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Prevalence of gastrointestinal parasites in small ruminants of Sirohi district, Rajasthan, India

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Abstract

This study was carried out with the aim of investigating endoparasitism by helminthes and protozoa in small ruminants of Sirohi district. Stool samples were collected from Disease Diagnostic Centre (DDC), Sirohi, Rajasthan between April 2015 to March 2017 monthly. The Stool samples were examined to determine eggs and oocytes counts per gram of feces to identify helminthes parasites. These parasites were an accompanying infection in nearly all animals. The parasitological investigation revealed eggs in the following groups of helminthes: *Strongyle* species, *Strongyloides* species, *Toxocara* species, *Moniezia* species, *Fasciola* species, Amphistome species and oocytes were also found in *coccidian* species. It observed that small ruminants have been highly infected with nematode parasites in comparison to trematode and cestode.

Keywords: Gastrointestinal parasite, nematode, helminth, domesticsmall ruminants

Introduction

Helminthes infections are major health problem in domestic small ruminants throughout the world. The state of Rajasthan is famous for its small ruminant's wealth. The economy of rural people largely depends on goat and sheep wealth. The domestic small ruminates have been found to suffer from various diseases such as *Paramphistomiasis*, *Fascioliasis* etc. Due to presence of different species of helminth parasites in the gastrointestinal tract. Morbidity and mortality have been observed in helminthes infected goats and sheeps in Rajasthan due to parasitic infections and these diseases lead to great economic losses and affect the productivity directly or indirectly worldwide. (Swarnakar *et al.*, 2014) ^[29]. In addition to these threats, a helminth infestation lowers the animal's immunity and renders it susceptible to other pathogenic infections;

Some external symptoms have been produced by the parasitic infected ruminants like reduced production of weight, growth rate, nutrient utilization, meat, wool and milk quality and quantity. Domestic small ruminants due to improper management, unhygienic conditions and improper use of anthelminthic chemicals are suffering from helminthes parasitic diseases and mostly infection occurs when they drinking water and grazing near the pond. Adult worm produce eggs that are passed to field in the faces or stool. Under favorable conditions the egg will hatch and larva transmitted to intermediate host lymnaeid snails and by snail infects many small ruminants as well as man (Pfukenyi et al., 2006)^[22]. (Keyyu et al., 2006)^[11]. (Kumsa & Wossene, 2007) [14]. (Hammami et al., 2007) [8]. (Biu et al., 2009) [5]. (Rafiullah et al., 2011) ^[24]. (Attindehou & Salifou, 2012) ^[3]. (Getachew *et al.*, 2012) ^[7]. (Akkari *et al.*, 2013) ^[2]. (Garedaghi et al., 2013)^[6]. (Hassan et al., 2013)^[9]. (Kuchai et al., 2012 & 2013)^{[12][13]}. (Laha et al., 2013) ^[15] (Mir et al., a & b 2013) ^[18]. (Pfukenyi & Mukaratirwa 2013) ^[22]. (Swarnakar & Kumawat, 2013) [26]. (Owhoeli et al., 2014) [20]. (Raza et al., 2014) [25]. (Swarnakar et al., 2014) and (Swarnakar & Sanger, 2014) [27] [28]. There for, present investigation had been undertaken with the objective of assessing the occurrence of endoparasites of goats and sheep in Sirohi region, Rajasthan, India.

Materials and Methods

Study animals and sample collection

Stool samples were collected from different villages of Sirohi, Rajasthan (from April, 2015 to March, 2017) for identification of helminthes and coccidia cyst. First of all collect the stool samples with a forceps. Then stool samples were transferred into labeled poly bags and packed. Take one gram stool sample of goats and sheep was mixed with more salt solution

(15-20 ml.) in cylinder and Stir well with glass rod and eggs were collected on and examine under stereo microscope. Many data during the period of study were collected from DDC, Sirohi District, Rajasthan.

Results and Discussion

During the study 2400 stool samples were collected from goats and sheep's of different villages of Sirohi in camps and goat and sheep farmers were took from their animal's samples to veterinary polyclinic evaluation from April 2015 to March 2017 (Table 1 and 2). In Nematoda, generally found four types. Of eggs i.e Strongyle type, Strongloides type, Trichuris type and Toxocara type. Out of 2400 samples, 790 samples were positive in goats and 180 faecal or stool samples in sheeps infected with Strongyle species, 3 and 7 samples infected with Strongloides species respectively in goat and sheep, Trichuris species not found during the study and only 2 samples were positive for *Toxocara* species in sheep. Mostly Fasciola species and amphistomes species present in Trematoda, 78 goat samples and 49 buffaloes samples were found infected with Fasciola species Amphistomes were highly infected in goat (170 samples positive) and sheep (129 samples positive) as compared to Fasciola species.

Table 1 shows that out of 2400 positive samples, 29 sheep and 14 infected with oocysts of coccidia resting *Moniezia expansa* 17 in goat and 08 positive in sheep and 9 samples (goat) and 5 samples (sheep) were found *Moniezia benedeni* infected

(Table 1). This result reveals those nematodes are more susceptible as compared to other gastrointestinal parasites in goat and sheep. The overall prevalence of gastrointestinal parasites in goat and sheep presented in Table 2. In the present study the prevalence of Nematoda, *Strongyle* type eggs (35.41%), *Strongyloides* type eggs (0.49%), *Trichuris* species (0%), *Toxocara* species (0.099%) in cow and buffalo. *Fasciola* species (4.44%) and Amphistomes species (11.06%) prevalence were found in trematoda (Figs. 2-7). In Cestoda, prevalence of *Moniezia expansa* (0.64%) and *Moniezia benedeni* (0.35%) noticed in cow and buffalo. It is interesting to note that prevalence of Nematoda was higher infected with 35.41% in cow and buffalo compared to others gastrointestinal parasites (Fig1). Helminths cause severe infection to domestic animals worldwide.

Helminthiasis, in large part, is caused by nematode, cestode and trematode in domestic animals and found reduction in fertility, work capacity, involuntary culling, reduction in food intake, weight &milk production and higher mortality rate (Biu *et al.*, 2009)^[5]. (Rafiullah *et al.*, 2011)^[24]. (Getachew *et al.*, 2012)^[7]. (Pfukenyi & Mukaratirwa 2013)^[22]. (Hassan *et al.*, 2013)^[9]. (Mir *et al.*, a & b 2013)^[18]. (Raza *et al.*, 2014) ^[25]. And (Owhoeli *et al.*, 2014)^[20]. Present study shows similarity with other scientists that the infection of gastrointestinal parasites responsible for huge economical losses to farmers at large manner in all over the world (Aga *et al.*, 2013)^[1] and (Laha *et al.*, 2013)^[15].

Table 1: Showing different type of gastrointestinal parasites collected from sheep and goat between years April 2015 to March 2017

	Nematode				Trematode		Coccidia	Cestode		
Species	Strongyle species	Strongloi des species	Trichuris	Toxocara	Fasciola species	Amphistome species		Moniezia expansa	Moniezia benedeni	Year
Cow	259	2	0	0	15	44	11	4	2	2015-16
	360	1	0	0	28	61	8	6	1	2016-17
Total	619	3	0	0	43	105	19	10	3	2015-17
Buffalo	44	4	0	1	21	55	3	1	2	2015-16
	54	3	0	1	26	64	2	2	2	2016-17
Tot al	98	7	0	2	47	119	5	3	4	2015-17

Sr. No.	Gastrointestinal parasites	Total parasite found in sheep and goat	Prevalence (%)
1.	Strongyle species	717	35.41
2.	Strongyloides species	10	0.49
3.	Trichuris species	0	0
4.	Toxocara species	02	0.099
5.	Fasciola species	90	4.44
6.	Amphistome species	224	11.06
7.	Coccidia and others	24	1.19
8.	Moniezia expansa	13	0.64
9.	Moniezia benedeni	07	0.35

Table 2: Total prevalence (%) of different types of gastrointestinal parasites in sheep and goat







Fig 2: Egg of *Toxocara* spp.

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Fig 3: Egg of Strongyle spp.



Fig 4: Egg of Strongyloides spp



Fig 5: Egg of Strongyle spp. Showing developing worm.



Fig 6: Worm coming outside the egg showing in fig. 6.

Plate 1: Various types of eggs of gastrointestinal parasites showing below

Due to helminthiasis, cause severe anaemia, bloody diarrhea and death to many domestic animals (Kumsa & Wossene, 2007) [14]. (Rafiullah et al., 2011 and Kuchai et al., 2013) [24] ^[13]. The main nematodes recovered from the study were Strongyle species, Strongyloides species, Toxocara species and Trichuris species, on the other hand, reported high prevalence of amphistomes species commonly called as rumen flukes compared to Fasciola species in domestic animals (Pfukenyi et al., 2006)^[22]. (Awraris et al., 2012)^[4]. (Kuchai et al., 2012) ^[12]. (Kakar et al., 2013) ^[10]. (Mashayekhi et al., 2013) [16]. (Swarnakar and Kumawat, 2013), (Swarnakar et al., 2014) and Swarnakar & Sanger, 2014) [26] [27] [28]. These findings also similar with (Biu et al., 2009) ^[5]. Observed that *Strongyle* species the most common parasite found in large no. in the domestic ruminants compared to other parasites. Oryan et al., (2012) [19] Examined that metacestodes are responsible for severe tissue damage, reduction in meat and milk production and considerable economic loss due to condemnation of the infected organs of herbivorous animals.

The only cestode observed in the ruminants was *Moniezia* species *i.e Moniezia expansa* and *Moniezia benedeni*. The occurrence of cestode species is very few compared to others gastrointestinal parasites (Keyyu *et al.*, 2006 and Raza *et al.*, 2014) ^[11, 25] and (Attindehou & Salifou, (2012) ^[3]. Observed that cestode infection was so high in Bening.

The prevalence of oocysts of coccidia species reported in the current study was higher in cow than buffalo. This study states that infection of oocysts of coccidia species is less to others parasites. Present study have agreements with (Raza *et al.* (2014)^[25]. Revealed that protozoans infection lower than others gastrointestinal infection in domestic animals.

Present investigation revealed that nematode infection highly

prevalent, followed by trematode, cestode and oocysts of coccidia species. Similar investigation have been reported in Maiduguri, Nigeria, Lafia Town and Environs, Nigeria and the Cholisthan desert, Pakistan (Biu *et al.*, 2009; Hassan *et al.*, 2013 and Raza *et al.*, 2014) ^[5, 9, 25].

Conclusion

In the present investigation revealed that Small ruminants were heavily infested with a variety of GI parasites including some that potentially entail substantial economic losses. Especially suckling animals carry a severe helminth burden, which indicates that particular attention should be paid to their management. In view of high prices, unavailability or inaccessibility of drugs and veterinary services, systematic deworming of animals with a broad-spectrum anthelminthic cannot be recommended to pastoralist. Therefore inexpensive locally applied measures such as the use of plant-based remedies against GI parasites should be systematically evaluated for their effectiveness against the most prevalent helminth species, so as to devise cheap but effective remedies that pastoralists can synthesize themselves and use regularly.

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