

Research Article

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## Prevalence of gastrointestinal helminthiasis in naturally infested buffalo in Sylhet district

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### Abstract

Prevalence of parasitic infestations of buffalo was studied in Sylhet district of Bangladesh from November, 2014 to October, 2015. Objective of the study was to identify the different types of gastro-intestinal helminths in buffalo and to determine the overall prevalence of gastro-intestinal helminths infestation in buffalo of Sylhet district in Bangladesh. A total of 467 buffaloes were examined, among them 397(85.01%) were found to be infested with gastrointestinal parasites. Six species of gastrointestinal parasites were identified namely *Fasciolasp.*, *Paramphistomum* sp., *Ascaris* sp., *Strongyloides* sp., *Bunostomum* sp., *Oesophagostomum* sp. and there prevalence was (34.9%), (26.98%), (7.28%), (3.85%), (7.49%) and (4.5%) respectively. In this study, prevalence of gastro-intestinal parasites in relation to age, sex and season dynamics were studied. Slightly higher prevalence of parasite was observed in rainy season (88.27%) followed by summer (86.96%) and winter (79.17%) season. Females (86.9%) were more susceptible to gastrointestinal parasitic infestation than males (81.92%). In case of age group, highest prevalence was found in adult (89.18%) followed by young (83.46%) and buffalo calves (71.21%). In the present study, EPG/CPG/OPG (egg per gram of feces) was also determined and ranges from 200-1900. The present study is not emphasized on the epidemiological parameter of parasitic infestation. So, further study should be conducted to assess the economic losses due to parasitic infestations and to find out effective control strategies against it.

### Keywords

Prevalence,  
gastrointestinal,  
parasite,  
season,  
buffalo.

### Introduction

Bangladesh is an over populated, rural and agrarian country in the world and livestock has been an important component of the mixed farming system practiced in Bangladesh for centuries. About 80% of our population is employed in agriculture and livestock farming. Twenty percent people are involved in livestock sector as permanent occupation. The contribution of Livestock

in the magnitude of Gross Domestic Product (GDP) is about 16.23% in Bangladesh (BBS, 2008). But the livestock diseases and disorders of animals are the most important hindrance towards livestock development in our country. The world population of buffalo (*Bubalus bubalis*) has been estimated at over 172 million head, more than 97% (167.6 million) of which are in Asia and

the Pacific region, mainly in India (97.7 million), Pakistan (25.5 million) and Bangladesh (0.83 million) (FAO, 2004). About 98% of buffaloes in the region are raised by small farmers owning to less than two hectares of land and less than five buffaloes (Mudgal, 1992). In general, the water buffalo is regarded as more productive, healthier and more useful than the cow, especially for the poorest "backyard" farmers in Asia (Bhat, 1999). According to the FAO, 1997 report, the buffalo are recognized as "Black Gold of Asia" (Khushuk and Mernon. 2004). In comparison to research on cattle, research on water buffaloes has been much neglected. Both the swamp and river type buffaloes are found in Bangladesh (Latif, 1994). Buffalo is considered to be a multipurpose animal and in some parts of the country, especially in the hilly areas and low lying marshy land, the farmers are more dependent on buffaloes than cattle. They are extensively used for agricultural land preparation (ploughing and laddering), inter-cultural operation (racking), carting and transportation of goods (mainly agricultural products) in rural areas, threshing and crushing of sugarcane and oil seeds in the country (Rahaman and Islam, 1992). The buffaloes are also the source of protein. Buffalo meat is nutritionally superior to ox meat (Ranjhan, 1992). In addition to milk, meat and draft facilities, buffaloes provide organic wastes like dung and urine for fuel and fertilizer, dead animals and bone for feeding of poultry and hides, horns and tallow for industrial use. The working life of buffalo is longer than that of cattle, usually more than 17 years and up to 25 years of age. Because of this excellent draft and pulling capacity, buffaloes are called the living tractor of the East (Cockrill, 1968).

In Bangladesh, among many causes, parasitism is thought to be a major cause that hindering, the development of livestock population (Jabber and Green, 1983). Unlike bacterial and viral diseases, the diseases caused by parasites are of great importance. The gastrointestinal tracts (GIT) of animals harbor a variety of helminthes, which causes clinical and sub clinical parasitism. Helminthes adversely affect the health status of animals which may be a cause of economic losses to the livestock industry. Helminthes has been noted as major constraint to ruminant's productivity on a clinical and subclinical level (Gonzalez *et al.*, 1998). Parasitic diseases are also emphasized for their pathogenicity and economic importance in animals by the experts both from the government and nongovernmental organizations. Helminthes are recognized as by for the most significant part of diseases in livestock sector. The most important predisposing factors of helminthes infestation are grazing habits, climates, nutritional

deficiency, pasture management, immunological status presence of intermediate host and vector and the number of infective larvae and eggs in the environment (Radostits *et al.*, 1994).

Gastrointestinal parasitism is a world-wide problem. It is thought to be one of the major constraints that hinder the development of livestock population and also adversely affects the health and productivity of animals (Radostits *et al.*, 1994). The losses caused by parasitic infestations are in the form of lowered general health condition, retarded growth rate, diminishing the working efficiency, decrease milk and meat production, abortion; cost associated with preventive measures and reduces the disease resistance capability, which may ultimately lead to higher mortality (Silvestre *et al.*, 2000; and Radostits *et al.*, 1994). In developed countries, the data on epidemiology of various helminthiasis are published in an efficient manner as an aid to combat infestations more effectively. In contrast, in developing countries, little published information and data on the epidemiological aspect of helminthic infestations exists. Helminth parasitism, especially, gastrointestinal parasitism is one of the major health problems severely limiting the animal productivity in dairy animals and the significant production losses, which may run into millions of rupees (Shah and Chaudhry, 1995). The problem is neglected due to its chronic and insidious nature (Sanyal, 1998). The diverse agro climatic condition, animal husbandry practices and pasture management largely determines the incidence and severity of various parasitic diseases in a region. Epidemiological pattern of the parasitic diseases in the different agro climatic zones of the country would provide a basis for evolving strategic and tactical control of these diseases. The study examines the present status of parasites in buffaloes and its management in the Bangladesh. Little information is available regarding the epidemiology of all types of parasites in buffaloes. The parasitic infestation in favor of buffaloes from different regions of Bangladesh was not study thoroughly especially offshore region in Sylhet district which a future contemplated resourceful for buffaloes rearing in Bangladesh. In Sylhet district, Beanibazar, Jakiganj, Bishwanath, Jaintapur and such other upazilas have formed at the river mouths; provide unique pasture resource for the development of livestock industry including buffaloes. Therefore, the present study was undertaken with a view to fulfill the following objectives- to identify the different types of gastrointestinal helminths in buffalo and to determine the overall prevalence of gastro-intestinal helminths infestation in buffalo of Sylhet district in Bangladesh.

## Materials and Methods

### Time of study:

The investigation was carried out during the period from November, 2014 to October, 2015. Although there are six seasons in Bangladesh but only three seasons are prominent such as summer (March-June), rainy (July-October) and winter (November-February). So, the study period was divided into these three seasons for the convenience of the study.

### Study area:

The study area was conducted in different areas of Sylhet district such as Beanibazar, Jakiganj, Bishwanath, Jaintapur, Balaganj where majority of buffaloes are reared as free range. Fecal samples were examined in the laboratory of Medicine Department, Sylhet Agricultural University, Sylhet.

### Description of Sylhet district:

Sylhet is located at 24.8917°N 91.8833°E, in the north eastern region of Bangladesh within the Sylhet Division, within the Sylhet District and SylhetSadarUpazila. The climate of Sylhet is humid subtropical with a predominantly hot and humid summer and a relatively cool winter. The city is within the monsoon climatic zone, with annual average highest temperatures of 23 °C (Aug–Oct) and average lowest temperature of 7 °C (Jan). Nearly 80% of the annual average rainfall of 3,334 mm occurs between May and September.

### Selection of buffaloes:

467 (Four hundred and sixty seven buffaloes) were selected randomly. During collection of samples, the age, sex, nutritional status and season of the year were carefully recorded. The age of the buffaloes was determined from the official record book, by interrogating the farmers and by examining the teeth.

### Techniques for parasite assays and identification of faecal samples:

To diagnose gastro-intestinal parasites of ruminants, the parasites or their eggs/larvae must be recovered from the digestive tract of the animal or from faecal material. These are subsequently identified and quantified. This chapter presents diagnostic techniques within the reach of most laboratories to identify and quantify parasite infestations from the examination of

faecal material. The following are the main tasks involved in this process:

- Collection of faecal samples
- Separation of eggs/larvae from faecal material, and their concentration
- Microscopical examination of prepared specimens
- Preparation of faecal cultures
- Isolation and identification of larvae from cultures.

## Results

The study was carried out 467 buffaloes throughout Sylhet district of Bangladesh during one year period from November, 2014 to October, 2015. During study, both healthy and sick animals faeces was examined. The following data are collected from monthly report (November, 2014 to October, 2015) from my study areas throughout Sylhet district. The important parasitic diseases in my study area shown in Table 1. Found reports shows that percentages of gastro-intestinal parasitic diseases of buffalo were *Fasciolas* p. 41.06%, *Paramphistomum* sp. 31.74%, *Ascaris* sp. 8.56%, *Stongyloides* sp. 4.53%, *Bunostomum* sp. 8.82% and *Oesophagostomum* sp. 5.29%. The Prevalence of different gastrointestinal parasites of buffaloes is shown in Table 2. During this study, a total of 467 buffaloes were examined through fecal sample examination, of which 397 (85.01%), were found infested with one or more species of gastro-intestinal parasites. A total of six species of gastro-intestinal parasites were identified. The Prevalence of *Fasciola* sp., *Paramphistomum* sp., *Ascaris* sp., *Strongyloides* sp., *Bunostomum* sp., and *Oesophagostomum* sp. were 34.9%, 26.98%, 7.28%, 3.85%, 7.49% and 4.5% respectively.

Seasonal fluctuation of the year had a significant effect (Table-3) on the prevalence of gastro-intestinal parasitic infestation in buffaloes. A relatively higher prevalence of gastro-intestinal parasites were observed in rainy season (88.27%) followed by summer (86.96%) and winter (79.17%) seasons. During the study, the result of Table 4 was revealed that the age of the buffaloes had a significant effect on gastro-intestinal parasitic infestation. Adult animals (89.18%) were found more infested with gastro-intestinal parasitic infestation than young animals (83.46%) and calves (71.21%). The result of Table 5 has shown that the prevalence of gastrointestinal helminths in male and female buffalo was 81.92% and 86.9% respectively. In case of *Fasiola* female 35.52% and

male 33.9%, *Paramphistomum* female 28.28% and male 24.86%, *Ascaris* female 6.9% and male 7.91%, *Strongyloides* female 4.14% and male 3.39%,

*Bunostomum* female 7.93% and male 6.78%, *Oesophagostomum* female 4.14% and male 5.08% respectively.

Table1. Parasitic diseases in the study area (Nov. 2014 to Oct. 2015)

Month/Parasite	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Total	(%)
<i>Fasciola</i>	14	10	7	9	17	15	12	12	21	18	15	13	163	41.06
<i>Paramphistomum</i>	8	8	9	12	14	8	10	10	14	15	9	9	126	31.74
<i>Ascaris</i>	2	2	3	4	4	6	0	3	3	0	5	2	34	8.56
<i>Strongyloides</i>	3	0	1	2	0	3	3	0	2	2	1	1	18	4.53
<i>Bunostomum</i>	1	2	2	7	5	5	1	3	4	2	2	1	35	8.82
<i>Oesophagostomum</i>	3	1	0	4	4	2	0	3	1	0	2	1	21	5.29
Total	31	23	22	38	44	39	26	31	45	37	34	27	397	100

Table 2. Prevalence of different gastrointestinal parasites of buffalo

Month/Parasite	Nov. N=36	Dec. N=29	Jan. N=33	Feb. N=46	Mar. N=53	Apr. N=40	May. N=30	Jun. N=38	Jul. N=49	Aug. N=43	Sep. N=39	Oct. N=31	Total	Prevalence %
<i>Fasciola</i>	14	10	7	9	17	15	12	12	21	18	15	13	163	34.9
<i>Paramphistomum</i>	8	8	9	12	14	8	10	10	14	15	9	9	126	26.98
<i>Ascaris</i>	2	2	3	4	4	6	0	3	3	0	5	2	34	7.28
<i>Strongyloides</i>	3	0	1	2	0	3	3	0	2	2	1	1	18	3.85
<i>Bunostomum</i>	1	2	2	7	5	5	1	3	4	2	2	1	35	7.49
<i>Oesophagostomum</i>	3	1	0	4	4	2	0	3	1	0	2	1	21	4.5
Total	31	23	22	38	44	39	26	31	45	37	34	27	397	85.01

Table 3. Seasonal prevalence of gastrointestinal parasitic diseases of buffalo

Season	Summer(Mar-Jun) N=161		Rainy(July-Oct) N=162		Winter(Nov-Feb) N=144	
	No.	Prevalence	No.	Prevalence	No.	Prevalence
<i>Fasciola</i>	56	34.78%	67	41.36%	40	27.78%
<i>Paramphistomum</i>	42	26.09%	47	29.01%	37	25.69%
<i>Ascaris</i>	13	8.07%	10	6.17%	11	7.64%
<i>Strongyloides</i>	6	3.73%	6	3.70%	6	4.17%
<i>Bunostomum</i>	14	8.7%	9	5.56%	12	8.33%
<i>Oesophagostomum</i>	9	5.59%	4	2.47%	8	5.56%
Total	140	86.96%	143	88.27%	114	79.17%

Table 4. Age wise prevalence of gastrointestinal parasitic diseases of buffalo

Age/ Disease		Age group(year)		
		up to 1 N=66	1-2 N=133	above 2 N=268
<i>Fasciola</i>	No.	3	40	120
	Prevalence	4.54%	30.07%	44.78%
<i>Paramphistomum</i>	No.	6	31	89
	Prevalence	9.09%	23.31%	33.21%
<i>Ascaris</i>	No.	16	15	3
	Prevalence	24.24%	11.28%	1.12%
<i>Strongyloides</i>	No.	3	5	10
	Prevalence	4.54%	3.76%	3.73%
<i>Bunostomum</i>	No.	17	15	3
	Prevalence	25.76%	11.28%	1.12%
<i>Oesophagostomum</i>	No.	2	5	14
	Prevalence	3.03%	3.76%	5.22%
Total	No.	47	111	239
	Prevalence (age wise)	71.21%	83.46%	89.18%

Table 5. Sex related prevalence of gastrointestinal parasitic diseases of buffalo

Sex/Disease	Female N=290		Male N=177	
	No.	Prevalence	No.	Prevalence
<i>Fasciola</i>	103	35.52%	60	33.9%
<i>Paramphistomum</i>	82	28.28%	44	24.86%
<i>Ascaris</i>	20	6.9%	14	7.91%
<i>Strongyloides</i>	12	4.14%	6	3.39%
<i>Bunostomum</i>	23	7.93%	12	6.78%
<i>Oesophagostomum</i>	12	4.14%	9	5.08%
Total	252	86.9%	145	81.92%

## Discussion

The result of Table 2 has shown that, prevalence of *Fasciola* sp. (34.9%) was the highest whereas *Strongyloides* sp. (3.85%) was the lowest. The result is higher than Mamun *et al.* (2011) and Azam *et al.* (2002) who reported that 61.02% and 64.41% buffaloes were positive for gastro-intestinal parasites in water buffalo of Kurigram district in Bangladesh and Pakistan respectively. Bhuyan (1970) reported that fasciolosis in buffaloes was 90.90% which are much higher than the present finding. The variations among the findings might be due to the difference in the selection of animal, techniques of sample collection, period and place of study, environmental factors and breed of the animals etc. The present findings of Table 3 is slightly higher and contrast than the previous reports of Mamun *et al.* (2011) who reported the overall highest (71.70%) seasonal prevalence in all

water buffalo of Kurigram district during rainy season, followed by summer (58.90%) and winter (57.27%). In the present finding the prevalence of *Fasciola* sp. was 41.3 6% (rainy season), 34.78% (summer season), 27.78% (winter season) which was in contrast with the earlier reports of Islam (1989) who reported the prevalence of fasciolosis by fecal examination was 28.6%, 18.7% and 11.7%, respectively, during winter, summer and rainy season. The contrast in between the present and earlier findings can be explained by the fact of variation in the geographical location of the study area and also the methods used in the study. Moreover, in this study, year was divided into three seasons but in other parts of the world there were four seasons. So, this difference in the division of seasons had made some overlapping of months and seasons. Therefore, that might have created some contradictions.

The finding of Table 4 were agreed with the earlier report of Azhar *et al.* (2002) who noticed that higher infestation rate was recorded in older buffaloes than the young buffaloes. The present finding was also supported to the previous reports of Alim *et al.* (2004) who observed that infestation rate of fasciolosis increased with the increase of age. But it was not supported the findings of Mamun *et al.* (2011) and Asif *et al.* (2007) who reported that the higher prevalence of helminths infestation was found in young animals compared to adults in buffalo of Kurigram district in Bangladesh and in Pakistan respectively. The cause of variation on the basis of age is difficult to explain but it might be due to exhausted immune system. An immunological phenomenon as it was stated by Baily (1971) who suggested that the fascioliasis is not as self limiting in the animals. The cause of this variation also might be due to the difference grazing area and management variation of animals.

The result of Table 5 has shown that the prevalence of gastrointestinal helminths in male and female buffalo was 81.92% and 86.9% respectively, which supported the previous report of Bachalet *al.* (2002) who reported a slightly higher prevalence (48.30%) of helminths in female than in male (45.12%) in buffalo calves. Alim *et al.* (2004) also reported that females (52.8%) were more susceptible to *Fasciola* infestation than male (47.5%). But this report is in contrast to the findings of Asif *et al.* (2007) who reported the higher prevalence was in males than female's buffaloes in Pakistan and also Mamun *et al.* (2011) who reported the higher prevalence of findings higher in males (61.34%) than females (59.52%). On the other hand, Azhar *et al.* (2002) reported that no sex variation in gastro-intestinal parasitic infestation. He noticed that buffaloes of either sex were equally affected. This disparity among the findings can't be explained exactly. The higher percentage of infestation in the females may be due to the alteration in the physiological condition of the animals during pregnancy and lactation (production activity).

## Conclusion

Gastrointestinal parasitic infestation is one of the major obstacles to livestock productivity in Bangladesh. The present study was conducted on gastrointestinal parasites of buffalo in Sylhet district. The species of parasites identified were *Fasciola* sp., *Paramphistomum* sp., *Ascaris* sp. *Strongyloides* sp., *Bunostomum* sp. and *Oesophagostomum* sp. The prevalence of gastrointestinal parasitic infestation was

presented in the table 2, 3, 4, and 5. Season wise prevalence of different gastrointestinal parasitic diseases was presented in the table 3. The highest prevalence rate of different parasites was observed in the rainy season (July to October) than that of other seasons. The high rate of infestation in rainy season was due to this time the rainfall was abundant and there was abundance of intermediate hosts of *Fasciola* and *Paramphistomum*. The temperature and humidity become optimum for larval development of parasites in rainy season and are favorable for the migration and development of infective stages of snails. Prevalence of *Ascariasis* (24.24%) was high in (0-1 year) age group of buffalo and prevalence of *Fasciolosis* (44.78%) was high in (above 2 years) age group of buffalo. It is concluded that, further studies should be conducted to identify these species of parasites. But it would be better, if a sero-surveillance could be conducted. Result of sero-surveillance (detection of antibody against blood parasites) would give an idea about the endemic stability. Besides this, actual losses due to parasitic diseases in buffaloes in terms of mortality, morbidity and treatment cost have to be determined. So, further study should also be conducted to assess the economic losses due to parasitic diseases of buffaloes and to find out effective control strategies against it.

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