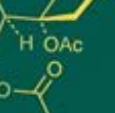
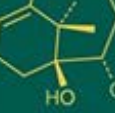
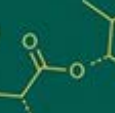
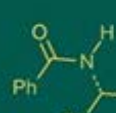
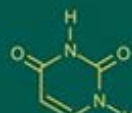
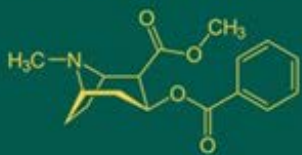


International Journal of Advanced Biochemistry Research



ISSN Print: 2617-4693
ISSN Online: 2617-4707
NAAS Rating (2026): 5.29
IJABR 2026; SP-10(8): 394-398
www.biochemjournal.com
Received: 22-05-2026
Accepted: 27-06-2026

Priyanka Kumari Sharma
Division of Parasitology,
ICAR-Indian Veterinary
Research Institute, Bareilly,
UP, India

Sakshi
Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Bareilly, UP, India

Deepak Dohare
Division of Parasitology,
ICAR-Indian Veterinary
Research Institute, Bareilly,
UP, India

M Sankar
Division of Parasitology,
ICAR-Indian Veterinary
Research Institute, Bareilly,
UP, India

Corresponding Author:
Sakshi
Division of Medicine, ICAR-
Indian Veterinary Research
Institute, Bareilly, UP, India

Comparative epidemiology of gastrointestinal parasitic infections in livestock in wellmanaged farms of India

Priyanka Kumari Sharma, Sakshi, Deepak Dohare and M Sankar

DOI: <https://www.doi.org/10.33545/26174693.2026.v10.i8Se.9456>

Abstract

Gastrointestinal parasites remain a major challenge for livestock populations despite the existence of regular control programmes. The present study evaluated the faecal samples randomly collected from different farms of the Assam region maintained under good management practices and with a history of routine deworming. The study involved 450 animals: pigs, goats and cattle (150 each). The faecal flotation method of examination was used, and the samples were also examined by the simple sedimentation technique. We observed mixed infections in both pigs and goats; however, in cattle we did not find any mixed infections, and very few were positive. Statistical analysis showed a significant difference. The overall prevalence of gastrointestinal parasites was 55.3% and highest in goats (76.0%), followed by pigs (54.0%) and cattle (36.0%). The results revealed high levels of mixed infections in pigs and goats, a major difference in parasitic infections between the two species, despite routine management. These findings emphasise the need for continuous investigations on the efficacy of the antiparasitic drugs in use.

Keywords: Faecal examination, coccidia, livestock, deworming, mixed infections

1. Introduction

In India, the methods of animal husbandry are primarily defined by conventional livestock management techniques, especially with cattle, sheep, goats, pigs, and poultry. In 2025, the predicted livestock numbers included around 193.5 million cattle, 74.26 million sheep, 153.8 million goats, 9.06 million pigs, and 851.81 million fowl.

Parasitic diseases of the gastrointestinal system remain a significant danger in global livestock husbandry, resulting in considerable economic losses due to decreased growth rates, impaired milk output, and increased mortality (Thrusfield, 2018) ^[1]. These infections represent a higher risk to animals, including sheep, goats, pigs, and cattle, particularly in production systems that depend on substantial or semi-intensive management (Anish *et al.*, 2026) ^[2]. Recent discoveries indicate the widespread presence of gastrointestinal parasites across many geographical regions, emphasising their significance in animal health management (Karimou *et al.*, 2025) ^[3].

Coprospecty is a trustworthy diagnostic procedure for evaluating parasite loads by faecal analysis, with the McMaster technique being acknowledged as the principal approach for faecal egg quantification (Roeber *et al.*, 2013) ^[4]. The incidence and dissemination of gastrointestinal parasites fluctuate significantly, influenced by a blend of agroclimatic variables, management strategies, and host-specific characteristics including age, sex, and breed vulnerability (Thrusfield, 2018) ^[1]. In domesticated ruminants, prevalent gastrointestinal nematode genera are *Ascaris*, *Haemonchus*, *Trichostrongylus*, *Strongyloides*, *Trichuris*, *Cooperia*, *Ostertagia*, *Nematodirus*, *Capillaria*, and *Oesophagostomum*, among all (Mohammedsalih *et al.*, 2019) ^[5].

Moreover, protozoan parasites such as *Balantidium*, *Eimeria*, and *Cryptosporidium* are recognized for infecting these animals, adversely affecting their health, productivity, and reproductive efficacy (Rashid *et al.*, 2019) ^[6]. Tropical and subtropical climates, high humidity, moist soil, high temperatures, and even frigid environments facilitate the survival, reproduction, and spread of gastrointestinal nematodes and protozoan parasites (Rashid *et al.*, 2019) ^[6]. Parasitic infections in domesticated ruminants usually exhibit a seasonal pattern, with higher occurrence during the monsoon season and a lower prevalence during the summer (Getahun *et al.*, 2017) ^[7].

Coprospecty is a reliable diagnostic tool for evaluating parasite loads through faecal inspection, and the McMaster approach has long been acknowledged as the main way for quantifying faecal eggs (Roeber *et al.*, 2013; Cringoli *et al.*, 2017; Garcia & Cimerman, 2012) ^[4, 8, 9].

2. Materials and Methods

2.1 Sample source

A total of 450 faecal samples, 150 each from pigs, goats, and cattle, were collected/received at the Division of Parasitology, ICAR-Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, India, from animal farms in North East India. Samples were taken via rectum from seemingly healthy animals to determine parasite burden and the requirement for targeted deworming.

2.2 Coprological examination

All faecal samples were qualitatively evaluated using conventional flotation and sedimentation methods. Flotation was carried out with a saturated sodium chloride (NaCl) solution, whereas sedimentation was used to detect heavier helminth eggs. Microscopic inspection was conducted using 10× and 40× objective magnifications. Gastrointestinal parasite eggs and coccidian oocysts were recognised using Soulsby's (1982)^[10] standard identification keys, which included size, shape, shell characteristics, internal contents, and other differentiating factors.

2.3 Statistical analysis

Collected data were processed using Microsoft Excel, with statistical analyses conducted via SPSS version 26.0 (IBM Corp., Armonk, NY, USA) and GraphPad Prism 10.0 (GraphPad Software Inc., San Diego, CA, USA) to evaluate

gastrointestinal parasite prevalence in pigs, cattle, and goats. Descriptive statistics summarised prevalence and infection patterns. Pearson's Chi-square test assessed significance in parasite prevalence across species, using a degrees of freedom value of 2. Individual Chi-square tests (χ^2) analysed parasite distribution variations, with $P < 0.05$ indicating statistical significance and $P < 0.001$ indicating high significance.

3. Results

3.1 Prevalence of gastrointestinal parasites in different livestock species

A comprehensive analysis of 450 faecal specimens, consisting of 150 samples from pigs, cattle, and goats, respectively, was conducted to detect gastrointestinal parasites employing flotation and sedimentation methods. Out of the total, 249 (55.3%) samples were positive for one or more gastrointestinal parasites (Fig.1), whereas 201 (44.7%) samples were negative (Table 1).

Table 1: Overall infection status by host species
Infected (n, %) Not infected (n, %)

Pig	81 (54.0%)	69 (46.0%)
Cattle	54 (36.0%)	96 (64.0%)
Goat	114 (76.0%)	36 (24.0%)

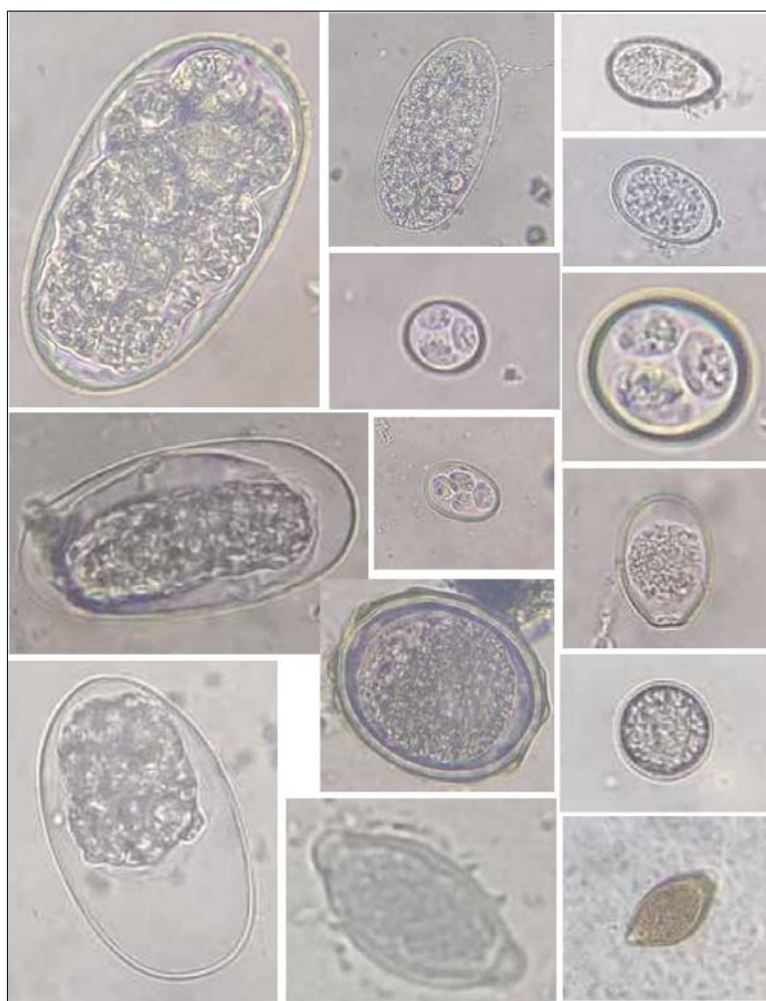


Fig 1: Photomicrographs of gastrointestinal nematode eggs and protozoan oocysts isolated from livestock faecal samples via conventional flotation technique. Typical *Strongyle*-type egg, sporulated and unsporulated Eimerian/Coccidian oocysts, *Trichuris suis* egg, *Ascaris suum* egg and *Strongyloides* egg

The general occurrence of gastrointestinal parasite infections differed markedly across the three livestock species ($\chi^2=16.24$, $df=2$, $P<0.001$). Goats had the highest infection rate (76.0%; 114/150), followed by pigs (54.0%; 81/150) and cattle (36.0%; 54/150) (Table 2).

Table 2: Prevalence of gastrointestinal parasites in faecal samples of pigs, cattle and goats

Parasite	Pig (n = 150)	Cattle (n = 150)	Goat (n = 150)
Coccidia/Eimeria spp.	78 (52.0)	42 (28.0)	84 (56.0)
Ascaris suum	24 (16.0)	0	0
Trichuris suis	12 (8.0)	0	0
Strongyle-type eggs	36 (24.0)	9 (6.0)	99 (66.0)
Strongyloides spp.	0	3 (2.0)	0
Negative samples	69 (46.0)	96 (64.0)	36 (24.0)

3.2 Parasite-wise prevalence

The investigation revealed five primary categories of gastrointestinal parasites: *Coccidia/Eimeria* spp., *Ascaris suum*, *Trichuris suis*, Strongyle-type eggs, and Strongyloides spp. (Fig. 3).

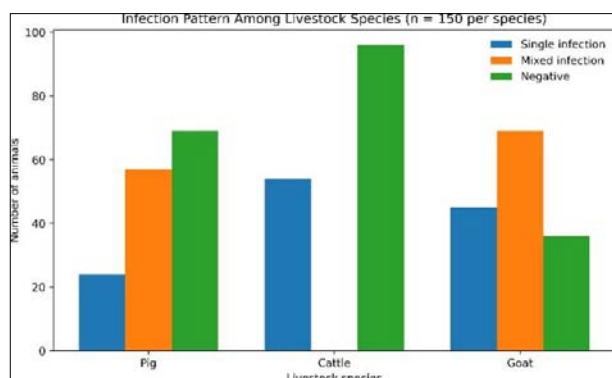


Fig 2: Graph showing single or mixed infection pattern among different livestock species

Table 5: Parasite-wise comparison among host species

Parasite	Pig (+)	Cattle (+)	Goat (+)	χ^2	P-value	Interpretation
Coccidia/Eimeriaspp.	78	42	84	9.254	0.0098	Significant
Ascaris suum	24	0	0	16.901	0.0002	Significant
Trichuris suis	12	0	0	8.219	0.0164	Significant
Strongyle-type eggs	36	9	99	43.566	<0.0001	Highly significant
Strongyloides spp.	0	3	0	2.013	0.3654	Not significant

3.3 Pattern of single and mixed infections (Fig. 2)

The analysis of infection patterns indicated significant variance among animal species (Figure 2). Of the 81 afflicted pigs, 24 (29.6%) had only one infection, whereas 57 (70.4%) had

Coccidia/Eimeria spp. was the most frequently found parasite in pigs, accounting for 52.0% (78/150), followed by Strongyle-type eggs (24.0%; 36/150), *Ascaris suum* (16.0%; 24/150), and *Trichuris suis* (8.0%; 12/150). Pigs tested negative for Strongyloides spp. infection.

In cattle, *Eimeria* spp. was the most common parasite (28.0%; 42/150), followed by Strongyle-type eggs (6.0%; 9/150) and Strongyloides spp. (2.0%; 3/150). Neither *Ascaris suum* nor *Trichuris suis* were found in cattle.

Goats had the highest prevalence of Strongyle-type eggs (66.0%; 99/150), followed by *Coccidia/Eimeria* spp. (56.0%; 84/150). No infections with *Ascaris suum*, *Trichuris suis*, or Strongyloides spp. were observed in goats (Table 3).

Table 3: Distribution of gastrointestinal parasites in different livestock species Host species No. examined Positive Negative Most prevalent parasite

Pig	150	81*	69	Coccidia/Eimeria spp. (52.0%)
Cattle	150	54*	96	Eimeria spp. (28.0%)
Goat	150	114*	36	Strongyle-type eggs (66.0%)

The prevalence of *Coccidia/Eimeria* spp. ($\chi^2=9.25$, $P=0.0098$), *Ascaris suum* ($\chi^2=16.90$, $P<0.001$), *Trichuris suis* ($\chi^2=8.22$, $P=0.016$), and Strongyle-type eggs ($\chi^2=43.57$, $P<0.001$) varied significantly between host species. The presence of Strongyloides spp. did not differ significantly among host species ($\chi^2=2.01$, $P=0.365$) (Table 5).

multiple infections. In cattle, all 54 affected animals (100%) had single parasite infections; no mixed infections were found. In goats, 45 (39.5%) of the 114 sick goats had single infections, whereas 69 (60.5%) had mixed infections (Table 4).

Table 4: Distribution of single, mixed and negative infections among host species

Host	Examined	Single infections	Mixed infections	Negative
Pig	150	24	57	69
Cattle	150	54	0	96
Goat	150	45	69	36

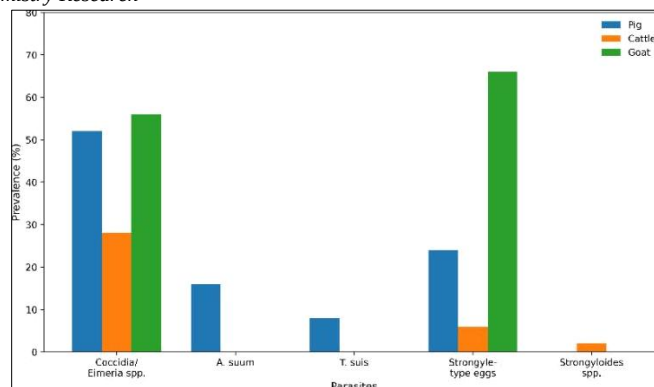


Fig 3: Graph showing grouped prevalence of parasites among different host species

In pigs, the most common mixed infections were *Coccidia/Eimeria* spp. + *Ascaris suum* and *Coccidia/Eimeria* spp. + Strongyle-type eggs, whereas in goats, the main mixed infection was *Coccidia/Eimeria* spp. + Strongyle-type eggs.

3.4 Distribution of negative samples

The percentage of parasite-negative samples varied by host species. Cattle had the largest proportion of negative samples (64.0%; 96/150), followed by pigs (46.0%; 69/150), with goats having the lowest proportion (24.0%; 36/150) (Fig. 2).

4. Discussion

4.1 Overall prevalence of gastrointestinal parasites

The overall prevalence of gastrointestinal parasites in livestock examined in the present study was 55.3%, and the highest prevalence was observed in goats (76.0%), followed by pigs (54.0%) and cattle (36.0%). The higher prevalence of gastrointestinal parasites in goats than cattle may be due to their extensive grazing habits, frequent exposure to contaminated pastures and increased contact with infective stages of gastrointestinal parasites. Differences in management, deworming schedules, stocking density, nutrition and environmental conditions may also affect the prevalence of parasites in livestock. Such findings have been reported in many epidemiological studies, where grazing small ruminants invariably exhibited a higher burden of gastrointestinal parasites than stall-fed or better-managed cattle. (Borah, S. 2015; Das et al., 2024; Sontigun et al., 2025) [11, 12, 13]

4.2 *Coccidia/Eimeria* spp.

Coccidia/Eimeria spp. were among the most often found parasites, appearing in 52.0% of pigs, 28.0% of cattle, and 56.0% of goats. Coccidiosis is one of the most important protozoan diseases of young and intensively managed livestock causing diarrhoea, poor growth, reduced feed efficiency and economic losses. High prevalence observed in pigs and goats may suggest favourable environmental conditions for oocyst sporulation, overcrowding and contamination of feeding and watering areas. In the field, oocysts survive with moisture and moderate temperatures, allowing continuous transmission. In caprine coccidiosis, reviews have also indicated that mixed infections with *Eimeria* species are frequent and that environmental contamination plays an important role in the persistence of infection within herds. (Das et al., 2024; Ali et al., 2025) [12, 14]

The decreased incidence found in cattle may be due to changes in husbandry, age-related immunity, or more efficient parasite management measures. Field-based epidemiological studies have found similar variance in *Eimeria* prevalence among cattle species (Sontigun et al., 2025) [13].

4.3 Strongyle-type eggs

Strongyle-type eggs were detected in all three livestock species, with a notably higher prevalence in goats (66.0%) compared to pigs (24.0%) and cattle (6.0%). The significantly elevated occurrence in goats aligns with the established vulnerability of small ruminants to gastrointestinal nematodes. Grazing continuously close to the ground where infective larvae accumulate also increases exposure. Warm temperatures and adequate humidity are also favorable for development and survival of larvae on pasture and thus increase infection pressure. Similar findings have been reported in goats from tropical and subtropical regions where strongyle nematodes are often the predominant gastrointestinal parasites. (Koyan et al., 2025; Singh et al., 2017; Das et al., 2024) [15, 16, 12]

4.4 *Ascaris suum* and *Trichuris suis*

Only swine exhibited infection with *Ascaris suum* (16.0%) and *Trichuris suis* (8.0%). These parasites are nematodes that have adapted to their hosts, frequently linked to swine production techniques, and are mostly spread by the consumption of infectious eggs from polluted surroundings. These species are not expected to be found in cattle and goats as these hosts are not the normal definitive hosts for these species. The present study revealed the prevalence of the disease indicating persistent environmental contamination and the need of better hygiene and strategic deworming in pig production units. (Das et al., 2024; Bawm et al., 2024; Tiele et al., 2023) [12, 17, 18].

4.5 *Strongyloides* spp.

A mere three (2.0%) cattle specimens tested positive for *Strongyloides* spp., whereas no infections were identified in swine or caprines. Low prevalence may be attributed to limited environmental contamination, good farm hygiene or previous anthelmintic treatment. *Strongyloides* infections are generally less common than those caused by strongyle nematodes in livestock but they are still important because of the ability to cause enteritis especially in young animals (Bhangale, 2018) [19].

4.6 Mixed infections

The elevated incidence of concurrent infections in swine and caprines was an important outcome of the current research. Infection with more than one species of gastrointestinal parasite was found in about 70.4% of the infected pigs and 60.5% of the infected goats, while all infected cattle had single infections. Mixed infections are common under natural grazing conditions as animals are constantly exposed to a variety of infective stages on contaminated pastures.

Mixed infections can increase disease severity, reduce feed conversion efficiency, impair growth, and complicate parasite

control programmes. Recently, epidemiological studies have also reported mixed infections with *Eimeria* spp. and gastrointestinal nematodes to occur frequently in grazing livestock (Das *et al.*, 2024; Chaurasiya *et al.*, 2021; Elshafie *et al.*, 2025) [12, 20, 21]

4.7 Study implications

The present findings indicate that gastrointestinal parasitism is prevalent in livestock within the study area, with considerable variability in parasite distribution among host species. Goats had the highest overall infection rate and the greatest number of strongyle-type eggs. Pigs were more commonly infected with host-specific nematodes such as *Ascaris suum* and *Trichuris suis*. These findings highlight the relevance of routine parasitological surveillance, strategic anthelmintic treatment, pasture management, and better sanitation in lowering infection pressure and increasing animal output.

References

1. Thrusfield M. Veterinary epidemiology. John Wiley & Sons; 2018.
2. Anish RK, Tamilm TV, Edith R, Elango A. Prevalence of gastrointestinal parasites among ruminants in north-central belt of Tamil Nadu: A coprological survey. Int. J. Adv. Biochem. Res. 2026;10(3):1021-1023.
3. Karimou IA, Maitourare HB, Marichatou H, Issa M. Prevalence and risk factors for gastrointestinal parasitosis of small ruminants at the end of the rainy season in periurban livestock farms in Tahoua, Niger. Moroccan Journal of Agricultural Sciences. 2025;6(3):161-169.
4. Roeber F, Jex AR, Gasser RB. Next-generation molecular-diagnostic tools for gastrointestinal nematodes of livestock, with an emphasis on small ruminants: a turning point. Advances in Parasitology. 2013;83:267-333.
5. Mohammedsalih KM, Khalafalla A, Bashar A, Abakar A, Hessain A, Juma FR, *et al.* Epidemiology of strongyle Nematode infections and first report of benzimidazole resistance in *Haemonchus contortus* in Goats in South Darfur State, Sudan. BMC veterinary research. 2019;15(1):184.
6. Rashid M, Rashid MI, Akbar H, Ahmad L, Hassan MA, Ashraf K, *et al.* A systematic review on modelling approaches for economic losses studies Caused by parasites and their associated diseases in cattle. Parasitology. 2019;146(2):129-141.
7. Getahun TK, Siyoum T, Yohannes A, Eshete M. Prevalence of gastrointestinal Parasites in dry season on dairy cattle at Holeta Agricultural Research Center Dairy Farm, Ethiopia. Journal of Veterinary Medicine and Animal Health. 2017;9(12):356-360.
8. Cringoli G, Maurelli MP, Levecke B, Bosco A, Vercruysse J, Utzinger J, *et al.* The Mini-FLOTAC technique for the diagnosis of helminth and protozoan Infections in humans and animals. Nature protocols. 2017;12(9):1723-1732.
9. Garcia JA, Cimerman S. Detection of *Dientamoeba fragilis* in patients with HIV/AIDS by using a simplified iron hematoxylin technique. Revista da Sociedade Brasileira de Medicina Tropical. 2012;45(2):156-158.
10. Soulsby EJJ. Helminths, Arthropods and Protozoa of Domesticated Animals. 7th Edition. London: Baillière Tindall; 1982.
11. Borah S. Parasitic load and haematobiochemical profile of cattle population of Joyhing area, North Lakhimpur, Assam. IJAR. 2015;5(3):85-88.
12. Das S, Pandit S, Jas R, Baidya S, Mandal SC, Debbarma A, *et al.* Prevalence of gastrointestinal parasitism in pigs of Tripura, India. Journal of Parasitic Diseases. 2024;48(1):108-116.
13. Sontigun N, Sansamur C, Klong-Klaew T, Kaewthamasorn M, Fungwithaya P, Mektrirat R. Seasonal Infective Dynamics and Risk Factors Associated with Prevalence of Zoonotic Gastrointestinal Parasites from Meat Goats in Southern Thailand. Animals. 2025;15(14):2040.
14. Ali EA, Ghafar A, Angeles-Hernandez JC, Yaseen M, Gauci CG, Beveridge I, *et al.* Global prevalence of *Eimeria* species in goats: a systematic review and meta-analysis. Frontiers in Veterinary Science. 2025;11:1537171.
15. Koyan OC, Kagira J, Waweru KP, Naomi M, Isaac O. Prevalence and Intensity of Gastrointestinal Parasites and Related Risk Factors in Goats Kept by Smallholder Farmers in Juja Sub-County, Kenya. 2025.
16. Singh E, Kaur P, Singla LD, Bal MS. Prevalence of gastrointestinal parasitism in small ruminants in western zone of Punjab, India. Veterinary world. 2017;10(1):61.
17. Bawm S, Htun LL, Chel HM *et al.* A survey of gastrointestinal helminth infestation in smallholder backyard pigs and the first molecular identification of the two zoonotic helminths *Ascaris suum* and *Trichuris suis* in Myanmar. BMC Vet Res. 2024;20:139. <https://doi.org/10.1186/s12917-024-03998-w>
18. Tiele D, Sebro E, H/Meskel D, Mathewos M. Epidemiology of Gastrointestinal Parasites of Cattle in and Around Hosanna Town, Southern Ethiopia. Vet Med (Auckl). 2023;14:1-9. <https://doi.org/10.2147/VMRR.S389787>
19. Bhangle G. A Coprological Survey of Gastrointestinal Parasites of Cattle in Udgir, Marathwada, India. 2018. <https://doi.org/10.20546/IJCMAS.2018.706.335>
20. Chaurasiya R, Dixit P, Dixit AK. Prevalence of Gastrointestinal Parasites in Goats in and Around Rewa, India. International Journal of Livestock Research. 2021;11(2):150-154.
21. Elshafie EI, Al-Habsi K, Ali H, eltahir Y, Al-Kharousi K, Al-Hamrashdi A, *et al.* Gastrointestinal parasites and molecular characterization of *Eimeria* spp. Among imported small ruminants in the Sultanate of Oman. Veterinary Parasitology: Regional Studies and Reports. 2025;61:101273.
22. Values are presented as number of positive samples with prevalence (%) in parentheses. Coccidia/*Eimeria* spp. Includes unidentified coccidian oocysts and morphologically identified *Eimeria* spp.
23. Figure 1. Graph showing grouped prevalence of parasites among different host species via conventional flotation technique. Typical Strongyle-type egg, sporulated and unsporulated *Eimeria*/*Coccidia* oocysts, *Trichuris suis* egg, *Ascaris suum* egg and Strongyloides egg