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Prevalence of gastrointestinal Nematodosis in sheep of Srinagar and Ganderbal districts of Kashmir valley

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Abstract
Present study was conducted in sheep reared in organized and unorganized areas of Srinagar and Ganderbal districts of Kashmir valley for determining the prevalence of gastrointestinal helminth parasites. A total of 1200 faecal samples were examined of which 925 (77.08%) were found positive for one or other gastrointestinal nematode parasite. Based on coproculture, the prevalence of different genera of GIN parasites was: *Haemonchus* spp. (59.75%), *Trichostrongylus* spp. (36.9%), *Ostertagia* spp. (36.6%), *Nematodirus* spp. (19.33%), *Bunostomum* spp. (17.08%), *Oesophagostomum* spp. (15.6%), *Trichuris* spp. (12.66%) and *Marshallagia* spp. (6.16%). The prevalence was found to be higher in unorganized farms (80.0%) compared to that of organized farms (73.3%). Most of the cases were reported during summer (83.0%) followed by spring (81.0%), winter (73.0%) and least in autumn (71.33%). The adults of 6-12 months age were affected more compared to young sheep of 1-6 months age (84.8% versus 72.7%). In male sheep, prevalence was found to be 78.60% and 76.0% in female. In Srinagar and Ganderbal districts higher prevalence may be attributed to the fact that owners rarely go for livestock deworming on regular basis leading to pilling up of infection and could also be attributed to open grazing in animals.

Keywords: Gastrointestinal nematodosis, Kashmir valley, prevalence, sheep

Introduction
Gastrointestinal nematodosis is a primary constraint and a direct threat to health and productivity of sheep, as it endangers animal welfare in the tropical and subtropical areas (Swarnkar *et al*., 2010) [1]. The situation is responsible for severe economic losses especially in developing countries (Jitendran and Bhat, 1999) [2]. The infection is associated with frequent and high mortality rates and ranges from acute to chronic disease conditions. Despite immense progress to manage GI nematodiosis, farmers continue to suffer economic losses mainly due to lack of epidemiological information of parasites (Swarnkar *et al*., 2010) [1]. Sheep are the treasure house of various gastrointestinal nematodes including *Haemonchus* spp., *Ostertagia* spp., *Trichostrongylus* spp., *Bunostomum* spp., *Oesophagostomum* spp., *Cooperia* spp., *Gregeria* spp., *Mecistocirrus* spp., *Chabertia* spp., *Marshallagi* spp., and *Trichuris* spp. In most of the cases, infections appear to be of mixed type. *Haemonchus* is the most pathogenic of blood suckers with large numbers of this parasite often leading to severe anaemia in the affected animal. There is greenish diarrhoea along with mucous in Oesophagostomiosis. Loss of condition is predominant feature in severe *Chabertia* infection wherein the animal becomes anaemic and eventually succumbs. In trichostrongylosis, emaciation, oedema is there, the skin becomes dry and there is alternately diarrhea and constipation. The clinical signs and lesions in *Cooperia* are similar to that of trichostrongylosis (Soulsby, 1982b) [3]. The primary pathology caused by *Haemonchus contortus* and *Mecistocirrus digitatus* involves anaemia due to blood sucking activity and well-marked haemorrhages through wounds in the abomasal mucosa. Infection of *Trichostrongylus* spp. and *Nematodirus* spp. cause villous atrophy and adults of *Oesophagostomum* spp. and *Chabertia ovina* causes ulceration and haemorrhages in the large intestine. Reduced feed intake is a well-known feature of trichostrongyle infection in ruminants (Coop and Holmes, 1996) [4]. In general, anorexia is observed in parasitized animals, which contributes to the loss of condition, poor weight gain and lowered efficiency of production. In parasitic infections, diagnosis is carried out based on clinical symptoms and laboratory examination of feces, blood, excretions and secretions of body for parasite or parasitic stages, or their eggs.

Material and Methods

Study animals and area

For conducting studies on prevalence of gastrointestinal nematodosis in sheep of organized (MRCSG, SKUAST-K, Shuhama and Dachigam Sheep Breeding farm) and unorganized areas (Srinagar and Ganderbal) of Kashmir valley. 1200 fecal samples were collected from sheep of 1 to 12 months age group without differentiation between their sexes and were screened for the presence of different nematode eggs in both.

Collection of fecal samples

The faecal samples were collected directly from the rectum of sheep in aseptic manner in disposable envelops aided by a gloved hand. The envelopes were made air-tight so as to exclude air as much as possible to diminish the rates of egg hatching. Samples were preserved at refrigeration temperature (4^0 C) till further examination was carried out during next 1-2 days.Commencing with faecal samples collection, the color, consistency, presence of blood, mucous and dead worms were looked for immediately.

Microscopic examination of fecal matter

Microscopic examination of fecal samples was done by adopting concentration techniques both sedimentation and floatation. In concentration by sedimentation technique, 2-3 grams of feces were taken, mixed thoroughly with 10-15 ml water and the emulsion was strained to remove all coarse particles. Filtrate was centrifuged at 1500rpm for three minutes. After discarding supernatant, sediment was taken and examined under microscope (10X). While in concentration by floatation method, about 1-3 grams sample was mixed with water and sieved then centrifuged at 1500 rpm for 2-3 minutes. The sediment was taken, mixed with saturated salt solution and centrifuged at 1500 rpm for 2 more minutes. Eggs floated to the surface and were removed by touching the surface with a cover slip.

Coproculture

Using jar and petridish method, a total of 100 fecal samples (25 samples in each season) positive for strongyle type eggs were subjected to coproculture and the third stage larvae were harvested to find out prevalence of different genera of strongyle worms. The jar was fully filled with faeces of good consistency and kept in an incubator at 26^0 C for 7 days. After 7^{th} day of incubation, jar was taken out and inverted in a big petridish filled with warm water. All the larvae came down into the water which was centrifuged to get the sediment. Sediment was then examined under light microscope as per key of Van Wyk *et al*. (2004) [5] and Soulsby (1982) [3].

Results and Discussion

Of 1200 sheep examined, the qualitative fecal examination revealed that 925 samples were positive for different gastrointestinal helminth parasites with an overall prevalence of 77.08%. The species wise prevalence was *Haemonchus* spp. (59.75%), *Ostertagia* spp. (36.66%),*Chabertia* spp. (29.75%), *Bunostomum* spp. (17.08%), *Trichostrongylus* spp. (36.91%), *Trichuris* spp. (12.66%), *Oesophagostomum* spp. (15.66%), *Marshallagia* spp.(6.16%) and *Nematodirus* spp. (19.33%) with the *Haemonchus* being predominant nematodal parasite as depicted in Figure 1.The results of the present study were similar to the findings of Tariq *et al*. (2008a) [6] as per whom the overall prevalence stands at 61.6%. The results are also consistent with the data reported by different researchers both from India and abroad (Abouzeid *et al*., 2010; Pandith *et al*., 2003; Yadav *et al*., 2006; Maichomo *et al*., 2004; Atlas *et al*., 2006; Tariq *et al*., 2008a) [6, 7, 9, 10, 11].Of the 275 samples examined in sheep under one year of age of both sexes at MRCSG, Shuhama, 197 samples were found positive for parasitic ova with a prevalence of 71.64% as shown in Table 1 and out of 250 samples examined at Sheep Breeding Farm, Dachigam, 188 samples were found positive for parasitic ova with prevalence of 75.20%. Out of 350 samples examined in sheep under 1 year age of both sexes in Srinagar district, 263 samples were found positive for parasitic ova with prevalence of 75.14% and out of 325 samples examined in Ganderbal district, 277 samples were found positive for parasitic ova with prevalence of 85.23% (Table2). Higher prevalence in Srinagar and Ganderbal districts may be due to the fact that owners do not regularly go for livestock deworming leading to pilling up of infection and could also be attributed to open grazing in animals.

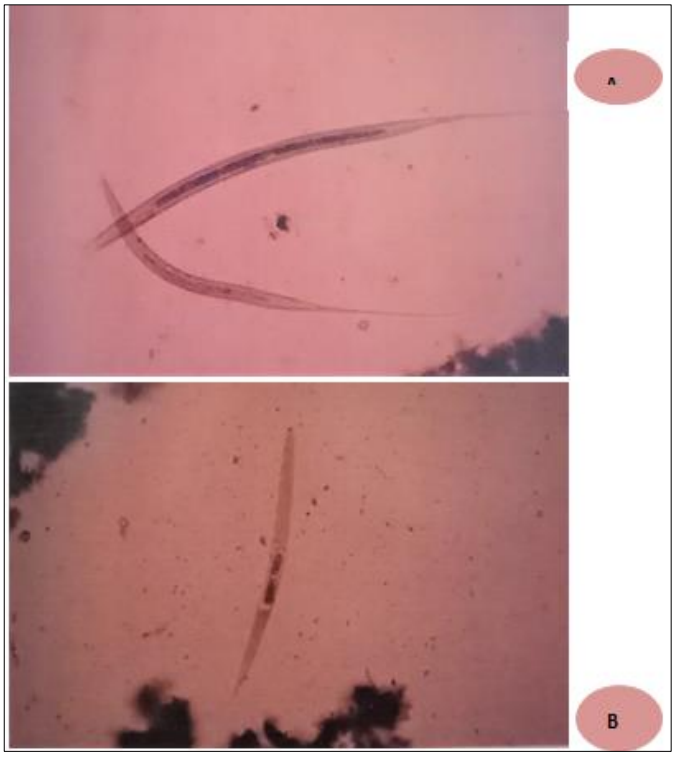

Fig 1.A: L3 larva of *Haemonchus contortus* obtained after coproculture, B: L3 larva of *Bunostomum* spp.

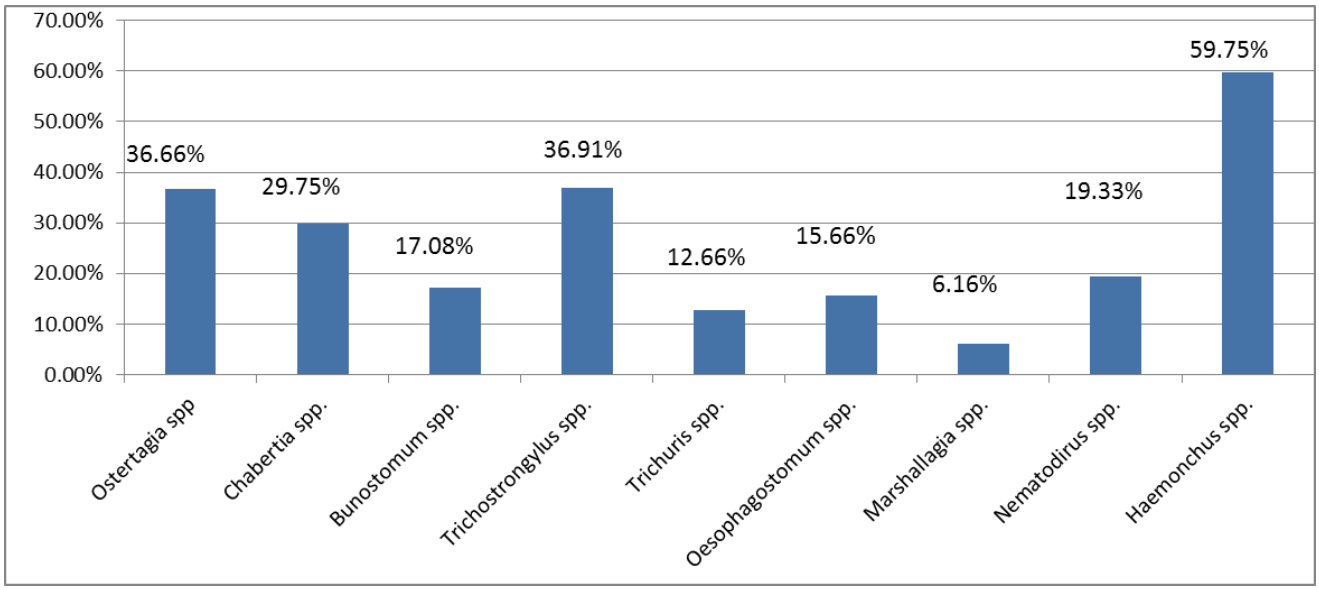

Fig 2: Overall prevalence of different gastrointestinal nematodes in sheep

Table 1: Prevalence of gastrointestinal nematodes in organized farms

Organized farm	No. of samples	Positive samples	Percent prevalence
Mountain Research Centre for Sheep and Goat (MRCSG), Shuhama, SKUAST-K	275	197	71.64
Government Sheep Breeding Farm, Dachigam	250	188	75.20
Total	**525**	**385**	**73.33**

Table 2: Prevalence of gastrointestinal nematodes in unorganized farms

District	No. of samples	Samples positive	Percent prevalence
Srinagar	350	263	75.14
Ganderbal	325	277	85.23
Total	675	540	80.00

Season wise prevalence was reported to be 83.00%, 81.00%,73.00% and 71.33% for summer, spring, winter and autumn respectively, being highest in summer and lowest in autumn. The percent prevalence of *Haemonchus* spp. was estimated to be highest compared to other nematodes in all four seasons followed by *Ostertagia* and *Chabertia* (Table3). Higher prevalence in summer may be attributed to suitable conditions as humidity, temperature present in Kashmir valley that aids in egg hatching as well as larvae development. It might also be due to the fact that grazing area available in summer season is small that results into gathering up of all animals over a smaller area which ultimately results into building up of heavy infection. The lower infection rate in autumn is probably because of less rainfall due to which fecal pellets get desiccated and also because of low temperature that delays the egg hatching. Hence, lesser amounts of infective larvae are available in autumn season. One more reason might be that following paddy harvest, fields are available for grazing of sheep along with which fecal material gets distributed over larger area which decreases amount of infection taken by an animal. Winter season revealed higher infection as compared to autumn, possibly because of the fact that during winters animals are kept indoors. As sheds are either cleaned after longer periods or not cleaned at all in winters which lead to release of ammonia gas, increase in humidity and temperature as well inside sheds which in turn favour ova development into different infective stages.

Table 3: Seasonal prevalence of different gastrointestinal nematodes in sheep

Season	No. of samples	Samples positive	A	B	C	D	E	F	G	H	I
Autumn	300	214 (71.3)	209 (69.6)	90 (30.0)	51 (17.0)	58 (19.3)	110 (36.6)	40 (13.3)	42 (14.0)	13 (4.3)	36 (12.0)
Winter	300	219 (73.0)	150 (50.0)	120 (40.0)	61 (20.3)	53 (17.6)	105 (35.0)	28 (9.3)	41 (13.6)	11 (3.6)	73 (24.3)
Spring	300	243 (81.0)	136 (45.3)	120 (40.0)	113 (37.6)	52 (17.3)	115 (38.3)	47 (15.6)	40 (13.3)	30 (10.0)	50 (16.67)
Summer	300	249 (83.0)	222 (74.0)	110 (36.6)	132 (44.0)	42 (14.0)	113 (37.67)	37 (12.3)	65 (21.6)	20 (6.6)	73 (24.3)
Total	1200	925 (77.08)	717 (59.75)	440 (36.6)	357 (29.75)	205 (17.08)	443 (36.91)	152 (12.6)	188 (15.6)	74 (6.16)	232 (19.3)

Values in parenthesis indicate percentage

A=*Haemonchus* spp.; B= *Ostertagia*spp.; C=*Chabertia* spp.; D= *Bunostomum* spp.; E= *Trichostrongylus*spp.; F= *Trichuris*spp.; G=*Oesophagostomum* spp.; H= *Marshallagia* spp.; I=*Nematodirus* spp.

Of total 1200 samples, 500 samples were collected from males and 700 from females. Out of 500 male fecal samples, 393 (78.60%) and in 700 female fecal samples, 532 (76.00%) were found positive. Sex wise prevalence was observed to be higher in males than females (Table 4). The reason behind the higher prevalence in males could be due to the fact that males are usually left to graze outside for a longer periods while females are kept indoors for more time. It was found out that out of 1200 samples, 430 were collected from adults(6 month-1 year) and 770 samples were collected from young sheep(<6 months). In case of adults out of 430 samples examined, 365 samples (84.8%) were found positive while in young sheep, out of 770 samples, 560 (72.7%) were found positive for one or other type of gastrointestinal nematode parasites as presented in Figure 3. Higher prevalence of gastrointestinal nematodosis was recorded in adult sheep than young ones. As per Yadav *et al*. (2006) [9], 83.24%, 80.0%, 84.72% and 80.5% percent prevalence was observed in sheep, lambs, goats and kid respectively which is in agreement with the study. The reason may be exposure of adult animals to infection during grazing on contaminated pastures for a longer time periods leading to pilling up of infection in adults, however, in young ones lesser prevalence could be attributed to minimum exposure to contaminated pastures and also because of early immunity due to colostrums.

Table 4: Prevalence of gastrointestinal nematodes in sheep based on sex

Animal	Total samples	Sample positive	Percent prevalence
Male sheep	500	393	78.60
Female sheep	700	532	76.00
Total	1200	925	77.08

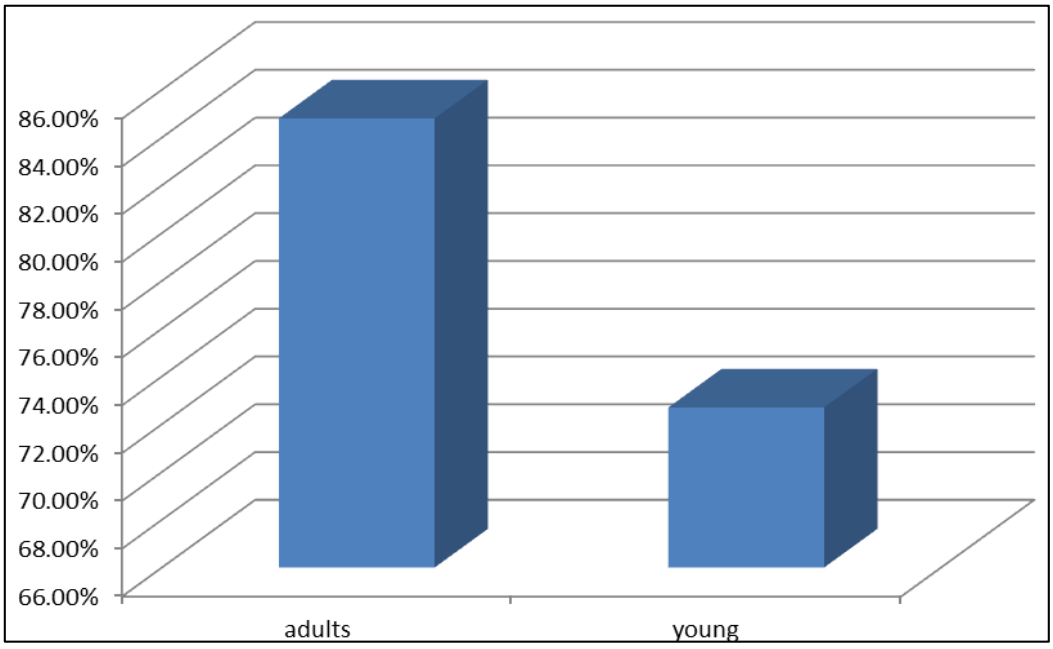

Fig 3: Age-wise Prevalence

References

1. Swarnkar CP, Singh D, Solanki VK. Prevalence of Gastrointestinal Parasites of Sheep in Semi-Arid Rajasthan: A Field Study. Indian J Small Rum. 2010;16(2):221-227.
2. Jitendra KP, Bhat TK. Epidemiology of parasites in dairy animals in North West humid Himalayan region of India with particular reference to gastrointestinal nematodes. Tropical Animal Health and Production. 1999;31:205-211.
3. Soulsby EJL. Helminths, Arthopods and Protozoa of Domesticated Animals. Bailliere Tindall London. 1982;pp:763-766.
4. Coop RL, Holmes PH. Nutrition and parasite interaction. International J Parasitol, 1996; 26: 951-962.
5. Van Wyk JA. A key for identifying nematode and lungworm larvae of sheep and goats. Vet. Parasitol. 2004;119:277-306.
6. Tariq KA, Chisti MZ, Ahmad F, Shawl AS. Epidemiology of gastrointestinal nematodes of sheep managed under traditional husbandary system in Kashmir valley. Vet. Parasitol. 2008(a);158:138-143.
7. Abouzeid NZ, Selim AM, El-Hady KM. Prevalence of gastrointestinal parasites infections in sheep in the Zoo garden and Sinai district and study the efficacy of anthelmintic drugs in the treatment of these parasites. J American Sci. 2010;6(11):544-551.
8. Pandit BA, Shahardar RA, Bhat AS, Darzi MM. Prevalence of gastrointestinal parasitic infection in sheep of Kashmir valley under different management practices. Applied Biol. Res. 2003;5:1-5.
9. Yadav A, Khajuria JK, Raina AK. Seasonal prevalence of gastrointestinal parasites in sheep and goats of Jammu. J Vet. Parasitol. 2006:20:65-68
10. Maichomo MW, Kagira JM, Walker T. The point prevalence of gastrointestinal parasites in calves, sheep and goats in Magadi division, south western Kenya. Onderstepoort. J Vet. Res. 2004;4:257-260
11. Atlas M, Sevgili M, Gokeen A, Bayburs HC. Prevalence of gastrointestinal nematodes in sheep in Sanliurfa region, Turkey. Parazitol Derg. 2006;30:317-321.