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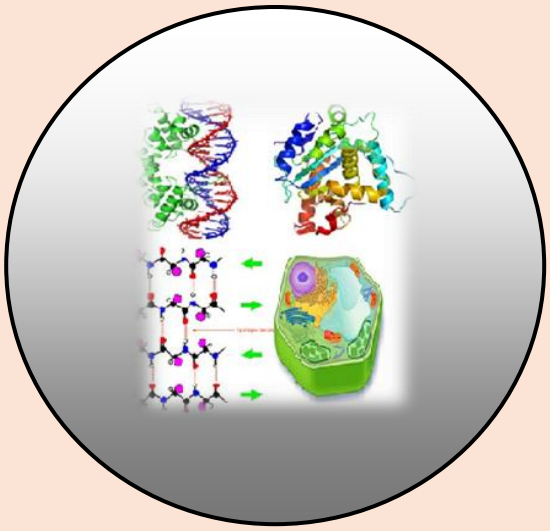

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RESEARCH PAPER
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Prevalence of Parasitic Diseases in Cattle at Sylhet Division of Bangladesh

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ABSTRACT
The present study was conducted to determine the prevalence of parasitic diseases in cattle at Sylhet division of Bangladesh. Among the prevalence of fascioliosis (49.41%) was higher followed by paramphistomiosis (11.37%), ascariasis (10.18%), stephanofilariasis (5.20%), tick infestations (19.61%) and coccidiosis (4.24%). According the age groups, prevalence of parasitic diseases was recorded as 57.65 % among the age group of > 1.0 to 2.0 years followed by > 2 years age group (30.24%) and < 1.0 years age group (12.11%) of cattle. Moreover, the overall prevalence of parasitic diseases in female's cattle (62.70%) was more than males (37.30%). The distribution and proportionate occurrence of parasitic diseases in cattle of Bangladesh indicated that the prevalence frequently occurred in rainy season (39.97%) followed by winter (35.44%) and summer season (24.59%). The study suggests that importance should be given to proper management, improved hygiene and regular deworming to control the parasitic diseases in cattle and to reduce the production loss at Sylhet division of Bangladesh.
Keywords: Prevalence, Parasitic Diseases, Cattle; Sylhet and Bangladesh.

INTRODUCTION
The livestock population in Bangladesh is currently estimated to comprise 26.828 million cattle, 0.544 million buffalo, 16.242 million goat and 1.221 million sheep (BBS, 2010) which plays an important role in the rural economy (Kamaruddin, 2003). The cattle are kept mostly by poor, landless, marginal and small-scale farmers. In addition, 80% of the poor and ultra-poor people rear livestock as a major means of livelihoods (BBS, 2010). The hygiene and bio-security are not maintained properly. Domesticated ruminants in Bangladesh are at continuous risk of infection with one or more harmful helminths and the extent of financial losses is estimated between 25 and 30 million sterling pounds annually. The cattle production system is hampered by deficiencies in feeding and breeding and the situation is further aggravated by the effects of diseases. All together, the general nutritional status of most of the cattle is in subnormal level and condition which greatly increases susceptibility to the animals to parasitic diseases (Blood and Radostits, 2000).

Parasitism is one of the main constraints limiting livestock productions and especially related to gastrointestinal parasites represent a serious threat, which has been hindering the cattle development in Bangladesh for long time. Mortality of animals from parasitic diseases may not be alarming at times but their direct effects in terms of reduced milk, meat, wool, hide production, infertility and loss of stamina of working animals (Baker and Muller, 1988). Climatic condition of Bangladesh is highly favorable for survival, development and reproduction of different parasites. The climatic condition of Bangladesh with an average rainfall of 90 mm, humidity of 75%, temperature ranges between 11 ^{O}C and 35°C are favorable for the optimal ecological survival of most of the parasites and the intermediate hosts (Rahman and Jahan, 2001). Prevalence of different parasites in native and crossbred dairy cattle has been reported from different areas of Bangladesh (Khandakar and Chanda, 1998, Akter et al., 2011, Alim et al. 2012, Nath et al. 2013) but limited study on cattle. Therefore, it is necessary to know the type of parasites causing infection and losses in cattle industry for developing effective treatment, prevention and control measures. The present study has undertaken to investigate thoroughly the prevalence of parasitic diseases in cattle on the basis of rectal fecal and skin examination from live cattle to detect eggs, larvae and also their relationship with age, sex, seasons and different areas in Sylhet division of Bangladesh.

MATERIALS AND METHODS

This study was conducted in Sylhet division of Bangladesh (Figure 1). Sylhet division is located in North-East part of Bangladesh and between 24^{o}30′ North latitude and 91^{o}40′ East longitudes. The division has an area of 3490.40 square kilometers. It was formed to four districts such as Habiganj, Moulvibazar, Sunamganj and Sylhet (Figure 1). The study was conducted to determine the prevalence of parasitic diseases in cattle at Sylhet division of Bangladesh during the period from January 2018 to December 2018 at the different areas in Sylhet division of Bangladesh. A total of 1346 sick cattle were selected and collected fecal samples and ectoparasites from the different areas of Sylhet division to diagnose the existing parasitic diseases. The diagnosis of different parasitic diseases was done based on the clinical history of the honor, age of affected animal, clinical signs and symptoms, gross and microscopic examinations of feces by direct smear/and sedimentation techniques for the presence of parasitic eggs in the Laboratory of Parasitology, Faculty of Veterinary, Animal and Biomedical Sciences, Sylhet Agricultural University, Sylhet-3100, Bangladesh.

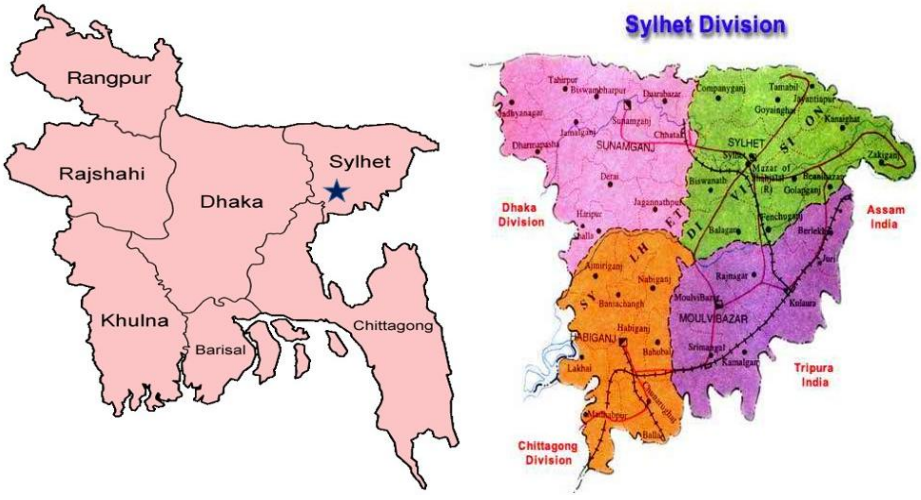

Figure 1. Map of Bangladesh indicating the location of study area (star mark) and map of Sylhet division indicating sampling sites at different districts.

Identification was done on the basis of morphology (Soulsby, 1986). The influences of age; sex and season on the occurrence of diseases were also analyzed. The age of the cattle were determined by dentition. Accordingly, data were analyzed into three age groups: <1.0 year, >1.0 to 2.0 years and >2.0 years.

The sexes of the cattle were recorded by examining presence of penis/testis or vulva/uterus. On the basis of climatic conditions the year was divided into three seasons namely winter, summer and rainy. Winter season was considered from October to January, rainy season from June to September and summer was considered from February to April.

RESULTS AND DISCUSSION

The prevalence of parasitic infection in cattle at Sylhet division of Bangladesh was shown in Table 1 and Figure 1. According to our results, prevalence of fascioliosis were higher (49.41%) followed by tick infestations (19.61%), paramphistomiosis (11.37%), ascariasis (10.18%), stephanofilariasis (5.20%) and coccidiosis (4.24%). These results correlate with the findings of other study (Chowdhury et al. 1993; Aktaruzzaman et al. 2010, Ghosh et al. 2016). The variations in the finding with the earlier reports might be due to the difference in the sample size, selection of samples, breed, period and place of study, climatic conditions, managemental factors and the availability of intermediate hosts.

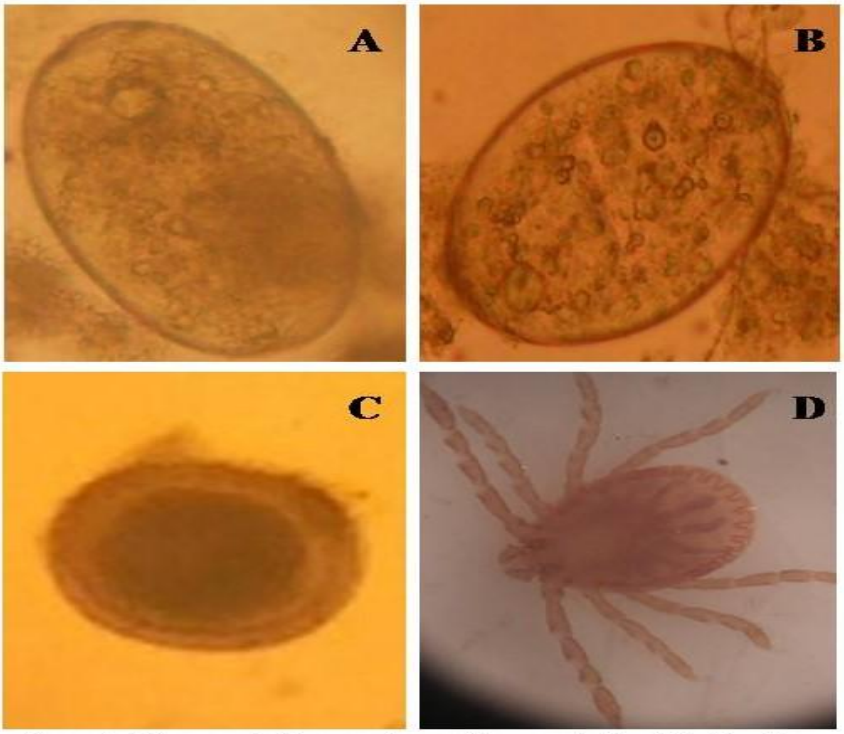

Figure 1. Microscopic feature of parasitic eggs A. *Fasciola gigantica* B. *Paramphistomum sp.* C. *Neoascaris vitulorum* and D. Tick

The present study revealed 49.41% of fascioliosis in Sylhet division of Bangladesh. The prevalence of fascioliosis observed in present study was in accordance to similarities of the earlier reports. The prevalence of fascioliosis was recorded as 3.7-63.4% in cattle of different parts of Bangladesh (Rahman and Ahmed, 1991, Chowdhury et al. 1993, Khandaker et al. 1999). The geo-climatic conditions together with the water logged and low lying areas in Sylhet region of Bangladesh and most of the animals graze on the low land where are highly favorable for the development and multiplication of *Fasciola* species and their intermediate hosts (snails). The prevalence of parasitic diseases of cattle in Mymensingh Sadar upazila was 51.03%. Among the parasitic disease prevalence of *Fasciola* was 25.88%, *Paramphistomum* 6.63%, *Ascaris* 6.25%, Hump sore 2.79 % and tick infestation 7.5%. These results correlate with the findings of other study (Aktaruzzaman et al. 2013). On the other hand the prevalence of parasitic diseases of cattle in Ishwargonj upazila was 46.22% and the prevalence of specific parasitic diseases was also less than the Mymensingh Sadar upazila may be due to geo-climatic condition and the findings correlate with the findings of other study (Islam et al. 2008).

Table 1. Overall prevalence of parasitic diseases in cattle at Sylhet division, Bangladesh.

Name of parasitic diseases	No. of identification cases	Prevalence (%)
Fascioliosis	665	49.41
Paramphistomiosis	153	11.37
Ascariasis	137	10.18
Stephanofilariasis	70	5.20
Tick infestations	264	19.61
Coccidiosis	57	4.23
Total	1346	100

The highest number of cases were recorded in the young age group (57.06%), followed by adult age group (30.24%) and below 1 year age group (12.70%) of cattle (Table 2). Age of the cattle had a significant relationship on prevalence and mortality of the infections. Younger are more susceptible to parasitic infections, especially cattle has of age > 1 to 2 years were more susceptible to the infection. Age specific prevalence of parasitic infections especially, fascioliosis, paramphistomiosis, ascariasis, stephanofilariasis and coccidiosis were found more in young cattle which supported the observation of who reported that parasitic infection rates were highest in the young age group (Regassa et al. 2006, Raza et al. 2007, Rony et al. 2010). The earlier findings of this investigation showed disagreement with (Sardar et al. 2006) who recorded significantly higher worm burden in adults than young. Higher prevalence of parasitic infection in young cattle might be due to keeping them for a longer period of time inbreeding and milk production purposes or supply inadequate feed against their high demand (Sardar et al. 2006). Moreover, stress like lactation, pregnancy, nutritional deficiency which might be accounted for higher prevalence in adult cattle. On the other hand, the highest prevalence of Ascariasis in calf was supported by the reports of (Bachal et al. 2002, Sardar et al. 2006) who recorded such infection in early months of life. Ascariasis of local calf of this study partially supported the findings of (Avcioglu and Balakaya, 2011) who recorded higher prevalence at 0-12 month of age. Higher prevalence of such infection might be due to prenatal infection through transfer of 3rd larval stage (L3) and post-natal infection by poor hygienic condition (Soulsby, 1986, Urquhart et al. 1996) stress, genetic resistance of host and insufficient feed supply against their higher needs (Hendrix and Robinson, 2006, Raza et al. 2010).

Prevalence of parasitic infections according to the sex in cattle was shown in Table 3. Sex wise prevalence of parasitic infection was recorded higher female (62.70%) than male (37.30%). Prevalence of parasitic diseases in cattle was insignificantly higher in male in case of stephanofilariaisis but other parasitic diseases were higher in female. Some researchers who were (Chowdhury et al. 1993, Kuchai et al. 2011) reported that fascioliasis was higher in female than male cattle which is similar to the present findings but dissimilar results were found in the observation of other researcher (Kabir et al. 2010) who observed that fascioliasis was higher in male (18.04%) than female (5.45%) but similar result was found in case of hump sore. Another (Kabir et al. 2011) recorded that infestation of tick was significantly higher ($p<0.01$) in female (59.37%) than the male (35.83%) cattle.

Table 2. Age-wise prevalence of parasitic diseases of cattle at Sylhet division, Bangladesh.

Name of parasitic diseases	No. of cases	< 1 year		>1 to 2 years		>2 years	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Fascioliosis	665	31	4.66	441	66.32	193	29.02
Paramphistomiosis	153	04	2.61	93	60.78	56	36.60
Ascariasis	137	46	33.58	72	52.55	19	13.87
Stephanofilariasis	70	02	2.86	26	37.14	42	60.00
Tick infestations	264	61	23.11	117	44.32	86	32.58
Coccidiosis	57	27	47.37	19	33.33	11	19.30
Total	1346	171	12.70	768	57.06	407	30.24

Table 3. Sex- wise prevalence of parasitic diseases in cattle at Sylhet division, Bangladesh.

Name of parasitic diseases	No. of cases	Female		Male	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Fascioliosis	665	426	64.06	239	35.94
Paramphistomiosis	153	97	63.40	56	36.60
Ascariasis	137	109	79.56	28	20.44
Stephanofilariasis	70	24	34.29	46	65.71
Tick infestations	264	156	59.09	108	40.91
Coccidiosis	57	32	56.14	25	43.86
Total	1346	844	62.70	502	37.30

Occurrence of parasitic infections has a significant relationship with season. It was found that prevalence of parasitic infections were significantly highest in rainy season (39.90%) followed by winter (36.40% and summer (23.70%) (Table 4) but several previous reports indicated that rainy season is the more prevalent for parasitic infections (Akhtaruzzaman et al. 2013, Ghosh et al. 2016). Although, parasitic infection in summer is always comparatively lower than other season. In summer season fascioliosis (15.79%), paramphistomiosis (20.92%), ascariasis (38.69%), stephanofilariasis (25.71%), tick infestations (38.64%) and coccidiosis (15.79%), in rainy season fascioliosis (45.41%), paramphistomiosis (46.41%), ascariasis (32.12%), stephanofilariasis (50.00%), tick infestations (24.24%) andcoccidiosis (36.84%) and in winter season fascioliosis (38.80%), paramphistomiosis (32.68%), ascariasis (29.20%), stephanofilariasis (24.29%), tick infestations (37.12%) and coccidiosis (47.37%) are the subsequently most prevalent diseases among all (Table 4). It was manifest that climate play key role in the transmission of parasitic infections (Moyo et al. 1996). The prevalence of parasitic infections were more in rainy season which was in agreement with the reports of (Chavan et al. 2008, Jeyathilakan et al. 2008, Akhtaruzzaman et al. 2010, Ghosh et al. 2016). It might be due to adequate moisture and optimum temperature which favored the growth and survival of infective stages in the pasture (Regassa et al. 2006, Shirale et al, 2008). On the other hand, subsequent occurrences of gastrointestinal parasitic infections were observed in winter followed by summer season which showed consistency with the observation of (Chavan et al. 2008, Shirale et al. 2008). It might be due to hot humid climate in summer and low temperature in winter season provides unfavorable environment for the survival and development of parasitic larvae (Pfukenyi et al. 2007) which decreased the availability of infective larvae in the pasture (Moyo et al. 1996). The results are in agreement with the findings of Kamal et al. 1996 and Kabir et al. 2011, who were reported that tick infestation were highest in summer than rainy and winter season . In all three seasons of this study, parasitic infections were more prevalent in cattle which might be due to communal grazing and never use of anthelmintic. Losses arise from deaths (10-15%) of young animals, stunted growth, reduced milk and meat production and draft output, delayed maturity and prolonged calving intervals. Cattle have numerous gastrointestinal parasites also.

Table 4. Season-wise prevalence of parasitic diseases in cattle at Sylhet division, Bangladesh.

Name of parasitic diseases	No. of cases	Winter		Summer		Rainy	
		No. of cases	Prevalence (%)	No. of cases	Prevalence (%)	No. of cases	Prevalence (%)
Fascioliosis	665	258	38.80	105	15.79	302	45.41
Paramphistomiosis	153	50	32.68	32	20.92	71	46.41
Ascariasis	137	40	29.20	53	38.69	44	32.12
Stephanofilariasis	70	17	24.29	18	25.71	35	50.00
Tick infestations	264	98	37.12	102	38.64	64	24.24
Coccidiosis	57	27	47.37	9	15.79	21	36.84
Total	1346	490	36.40	319	23.70	537	39.90

CONCLUSION

This study revealed that most prevalence of parasitic infection in cattle at Sylhet division of Bangladesh include fascioliosis, paramphistomiosis, ascariasis, stephenofilariasis, tick infestations and coccidiosis. It was also found that >1 to 2 years age group of cattle was more susceptible to parasitic infections. Highest prevalence of parasitic infection was recorded in rainy season. The results of the current study provide an overall prevalence of parasitic infection in cattle at Sylhet division of Bangladesh. It is predicted that the high prevalence of parasitic infection found in this study may be due to hot and humid climate, poor management, insufficient diet, lack of awareness and irregular de-worming practices in the studied area.

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