Vol. 6 No. 1, June, 2026

FUAM Journal of Pure and Applied Science

Available online at
www.fuamjpas.org.ng

An official Publication of
College of Science
Joseph Sarwuan Tarka University,
Makurdi.

FUAM Journal of Pure and Applied Science

© College of Science, Joseph Sarwuan Tarka University, Makurdi

https://fuamjpas.org.ng/

Vol.6 No. 1 June, 2026

Report of Arthropod Parasites of West African Dwarf Goats (*Capra Hircus*), Rivers State, Nigeria

C.C.[1]*Amuzie, T.[1] Ikonwa, I.B.[1] Ekerette, C.[1] Okoli & L.S.[2] Gbiiah

[1]Laboratory of Entomology and Parasitology, Department of Animal and Environmental Biology, Rivers State University, Port Harcourt

[2]Department of Science Laboratory Technology, Ken-Sarowiwa Polytechnic, Bori, Rivers State

*Correspondence E-mail: ekeh.chidinma@ust.edu.ng

Received: 24/10/2025 **Accepted**: 01/12/2025 **Published online**: 02/12/2025

Abstract

Parasitic arthropods are important causes of economic loss in veterinary animals such as the West African dwarf goats which are globally recognized as sources of protein, financial prosperity and hides. In this research, a sample of forty-one goats were examined from two locations (Elele and Diobu) in Rivers State, Nigeria, using coat brushing techniques, fixation in 70% ethanol, microscopy and identification using keys. Lice (*Bovicola limbatus, Damalinia caprae, Linognathus africanus*) and mites (*Psoroptes cuniculi*) were isolated from both locations. Both parasite diversity and prevalence were higher in Elele with three parasites (*Bovicola limbatus, Damalinia caprae* and *Psoroptes cuniculi*) and 28.6% prevalence against two parasites (*Linognathus africanus* and *Psoroptes cuniculi*) and 10% prevalence at Diobu. Individual prevalence ranged from 5.0% to 14.3% while mean intensity of infection was about one parasite per infected host. Considering differences with species isolated from related research, the need for continual monitoring for these parasites is emphasized as identification is key to specific control and treatment measures. Host pathology and zoonotic potentials are highlighted, as well as adoptable control measures.

Keywords: lice, mites, mange, zoonosis, dermatoses

Introduction

West African Dwarf Goats are often kept for their meat, milk, hides and financial gains [1]. They are easy to maintain and do well in extensive or semi-intensive rearing systems [2]. Goats are reared by several households in rural communities in southern and eastern Nigeria. In fact, in the Igbo tradition in south eastern Nigeria, it is required of the parents of a newly married lady to give her a female goat as she goes to live with her husband. It is a symbol of fertility and resourcefulness. This practice and several others, including its use in sealing of transactions, have over the years contributed to the constant rearing of goats among those tribes.

Arthropod parasite infestations, however, inflict injuries and degrees of discomfort to goats while resulting in losses to the owners. They have been reported to contribute to a reduction in levels of vitamin B12 and iron in goats [3]. Some species also transmit disease-causing organisms to infested animals [4] while others could provide avenue for secondary infection by microbes [5]. These parasites include the flies, lice, fleas, mites and ticks.

In earlier research in Onitsha, a commercial city in south eastern Nigeria, Anyaegbunam *et al.* [6] revealed the presence of several of these parasites including lice (*Damalinia* sp.), ticks (*Ixodes ricinus*), mites (*Demodex bovis*), flies (*Culiseta longiareolata*), and fleas (*Ctenocephalides canis*) on goats. These authors reported a prevalence of 53.5%, which was high and attributed it to the refusal of the farmers to adopt methods of parasite control. In another research still in southeastern Nigeria, 70.7% of goats were found to be infested by arthropod parasites [7].

Some authors have also reported on ectoparasite infestation of goats in southern Nigeria. For instance, Isaac *et al.* [8] reported on the presence of lice, ticks and fleas on goats at Edo State. In Port Harcourt, Abah *et al.* [9] reported a relatively high prevalence of arthropod parasites in goats. These authors isolated *Culiseta* spp., *Demodex* spp., *Ixodes* spp., *Damalinia* spp. and *Ctenocephalides* spp. at a prevalence of 38.1%, 20.6%, 16.9%, 14.0% and 10.3%, respectively.

Nigerian dwarf goats have been reported to be at a higher risk of developing skin diseases such as pediculosis, malignant skin tumours, *Psoroptes* and *Chorioptes* spp. infestation among others

[1]. It is hence important to continually examine them for ectoparasitic organisms for early identification and commencement of treatment and control measures. This research was therefore conducted to ascertain the species, prevalence and intensity of arthropod parasite infestation on goats from two study locations (Diobu and Elele) in Rivers State, Nigeria.

Materials and Methods

Study Area

The samples for this study were collected from two locations (Elele and Diobu) in Rivers State, Nigeria. Elele lies at coordinates 5° 5' 60.00"N and 6° 49' 0.00"E in Ikwerre Local Government Area of Rivers State, Nigeria. The major occupations in Elele are farming and trading. Diobu (4°47'24"N, 6°59'36"E), on the other hand, is located in Port Harcourt Local Government Area of Rivers State, Nigeria. It is a more developed area and a major commercial center; the Rivers State University, Nkpolu-Oroworukwo campus is situated in Diobu, along with a major market in the State, Mile III market.

Sample Collection and Identification

The goats were selected randomly. A coat brushing technique was applied to dislodge parasites from the goat skin. Each animal was restrained by hand while the brushing was done with one brush per animal, and the entire animal body was examined. A white cardboard paper was placed underneath the animal to collect the fallouts. These were then transferred to and fixed in well labeled universal sample bottles containing 70% ethanol and transported to the Entomology and Parasitology Laboratory, Department of Animal and Environmental Biology, Rivers State University for examination and identification.

Samples were viewed under the light microscope (at x10 and ×40 magnification) and identified using keys [10].

Calculation of Prevalence and Mean Intensity of Infection

Prevalence and intensity of infection were calculated for the parasites according to the formula of Ifegwu *et al.* [11]: prevalence as percentage of infected hosts while mean intensity as number of parasites per infected hosts.

Prevalence = number of infected hosts x 100 ÷ total number of hosts

mean intensity = number of parasites isolated ÷ number of infected hosts.

Results

A total of forty-one West African dwarf goats were examined for ecto-parasites in this research, twenty-one were examined at Elele and twenty at Diobu, both in Rivers State, Nigeria. In total, three lice and one mite species were isolated from infested hosts from both locations. Generally, the level of parasite infestation was low. Eight hosts were infested - six at Elele and two at Diobu.

Two species of lice (*Bovicola limbatus* and *Damalinia caprae*) and the mite, *Psoroptes cuniculi*, were isolated from west African dwarf goats of Elele, Ikwerre LGA, Rivers State. Six of the twenty-one hosts were infested accounting for a prevalence of 28.6%. *Bovicola limbatus* infested three hosts, co-occurring with *Damalinia caprae* in one of the hosts. *Damalinia caprae* also infected three hosts, while *Psoroptes cuniculi*, on the other hand, infected two hosts, independently (Table 1).

Among the goats examined at Diobu, two hosts were infested. Hence, prevalence of infection was 10%. The hosts were independently infested with the mite, *Psoroptes cuniculi* and the louse, *Linognathus africanus*. Intensity of infection was also low as only one individual of each parasite was encountered in this location (Table 1). Photographs of the parasites are presented in plates 1 – 5.

Table 1: Ectoparasites isolated from West African Dwarf Goats of Elele and Diobu, Rivers State, Nigeria

Parasite	Elele		Diobu	
	Number of infected hosts (Prevalence %)	Number of parasites isolated (mean intensity)	Number of infected hosts (Prevalence %)	Number of parasites isolated (mean intensity)
Psoroptes cuniculi (mite)	2 (9.5%)	2 (1.0 parasite/infected host)	1 (5.0%)	1 (1.0 parasite/infected host)
Bovicola limbatus (louse)	3 (14.3%)	4 (1.33 parasite/infected host)	0	0
Damalinia caprae (louse)	3 (14.3%)	4 (1.33 parasite/infected host)	0	0
Linognathus africanus (louse)	0	0	1 (5.0%)	1 (1.0 parasite/infected host)

Plate 1: The louse, *Bovicola limbatus*, isolated from West African Dwarf Goats, Elele, Rivers State, Nigeria (x40 magnification)

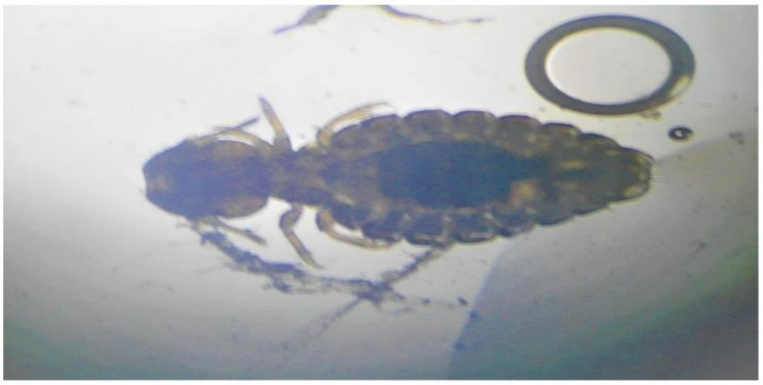

Plate 2: Biting louse, *Damalinia caprae*, isolated from West African Dwarf Goats, Elele, Rivers State, Nigeria (x40 magnification)

Plate 3: The biting louse, *Damalinia caprae*, attached to a hair shaft from the body of West African Dwarf Goats, Elele, Rivers State, Nigeria (x40 magnification)

Plate 4: The mite, *Psoroptes cuniculi*, isolated from West African Dwarf Goats, Elele and Diobu, Rivers State, Nigeria (x40 magnification)

Plate 5: The African louse, *Linognathus africanus*, isolated from West African Dwarf Goats, Diobu, Port Harcourt, Nigeria (x40 magnification)

Discussion

Lice species differed between both locations examined in this research. Whereas *Bovicola limbatus* and *Damalinia caprae* were isolated from goats of Elele, *Linognathus africanus* were isolated from goats of Diobu. A similar observation was made by Isaac *et al.* [8] who found different arthropod parasites infesting goats from different localities, and attributed it to parasite availability which is affected by prevailing local environmental and climatic conditions. The influence of prevailing environmental conditions on the distribution of parasites had earlier been emphasized by Urquhart *et al.* [12]. However, parasite availability is also determined by its presence, possibly by being transported from one location to another. As such, the absence of a parasite species may not be wholly accounted for by differences in environmental and climatic conditions as sanitary conditions and parasite availability are also implicated [8].

Psoroptes mites were isolated in this research; together with *Chorioptes* mites they are of global occurrence in goats [5, 13-14]. However, they are rarely reported as compared to ticks which are usually higher in prevalence [1]. Mite transmission is usually by direct contact with infected animals, and they are known to survive for longer periods in cooler environments. Elele being a rural setting with lots of shade trees must have provided adequate conditions for the parasite.

The higher prevalence of arthropod parasites in West African Dwarf goats of Elele is attributed to the husbandry practices and environmental conditions. Here, the animals are owned by families, and live long enough to encounter parasite species both from other animals and from the environment. At Diobu, however, they are kept by traders who purchase them from several places only to sell them out. The environment at Elele is also more humid, characterized by trees and surrounding bushes and farmlands, unlike at Diobu where the animals are kept in partly covered stalls.

The biting feeding method of *D. caprae* and the piercing and sucking action of *L. africanus* both cause damage to the animal skin, and could lead to secondary infections. Same is applicable to the biting/chewing louse, *B. limbatus*. Though *Psoroptes* mites feed on the surface of the skin, they cause mange which can be transmitted by direct contact or indirectly through contaminated objects. They often damage the skin if untreated [15].

The prevalence of arthropod parasites recorded in this study (28.6% in Elele and 10% in Diobu) is similar to that reported by other authors from the southern part of Nigeria. For instance, in Port Harcourt- Rivers State, Abah *et al.* [9] reported prevalence values ranging from 21.6% in Alakahia to 30.4% in Uniport Agric Farm. In the report of Isaac *et al.* [8] from Edo

State, southern Nigeria, prevalence of some tick species on cattle varied from low (2%) to high (90%) in some locations. However, the prevalence of the individual parasites was generally lower than those recorded for goats in southeastern Nigeria [6-7].

Comparing the diversity of parasite isolates in the present research to those reported by Abah *et al.* [9], in Rivers State, differences were observed. They [9] reported *Culiseta* spp., *Demodex* spp., *Ixodes* spp., *Damalinia* spp. and *Ctenocephalides* spp. from the goats examined at Alakahia, Rumuosi, Mile III and Uniport Agric farm. In the present research however, from goats of Elele and Diobu, *Bovicola limbatus*, *Damalinia caprae*, *Linognathus africanus* and *Psoroptes cuniculi* were isolated. Only *Damalinia* spp. was similar. This emphasizes the need for continual monitoring of ecto-parasites as identification of prevalent species is key to specific control measures. In comparison with a report from Abuja- Nigeria [16], however, both *Damalinia* and *Linognathus* species were similarly reported in the goats examined. This proves that variations in parasite occurrence may not only result from different ecological characteristics. Other factors include husbandry practices, herd size, sanitary conditions, source and kinds of feed, etc.

Results from Pakistan [13] showed lower overall prevalence of 11.14% as opposed to 28.6% reported herein for Elele but comparable to the 10.0% reported herein for Diobu, Rivers State, Nigeria. Also, ticks were predominant whereas they were completely absent from the present research. However, genera such as *Damalinia*, *Linognathus* and *Psoroptes* were common among the parasitic isolates from both studies.

The zoonotic potentials of parasitic arthropods have been highlighted [17-18], but are often overlooked especially among peasants. Different forms of dermatoses (scabies, chiggers, etc) and lice infections inflict man as a result of transmission from infected animals and farm equipment [18]. Also, arthropod-borne infectious diseases often emerge in populations, sometimes spreading globally [19]. Care should therefore be taken by goat farmers, for instance, to ensure that preventive and control measures are adopted. The practice of personal hygiene and use of personal protective equipment while handling animals is recommended, as well as regular surveillance of farm animals for parasitic infections and subsequent treatment.

Conclusion

Lice (*Bovicola limbatus*, *Damalinia caprae*, *Linognathus africanus*) and mites (*Psoroptes cuniculi*) were isolated from West African Dwarf goats examined from two locations (Elele and Diobu) in Rivers State, Nigeria. The individual prevalence of these parasites ranged from 5.0% to 14.3% while the mean intensity of infection was about one parasite per infected host. Parasite diversity and prevalence was higher at Elele (28.6%), a more rural location, than at Diobu (10%).

Funding: This research was not funded by any organization.

References

1. White S.D., Affolter V.K., Molinaro A.M., Depenbrock S.M., Chigerwe M., Heller M.C. and Rowe J.D. 2022. **Skin Disease in Goats (Capra aegagrus hircus): a Retrospective Study of 358 Cases at a University Veterinary Teaching Hospital (1988–2020).** *Veterinary Dermatology*. 33, 227-e64. https://doi.org/10.1111/vde.13052.
2. Ka'oje A.B. and Bello A. 2021. **Goat (*Capra aegagrus hircu*) Production in Nigeria**. *Scholarly Journal of Agricultural Science*. 11(1), 33- 41.
3. Abdalrahman B., Mustafa B., Sadq S. and Ahmed K. 2022**. Influences of Some Ectoparasites on Vitamin B12 and Iron Levels of the Local Goats *(Capra hircus)*.** *Syrian Journal of Agricultural Research*. 9(3), 407-416.
4. Irshad N., Quyyum M., Hussain M. and Khan M.Q. 2010. **Prevalence of Tick Infestation and Theilerosis in Sheep and Goats**. *Pakistan Veterinary Journal*. 30(1), 178-180.
5. Rambozzi L., Meneguz P.G., Molinar-Min A.R., Pasquetti M. and Peano A. 2022. **Concurrent Chorioptic Mange and Dermatophytosis in Dairy Goats: A Case Report**. *Veterinary Science*. 9, 677. https://doi.org/10.3390/vetsci9120677.
6. Anyaegbunam L.C., Obi Z.C. and Ezeoke C.M. 2013. **Ectoparasitosis and Endoparasites in Local Goats (*Capra hircus*) In Onitsha, Anambra State, Nigeria**. *International Journal of Fauna and Biological Studies*. 1(1), 1-3.
7. Obi Z.C., Anyaegbunam L. and Orji M-K.N. 2014. **Ectoparasitosis, a Challenge in Sheep and Goat Production in Uli, Anambra State, Nigeria**. *International Journal of Fauna and Biological Studies*. 1(1), 27-29.
8. Isaac C., Ohiolei J.A., Igbinosa I.B. and Nmorsi O.P.G. 2019. **The Prevalence of Ectoparasites of Livestock and Dogs in Edo State (South-South), Nigeria.** *Nigerian Veterinary Journal*. 40(1), 62 – 72.
9. Abah A.E., Awi-Waadu G.D.B. and Sunday F.O. 2022. **Ectoparasites and Endoparasites of Goats in Port Harcourt, Rivers State, Nigeria**. *Journal of Entomology and Zoological Studies*. 10(1), 8-12.
10. Mathison B.S. and Pritt B.S. 2014. **Laboratory Identification of Arthropod Ectoparasites**. *Clinical Microbiology Reviews*. 27(1), 48-67. Doi: 10.1128/CMR.00008-13.
11. Ifegwu M., Dagogo H.A., Robert B., Amuzie C.C. and Ekweozor I.K.E. 2023. **The gastrointestinal helminth parasite community of the bobo croaker, *Pseudotolithus elongatus* (Bowdich, 1825).** *Romanian Journal of Biology-Zoology*. 68(1-2), 3-9.
12. Urquhart G.M., Amuor J., Duncan J.L., Dunn A.M. and Jennings F.W. 2001. **Veterinary Parasitology**. Second edition, Backwell Science Ltd, London, 158-202 p.
13. Iqbal A., Siddique F., Mahmood M.S., Shamim A., Zafar T., Rasheed I., Saleem I. and Ahmad W. 2014. **Prevalence and Impacts of Ectoparasitic Fauna Infesting Goats *(Capra hircus)* of District Toba Tek Singh, Punjab, Pakistan**. *Global Veterinaria*. 12(1), 158-164.
14. Akinboade O. 2021. **Studies on Mange Mite Infections of Sheep and Goats in the South Western Region of**

Nigeria. *Nigerian Journal of Animal Production*. 9(1), 74-79. 10.51791/njap.v9i2.1990.

15. Mullen G.R., O'connor B.M., 2019. **Mites (Acari)**, pp. 533-602. In: *Medical and Veterinary Entomology*. Mullen G.R., Durden L.A. (eds.), Academic Press, Cambridge, USA. https://doi.org/10.1016/C2017-0-00210-0.

16. Idris H.S. and Umar H. 2007. **Prevalence of Ectoparasites in Goats *(Capra aegagrus hircus)* brought for Slaughter in the Gwagwalada Area, Abuja, Nigeria**. *Entomology Research*. 37(1), 25-28.

17. Diaz J.H. 2010. **Mite-Transmitted Dermatoses and Infectious Diseases in Returning Travelers**. *Journal of Travel Medicine*. 17, 21–31, https://doi.org/10.1111/j.1708-8305.2009.00352.x.

18. Rahman T., Sobur A., Islam S., Levy S., Hossain J., El Zowalaty M.E., Rahman A.T. and Ashour H.M. 2020. **Zoonotic Diseases: Etiology, Impact, and Control**. *Microorganisms*. 8, 1405; https://doi.org/10.3390/microorganisms8091405.

19. Wu W., Huang X. and Li J. 2021. **The Risk, Prevention, and Control of Arthropod-Borne Infectious Diseases**. In: *Prevention and Control of Infectious Diseases in BRI Countries*. Yang W. (eds), Springer, Singapore. https://doi.org/10.1007/978-981-33-6958-0_7.

Cite this article

Amuzie C.C., Ikonwa T., Ekerette I.B., Okoli C., & Gbiiah L.S. (2026). Report of Arthropod Parasites of West African Dwarf Goats (*Capra Hircus*), Rivers State, Nigeria. FUAM Journal of Pure and Applied Science, **6**(**1**):83-88