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Prevalence and Seasonal Occurrence of Intestinal Parasites in Sheep at Arid Zone of Western Rajasthan

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ABSTRACT

The present study was conducted to detect the prevalence and seasonal variation of intestinal parasites in Sheep which carried out from October 2021 to September 2022 at arid zone of western Rajasthan, India. A total of 600 faecal samples (50 from sheep per month) were screened for qualitative (floatation and sedimentation) examination and examined under light microscope. Among the scrutinized samples 62.33% were positive for endoparasites, in the various parasitic infections highest prevalence was recorded for *Eimeria spp.* 150 (40.11%) followed by *Strongyle spp.* 81 (21.66%), *Amphistome spp.* 64 (17.11%), *Trichuris spp.* 24 (6.42%), and *Moniezia spp.* 15 (4.01%), Mixed parasitic infection 40 (10.69%) and in 226 (37%) samples were found negative for parasitic infestation. The age wise prevalence was recorded as 57.21 % in the age of 0 to 12 months of age whereas 42.78% incidence was found in more than 12 months old sheep. Sex wise distribution of parasitic infestation revealed slightly higher incidence in female as in 51.06% incidence while 48.93% in males. The season wise investigations designates that the overall percentage of infection was higher in rainy season (69%) followed by winter (61%) than in summer (57%).

HIGHLIGHTS

- Young animals are at high risk of infection especially females.
- Incidence of parasitic infestation is highest in rainy season.

Keywords: Intestinal parasites, incidence, seasonal variation, sheep, Rajasthan

Sheep having multi-facet utility as it contributes in providing wool, meat, milk, skin and manure thus become an integral part of rural economy particularly in the arid and semi-arid regions according to National Action Plan, 2022 on Sheep (BAHS, 2019). Sheep is called as "Automatic Teller Machine" (ATM) for poor people. Sheep reared in India as indigenous dual-purpose animal for production of both lambs for meat and wool production. Milk of sheep has also contained significant features that make it more nutritious (Mohapatra *et al*., 2019).

Sheep is a ruminant having carpet grazing behavior as they are grazing very close to the land so infestation of enteric parasites become very common. It is definitely a major challenge for the health and the welfare of sheep as it causing inappetence, diarrhoea, anemia and even death in severe cases. Sheep are known to suffer from various intestinal parasites of which helminth diseases are of great importance including the diseases like Amphistomosis in trematodes, Monieziosis, Avitellinosis in cestodes and Haemonchosis, Trichostronglylosis, Oesophagostomosis, Trichuriosis, Strongyloidosis in nematodes and protozoan infection as Eimeriosis are still serious challenges in the region threatening for the Sheep production (Choubisa and Jaroli, 2013; Sharma *et al*., 2020).

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Farmers in western arid region were mostly dependent on livestock rearing as seasonal rainfall-based farming practices so parasitic infestation is an intensive threat for their livelihood. An integrated regulatory approach is mandatory to control intestinal parasitism at regional level. Although, some work has been done on the parasitic infestation of sheep in southern part of Rajasthan (Choubisa and Jaroli, 2013; Swarnakar *et al*., 2014) but in western part there are difference in agro-climatic conditions and feeding habits, thus keeping all these factors in views the proposed investigations were undertaken.

MATERIALS AND METHODS

The fecal samples for proposed investigation were collected from sheep with sign of diarrhea, emaciation, anorexia and wasting diseases came for treatment in Veterinary Clinics College of Veterinary and Animal Science, Bikaner and various Veterinary clinics and sheep flocks in villages in and around Bikaner district of western Rajasthan. The study was carried out in 600 (50 sheep per month) randomly selected animals. faecal sample was collected from rectum in each animal, placed in plastic pouch, labelled and transported to laboratory and examined them mostly on the same day. Qualitative examination was performed as Floatation technique for representing nematode and cestode egg's as well as coccidian oocysts, whereas sedimentation technique was used for noticing the trematode egg. The morphological characters of parasitic eggs were identified from light microscope on oil immersion (Soulsby, 1982).

RESULTS AND DISCUSSION

Out of 600 sheep examined, 374 (62.33%) were found positive for eggs of one or more species of intestinal parasites (Table 1). Almost similar incidence was reported by Bhat *et al*. (2012) as 62.9 % whereas by Wani *et al.* (2011) it was noticed as 67.50% in Kashmir valley. Age-wise distribution of gastro-intestinal parasites is given in Table 2. Occurrence of parasites was slightly highest in 2- 6 months old lambs as 38.50 % then 0-2 months old as 9.63% and 9.09%% in 6-12 months old and 42.78% in more than 1 year old sheep. Overall, in young animals incidence was reported significantly higher ($p \leq 0.05$) then adult animal parasitic infestation. Young animal might be higher in incidence because of their lower immunity thus they are more vulnerable to the infection. Adult animals were Low in frequency of infection as these might be have acquired resistance by virtue of repeated infections. Similar finding was reported by Waruru *et al.* (2005) in Kenya.

Table 1: Various parasitic egg/ova recovered from infected sheep

Sl. No.	Parasitic egg recovered	Number of positive samples (%)
1	*Eimeria spp*	150 (40.11%)
2	*Strongyles spp*	81 (21.66%)
3	*Amphistome spp*	64 (17.11%)
4	*Trichuris spp*	24 (6.42%)
5	*Monienzia spp*	15 (4.01%)
6	Mixed	40 (10.69%)

Table 2: Age wise Incidence of Parasitic infection in Sheep

Sl. No.	Parasitic egg recovered	0-2 month	2-6 month	6-12 month	>12 month
1	*Eimeria* spp.	6	98	8	38
2	*Strongyles* spp.	11	14	10	46
3	*Amphistome* spp.	8	14	9	33
4	*Trichuris* spp.	4	6	2	12
5	*Monienzia* spp.	2	3	1	9
6	Mixed	5	9	4	22
	Total	36	144	34	160

There was significant ($p \leq 0.05$) difference was reported in sex wise prevalence of GI parasites as it was slightly higher in females (51.06%) as compared to the males (48.93%) (Table 3). Higher prevalence of intestinal helminths was reported in female could be attributed to their lowered resistance due to different physiological states like reproduction and lactation causes low immune status. The incidence reported in male and female sheep were not in much difference because both sex of animals were graze on almost similar agroclimatic conditions where equal chances for both to get infected. A similar observation was made by Bhat *et al*. (2012) as in female (75.6%) as compared to male (44.8%) in sheep at Kashmir valley.

Parasitological findings revealed 62.33 % of parasitic infestation in sheep/lambs with the highest intensity during monsoon/rainy season (69%) followed by winter

(61%) and summer seasons (57%) (Table 4), similar findings were reported in earlier study by Varadharajan and Vijayalakshmi (2015) in south coastal region of Tamil Nadu. Incidence of intestinal ailments was higher in rainy season may be due to over eating of green pasture by rapidly growing lambs and adult sheep leading to more access to parasitic infestation similar as Choubisa and Jaroli (2013) and Faran *et al.* (2017) from Rajasthan. Lesser in winter are might be due to lack exposure to parasitic infection due to no overfeeding of pasture. Least incidence of intestinal ailments in summer season of the year might be due to dormient stage of larva. Heavy rainfall and high relative humidity predisposed to heavy parasitic infection similar observations were found out by Varadharajan and Vijayalakshmi (2015) in Tamil Nadu and Singh *et al*. (2017) in Punjab. This variation in prevalence of parasitic infestation in enteric lesions depends upon difference in agro-climatic condition and availability of susceptible host were in agreement of Vohra *et al*. (2018). The intestinal affections were predominant cause of mortality in sheep/ lamb as described by Swarnkar *et al*. (2014).

Table 3: Sex wise incidence of parasitic infections in sheep

Diseased Sheep	Male	Female	Total
Parasitic infection	177 (47.32%)	197 (52.67%)	374

Table 4: Season wise prevalence of Intestinal parasites

Sl. No.	Season	No. of sample collected	No. of Positive Samples	% Parasitic infection
1	Winter	200	122	61
2	Summer	200	114	57
3	Rainy	200	138	69

Highest prevalence was recorded for *Eimeria spp.* 150 (40.11%) higher incidence was also reported (71.18%) by Satish *et al*. (2018). *Eimeria spp*. incidence was reported highest in the age group of 2-6 months (Khodakaram and Mansourian, 2008). Among helminths, *Strongyle spp.* reported in 81 sheep (21.66%) was found to be most predominant, followed by *Amphistome spp.* 64 (17.11%), *Trichuris spp.* 24 (6.42%) were in agreement with Vohra *et al*. (2018). A cestode was reported as *Moniezia spp.* 15 (4.01%) with higher incidence of 15% was reported by Vohra *et al*. (2018) in Haryana whereas findings were in close agreement with Choubisa and Jaroli (2013) as 6.02% from southern Rajasthan. Mixed parasitic infection 40 (10.69%) and negative in 226 (37%) sample. These findings were in general, agreement with those reported by Balachandran *et al.* (2010) in Tamil Nadu, Bhat *et al.* (2012) from Kashmir; Singh *et al.* (2017) in Punjab, Dappawar *et al.* (2018) from Maharashtra and Sharma *et al*. (2020) in southern Rajasthan.

Present investigation reported that 10.69% animals were infected with more than one intestinal helminth parasites which was in close agreement to the findings of Awaludin and Nusantoro, (2020) from Indonesia and Malathi *et al.,* (2021) from Andhra Pradesh. It might be due to infection of one parasite hampers the immune status of animals and make them prone to get infected with other parasites and mixed infection is more injurious to the health of animals.

CONCLUSION

From the above observations it was concluded that the intestinal parasites infections of sheep were utmost prevalent throughout the year but appropriate strategies before and after monsoon to proper management of sheep and awareness in farmers should be practiced. Lambs and pregnant animals should be in proper supervision so that production and economic losses could be minimized.

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