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PREVALENCE OF PARASITIC ARTHROPODS ON *SUS SCROFA DOMESTICUS* LINNAEUS (ACTIODACTYLA: SUIDAE) FROM TWO SELECTED PIG FARMS, PORT HARCOURT – NIGERIA

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Abstract
Parasitic arthropods are ecto-parasites that impact on domestic animal production. Pig rearing is very attractive due to the low management costs involved. However, parasitic arthropods can lead to economic losses. Most reports on ecto-parasites of livestock are concentrated on goats, cattle and poultry, thereby necessitating this research. This study investigated the prevalence of parasitic arthropods on the body of pigs reared at two farms located at Elelenwo and Rivers State University, Rivers State, Nigeria. A total of 76 pigs were examined (40 from Elelenwo comprised of 17 males and 23 females; and 36 from Rivers State University Farm comprised of 16 males and 20 females). Standard sampling and parasitological techniques, including coat shaving techniques and microscopy, were employed and appropriate identification keys were used. An overall prevalence of 39.4% (30 samples positive for parasites) was encountered. Two species of parasitic arthropods were isolated: *Rhipicephalus spp.* (26.3% prevalence) and *Ctenocephalides spp.* (13.1% prevalence). Specifically, Elelenwo farm exhibited a higher prevalence of infestation (42.5%) compared to Rivers State University (36.1%), and this is attributed to higher hygiene standard maintained at the Rivers State University farm. Overall, thirteen male (17.1%) and seventeen female (22.4%) pigs were infested. This study has revealed the prevalence of ticks (*Rhipicephalus spp*.) and fleas (*Ctenocephalides spp.*) infesting pigs in the farms hereby examined. This both demonstrates the cosmopolitan nature of these parasites and necessitates the use of appropriate control and treatment measures to forestall high economic losses to farmers.
Keywords: Ectoparasites, *Rhipicephalus* sp., *Ctenocephalides* sp., ticks, fleas, agricultural extension services

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INTRODUCTION

Parasitic arthropods, including ticks, mites, lice and fleas, significantly impact the health and productivity of farm animals including pigs (Klein *et al.,* 2020). In addition to causing discomforts to farm animals several species of parasitic arthropods transmit pathogenic micro-organisms (Baker *et al.,* 2023). Farming practices, especially

extensive farming methods, and prevailing environmental conditions in the tropics have been highlighted as factors contributing to high infestation rates of these parasites in tropical Africa (Machebe *et al.*, 2019; Koffi *et al.,* 2021; Oluwafemi *et al.,* 2022). Contact with free-range pigs as well as the length of the interval between treatments in confinement systems are also considered as risk factors (Braae *et al*., 2013).

Pig production is gaining prominence in animal husbandry due to the high fecundity and feed conversion ratio of pigs, and inexpensive rearing and space requirements (Oluwafemi, 2008; Dewey *et al*., 2011). However, parasitic infections impact negatively on efficient pig production by delaying maturity, reducing growth rate and weight gain as well as exposing the animals to secondary infection (Onah and Chiejina, 1995; Sangeeta *et al.,* 2002; Igbokwe and Maduka, 2018). Both endoparasites (such as, *Oesophagostomum* spp., *Trichinella* spp., *Strongylus* spp., *Eimeria* spp., *Isospora* spp. and *Cryptosporidium* spp.) and ectoparasites (including, *Sarcoptes scabiei* var. *suis*, *Demodex phylloides* and *Haematopinus suis* etc.) are implicated (Kagira *et al*., 2008; Machebe *et al.*, 2019).

Pig production is also affected by protozoan parasites such as haemoparasites (e.g., *Trypanosoma* spp. and *Eperythrozoon suis*) (Ejinaka and Onyali, 2020) which impact on the function of the circulatory and nervous systems. Gastrointestinal protozoan infections (such as, *Cryptosporidium* spp., *Balantidium* spp., *Entamoeba* spp. and *Giardia* spp.) have also been reported (Onyeabor *et al*., 2025). Since these groups of parasites do not necessarily infect in isolation, their co-infection can synergistically result in more harm for infected hosts.

This study was aimed at identifying and comparing the diversity of parasitic arthropods in selected pig farms in Port Harcourt, thereby adding to the growing knowledge of the risk of ectoparasites in pig farms, while suggesting adoptable control measures.

MATERIALS AND METHODS

Description of Study Area

This study was carried out from July to September 2024 at two locations – a pig farm at Elelenwo (Latitude 4.849258ºN, Longitude 7.076958ºE) and the piggery section of the Rivers State University Agricultural Farm (Latitude 4.80401ºN, Longitude 6.97711ºE) both in Rivers State, Nigeria. Elelenwo is a suburban community located at Obio/Akpor Local Government Area, Rivers State. The people of Elelenwo engage in small scale businesses and also in agricultural activities. The animals were confined in the pen, which was always cleaned of left-over feed while the pigs were bathed in the morning and the pen cleaned up. The pigs were fed with millet, corn and shells of palm kernel. However, the farm was readily accessible to passers-by and stray animals. The University Agricultural Farm is used for research studies and practical demonstration by the Faculty of Agriculture. The animals were confined to the pen also. Each pig was sampled / examined once.

Sample Collection, Examination and Identification Procedures

Personal protective equipment like hand gloves, laboratory coats and masks were worn during sample collection. The pigs were restrained by the farmers who handled them calmly to ensure safety and minimize stress while parasitic arthropods were searched for and collected from different sections of the animal body by means of shaving off hair on the skin of the animals; shaving was achieved by the use of new shaving sticks, one for each animal. Scrapings of crust and lesions were taken as well as the contents of pustules and

abscesses when present. Crusts were taken by means of a white paper cloth kept underneath affected animals. These were later poured into specimen bottles. Large White breed of pigs was investigated in this research. The arthropods targeted were ecto-parasitic arthropods such as lice, mites and fleas.

These were fixed in separate vials and transported in 70% ethanol to the Parasitology Laboratory of Animal and Environmental Biology, Rivers State University. The shavings were transferred to separate glass slides containing two drops of paraffin oil and examined under the microscope at x10 objective lens for the presence of parasites. Contents of pustules and abscesses were spread on the slides using a pipette, diluted with saline and examined for mites under the microscope at x10 objective.

Parasitic arthropods were identified using morphological keys after the protocol of Soulsby (1987). Prevalence of infection was computed as percentage of infected hosts after Bush *et al.* (1997). The prevalence was computed as the number of infected hosts divided by the total number of hosts multiplied by 100.

RESULTS

Seventy-six pigs were examined from both farms (40 from Elelenwo comprised of 17 males and 23 females; and 36 from Rivers State University Farm comprised of 16 males and 20 females). Thirty samples (39.4%) were positive for the presence of parasitic arthropods as follows: 17(22.4%) at Elelenwo and 13(17.1%) at the Rivers State University Farms (Table 1).

Sex Related Prevalence of Parasitic Arthropods of Pigs in the Study Area

Overall, there were thirty-three male and forty-three female pigs at both locations. Thirteen male pigs (17.1%) were positive as follows: 8(20%) and 5(13.8) at Elelenwo and Rivers State University farms respectively; 17(22.4%) females were positive as follows 9(22.5%), 8(22.2%) at Elelenwo and Rivers State University farms, respectively (Table 2).

Species of Parasitic Arthropods Isolated from Pigs in the Study Area

Two species of parasitic arthropods were isolated from the pigs, namely *Rhipicephalus spp.* (ticks) (Plate 1) and *Ctenocephalides spp.* (fleas) (Plate 2). These were found attached to fur dislodged by the shaving action. Overall prevalence of infection was 39.4% representing thirty infected hosts. The ticks were more prevalent than the fleas at both locations: twelve hosts (30%) were positive for *Rhipicephalus* spp. at the Elelenwo Farm, while eight (22.2%) were infested with same parasite at the RSU Farm. *Ctenocephalides* spp. were isolated from five hosts each from both locations (Table 3).

Table 1: Prevalence of Parasitic Arthropods in Pigs from Elelenwo and Rivers State University Farms, Port Harcourt – Nigeria

FARMS	NO. SAMPLED	NO. POSITIVE (%)	NO. NEGATIVE (%)
Elelenwo	40	17 (42.5)	23 (57.5)
Rivers State University	36	13 (36.1)	23 (63.9)
Total	**76**	**30 (39.4)**	**46 (60.5)**

Table 2: Sex Related Prevalence of Parasitic Arthropods in Pigs from Elelenwo and Rivers State University Farms, Port Harcourt – Nigeria

FARMS	N0. SAMPLED	NO. MALES NEGATIVE %	NO. FEMALES NEGATIVE %	NO. MALES POSITIVE %	NO. FEMALES POSITIVE %
Elelenwo	40	17(42.5)	23(57.5)	8(20)	9(22.5)
Rivers State University	36	16(44.5)	20(55.5)	5(13.8)	8(22.2)
Total	**76**	**33(43.4)**	**43(56.6)**	**13(17.1)**	**17(22.4)**

Table 3: Species of Parasitic Arthropods in Pigs from Elelenwo and Rivers State University Farms, Port Harcourt – Nigeria

FARMS	NO. SAMPLED	NO. POSITIVE %	No. Infested with *Rhipicephalus spp.*	No. Infested with *Ctenocephalides spp.*
Elelenwo	40	17(42.5)	12(30)	5(12.5)
Rivers State University	36	13(36.1)	8(22.2)	5(13.9)
Total	**76**	**30(39.4)**	**20(26.3)**	**10(13.1)**

Plate 1: *Rhipicephalus* spp (x10) isolated from the skin of Pigs (*Sus scrofa domesticus*) reared at Rivers State University Agricultural Farm and Elelenwo Farm, Rivers State, Nigeria (x10).

Plate 2: *Ctenocephalides* spp. isolated from the skin of Pigs (*Sus scrofa domesticus*) reared at Rivers State Agricultural Farm and Elelenwo Farm, Rivers State, Nigeria (x10).

DISCUSSION

This study investigated the prevalence of parasitic arthropods in pigs (*Sus scrofa domesticus*) from two distinct pig farms: Elelenwo and Rivers State University Farms. These findings provide critical insights into the diversity and economic impact of ectoparasites on pig farming in the study areas. The research revealed two predominant ectoparasite species: *Rhipicephalus spp.* (ticks) and *Ctenocephalides spp.* (fleas), highlighting the potential threats posed by these parasites to pig health and the broader pig farming industry. *Rhipicephalus spp*. feeds on vertebrates leading to irritation, anemia, secondary infection by bacteria and also transmit viral pathogens (especially Rickettsia) to infected hosts (Luciano *et al*., 2025). *Ctenocephalides spp.*, on the other hand, lead to iron-deficiency anaemia and localized inflammatory responses in heavy infection (Dahm *et al*., 2021).

The overall prevalence of infestation of 39.4% (30 out of 76 pigs) observed in the study is comparable to similar research conducted in other parts of Nigeria, including the prevalence values reported by Mohammed *et al.* (2022), where 35.6% of pigs were infested with ectoparasites. The infestation rate of *Rhipicephalus spp.* was higher than *Ctenocephalides spp.*, with 26.3% of pigs positive for ticks and 13.1% for fleas. This result aligns with studies that indicate ticks tend to dominate as ectoparasites in livestock, including pigs, especially in regions with high temperatures and humidity, which favor their survival and proliferation (Amuta *et al.,* 2010). Comparing the two farms, Elelenwo farm recorded a higher prevalence of ectoparasites (42.5%) compared to Rivers State University farm (36.1%). This difference may be due to the higher hygienic standard of the Rivers State University farm. Elelenwo farm had more opportunities for cross-infestation, resulting in higher ectoparasite levels. The study also explored the role of sex in ectoparasite infestation. A higher proportion of male pigs (37.1%) were infested compared to females (22.3%). Similar findings have been reported in past research, where male pigs tend to exhibit higher infestation rates, potentially due to behavioral and physiological differences between sexes (Mohammed *et al.,* 2022). The predilection for male pigs might also be related to the locations where ticks and fleas attach, with male pigs frequently showing infestations around the penile and anal regions. This supports previous observations of the specific regions targeted by ectoparasites in pigs (Mohammed *et al.,* 2022).

Ectoparasite infestations have significant economic and health impacts on pig farming. Ticks, such as *Rhipicephalus spp.*, are known vectors of various pathogens that can lead to serious health problems in pigs, including anemia, reduced growth rates, and increased susceptibility to secondary infections (Parola *et al.,* 2001). In this study, the high infestation rates of *Rhipicephalus spp.* (particularly at 30% in Elelenwo farm) raise concerns about the potential transmission of tick-borne diseases that could negatively affect the pigs' productivity and general well-being. Additionally, flea infestations, while less prevalent in this study, also pose risks to pigs. *Ctenocephalides spp.* (fleas) are blood-sucking ectoparasites that can cause irritation, dermatitis, and reduced feed efficiency in pigs (Braae *et al.,* 2013). Fleas are also known to transmit zoonotic pathogens, posing risks not only to pigs but also to farm workers who may come into close contact with infested animals. The findings of this study underscore the importance of ectoparasite control measures in pig farming. The prevalence of ectoparasites in the studied farms highlights the need for regular and effective ectoparasite treatments, such as

acaricides, particularly in regions with free-range systems but also important in intensive farming systems, which tend to have higher infestation rates (Braae *et al.,* 2013). Implementing better biosecurity practices, improving hygiene, and ensuring regular veterinary care can reduce ectoparasite infestation and the related economic losses (Singh and Panda, 2024).

CONCLUSION AND RECOMMENDATIONS

The study revealed a significant prevalence of skin parasites among pigs at Elelenwo and Rivers State University farms, with an overall prevalence of 39.4%. The higher rates observed at Elelenwo (42.5%) compared to Rivers State University (36.1%) underscore the potential impact of management practices and environmental factors on parasite infestation. Gender-specific differences in infection rates suggest that male pigs may be more susceptible, warranting further investigation into their behavior and management. The predominance of *Rhipicephalus spp*. poses a notable risk due to its potential to transmit diseases, which could lead to substantial economic losses in the livestock sector.

In conclusion, parasitic arthropods remain a significant challenge to pig farming, with adverse effects on animal health, productivity, and the economy. The presence of both *Rhipicephalus spp.* and *Ctenocephalides spp.* in the studied pig farms reinforces the need for integrated parasite control strategies, regular monitoring, and proactive management practices to minimize the impact of ectoparasites on pig production systems.

It is recommended that pig farmers should implement regular health checks and surveillance to detect and address ectoparasite infestations promptly. Strict hygiene protocols should be enforced on farms to minimize the risk of parasite transmission. Agricultural extension services, educating farmers on the application of acaricides and insecticides should be encouraged.

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