

Abstract

A survey on gastrointestinal parasitic infestations in cattle was conducted at Cox's Bazar Sadar, Cox's Bazar district, Bangladesh during the period from 13th October 2019 to 12th December 2019 using coproscopy. Examination of 62 fecal samples of Cattle revealed that 42.54% of the samples were positive for the gastrointestinal parasites. Among different gastrointestinal parasitic infestations, the overall prevalence of *Fasciola* spp infection was the highest (15.00 %) followed by *Paramphistomum* spp infection (9.33%). The lowest overall prevalence was recorded in *Trichuris* (2.62%) and *Strongyloides* spp infections (1.33%). Age specific prevalence was found higher in adult and young cattle where *Fasciola* spp infection was the highest (19.01%) in adult followed by young and calf. *Paramphistomum* spp infection was the highest in young (15%) where as *Moniezia* spp infection were more in adult cattle (6.29%). *Toxocara* spp infections were recorded highest (23.5%) in calf which was not statistically significant. Sex specific prevalence exposed that female cattle showed more susceptibility to different gastrointestinal parasitic infestations than male but it was not statistically significant. However, frequency of *Fasciola* spp infections was the highest in female crossbred cattle (9.89%) where as *Toxocara* spp (5%) and *Moniezia* spp (4.49%) were found more in male cattle. It could be stated that the current investigation was a limited study as topographical variation, seasonal pattern of the diseases as well as indigenous/native cattle were not included.

Key words: Gastro-intestinal parasites, Cattle, Sex, Age.

CHAPTER-I

INTRODUCTION

Bangladesh is an agricultural country with low per capita income. Cattle is one of the most common and prominent domesticated livestock in Bangladesh. Among all agricultural activities cattle farming occupy large area and play a vital role in the national economy. In Bangladesh, the contribution of agricultural sector to the gross domestic product (GDP) is 21.11% Anonymous,(2007). The livestock sector contributes 2.97% of the GDP while cattle production solely contributes almost 2.1% of the total Economic index, (2012). Cattle is important for both meat and milk, despite the fact that there could be losses because of different diseases including parasitic infections. The amount of meat, milk and income acquired from domesticated animals is far beneath the national interest because of factors such as death and sickness with associated reduced productivity and expanded the expense of treatment Hossain et al,(2011).

Herd health is important for economic profitability but Parasitic infestation is considered to be one of the major constraints that hinder the development of livestock population and also adversely affects the health and productivity of animals. *Hesterberg et al*,(2007). Infection of cattle with gastro intestinal parasite is widely reported from all corners of the world and shown to be influenced by the type of cattle management practiced *Raza et al.*, (2010). The most important predisposing factors for parasitic infestations are grazing habits, climate, nutritional deficiency, pasture management, poor immunological status, presence of vector and intermediate host, and the number of infective larvae and eggs in the environment *Edosomwan et al*, (2012). The effect of parasitic infestations is determined by a combination of factors, of which the varying susceptibility of the host species, the pathogenicity of the parasite species, the host/parasite interaction, and the infective dose are the most important FAO,(2000). Despite significant losses by gastrointestinal parasitism, the problems are often neglected and overlooked as majority of the infected animals show a number of little obvious clinical signs during their productive life and their effects are gradual and chronic *Raza et al.*,(2010). Indirect losses associated with parasitic infections include the reduction in productive potential such as decreased growth rate, weight loss, diarrhea, anorexia, and sometimes anaemia *Swai et al*, (2006).

Considering the above facts, the present study was undertaken to fulfill the following objectives:

- I. To investigate the prevalence gastrointestinal parasitic infestation in Holstein Friesian crossbred at Cox's Bazar sadar.
- II. To determine different factors such as, breed, age, sex, etc. in the occurrence of such disease.

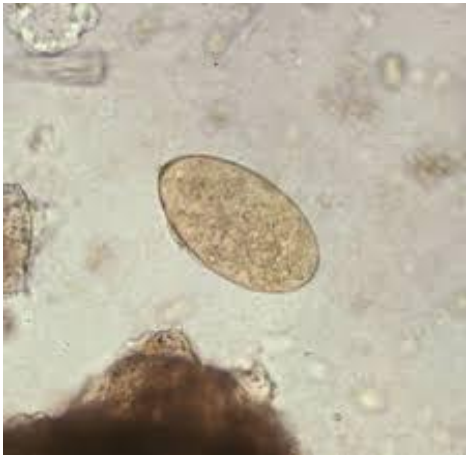


Fig : Egg of Fasciola spp



Fig : Egg of Paramphistomum spp



Fig : Egg of Trichuris spp



Fig : Egg of Strongyloides spp

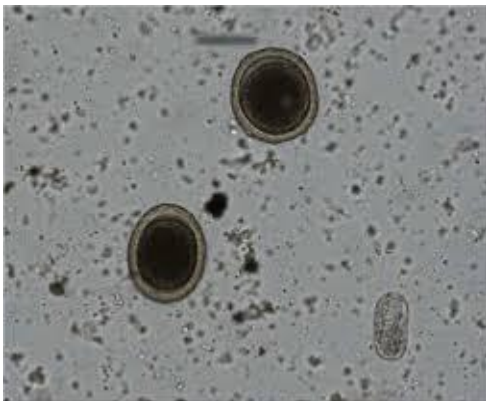


Fig : Egg of Toxocara spp



Fig : Egg of Moniezia spp

CHAPTER-II

MATERIALS AND METHODS

2.1 Description of the study area and duration

The study was conducted at Cox's Bazar Sadar . The study was undertaken for a period of 2 months starting from 13th October 2019 to 12th December 2019 .

2.2 Selection of animal

The study was taken on 62 sick cattle from different farm of the area. The cattle were suspected to be affected with gastro-intestinal parasitic infestation on the basis of owner complaint, clinical history- emaciation and gastro-intestinal disturbances; clinical signs- diarrhoea, inappetite, unthriftiness ; and physical examination .

2.3 Target animals and age groups

Holstein Friesian (HF) crossbred cattle were selected for this study as target animals. To determine the age susceptibility to different parasites, cattle were categorized into three different sub- groups as calf (≤ 1 year), Young ($>1 - < 2.5$ years) and Adult (≥ 2.5 years) (Sastrt et al., 2005).

2.4 Sample collection & examination

At first fecal samples were collected from the rectum of cattle. Three different types of qualitative tests, like direct smear, flotation techniques were used to examine the fecal samples .

2.4.A. Direct Smear

1. Placed a small amount of feces on a microscope slide.
2. Added a drop of saline water to the feces and mix thoroughly.
3. Cover with a cover slip. Moved the cover slip around until it lays flat.
4. Examined the slide using the 10X objective, and then go over it with the 40X objective.

2.4.B.Simple test tube flotation

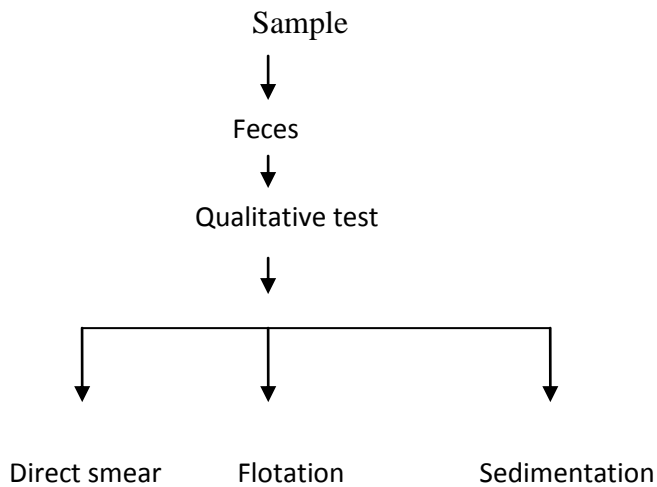
Equipment

- Beakers
- A tea strainer
- Measuring cylinder
- Stirring rod
- Test tube
- Test tube rack
- Microscope
- Microslides, coverslips
- Teaspoon
- Flotation fluid (500 gram sugar + 400 gram salt + 1 litter water)

Procedure

- (a) Putted approximately 3g of faeces (weigh or measure with a precalibrated teaspoon) into Container 1.
- (b) Poured 50 ml flotation fluid into Container 1.
- (c) Mixed (stir) feces and flotation fluid thoroughly with a stirring device (tongue blade, fork).
- (d) Poured the resulting fecal suspension through a tea strainer or a double-layer of cheesecloth into Container 2.
- (e) Poured the fecal suspension into a test tube from Container 2.
- (f) Placed the test tube in a test tube rack or stand.
- (g) Gently top up the test tube with the suspension, leaving a convex meniscus at the top of the tube and carefully place a coverslip on top of the test tube.
- (h) Let the test tube stand for 20 minutes.
- (i) Carefully lifted off the coverslip from the tube, together with the drop of fluid adhering to it, and immediately place the coverslip on a microscope slide.

2.5 Experimental Design (at a glance)



CHAPTER- III

Results

3. Prevalence of gastrointestinal parasitic infestations

3.1 Overall prevalence of gastrointestinal parasitic infestations

The current investigation was revealed 7 helminths species as 1 Cestodes, 2 Trematodes and 3 species of Nematodes in cattle population.

The overall prevalence of gastrointestinal parasitic infestation (either single or mixed infections) was 42.54% in study population.

Table 1: Overall prevalence of gastrointestinal parasitic infestations in crossbred cattle

Gastrointestinal Parasitic infections	Percentage %	95% Confidence Interval
<i>Fasciola</i> spp	15	7.65-11.87
<i>Paramphistomum</i> spp	9.33	5.93-11.45
<i>Toxocara</i> spp	8.23	5.93-11.45
<i>Trichuris</i> spp	2.62	-0.68-1.79
<i>Strongyloides</i> spp	1.33	-0.28-1.09
<i>Moniezia</i> spp	6.01	2.67-5.75
Total	42.54%	

Among different gastrointestinal parasitic infestations, prevalence of *Fasciola* spp infestations was the highest and it was (15.00%) in studied cattle. The lowest parasitic infection was recorded in *Trichuris* (2.62%) and *Strongyloides* spp infections (1.33%). However, slightly higher prevalence was recorded in *Paramphistomum* spp, *Toxocara* spp, and *Moniezia* sp infections in the study population (Table 1).

3.2 Age specific prevalence of gastrointestinal parasitic infestations

Occurrences of gastrointestinal parasitic infestations were influenced by the age of animals. During this investigation, it was observed that adult and young cattle were affected more by different gastrointestinal parasitic infestations. Among different parasitism, *Fasciola* spp infestation was the highest (19.01%) in adult followed by young and calf. *Paramphistomum* spp infestation was the highest in young (15%) where as *Moniezia* spp infestation were more in adult cattle (7.29%). *Toxocara* spp infestations were recorded highest (23.05%) in calf where as *Strongylus* spp and *Trichuris* spp were only recorded in adult cattle of this study.

3.3 Sex-specific prevalence of gastrointestinal parasitic infestations

In the current study, it was exposed that female cattle showed more susceptibility to different gastrointestinal parasites than male but it was not statistically significant. However, prevalence of *Fasciola* spp infestations was the highest in female crossbred cattle (9.19%) while occurrence of *Paramphistomum* spp infestations (7.11%) along with *Toxocara* spp and *Moniezia* spp were found more in male cattle. *Trichuris* spp and *Strongyloides* spp infestation were only recorded in female cattle of this study (Fig.1).

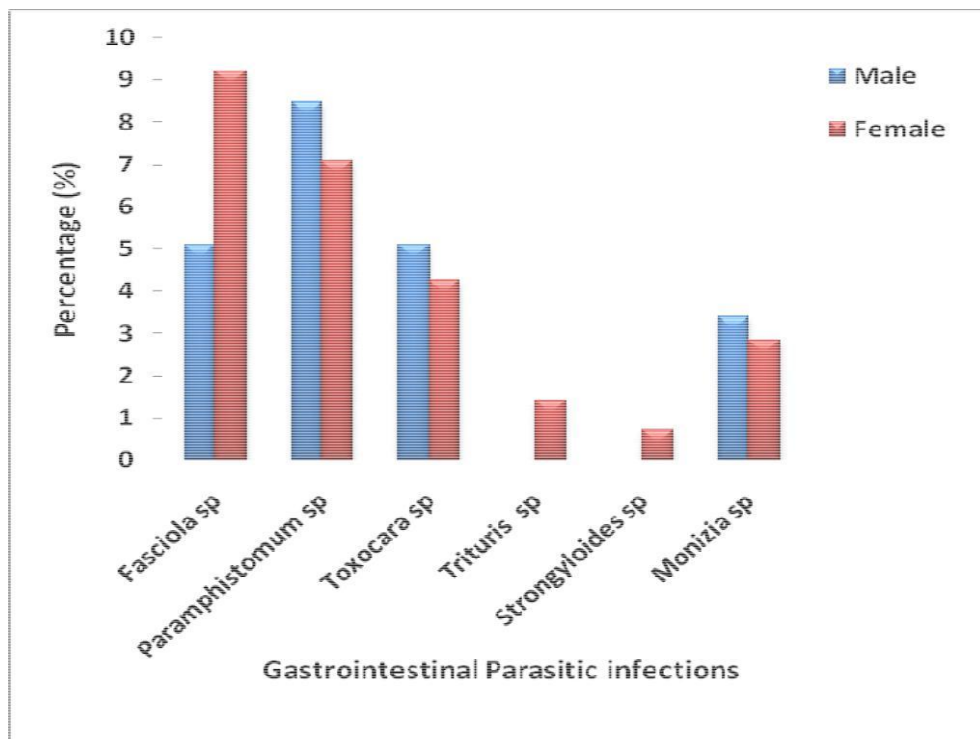


Fig 1.: Sex-specific prevalence of gastrointestinal parasitic infestation in crossbred cattle

CHAPTER-IV

DISCUSSION

The overall prevalence of gastrointestinal parasitic infestations in crossbred cattle of this study showed somewhat similarity with the report of *Khan et al.* (2010), *Saravana et al.* (2009) and *Rahman and Razzak* (1973) who recorded 30.0% in India and 37% in Cumilla district, Bangladesh. Higher prevalence of *Faciola* spp might be due to geo-climatic condition *Kakar et al.*,(2008) or poor same size *Bachal*.(2002).

Alim et al. (2011) recorded 14.81% and 12.96% of Paramphistomiasis in Holstein Friesian crossbred and indigenous cattle, respectively which was slightly higher with the findings of this study. There was found contradictory result with *sardar et al.*(2006) and *Raza et al.*(2009) in case of pramphistomum spp. Infestation that was higher in other country than Bangladesh, might be due to geo-climatic condition. Prevalence of *Toxocara* spp infestation in cattle was found partially similar with the report of *Iqbal et al.* (2007) and *Alim et al.* (2011), who reported 8.48% infection in Pakistan, 5.1% in Turkey and 6.6% and 5.55% in different areas of Bangladesh, respectively.

Prevalence of *Trichuris* spp infection of this study was consistent with the findings of *Saravanana et al.* (2009) and *Lima* (1998) who recorded 1.9% in Namakkal, India and less than 1% in Minas Gerais State, Brazil, respectively. Higher prevalence of *Trichuris* spp infection was recorded by *Shirale et al.* (2008), *Jiméneza et al.* (2007) and *Sardar et al.* (2006) in different corners of the world. Variation in the occurrence of *Trichuris* spp infection in this study might be due to geo-climatic conditions of the study areas as well as husbandry practices.

Prevalence of *Strongyloides* spp infection strongly similar to *Alim et al.* (2011), *Sardar et al.* (2006) who recorded 1.38% in Chittagong division, 1% infection in Mymensingh and 1.6% in Tangail, Bangladesh, respectively. Occurrence of *Strongyloides* spp of this study showed higher variation from the reports of *Shirale et al.* (2008) who recorded 11.14% in Akola district, India and 11.98% in Nagpur India, 5.6% in Hokkaido, Japan, 7.4% in Savar, Bangladesh, respectively.

4.2 Age specific prevalence of gastrointestinal parasitic infestations

In current study, influences of age on the occurrence of gastrointestinal parasitic diseases were observed. The frequency of GI parasitic infections especially, *Fasciola* spp, *Trichuris* spp and *Moniezia* spp were found more in adult cattle than young and calf. Higher prevalence of gastrointestinal parasitic infestations in adult cattle of this study showed consistency with the observation of Sardar *et al.* (2006), who reported that *Fasciola*, *Paramphistomum*, *Trichuris* and *Schistosoma* were highest in the age group greater than 36 months and lowest in age group less than 12 months. Prevalence of *Paramphistomum* spp were found more in young cattle which was similar with the observation of Reza *et al.* (2007) Regassa *et al.* (2006) who recorded significantly higher prevalence of helminths in younger animals than adult. In this study, higher prevalence of parasitic infestation in adult cattle might be due to keeping them for a longer period of time in breeding and milk production purposes or supply inadequate feed against their high demand. The Occurrence of *Toxocara* spp infection was highest in young which was supported by the reports of Lay *et al.* (2008), Sarder *et al.* (2006), Aydin *et al.* (2006) and Bachal *et al.* (2002), who recorded the infection in early months of life. Higher prevalence might be due to prenatal infection through transfer of 3rd larval stage and post-natal infection by poor hygienic condition. Lay *et al.* (2008) Urquhaeta *et al.* (2008), Urquhart *et al.* (1996) and Soulsby (1982).

4.3 Sex-specific prevalence of gastrointestinal parasitic infestations

In the present study, infestation caused by *Fasciola* spp, *Trichuris* spp *Strongyloides* spp, were found predominant in female than male cattle. Findings of this study was found in accordance with the reports of Davila *et al.* (2010), Raza *et al.* (2010) and Al-Shaibani *et al.* (2008) who also reported higher prevalence of helminths in female cattle. On other hand, *Toxocara* spp infestation e was more in male than female cattle which was found in accordance with the reports of F. & Gilleard, J.S (2008). In this study, variation in occurrence of such helminths in male and female animals might be due to the variation in sample size Bachal *et al.*, (2002), lowered resistance of female animals or on the part of their reproductive events or temporary loss of acquired immunity near parturition Garcia *et al.*, (2007), stress, genetic resistance of host and insufficient/imbalanced feed against higher needs Raza *et al.*,(2010).

Chapter- V

CONCLUSION

The explored data of this survey will furnish an overall idea about the distribution of gastrointestinal parasitic infestations along with the study areas. Yet, this survey will construct the approach to take further widespread study related to these infections which will help to take obligatory preventive and control measures against parasitism. The study revealed comparatively higher prevalence of *Fasciola spp*, *Paramphistomum spp* and *Toxocara spp* in cattle in relation to age and sex. The occurrence of gastrointestinal parasitic infestations was observed higher in adult and female cattle. It is predicted that Gastrointestinal parasitism were more might be due to hot and humid climate which was ideally suitable for the development of such parasites. However, poor management, insufficient diet, lack of awareness about deworming also enhances the high incidence of the infection.

CHAPTER-VI

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Biography

I am Shahed Mohammad Raihan, son of Mr. Forkan Ahmad and Mrs. Safura Begum. I am from Moheshkhali, Cox's Bazar district. I passed my Secondary School Certificate (SSC) examination in 2011 and Higher Secondary Certificate (HSC) in 2013. I enrolled for Doctor of Veterinary Medicine (DVM) degree in Chittagong Veterinary and Animal Sciences University (CVASU), Chittagong Bangladesh in 2014-2015 session. I have immense interest to work in livestock sector.