



## PREVALENCE OF GASTROINTESTINAL PARASITES IN BLACK BENGAL GOATS OF SUNDARBAN DELTA IN WEST BENGAL

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**Abstract-** Gastroenteritis 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 parasites (GIP) and intensity of gastrointestinal nematode (GIN) infection in Black Bengal goat of Sundarban Delta of South 24 Parganas district in West Bengal. A total of sixty goats 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 Nov. 2012-Oct. 2013). The overall prevalence of GIP infection was 73.34%. Highest overall prevalence (81.67%) as well as intensity of GIN infection (606.5) was observed in monsoon and lowest prevalence (68.33%) and intensity (361.5) was recorded in summer. *Haemonchus contortus* was recorded as the predominant gastrointestinal parasite species with an overall prevalence of 63.25%. The results of the present study might be exploited for developing strategic control measures against naturally occurring GIP in black Bengal goat of Sundarban Delta.

**Keywords-** Gastrointestinal parasites, Prevalence, Intensity, Goat, West Bengal

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### Introduction

Small ruminant livestock are important assets of landless and marginal farmers and help in improving rural Indian economy. Goat with its unique feature of providing maximum returns with minimum care and expenditure has made it the most popular livestock of the rural India. Profitable goat husbandry confronts a variety of constraints of which disease problem is the major hindrance for optimum productivity. Among various diseases parasitic disease is the major constraint which leads to significant economic losses attributable to reduced weight gain, retarded growth and impaired productive and reproductive efficiency [1-3]. The net economic loss on the account of loss meat production due to naturally occurring gastrointestinal nematodes in terms of rupees was Rs. 195.33 in sheep [3] and Rs. 167.24 in goat [4]. Clinical and sub-clinical infections with internal parasites reduce the productivity in small ruminants and parasitic gastroenteritis due to nematode infections has been a major constraint to profitable goat production [3,4]. Besides parasitic gastroenteritis is also responsible for the losses incurred on account of increased management cost and associated mortality [5,6].

Nevertheless, systematic study on gastrointestinal parasites in black Bengal goat is lacking and it continues to be a major limiting factor for their optimal productivity. Epidemiological studies in this regard plays an essential role to utilise the disease data for diagnostic purposes, that helps in creating disease control strategies and also assess the relationship between climatological factors and

pathogens and thereby health of animals. Therefore, the present study was conducted to determine the prevalence and intensity of infection of naturally occurring gastrointestinal parasites in Goats of Sundarban Delta, West Bengal.

### Materials and Method

#### Study Location

Two villages (Rangabelia and Jotirampur) under the block Gosaba located in the Sundarban Delta in South 24 Parganas district, where Black Bengal goat is one of the major livestock species, were selected for the study of 12 months' total duration. In those villages routine deworming was not practised by farmers and the animals were maintained by semi-intensive system of rearing.

#### Selection of Animals and Collection of Faecal Samples

A total of, 60 goats of either sex, in the age group of three months to one year old, were selected, properly identified by neck tags and maintained as per the owners' practices.

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

### Examination of Faecal Sample

A part of each sample was subjected to qualitative faecal examination by standard sedimentation technique for the presence of trematode eggs and salt flotation technique for cestode and nematode eggs [7]. Quantitative faecal examination of the remaining part of the samples was performed by Modified McMaster's Technique [7]. Coprocultural examination of the faeces pooled from all the goats under study was also performed by honey-jar coproculture technique [7] concomitantly with the qualitative and quantitative faecal 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 of Her Majesty's Stationery Office [8] following slight modification. A small drop of larval suspension was placed on a microscopic glass 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 [8] 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

Gastroenteritis caused by different types of helminth was prevalent throughout the study period in goats of Sundarban Delta. The overall prevalence of naturally occurring gastrointestinal parasites in goats of South 24 Paraganas was recorded as 73.34% [Table-1]. Parasitic gastroenteritis is a common occurrence in small ruminants of the world [9,10] including India [11-13]. The prevailing agroclimatic conditions including monthly average temperature, rainfall and relative humidity of South 24 Paraganas are optimum for survival and translation of free living stages of gastrointestinal parasites all round the year (AINP on GIP, Annual Report, 2009-2010).

Strongyle group of nematodes was found to be the highest among all the naturally occurring gastrointestinal parasites with an overall

prevalence of 59.72%. The prevalence of *Strongyloides* and *Trichuris* were 10.00 % and 8.05 %, respectively in goats under study [Fig -1]. Strongyle group of nematodes was the predominant among the different types of GI parasites and this was in agreement with earlier finding [14] who reported 72.91% prevalence of Strongyle in Garole sheep of South 24 Paraganas district of West Bengal. As the strongyle group of nematodes infect both sheep and goat therefore a high prevalence of Strongyle in goats of present study area (Sundarban Delta of South 24 Paraganas) has been recorded.

The trematode parasites recorded in goats of Sundarban Delta were *Fasciola* and *Paramphistome* [Fig-1]. The prevalence of *Fasciola* (1.67%) and *Paramphistome* (8.33%) in Black Bengal goats of the present study was more or less similar to the earlier findings of [11,14,15]. The prevalence of *Moniezia* (12.50%) as recorded in the present study was in line with earlier finding in Bengal goats [16] and in Garole sheep of Sundarban Delta [17].

The overall intensity in terms of mean faecal egg output i.e. eggs per gram of faeces of gastrointestinal nematode infection was recorded as 464.30 in goats of Sundarban Delta [Fig-2]. The prevalence (81.67%) of GIP and intensity of Strongyle group of nematode infection (EPG= 606.50) were highest in monsoon followed by winter (prevalence - 70.00%, EPG= 425.00) and lowest prevalence (68.33%) and intensity (EPG= 361.50) recorded during summer [Fig -1] and [Fig-2]. In West Bengal, the environmental temperature and relative humidity and also availability of green vegetations around the water filled ponds, river, ditches, are highly favourable for development, survival, and translation of free living stages of gastrointestinal parasites. The lower prevalence and intensity of infection during summer season [18].

The prevalence of different species of Strongyle group of nematodes as revealed in the coprocultural examination [Fig-3] were *Haemonchus contortus* (63.25%), *Oesophagostomum* (17.58%), *Trichostrongylus* (10.58%), Hookworm (4.67%) and *Strongyloides* (3.91%). This finding is in accordance with the previous reports in small ruminants [14,18] in which *Haemonchus contortus* was the predominant GIN of sheep and goats of West Bengal as well as in India [19,20].

**Table 1-** Prevalence and intensity of infection of gastrointestinal parasites in Black Bengal Goats of Sundarban Delta of West Bengal

Months	Overall prevalence (%)	Strongyle (%)	Strongyloides (%)	Trichuris (%)	Fasciola (%)	Paramphistome (%)	Moniezia (%)	Overall intensity
Nov	70	63.33	16.67	10	0	6.67	20	525
Dec	66.67	56.67	10	6.67	0	6.67	26.67	405
Jan	70	50	3.33	6.67	0	3.33	20	352
Feb	73.33	43.33	6.67	10	0	3.33	13.33	418
<b>Winter</b>	<b>70</b>	<b>53.33</b>	<b>9.17</b>	<b>8.34</b>	<b>0</b>	<b>5</b>	<b>20</b>	<b>425</b>
Mar	70	50	10	6.67	3.33	6.67	13.33	336
Apr	66.67	53.33	13.33	10	3.33	10	16.67	300
May	63.33	50	6.67	6.67	0	3.33	20	280
Jun	73.33	63.33	10	10	0	6.67	10	530
<b>Summer</b>	<b>68.33</b>	<b>54.16</b>	<b>10</b>	<b>8.34</b>	<b>1.66</b>	<b>6.67</b>	<b>15</b>	<b>361.5</b>
Jul	83.33	73.33	13.33	10	3.33	13.33	6.67	603
Aug	90	80	10	6.67	3.33	13.33	10	593
Sept	76.67	66.67	6.67	6.67	3.33	16.67	13.33	630
Oct	76.67	66.67	13.33	6.67	3.33	10	13.33	600
<b>Monsoon</b>	<b>81.67</b>	<b>71.67</b>	<b>10.83</b>	<b>7.5</b>	<b>3.33</b>	<b>13.33</b>	<b>10.83</b>	<b>606.5</b>
Overall	73.34	59.72	10	8.06	1.66	8.34	15.27	424.5

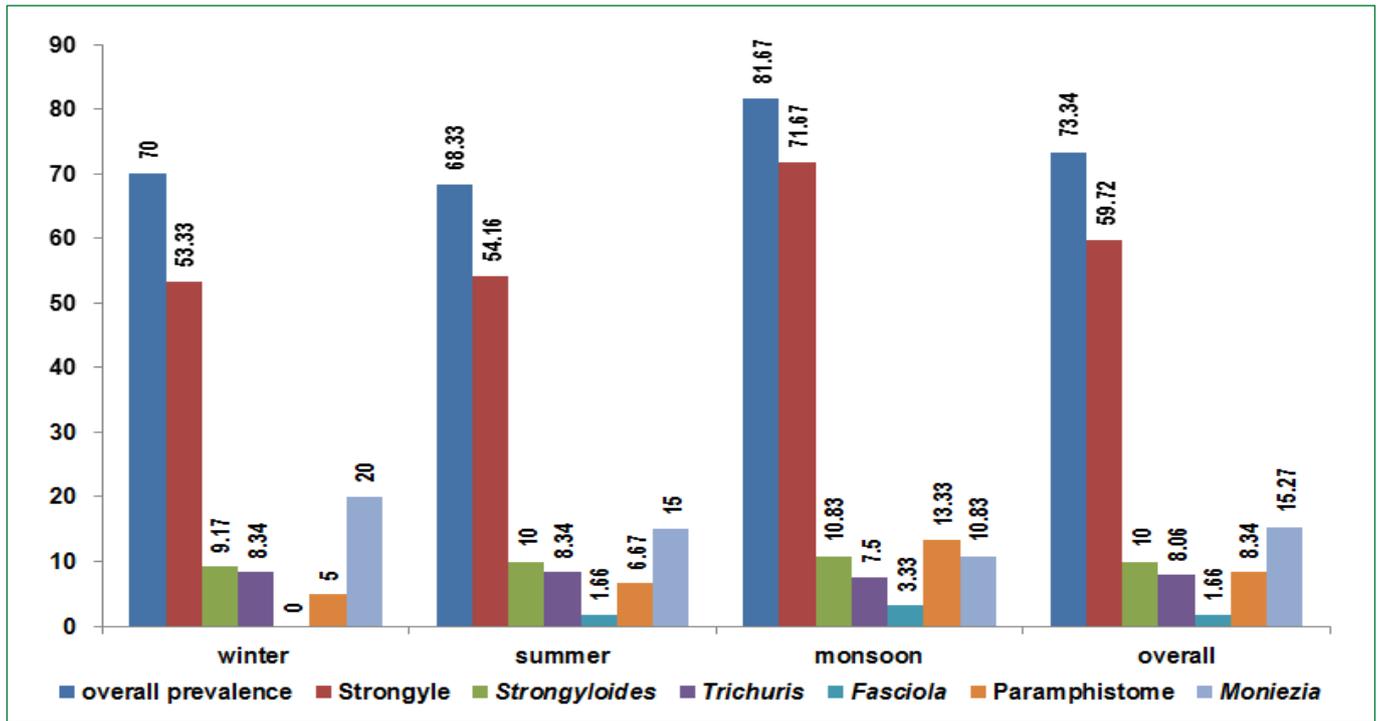


Fig. 1- Overall and seasonal prevalence of gastrointestinal parasites in Black Bengal Goats of Sundarban Delta of West Bengal

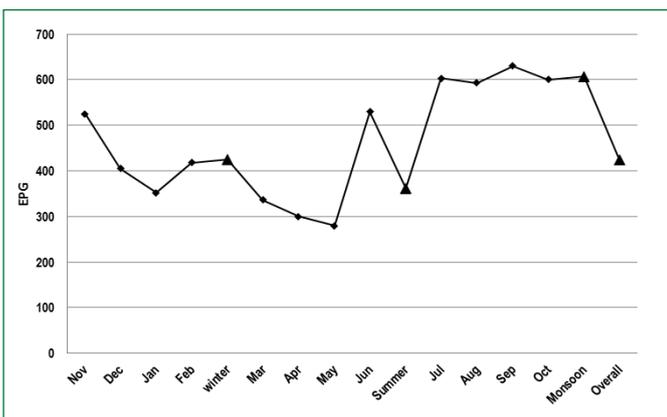


Fig. 2- Monthly and seasonal intensity infection of gastrointestinal parasites in Black Bengal Goats of Sundarban Delta, West Bengal

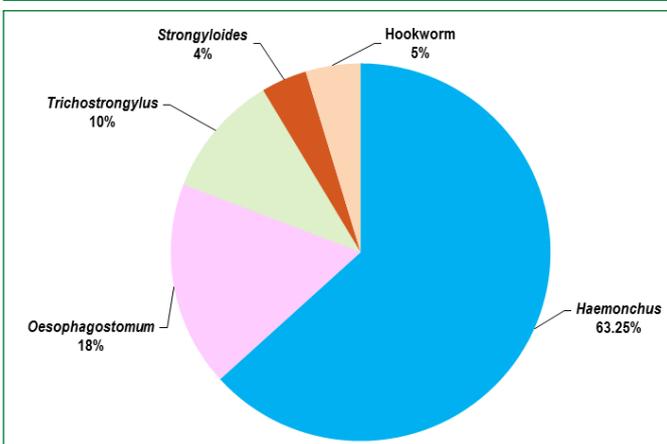


Fig. 3- Prevalence of different species of infective larvae of Strongyle group of nematodes in Black Bengal Goats of Sundarban Delta, West Bengal

### Conclusion

The prevalence of gastrointestinal parasites and intensity of nematode infection in Black Bengal goats of Sundarban Delta was quite high all round the year and it was highest during monsoon season. Therefore the epidemiological data obtained in the present study might be exploited for strategic worm control programme in goats of Sundarban Delta to prevent economic losses to the farmers.

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**Conflicts of Interest:** None declared.

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