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## Prevalence of gastrointestinal parasites of small ruminants in and around Shivamogga and assessment of their risk factors

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### Abstract

The study was carried out for a period of two years from October 2015 to September 2017 with an objective of studying the prevalence and seasonal variation of gastrointestinal (GI) parasites in small ruminants. A total of 1120 faecal samples which includes sheep (620) and goats (500) in and around Shivamogga - a malnad region of Karnataka were screened by direct, sedimentation and flotation methods. Among 1120 samples screened, 67.23% animals were found positive for GI parasitic infections. Upon coprological examination, the different GI parasites recorded were Strongyle spp, *Eimeria* spp, *Trichuris* spp, Amphistome spp, *Fasciola* spp, *Moniezia* spp and mixed GI parasites. Statistically, there was not much significant difference observed between the GI parasitic infection level in sheep (69.35%) and goats (64.60%). However, statistically there was a significant higher prevalence of GI parasitic infection of 83.02% in sheep and 76.74% in Goats were recorded in south west monsoon (rainy) season compared to other seasons. The higher prevalence rate of 81.65% in sheep and 75% in goats were observed in young ones up to 6 months of age than those of more than 6 months age. Among sex wise prevalence of GI parasitic infections, females showed higher prevalence of 79.82% in sheep and 72.75% in goats compared to their male counterparts.

**Keywords:** prevalence, GI parasites, sheep, goat, Shimoga

### Introduction

Rearing of small ruminants like sheep and goats play an important role in the rural [economy](#) in India. Both the animals have been popularly known as mortgage lifters of India. The sheep population is 65.07 million (5% of world's population) and the goat population is 135.17 million (20% of the global population) as per 2012 census. Goat meat occupies 37% of the total meat produced in the country and goat milk occupies 3.2% of the total milk produced. The production performance of these animals depends upon good health condition and better management. The production of these animals can be affected by poor management practices, improper ration and diseases caused by various pathogens viz. bacteria, viruses, fungi, parasites etc. Parasitic diseases come in the way of profitable production especially gastro intestinal parasites, pose a serious threat due to the loss in production and reproduction, associated morbidity, mortality, cost of treatment and the control measures.

Variable prevalence rate of these parasitic infections have been reported from different states of India as Jammu and Kashmir <sup>[1, 2]</sup>, Maharashtra <sup>[3]</sup>, Meghalaya <sup>[4]</sup>, Rajasthan <sup>[5]</sup> and Uttar Pradesh <sup>[6]</sup>. From the Shivamogga district of Karnataka reports pertaining to prevalence of gastrointestinal parasitic infections are scanty. However, few reports are available from Karnataka <sup>[7-9]</sup>. Hence, the present study was designed to know the different species of gastrointestinal parasites and their prevalence rate in small ruminants in and around Shivamogga, Karnataka.

### Materials and Methods

A carpolological study was conducted between October 2015 to September 2017 for a period of two years in and around Shivamogga, Karnataka to record the prevalence of gastrointestinal parasites of small ruminants. Fresh Faecal samples were collected from 1120 small ruminants (620 sheep and 500 goats) in and around Shivamogga district, Karnataka per rectum or from recently voided faeces by avoiding soil. Then placing faecal samples in ziplock bags and labelled properly. The age, sex and season of collection were recorded. In the laboratory, faecal samples were examined for detection of gastrointestinal parasitic eggs, ova or oocysts

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using standard procedures of direct smear, floatation and sedimentation methods. Identification of ova, oocysts, of gastrointestinal parasites was done on the basis of morphological features [10, 11].

## Results

The examination of faecal samples revealed that among the 1120 samples from small ruminants (both sheep and goat) examined, 753 samples found positive for gastro intestinal parasitic infection with an overall prevalence of 67.23% (Table.1). However, the prevalence of gastro intestinal parasitic infection tended to be higher in sheep 69.35% (430 out of 620 Sheep) compared to goats 64.60% (323 out of 500 Goats). Out of 620 sheep faecal samples screened, 430 (69.32%) were found positive for GI parasites. The study revealed that, 108 (25.11%) sheep had only Strongyle eggs, 50 (11.62%) sheep had *Eimeria* spp, 15 (3.48%) sheep had *Trichuris* spp., 20 (04.65%) sheep had amphistomes, 07 (01.62%) sheep had *Fasciola* spp., and 05 (01.17%) sheep had *Moniezia* spp., infection; whereas mixed GI parasitic infection was found in 225 (53.96%) sheep. However, during summer infection was moderate in both goat and sheep flocks (52.32%).

Out of 500 goat faecal samples screened, 323 (64.60%) were found positive for GI parasites. The study revealed that, 92 (28.48%) goats had only strongyles, 57 (17.64%) goats had

*Eimeria* spp., 31 (09.59%) goats had amphistomes, 14 (04.33%) goats had *Moniezia* spp., and 07 (02.16%) goats had *Trichuris* spp., infection; whereas mixed GI parasitic infection was found in 122 (37.77%) goats.

The season wise infection percentage for different seasons was displayed in Table 2. This study has shown that, more prevalence of GI parasites was seen in south west monsoon (rainy) season (Jun –Sept) compared to all the three seasons in both Sheep and Goats. During rainy season drinking water and fodder of small ruminants gets contaminated. Therefore, in rainy season a high prevalence of helminths and protozoan infection is possible.

The age wise prevalence recorded during the present study is tabulated in the Table.3. The higher prevalence of 81.65% GI parasitic infections was observed in young animals of up to 6 months of age and 75% in sheep and goats respectively. However, the animals more than 6 months old showed prevalence of 62.68% and 59.88% in Sheep and Goats respectively.

The sex wise prevalence is displayed in Table. 4. The present study records higher prevalence of GI parasitic infections in females with rate of 79.82% and 72.75% Sheep and Goats. In male counterparts the prevalence of GI parasitic infections were 38.99% (62 out of 159 Sheep) and 42.10% (56 out of 133 Goats) in Sheep and goats respectively.

**Table 1:** Prevalence of GI parasites in small ruminants in & around Shivamogga, Karnataka

Species of Animal	Total No. of samples examined	Number of positive animals							Total positive samples	Prevalence (%)
		<i>Strongyle</i> spp	<i>Eimeria</i> Spp	<i>Trichuris</i> spp	<i>Amphistome</i> spp	<i>Fasciola</i> spp	<i>Moniezia</i> spp	Mixed		
Sheep	620	108	50	15	20	7	5	225	430	69.35%
Goat	500	92	57	7	31	-	14	122	323	64.60%
Total	1120	200	107	22	51	7	19	347	753	67.23%

**Table 2:** Seasonal distribution and Prevalence (%) of GI parasites of small ruminants in & around Shivamogga, Karnataka

Species of animal	Over all Prevalence		Cold weather (Jan &Feb)		Hot weather (Mar-May)		South West Monsoon (Jun-Sep)		North East Monsoon (Oct-Dec)	
	Examined	Positive	Examined	Positive	Examined	Positive	Examined	Positive	Examined	Positive
Sheep	620	430 (69.35%)	85	48 (56.47%)	136	59 (43.38%)	218	181 (83.02%)	181	142 (78.45%)
Goat	500	323 (64.60%)	82	43 (52.43%)	89	43 (48.31%)	172	132 (76.74%)	157	105 (66.87%)

**Table 3:** Age wise prevalence of GI parasites of small ruminants in & around Shivamogga, Karnataka

Age	Sheep			Goats		
	Examined	Positive	Prevalence	Examined	Positive	Prevalence
Upto 6 months	218	178	81.65%	156	117	75%
More than 6 months	402	252	62.68%	344	206	59.88%

**Table 4:** Sex wise prevalence of GI parasites of small ruminants in & around Shivamogga, Karnataka

Age	Sheep			Goats		
	Examined	Positive	Prevalence	Examined	Positive	Prevalence
Male	159	62	38.99%	133	56	42.10%
Female	461	368	79.82%	367	267	72.75%

## Discussion

This present study is in accordance with the report where overall prevalence of 68.75% GI parasites in sheep and goats in and around Mathura [12] and 67.24% prevalence of helminthic infections in sheep and goat flocks of the middle agroclimatic zone of Jammu province [1].

The current study reported the presence of Strongyle, *Eimeria*, *Trichuris*, *Fasciola*, Amphistome and *Moniezia* spp of GI parasites. Among the recorded helminthes, in the present study, the nematodes account the highest followed by

trematodes and the least were cestodes. This finding is in agreement with other studies [13].

Several workers [1, 8, 14-17] have also observed and reported comparatively high prevalence of gastrointestinal parasitic infections in monsoon period.

In the present study the flock wise analysis of GI parasitic infection showed sheep flock was more affected than the goat flock. One of the author [18] reported higher prevalence of GI parasites in sheep (56.95%) in comparison to Goats (37.5%). They have reported high prevalence of GI parasites in young

ones compared to adults, they also stated that female animals have higher prevalence of in comparison to male counterparts. High prevalence in sheep than that of goats among small ruminants was reported [19].

### Conclusion

The study on prevalence and risk factors associated with gastrointestinal (GI) parasites in small ruminants was conducted in and around Shivamogga - a malnad region of Karnataka. Overall prevalence noted was 67.23%, significant difference was not observed between the GI parasitic infection level in sheep and goats. But higher prevalence was observed in rainy season among all seasons, young ones of less than 6 months age among all age groups and females among sex. All these risk factors associated need to be considered while planning control strategies against GI parasites in small ruminants.

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