

Epidemiology of gastrointestinal nematodes in migratory sheep and goats in north-west humid Himalayan region

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Received : 9 July 1997; Accepted : 25 February 1998

ABSTRACT

A study conducted on migratory sheep and goats of Himachal Pradesh revealed 94% infection with gastrointestinal nematodes. The intensity of infection in terms of monthly mean eggs per gram of faeces (EPG) revealed in July-September with high intensity of infection with an overall EPG ranging from 236 to 3 400 in sheep and 325 to 5 908 in goats, mainly because of species of *Strongyloides*, *Trichostrongylus*, *Haemonchus*, *Oesophagostomum*, *Bunostomum* and *Chabertia* in the decreasing order of prevalence. The role of migratory sheep and goats in the spread, and seasonal outbreak of parasite induced morbidity and mortality has been discussed.

Key words : Epidemiology, Goat, Nematodes, Sheep

Sheep (44.8 million) and goats (118.3 million) with a large genetic diversity (40 breeds of sheep and 20 breeds of goats) account for 0.5% to 5% of total output of the livestock sector in India (Singh 1995). The parasitic gastroenteritis, dominated by haemonchosis, is one of the major constraints to profitable sheep and goat production in India, and is largely determined by rainfall and production systems practised. In spite of significant production loss the problem is neglected due to its chronic and insidious nature (Sanyal 1996). The information on the gastrointestinal (GI) nematodes in north-west humid Himalayan region (N-WHHR) is limited and merits investigation. The present communication is a pilot survey in this direction in the region.

MATERIALS AND METHODS

Himachal Pradesh is located between latitude 30° 22' 40" N to 33° 12' 40" N and longitude 75° 45' 55" E to 79° 04' 20" E and altitude range from 350 to 6975 m above mean sea level. Gaddi breed is found in Kangra, Kullu, Chamba, Lahauli-Spiti and Shimla in Himachal Pradesh and parts of Jammu hills and are reared extensively under migratory system of management. These animals remain confined to the low plains in Kangra, Hamirpur, Bilaspur and Una districts of Himachal Pradesh and border areas of Punjab during winter, but migrate to the alpine pasture land (3000-4500 m above msl) during spring and summer, mainly in Lahauli-Spiti, Chamba, Kullu, Mandi and Shimla districts, through well defined migratory routes. Random sam-

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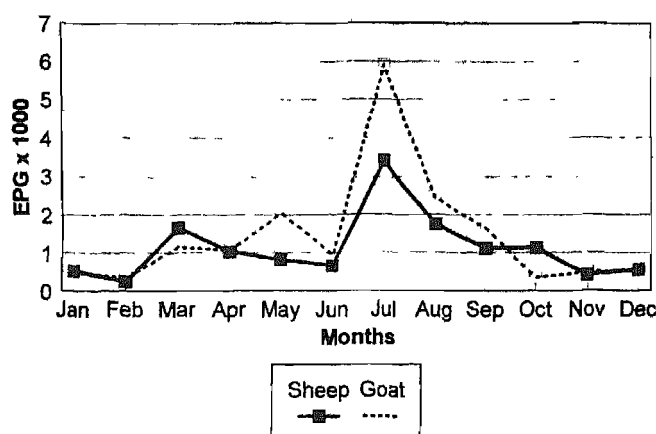


Fig. 1. Overall mean strongyle EPG counts in sheep and goats.

ples of faeces were collected from both sheep and goats of migratory flocks during the 12 month, January-December 1990, and examined for gastrointestinal parasites qualitatively as well as quantitatively. A part of each faecal sample was used for egg counts. The number of eggs per gram of faeces (EPG) was estimated with a modified McMaster technique (MAFF 1984). All remaining faeces were pooled and used for coproculture at 27°C. The infective larvae were harvested and used for larval identification (Soulsby 1965). Meteorological data were collected from the Department of Agronomy and Agrometeorology of HPKV, Palampur.

RESULTS

Strongyles revealed 93% infection out of 493 samples either singly or mixed with species of *Fasciola*, amphistomes,

Table 1 Gastrointestinal parasites in migratory sheep and goats

Host	No. (per cent) infection of parasites								
	Strongyle	Fasciola	Amphistome	Dicrocoelium	Schistosoma	Dictyocaulus	Moniezia	Trichuris	Eimeria
Sheep (n=335)	32 (9.6)	32 (9.6)	13 (3.8)	24 (7.2)	4 (1.2)	4 (1.2)	9 (2.7)	48 (14.3)	48 (29.9)
Goat (n=158)	158 (100)	14 (8.9)	4 (2.5)	4 (2.5)	1 (0.6)	2 (1.3)	2 (1.3)	2 (17.1)	27 (24)
Overall (n=493)	465 (94.3)	46 (9.3)	17 (3.4)	28 (5.7)	5 (1.0)	6 (1.2)	11 (2.2)	75 (15.2)	124 (25.2)

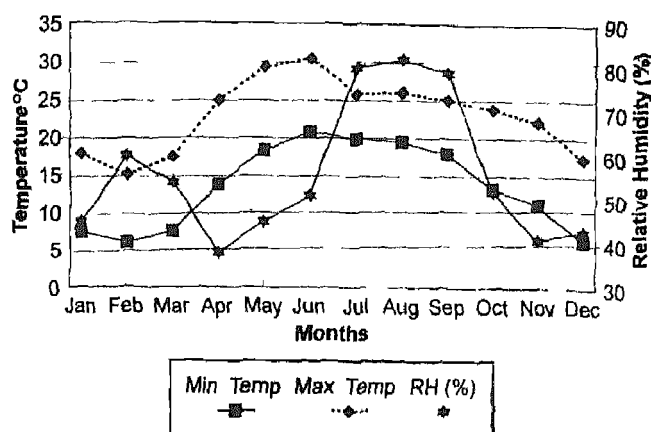


Fig. 2. Meteorological data of Palampur.

Moniezia, *Dictyocaulus*, *Trichuris*, and *Eimeria* in various combinations (Table 1). The prevalence of strongyle infection was very high throughout the study but the intensity in EPG and composition of major contributors for EPG was different in different seasons. The major proportion of larvae were species of *Strongyloides*, *Trichostrongylus*, *Haemonchus* and *Oesophagostomum* besides *Bunostomum* and *Chabertia* occasionally. The overall mean monthly EPG ranged from 236 to 3400 in sheep and 325 to 5908 in goats with a high peak during June to August (Fig. 1) mainly because of species of *Strongyloides*, *Trichostrongylus*, *Haemonchus* and *Oesophagostomum* were observed throughout the study period. The difference in overall mean strongyle egg counts between sheep and goats was not significant. *Trichuris* infection was found in 17% and *Dictyocaulus* in 13% of the animals. The meteorological data (relative humidity, minimum and maximum temperature) of the study area are shown in Fig. 2.

DISCUSSION

Occurrence and seasonal prevalence of various GI nematodes were reported from Himachal Pradesh, but hardly any attention on nematodes and the intensity of infection (Krishna *et al.* 1989, Jithendran 1996, Jithendran and Bhat 1996). Dhar and Dash (1982) reported a high prevalence of strongyle nematodes with an EPG ranging from 100 to 10 600 in sheep flocks of government and private ownership in Himachal

Pradesh. Dhar *et al.* (1982) reported prevalence of GI nematode infection in sheep from Kashmir valley with similar agroclimate. Infection with *Trichostrongylus*, *Bunostomum* and *Chabertia* was observed as the most important followed by *Haemonchus*, *Trichuris*, *Nematodirus* and *Skrjabinema*. The adult animals showed a low EPG with slight rise in March-April while the lambs showed low EPG up to May followed by a rise with its peak in September. The present study also showed a similar trend with a small peak in the spring (March-April) and high peak in monsoon and post-monsoon seasons (July-September). During the dry winter of November-February, there was a sharp decline. The egg count data revealed that July-September had high risk of GI nematodosis and pasture contamination. The monsoon starting by the middle of the June might be making the environment favourable for the development and survival of prepatent stages leading to increased availability of infective larvae in pasture.

Outbreaks of parasite induced mortality occurred mainly in spring and autumn seasons in these migratory flocks and many such outbreaks remain unnoticed due to the grazing of flocks in far-flung areas of Lahaul-Spiti, Chamba and Kangra districts. Non-synchronized breeding also poses problem due to exposure of young animals to heavy infection before they reach the lower plains resulting in seasonal outbreaks of various helminthic diseases. Such outbreaks of diseases have been diagnosed in 1986 because of amphistomosis in sheep and goats at Chamba, in 1987, due to verminous pneumonia in goats in Hamirpur and recently in 1996 due to lung worms (*Dictyocaulus* and *Protostrongylus*) in sheep and goats at Sirmour and Kinnaur districts.

The present study also indicates that under normal conditions the animals do possess a certain degree of GI parasitism without any clinical symptoms but worm burden reaches to pathogenic level during monsoon and post-monsoon seasons. Therefore strategic treatment seems to be the option available for the control of GI nematodes. Further studies on epizootiology of GI nematodes in high alpine pastures, larval bionomics and pasture burden are needed.

ACKNOWLEDGEMENTS

The author is thankful to the Scientist Incharge for encouragement. The technical support of (late) Shri Murli Ram is also acknowledged.

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