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Prevalence of Helminth Parasites of Terrestrial Snails Sold for Meat in Gwagwalada Area Council, Federal Capital Territory, Nigeria

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Abstract

The African giant land snail is a notable invasive species and a source of alternative protein but also a potential host of zoonotic parasites of medical and veterinary significance. This study investigated the prevalence of helminth parasites in African giant snails (Achatinidae) sold for meat in Gwagwalada Area Council, Abuja, Nigeria, and assessed the possible public health implications. Between June and August 2025, 50 snails belonging to four species (Achatina achatina, A. fulica, A. belteata, and Archachatina marginata) were collected from markets, farms, and natural habitats. Intestinal samples were examined using direct wet mount and flotation techniques. Results revealed an overall prevalence of 46% (23/50), with species-specific prevalence rates of 33.33% in A. marginata, 47.15% in A. achatina, 45.15% in A. belteata, and 53.33% in A. fulica. Six helminth species were identified as Strongyloides stercoralis, Angiostrongylus cantonensis, Fasciola gigantica, Dicrocoelium dendriticum, Schistosoma mansoni, and Ascaris lumbricoides. The most frequently encountered parasites were S. stercoralis and A. cantonensis (mean intensity = 5.75). Chi-square analysis showed no significant difference in infection prevalence among the snail species ($\chi^2 = 0.91$, $p = 1.86$). The findings highlight the zoonotic risks associated with snail consumption, emphasizing the need for improved hygiene in snail farming, handling, and preparation, alongside targeted public health education.

Keywords: African giant snail, Helminths, Prevalence, Zoonoses, Public health

Introduction

Terrestrial snails are widely consumed across Africa, Asia, and Europe due to their nutritional value, cultural significance, and perceived health benefits [1]. In Nigeria, giant land snails such as *Achatina fulica* and *Archachatina marginata* are prized for their meat and sold extensively in various markets. However, snails are also recognized reservoirs and intermediate hosts of helminth parasites of public health importance [2,3]. Historically, snails were considered delicacies by ancient Greeks and Romans, and their use in African cuisine continues to expand. Yet, the same species that provide nutrition may act as vectors of zoonotic infections such as strongyloidiasis, fascioliasis, and angiostrongyliasis [4]. While research exists on helminths in wild snails, studies specifically targeting snails sold for human consumption in Nigerian communities remain limited, leaving a significant knowledge gap. This study therefore aimed to investigate the prevalence and diversity of helminth parasites in terrestrial snails sold for meat in Gwagwalada Area Council, Abuja. The objectives were to: Determine the prevalence and types of helminth parasites in snails sold for human consumption; assess variations in parasite load among different snail species, and evaluate the potential public health risks posed by consumption of contaminated snails.

Materials and Methods

Study Area

The research was conducted in Gwagwalada Area Council, Federal Capital Territory, Abuja, Nigeria. The area lies within the Guinea savannah vegetation, with a tropical wet-and-dry climate characterized by rainy seasons (April–October) and dry seasons (November–March). Temperatures range between 30–37°C annually, with the hottest period occurring in March.

Sampling and Identification: A total of 50 mature snails were collected from markets (n = 20), farms (n = 20), and bushes/vegetation (n = 10) between June and August. Species identification was based on morphological features including shell size, shape, colour markings, spire angle, and aperture form following Raut and Barker [5].

Dissection and Parasitological Examination: Snails were carefully deshelled, their intestines removed and then preserved in 10% formalin. Two diagnostic techniques were employed:

Direct Wet Mount: Intestinal tissues were macerated, diluted with distilled water, and examined microscopically at 10× and 40× magnification.

Flotation Method**:** Homogenized intestinal contents were suspended in saturated salt solution, centrifuged, and examined microscopically following WHO protocols [6].

Data Analysis

Prevalence and mean intensity of infection were calculated. Statistical analyses (Chi-square test) were performed using SPSS version 26, while charts and diversity indices were generated in Microsoft Excel 2015. Mean differences at $p<0.05$ were considered significant.

Results

Out of 50 snails examined, 23 (46%) were infected with one or more helminth parasites. The highest prevalence was recorded in *A. fulica* (53.33%), followed by *A. achatina* (47.15%), *A. belteata* (45.15%), and *A. marginata* (33.33%). Differences in prevalence between species were not statistically significant ($\chi^2 = 0.91$, $p = 1.86$). Six helminth species were identified (Table 1), with *Strongyloides stercoralis* and *Angiostrongylus cantonensis* showing the highest mean intensities (5.75 each)

Table 1: Parasite Species and Mean Intensities

Parasite species	Mean Intensity	95% Confidence Interval
S. stercoralis	5.75	4.28 – 7.22
A. cantonensis	5.75	3.30 – 8.20
F. gigantica	4.50	3.52 – 5.48
D. dendriticum	4.00	2.61 – 5.39
S. mansoni	3.50	2.52 – 4.48
A. lumbricoides	3.33	2.68 – 3.98

Discussion

The overall infection rate of 46% highlights a significant parasitic burden in terrestrial snails sold in Gwagwalada. This aligns with previous studies in Nigeria where prevalence rates ranged from 35–50% [3]. The dominance of *S. stercoralis* and *A. cantonensis* is concerning, given their zoonotic predisposition. *Strongyloides stercoralis* is a soil-transmitted helminth capable of infecting humans through ingestion or skin penetration, while *Angiostrongylus cantonensis*—the rat lungworm is known to cause eosinophilic meningitis in humans [7]. The detection of *F. gigantica* and *S. mansoni* suggests potential cross-transmission between terrestrial and freshwater habitats, reflecting complex parasite-host dynamics. The higher infection rates observed in *A. fulica* may be linked to its ecological adaptability and feeding habits, increasing exposure to parasite-laden environments. Conversely, the lower infection in *A. marginata* could be attributed to more controlled farming practices, as this species is commonly reared commercially [8]. These findings underscore the public health risks associated with snail consumption, particularly in settings where they are consumed undercooked or handled without hygiene precautions.

Conclusion

This study revealed a high prevalence of helminth parasites in terrestrial snails sold for meat in Gwagwalada Area Council, with zoonotic species posing significant health risks. While no statistically significant differences were observed among species, the presence of parasites like *A. cantonensis* and *S. stercoralis* indicates an urgent need for public health interventions.

Recommendations

1. Regular parasitological screening of farmed and wild-caught snails.
2. Standardized hygiene and processing protocols in snail farming and markets.
3. Public health campaigns should be mounted on the dangers of consuming raw or improperly cooked snails.
4. Further research to assess seasonal variation and molecular identification of helminths for accurate epidemiological mapping is advocated

References

1. Omole AJ, Kehinde AS, Fajemilehin SO. Utilization of snail meal as a source of protein in livestock feeding. *Afr J Biotechnol*., 2006; 5(1): 26–29.
2. Caron Y, Rondelaud D, Losson B, Lempereur L. The potential role of terrestrial molluscs as natural intermediate hosts for *Fasciola hepatica*. *Parasitol Res.,* 2014;113(7): 2253–2261.
3. Igbinosa IB, Isaac C, Adamu T. Gastrointestinal helminths of the giant African land snail (*Achatina fulica*) in Nigeria. *Helminthologia.* 2016;53(2): 149–155.
4. Lv S, Zhou XN, Andrews JR, Fang W. Emerging angiostrongyliasis in mainland China. *Emerg Infect Dis.,* 2009;15(9):161–164.
5. Raut SK, Barker GM. Gastropods as

pests and vectors. In: Barker GM, editor. *Molluscs as Crop Pests.* Wallingford: CABI Publishing; 2002. p. 259–289.

6. World Health Organization (WHO). Manual of basic techniques for a health laboratory. Geneva: WHO; 2023.
7. Jarvi SI, Howe K, Severson D. Transmission dynamics of Angiostrongylus cantonensis and its implications for human health. Trends Parasitol., 2012;28(12):595–603.
8. Okafor J, Nwosu E. Parasitic infections in commercially reared snails in Nigeria. Nig J Parasitol., 2019; 40(1):45–53.