

Prevalence and seasonal variation of trichurid worm infections of small ruminants of Mathura, India

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Abstract Despite single handily causing significant deleterious effects on the health and production of small ruminants, trichurid infections are still amongst the underreported diseases in the Indian context. The present study deals with the season wise prevalence of *Trichuris* sp. in small ruminants from Mathura region India. An overall prevalence of 8.73 % in sheep and 13.65 % in goats was found in the instant study. Highest prevalence were recorded in rainy season (11.03 and 16.84 %) followed by summer (8.12 and 13.06 %) and winter season (6.91 and 11.39 %) in sheep and goats, respectively. So far as age wise prevalence is concerned, young sheep and goat (<6 months of age) were found to more affected than their adult (>6 months) counterparts. Again considering the sex wise prevalence rates, female animals were found more affected than male counterparts regardless of both the species. Finally, the contributing factors, trends in variations of parasitism and comparison with available literature has been described. The study has generated some vital data about this under reported parasitic entity.

Keywords Epidemiology · Mathura · Small ruminants · Trichurid infection

Gastrointestinal helminths have a disastrous impact in suppressing the performance, both in terms of production and reproduction, of small ruminants (Jaiswal et al. 2013).

A large group of gastrointestinal helminths impart these deleterious effects, depending upon the prevalence of individual parasitic species in the particular geographical niche. Amongst them, trichurids, despite of being known to cause severe ill effect on animal health, are perhaps the most under reported and under rated helminths. The present study was designed with the aim of studying the prevalence, seasonal and age wise variation of the trichurid infection in small ruminants of Mathura district, India.

Materials and methods

Mathura, lying between the 27°41' North latitude and 77°41' East longitude, located on the banks of river Yamuna at an average height of 187 m above the sea level. The average rainfall is around 593 mm with the summer temperatures range between 22 and 45 °C and the winter temperature range between 14 and 32 °C. The present year wise study was undertaken from March 2012 to February 2013. A total of 1869 (939 sheep and 930 goats) per rectal faecal samples of small ruminants were collected individually from the selected animals in labeled polythene bags and brought to the laboratory of Department of Veterinary Parasitology, College of Veterinary science and Animal husbandry, Mathura and stored at 4 °C till further processing. The samples were examined by centrifugal floatation technique using standard procedure (Soulsby 1982) for the presence of trichurid eggs and results were recorded.

Results

Out of 1869 animals examined, 209 animals (82 sheep with prevalence rate of 8.73 % and 127 goat with prevalence

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Table 1 Season wise prevalence of *Trichuris* spp. in sheep and goats

Season	Sheep			Goat		
	No. of sample examined	Positive sample	Percentage positivity	No. of sample examined	Positive sample	Percentage positivity
Summer (March–June)	394	32	8.12	329	43	13.06
Rainy (July–October)	299	33	11.03	285	48	16.84
Winter (November–December)	246	17	6.91	316	36	11.39
Total	939	82	8.73	930	127	13.65

Table 2 Season wise prevalence of *Trichuris* spp. in young and adult sheep

Season	Young Sheep (<6 month)			Adult Sheep (>6 month)		
	No. of sample examined	Positive sample	Percentage positivity	No. of sample examined	Positive sample	Percentage positivity
Summer (March–June)	94	8	8.51	300	24	8.00
Rainy (July–October)	40	5	12.50	259	28	10.81
Winter (November–December)	54	4	7.40	192	13	6.77
Total	188	17	9.04	751	65	8.66

rate of 13.65 %) were found positive for *Trichuris* sp. eggs (details given in Table 1). The overall prevalence was found maximum in rainy season followed by summer and winter seasons. Identical trend was followed for trichurid infection in both sheep and goat. So far as age wise prevalence is concerned, young sheep and goat (<6 months of age) were found to more affected than their adult (>6 months) counterparts (details given in Tables 2, 3). Again considering the sex wise prevalence rates, female animals were found more affected than male counterparts regardless of both the species (details given in Table 4, 5).

The environmental attributes prevailing in the studied area were mostly dry and hot (semi arid zone) with occasional rains and is, henceforth, very uncondusive for the development and survival of preparasitic stages leading to decreased availability of infective larvae on the pasture significantly attributing for an overall low prevalence rate in the instant study. Traditional practices of the region allow the animals to graze throughout the day in the fields which increase the chances of contact between host and larvae especially during the months when the environmental temperatures are not so higher. Moreover, the prevalence rates were found maximum during the raining seasons, irrespective of the sex, age and species. Similar rise during monsoon seasons have earlier been reported by various workers (Garg et al. 2007; Agrawal et al. 2010). For small ruminants, kidding and lambing are managed in such a way the arrival newly flock is simultaneous with the lush green fodders grown during rains. Gibbs (1986) had earlier reported peak egg counts just before lambing and

kidding owing to peri-parturient rise due to pregnancy stress and hormonal variations (Baker et al. 1998).

Goats (13.65 %) were found to be more affected than sheep (8.73 %) in the present study. The selective feeding habit of sheep might have given them the edge over the versatile feeding nature of goat accounting for more trichurid infection in goats. Young flock (<6 months age) was found to be more affected than the older flock (>6 months age). Singh et al. 2005 and Sonogaokar et al. 2007 also found the younger flock to be more prone than the adults. Contrary to this, higher prevalence rates were reported in adult sheep and goat by few researchers (Talukdar 1996; Yadav et al. 2006). The differences might be attributed to the feeding culture of the owners in the respective studied areas, who used to keep the young ones mainly as stall fed while the adults are kept free to roam in pastures contributing to the lower prevalence rates in young ones as compared to adults. Females were found to more infected than the male counterparts. Similar findings were earlier also reported by Chavan et al. 2008 and Sonogaokar et al. 2007. Peri-parturient rise (Baker et al. 1998) due to pregnancy stress and hormonal variations could be a decisive factor attributing to higher prevalence rates in females.

The present study also indicates that under normal conditions, most of the animals under free range feeding habit do possess certain degrees of parasitism without any clinical symptoms but worm burden reaches to pathogenic level during monsoon and post-monsoon seasons. Therefore strategic treatment seems to be the option available for

Table 3 Season wise prevalence of *Trichuris* spp. in female and male sheep

Season	Female Sheep			Male Sheep		
	No. of sample examined	Positive sample	Percentage positivity	No. of sample examined	Positive sample	Percentage positivity
Summer (March–June)	312	25	8.01	82	7	8.53
Rainy (July–October)	246	28	11.38	53	5	9.43
Winter (November–December)	201	14	6.96	45	3	6.66
Total	759	67	8.82	180	15	8.33

Table 4 Season wise prevalence of *Trichuris* spp. in young and adult goats

Season	Young Goat (<6 month)			Adult Goat (>6 month)		
	No. of sample examined	Positive sample	Percentage positivity	No. of sample examined	Positive sample	Percentage positivity
Summer (March–June)	49	7	14.28	280	36	12.85
Rainy (July–October)	54	10	18.51	231	38	16.45
Winter (November–December)	56	7	12.50	260	29	11.15
Total	159	24	15.09	771	103	13.35

Table 5 Season wise prevalence of *Trichuris* spp. in female and male goats

Season	Female Goat			Male Goat		
	No. of sample examined	Positive sample	Percentage positivity	No. of sample examined	Positive sample	Percentage positivity
Summer (March–June)	290	38	13.11	39	5	12.82
Rainy (July–October)	226	40	17.70	59	8	13.56
Winter (November–December)	275	32	11.64	41	4	9.76
Total	791	110	13.90	139	17	12.23

the control of gastrointestinal nematodes particularly trichurids. Further studies on epizootiology of gastrointestinal nematodes in high alpine pastures as well as lower grass lands along side bionomics and pasture burden are thereby warranted.

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References

- Agrawal N, Sharma DK, Mandal A (2010) Faecal egg output in Jakhrana goats naturally infected by *Haemonchus contortus* in Physiological states and seasons effect. Indian J Anim Sci 80(6):509–511
- Baker RL, Mwamachi DM, Audho JO, Aduda EO, Thorpe W (1998) Resistance of Galla and Small East African goats in the sub humid tropics to gastrointestinal nematode infections and the periparturient rise in faecal egg counts. Vet Parasitol 79(5):3–64
- Chavan PB, Damle PS, Waghode HJ, Bendre MU, Kurve VP, Maske DK (2008) Seasonal prevalence of gastrointestinal parasitism in goats at Nagpur. Vet World 1(12):360
- Garg R, Kumar R, Yadav CL, Banerjee PS (2007) Duration of anthelmintic effect of three formulations of ivermectin (oral, inject able and pour-on) against multiple anthelmintic-resistant *Haemonchus contortus* in sheep. Vet Res Commun 31:749–755
- Gibbs HC (1986) Hypobiosis and the periparturient rise in sheep. Vet Clin North Am Food Anim Pract 2(2):345–353
- Jaiswal AK, Sudan V, Shanker D, Kumar P (2013) Emergence of ivermectin resistance in gastrointestinal nematodes of goats in a semi-organized farm of Mathura district–India. Vet Arhiv 83(3):275–280
- Singh H, Rai HS, Singh NK, Kaur A (2005) Prevalence of helminthic infections in sheep in Ludhiana. J Vet Parasitol 19(2):97–101
- Sonegaokar AD, Gawali VM, Chavhan PB, Jayraw AK, Gawande PJ, Baviskar BS (2007) Incidence of parasitic infection in goats at Nagpur, Abstract Presented in XVIIIth National Congress of Veterinary Parasitology, Jammu, 239: Sept 7–9

- Soulsby E JL (1982) Helminths, Arthropods and Protozoa of Domesticated Animals, 7th edn. ELBS and Bailliere Tindall, London 381
- Talukdar SK (1996) Prevalence of helminthic infections of goats in Assam. *Vet Parasitol* 10:83–86
- Yadav A, Khajuria JK, Raina AK (2006) Seasonal prevalence of gastrointestinal parasites in sheep and goats of Jammu. *J Vet Parasitol* 20(1):65–68