



Prevalence of gastrointestinal parasitic infestation of ruminants at Rajbari, Bangladesh

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ABSTRACT

A prevalence study was conducted on helminthes infestation in ruminant in Rajbari district of Bangladesh. A total of 5397 animals of different age, sex at different management systems were examined. The overall prevalence of helminthes infestation in cattle, goat and buffalo are 52.40%, 55.24% and 91.43% respectively. Trematode infestation of *Fasciola*, *Paramphistomum*, *Schistosoma* were found 20.84%, 7.47% and 4.13%, respectively in cattle whereas 10.37%, 2.56% and 3.17% in goat and 23.96%, 16.87% and 11.24% in buffalo. Nematode infestation of *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found 9.48%, 2.79%, 4.46% and 1.12%, respectively in cattle; 15.61%, 12.56%, 5.24% and 0.49% in goat, and 12.05%, 11.91%, 5.76% and 3.35% in buffalo, respectively. Cestode infestation of *Moniezia* and *Taenia* were found 1.12% and 0.99% in cattle; 4.76% and 0.49% in goat, and 4.02% and 2.28% in buffaloes, respectively. The highest prevalence rate was recorded in animal aged over 3 years in comparison to 0-1 year and 1-3 year. The male were the most susceptible than female. Indigenous breed was more susceptible to helminthes infestation than exotic/cross breeds. Prevalence of helminthes infestation was higher in ruminants reared in open system than confined system. The overall helminthes infestations in ruminant was found highest in November (14.89%) and the lowest prevalence was recorded in October (6.71%). The study suggests the helminthes infestation was widely prevalent in ruminant of Rajbari district and deserve treatment and control measures against them.

Key words: Prevalence, helminthes, cattle, goat, buffalo, Rajbari, Bangladesh.

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INTRODUCTION

The health of the nation depends on the status of the animal health. This scenario is completely opposite in Bangladesh. The productivity of indigenous livestock is very low (Rahman et al. 2009). One of the causes of ill health is due to parasitic diseases. It is estimated that about 10% animals die annually due to gastrointestinal illness (CDC, 2011), and parasitic disease (Nath et al. 2013). Parasitism is one of the most hindering

cause for the development of livestock population in our country (Bhuiyan, 1970). Endoparasitic infestation is a common problem and causes substantial economic loss (Garrels, 1975; Qadir, 1974; Rahman and Razzak, 1973). The climatic condition and geographic position of locality influence the types and severity of parasitic infestation in grazing animals (Arambulo and Moran, 1981). Rajbari upazila of Rajbari district is one of the vulnerable upazilas for parasitic infestation in Bangladesh. Geographically it is low

land which harbors the one step of life cycle of parasites. Helminthes infestation cause economic loss through lowering the productivity, disease resistance capacity and mortality of animals in severe cases. Therefore, the present study was undertaken to know the prevalence of gastrointestinal parasite in Rajbari district of Bangladesh. This study will be helpful to epidemiologist for taking the control and treatment measures for the betterment of the livestock rearing in Bangladesh.

MATERIALS AND METHODS

Study area

The investigation was carried out in Rajbari Veterinary Hospital, Bangladesh from July 2011 to June 2012. A total of 5397 ruminants were selected for this study who were admitted to the hospital for treatment. Owners were interviewed with a prepared questionnaire.

Sample collection

Fecal sample were collected from the animals immediately after coming into the hospital. The fecal samples were collected directly from rectum and/or freshly voided feces. About 10 grams of feces were collected from each animal and immediately examined under microscope using direct smear method and simple sedimentation procedure described by Urquhart et al. (1996). The identification of egg of different helminths was performed by their characteristic morphological features as described by Soulsby (1982) and Rahman et al. (1996).

RESULTS AND DISCUSSION

The prevalence of helminthes infestation

The helminthes infestations were found on the basis of species represent in the table 1. The trematodal infestation including *Fasciola*, *Paramphistomum* and *Schistosoma* were found of 20.84%, 7.47% and 4.13% in cattle; 10.37%, 2.56% and 3.17% in goat; and 23.96%, 16.87% and 11.24% in buffalo respectively. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 9.48%, 2.79%, 4.46% and 1.12% in

cattle; 15.61%, 12.56%, 5.24% and 0.49% in goat; and 12.05%, 11.91%, 5.76% and 3.35% in buffalo respectively. The cestodal infestation such as *Moniezia* and *Taenia* were found of 1.12% and 0.99% in cattle; 4.76% & 0.49% in goat; and 4.02% and 2.28% in buffaloes respectively. *Paramphistomum*, *Strongylus*, *Fasciola* and *Schistosoma* were 21.58%, 19.82%, 12.61%, and 3.63% respectively reported by Haque et al. (1992) which correlate the present study.

Prevalence of helminthes infestation according to age

The helminthes infestation was found on the basis of age represent in the table 2. The trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 19.60%, 1.68% and 6.70% in cattle; 3.41%, 2.27% and 3.98% in goat; 10.07%; 8.05% and 8.05% in buffalo at age of 0-1 year respectively. 50.40%, 18.83% and 10.12% in cattle; 24.42%, 5.81%, 6.98% in goat; 29.77%, 18.32%, 15.27% in buffalo at age of 1- 3 years respectively. 47.16%, 19.98% and 7.42% in cattle; 30.37%, 6.28% and 6.81% in goat; 31.02%, 22.33% and 12.90 in buffalo at age of over 3 years respectively. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 60.80%, 2.35%, 5.19% and 1.01% in cattle; 69.89%, 10.80%, 4.55% and 0.57% in goat; 59.06%, 6.71%, 3.36% and 1.34% in buffalo at age of 0-1 year respectively, 0.00%, 5.06%, 9.11% and 2.02% in cattle; 5.81%, 29.07%, 11.63% and 1.16% in goat; 1.53%, 16.03%, 6.11% and 4.58% in buffalo at age of 1-3 years respectively and 0.00%, 7.42%, 10.37% and 2.95% in cattle; 0.00%, 30.89%, 13.09% and 1.05% in goat; 0.00%, 14.39%, 7.44% and 4.22% in buffalo at age of over 3 years aged respectively. The cestodal infestation such as *Moniezia* and *Taenia* were found of 1.68% and 1.01% in cattle; 3.98% and 0.57% in goat; 2.01% and 1.34% in buffalo at age of 0-1 years respectively, 2.43% and 2.02% in cattle; 13.95% and 1.16% in goat; 6.11% and 2.29% in buffalo at age of 1-3 years respectively and 2.29% and 2.40% in cattle; 10.47% and 1.05% in goat; 4.71% and 2.98% in buffalo at age of over 3 years respectively. Highest prevalence of parasite in this study was observed in older animal which is in confirmatory with the study of Hasan et al. (2011), Saha et al. (2013) and Islam et al. (2014).

Table 1
Overall prevalence of helminthes in Rajbari district.

Type of parasite	Species	Cattle		Goat		Buffalo	
		No.	%	No.	%	No.	%
Trematode	<i>F. gigantica</i>	798	20.84	85	10.37	179	23.96
	<i>Paramphistomum</i>	286	7.47	21	2.56	126	16.87
	<i>Schistosoma</i>	158	4.13	26	3.17	84	11.24
Nematode	<i>Ascaris</i>	363	9.48	128	15.61	90	12.05
	<i>Hemonchus</i>	107	2.79	103	12.56	89	11.91
	<i>Strongylus</i>	171	4.46	43	5.24	43	5.76
	<i>Trichuris</i>	43	1.12	4	0.49	25	3.35
Cestode	<i>Moniezia</i>	43	1.12	39	4.76	30	4.02
	<i>Taenia</i>	38	0.99	4	0.49	17	2.28
Total positive case		2007	52.40	453	55.24	683	91.43
Total population		3830	70.97	820	15.19	747	13.84

Table 2
Prevalence (%) of helminthes according to age of cattle, goat and buffalo in Rajbari district.

Species	0-1 year			1-3 years			>3 years		
	Cattle	Goat	Buffalo	Cattle	Goat	Buffalo	Cattle	Goat	Buffalo
<i>F. gigantica</i>	19.60	3.41	10.07	50.40	24.42	29.77	47.16	30.37	31.02
<i>Paramphistomum</i>	1.68	2.27	8.05	18.83	5.81	18.32	19.98	6.28	22.33
<i>Schistosoma</i>	6.70	3.98	8.05	10.12	6.98	15.27	7.42	6.81	12.90
<i>Ascaris</i>	60.80	69.89	59.06	0.00	5.81	1.53	0.00	0.00	0.00
<i>Hemonchus</i>	2.35	10.80	6.71	5.06	29.07	16.03	7.42	30.89	14.39
<i>Strongylus</i>	5.19	4.55	3.36	9.11	11.63	6.11	10.37	13.09	7.44
<i>Trichuris</i>	1.01	0.57	1.34	2.02	1.16	4.58	2.95	1.05	4.22
<i>Moniezia</i>	1.68	3.98	2.01	2.43	13.95	6.11	2.29	10.47	4.71
<i>Taenia</i>	1.01	0.57	1.34	2.02	1.16	2.29	2.40	1.05	2.98
Total positive	18.99	5.60	4.74	15.72	2.74	4.17	29.14	6.08	12.82

Table 3
Prevalence (%) according to sex of different animals in Rajbari district.

Species	Cattle		Goat		Buffalo	
	Male	Female	Male	Female	Male	Female
<i>F. gigantica</i>	39.02	40.92	18.92	18.04	26.43	25.86
<i>Paramphistomum</i>	14.29	14.19	4.63	4.12	16.19	22.05
<i>Schistosoma</i>	6.94	9.34	4.63	6.19	12.86	11.41
<i>Ascaris</i>	19.18	16.37	27.03	27.84	15.24	9.89
<i>Hemonchus</i>	5.22	5.50	22.39	21.13	12.14	14.45
<i>Strongylus</i>	8.73	8.18	9.65	8.25	6.19	6.46
<i>Trichuris</i>	2.45	1.66	3.09	4.12	3.81	3.42
<i>Moniezia</i>	2.12	2.17	8.11	8.25	4.05	4.94
<i>Taenia</i>	2.04	1.66	1.54	2.06	3.10	1.52
Total positive	38.98	24.88	8.24	6.17	13.36	8.37

Table 4
Prevalence (%) helminthes according to breed of animals in Rajbarri district.

Species	Cattle		Goat		Buffalo	
	Local	Cross	BB	JP	Indigenous	Cross
<i>F. gigantica</i>	39.76	39.77	18.73	18.87	25.98	26.77
<i>Paramphistomum</i>	14.25	14.25	4.61	4.72	18.97	17.17
<i>Schistosoma</i>	7.85	7.90	5.76	5.66	12.37	12.12
<i>Ascaris</i>	18.06	18.13	28.24	28.30	12.99	13.64
<i>Hemonchus</i>	5.34	5.31	22.77	22.64	13.20	12.63
<i>Strongylus</i>	8.50	8.55	9.51	9.43	6.19	6.57
<i>Trichuris</i>	2.11	2.20	0.86	0.94	3.71	3.54
<i>Moniezia</i>	2.11	2.20	8.65	8.49	4.54	4.04
<i>Taenia</i>	2.02	1.68	0.86	0.94	2.06	3.54
Total positive	39.29	24.56	11.04	3.37	15.43	6.30

Table 5
Prevalence (%) of helminthes according to rearing system of animal in Rajbari district.

Species	Cattle		Goat		Buffalo		Total	
	Open	Confined	Open	Confined	Open	Confined	Open	Confined
<i>F. gigantica</i>	38.63	42.99	18.62	19.48	26.42	25.36	32.74	37.23
<i>Paramphistomum</i>	13.53	16.31	4.79	3.90	18.90	16.67	13.38	15.08
<i>Schistosoma</i>	7.27	9.60	5.85	5.19	12.11	13.04	8.14	9.78
<i>Ascaris</i>	18.03	18.23	28.72	25.97	13.76	10.87	18.74	17.66
<i>Hemonchus</i>	5.85	3.84	22.61	23.38	12.29	15.94	9.93	8.15
<i>Strongylus</i>	10.03	4.22	9.31	10.39	6.06	7.25	9.02	5.43
<i>Trichuris</i>	2.36	1.54	0.80	1.30	3.67	3.62	2.41	1.90
<i>Moniezia</i>	2.42	1.34	8.51	9.09	4.40	4.35	3.82	2.72
<i>Taenia</i>	1.88	1.92	0.80	1.30	2.39	2.90	1.83	2.04
Total positive	47.28	16.58	11.96	2.45	17.34	4.39	76.58	23.42

Table 6
Prevalence (%) helminthes according to season in Rajbarri district.

Months	Trematode		Nematode		Cestode		Total	
	No.	%	No.	%	No.	%	No.	%
January	135	7.66	70	5.79	11	6.43	216	6.87
February	138	7.83	80	6.62	9	5.26	227	7.22
March	140	7.94	103	8.52	13	7.60	256	8.15
April	135	7.66	75	6.20	10	5.85	220	7.00
May	187	10.61	81	6.70	14	8.19	282	8.97
June	121	6.86	100	8.27	15	8.77	236	7.51
July	147	8.34	110	9.10	12	7.02	269	8.56
August	113	6.41	118	9.76	16	9.36	247	7.86
September	157	8.91	95	7.86	11	6.43	263	8.37
October	95	5.39	102	8.44	14	8.19	211	6.71
November	267	15.14	171	14.14	30	17.54	468	14.89
December	128	7.26	104	8.60	16	9.36	248	7.89

Winter = November to February, Summer = March to May and Rainy = June to October

The prevalence of helminthes infestation according to sex

The helminthes infestations were found on the basis of age in cattle represent in the table 3. The trematodal infestation such as *Fasciola*, *Paramphistomum*, and *Schistosoma* were found 39.02%, 14.28% and 6.96% in male respectively and 40.98%, 14.20% and 9.28% in female respectively. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 19.18%, 5.22%, 8.71% and 2.45% in male respectively and 16.37%, 5.50%, 8.18% and 1.66% in female respectively. The cestodal infestation such as *Moniezia* and *Taenia* were found of 2.12% and 2.04% in male respectively and 2.17% and 1.66% in female respectively.

The helminthes infestations were found on the basis of sex in goat represent in the table 3. The trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found of 18.92%, 4.63% and 4.63% in male respectively and 18.04%, 4.12% and 6.19% in female respectively. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus*, and *Trichuris* were found of 27.03%, 22.39%, 9.65% and 3.09% in male respectively and 27.84%, 21.13%, 8.25% and 4.12% in female respectively. The cestodal infestation such as *Moniezia* and *Taenia* were found of 8.11% and 1.54% in male respectively and 8.25% and 2.06% in female respectively.

The helminthes infestations were found on the basis of sex in buffalo represent in table 3. The trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found of 26.43%, 16.19% and 12.86% in male respectively and 25.86% and 22.05%, 11.41% in female respectively. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 15.24%, 12.14%, 6.19% and 3.81% in male respectively and 9.89%, 14.45%, 6.46% and 3.42% respectively in female. The cestodal infestation such as *Moniezia* and *Taenia* were found of 4.05% and 3.10% in male respectively and 4.94% and 1.52% in female respectively. The overall prevalence of parasites in ruminants were found higher in male than female in this study which was in agreement with the study of Mamun et al. (2011) but contradictory with Islam et al. (2014).

The prevalence of helminthes infestation according to breed

The table 4 represents the prevalence of helminthes infestation in cattle, goat and buffalo according to their breed. The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 39.76%, 14.25% and 7.85%, respectively in local breed of cattle and 39.77%, 14.25% and 7.90%, respectively in cross bred of cattle in Rajbari. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 18.06%, 5.34%, 8.50% and 2.11% prevalence, respectively in local breed of cattle and 18.13%, 5.31%, 8.55% and 2.20% prevalence, respectively in cross bred of cattle in Rajbari. The cestodal infestation such as *Moniezia* and *Taenia* were found of 2.11% and 2.02% prevalence, respectively in local bred of cattle and 2.20% and 1.68% prevalence, respectively in cross bred of cattle in Rajbari.

The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 18.73%, 4.61% and 5.76%, respectively in Black Bengal goat and 39.77%, 14.25% and 7.90%, respectively in Jamunapari goat in Rajbari. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 28.24%, 22.77%, 9.51% and 0.86% prevalence, respectively in Black Bengal goat and 28.30%, 22.64%, 9.43% and 0.94% prevalence, respectively in Jamunapari goat in Rajbari. The cestodal infestation such as *Moniezia* and *Taenia* were found of 8.65% and 0.86% prevalence, respectively in Black Bengal goat and 8.49% and 0.94% prevalence, respectively in Jamunapari goat in Rajbari.

The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 25.98%, 18.97% and 12.37%, respectively in indigenous breed of buffalo and 26.77%, 17.17% and 12.12%, respectively in cross bred of buffalo in Rajbari. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 12.99%, 13.20%, 6.19% and 3.71% prevalence, respectively in indigenous breed of buffalo and 13.64%, 12.63%, 6.57% and 3.54% prevalence, respectively in cross bred of buffalo in Rajbari. The cestodal infestation such as *Moniezia*

and *Taenia* were found of 4.54% and 2.06% prevalence, respectively in indigenous bred of cattle and 4.04% and 3.54% prevalence, respectively in cross bred of buffalo in Rajbari. The maximum rate of infection of gastro-intestinal parasite was recorded in crossbred cattle (Sardar et al. (2006) whereas higher prevalence of helminth infection was found in local breed compared to cross breed in this study. Jamunapari goat was more susceptible to abomasal worm *Haemonchus* reported by Nuruzzaman et al., (2012) which is dissimilar with the present study.

The prevalence of helminthes infestation according to rearing system

The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 38.63%, 13.53% and 7.27%, respectively in open rearing system of cattle and 42.99%, 16.31% and 9.60%, respectively in confined rearing system of cattle in Rajbari (Table 5). The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 18.03%, 5.85%, 10.03% and 2.36% prevalence, respectively in open rearing system of cattle and 18.23%, 3.84%, 4.22% and 1.54% prevalence, respectively in confined rearing system of cattle in Rajbari. The cestodal infestation such as *Moniezia* and *Taenia* were found of 2.42% and 1.88% prevalence, respectively in open rearing system of cattle and 1.34% and 1.92% prevalence, respectively in confined rearing system of cattle in Rajbari.

The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 18.62%, 4.79% and 5.85%, respectively in open rearing system of goat and 19.48%, 3.90% and 5.15%, respectively in confined rearing system of goat in Rajbari. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 28.72%, 22.61%, 9.31% and 0.80% prevalence, respectively in open rearing system of goat and 25.97%, 23.38%, 10.39% and 1.30% prevalence, respectively in confined rearing system of goat in Rajbari. The cestodal infestation such as *Moniezia* and *Taenia* were found of 8.51% and 0.80% prevalence, respectively in open rearing system of goat and 9.09% and 1.30% prevalence,

respectively in confined rearing system of goat in Rajbari.

The prevalence of trematodal infestation such as *Fasciola*, *Paramphistomum* and *Schistosoma* were found 26.42%, 18.90% and 12.11%, respectively in open rearing system of buffalo and 25.36%, 16.67% and 13.04%, respectively in confined rearing system of buffalo in Rajbari. The nematodal infestation such as *Ascaris*, *Haemonchus*, *Strongylus* and *Trichuris* were found of 13.76%, 12.29%, 6.06% and 3.67% prevalence, respectively in open rearing system of buffalo and 10.87%, 15.94%, 7.25% and 3.62% prevalence, respectively in confined rearing system of buffalo in Rajbari. The cestodal infestation such as *Moniezia* and *Taenia* were found of 4.40% and 2.39% prevalence, respectively in open rearing system of buffalo and 4.35% and 2.90% prevalence, respectively in confined rearing system of buffalo in Rajbari. Cattle, goat and buffalo reared in open or extensive systems showed higher prevalence of parasite which is in agreement with studies of Rabbi et al. (2011). Most of the ruminants are reared in rural areas in scavenging or semi scavenging system (Devendra, 1970). In this type of rearing, goats graze on the fields. Probably, this type of management practice plays a vital role in the high rate of parasitic infection.

Prevalence of helminthes infestation according to season

Prevalence of helminthes infestation on the basis of season / months is represented in table 6. The trematodal infestation were found of 7.66%, 7.83%, 7.94%, 7.66%, 10.61%, 6.86%, 8.34%, 6.41%, 8.91%, 5.39%, 15.14% and 7.26% in January, February, March, April, May, June, July, August, September, October, November and December respectively. The nematodal infestation were found of 5.79%, 6.62%, 8.52%, 6.20%, 6.70%, 8.27%, 9.10%, 9.76%, 7.86%, 8.44%, 14.14% and 8.60% in January, February, March, April, May, June, July, August, September, October, November and December respectively. The cestodal infestation were found of 6.43%, 5.26%, 7.60%, 5.85%, 8.19%, 8.77% 7.02%, 9.36%, 6.43%, 8.19%, 17.54%, 9.36% in January, February, March, April, May, June, July, August,

September, October, November and December respectively.

The highest prevalence of parasitic infestation was found in month of November (14.89%) and lowest in October (6.71%). The results are almost similar to Farleigh (1966), Okon (1974) and Mondal et al. (1994). Higher prevalence of helminthes infestation in late autumn and winter might be attributed to suitable environmental condition like optimum temperature and relative humidity (81.60%), which might be, helped for the development and survival of helminthes ova in the environment. However, this variation in between the present and earlier results might be due to the differences among the geographical locations and climatic conditions of the experimental areas, method of study, sample size, breed of the animals.

CONCLUSION

The prevalence study of helminthes infestation especially trematode is alarming in ruminant at Rajbari Sadar Upazila, Rajbari. Considerable differences in prevalence of helminthes in different animals according to age, sex, breed, season and rearing system of animals were observed. Among the animal examined cattle were highly infested (37.18%) and then the goats (8.70%). Over 3 years ruminants were highly infested (43.10%) with helminthes and low infestation (25.14%) are recorded in below 1 year of age. The male animals were highly infested than female. The helminthes infestations were found on the basis of season or month, the highest prevalence recorded in November (13.86%) and the lowest prevalence was recorded in October (6.90%). The study suggests the helminth infection was widely prevalent in ruminant of Rajbari district.

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