



Gastrointestinal parasites of yaks from Katao Valley in North Sikkim, India

PAPRI PAL¹, L R CHATLOD² and R K AVASTHE³

ICAR Research Complex for NEH Region, Sikkim Centre, Gangtok, Sikkim 737 102 India

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Yak (*Poephagus grunniens*) farming is an important source of livelihood for various pastoral tribes in the alpine dry area of North Sikkim. The incidence of many of the common diseases of cattle is reported in yaks (Shrestha 2013). Information on the prevalence of gastrointestinal helminth infection of yaks is very limited. Some studies have reported on the incidence of parasitic infections in domesticated yaks in Sikkim (Bandyopadhyay *et al.* 2010, Rahman *et al.* 2010, Pal *et al.* 2013) and Arunachal Pradesh (Bam *et al.* 2012, Goswami *et al.* 2013). The aim of this work is to contribute to the knowledge of gastrointestinal parasites of yaks from Katao valley, North Sikkim, India, which would provide useful information of GI parasites and might help in effective deworming schedule, treatment and developing control strategies.

Faecal samples of 377 yaks of both sexes and different ages were collected from organized and traditionally managed herds and subjected to qualitative and quantitative examinations of gastrointestinal parasites (Soulsby 1982) and the parasites were identified by examining the eggs and culturing for larvae (Soulsby 1982).

Overall prevalence was 15.38% with 11.14% multiple and 4.24% single parasitic infections (Table 2). The prevalence of the different gastrointestinal parasitic infections of the yak showed that *Haemonchus* spp. infection was the most common in yaks (7.43%) followed by *Dicrocoelium* spp. (2.39%), *Nematodirus* spp. (2.12%), *Cooperia* spp. (1.59%), *Ascaroid* spp. (0.79%), *Strongyloides* spp. (0.53%) and *Moniezia* spp. (0.53%). These results were in accordance with the findings of Rahman *et al.* (2010), Bam *et al.* (2012), Goswami *et al.* (2013) and Pal *et al.* (2013) who had also reported the presence of different parasites in yaks. The presence of *Dicrocoelium dendriticum*, *Eurytrema pancreaticum*, *Ogmocotyle indica*, *Fasciola gigantica*, *F. hepatica* and *Paramphistomum cervi* in yak was also reported by Ansari *et al.* (1989) and Kuchai *et al.* (2010). Due to the differences in rearing animals in both farming situations, the prevalence of infection was less in organized farm (10.77%) than it

was in animals that were traditionally managed farm (16.35%). The higher prevalence may be due to favourable agroclimatic conditions, constant exposure of infestation and availability of infective stage larvae on the grazing ground by animals (Byanju *et al.* 2011, Pal *et al.* 2013, Shrestha 2013). Furthermore, sufficient rainfall and moisture during summer favour the survival of infective larvae in pasture and higher probability of uptake of the infective larvae leading to higher prevalence rate (Kuchai *et al.* 2010). Wangdi (1996) reported 19 and 37% prevalence of *Strongyle* spp. for adult and calves yak respectively; and 2% prevalence of each *Coccidia* spp. and *Trichuris* spp. in Bhutan. The grazing patterns of yak in the organized farms and traditionally managed farms were quite different. In traditionally managed farms reared by nomadic tribes, the animals were allowed to graze in the communal pasture at an altitude of less than 4000 feet during the winter. So the chances of getting the infection are more in these animals when compared with organized farms where the animals were allowed to graze within the farm managed grazing lands.

Animals below 5 months of age were found more infected (18.37%) than the animals above 5 months and below 2 years of age (16.52%) and lowest in those of above 2 years of age (14.01%). This finding was in agreement with Kuchai *et al.* (2010), Rahman *et al.* (2010), Pal *et al.* (2013) from different places of India. The reason could be the facts that animals below 5 months were more susceptible to infections than above 2 year of age groups. These animals may acquire immunity to the parasites through frequent challenge and expel the ingested parasite before they establish infection (Kuchai *et al.* 2010). This study revealed a relatively higher prevalence in females (16.55%) than males (11.11%). The higher percentage of infection in the females may be due to the alteration in the physiological condition of the animals during pregnancy and lactation (production activity) and also the lack of feed supplement for production, which may lead to the lowering of body resistance of the female.

The data generated in this study indicated that under prevailing agroclimatic conditions of Sikkim, prevalence of gastrointestinal parasites is slightly high among yaks. However, the EPG estimated in this study indicated the level

Present address: ¹Research Associate (drpapripa1@rediffmail.com), ²Scientist (chatlodlaxman@rediffmail.com), ³Joint Director (jdsikkim.icar@gmail.com).

Table 1. Prevalence of gastrointestinal parasitic infection in yaks in the alpine dry area of North Sikkim, India

Locality	Number of faecal samples examined	Number of animals infected	Percentage of infection	EPG range	Parasitic		Trematode	Cestodes		Nematodes				
					Single parasitic infection	Multiple parasitic infection		<i>Dicrocoelium</i> spp.	<i>Moniezia</i> spp.	Strongyle spp.	<i>Nematodirus</i> spp.	<i>Cooperia</i> spp.	<i>Strongyloides</i> spp.	<i>Ascaroid</i> spp.
Organized farm	65	7	10.77	100–200	2(3.08)	5 (7.69)	1 (1.54)	0 (0.00)	0 (0.00)	3 (4.62)	2 (3.08)	1 (1.54)	0 (0.00)	0 (0.00)
Traditionally managed farm	312	51	16.35	100–400	14 (4.49)	37 (11.86)	8 (2.56)	2 (0.64)	2 (0.64)	25 (8.01)	6 (1.92)	5 (1.61)	2 (0.64)	3 (0.96)
Total	377	58	15.38	100–400	16 (4.24)	42 (11.14)	9 (2.39)	2 (0.53)	2 (0.53)	28 (7.43)	8 (2.12)	6 (1.59)	2 (0.53)	3 (0.79)

of subclinical infections in the host species and may be helpful in planning chemotherapeutic and prophylactic strategies for yaks from an area studied and also of the regions with similar climatic conditions.

SUMMARY

Faecal samples (377) of yaks belonging to different age groups and of either sex were collected from November 2010 to October 2011 and examined for the presence of helminthic infections through coproscopy. The occurrence of gastrointestinal parasitic infection was recorded at 15.38% in both the organized and traditionally managed farms of yaks. The status of infection was either single (4.24%) or mixed (11.14.%) with a faecal egg count range of 100–400 eggs / gram of faeces in positive animals. *Haemonchus* spp. infection was predominant (7.43%) followed by *Dicrocoelium* spp. (2.39%), *Nematodirus* spp. (2.12%), *Cooperia* spp. (1.59%), *Ascaroid* spp (0.79%), *Strongyloides* spp (0.53%) and *Moniezia* spp. (0.53%). The rate of infestation was higher in calves and parasites mostly recorded were *Haemonchus* spp., *Ascaroid* spp. and *Eimeria* spp. The females were found more (16.55%) susceptible to gastrointestinal parasitic infections than the males (11.11%).

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