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# Faecal Examinations of Pashmina Goats (Capra siberica) of Ladakh for Nematode Infections

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*Abstract* - In the present study an attempt was made to find out the various nematodes and their prevalence infesting the pashmina goats of Ladakh through faecal examinations. The eggs collected from these were identified as Haemonchus contortus, Trichuris ovis, Dictyocaulus filaria and Chabertia ovina. Identification was done on the basis of various morphological and morphometric characters (Yamaguti, 1975; Soulsby, 1982). Of the 70 animals examined 22 (31.42%) were found infected with single or multiple parasite species. It was also observed that among these H. contortus 42.15% was most dominant followed by T. ovis (37.46%) D. filaria (32.24%) and C. ovina (18.78%) respectively. The study also revealed a significant difference with respect to season, wherein higher prevalence (40.00%) was observed during the rainy season as compared to the dry season 22.85%. Similarly an association was observed that females were more infected (37.14%) as compared to males (25.71%). Likewise young animals were more infected (34.28%) than the adult ones (28.57%). Similarly an association was observed between prevalence and agro-ecology of the study area where in higher values (32.05%) were recorded for comparatively lowland (Kargil) areas as compared to highland (Leh) areas (30.00%).

Keywords : Pashmina goats, Nematode parasites, Prevalence, Ladakh.

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# Faecal Examinations of Pashmina Goats (*Capra siberica*) of Ladakh for Nematode Infections

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Abstract - In the present study an attempt was made to find out the various nematodes and their prevalence infesting the pashmina goats of Ladakh through faecal examinations. The eggs collected from these were identified as Haemonchus contortus, Trichuris ovis, Dictyocaulus filaria and Chabertia ovina. Identification was done on the basis of various morphological and morphometric characters (Yamaguti, 1975; Soulsby, 1982). Of the 70 animals examined 22 (31.42%) were found infected with single or multiple parasite species. It was also observed that among these H. contortus 42.15% was most dominant followed by T. ovis (37.46%) D. filaria (32.24%) and C. ovina (18.78%) respectively. The study also revealed a significant difference with respect to season, wherein higher prevalence (40.00%) was observed during the rainy season as compared to the dry season 22.85%. Similarly an association was observed between sex and age of the host with prevalence of nematode infections. It was also observed that females were more infected (37.14%) as compared to males (25.71%). Likewise young animals were more infected (34.28%) than the adult ones (28.57%). Similarly an association was observed between prevalence and agroecology of the study area where in higher values (32.05%) were recorded for comparatively lowland (Kargil) areas as compared to highland (Leh) areas (30.00%). The study also show slight relationship between body condition and prevalence wherein the intensity of infection was higher (31.11%) in weak animals as compared to healthy ones (32.00%). Hence, it was concluded that the pashmina goats of Ladakh are infested by four species of nematode parasites or may be more and their prevalence was found varying with respect to season, sex, age, body condition and agro-ecology. This is for the first time that survey on nematode parasites in pashmina goats of this region have been taken into consideration.

*Keywords : Pashmina goats, Nematode parasites, Prevalence, Ladakh.* 

## I. INTRODUCTION

aecal examination is one of the important diagnostic tools for detection of helminth infections in all the animals especially in wild animals and in animals who are not being slaughtered, and also in areas where slaughtering is banned. Pashmina goats play an important role in economy throughout the world and satisfy a number of needs of mankind in different ways, a large section of people is directly or indirectly dependent on them so is the case with the people of Ladakh where rearing of domestic

animals including Pashmina goats is one of the most important activity for ensuring livelihood for these resource poor people. The wool of these animals is very costly and very suitable to the environmental conditions of this region therefore these animals are reared by the people of this reagion in large numbers. However, unfortunately the production of these animals is being reduced by a number of factors and one among them has been recognized as helminth parasitism. These are responsible for a number of economic losses in a variety of ways as: losses through lower fertility, reduced work capacity, involuntary culling, a reduction in food intake. lower weight gains, milk and meat production, treatment costs and mortality in heavily parasitized animals (Carmichael, 1972; Akerejola et al., 1979). After a century of research into their biology and control, nematode parasites continue to be an important constraint on goat production. Modern anthelmintics, together with an understanding of the epidemiology of parasitism, the immune response and nutritional requirements of goats, 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 goat industry. Novel developments for the management of nematode parasites such as vaccines, biological anthelmintics, genetic markers and selective breeding of goats 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.

## II. MATERIALS AND METHODS

A systematic survey of various farm houses, pastures and local houses was carried by visiting them at regular intervals during the study. The faecal samples for detection of infection were mostly collected directly from the rectum of the host or fresh samples were collected from the pasture in the collection tubes containing 10% formalin. The samples were examined by direct smear and concentration (floatation and sedimentation) methods for the presence of nematode parasite eggs. The counting of eggs was performed by

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McMaster egg counting technique (Urquhart *et al.*, 1966). Identification was done on the basis of various morphological and morphometric characters (Yamaguti, 1975; Soulsby, 1982). To record the prevalence age, sex, body condition of the animals was noted so was the case with locality and season of the study area. The number of total and infected animals was also recorded.

#### III. Results

The results of the present study show that the Pashmina goats of Ladakh shares the same nematode parasitic infections as those of the common goats and sheep of this region but comparatively with low intensity and prevalence. During the study a total of four species viz; *Haemonchus contortus, Trichuris ovis, Dictyocaulus filaria and Chabertia ovina* have been recovered from the host species of which *H. contortus* (42.15%) was the most prevalent followed by *T. ovis* 37.46% *D. filaria* 32.24% and *C. ovina* 18.78% respectively Table 1.1 while as in case of common goats and sheep of this region. Of the 70 hosts investigated, 22 (31.42%) were found to be infected with one or more parasite species. Most of the cases were reported with a multiple type infection it was also observed that the prevalence of

Dictyocaulus filaria was increasing with a decrease in temperature, while as the case was reverse with that of H. contortus. There was a significant difference in prevalence of parasites with respect to season, where in the prevalence was higher in wet season (40.00%) than in the dry season (22.85%) Table 1.2. Similarly the prevalence was higher in females (37.14%) and young animals (34.28%), as compared to males (25.71%) and adult ones (28.57%) Table 1.3 and 1.4. Also the study show an association between the prevalence and agroecology of the study area wherein the infection rate was higher in comparatively lowland areas (Kargil), (32.05%) as compared to high-altitude (Leh), (30.00%) Table 1.5. Furthermore an association was observed in prevalence of parasite and body condition of the host, weak animals were found slightly more infected (32.00%) as compared to the healthy ones (31.11%) Table 1.6. It was also observed that the animals infected with H. contortus and D. filaria or with one of the either species especially with the later one were much more affected as compared to the other two species so far as the health status is concerned. The animals infected with D. filaria were easily diagnosed showing the symptoms of cough, nasal discharge, weight loss, drowsiness, etc.

Table 1.1 : Prevalence on the basis of parasite species						
Host	No. Examined	No. Positive	H. contortus	T. ovis	D. filaria	C. ovina
P. Goats	70	22 (31.42%)	42.15%	37.46%	32.24%	18.78%
Table 1.2 : Prevalence on the basis of Season						
Host	No. Examined	Total No. Positive	Wet Season	% age	Dry Season	%age
P. Goats	70	22	14/35	40.00	08/35	22.85
Table 1.3 : Prevalence on the basis of Sex of the host						
Host	Total No. Examined	Total No. Positive	Males	%age	Females	%age
P. Goats	70	22	09/35	25.71	13/35	37.14
Table 1.4 : Prevalence on the basis of Age of the host						
Host	Total No.	Total No. Positive	Young	%age	Adult	%age
	Examined					
P. Goats	70	22	12/35	34.28	10/35	28.57
Table 1.5 . Prevalence on the basis of Agro-ecology						
Host	Total No.	Total No. Positive	Kargil	%age	Leh (high-	%age
	Examined		(Lowland)		altitude)	
P. Goats	70	22	13/40	32.05	09/30	30.00
Table 1.6 . Prevalence on the basis of body conditions of the host						
Host	Total No.	Total No. Positive	Healthy	%age	Weak	%age
	Examined					
P. Goats	70	22	14/45	31.11	08/25	32.00

(P= Pashmina; No= Number)

#### IV. DISCUSSION

This study revealed that pashmina goats of Ladakh are infected with the same parasite species as have been reported from those of the sheep and common goats of this region (Kuchai *et al.*, 2011) as well as from the other two regions of the same state (J&K), (Bali, 1976; Chishti, 1986). The possible reason

for the presence of the same species of nenatode parasites in all these animals could be because they share some common grazing, drinking and sheltering areas and therefore the possibility of picking the same eggs from ground along with grass, food, water, etc are also same. However the occurrence of comparatively low prevalence rate in pashmina goats from those of the other small ruminants could be that most of the samples

were collected from farm houses where these animals are dewormed regularly and properly, also these animals are reared more carefully even by the farmers because of their wool production which is very costly. Another possible reason could be the sampling error. The higher prevalence of *H. contortus* as compared to the other three species could be that it is more resistant to antihelmintics as well as to the environmental hazards. The significantly higher prevalence in wet season than that of the dry season is in consent with many reports around the world. (Tembelv et al., 1997: Moyo et al., 1996; Fritche et al., 1993; Githigia et al., 2005). This could be due to the existence of a direct relationship between prevalence with rainfall, humidity and temperature. The presence of sufficient rainfall and moisture during wet season favored the survival of infective larvae in pasture and higher probability of uptake of the infective larvae leading to higher prevalence rate Sissay et al., 2007. Similarly the higher prevalence recorded in younger animals as compared to the adult ones is in agreement with most literatures Dunn, 1978, Shah-Fischer and Sav, 1989, Kivvu, 2003, Nwosu et al., 1996, Nganga et al., 2004, from different corners of the world. This could be due to the fact that younger animals are more susceptible to infections than adults. Adult animals may acquire immunity to parasites through frequent challenge and expel the ingested parasites before they establish infectuion; (Dunn, 1978, Shah-Fischer and Say, 1989). The study further revealed that sex of animals show an association with the prevalence of the parasites, the higher prevalence in females than their counter partners could be due to some physiological peculiarities of the female animals, which usually constitute stress factors thus, reducing their immunity to infections, also females happen to be lactating which leads to weakness/ malnutrition as a result of which females are not able to fight against infections to the same extent as those of males (Blood and Radostists, 2000; Kuchai, et al., 2011). The possible reason for slightly higher prevalence in weak animals of the host species could be that these animals usually have a comparatively weak immune system which does not fight with the infections to the same extent as that of a healthy animal's immune system Kuchai et al., 2011. The reason for higher prevalence in lowland areas (Kargil), as compared to high altitude (Leh) could be that these agro-ecological zones are characterized by a hot humid environmental situation that is favorable for the survival of intermediate and infective stages of most of the parasites (Teklye, 1991, Fikru et al., 2006).

# V. ACKNOWLEDGEMENT

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# VI. CONCLUSION

The present study show that it is beyond the doubt that the pashmina goats of Ladakh make no exception from those of other ruminants so far as helminth infections is concerned which could be responsible for economic losses in a variety of ways, therefore efforts should be made to control helminthiasis which requires a detailed knowledge of these parasites and it is believed that the present study will provide some help for the same. The study also show that season, sex, age and geographical location appear to be the major limiting factors for the prevalence of nematode parasite infections.

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