

Prevalence of Trematode Parasitic Infestation in Yak of Ladakh (*Bos grunniens*)

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Abstract: The present study is a part of the helminthological survey was carried out on ruminants of Ladakh during (Oct.2007 - Sep.2008). During the study an attempt was made to find out various trematode parasites along with their prevalence infesting the yak of Ladakh (*Bos grunniens*). A total of 33 faecal samples of yaks belonging to different age groups and of either sex (including 19 wild and 14 domesticated) were collected randomly from different localities of the study area and were examined for the presence of helminthic infections. Of the 19 and 14 samples of wild and domesticated yaks examined 9 (47.36%) and 6 (42.85%) were found positive respectively with an overall prevalence of 15/33 (45.45%). It was observed that the intensity of infection was higher in wild as compared to domesticated animals. The prevalence of these parasites was found varying with respect to various factors, viz; season, age, and sex. Of these the most important factor responsible for overall prevalence of helminth parasites in the both host species (wild and domesticated) was climate. During rainy season the prevalence was higher 9/19 (47.36%) as compared to the dry season 6/14 (42.85%). The study also revealed a difference in prevalence with respect to the age of the host. The animals <3 years were more infected 5/10 (50.00%) as compared to those who were above three years and below ten years 4/12 (33.33%). The prevalence of infection was found again increasing 6/11 (54.54%) with respect to the increasing age. The eggs collected from the samples were identified as *Fasciola gigantica*, *Fasciola hepatica*, *Paramphistomum cervi* and *Dicrocoelium dendriticum*. Identification of eggs was done on the basis of various morphological and morphometric characters.

Keywords: Ladakh, prevalence, trematodes, yak

INTRODUCTION

Ruminants like cattle, sheep, goats, pashmina goats, yaks and in some areas buffaloes are the dominant group of livestock in Ladakh, generating substantial revenue and providing employment, animal protein for human consumption (milk and meat), fuel, manure and in some places, alternative means of traction and transportation. The cold climate, the alpine pastures, the perennial streams and demand for meat, wool, milk and milk products, manure and fuel, all favor the keeping of cattle, sheep and goats in the region. In addition to cattle, sheep, goats, and buffaloes yak is being reared by the people of this region at a large scale as in addition to the various similar importances as those of other ruminants it is a good means of transportation especially in areas where there is no any other alternative. Rearing of yak is an important economic activity and constitutes back bone of the people of Ladakh. They play a vital role in the agricultural and rural economies of Ladakh. Not only do they produce food directly, they also provide key inputs to crop agriculture. For many small farmers, they are the major ready source of cash to buy inputs

for crop production - seeds, fertilizers and pesticides. Most farmers in Ladakh are too poor to justify owning or using a tractor, for ploughing fields to make it ready for crop cultivation and the alternative is animal power. Their income also goes towards buying things the farmers cannot make for themselves including paying for school fees, medicine and taxes. In contrast, small stock, with their high rates of reproduction and growth, can provide a regular source of income from sale of milk and milk products like butter and cheese, hides, wool, etc. Therefore, it is evident that ruminants are very much important for the people of Ladakh in various ways, but unfortunately their health status and productivity, and hence their ability to fulfill this multipurpose function, are generally suboptimal largely due to disease. Helminthiasis has been found as one of the causes of the production losses, which arise primarily through severe weight loss, poor meat, milk and wool production, carcass and offal condemnation and impaired reproductive performance, etc (Akerejola *et al.*, 1979 and Carmichael, 1972). Although, a little work has been done on other ruminants of Ladakh, as for example Dhar and Sharma (1979), Zahida (1992) but no work has been done on this important animal. Therefore, it was found necessary to carry out helminthological studies on yak of Ladakh in order to provide more

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information for various controlling strategies to get rid of this problem for a better production which will fulfill the needs of these resource poor people, as well as to provide a more detailed data to the researchers and interested persons of this field.

MATERIALS AND METHODS

A systematic survey of various farm houses, pastures, local houses and wild areas of Ladakh 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 tubes were labeled properly in abbreviated form containing all the necessary information like date, sex, age, locality etc. The samples were examined by direct smear and concentration (floatation and sedimentation) methods for the presence of helminth parasite eggs (Urquhart *et al.*, 1966). Identification was done on the basis of various morphological and morphometric characters (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. The climatological data was provided by government Metrological Department, District Leh. The age of each animal was determined by dental inspection, where by animals having temporary incisors (milk teeth) were classified as young, and those with permanent incisors were recorded as adults (Kuchai, *et al.*, 2011a).

RESULTS AND DISCUSSION

In the present study a total of four trematode parasite species *Fasciola gigantica*, *Fasciola hepatica*, *Paramphistomum cervi* and *Dicrocoelium dendriticum* were recovered from the faeces of yak of Ladakh. Of these *Fasciola gigantica* (38.45%) was the most prevalent followed by *Fasciola hepatica*, (35.42%) *Paramphistomum cervi* (31.08) and *Dicrocoelium dendriticum* (27.64%), respectively. However, among these the intensity of *P. cervi* was the highest followed by *F. gigantica*, *F. hepatica*, and *D. dendriticum*, respectively. The possible reason for comparatively higher prevalence of *F. gigantica* and *F. hepatica* could be because these parasite species are most common, ubiquitous and infest almost all ruminant species, however the reason for high intensity of *P. cervi* could be its size as the parasite is comparatively small in size compared to *F. hepatica* and *F. gigantica*. There is less competition for space and it lives at a site which is rich in food therefore there is less competition of food which leads to the better growth and reproduction rate of the parasite and hence results in an increased intensity. Further more, the study also revealed that the wild animals

09/19 (47.36%) were more infected as compared to the domesticated 06/14 (42.85%). The possible reason for which could be that these wild animals are not dewormed like those of domesticated ones (Ray, 1996), also the number of wild animals examined were comparatively more than those of the domestic ones. However, the presence of the same species of trematode parasites in all these animals may be due to the fact that 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.

The study also revealed that the infection rate was higher in rainy season 9/19(47.36%) than the dry season 6/14(42.85%).The higher prevalence in wet season is in consent with many reports around the world, (Tembely *et al.*, 1997; Moyo *et al.*, 1996; Fritche *et al.*, 1993; Githigia *et al.*, 2005). This could be due to existence of a direct relationship between prevalence with rainfall, humidity and temperature. The presence of sufficient rainfall and moisture during wet season favor the survival of infective larvae in pasture and higher probability of uptake of the infective larvae leading to higher prevalence rate. Further more it was also observed during the study that the age of the host plays an important role in the prevalence of helminth parasite. It was observed that the animals below three years were more infected 5/10 (50.00%) than the animals that were above three years and below ten years 4/12(33.33), after which the prevalence was found again higher 6/11 (54.54%) with respect to the increasing age. This finding is in agreement with Olusi, 1996, Kiyuu, 2003, Nganga *et al.*, 2004, from different corners of the world. The reason could be the fact that animals below three years and above ten years are more susceptible to infections than middle age (3-10 years). These animals may acquire immunity to the parasites through frequent challenge and expel the ingested parasite before they establish infection. Also the immune system of animals below three is comparatively weak than those of the middle aged and also the immunity decreases after attaining adult age (Nwosu *et al.*, 1996; Kuchai, *et al.*, 2011b).

CONCLUSION

The yak of Ladakh both wild and domestic made no exception regarding helminth infection as is the case with other ruminants of this region. Steps must be taken to gather more knowledge regarding trematodes for a better control.

ACKNOWLEDGEMENT

The authors would like to thank the staff members of animal husbandry, farm houses, and local people of Ladakh for providing their assistance during the study.

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