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FREQUENCY OF GASTROINTESTINAL PARASITES AND EGG PER GRAM FAECES COUNT OF NEMATODES IN BLACK BENGAL GOAT UNDER FIELD CONDITION IN WEST BENGAL, INDIA

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ABSTRACT

Prevalence as well as intensity of infection of gastro-intestinal parasites in Black Bengal goat under field condition in different season was done to assess the prevalence of gastro-intestinal parasites in Black Bengal goat under field condition to guide farm managers. The Coprological study of faecal samples of apparently healthy Black Bengal goat was conducted in field condition at Nadia district of West Bengal state of India from July 2005 to June 2006 through direct microscopic examination as well as floatation and sedimentation methods. Out of 1147 faecal samples examined, 715 (62.34%) samples were found to be positive for gastrointestinal parasites. Strongyle sp. was the most prevalent (77.48%) parasites followed by Paramphistome sp. (30.63%), Trichuris (14.55%), Moneizia (12.73%) and Fasciola sp. (6.29%). Seasonal prevalence rate and eggs per gram of faeces (EPG) count was highest in monsoon and lowest in summer. Monthly EPG count and prevalence rate was highest in November followed by October and September.The present study might help to decide the deworming schedule and management measures for farmers to increase the productivity of Black Bengal.

Keywords: Black Bengal goat, Gastrointestinal parasites, EPG count, Prevalence, Coprological study.

1. INTRODUCTION

India is paradise of many parasites due to its hot and humid climatic condition. Though most of the Indian goat breeds are well adapted to the harsh environment, low nutrition, tropical disease and poor water quality, gastrointestinal parasites are considered to one of the top ten

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ranked disease in goats [1][15]. The goat plays a significant role in the national economy and rural socio-economic condition of the country. The climatic factor may favour the development of gastro-intestinal parasites during the period of nutritional stress and wet season in the tropical area [2][12] like India and could negatively contribute to the reproductive and productive performance of goat and slows down the genetic progress [3][1].

Improvement of goat production is necessary to benefit the rural community and smallholder farmers through research and policy-making on the physical characteristics, reproductive ability, feeding systems, productivity and health aspects of goats because increased animal production should be achieved rather than by increasing animal numbers, but enhanced disease control, integration of fodder production, improved husbandry and controlled breeding are essential steps to intensify animal production. Dhollander, et al. [4][16]. The control of gastro-intestinal parasites will help to conserve the genetic resources with their up gradation for better production and supply of healthy, disease free products for human use and also to reduce the animal population sizably and convert the animal population to be a potential one. The incidence of parasites among different breeds of goat has been reported from different parts of India [5, 6][3,9]. Black Bengal goat is the indigenous breed which is predominant in West Bengal state of India and is having some unique character of good meat and skin quality and high prolificacy.

But there is a few works done regarding the gastro-intestinal parasitic burden in this breed. The present study was undertaken to find out the prevalence of gastro-intestinal parasites in Black Bengal goat under field condition and also to find out monthly eggs per gram of faeces (EPG) count of strongyle with maximum level of EPG tolerated by Black Bengal goat without showing apparent clinical symptoms to chalk out the chemotherapeutic and management practices for Black Bengal goat rearing. Prevalence and seasonal incidence of nematode and fluke infestation in the semi- arid zone of eastern Ethiopia, Sissay, et al. [7].[19] recorded that the mean burdens of adult nematodes were moderate in both sheep and goat and showed patterns of seasonal abundance that corresponded with the bimodal annual rainfall pattern, with highest burdens around the middle of rainy season. Saha, et al. [8]. [7] recorded 75.83% overall prevalence of gastrointestinal nematodes in goats of Nadia district of West Bengal with a highest incidence in winter (79.41%), moderate in monsoon (76.4%) and lowest (72.28%) in summer.

2. MATERIALS AND METHODS

The study was conducted in Nadia district of West Bengal between July, 2005 and June, 2006 to determine the prevalence of GI parasites of Black Bengal goat. It was evident that the intensity of parasitic burden in a particular area is largely dependent on i) local environmental condition, specifically rainfall, temperature and humidity and ii) pasture and grazing management (greatly affects survival and dissemination of helminth larvae). The field area is situated at latitude of 23.5° N and longitude of 89^0E and an altitude of 9.75 mt above the mean sea level located close to the tropic of cancer [9][18].

The collected data of different months were partitioned according to the seasons. Seasons are:

Monsoon (S1) : July to October.

Winter (S2) : November to February

Summer (S3) : March to June.

Average temperature, relative humidity and rainfall of the three seasons are noted in Table 1.

Table-1. Average temperature and relative humidity of the three seasons

		July--October	November-February	March - June
		Monsoon	**Winter**	**Summer**
Average temperature, °C	Max.	31.93	26.95	35.23
	Min.	24.88	13.85	25.50
Average relative humidity, %	Max.	90.50	88.00	87.52
	Min.	71.75	45.25	46.50
Rain Fall(mm^3)	Max.	72.55	8.23	37.74
	Min.	1.95	0.29	1.85

All the animals utilized for the present study were reared in the farmers' house. The animals were fed mainly on grazing and allowing tree leaves during the rainy days. Little amount of concentrate (within the range of 50gm) were offered at the last stage of pregnancy and few days after birth. All the does were kept on floor made of soil/mud. The goat houses were sheded with paddy straw or corrugate sheet. Experimental animals were dewormed four times in a year. Vaccination against PPR, Goat pox and FMD was done in every year. Regular grooming of the animals had been practiced by the goat farmers. Other health care and treatment was done whenever needed. A total 1147 faecal samples from 118 apparently healthy Black Bengal goats of both the sexes were collected directly from rectum in every month and subjected to direct microscopic examination as well as floatation and sedimentation methods [10][2] for prevalence study of gastro-intestinal parasites. All the positive samples subjected to EPG count for gastro-intestinal nematodes (*Strongyle sp.*) by employing modified McMaster technique [11][4].

2.1. Statistical Methodology

The effect of the different months on the variability of EPG count was estimated by analysis of variance. The formulae used for statistical analysis was made using standard procedure. Snedecor and Cochran [12][6]

3. RESULTS

Coprological examination of 1147 faecal samples revealed that 715 (62.34%) samples were positive for gastro-intestinal parasites. The prevalence of recovered gastro-intestinal nematodes and other gastro-intestinal parasites (Table 2) revealed that *Strongyle sp.* were the most prevalent (77.48%) parasite in Black Bengal goat. Moreover there were presence of *Trichuris sp.* (14.55%), *Paramphistome sp.* (30.63%), *Moneizia sp.* (12.73%) and *Fasciola sp.* (6.29%).

Table-2. Incidence of various gastrointestinal parasites in Black Bengal goat

	Species of GI Parasite	Positive sample	Percentage (%)
GI nematode	*Strongylesp*	554	77.48
	Strongyloides sp.	38	5.31
	Trichuris sp.	104	14.55
Other GI parasites	*Fasciola sp.*	45	6.29
	Paramphistome sp.	219	30.63
	Moneizia	91	12.73

The overall prevalence of gastro-intestinal parasites were found to be highest (82.34%) in monsoon followed by winter (63.78%) and summer (41.89%) (Table 3). The EPG count in different months were low to moderate with the mean EPG of 1324 recorded in November which was significantly ($p<0.01$) higher than the results of other months (Table 4). It was observed that the prevalence rate of gastro-intestinal parasites was also high in November (96.70%). Next highest mean EPG count was observed in October (1260) followed by September (1244) and the corresponding prevalence rate was also high being 95.79% and 93.62% respectively.

Table-3. Monthly overall incidence of GI parasites of apparently healthy Black Bengal Goat (%)

Season	Month	Sample	GI +ve	Month %	Season %
Monsoon	July	97	63	64.95	
	August	96	72	75.00	
	September	94	88	93.62	
	October	95	91	95.79	82.34
Winter	November	91	88	96.70	
	December	93	72	77.42	
	January	94	41	43.62	
	February	91	34	37.36	63.78
Summer	March	101	42	41.58	
	April	98	40	40.82	
	May	94	39	41.49	
	June	103	45	43.69	41.89
Total		1147	715	62.34	

The prevalence rate (Table 3) and mean EPG count (Table 4) was low during March to June which sharply increased during July. This increasing trend reached peak value in November and declined in December. The result revealed low EPG count from the end of winter to summer season which increased in rainy/post rainy season.

4. DISCUSSION

The result about prevalence of recovered gastro-intestinal nematodes in the present study was similar to the findings reported by Khajuria and Kapoor [13][13], in goat. All parasites had been reported in goats in India as well as in different parts of varied climatic regions of the world [13-16][10;11;13;14]. This high figure of EPG could be attributed to the higher fecundity of nematode

parasites in the study animals during sampling period [2][12]. The minimum value of EPG and prevalence was observed during January to June as observed earlier [2, 5][3],[12]. The low EPG count from the end of winter to summer season might be associated with a condition of hypobiosis occurred during dry season which allows the parasites to survive in the host as arrested larvae or survived as adults with a reduced fecundity [17][5] and resumption of development begins just as the rainy season begins [18][17].

Table-4. Mean EPG count of GI nematode in Black Bengal goat. (MEAN ± SEM)

Season	Month	Mean ± SEM	Minimum	Maximum	Seasonal mean ± SEM
Monsoon	July	568 ± 19.9[a]	227	905	1029 ± 21.3 [a]
	August	915 ± 19.8[b]	368	1356	
	September	1244 ± 38[c]	298	2030	
	October	1260 ± 28.2 [c]	580	2258	
Winter	November	1324 ± 42.2 [d]	349	2475	745 ± 33.5 [b]
	December	562 ± 23.5 [a]	223	989	
	January	353 ± 16.1[e]	190	486	
	February	316 ± 22.9 [f]	146	690	
Summer	March	243 ± 14.9 [g]	200	477	241 ± 7.02 [c]
	April	246 ± 13.6 [g]	140	477	
	May	235 ± 14.4 [g]	205	451	
	June	239 ± 13.6 [g]	170	470	

* Values bearing same superscript within a column do not differ significantly.

Variation was observed in the maximum and minimum range of EPG count in a particular month without any clinical symptoms which might be associated with variation in individual nutritional status and physiological factors or goats developed tolerance to high level of EPG. About the levels of EPG to be considered as pathogenic, there is a wide variation in the opinion of researchers and no firm limit has been fixed for lower and upper EPG range. In an experimental study Chartier and Hoste [19][8] categorized resistant goats with EPG range 250-1800 and susceptible with EPG range of 5400-14900 while Palamapalle, et al. [16][14] recorded 6023 EPG (3000-105000) in subclinical nematode infection. The present study revealed that prevalence of nematode infection was not associated with clinical form though increase in the EPG count is positively correlated with worm burden [2][12].

5. CONCLUSION

As there is scanty of literature regarding the GI parasite infestation in Black Bengal goat, the observation of the present study might help to decide the deworming schedule and management measures for farmers flock in this type of agro-climatic zones which would increase the productivity of Black Bengal goat and thus would make the rearing economic.

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