



Prevalence of gastrointestinal parasitism of cattle at Chandaniash Upazilla, Chittagong, Bangladesh

Rana Chowdhury¹, Arup Sen^{2*}, Jotan Kar³ and Sabuj Kanti Nath⁴

¹Department of Dairy & Poultry Science, Chittagong Veterinary and Animal Sciences University (CVASU), Chittagong, Khulshi-4225, Bangladesh.

²³Department of Microbiology and Veterinary Public Health, Chittagong Veterinary and Animal Sciences University (CVASU), Chittagong, Khulshi-4225, Bangladesh.

⁴Department of Animal Science and Animal Nutrition, Chittagong Veterinary and Animal Sciences University (CVASU), Chittagong, Khulshi-4225, Bangladesh.

*Corresponding author: arup09dvm@gmail.com

Abstract

A prevalence study for a period of two months was conducted in cattle on gastrointestinal parasitism of Chndanaish Upazilla, Chittagong, Bangladesh. A total of 50 fecal samples were collected randomly from different cattle breeds (Red Chittagong Cattle and crossbred of HF). Samples were examined by routine coproscopical methods. The investigation revealed that the overall prevalence of gastrointestinal parasitic infestation was 64% in the study population. Among different gastrointestinal parasitic infections, the prevalence of *Paramphistomum spp* infection was the highest (22%) followed by *Toxocara spp* infection (12%) and the lowest prevalence was recorded in case of *Trichostrongylus spp* (2%). In case of mixed infection, the prevalence of *Paramphistomum* and *Oesophagostomum* was same (2%). In cattle, age specific prevalence was found higher in young than adult and calf. On the other hand, female cattle showed almost same susceptibility to different gastrointestinal parasites like male in sex-specific prevalence but it was not statistically significant. It could be stated that the current investigation was a limited study as a topographical variation, the seasonal pattern of the diseases, short study period and the small number of the study population. Hence, it can be recommended further extensive investigation on gastrointestinal parasitism to overcome the limitation of the current studies which will assist to determine the important predictors related to such diseases.

Keywords: Parasitism, RCC Cattle, Crossbred cattle, Prevalence.

Introduction

In Bangladesh livestock is an essential component of crop cultivation and post-harvest operation. Our country is an agricultural dependent country with a high population density and per capital, income is very low. In our country, one of the most potential sub-sectors of agriculture is livestock which plays a great role in promoting human health and national economy of the country. About 98% of livestock reared by the landless and marginal farmers in rural areas has

removed their poverty (Alam, 1993). Livestock not only assists in upgrading the financial condition but also makes a substantial contribution to human nutrition. However, livestock is an integral part of the farming system which has a better contribution to enhancing the economy of Bangladesh. Large ruminants (Cattle and Buffalo) and small ruminants (sheep and goat) constitute the major portion of livestock. The present population of livestock is 23.95

million cattle, 1.39 million Buffalo, 24.15 million goats and 3.07 million sheep (DLS, 2011). The total contribution of livestock sub-sector to Gross Domestic Product (GDP) in Bangladesh is approximately 2.9 % (DLS, 2011). It also generates 13% of foreign currency and provides 20% full-time employment and 50% partial employment of rural population (Alam, 1993). The annual milk production is 50.67 million ton, meat production 36.20 million ton in our country (DLS, 2011). In Bangladesh 80% rural people rear indigenous cattle (Siddiki *et al.*, 2009). But many people are also involved with urban and rural dairy farming. Most animals are reared in houses under the traditional husbandry practices. Nowadays, dairy farming in rural and urban areas is increasing with modern husbandry practices where cattle are mainly reared for several reasons including meat and milk production (Lako *et al.*, 2007). But the production system is compounded by deficiencies in feeding and breeding; with further aggravate the effects of disease and parasitism. Gastrointestinal parasitism is a worldwide problem (Regassa *et al.*, 2004). It is thought to be one of the major constraints that hinder the development of livestock population (Kakar *et al.*, 2008 and Jabber and Green, 1983) and it also adversely affects the health and productivity of animal (Irfan, 1984). 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 are caused by parasitic infection, which may ultimately lead to higher mortality (Chavan *et al.*, 2008, and Radostits *et al.*, 1994). However, the geo-climatic condition of the country also favors the growth, development, and survival of various parasites. It has been estimated that about 10% animal die annually due to parasitic disease. Prevalence of helminthes parasitic infestation in cattle in some areas of Bangladesh has been reported earlier (Rahman, 1970; Rahman and Razzak, 1973).

The parasitic infestation is the major cause of hindering the development of livestock population (Jabber and Green, 1983). The climate of Bangladesh is suitable for the parasites, which are too great extent responsible for calf mortality in this country. The mortality rate of crossbred calves is more than that of indigenous ones. Infections caused by gastrointestinal parasites especially nematodes are one of the major causes of calf mortality and act as a big threat for dairy industry of this country. Earlier reports revealed that 50% calves up to 1 year of age died due to gastrointestinal parasitism (Debnath *et al.*, 1995).

The total annual loss due to gastrointestinal parasites was 25-30 million sterling pounds reported by Rahman (1997). In different regions of Bangladesh, many research on gastrointestinal parasitic diseases have been conducted but in Chittagong region (Siddiki *et al.*, 2009 and Alim *et al.*, 2012), it was very meager.

Materials and Methods

Study Area and period: The study was conducted in the Upazilla Veterinary Hospital, Chandanaish in Chittagong. The investigation was conducted for a period of 2 months starting from 13 January to 15 March 2016.

Selection of animals and Survey Design: Different cattle breed were selected for this study. Mainly, local breeds, Red Chittagong Cattle and Holstein Friesian (HF) crossbred cattle were selected for this study. To determine the age and breed susceptibility of different parasites, cattle were categorized into three subgroups as calf (1year i.e. 12 months), young (>1 -<2.5years i.e. >12-<30 months) and adult (2.5years i.e. 30 months) (Sastry and Thomas, 2005). A total of 50 fecal samples were collected from 50 individuals, were brought for examination in Upazilla Veterinary Hospital (UVH) during the study period. The cattle were suspected to be affected with a gastro-intestinal parasitic infection on the basis of owner complaint, clinical history- emaciation and gastro-intestinal disturbances; clinical signs- diarrhea, inappetite, unthriftiness; and physical examination. The description of each patient age, sex & date etc. was recorded to assess their influence on the prevalence of the GI parasitic infection. Random sampling was followed during sample collection. A prototype questionnaire was used to record the information like owner's name and address, animal Identification (ID), farm size, breed, age, sex, deworming history.

Sample collection and preservation: Only one biological sample; feces samples were collected during this study where an individual animal was considered as a sampling unit. Approximately 5-10gm of fecal sample from each individual animal was collected directly from rectum. However, freshly voided fecal samples were also considered and subsequently the collected samples were stored in plastic containers. Then, the container was filled with formalin (10%) and refrigerated at 4^oC temperature. During sample collection, labeling of the samples were strictly maintained to prevent the misinterpretation.

Examination of samples: In addition to gross examination of fecal samples (color, consistency, blood or mucus, etc.), three different types of qualitative tests, namely direct smear, flotation, and sedimentation techniques were used to examine the fecal samples (Hendrix and Sirois, 2006). Zinc Sulphate solution was used as floatation fluid. At least, two smears were prepared from each sample for each test to identify the morphological characteristics of eggs, cyst, Oocysts etc.

Statistical Analysis: The obtained information was imported, stored and coded accordingly. Data management and analysis were performed using Microsoft Excel and STATA version 12 (Stata Corp, College Station, Texas). Descriptive statistics was expressed as a proportion with P-value for chi-square test. Significance was determined when P 0.05.

Results

Prevalence of gastrointestinal parasitic infection

Descriptive statistics of different variables:

Samples were collected from different breeds of cattle, namely Red Chittagong Cattle (RCC), local breed and crossbred of HF which constituted 22%, 44%, and 34% samples, respectively. Among all study population 56% were female and the rest 44% were male. Samples were collected from three group of animals on the basis of body condition (cachectic, medium and healthy) of which 16% sample were from the cachectic animal, 22% were from the healthy animal and 62% were from medium health animal. The study population was categorized into three subgroups as calf (< 1 year i.e. 12 months), young (>1 - <2.5 years i.e. >12-<30 months) and adult (>2.5 years i.e. >30 months) which consist 40%, 34% and 26% of total samples. Among the study population, 50% animal were dewormed and 50% were not dewormed.

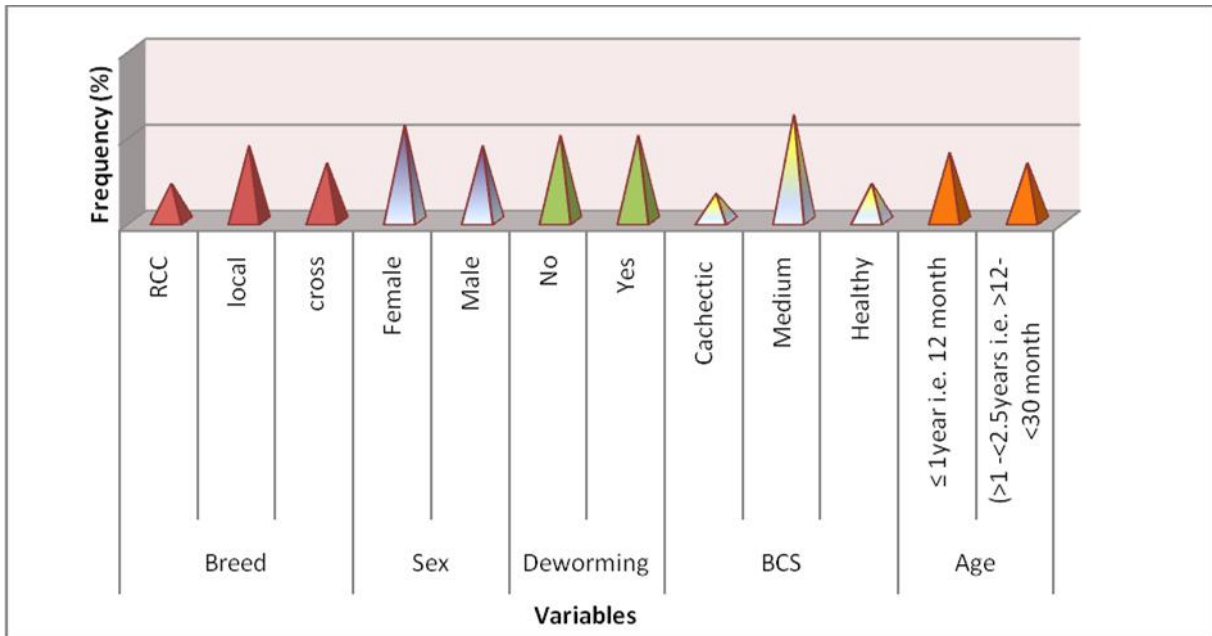


Figure1: Descriptive statistics of the variables: breed, sex, deworming, BCS, age.

Overall prevalence of gastrointestinal parasites in cattle:

During the current investigation, an approach was taken to determine the status of gastrointestinal parasitic infection in cattle. It was revealed 7 helminths species as 1 Cestodes, 2 Trematodes and 3 species of Nematodes in the cattle population. The overall prevalence of gastrointestinal parasitic

infections (either single or mixed infection) was 64% in the study population. The table1 showing the association of different variables with overall parasite positive samples. Chi-square test was performed to identify the association of different variables with the presence of a parasitic infestation. The study population consists of 3 cattle breeds; crossbreed of Holstein Friesian (HF), local breeds and Red Chittagong Cattle (RCC).

Among these 3 breeds prevalence of gastrointestinal parasitic infection is highest in crossbred cattle (71%) and lowest in RCC cattle (55%) however, variables were not significantly associated (P-value=0.68).

In the study population, no of the female are 28 and male are 22. The prevalence of gastrointestinal parasitic infection is slightly higher in male (68%) than female (61%) but this is not statistically significant (P-value=0.58). The study population was

categorized into 3 group according to BCS, these are cachectic, healthy and medium. The prevalence of parasitic infection is highest in cachectic animal (100%) and lowest in the healthy animal (27%) and the variable is statistically significant (P – value=0.004).The prevalence of parasitic infection is higher in dewormed animal (80%) than not dewormed animal (48%) and this variable is also statistically significant (P –value=0.01).

Table 1: Association of different variables with overall parasite positive samples

Variables	Level	Total observation	Samples positive to parasites(%)	Chi(2)square value	p-value
Breed	Cross	17	12 (71)	0.74	0.68
	Local	22	14 (64)		
	RCC	11	6 (55)		
Sex	Female	28	17 (61)	0.29	0.58
	Male	22	15 (68)		
BCS	Cachectic	8	8 (100)	11.12	0.004
	Healthy	11	3 (27)		
	Medium	31	21 (68)		
Deworming	Yes	25	12 (48)	5.55	0.01
	No	25	20 (80)		

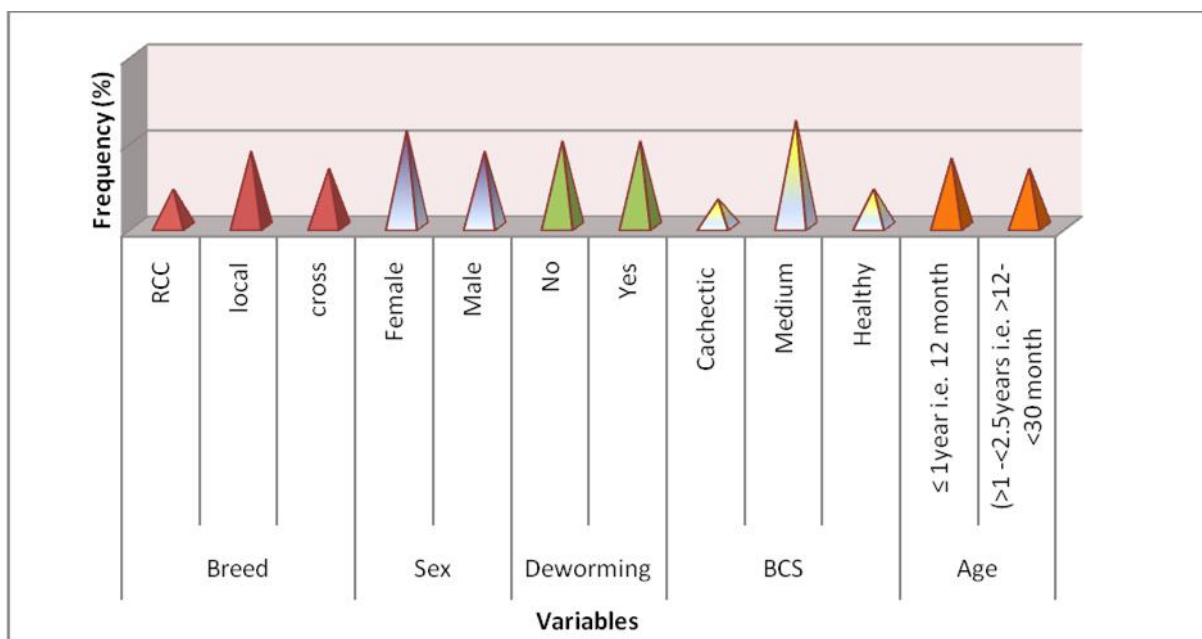


Figure1: Descriptive statistics of the variables: breed, sex, deworming, BCS, age.

Discussion

The overall prevalence of gastrointestinal parasitic infections in cattle of this study showed somewhat similarity with the report of Alam (1993) who recorded 63.32% had a single parasitic infection in Bangladesh. The observation greatly varied from the report of Alim *et al.*, (2012) who recorded 39.75% and 46.25% in crossbred and local cattle, respectively. The report is also varied from Khan *et al.*, (2010) and Saravana *et al.*, (2009) who recorded 33.68% in Pakistan, 30.0% in India and 37% in Comilla district in Bangladesh. Variation in the occurrence of gastrointestinal parasites infection might be due to geo-climatic conditions, sample size, breed, age, sex, the plane of nutrition, stress, availability of intermediate host, grazing pattern, rearing and husbandry measures, anthelmintic therapy, genetic resistance etc (Hansen and Perry, 1990).

In the current study, influences of age on the prevalence of gastrointestinal parasitic diseases were observed. The prevalence of GI parasitic infections especially, *Fasciola spp*, *Paramphistomum spp*, *Oesophagostomum spp* and *Moniezia spp* were found more in young cattle than adult and calf. Prevalence of *Paramphistomum spp* was found more in young cattle which were similar to the observation of Regassa *et al.*, (2004), Shah –Fischer (1989) and Dunn (1978), who recorded the higher prevalence of helminth in younger animals than the adult. In this study, higher prevalence of parasitic infection in young cattle might be due to sudden exposure to grassland containing egg of parasites and lack of immunity against these infections. In the present study, the infection caused by GI parasites was found predominant in female than male cattle. Findings of this study were found in accordance with the reports of Davila *et al.* (2010), Raza *et al.* (2010) and Al- Shaibani *et al.* (2008) who also reported the higher prevalence of helminthes in female cattle. In this study, variation in occurrence of such helminthes in male and female cattle might be due to variation in sample size (Bachal *et al.*, 2002), stress, genetic resistance of host and insufficient/imbalanced feed against higher needs (Raza *et al.*, 2010 and Hansen and Perry, 1990).

Acknowledgments

I would like to express my sincere gratitude and humble respect to reverend teacher Prof. Dr. Paritosh Kumar Biswas, Professor, Department of Microbiology and Veterinary Public Health, CVASU for his scholastic guidance, kind help,

valuable suggestions, simultaneous inspiration, constructive criticism.

References

- Alam, J. 1993. Livestock sector for more investment in Bangladesh. *Asian Livestock*, 18: 77-78.
- Alim, M.A., Das, S., Roy, K., Sikder, S., Masuduzzaman, M., and Hossain, M.A. 2012. Prevalence of Gastrointestinal Parasites in cattle of Chittagong Division, Bangladesh. *Wayamba J. Anim. Sci.*, 4: 1-8. ISSN: 2012-578X.
- Al-Shaibani, I.R.M., Phulan, M.S., Arijo, A. and Qureshi, T.A. 2008. Epidemiology of ovine gastrointestinal nematodes in Hyderabad district, Pakistan. *Pak. Vet. J.*, 28 (3): 125-130.
- Bachal, B., Phullan, M.S., Rind, R. and Soomro, A.H. 2002. Prevalence of Gastrointestinal Helminths in Buffalo Calves. *Online J. Bio. Sci.*, 2(1): 43-45.
- Chavhan, P.B., Khan, L.A., Raut, P.A., Maske, D.K., Rahman, S., Podchalwar, K.S., and Siddiqui, M.F.M.F., .2008. Prevalence of Nematode parasites of Ruminants at Nagpur. *Vet. World.*, 1(5): 140.
- Davila, G., Irsik, M. and Greiner, E.C. 2010. *Toxocara vitulorum* in beef calves in North Central Florida. *Vet. Parasitol.*, 168: 261-263.
- Devnath, N.C., Taimur, M.J.F.A., Saha, A.K., Ersaduzzaman, M., Helaluddin, M., Rahman, M.I., Roy, D.K. and Islam, M.I. 1995. A retrospective study of calf losses on the central dairy cattle breeding station in Bangladesh. *Prev. Vet. Med.*, 24:43-53.
- D.L.S. 2011. Livestock and poultry profile Bangladesh, Sunil Chandra Ghosh, D.G., and DLS.
- Dunn, A.M. 1978. *Veterinary Helminthology*. 2nd edn, William Heinemann Medical Books, London.p.184
- Hansen J. and Perry B. 1990. A Handbook: The Epidemiology, Diagnosis and Control of Gastro-Intestinal Parasites of Ruminants in Africa. I.L.R.A.D (International Laboratory for Research on Animal Diseases), Nairobi, Kenya., 20-22.
- Hendrix & Sirois. 2006. Laboratory Procedures for Veterinary Technicians, 5th Ed., 812-814.
- Irfan, M., 1984. Key note address on effect of parasitism in lowering livestock population. *Pak., Vet., J.*, 4: 25-27.
- Jabbar, M.A. and Green, H.A.G. 1983. The status and potential of livestock within the context of agricultural development policy in Bangladesh. The University of Wales, Aberystwyth, p.113.
- Kakar, M.N. and Kakarsulemankhel, J.K. 2008. Prevalence of endo (trematodes) and ecto-parasites in cows and buffaloes of Quetta, Pakistan. *Pak. Vet. J.*, 28(1): 34, 34-36.

- Khan, M.N., Sajid, M.S., Khan, M.K., Iqbal, Z. and Hussain, A. 2010. Gastrointestinal helminthiasis: prevalence and associated determinants in domestic ruminants of district Toba Tek Singh, Punjab, *Pak. Parasitol. Res.*, 107(4): 787-794.
- Lako, N.J., Tchoumboue, J., Payne, V.K., Njiokou, F., Abdoulamouminim. and Awah-Ndukum, J. 2007. Prevalence of Trypanosomosis and Babesiosis among domestic ruminants in the Western Highlands of Cameroon. Proc of the 12th International conference of the Association of Institutions of Tropical Veterinary Medicine, Montpellier, France. pp. 405-410.
- Radostits, O.M., Blood, D.C. and Gay, C.C. 1994. Diseases caused by helminth parasites. *Veterinary Medicine: A textbook of diseases of cattle, sheep, pigs, goats and horses, 8th edn.* Balliere Tindall Publication, London. 1223-1230.
- Rahman, M.H. 1970. Taxonomic studies on helminth parasites encounters in the abomasums of ruminants in East Pakistan. M.Sc. Thesis, Dept. of Parasitology, East Pak. Agri. Univ., Mymensingh.
- Rahman, M.H. and Razzak, A. 1973. Incidence of helminth parasites infecting cattle in the Kotwali thana of Comilla. Proceedings of First Bangladesh Veterinary conference, Bangladesh Agricultural University, Mymensingh. p.25.
- Rahman, M.H. 1997. Deworm your livestock to increase their productivity. *Agribusiness Bulletin*, 33:14-15.
- Raza, A.M., Murtaza, S., Bachaya, H.A., Qayyum, A. and Zaman, M.A. 2010. Point prevalence of *Toxocara vitulorum* in Large Ruminants Slaughtered at Multan Abattoir. *Pak. Vet. j.*, 30(4): 242-244.
- Regassa, F., Sori, T., Dhuguma, R. and Kiros, Y. 2004. Epidemiology of Gastrointestinal Parasites of Ruminants in Western Oromia, Ethiopia. *Intern. J. Appl. Res. Vet. Med.*, 4(1): 51-57.
- Saravanan, S., Dinakaran, A.M., Muralidharan, J., Geetha, M. and Selvaraju, G. 2009. Prevalence of sub-clinical gastrointestinal parasitic infection in dairy animals. *Ind. J. Field Vet.*, 5(2): 45-46.
- Shah-Fischer, M. and Say, R. 1989. Manual of Tropical Veterinary Parasitology. CAB International; The Technical Center for Agricultural and Rural Cooperation (CTA).
- Siddiki, A.Z., Uddin, M.B., Hasan, M.B., Hossain, M. F., Rahman M. M., Das, B. C., Sarker, M. S. and Hossain, M.A. 2009. Coproscopic and Haematological Approaches to Determine the Prevalence of Helminthiasis and Protozoan Diseases of Red Chittagong. *Pak. Vet. J.*, 30(1): 1-6.

Access this Article in Online	
	Website: www.ijarbs.com
	Subject: Medicinal Plants
Quick Response Code	
DOI: 10.22192/ijarbs.2017.04.06.021	

How to cite this article:

Rana Chowdhury, Arup Sen, Jotan Kar and Sabuj Kanti Nath. (2017). Prevalence of gastrointestinal parasitism of cattle at Chandaniash Upazilla, Chittagong, Bangladesh . *Int. J. Adv. Res. Biol. Sci.* 4(6): 144-149.

DOI: <http://dx.doi.org/10.22192/ijarbs.2017.04.06.021>