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ISOLATION AND IDENTIFICATION OF GASTROINTESTINAL PARASITES IN SHEEP (OVIS ARIES)

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Abstract

Gastrointestinal parasitic infections (GIP) represent a major health and economic concern for sheep farming globally. This study, conducted in Hyderabad, India, aimed to streamline the isolation and identification of specific helminth species and assess their prevalence in local sheep populations. Post-mortem examinations were performed on gastrointestinal tract samples collected from a local slaughterhouse. Parasites were isolated and identified morphologically using standard parasitological techniques and microscopic examination. Of the six samples examined, four were positive, indicating a high overall prevalence of 67%. Two major species were identified: *Paramphistomum cervi* (rumen fluke) and *Moniezia expansa* (sheep tapeworm). *Paramphistomum cervi* was the predominant species, found in 84.9% of the total parasites identified, while *M. expansa* accounted for 15.1%. These findings highlight the significant impact of these parasites on the local sheep industry, particularly in younger animals, and the necessity for effective control strategies beyond just anthelmintic use.

Key words: Cestodes, *Moniezia expansa*, *Ovis aries*, *Paramphistomum cervi*, Trematodes Introduction

Sheep have been the most widely domesticated ruminant species worldwide for decades. According to the 20th census, sheep have the highest (14.13%) livestock production compared to goat (10.14%), but also get highly infected by various viruses, fungi, bacteria, and parasites, significantly decreasing the economy worldwide. (Ipsita Kar and Paviter Kaur, 2021). Parasites represent the major health concerns in sheep farming. Parasites are of two types: ectoparasites and endoparasites that affect the overall health of small ruminants. A parasite is an organism that lives on or inside the body of a host. Parasitic diseases are a primary concern to livestock production, which are caused by a diverse range of infections. (Carolino et al., 2017)) Helminths are the endoparasites that are classified into two groups: 1. Nematodes (roundworms), 2. Platyhelminthes (flatworms) were subdivided latterly into trematodes and cestodes. (Chaney, Amanda, 2012). It depends on the host metabolically for its habitat and nutrition, and competes with the host for food, resulting in harm to the sheep and goats. (Jyothi, Harikrat Singh et al., 2021) Ruminant production is an important part of the livestock industry across the world. The major obstacle to the growth of small ruminants such as sheep and goat is caused by parasitic infection. (Whitley et al., 2014) Parasites are the major issue that causes serious illness in sheep and goats, as they induce major economic losses such as decreased productivity, weight loss in sheep, low fertility rate, etc. (Antunes, 2021). Trematodes such as *Paramphistomum* belong to the platyhelminths and cause gastrointestinal parasitic diseases in sheep and goats, which impact economic loss worldwide. (Choudhary, Hasnani et al., 2015). *Moniezia* is a genus of tapeworms found in the intestine. Species include *M. expansa*



Methodology:

The study was conducted in Hyderabad, India. Gastrointestinal tract samples were collected from six sheep at the Kachiguda slaughterhouse in May Standard parasitological techniques were employed for the isolation of adult flukes and tapeworms from the rumen and intestine.

Isolated parasites were fixed in 10% formalin and 90% distilled water for 24 hours For morphological examination, specimens were stained using an aceto-carmin solution and mounted on microscopic slides with DPX mountant Microscopic examination under both standard and electronic microscopes was performed to identify the parasite species based on morphological characteristics The overall prevalence was calculated as the number of infected hosts divided by the total number of hosts examined Prevalence percentages for individual species were determined by dividing the number of a specific parasite species by the total number of parasites found in the infected sheep.

Results:

No. of host examined	Infected	No. of % extracted from trematode	Cestode	Prevalence percentage P.cervi	Abundance percentage P.cervi	Mean percentage P.cervi	Prevalence percentage M.expansa	Abundance percentage M.expansa	Mean percentage M.expansa
6	4	40	8	67%	666.60%	1000%	67%	133.33%	200%
6	4	28	4	67%	466.60%	700%	67%	66.60%	100
6	4	44	9	67%	733%	1100%	67%	150%	225%
6	4	73	13	67%	1,216.60	1825%	67%	216.60%	325%
6	4	58	8	67%	966.60%	1450%	67%	133.33%	200%
6	4	32	7	67%	533.30%	800%	67%	116.66%	175%

Table 1. To represent the prevalence, Abundance, and Mean Intensity of parasites present in sheep.

Parasites were found in the gastrointestinal tracts of the examined sheep Out of 6 samples collected, 4 were found to be positive, resulting in an overall prevalence of 67% Two species were identified: *Paramphistomum cervi* (rumen fluke) and *Moniezia expansa* (sheep tapeworm) A total of 324 gastrointestinal parasites were found across all samples. *Paramphistomum cervi* was the most predominant species, accounting for 275 individuals, which is a prevalence percentage of 84.9% *Moniezia expansa* accounted for the remaining 49 individuals, with a prevalence percentage of 15.1%). Trematodes (specifically *P. cervi*) showed higher prevalence than cestodes (*M. expansa*), especially in younger sheep



Fig.1 . Parasites attached to wall



Fig:2 cestodes



Fig: 3Trematodes

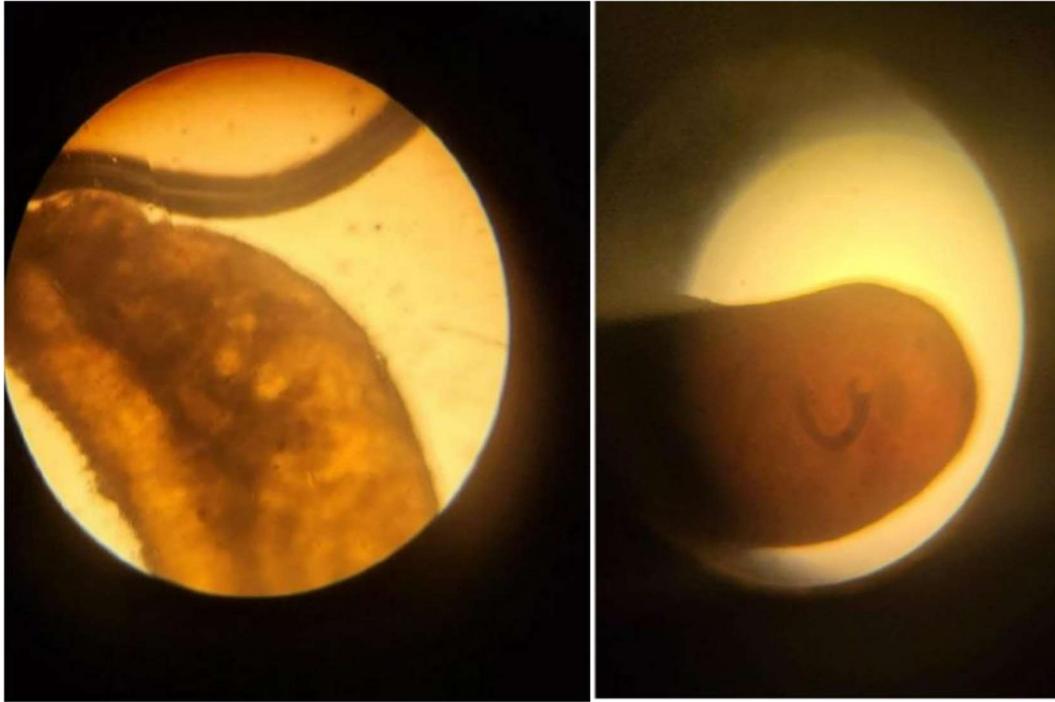


Fig:4 Microscopic view of *Paramphistomum Cervi*

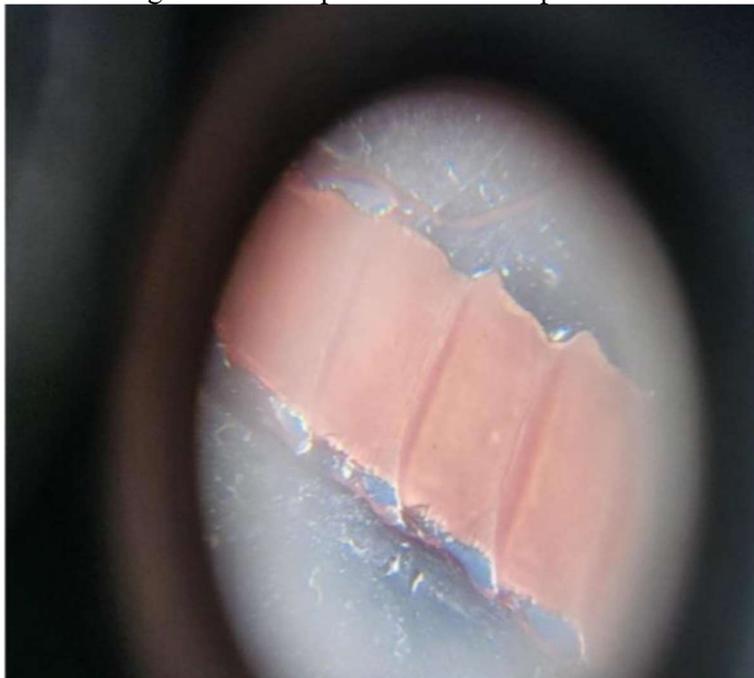


Fig. 5: Microscopic view of *Moniezia Expansa*



Discussion

The present study was conducted successfully to isolate and identify parasites in sheep. The two major parasites found in the gastrointestinal tract of sheep are *Paramphistomum cervi* and *Moniezia expansa*. The finding report highlights the high prevalence of trematodes, followed by cestodes.

The dominance of *P. cervi* suggests that the local environmental conditions, (Almeida et al, 2023). The present study was conducted during the month of June, and the result of parasite prevalence in examined sheep was 67%. The two major species recorded in the study were *Paramphistomum cervi*, belonging to the trematode, and *Moniezia expansa*, belonging to the cestode.

The prevalence of *Paramphistomum cervi* was 84.9% where the parasite *Moniezia expansa* showed a prevalence of 15.1%. Therefore, the trematode parasite was more prevalent than cestodes in younger ones compared to older 44 ones, which aligns with the report of (Ayaz, Raza et al, 2013). The age of sheep also influences the prevalence of parasites (Raza et al, 2007). ikely involving intermediate snail hosts in wet grazing areas, favor its lifecycle. Immature *P. cervi* flukes cause significant damage and mortality in young ruminants during migration through the intestinal wall, while adults in the rumen lead to production losses and general unthriftiness.

While *M. expansa* infections are often considered less pathogenic than fluke infections, they can still contribute to weight loss and digestive problems, particularly in younger, more susceptible animals (The findings highlight that age and possibly management factors (e.g., access to contaminated pastures) influence the prevalence of different parasites The increasing issue of anthelmintic resistance globally underscores the need for integrated parasite management strategies that include proper diagnosis, hygiene, pasture management, and targeted use of effective drugs, rather than relying solely on chemical treatments. Studies conducted in various regions have shown that the variation in the prevalence of these gastrointestinal parasites is due to climate conditions in tropical and subtropical areas. The high prevalence of parasites can also be due to poor immunity (Demiaszkiewicz et al, 2020). The infestation of parasites can also be influenced by factors such as age, gender, geographical location, and management. (Eke et al., 2019).

Conclusion

This study successfully isolated and identified two major gastrointestinal parasites in the local sheep population: *Paramphistomum cervi* and *Moniezia expansa*. The high prevalence of *P. cervi* emphasizes its significant economic impact and the need for region-specific control measures. Addressing these parasitic infections through an integrated approach is crucial for improving animal health and productivity in the livestock industry.

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