

## Epizootiology of Gastrointestinal Helminthoses in Garole Sheep of Organized Farm in West Bengal

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**Abstract** Gastroenteritis and its associated disease caused by helminth parasites is a major hindrance for optimum productivity in small ruminants. The present study was conducted to determine the prevalence of gastrointestinal helminths (GIH) and intensity of gastrointestinal nematode (GIN) infection in Garole sheep of one organized farm at Mohanpur campus of the West Bengal University of Animal and Fishery Sciences in Nadia. A total of thirty sheep in the age group of three months to one year were selected and coprologically screened by standard technique for a period of one year (from November 2012–October 2013). The overall prevalence of GIH infection was 72.49%. Highest overall prevalence (79.16%) as well as intensity of GIN infection (647) was observed in monsoon and lowest prevalence (68.33%) and intensity (402.5) was recorded in summer. *Haemonchus contortus* was recorded as the predominant species with an overall prevalence of (64.5%). The results of the present study might be exploited for planning strategic control measures against naturally occurring GI helminths in sheep of organized farms.

**Keywords** Gastrointestinal parasites, Prevalence, Intensity, Sheep.

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### Introduction

Profitable and healthy sheep rearing is the plan of many rural livestock owners alongside fruitful farming which serves as the back bone in their livelihood. Sheep is a unique species of livestock with a special ability to thrive on a wide variety of grasses and to utilize wastelands or weeds from the field even without any dependence on supplemental feed. Gastrointestinal parasitic infection dominated by a variety of helminths is responsible for causing significant economic losses in sheep attributed to reduced weight gain, retarded growth and impaired reproductive efficiency [1] in addition to the losses incurred on account of increased management cost and mortality [2]. Formulation of control program for GI helminths depends upon comprehensive knowledge of the epidemiological factors, which merit particular attention. Epidemiological studies in this regard plays a very important role to analyze the disease data for planning disease control strategies and also assess the likely impact between environment and health.

Therefore epidemiology of naturally occurring GI helminths was studied in terms of prevalence and intensity of infection in Garole sheep of University farm of West Bengal University of Animal and Fishery Sciences at Mohanpur in Nadia.

### Materials and Methods

#### Study location

One sheep farm under the West Bengal University of

**Table 1.** Overall prevalence of gastrointestinal helminths in sheep of the university farm at Mohanpur in Nadia.

Months	Overall prevalence (%)	Strongyle (%)	<i>Strongyloides</i> (%)	<i>Trichuris</i> (%)	<i>Fasciola</i> (%)	Paramphistome (%)	<i>Moniezia</i> (%)
Nov	70.00	56.67	10.00	13.33	6.00	6.67	13.33
Dec	70.00	53.33	6.67	10.00	3.33	10.00	16.67
Jan	66.67	50.00	10.00	6.67	3.33	6.67	10.00
Feb	73.33	50.00	10.00	10.00	6.67	10.00	30.00
Winter	70.00	52.50	9.16	10.00	4.83	8.35	17.50
Mar	70.00	63.33	6.67	20.00	3.33	10.00	23.33
Apr	66.67	60.00	6.67	16.67	2.67	10.00	20.00
May	63.33	53.33	3.33	10.00	0.00	6.67	6.67
Jun	73.33	66.67	10.00	10.00	0.00	6.67	6.67
Summer	68.33	60.83	6.67	14.17	1.50	8.35	14.17
Jul	83.33	80.00	6.67	3.33	0.00	10.00	10.00
Aug	80.00	70.00	10.00	6.67	6.67	13.33	6.67
Sept	73.33	63.33	3.33	10.00	3.33	10.00	10.00
Oct	80.00	66.67	6.67	10.00	0.00	10.00	20.00
Monsoon	79.16	70.00	6.67	7.50	2.50	10.83	11.67
Overall	72.49	61.11	7.50	10.56	2.94	9.17	14.45

Animal and Fishery Sciences at Mohanpur in Nadia district was selected for the present study. The study was continued for 12 months total duration. In this farm routine deworming was practised by the farm personnel maintaining duration of three months.

#### Selection of animals and collection of fecal samples

A total of 30 Garole sheep of either sex, 3 to 12 month-old, were selected, properly identified by neck tags and maintained as per the farm's practices.

Per-rectal or freshly voided fecal pellets from individual sheep were collected in plastic bottles (Tarsons) containing 10% formalin, at monthly interval during the study period. Pooled sample comprising the mixture of fecal samples of all the sheep were also collected without preservative for coprocultural examination and determination of species composition of different nematode larvae prevalent in those animals.

#### Examination of fecal sample

A part of each sample was subjected to qualitative fecal examination by standard sedimentation technique for the presence of trematode eggs and salt

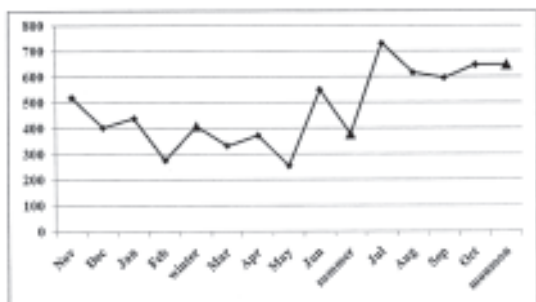
flotation technique for cestode and nematode eggs [3]. Quantitative fecal examination of the remaining part of the samples was performed by Modified McMaster's Technique [3]. Coprocultural examination of the feces pooled from all the sheep under study was also performed by honey-jar coproculture technique [3] concomitantly with the qualitative and quantitative fecal examinations.

#### Determination of species composition of third stage larvae (L<sub>3</sub>)

The species composition of nematodes (comprising strongyles and *Strongyloides*) in the larval samples obtained by coproculture was determined following the standard guidelines [4]. A small drop of larval suspension was placed on a microscopic slide, a drop of Gram's iodine solution was added to it, carefully mixed and a cover slip was gently placed over the fluid. The L<sub>3</sub> were examined under a compound microscope and the characters given in the keys by Anon [4] were used to identify a minimum of 200 larvae. The percent composition of different nematode species in the L<sub>3</sub> suspension was calculated accordingly.

## Results and Discussion

The overall prevalence of naturally occurring gas-

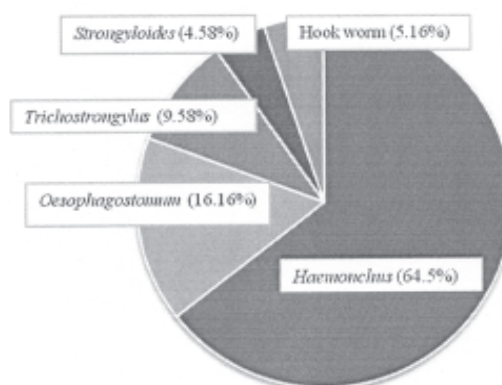


**Fig. 1.** Monthly and seasonal intensity of infection of GI nematodes in sheep of the university farm at Mohanpur in Nadia.

gastrointestinal helminths in sheep of this farm was recorded as 72.49% (Table 1). Strongyle group of nematodes was found to be the highest among all the naturally occurring gastrointestinal parasites with an overall prevalence of 61.11%. The overall prevalence of other two nematodes i.e. *Strongyloides* and *Trichostrongylus* were 7.50% and 10.55% respectively. *Fasciola* sp. and Paramphistome were the trematode parasites recorded in the study with an overall prevalence of 2.78% and 9.17% respectively. *Moniezia* sp. with an overall prevalence of 14.44% was the only cestode parasite recorded in sheep of this farm.

Gastrointestinal parasitism is a common occurrence in small ruminants of the world [5] including India [6, 7]. Since the prevailing agro-climatic conditions of Nadia district of West Bengal favor the occurrence of gastrointestinal parasites in livestock in which a high prevalence has been recorded (Fig. 1). The high rate of infection might be due to that the same pasture used before as well as after treatment and also the meteorological condition of Nadia. The monthly average temperature, rainfall and relative humidity of West Bengal are optimum for all round the year for survival and translation of free living stages of GI parasites (AINP on GIP, Annual Report, 2009–2010).

The prevalence of Strongyle group of nematodes was highest among all GI parasites and this is in accordance with the finding of Ghosh et al. [8] who recorded 72.91% prevalence of Strongyle in Garole sheep. The prevalence of *Moniezia* (14.44%) as recorded in the present study is slightly similar to the



**Fig. 2.** Species composition of infective larvae of gastrointestinal nematodes of sheep of the university farm at Mohanpur in Nadia.

finding of Pandit et al. [9] who reported prevalence of *Moniezia* was 13.75% in Garole sheep.

Highest (79.16%) overall prevalence of gastrointestinal helminths was recorded during monsoon followed by winter (70.00%) and lowest in (68.33%) summer (Fig. 2). In West Bengal, the environmental temperature and relative humidity during monsoon are suitable for survival and development for the parasitic stages of different GI nematodes. The lower prevalence during summer season compared to monsoon and winter season might be attributed to the high environmental temperature and low relative humidity which were detrimental to the transmission and translation of the infective stages [10].

The overall intensity of GI nematode infections in terms of eggs per gram of feces for Strongyle group of nematodes was 486.34 in sheep of the present study (Fig. 1). The finding of the present study was corroborated with the earlier report by Ghosh et al. [8] who recorded an overall EPG of 422.37 in Garole sheep of other places of South 24 Parganas in West Bengal. In North–West India a very high intensity (EPG 0–28000) of Strongyle infection in sheep by Yadav et al. [6] and in Arunachal Pradesh, a North East state, an equally low intensity (EPG<50) of the infection was reported by Saravanan et al. [11]. This indicates that geo-climatic factors play an important role in the intensity of the infections. Evidently

Strongyle infections in terms of intensity had its peak in monsoon (647), followed by winter (409) and lowest in summer (402.5) which corroborated the earlier findings [8—10].

Coprocultural examination revealed that *H. contortus* (64.5%) was the predominant GI nematodes followed by *Oesophagostomum* (16.16%), *Trichostrongylus* (9.58%), hookworm (5.16%) and *Strongyloides* (4.58%) (Fig. 2). This finding commensurate with the previous observations as recorded in small ruminants of West Bengal [8, 10] and India [6].

In spite of regular anthelmintic treatment in Garole sheep of the organized farm a high prevalence rate and moderate intensity of GI helminths was recorded. Therefore the epidemiological data obtained in the present study might be exploited for refinement of worm control program of the university farm to prevent economic losses.

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