificed and dissected as soon as possible. All viscera were removed and each placed in petri dish with normal physiological saline. The viscera were examined for helminths under a dissecting microscope. The parasites recovered from each toad were collected and counted. Details like; location, number, species of the parasites and month of collection. The lungs were cut and checked out for infection. The recovered helminths were cleaned carefully. Trematodes were fixed under pressure of cover glass in AFA solution. Cestode parasites were

fixed in AFA in between two slides or glass plates tied together at the ends by rubber bands and placed two hours in a jar or petri dishes containing the fixative. Specimens of trematodes and cestodes were then transferred to separate vials containing the fixative. After 24 hours the fixed worms were preserved in 70% alcohol in separate vials. For anatomical study, both Trematodes and Cestodes were stained in Semichon's Solution. The nematodes were fixed in 70% alcohol and cleared in lactophenol.

## RESULTS AND DISCUSSION

Out of total 1328 Toads (*Bufo melanostictus*) collected and examined, trematodes were 450 (57.3 per cent). Sex-wise, the rate of infection of trematodes was higher in females 256 (34.5 per cent), than the males 194 (33.1 per cent).

**Table 1: The Sex-wise, the rate of infection of trematodes**

Sex	Total;			No. of toads infected with		
	Examined	Infected	%	Trematodes	Percentage	
					Examined	Infected
Male	586	321	54.7	194	33.1	60.4
Female	742	463	62.3	256	34.5	55.2
Total	1328	784	59	450	33.8	57.3

**Table 2: Month-wise, the rate of infection of trematodes**

Month	Infection in			Male infected with Trematodes		Female infected with Trematodes		Total infected with Trematodes	
	Male	Female	Total	No.	%	No.	%	No.	%
May	21	27	48	17	80.9	24	88.8	41	85.4
June	46	47	93	24	52.1	29	61.7	53	56.9
July	53	54	107	28	52.8	34	62.9	62	57.9
August	51	66	117	31	60.7	37	56	68	58.1
September	49	79	128	26	53	38	48.1	64	50
October	48	98	146	21	43.7	27	27.5	48	32.8
November	20	25	45	19	95	20	80	39	86.6
December	-	2	2	-	-	-	-	-	-
January	-	-	-	-	-	-	-	-	-
February	7	20	27	7	100	10	50	17	62.9
March	11	17	28	9	81.8	16	94.1	25	89.2
April	15	28	43	12	80	21	75	33	76.7
Total	321	463	784	194	60.4	256	55.2	450	57.3

**Table 3: Season-wise, the rate of infection of trematodes**

Seasons	Examined	Infected	Percentage (%) (taken from examined hosts)	Both(Male & Female)	
				Trematode	
				No.	%
Winter	194	74	38.1	56	12.4
Summer	431	212	49.1	152	33.7
Rainy	703	498	70.8	242	53.7
Total	1328	784	59	450	57.3

Table 4: Location-wise infection of Trematode Parasites in *Bufo melanostictus* (Toad)

Month	Infection in		Location																		
	Male	Female	Total	Rectum				Intestine				Lungs									
				M	%	F	%	Total	%	M	%	F	%	Total	%						
May	17	24	41	10	58.8	-	-	10	24.3	7	41.1	20	83.3	27	65.8	-	-	4	16.6	4	9.7
June	24	29	53	-	-	-	-	-	-	11	45.8	17	58.6	28	52.8	13	54.1	12	41.3	25	47.1
July	28	34	62	-	-	28	82.3	28	45.1	18	64.2	6	17.6	24	38.7	10	35.7	-	-	10	16.1
August	31	37	68	6	19.3	-	-	6	8.8	25	80.6	22	59.4	47	69.1	-	-	15	40.5	15	22
September	26	38	64	-	x	25	65.7	25	39	18	69.2	13	34.1	31	48.4	8	30.7	-	-	8	12.5
October	21	27	48	21	100	27	100	48	100	-	-	-	x	-	-	-	-	-	-	-	-
November	19	20	39	-	-	8	40	8	20.5	17	89.4	12	60	29	74.3	2	10.5	-	-	2	5.12
December	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
January	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
February	7	10	17	5	71.4	10	100	15	88.2	2	28.5	-	-	2	20	-	-	-	-	-	-
March	9	16	25	7	77.7	10	62.5	17	68	2	22.2	6	37.5	8	50	-	-	-	-	-	-
April	12	21	33	-	-	15	71.4	15	45.4	4	33.3	6	28.5	10	47.6	8	66.6	-	-	8	24.2
TOTAL	194	256	450	49	25.2	123	48	172	38.2	104	53.6	102	39.8	206	45.7	41	21.1	31	12.1	72	16

In the present study, females showed insignificantly higher (34.5 per cent) rate of infection than the male toads (33.1 per cent). The present finding is in conformity with the findings of Griffin (1989), while working on frog. Griffin (1989) has also mentioned about correlation between size of the host and the intensity of infection. The higher rate of infections in females could be due to their larger size; more feed requirement, hence prone to more parasites. This is also in agreement with the findings of Muzzall (1991).

However, the present finding is in contrary with the findings of Lees (1962), Begum and Banu (2012), while working on *Bufo melanostictus* of Dhaka city. Khurshid (2010), while working on carp, also reported the higher rate of infection in females than males.

Month-wise, the maximum (100 per cent) rate of infection was observed in male in the month of February and the minimum (43.7 per cent) in the month of October. In female, maximum (94.1 per cent) rate of infection was observed in the month of March and the minimum (27.5 per cent) was observed in the month of October.

Trematodes were found in minimum (89.2 per cent) number in the month of March. The present finding is in contrary with the finding of Rizvi and Bhutia (2009). These differences are statistically insignificant. As far as the rate of infection is considered and showed the minimum infection in the month of October the lowest (32.8 per cent) was in case of this helminth parasite.

Sex-wise, males toads were heavily (100 per cent) infected and in month of February. Similarly, in case of male, when lowest rate of infection was considered with respect to month of October (43.7 per cent). In case of females, (94.1 per cent) in the month of March and the minimum (27.5 per cent) rate of infection in the month of October.

Location-wise, the rate of infection of trematodes was maximum (45.7 per cent) from intestine, followed by the rectum (38.2 per cent) and the lungs (16 per cent). Location-wise the parasites were collected from intestine, rectum, stomach, lungs and gall bladder (no infection was observed from the buccal cavity, skin, liver and urinary bladder).

In the present study, the parasites were usually found along the digestive tract i.e. intestine, rectum and

stomach as these were observed as their favourite sites and believed to have a commensalistic relationship with its host and did not pose any threat to the host even though they were found in abundance. These differences were found statistically significant. Table- Location -wise:

Season-wise, the maximum (53.7 per cent) rate of infection was observed in rainy season followed by summer (33.7 per cent) while minimum (12.4 per cent) trematodes were found during the winter season. This observation is in conformity with the findings of Chandra and Gupta (2007); Begum and Banu (2012) The higher rate of infection in rainy season may be due to the damp habitats favoring the survival of infective stages of parasites.

During winter season, toads hibernate and there is a reduction in metabolism resulting in hypobiosis. The influence of hibernation can be more properly considered as being the sum of influence of several factors involving cessation of feeding. The drop in temperature retards reproduction and may lead to a reduction in the number of parasites.

The parasites of amphibians are still more affected due to seasonal and climatic factors because, firstly their hosts are cold-blooded and secondly, they are amphibious in nature, which directly affect the parasite population and the amphibians mode of life provides a wider exposure to both terrestrial and aquatic conditions, which favour parasites. These differences were found statistically insignificant.

However, the present finding is in contrary to the finding of Lees (1962), who reported the highest incidence, was in autumn.

Statistically, these differences were found insignificant. The reasons for the highest rate of infection in rainy season and lowest in winter season have already being mentioned, earlier in this chapter.

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