

Prevalence of *Trichuris* spp. in small ruminants slaughtered in Srinagar District (J&K)

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Abstract The present study aims to determine the age-wise, sex-wise and month-wise prevalence along with seasonal fluctuations of *Trichuris* spp. in ovines and caprines slaughtered during a 12 month period in local abattoirs in Srinagar region from August 2011 to July 2012. Adult parasites were identified on the basis of morphological characters (Soulsby [Helminths, arthropods and protozoa of domesticated animals, CLBS and Bailliere Tinda, London, 1982](#)). The highest prevalence (66.6 %) was in the month of Jan, 2012 whereas prevalence was lowest in the month of August 2011. *Trichuris* count in ovines increased in autumn (42.02 %), reached maximum levels in winter (59.37), and then tended to decline until spring (53.22 %) and reached minimum levels in summer (30.6 %), before increasing again in mid-autumn. Thus with respect to climatic conditions of area from which exotic ovines were imported, *Trichuris* prevalence was more prevalent in dry season (55.5 %) than in wet season (36.36 %). Moreover, an association was observed between sex and age of the host with prevalence of *Trichuris* infection. Of the representative examined samples, *Trichuris* infection was 44.07 % in female host comparative to 38.07 % infection in males ($p > 0.05$). Likewise young animals were more infected (53.8 %) than the adult ones (32.9 %) and kids (37.5 %). Moreover, *Trichuris* spp. were more prevalent in goats than in sheep ($p < 0.05$). Hence, it was concluded that prevalence of *Trichuris* spp. infecting ovines varied with respect to season, age and sex.

Keywords *Trichuris* · Ovines · Caprine · Prevalence · Age and sex

Introduction

Gastrointestinal parasite infections are a world-wide problem for both small- and large-scale farmers due to the availability of a wide range of agro-ecological factors suitable for diversified hosts and parasite species. Economical losses are caused by gastrointestinal parasites in a variety of ways; they cause losses through lowered fertility, reduced work capacity, a reduction in food intake and lower weight gains, treatment cost and mortality in heavy parasitized animals. The host-parasites relationships in case of Nematode parasites result into large scale damage at the site of attachment consequently economical loss (Padwal et al. 2011). Small ruminant helminthiasis is found to be an important problem and Trichuriasis is among one such problem caused by *Trichuris* spp. *Trichuris* spp. prefer the caecum and the first section of the colon up to the beginning of the disk-like section (Rehbein et al. 1997). The present paper deals with studying the seasonal and age wise prevalence of *Trichuris* spp. Seasonal prevalence of spp. is done to find the time at which infections with infective larvae begin, rise to a peak and decline, so that the treatment can be timed to prevent development of serious infection. Age wise prevalence has been carried out so as to determine which age group is more prone to *Trichuris* spp. and the one with least susceptibility.

Materials and methods

Study area

The study was conducted at local abattoirs in Srinagar district situated in the centre of Kashmir Valley—state of India, from September 2011 to August 2012.

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Study animals

The study was done on various breeds of sheep imported to Jammu and Kashmir State from outside state. The various breeds examined were Marwadi, Jaiselmeri, Desi, Bak-erwali and Bawalpuri. The animals were 1 to above 4 years age from both sexes. A total of 270 caeca were examined for adult parasites.

Postmortem worm recovery

The intestines were examined carefully from the parietal surface to detect the gross pathological changes caused by *Trichuris* spp., if any. Then the intestine was cut along the log axis with the help of scissors and the internal mucus membranes were also thoroughly examined. Parasites were collected according to the procedures by Urquhart et al. The recovered worms were washed several times in normal saline, and then preserved in 70 % alcohol. The nematodes were then cleared in lactophenol, identified under the microscope with reference to the literature (Soulsby 1986) and then kept in nematode storing solution.

Report recording

Age of animals was recorded prior to slaughtering of animal. Age of small ruminants was categorized into: 2–12 months (**kids**), 12–24 month (**young**) and above 2 years (**Adults**). Seasonal prevalence was studied throughout the year dividing into four seasons: winter (Dec–Feb.), spring (March–May), summer (June–July) and autumn (Sep–Oct).

Parasitological data

The data recorded during this study included the following:

- Month-wise prevalence of *Trichuris* spp.
- Season-wise prevalence of *Trichuris* spp.
- Age-wise prevalence of *Trichuris* spp.
- Sex-wise prevalence of *Trichuris* spp.

Data analysis

Prevalence of *Trichuris* spp. was calculated as number of individuals of a host species infected with *Trichuris* species/number of host examined. Chi square test was employed to examine the effect of season, age and sex of the host on the level of parasitism.

Results and discussion

Monthwise prevalence of *Trichuris* spp.

Out of representative 270 caeca, 116 were infected with *Trichuris* spp. accounting to overall prevalence of 42.96 % in exotic breeds of Ovines. The current findings are in close association to reports of Lone et al. (2011). Highest prevalence was recorded during the month of January 2012 (66.6 %) whereas lowest prevalence was recorded in the month of Aug 2012 (20 %). However, parasitic abundance showed inverse association to prevalence (Fig. 1).

Seasonal prevalence of *Trichuris* spp.

The seasonal dynamics of nematode infection are the consequence of complex inter-relationships between the sheep, their husbandry and the prevailing climate (Viassof et al. 2001). In the present study, highest prevalence was during winter month i.e., 59.37 % and least in summer i.e., 30.6 % ($p = 0.009$) which was in accordance to findings of Saha et al. (1996). High incidence of parasitic infection during winter could be attributed to suitable climatic conditions and the availability of food i.e. pastures during their development (Padwal et al. 2011). Umur (2005) reported that the late high wave of infection, occurring in winter, may have derived from eggs deposited by young and mature sheep grazing on pasture in late October and September months (Table 1).

Sexwise prevalence of *Trichuris* spp.

In present investigations, females show high prevalence (44.07 %) in comparison to males (38.9 %), however statistically insignificant ($p > 0.05$) which could be probably because of sampling error. Our findings are in accordance to (Asanji and Williams 1987; Pal and Qayyum 1992; Patel et al. 2001; Raza et al. 2007; Saiful Islam KBM and Taimur MJFA 2008). High prevalence in females could be due to the physiological peculiarities. Above factors constitute stress factors thus, reducing their immunity to infections, and for being lactating mothers, females happen to be weak, as a result of which they are more susceptible to the infections besides some other reasons (Kuchai et al. 2011; Blood and Radostits 2000).

Agewise prevalence of *Trichuris* spp.

Moreover, young animals showed high parasitic prevalence (53.8 %) as compared to adults (32.9 %). Our results were in close association to report of Islam (1989) that a high occurrence of *Trichuris* spp. was observed in the middle

Fig. 1 Monthwise prevalence and parasitic abundance

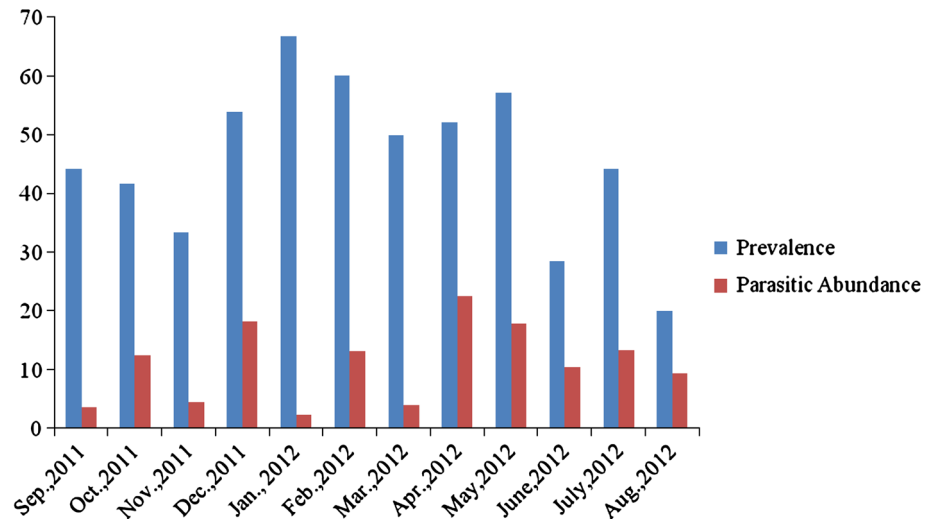


Table 1 Seasonal prevalence *Trichuris* Spp

	No. examined	No. positive	Prevalence	Chi square
Spring	62	33	53.22	11.629 ($p = 0.009$)
Summer	88	27	30.6	
Autumn	88	37	42.04	
Winter	32	19	59.375	

aged animals. These findings of the effect of host age on the prevalence of nematode infection is also confirmed by earlier observations carried out in Kashmir on sheep (Tariq et al. 2008). The low level of parasitism reported in adult animals was due to the immunity of the host. Previous infection and age of the host provide effective protection against re-infection (Soulsby 1986). However, the low level of immunity in adults is initially low but increases with the intensity and duration of exposure of infection.

Breedwise prevalence of *Trichuris* spp.

During the study, goats were found more prone to *Trichuris* infection than sheep. It could be assumed that sheep do have a considerably higher immunological response to gastrointestinal parasites compared with that of goats (Urquhart et al. 1996) (Table 2).

Conclusion

Findings in current paper indicate the need of hour to study other epidemiological factors to better understand the knowledge regarding *Trichuris* spp. Moreover, abattoir study should be properly studied so that veterinarians understand importance of checking health status of slaughtered sheep for further meat consumption by human population. Strict policies should be adopted by Govt to have regular checks on slaughtered animals at local

Table 2 Proportion of each category investigated and the associated prevalence

Sex	Examined	Infected	Prevalence	Chi square value
Female	211	93	44.07	$p > 0.05$
Male	59	23	38.9	
Age	Examined	Infected	Prevalence	
2–12 months (kids)	56	21	37.5	11.629 ($p = 0.009$)
12–24 month (young)	117	63	53.8	
Above 2 years (Adults)	97	32	32.9	
Host	Examined	Infected	Prevalence	
Sheep	173	70	40.46 %	4.075 ($p = 0.04$)
Goat	97	49	50.51 %	

abattoirs. To decrease the harmful effects of the parasite, young and adult stock should be pastured separately. Moreover, to get clear epidemiological picture of *Trichuris*, comprehensive study should be launched in the Kashmir where sheep and goats are abundant and practically participating in cash incomes particularly on mandatory eve of Eid-ul-Azha, sources of food to farming communities and play significant role in these sector.

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