

Short Communication

Prevalence of nematode parasites in Sheep of Ladakh - India

J. A. Kuchai^{1*}, M. Z. Chishti¹, Manal M. Zaki², Javid Ahmad¹, Muzaffar Rasool¹, S. A. Dar¹ and Hidayatullah Tak¹

¹Department of Zoology, University of Kashmir, Srinagar- 190 021 India.

²Department of Veterinary Hygiene and Management, Cairo University, Giza -12211 Egypt.

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Nematode parasite infections of sheep are a major problem throughout the world and are responsible for economic losses in a variety of ways. In the present study an attempt was made to find out the various nematode parasites and their prevalence infesting the sheep of Ladakh region of Jammu and Kashmir State in India. A total of 313 sheep of either sex and of different age groups belonging to different areas of Ladakh were examined for nematode parasites, out of these 136 (43.45%) were found infected. The study reveals the presence of four species of nematodes viz; *Trichuris ovis*, *Haemonchus contortus*, *Dictyocaulus filaria* and *Chabertia ovina*. It was also observed that among these *T. ovis* was most dominant followed by *H. contortus*, *D. filaria* and *C. ovina*, respectively. Furthermore season, sex, age and agro-ecology show an association with prevalence.

Key words: Sheep, nematode, parasite, prevalence, Ladakh.

INTRODUCTION

Gastrointestinal nematodes have been recognized as a major factor limiting sheep production throughout the world. After a century of research into their biology and control, nematode parasites continue to be an important constraint on sheep production. Modern anthelmintics, together with an understanding of the epidemiology of parasitism, the immune response and nutritional requirements of sheep, currently enable satisfactory management of the problem. However, the increasing incidence of resistance by the parasites to available anthelmintics is challenging task for producers to maintain high levels of productivity in the sheep industry. Novel developments for the management of nematode parasites such as vaccines, biological anthelmintics, genetic markers and selective breeding of sheep may, in the future, provide additional or alternative means of parasite control. However, such alternative control methods are likely to be more dependent on a sound understanding of the species, lifecycle and population dynamics of the parasites involved and the epidemiology of disease they cause than current methods that rely

heavily on broad-spectrum anthelmintics.

MATERIALS AND METHODS

Different parts of the study area were surveyed and a total of 313 gastrointestinal tracts together with heart and lungs of slaughtered sheep were collected randomly for parasitological investigation. The gastrointestinal (GI) tracts were separated anatomically, then each organ was opened separately and its contents and mucosa were washed in water to remove all parasites. The contents of the abomasum and small intestine were washed through a 90 mesh sieve and of the large intestine through a 250 mesh sieve for the collection of mature and immature parasites. Abomasum and small intestines were opened and examined by the naked eye for parasitic nodules put into a digestion solution (Pepsin 5 g, HCl 7ml, distilled water 1000 ml) and incubated at 37°C for 2 h. The fluids were washed by the same way to get a collection of 100 nematodes from each organ. The total content of large intestine was examined in petri dishes under a light microscope. The contents of the large intestine were also examined on a stereomicroscope for larval nematodes. The lungs and trachea were processed for parasite collection. The trachea and bronchi were opened, scrutinized for visible parasites and rinsed in running water over a sieve with 90 mm mesh size. The entire lungs were washed and then cut into about 10 mm cubes and placed in plastic jar with normal saline for further processing (for the collection of microscopic parasites). Every nematode recovered from the contents was cleaned with physiological saline and fixed in hot 70% alcohol. The nematodes

*Corresponding author. E-mail: kuchayjk@gmail.com.

Table 1. Prevalence on the basis of parasite species.

Host	No. examined	No. of positive	<i>T. ovis</i>	<i>H. contortus</i>	<i>D. filaria</i>	<i>C. ovina</i>
Sheep	313	136	43.08%	38.05%	34.09	21.18%

Table 2. Prevalence on the basis of season.

Host	No. examined	No. of positive	Wet season	Age (%)	Dry season	Age (%)
Sheep	313	136	84	61.76	52	38.23

Table 3a. Prevalence on the basis of sex of the host.

Host	No. examined	No. of positive	Males	Age (%)	Females	Age (%)
Sheep	313	136	63	46.32	73	53.67

Table 3b. Prevalence on the basis of age of the host.

Host	No. examined	No. of positive	Young	Age (%)	Adult	Age (%)
Sheep	313	136	70	51.47	66	48.52

Table 4. Prevalence on the basis of agroecology.

Host	No. examined	No. of positive	Kargil (Lowland)	Age (%)	Leh (high-altitude)	Age (%)
Sheep	313	136	78	57.35	58	42.64

were then cleared in lactophenol and identified on the basis of various morphological and morphometric characters (Yamaguti, 1959).

RESULTS AND DISCUSSION

The study showed that the sheep of Ladakh are infected with four species of nematodes viz; *Trichuris ovis*, *Haemonchus contortus*, *Dictyocaulus filaria* and *Chabertia ovina* of which *T. ovis* was the most dominant followed by *H. contortus*, *D. filaria* and *C. ovina* respectively (Table 1). Of the 313 sheep investigated, 136 (43.03%) were found to be infected with one or more parasite species. There was a significant difference in prevalence of parasites with respect to season, where in the prevalence was higher in wet season (61.76%) than in the dry season (38.23%) as shown in Table 2. Similarly the prevalence was higher in females (53.67%) and adults (48.52%) as compared to males (46.32%) and young ones (51.47%) (Table 3a and b). Furthermore the study showed an association between the prevalence and the agroecology of the study area and it was

observed that the infection was higher in Kargil (comparative lowland), (57.35%) as compared to Leh (42.64%) (Table 4). However no significant association was observed in prevalence of parasite and body condition of the host.

This study showed that the overall prevalence of nematode parasites in sheep of Ladakh to be (43.03%). It also disclosed that regardless the season, age, sex, and locality; the animals are infected with a variety of nematode parasites of which *T. ovis* was the most abundant. The higher prevalence in wet season than dry is in consent with many reports around the world (Fritche et al., 1993; Moyo et al., 1996; Tembely et al., 1997; Githigia et al., 2005). This could be due to the existence of a direct relationship between prevalence with the rainfall, humidity and temperature. The presence of sufficient rainfall and moisture during the wet season favoured the survival of infective larvae in the pasture and higher probability of uptake of the infective larvae leading to higher prevalence rate.

The study further revealed that sex of the animals showed an association with the prevalence of the parasites, it was observed that females were more

infected than their counter partners. This could be due to the physiological peculiarities of the female animals, which usually constitute stress factors thus, reducing their immunity to infections, and for being lactating mothers, females happen to be weak/malnourished, as a result of which they are more susceptible to the infections besides some other reasons (Blood and Radostits, 2000).

Similarly, a higher prevalence recorded in younger animals as compared to the adult ones is in agreement with most literatures (Dunn, 1978; Shah-Fischer and Say, 1989; Keyyu, 2003; Nganga et al., 2004) from different corners of world. The reason for which may be the fact that younger animals are more susceptible to infections than adults. Adult animals may acquire immunity to the parasites through frequent challenge and expel the ingested parasite before they establish infection, (Dunn, 1978; Shah-Fischer and Say, 1989).

The study also indicated higher prevalence in Kargil which is comparatively lowland as compared to Leh (high altitudes) which is in consent with reports from many parts of world (Teklye, 1991; Fikru et al., 2006). These low lands are characterized by a comparatively hot humid environmental situation which is favorable for the survival of the infective larval stage of most of the parasites.

Conclusion

Based on the findings of present study it is clear that sheep of Ladakh are infected with a variety of nematode parasites so may be the case with other animals of this region, therefore it seems to be an urgent task to take further steps towards the same field in order to gather more and more knowledge for a better management of helminth parasites which will lead to better production.

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