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Prevalence of gastrointestinal parasites at an organised sheep farm

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Abstract
Gastrointestinal (GI) parasitism is often classified as production disease & had major limitation on sheep productivity. GI parasites of sheep cause significant morbidity & mortality and resultant production losses are considerable. During the year January, 2022 to July, 2023, faecal samples of 87 sheep from Sheep Breeding Farm, Aseda, Banaskantha, Gujarat were examined for gastrointestinal parasites. Faecal samples were processed by sedimentation method. Out of 68 faecal samples examined, 44 (50.57%) were found positive for GI parasites. The study revealed 20 (22.98%) cases of *Trichostrongylus* spp., 09 (10.34%) cases of *Strongyloides* spp., 03 (3.44%) cases of *Trichuris* spp., 01 (1.14%) case of *Eimeria* spp. and 11 (12.64%) cases of mixed infection and 43 (49.42%) were negative for parasitic infection. The average EPG of nematode done by Mac master technique was 600-800 in positive sample. Post mortem examination of two sheep revealed infection of *Moniezia* spp. and *Stilesia* spp. which were identified and preserved in laboratory museum.

Keywords: Gastrointestinal parasites, sheep farm, *Trichostrongylus*

1. Introduction
Small ruminant farming is crucial for the advancement of socioeconomic conditions in emerging nations and serves a number of socioeconomic purposes for farmers who live nomadic lifestyles. Climate change, nutritional deficiency and infectious pathogens like bacteria, viruses and parasites are all causing farmers a lot of issues with livestock production. Sheep production is more affected than goat production by the significant economic losses brought on by GI nematode infection, particularly the *Trichostrongylus* nematodes. In addition to the direct losses caused by acute illness, death and damage, as well as the condemnation of organs and the cost of veterinary care, parasitic diseases also cause indirect losses that include reductions in productivity, such as slower growth rates, weight loss in young growing animals and delayed maturity of slaughter stock [2, 3].
This study was carried out to look into the prevalence of gastrointestinal parasites in a managed sheep farm, keeping in mind the significance of gastrointestinal parasites in small ruminants.

2. Materials and Methods
2.1 Study area & study design
In this study, samples were collected from Sheep Breeding Farm, Aseda, Gujarat.

2.2 Farm management practices
The animals with a flock size of 150 were run by Government of Gujarat, Sheep Breeding Farm, Aseda, Gujarat. Animals were kept under strict control systems and during the day they were permitted to graze freely on farms with only a minimal supplement of groundnut and sesame cake concentrates. The animals were raised in open grazing regions where they frequently came into touch with various kinds of animals.

2.3. Sample Collection
A total of 87 faecal samples of sheep from sheep breeding farm were randomly collected from the rectum and collected faecal samples were placed in a labelled zip-lock bag, maintained in an icebox and transported to the laboratory of Department of Veterinary Parasitology, Kamdhenu University, Sardarkrushinagar. Prior to starting the faecal examination, the samples were kept in a refrigerator at 4 °C.

2.4. Questionnaire Survey
Information regarding sheep husbandry, such as feeding practices, farm management and anthelmintic schedules and clinical signs such as diarrhoea, anorexia, conjunctiva congested or pale, anaemia, and bottle jaw conditions were noted during sample collection.

Fig 1: Pale mucus membrane

Fig 2: Bottle jaw condition

2.5. Faecal Examination
Qualitative examination was done by sedimentation technique [4] and quantitative examination was done by McMaster method. According to Soulsby [5], there are four different types of faeces egg counts free, low (500 EPG), medium (500 -1000 EPG), and high (> 1000 EPG). Faecal oocyst count (FOC) levels were classified by Idris *et al.* as Eimeria-free, Low (1800 OPG), medium (1800-6000 OPG), and high (> 6000 OPG). In this investigation, the McMaster counting method was used to count the eggs and oocysts in each individual sample of sheep faeces.

2.6 Post mortem examination
During the post-mortem examination of two sheep, which revealed gross specimen of *Moniezia* spp. and *Stilesia* spp. in the small intestine. The intestine were fulled with the heavy load of *Moniezia* spp. and one plastic bag, one piece of metal found in the reticulum of the sheep. By microscopic examination and identification (Soulsby, 1982) [5] of *Moniezia expansa* and *Stilesia globipunctata*.

2.7 Statistical Analysis
The animal was deemed positive if one or more parasite eggs or oocysts were discovered during the faeces examination.

Fig 3: Post-mortem examination

Fig 4: *Moniezia* spp. in intestine

Fig 5: *Moniezia* spp. from the small intestine

Fig 6: *Stilesia* spp. from the small intestine

Fig 7: Foreign bodies from the reticulum

3. Results

Out of 87 faecal samples examined, 44 (50.57%) were found positive for GI parasites. The study revealed 20 (22.98%) cases of *Trichostrongylus* spp., 09 (10.34%) cases of *Strongyloides* spp., 03 (3.44%) cases of *Trichuris* spp., 01 (1.14%) case of *Eimeria* spp. and 11 (12.64%) cases of mixed infection and 43 (49.42%) were negative for parasitic infection. The majority of the animals that were sampled, meanwhile, lacked any clinical symptoms. The average EPG of nematode done by Mac master technique was 600-800 in positive sample.

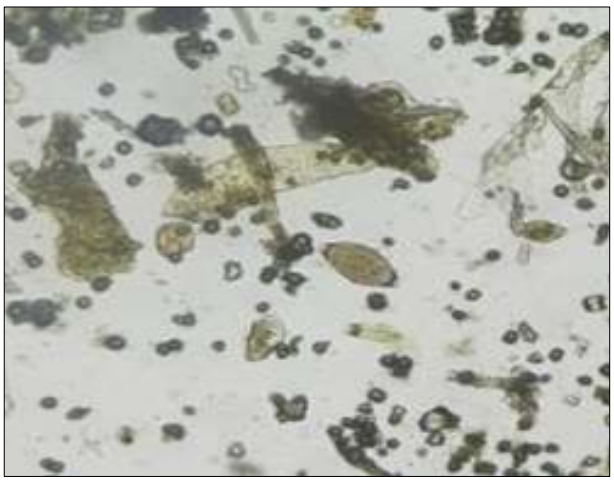

Fig 8: Egg of *Trichuris* spp

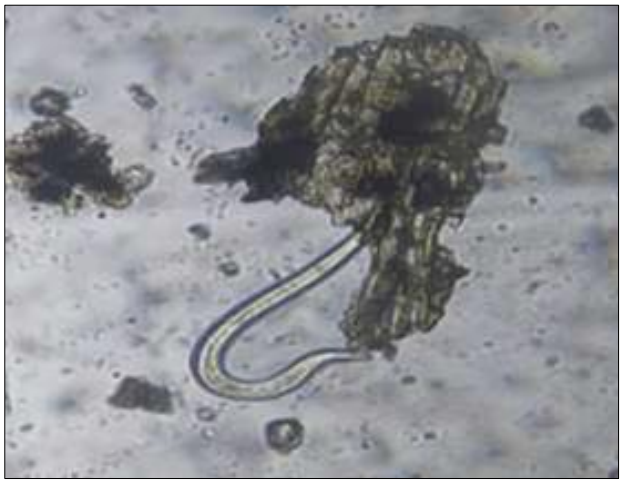

Fig 9: Larva of *Strongyloides* spp

Fig 10: Eggs of *Strongyloides* spp

Fig 11: Eggs of *Trichostrongyloides* spp

4. Discussion

Infection with gastrointestinal parasites can have a significant negative impact on small ruminant production, especially in the tropics and subtropics. Aside from these additional negative effects, due to decreased food intake, weight gain, decreased fertility, increased medical expenses, and mortality in animals with severe parasitism, GI parasite infections can result in significant economic losses [6]. In this study, tiny

ruminants had a high incidence of gastrointestinal parasite infection (76.47%). This conclusion is in line with reports of GI parasite prevalence in Ghana (90.8%) [9] and small ruminants in India (91-95%) [7, 8]. On the other hand, Nigeria (69.64%) saw a lower incidence [1]. The high prevalence of GI parasites in sheep and goats may be attributed to farm hygiene procedures and grazing range management. Since the parasite species identified in this study were infected by consumption of contaminated food, one theory for the likely cause of infection is due to parasite contamination in the pasture. Furthermore, this study found no connection between deworming practices on farms and the prevalence of GI parasites. Therefore, it is reasonable to conclude that GI parasites are no longer susceptible to anthelmintics. Current agroclimatic factors, such as overcrowding and grazing of both young and adult animals, provide an excellent environment for the spread of GI parasites [10].

According to the current study, this variation may result from different geographical features of the study area as well as animal rearing and management techniques that are related to the animals' nutritional state. A significant rate of parasite infection by a single parasite (22.98%) was noted, whereas a mixed infection rate was 12.64%. This could be as a result of the increased risk of diseases brought on by an infestation of any parasite species. Because the sheep were grazing in an area that was resistant to snails, no fluke infection was seen in the current investigation.

This study found a high prevalence of *Trichostrongylus* spp. infections (22.98%), followed by mixed infections and *Strongyloides* spp. infections (12.64% and 10.34%, respectively). *Fasciola gigantica* (4.16%), *Strongyloides* spp. (4.16%), *Paramphistomum* spp. (8.91%), *Trichuris* spp. (8.72%), *Haemonchus contortus* (43.7%) and *Moniezia expansa* (3.39%) all had higher infection rates in India [8]. The varying climatic conditions and immune health of each animal may be the causes of variances in the prevalence of certain parasite illnesses.

Trichostrongylus spp., *Strongyloides* spp., and *Trichuris* spp. were found to be strongly correlated with host species. This connection may result from variations in the host species' dietary habits and individual animals' immunological capacities.

5. Conclusion

Many different GI parasites, the majority of which were coinfections, were present in small ruminants on a managed sheep farm. The animals in the sample did not exhibit any clinical indications, despite the fact that GI parasites were relatively common. *Strongyloides* spp., *Trichostrongylus* spp., and *Trichuris* spp. had the lowest infection rates overall. It is important to give adequate treatment and control methods because the parasite intensity was quite high in the research location.

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