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Prevalence of Gastrointestinal Parasitism of Black Bengal Goats from Jalpaiguri district of West Bengal

Subham Das[1]*, Neeraj Kumar[2], Sudip Das[3] and Arnab Chakraborty[4]

1. Department of Veterinary Parasitology, Sanskaram College of Veterinary and Animal Science, Haryana-124108
2. Division of Veterinary Pathology, Indian Veterinary Research Institute, Izzatnagar- 243122
3. Department of Veterinary Parasitology, College of Veterinary Sciences and Animal Husbandry, R.K Nagar- 799008
4. Animal Resource Development Department, Jalpaiguri, West Bengal- 735101

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ABSTRACT

Goat farming is a cornerstone of the rural socio-economic landscape in India, providing a critical source of livelihood for smallholder farmers. However, gastrointestinal (GI) parasitism remains a significant barrier to productivity, leading to poor growth rates and inefficient feed conversion. This study was conducted between March 2024 and February 2025 in the Jalpaiguri district of West Bengal to determine the prevalence of GI parasites in the indigenous Black Bengal goat. A total of 510 fecal samples were collected from goats across different ages and sexes and examined using standard salt flotation and sedimentation techniques. The study revealed total 428 samples positive (83.92%), with roundworms (nematodes) being the most common parasite at 71.76%. Furthermore, 36.93% of the animals suffered from multiple species infections. The findings highlight an alarming level of GI parasitism in the region, providing baseline data essential for developing effective chemotherapeutic and management strategies to improve the health and productivity of Black Bengal goats.

Introduction

The goat plays a significant role in the national economy and rural socio-economic condition of the country. In rural areas of our country, goat farming is one of the most important sources of livelihood of the farmers. India ranks second in goat production with a population of 148.84 million goats and West Bengal accounts to 16.28 million of goats (21st livestock census). India is a paradise of many parasites due to its hot and humid climatic condition (Ajith et al., 2024). To the benefit of rural communities and smallholder farmers, goat production must be improved through targeted research into physical health, reproductive health, and feeding systems. This intensification should be achieved by enhancing parasitic disease control programme and management husbandry practices rather than merely increasing the total number of animals (Dhollander et al., 2005).

The control of gastro-intestinal parasites will help to conserve the genetic resources with their upgradation for better production and supply of healthy, disease free products for human use. The incidence of parasites among different breeds of goat has been reported from different parts of India. Black Bengal goat is the indigenous breed

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* **Corresponding author E-mail addresses:** drsuvam14@gmail.com(Subham Das)

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which is predominant in West Bengal state of India and is having some unique character of good meat and skin quality and high prolificacy (Apu et al., 2025). Jalpaiguri district is located in the northern part of the Indian state of West Bengal, situated between latitudes 26° 16′ and 27° 0 ′ north and longitude 88 4' and 89 53' east.The field area is having altitude of 89 m above the mean sea level. The district is generally considered to be a low-to-mid altitude region, but it is located in the foothills of the Himalayas and has some areas of higher elevation (Maiti et al., 2016). The present study was undertaken to find out the prevalence of gastro-intestinal parasites in Black Bengal goat under field condition without showing apparent clinical symptoms to chalk out the chemotherapeutic and management practices for Black Bengal goat rearing.

Materials and Method

The study was conducted in the Jalpaiguri district of West Bengal between March 2024 and February 2025 to determine the prevalence of gastrointestinal (GI) parasites in Black Bengal goats. The intensity of parasitic burden in a particular area was found to be largely dependent on specific environmental conditions such as rainfall, temperature, and humidity, as well as pasture and grazing management practices, which greatly influence the survival and dissemination of helminth larvae.

The data collected for the present study were obtained from different months, and animals above three months of age were categorized according to the seasons. Under Indian climatic conditions, the seasons were broadly divided into summer (S1), extending from March to June; the rainy season (S2), from July to October; and winter (S3), from November to February. Samples were collected directly from field-managed animals reared under free-range or semi-intensive conditions, without standardized or intensive housing facilities. Management practices reflected typical village-level conditions with minimal structural shelter.

The fecal sample examination of each sample was carried out to detect the nematode eggs as well as coccidian oocysts using the standard salt flotation technique and for trematode eggs by simple sedimentation technique described by Soulsby (1982).

No ethical committee approval was needed as this present study was conducted on fecal sample basis and fecal samples were collected from freshly void or directly from the animals' with prior permission of their owners.

Results and Discussion

The examination of 510 fecal samples collected from Black Bengal goats in the Jalpaiguri district revealed a high burden of gastrointestinal (GI) helminth infections. Out of 510 samples total 428 samples were recorded to be positive for gastrointestinal helminths. Thus, the Overall prevalence was found to be 83.92%. GI parasitism is one of the major constrain in profitable goat rearing. It results into inefficient feed conversion; poor growth rate and reduced weight gain. The highest prevalence was observed for round worm (71.76%) and most importantly, 36.93 % goats were infected with multiple species of GI parasites.

Table 1: Overall prevalence of gastrointestinal (GI) parasites in Black Bengal goats

Category	Groups	Samples Examined	Positive	Prevalence (%)	p-value
	Summer	170	139	81.76	
	Rainy	170	158	92.94	
Season	Winter	170	131	77.05	0.05
	0-3	162	147	90.74	
	4-9	203	170	83.74	
Age (months)	>9	145	111	76.55	0.1
	Male	125	93	74.4	
Sex	Female	385	335	87.01	0.02

The different GI helminths those were observed are *Fasciola spp*. and *Paramphistomum spp.* in trematodes; only *Moniezia spp* in cestodes, coccidian oocyst and among nematodes *Strongyloides spp.*, *Strongyle spp*., *Haemonchus spp.* and *Trichuris spp*. were recorded (Dhara et al., 2015; Bandyopadhyay et al, 2010; Brahma et al., 2015). All parasites had been reported in goats in India as well as in different parts of varied climatic regions of the world (Silvestre et al., 2000; Palamapalle et al., 2003; Dabasa et al., 2017). The factors that could affect the prevalence are managemental practices, anthelmintic used, grazing habitat and economic status of the farmer. Moreover the farmer's educational background, climatic conditions, age and sex of the animals is also determine parasitic load (Ahmed et al., 2017; Mondal et al., 2000).

Table 2: Seasonal prevalence of different type of gastrointestinal (GI) parasites in Black Bengal goats

Season	Sample	Nematode		Trematode		Cestode		Mixed Infection
		Positive	%	Positive	%	Positive	%	%
Summer	170	95	55.88	77	45.29	58	34.11	30.24
Rainy	170	122	71.76	101	59.41	72	42.35	43.86
Winter	170	103	60.58	59	34.7	47	27.64	36.71
Total Sample	510	320	62.7	237	46.47	177	34.70	

In this study, the overall prevalence was higher in the rainy season 92.94% followed by summer 81.76% and winter 77.05% (Table 1). The relationship between season and infection was found to be highly significant (p<0.05). Among all the GI helminths viz. trematodes 59.41%, cestodes 42.35% and nematodes 71.76%, it was observed that higher prevalence was being recorded in Rainy season. In winter nematodes were recorded to have highest prevalence (60.58%) followed by trematodes (34.7%) and cestodes (27.64%). Summer was found to be with least prevalence rate, viz. trematodes, cestodes and nematodes at 45.29 %, 34.11% and 55.88%, respectively (Table 2). These finding aligns with Gaherwal et al., (2016), Sanalkumar et al., (2017) Jena et al., (2018), Khajuria and Kapoor (2003) in goat. During the rainy season, climatic conditions such as rainfall, soil salinity, and high humidity create an ideal environment for helminth growth (Brahma et al., 2015). High humidity and temperatures, along with the vegetation found surrounding ponds, rivers, and ditches, create a perfect habitat for gastrointestinal parasites to develop and persist in the environment. As noted by Soulsby (1982), the rate of infection in livestock is closely linked to the level of larval presence and contamination found on the grazing pasture.

Table 3: Age wise prevalence of different type of gastrointestinal (GI) parasites in Black Bengal goats

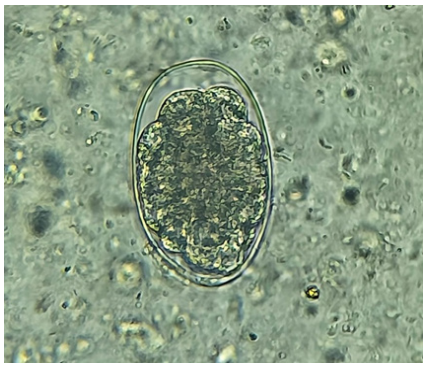
Age group	Sample	Nematode		Trematode		Cestode		Mixed Infection
		Positive	%	Positive	%	**Positive**	**%**	**%**
0-3 Month	162	121	74.69	73	45.06	65	40.12	44.33
4-9 Month	203	118	58.13	105	51.72	66	32.51	35.64
> 9 Month	145	81	55.86	59	40.69	46	31.72	30.79
Total	510	320	62.7	237	46.47	177	34.70	

Age wise prevalence showed strong statistical evidence (p<0.05) of relationship between different age groups and gastrointestinal helminths infection. Younger animals (0 to 3 months at) 90.74% showed higher infection rate in comparison to adults' viz. 4 to 9 months at 83.74% and more than 9 months at 76.55% (Table 1). Molla and Bandyopadhyay (2010), Poddar et al., (2017) and Jena et al., (2018) found similarly higher and lower rate of prevalence among younger age groups and adult animals, respectively. 0- 3 months age group was also recorded to have highest prevalence (74.69%) of nematode infection. The lowest infection was recorded in >9 month age group of cestodes (31.72%) (Table 3). Kids under three months old are much more likely to carry heavy infections because they haven't yet built up their natural defenses. Unlike older goats, whose bodies have acquires immunity against gastro intestinal parasites from past infection, these younger animals are highly susceptible to sudden and serious health issues (Soulsby, 1982).

Table 4: Sex wise prevalence of different type of gastrointestinal (GI) parasites in Black Bengal goats

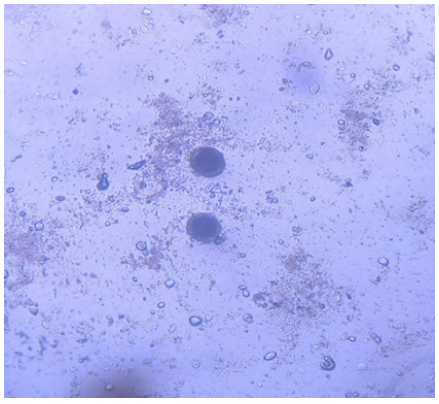
Sex group	Sample	Nematode		Trematode		Cestode		Mixed Infection
		Positive	%	Positive	%	Positive	%	%
Male	125	67	53.6	53	42.40	28	22.4	38.35
Female	385	253	65.71	184	47.79	149	38.70	49.61
Total	510	320	62.7	237	46.47	177	34.70	

In this present study, females (87.01%) were recorded with higher prevalence rate in comparison to males (74.4%) and the relationship was highly significant (p<0.05) (Table 1). Also higher prevalence among trematodes, cestodes and nematodes was recorded in females' viz. 47.79%, 38.70% and 65.71% whereas lower prevalence was recorded in male viz. 42.40%, 22.4% and 53.6%, respectively (Table 3). Same findings were also reported by Islam et al., at Mymensingh, Bangladesh in 2017, Dabasa et al., at Bale zone of south eastern Ethiopia in 2017, Rizwan et al., in 2017 at Sialkot district of Punjab, Pakistan and recently by Jena et al., (2018) in and around Ranchi. Factors such as lactational stress, gravidity, parturition, hormonal imbalance probably contributes to higher susceptibility of female goats to the GI parasites (Islam et al., 2017; Dabasa et al., 2017; Jena et al., 2018).

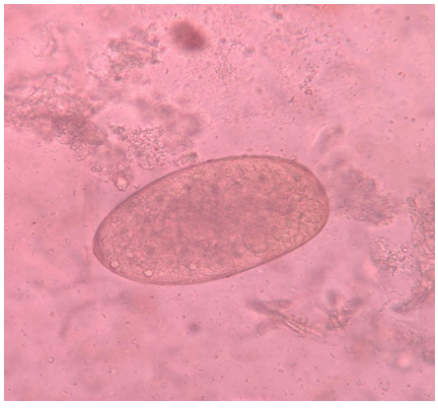


A. *Strongyle spp.*

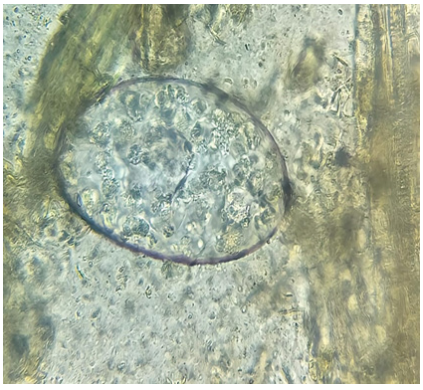
B. *Trichuris spp.*



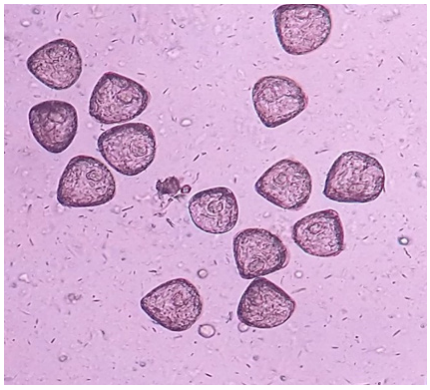
C. Coccidian oocyst



D. *Fasciola spp.*



E. *Paraphistomum spp.*



F. *Moneizia spp.*

G. *Strongyloides spp.*

Figure 1: Photograph showing eggs of gastrointestinal parasite from Black Bengal goat

Conclusion

The present study reported the scenario of GI parasitism in Black Bengal goats of Jalpaiguri district of West Bengal. The overall high prevalence of GI parasites observed in goat in the study is alarming and warrants prompts and appropriate control strategies to carve the situation. When animals are malnourished or already battling other diseases, their immune systems are less capable of fighting off new parasites. This weakened state creates an ideal environment for parasites to infect. The parasites actually reproduce more effectively when the host's defenses are down. The study provided a baseline data on the GI parasitism of goats in the district and further detailed study with involvement more numbers of animals and also other district of West Bengal can be carried out to formulate control strategies for the whole state.

Conflict Of Interest

The authors declare that they have no conflicts of interest.

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