



Incidence of gastrointestinal parasites in ruminants of organized farm in Sikkim

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Received: 17 August 2011; Accepted: 28 November 2012

ABSTRACT

A study was conducted to determine the incidence of gastrointestinal parasitic infections in ruminants of different organized farms of Sikkim from April 2009 to March 2010. Ruminants (411— 253 cattle, 141 goats and 17 sheep) were included in the study using standard parasitological procedure. The study showed that the overall infection rate was 38.44% with 21.34%, 63.83% and 82.35% in cattle, goats and sheep, respectively, either in single or mixed infection with a mean number of eggs per gram of faeces (EPG) as 1050.50. The incidence was significantly lower in Government dairy farm (9.74%) and goat farm (62.11%) than that of privately managed cattle farm (22.51%) and goat farm (67.39%). The highest prevalence was noticed in Gharpala sheep (82.35%). Strongyles and strongyloides were the most prevalent parasites encountered in the area. A higher rate was found in small ruminants than in cattle, and a greater proportion of study animals (17.52%) had severe EPG compared with study animals with low (8.03%) to moderate EPG (12.89%). Coproculture studies showed that the *Haemonchus contortus* was the most prevalent nematode followed by *Oesophagostomum* spp. and *Bunostomum* spp. in both the farms. Overall age-wise prevalence was 44.78, 31.58 and 40.76% in the animals below 1 year, within 1–2 year and above 2 years of age respectively. The seasonal prevalence of infections indicated that the gastrointestinal helminth infection was highest during summer (51.96%) followed by autumn (47.01%) and spring (34.38%). The infection rate was significantly lower in winter (11.39%). These findings may be useful to formulate an appropriate control strategy for gastrointestinal parasites of ruminants in Sikkim.

Key words: Gastrointestinal parasites, Prevalence, Ruminants, Sikkim

Gastrointestinal parasitic infection is one of the major constraints for limiting the productivity of dairy animals. In Sikkim, like other hilly regions of India, this infection is mainly responsible for retarded growth and increased susceptibility of animals to other diseases. These losses can be minimized by early detection and strategic use of anthelmintic drug. The epidemiological study from different parts of country revealed that the incidence of strongyle worm in small ruminants varied from 59–94% (Balasubramaniam *et al.* 2001, Khajuria and Kapoor 2003, Nasreen *et al.* 2005). Detail epidemiological study of gastrointestinal parasitic diseases in small and large ruminants of organized farm was not conducted in this state except a preliminary report on prevalence of gastrointestinal nematodiasis in goats and cattle in Sikkim (Pal and Bandyopadhyay 2004, 2008). The present study therefore highlighted the current status of GI parasitism

in ruminants of various organized farms of Sikkim on the basis of epidemiological investigation.

MATERIALS AND METHODS

The investigation was carried out between April 2009 and March 2010, on randomly selected cattle, goat and sheep of different ages and both sexes in 4 districts of Sikkim, which comes under sub-tropical high humid zone of lower altitudes. Faecal samples from 411 animals were collected randomly from 6 villages of 4 districts and subjected to qualitative and quantitative examination for presence of gastrointestinal parasites. Faecal egg count (eggs per gram of faeces, epg) of nematode eggs was determined by Modified Mc Master technique (MAFF 1984).

RESULTS AND DISCUSSION

Of the 411 ruminants examined, 158 (38.44%) were found positive for various gastrointestinal parasites, either in singly or in mixed infections, during study period with an overall mean EPG of 1050.50 and EPG range of 100 –5 600 (Table 1). Similarly, the prevalence of gastrointestinal parasites was 21.34, 63.83 and 82.35% in cattle, goats and sheep, respectively (Table 2). The greater proportions of study

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Table 1. Prevalence of gastrointestinal parasites in different organized farms of Sikkim

Farms	No. of animal examined	No. of animal positive (%)	Mean EPG	Range of mode
Private Cattle Farm, Melli Mezi-gaon, South Sikkim	73	13 (17.81)	92.543	100–1100
Private Cattle Farm, Rumtek, East Sikkim	104	27 (25.96)	82.55	200–700
Govt. Goat Farm Mangalburey, West Sikkim.	33	26 (78.79)	2252.68	1200–3900
Govt. Gharpala sheep Farm, Tadong, East Sikkim	17	14 (82.35)	2836.52	800–5600
Govt. Goat Research Farm, Tadong, East Sikkim	62	33 (53.22)	1850.86	1200–3800
Govt. Dairy Farm, Tadong, East Sikkim	22	2 (9.74)	16.524	100–200
Private Goat Farm, Lyngepoyang, South Sikkim	46	31 (67.39)	1250.73	600–3600
Private cattle Farm, Mongshila village, North Sikkim	54	12 (22.22)	65.568	200–400
Total	411	158 (38.44)	1050.50	100–5600

Table 2. Overall prevalence of gastrointestinal parasite and degree of EPG

Species	Sample examined	Prevalence (%)	EPG category (%)		
			Low	Moderate	Severe
Cattle	253	54 (21.34)	19 (7.52)	28 (11.07)	7 (2.77)
Goat	141	90 (63.83)	11 (7.81)	24 (17.02)	55 (9.01)
Sheep	17	14 (82.35)	3 (17.65)	1 (5.83)	10 (8.82)
Total	411	158 (38.44)	33 (8.03)	53 (12.89)	72 (17.52)

animals (17.52%) were with severe EPG while fewer were with low (8.03%) to moderate (12.89%) infection rates (Table 2). The incidence was significantly lower in Government dairy farm (9.74%) and goat farm (62.11%) than that of privately managed cattle farm (22.51%) and goat farm (67.39%). The highest prevalence was noticed in Gharpala sheep than that of goat and cattle (Table 2). Coproculture studies showed that the *Haemonchus contortus* was the most prevalent nematodes followed by *Oesophagostomum* spp. and *Bunostomum* spp. in both the farms. The most commonly occurring parasite egg recovered from faeces were strongyle, *Strongyloides*, *Coccidian oocysts*, *Moniezia*, *Ascaris*, *Nematodirus*, amphistome and *Trichuris* spp (Table 3). Higher rate of infection could be possibly due to conducive agroclimatic conditions, constant exposure of infection and availability of infective stage larvae on the grazing ground by animals, which was also reported in sheep by Sharma *et al.* (2007). On the contrast, comparatively less prevalence of amphistome and *Dicrocoelium* spp. could probably due

to less availability of the intermediate host. The prevalence of strongyle infection was higher as compared to *Strongyloides* spp. and *Trichuris* spp. Among strongyle, *Haemonchus contortus* emerged as most prevalent species in the region, besides *Oesophagostomum*, *Bunostomum*, *Trichostrongylus* and *Nematodirus* spp. also being isolated from goats. Similar observation was also reported by Yadav *et al.* (2006) in sheep and goat from Jammu, India. Among Strongyle group of parasite, *Haemonchus* spp. incidence was the highest in all 3 animal species. No significant difference was observed in prevalence of the parasite and degree of EPG between male and female subjects and age of the host (Table 4). The incidence of helminthes especially strongyles was high throughout the period of study with a peak during August to October which also was reported by Sharma *et al.* (2007). High rainfall and humidity lowered the resistance of animal vis –a–vis establish heavy infection in the host. Moreover, high humidity and moderate temperature during the monsoon also favoured bacterial multiplication, which

Table 3. Prevalence of gastrointestinal parasite in ruminants of organized farm

Species	Type of parasite (%)*							
	<i>Eimeria</i>	Amphistome	<i>Moniezia</i>	Strongyle	<i>Strongyloides</i>	<i>Trichuris</i>	<i>Nematodirus</i>	<i>Ascaris</i>
Cattle	9 (3.56)	12 (4.74)	21 (8.30)	47(18.58)	25 (9.88)	5 (1.98)	2 (0.79)	17 (6.72)
Goat	51 (36.17)	8 (5.67)	37 (26.24)	83(58.87)	49 (34.75)	11 (7.8)	22 (15.6)	14 (9.93)
Sheep	11 (64.71)	3 (17.65)	8 (47.06)	13 (76.47)	9 (52.94)	5 (29.41)	0 (0)	0 (0)
Total	71 (17.27)	23 (5.6)	66 (16.06)	143 (34.79)	83 (20.19)	21 (5.11)	24(5.84)	31 (7.54)

Total numbers and overall percentage of animals exceed expected values because of multiple gastrointestinal parasitism.

Table 4. Prevalence and degree of EPG of the sex and age groups

Sex and Age group	Sample examined	Prevalence (%)	EPG category (%)		
			Mild(%)	Moderate (%)	Severe(%)
Sex					
Female	305	127 (41.64)	27 (8.85)	39 (12.79)	61 (20.10)
Male	106	31 (29.25)	6 (5.66)	11 (10.38)	14 (13.21)
Total	411	158 (38.44)	33 (8.03)	50 (12.17)	75 (18.25)
Age					
Below 1 year	67	30 (44.78)	7 (10.45)	11 (16.42)	13 (19.41)
Between 1–2 year	133	42 (31.58)	4 (3.01)	18 (13.53)	20 (15.04)
Above 2 year	211	86 (40.76)	16 (7.58)	26 (12.32)	44 (20.85)
Total	411	158 (38.44)	27 (6.57)	55 (13.38)	77 (18.73)

Table 5. Season-wise prevalence and degree of EPG of gastrointestinal helminth

Season	Sample examined	Prevalence (%)	EPG category (%)		
			Low	Moderate	Severe
Spring (Mar-May)	96	33 (34.38)	8 (8.33)	13 (13.54)	12 (12.5)
Summer (June-Aug)	102	53 (51.96)	11 (10.78)	18 (17.65)	24 (23.53)
Autumn (Sep-Nov)	134	63 (47.01)	7 (5.22)	20 (14.93)	36 (26.87)
Winter (Dec - Feb)	79	9 (11.39)	3 (3.79)	4 (5.06)	2 (2.53)

was used as nutrition by free living larvae for their survivability (Katoch *et al.* 1998).

A significantly higher prevalence rate was encountered during the summer (51.96%) than that of autumn and spring season while significant difference were found in degree of EPG between the summer and winter (Table 5). The prevalence in the present study was recorded to be highest in monsoon for cattle, goats and sheep in Sikkim and lowest during winter. With the beginning of the winter from December onwards, the mean total EPG count was steadily decreasing to a minimum level of 3.79% EPG in January then again it increased gradually with the increase in rainfall. Sanyal and Singh (1995) reported increased parasite burden both inside host as well as on pasture during rainy season in seven different agroclimatic zones of India. The present observation was in accordance with Jithendran and Bhat (1999) in dairy animals in the North West Humid Himalayan region of India, Sharma *et al.* (2007) in Gaddi sheep in Palam Valley of North Western Himalayan region of India, Yadav *et al.* (2008) from high altitudes of Uttarakhand, Pal and Bandyopadhyay (2008) from Sikkim. The variation in the prevalence might be due to changes in agroclimatic conditions, the timing of the onset of rainy season and differences in the managerial practices followed in the 2 states. High incidence of strongyle worms as compared to *Strongyloides* and *Ascaris* recorded in the present study is comparable with the earlier epidemiological studies of Pal and Bandyopadhyay (2004) and Yadav *et al.* (2008).

Present findings also indicated that the animals harboured a worm burden in normal condition without any clinical

infestation. The high humidity and high rainfall prevailing in this region is providing suitable molarities of salt present in soil which is an important factor for ecoclysis and prolonged survivability of nematode eggs in the soil vis-a-vis increase the possibility of host infections. The study showed that from June to September ruminants were most vulnerable to gastrointestinal parasite infection and pasture contamination. Our results suggested that cattle, goats and sheep of Sikkim were highly susceptible to various gastrointestinal parasitic infections throughout the year and may need anthelmintics treatment of animal at least twice a year, once in March to April and again in June to August that might reduce the gastrointestinal parasitism and increase the productivity of animals in Sikkim state.

ACKNOWLEDGEMENT

The authors are thankful to the Department of Agricultural Research and Education, Government of India for financial assistance under the Project of AINP on GIP and also to the Joint Director, ICAR Research Complex for NEH Region, Sikkim Centre, Gangtok, for providing the necessary facilities.

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