FUDMA JOURNAL OF ANIMAL PRODUCTION AND ENVIRONMENTAL SCIENCE

(*FUDMAJAPES*)

Volume 1 issue 1 2025

ASSESSMENT OF ENDOPARASITES AND ECTOPARASITES IN SMALL RUMINANTS IN ODO-ERAN, OBANTOKO, OGUN STATE

[1*]Olawale-Success, O. O., [2]Ajani, A. R., [3]Oyetayo, O. P., & [4]Oluwajinmi, A. L.
[1]Department of Microbiology and Biotechnology, Dominion University, Lagos-Ibadan Expressway, Oyo State, Nigeria.
[2]Department of Biology Education, Faculty of Education, Lagos State University, Ojo, Lagos, Nigeria.
[3] Department of Animal Science, Faculty of Agriculture, Obafemi Awolowo University, Ife, Nigeria.
[4]Department of Microbiology and Biotechnology, Dominion University, Lagos-Ibadan Expressway, Oyo State, Nigeria.
*Corresponding author: o.olawale-success@dominionuniversity.edu.ng 08029998323

Keywords: Prevalence, Gastro-Intestinal, Ectoparasites, Small Ruminants

ABSTRACT
The study investigates the prevalence of gastrointestinal parasites (GIPs) and ectoparasites (EPs) in small ruminants in Odo-Eran, Obantoko, Ogun State'. The objective of the study is to characterize GIPs as well as EPs present to determine level of prevalence of parasites and evaluate the risk factors of insect pest and parasite in sheep and goat using an experimental research approach. A cross sectional study using random sampling technique was used to select thirty (30) sheep and goats from five different farms. 2.5% potassium dichromate was used to preserve the parasite morphology and halt development of eggs and larva after collection. The samples were taken to the laboratory and were examined utilizing the floatation and sedimentation techniques. The statistical analysis of the collected data was done using SPSS 21. The findings of the study revealed that GIP prevalence was influenced by agro-economic zones in which intensive systems show a GIP prevalence of 75% and an EP prevalence of 60%, semi-intensive systems have a higher GIP prevalence of 83% and an EP prevalence of 64% while extensive systems exhibit the highest prevalence rates with 90% for GIPs and 70% for EPs. The research revealed that various species of parasites were present in the study population, with higher prevalence of gastro-intestinal parasites compared to ectoparasites. Based on the findings of this study, the research recommends collaboration between farmers, veterinarians, and the use of integrated parasite control measures, such as rotational grazing and use of anthelmintic should be promoted among farmers.

Citation: Olawale-Success, O. O., Ajani, A. R., Oyetayo, O. P., & Oluwajinmi, A. L. (2025). ASSESSMENT OF ENDOPARASITES AND ECTOPARASITES IN SMALL RUMINANTS IN ODO-ERAN, OBANTOKO, OGUN STATE. FUDMA Journal of Animal Production & Environmental Science, 1(1), 163-169. https://doi.org/10.33003/japes.2025.v1i1.163-169

INTRODUCTION

Small ruminants, particularly sheep and goats are essential component of livestock which are integral to the livelihoods of rural communities in Nigeria, serving as vital sources of meat, milk, wool and income (Chukwudi *et al.,* 2020). However, their productivity is significantly hindered by parasitic infections, notably gastrointestinal parasites and ectoparasites, which are prevalent across various regions of the country (Ezenwaka *et al.,* 2024).

Small ruminants like goats can adapt to several production systems and could be raised with relatively few inputs but they face huge production challenges (Hale and Coffey, 2011). Gastrointestinal parasites are considered the main diseases-causing organisms of small ruminants in Nigeria, leading to reduced production and productivity (Hassan *et al.,* 2013; Odogu and Okaka, 2016).

Goats and sheep are highly susceptible to gastro-intestinal parasites (GIP) and ectoparasites (EP) due to their reduced innate immune response against specific helminths as a result of their evolutionary history and the nomadic nature of goat husbandry. Ectoparasites, such as ticks, lice, and mites, are arthropods that live on the skin or hair of animals and can transmit diseases, while endoparasites live inside the body of their host, typically in the gastrointestinal tract. These gastrointestinal parasites cause a range of health problems in small ruminants, such as anaemia, weight loss, poor growth, and reduced milk production (Rizwan *et al.,* 2021). The prevalence of ectoparasites and endoparasites in small ruminants has been a subject of interest to researchers, veterinary practitioners, and animal health policymakers. In Nigeria, several studies have been conducted on the prevalence of ectoparasites and endoparasites in small ruminants (Karshima and Karshima, 2020); however, there is limited information on the prevalence of endoparasites in these animals in Ogun State. Understanding the prevalence of these parasites is critical for the effective management of small ruminants and the prevention of disease outbreaks (Ani and Nshiwu, 2015). This study aims to investigate the presence of endoparasite and ectoparasite in small ruminants in Odo-Eran, Obantoko, Ogun state.

MATERIALS AND METHODS

Study Location

The study was conducted in Odo-Eran, Obantoko, which lies in the centre of Odeda Local Government. The study was conducted at Abeokuta Metropolis, precisely sheep and goat farms available at Odo-Eran, Obantoko, Odeda Local Government Area, Ogun State, Nigeria. The local government has a land area of 2.053km^2 with the population of about 158,355, coordinate of Odeda $5^0 46^0$N and $3^0 2^0$ 20E.

Study Design

This cross-sectional study assesses the use of an experimental research which primarily involved the investigation of fecal sample from group of ruminant animals (goat and sheep) for prevalence of gastro-intestinal parasite. The prevalence of ectoparasites was determined by brushing animal's fur and examining with naked eyes, and under microscope.

Study Population And Size

This study was carried out by sampling three hundred (300) ruminant animals in five randomly selected farms within Odo-Eran, Obantoko, Ogun State in which thirsty sheep and thirty goats were analysis from each of these five randomly selected farm locations. The study was conducted for the duration of two month (April to May), in 2024.

Sample collection

Identification Of Endoparasite

Fresh fecal sample were directly collected from sheep and goats with cardboard paper and were placed inside a universal bottle at 7.00 am to 8.00 am in the morning. And the fecal samples were conveyed to the laboratory for further examination of the presence of gastrointestinal parasite.

Identification of ectoparasite

A pre-survey visit was made to the five randomly picked location to interact with the farmers and obtained their consent for the study through verbal acceptance and letter approval. The goats and sheep were examined visually for ectoparasites infestation on different body regions. This was done by brushing the animals' fur with fine-toothed brush to capture any arthropods insect. The insect were handpicked and forceps were used to pick some of these insect to retain mouthparts. The insects were kept in a 2.5% potassium dichromate solution, which helped to retain the ectoparasite morphology.

Laboratory Procedures

The fecal samples were examined by floatation and sedimentation techniques at the Federal University of Agriculture, Abeokuta Laboratory.

Floatation technique

This method was commonly used to detect intestinal parasite of nematode and cestode eggs because the eggs have a specific density (SG) that falls between 1.05 and 1.23, this technique allows the eggs to float. 3 grams of feces were transferred to a mortar and mixed with saturated sodium chloride solution. The mixture was stirred gently until the feces were thoroughly suspended and then poured through

a tea strainer into a container and gently pressed the excess fluid from debris remaining in the strainer. The mixture was immediately poured into the 15ml centrifuge tube. It was then centrifuge for five minutes at 1000rpm. After centrifugation, a drop of methylene blue (for staining) and additional saturated sodium chloride solution were added and mixed properly. A drop of the mixture was then placed on a clean slide and a coverslip was placed on the slide and was viewed at 10X and 40X magnification. Photographs of cyst, eggs and parasites were taken and identified based on egg's color, shape, and size.

Sedimentation Technique

This technique was used for detecting trematodes eggs with lower specific gravity. It provides good results as the eggs of the trematode are bit heavier than the other, where sediments of centrifuged contents were taken for eggs detection (Veterinary Lab. Techniques 2019). After analyzing the floatation section, the saturated salt solution was carefully removed from the test tube. The sediment content was then poured into the watch glass and gently stirred to blend it. To make a second slide, a single drop of the mixture was extracted. Iodine wet mount solution was used to stain the specimen. In order to find helminthe eggs, trophozoites, or cysts of gastrointestinal protozoans, two slides were made from a single sample (one from flotation and one from sedimentation) and viewed under a microscope at 10X and 40X magnifications.

Intensity of Infection

A sample was considered to have a heavy parasitic infection if six or more ova or oocysts were found per field; the number of eggs/oocyst and larvae found per field was used to measure the intensity of parasitic infection.

Data Analysis

Descriptive statistical tools such as percentages and chi square were used to analyse the data.

RESULTS

Tables 1 and 2 shows the prevalence of ecto- and endo-parasites in the sheep and goats studied. The presence of specific gastro-intestinal parasites (GIPs) and ectoparasites (EPs) varies across different farming management systems. In intensive farming systems, the predominant GIPs are *Strongyloides spp* with a value of 12.3% and *Trichostrongylus spp*., show highest prevalence value 18.1% while the main EPs are *Boophilus spp*. (13.2) and *Sarcoptes scabiei* (15.9). In semi-intensive systems, *Haemonchus contortus* (16.1) and *Nematodirus spp* (17.3) are the common GIPs, and *Amblyomma spp* (15.9) and *Demodex spp* (17.9) are the prevalent EPs. In extensive farming systems, *Oesophagostomum spp* (19.3) and *Cooperia spp* (16.9) are the key GIPs, and *Hyalomma spp* (19.6) and *Psoroptes spp* (11) are the main EPs. This distribution indicates that different farming practices and environmental conditions influence the different types of endoparasites and ectoparasites that sheep and goats are exposed to.

Table 1: Prevalence of Ectoparasite infestation on the ruminant (sheep and goat)

Management system	Ectoparasites	Ruminants infested Frequency n=189	Prevalence %
Intensive	*Boophilus spp*	25	13.2
	Sarcoptes scabiei	30	15.9
Semi-intensive	*Amblyomma spp*	30	15.9
	Demodex spp	34	17.9
Extensive	*Hyalomma spp*	37	19.6
	Psoroptes spp	33	11

Table 2: Prevalence of Endoparasite in the ruminant (sheep and goat)

Management system	Ectoparasites	Ruminants infested Frequency n = 248	Prevalence %
Intensive	*Strongyloides spp*	30	12.3
	Trichostronglus spp	45	18.1
Semi-intensive	*Haemnchus contortus*	40	16.1
	Nematodirus spp	43	17.3
Extensive	*Oesophagostomum spp*	48	19.3
	Cooperia spp	42	16.9

The prevalence of GIPs and EPs varies significantly across different farming systems (Table 3). Intensive systems show a GIP prevalence of 75% and an EP prevalence of 60%. Semi-intensive systems have a higher GIP prevalence of 83% and an EP prevalence of 64%. Extensive systems exhibit the highest prevalence rates, with 90% for GIPs and 70% for EPs. These findings suggest that more extensive and semi-intensive farming practices are associated with higher levels of parasite infections, potentially due to increased exposure to contaminated environments and limited parasite control measures. It was observed that there is a significant relationship between farming managing system and the infection of GIPs in sheep and goats, with a critical value of $r = 0.02$ at $P \leq 0.05$. This suggests that the prevalence of GIPs varies significantly across different agro-economic zones. However, for EPs, across different farming management system shows no significant relationship $r = 0.3$ at P 0.05

Table 3: Prevalence of GIPs and EPs base on Farming System

Infections	System	Infected	Not Infected	Total	Prevalence %
GIPs	Intensive	75	25	100	75
	Semi-Intensive	83	17	100	83
	Extensive	90	10	100	90
	Total	248	52	300	82.67
EPs	Intensive	60	40	100	60
	Semi-Intensive	64	36	100	64
	Extensive	70	30	100	70
	Total	194	106	300	64.67

Several risk factors contribute to the prevalence of GIPs and EPs in sheep and goats reared in low-input, low-output systems (Table 4). Poor housing conditions are associated with higher prevalence rates of both GIPs (89.1%) and EPs (86.5%) compared to good housing conditions. Continuous grazing practices result in a higher prevalence of GIPs (80.1%) and EPs (79.0%) compared to rotational grazing which only resulted in high GIPs (85.5%). Irregular or no health management practices lead to significantly higher prevalence rates for GIPs (96.5%) and EPs (91.2%) compared to regular health management. These findings highlight the importance of improving housing, grazing practices, and health management to reduce the burden of parasite infections in sheep and goats.

Table 4: Factors that enhance ruminant animal exposure to GIP and EPs

Risk Factors	Groups	Infected GIPs	Not Infected GIPs	GIPs (%)	Infected EPs	Not Infected EPs	Eps (%)
Housing condition	Poor housing	139	17	89.1%	135	21	86.5%
	Good housing	109	35	75.6%	59	85	40.9%
Grazing practices	Continuous	130	32	80.1%	128	34	79.0%
	Rotational	118	20	85.5%	66	72	47.8%
Health management practice	Regular	106	47	69.2%	60	93	39.2%
	Irregular	142	5	96.5%	134	13	91.2%

The results in Table 5 show the prevalence of GIPs and EPs during the sampling season of April and May. It was observed in the month of April that 130 ruminant animals were infected with GIPs and 20 animals were free from GIPs infection while in the month of May 118 ruminants animals were infected with GIPs and 32 animals were not infected. The prevalence of GIPs showed no significant relationship ($r = 0.07$, $P \leq 0.05$) between the sampling period and the infection rates of both GIPs. During the month of April 100 ruminant animals were infected with EPs and 50 animals were not infected and during the month of May 94 ruminant animals were infected with EPs while 56 animals were free of EPs. The prevalence of EPs across the sampling season suggests that there is no significant difference $r = 0.47$, at $P \leq 0.05$.

Table 5: Infection of GIP and EP by Sampling Season

Infections	Period	Infected	Not Infected	Total
GIPs	April	130	20	150
	May	118	32	150
	Total	248	52	300
EPs	April	100	50	150
	May	94	56	150
	Total	194	106	300

Out of 164 male ruminant animals examined for GIPs, only 164 were infected and 118 out of 136 female ruminant animals were infected with GIPs infection which show no significant difference ($r = 0.22$, at $p \leq 0.05$) among the sexes (Table 6). 108 out of 172 male ruminants animals examined for EPs were infected and 88 0ut of 128 were infected with EPs no significant differences was observed ($r = 0.55$, at $p \leq 0.05$). These findings suggest that the prevalence of GIPs and EPs infections does not significantly differ between male and female animals.

Table 6: Infection of GIPs and EPs by Sex

Infections	Sex	Infected	Not Infected	Total
GIPs	Male	130	34	164
	Female	118	18	136
	Total	248	52	300
Eps	Male	108	64	172
	Female	88	40	128
	Total	196	104	300

Table 7 shows the prevalence of GIPs and EPs according to the animal age group. 80 ruminant animals of age < 1 year were examined for GIPs and 68 were infected while 12 were not infected. However, 75 out of 90 ruminant animals were infected with EPs from the age of < 1 year and 119 out of 210 were infected with EPs from the age group of > 1 years. The prevalence of GIPs and EPs observed between the ages indicates a significant relationship with p-value less than 0.001. These results suggest that the prevalence of GIPs and EPs infections significantly varies with the age of the animals, with younger animals (<1 year) showing higher prevalence rates compared to older animals (>1 years). This highlights the increased susceptibility of younger animals to parasite infections.

Table 7: Infection of GIPs and EPs by Age

Infections	Age	Infected	Not Infected	Total
GIPs	< 1 year	68	12	80
	> 1 years	180	40	220
	Total	248	52	300
Eps	< 1 year	75	15	90
	> 1 years	119	91	210
	Total	194	106	300

Discussion

This study investigated the prevalence of gastro-intestinal parasites and ectoparasites in sheep and goats in Odo-Eran, Obantoko, Odeda Local Government, Ogun State. The results showed a high prevalence of gastrointestinal parasites (82.67) and ectoparasites (64.67) in the study area. This high prevalence suggested that different farming management system favours the multiplication of both GIPs and EPs in Odo-Eran, Ogun state. The 82.67% of GIPs and 64.67% in this study was high when compared to the 38.6% and 61.3% reported by Abah *et al.* (2022).

Six different GIPs were observed which includes *Strongyloides spp*, *Trichostronglus spp*, *Haemnchus contortus*, *Nematodirus spp*, *Oesophagostomum spp* and *Cooperia spp*. Although the *Oesophagostomum spp* was the most common gastrointestinal parasite (19.3) among the extensive farming system, *Haemnchus contortus* was abundant in semi-intensive farming system (16.1) while *Trichostronglus spp* (18.1) was the common GIPs found within intensive farming system. Six different ectoparasite were also observed in the study which includes *Boophilus spp*, *Sarcoptes scabiei*, *Amblyomma spp*, *Demodex sp*, *Hyalomma spp* and *Psoroptes spp*. And the most prevalent are *Sarcoptes scabiei* (15.9) in intensive farming management, *Hyalomma spp* (19.6) were the most common ectoparasite found in extensive farming system while *Demodex spp* (17.9) was observed in semi-extensive farming system. This is in line with a study conducted with Mohammed *et al.* (2025) and Biu *et al.* (2018). The prevalence of GIPs (130) and EPs (100) in the month of April is higher compare to the month of May. There are more GIPs (130) and EPs (108) in male ruminant animals compare to the Female ruminant animals. The ruminant animals > 1 years had more GIPs and EPs than the ruminant animals in the age bracket < 1 year this was collaborated with the finding of Biu *et al.* (2018) and Abah *et al.* (2022). The risk factors of age, sex and season are significant to the prevalence of GIPs and EPs.

The results show a high prevalence of gastrointestinal and ectoparasites in sheep and goats in Odo-Eran, Obantoko, Odeda Local Government, Ogun State. The study findings are consistent with previous studies in Nigeria. This study highlights the need for effective control measures to reduce the prevalence of gastro-intestinal parasites and ectoparasites in sheeps and goats in Odo-Eran, Obantoko, Odeda Local Government, Ogun State.

CONCLUSION

The prevalence of gastro-intestinal parasites and ectoparasites in sheep and goats in Odo-Eran, Obantoko, Odeda Local Government, Ogun State has been found to be significant. The study revealed that various species of parasites were present in the study population, with a higher prevalence of gastro-intestinal parasites compared to ectoparasites. The presence of these parasites can have significant implications for the health and productivity of sheep and goats, as well as the overall livestock industry. Farmers should be educated on the importance of parasite control and the available methods for preventing and treating infestations. Regular deworming and ectoparasite control measures should be implemented by farmers to reduce the prevalence of gastrointestinal. Collaboration between farmers, veterinarians, and extension workers is essential to develop and implement effective parasite control programs that can help reduce the prevalence of gastro-intestinal and ectoparasites in sheep and goats in Odo-Eran, Obantoko, Odeda Local Government, Ogun State

REFERENCES

Abah, A.E., Awi-Waadu, G.D.B., & Sunday, F.O. (2022). Ectoparasites and Endoparasite of goats in PortHarcourt, River State, Nigeria. *Journal of Entomology and Zoology Studies,* 10(2), 08-12. https://www.doi.org/10.22271/j.ento.2022.v10.i2a.8961

Ani, O.C., & Nshiwu, G.N. (2015). Assessment of intestinal parasites in goats slaughtered at Abakaliki abattoir, Ebonyi state, Nigeria. *Nig. J. Parasitol.,* 36(2), 81–84.

Biu, A.A., Ngoshe, I.Y., Onyiche, E.T., Raymond, D1., & Kayeri, B.K. (2018). Incidence of Endo and Ecto Parasites of Ruminants on the University of Maiduguri Animal Farm, Nigeria. *Ibadan Journal of Agricultural Research*, Vol. 14(1).

Chukwudi, I.C., Ogbu, K.I., Nwabueze, A.L., Olaolu, O.S., Ugochukwu, E.I., & Chah, K.F. (2020). Update on P*este des Petits* Ruminants status in South East Nigeria: Serological and farmers awareness investigation, and potential risk factors. *Trop. Anim. Health Prod.*, 52(6), 3285-3291. https://doi.org/10.1007/s11250-020-02359-7

Ezenwaka, C.O., & Kolawale, A.A. (2024). Prevalence of gastrointestinal parasites of goats slaughtered in Swali, Yenagoa, Bayelsa State, Nigeria. *African Journal Online,* Vol. 24, 1-5. https://orcid.org/0000-0002-6842-4470

Hale, M., & Coffey, L. (2011). Sustainable control of internal parasites in small ruminant production. www.sare.org/publications/factsheet/pdf/10 AGI 2011.pdf. Accessed 23 May, 2024.

Hassan, D.I., Mbap, S.T., & Naibi, S.A. 2013. Prevalence of worm infection in Yankasa sheep and West African dwarf goats in Lafia Town and Environs, Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 4(4), 84-90.

Karshima, S.N., & Karshima, M.N. (2020). A systematic review and meta-analysis on the prevalence, distribution and nematode species diversity in small ruminants: a Nigerian perspective. *J Parasit Dis*., 44(4), 702–718. https://doi.org/10.1007/s12639-020-01249-x

Mohammed, S., Ramlatu, A., Yusuf, F.A., & Basira, U. M. (2025). Prevalence of ectoparasites of some ruminants slaughtered in Katsina central abattoir, Nigeria. *Journal of Entomology and Zoology Studies,* 13(2), 31-37. https://www.doi.org/10.22271/j.ento.2025.v13.i2a.9471

Odogu, K.I. & Okaka, C.E. (2016). Prevalence of ectoparasites of goats (*Capra aegagrus hircus*) slaughtered at Aduwawa abattoir in Benin City, Nigeria. *Int. J. Innov. Biosci. Res*, 4, 55-59.

Rizwan, H.M., Sajid, M.S., Iqbal, Z., Nadeem, R., Ahmad, M., Sultan, M., Saqib, M., Abbas, H., Shamim, A., Qudoos, A., & Haenlein, G.F.H. (2021). Correlation of the gastrointestinal parasitism with the phytominerals in the grazing sheep (*Ovis aries*). *Intl. J. Agric. Biol,,* 26, 60-68. https://doi.org/10.17957/IJAB/15.1809