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Parasites Status of Village Chickens (*Gallus gallus domesticus*) in Selected Communities in Yenagoa Local Government Area of Bayelsa State, Nigeria

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Abstract

Parasites constitute a major obstacle to poultry production, leading to significant losses in many poultry farms. This study investigated the parasites status of village chicken (*Gallus domesticus*) collected from selected communities in Yenagoa Local Government Area of Bayelsa State Nigeria, during January to March 2020. A total of 35 birds were collected from 5 communities: Igbogeni, Tombia, Agudama, Akenfa and Opolo to assess their parasitic status. The procession of the chicken and the identifications of both ecto and endo parasites followed standard techniques. From the results, the prevalence of the ecto parasites and the endo parasites in the chickens were 85.71% and 88.57% respectively. The ectoparasites species in order of increasing frequency were Lice (37.65%), Fleas (32.94%), and Mites (29.41%). Mixed infection of lice & fleas accounted for 34.12%. The prevalence of endo parasites was: Nematode (71.59%) and Cestode (28.41%) respectively. The species specific prevalence of the endo parasites encountered were *Ascaridia galli* (44.4%), *Heterakis gallinarum* (22.2%), *Capillaria spp.* (33.3%), *Davainea proglottina* (56%), *Raillientina spp.* (44%) respectively. This present study has provided an insight into parasitic infection of domestic birds across communities in Yenagoa Local Government Area of Bayelsa State Nigeria and recommended that an intensive health education on their public health implications in the spread disease causing pathogens among humans be carried out.

Keywords

Gallus domesticus, Ectoparasites, Endoparasites, Yenagoa

1. Introduction

Village chicken (*Gallus domesticus*) is the major species in the rural poultry sub-sector in Africa [1] [2]. Traditionally, in some parts of Asia and Arica, village chickens are kept in the backyard by housing them in locally made hut in the night and allowing them to scavenge for food during the daytime [3] [4].

In Nigeria, village chicken production is the most established profit making business compared to other domesticated animal species [5]. Given its protein demand, chicken production is the pillars in which the future of improved protein supply and nation's economy rests [4] [6]. However, as important as poultry birds are to human dietary requirements, its production is limited by several factors, such as poor management, malnutrition, lack of bio-security, poor housing, poor veterinary services and parasite infestation [6]. Parasitic infestations manifest as late maturity, reduce egg output, induce emaciation, anaemia and death [7] [8]. Common among the poultry parasites are Mites, Gnats, Fleas, Lice and Ticks, Helminthes and Protozoa [9]. Parasites are considered as a major obstacle in poultry production, causing significant losses in many poultry farms. Studies haves shown that 100% of village chicken are infected with one or more parasites [10]. Other studies reported that, 71.3% prevalence of parasites was recorded among free range birds in the Southeastern part of Nigeria [6], 87.8% prevalence of helminth infection was recorded in Bauchi state [11], 81.5% of parasites were recorded in Kaduna State [12]) and 96.8% in Nsukka region of South Eastern Nigeria [4] while in Sokoto Metropolis, Bala, *et al.* [13] recorded four ectoparasites in the order of magnitude; Lice (27.5%), Mites (17.5%), Ticks (14.4%), Fleas (10.6%). The basic pre-requisite to reduce the menace of parasites burden in poultry birds in a local farm is to identify infested farm and characterize the type of parasitism in the birds (4). However, there is a paucity of information of parasites infestation in village chickens across communities in Yenagoa Local Government Area of Bayelsa State. This is the first study to assess the parasites burden of village chicken in selected communities in Yenagoa Local Government Area. The result of this study shall establish the public health implications of parasites infected chickens and call for public health intervention.

2. Materials and Methods

2.1. Study Area

Yenagoa (5˚02'N 6˚20'E) is the capital of Yenagoa Local Government Area and Bayelsa State. Yenagoa Local Government Area has an area of 106 km^2. The study communities for this study is shown in **Figure 1**. The communities are: Igbogeni, Tombia, Agudama, Akenfa and Opolo. Agriculture and subsidiary farming (Plantain, Banana production, fishing, and livestock including poultry production are the major occupations of the people.

2.2. Ethical Consideration

Verbal approval from the house hold head having local chicken houses. The age

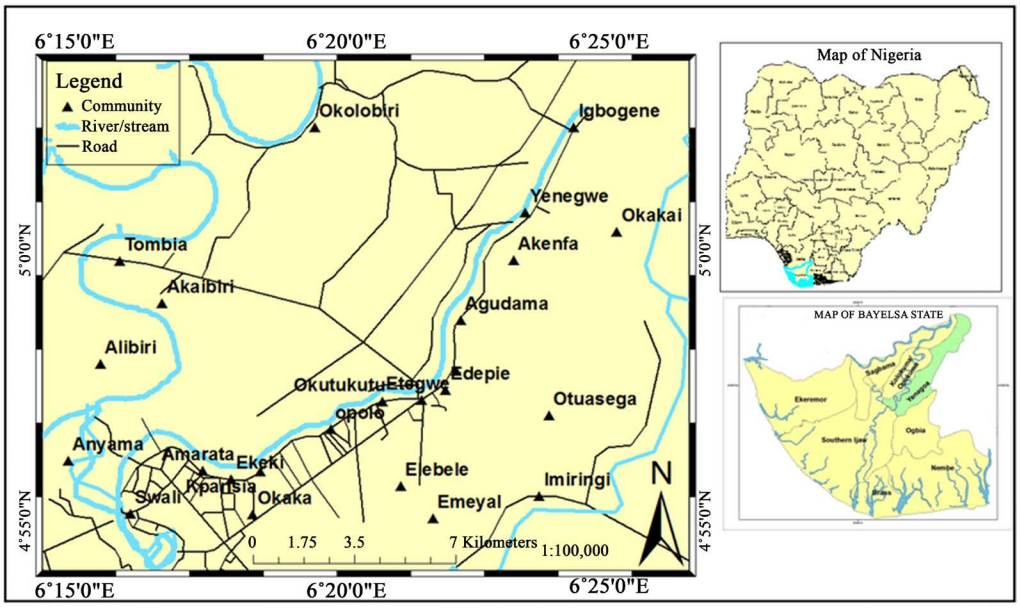

Figure 1. Map showing the study communities (source: google map).

and the weight of the chicken was sought for. The price tag for each of the chicken was fixed.

2.3. Inclusion Criteria

The chicken to be selected has no sex restriction. However, birds of the same weight and age were all included for the study. The age of the chicken was sought from the houselhod head and by their group movement.

2.4. Sample Collection

Chickens were collected from households across the 5 communities enlisted for the study during January, 2020 to March, 2020. The birds were randomly collected irrespective of their sexes. The selected birds were priced and bought. A minimum of 7 birds was selected from each community, making a total of 35 birds. Prior to examination, the chicken were collected early in the morning, from each of the selected chicken house in a sterilized cellophane bag properly perforated to allow maximum ventilation..

2.5. Examination and Identification of Parasites

The procession and examination of the birds for ectoparasites assessments followed standard techniques in Angyiereyiri, *et al.* [14]. Each of the sampled bird was placed on a white sheet of paper. The bird was examined for ectoparasite by ruffling the feathers with fine blunt toothed brushe. Ectoparasites that fell on the paper were collected and preserved in 70% ethanol. The morphological identification of parasites followed keys in Soulsby [15].

Fecal samples were extracted from the cloaca of the birds using a sterilized swab stick and preserved in a sample bottles containing 10% formalin and la-

belled accordingly to correspond with the record of the ectoparasite of each chicken. The procession of fecal sample for parasite examination followed standard concentration method in Cheesbrough [16]. A-2 g weight of the fecal sample was collected with a spatula from the sample bottle and introduced into an empty sample bottle containing normal saline and stirred to make a fecal suspension. The solution was filtered into a clean and empty sample bottle with a sieve. The process was repeated twice. A-3 ml of normal saline and the final filtrate was mixed, stirred and allowed to stand for about 15 seconds. A-3 ml of ether and the final solution was mixed gently. The solution was then centrifuged at 3000 rpm for 5 minutes and the supernatant was decanted. Another 3 ml of normal salinewas mixed with the sediments, stirred with a glass rod and centrifuged again for the second time at 2000 rpm for 3 minutes. The supernatant was carefully decanted and preserved in sterilized bottle. The specimen was collected with a pipette into a grease free microscopic slide and stained with a drop of lugol's iodine. The presence of parasite was confirmed by a microscopist using ×100 oil immersion.

2.6. Data Analysis

Data entry was done using Microsoft excel and analysis was done using the SPSS software version 20. Descriptive statistics using simple percentages were employed to calculate the propertion of parasites recover from each bird across the communities. Relationship parasites burden across study communities was analysed ANOVA at confidence level of $p = 0.05$.

3. Results and Discussion

The study of 35 chickens recorded 85.7% and 88.57% prevalence rates of ectoparasites and endoparasites respectively across 5 communities as shown in **Figure 2**. Multiple parasitism accounted for 100% of all the chickens examined. The differences of the parasites infestation were significant ($T = 0.784421$, $p < 0.05$). The community specific prevalence of parasites in the chicken is shown in (**Figure 3**). The ectoparasites were more prevalent among the chickens in Tombia and Opolo communities while endoparasites were more prevalence among the chickens in Igbogene and Akenfa communities. The prevalence was the same in Agudama community. When the Ectoparasiteswere pooled across location, the order of frequency are Lice (37.65%), Fleas (32.94%) and Mites (29.41%). Mixed infestation, of lice & fleas accounted for 34.12%. Differences was not significant ($T = 3.315332$, $p > 0.05$) (**Table 1**). Five endoparasites in two genera were identified. They are nematodes (71.59%) and cestodes (28.41%) respectively. Nematodes species recorded were *Ascaridia galli* (44.4%) *Heterakis gallinarum* (33.3%) and *Capillaria spp.* (22.2%) respectively. The prevalence of cestodes; *Davainea proglottina* and *Raillientina spp.* was 56% and 44% respectively. Differences was significant ($T = 0.029092$, $p < 0.05$). Detail is shown in **Table 2**.

Village chickens in all the five communities in Yenagoa Local Government

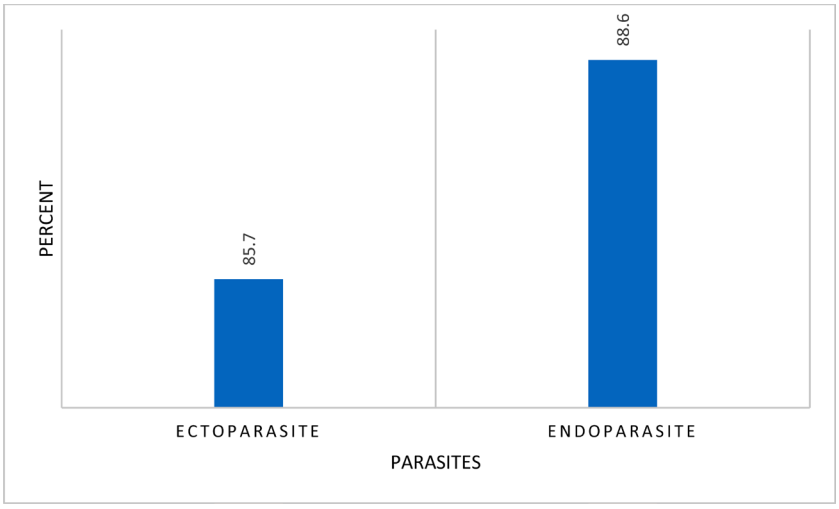

Figure 2. Prevalence of parasites in chickens across communities in YELGA during January, 2020 to March, 2020.

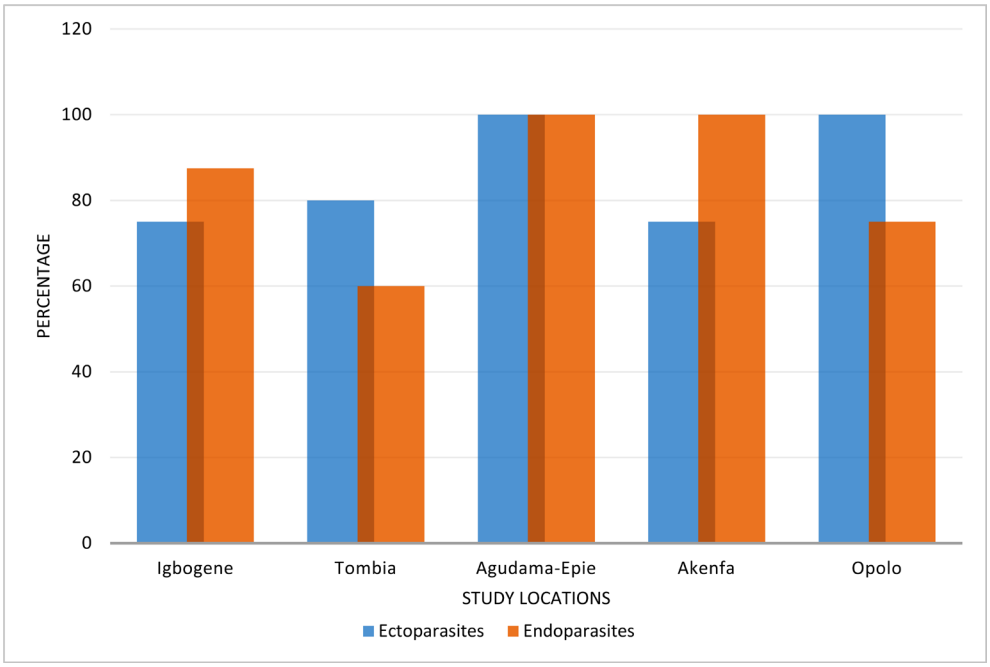

Figure 3. Location specific prevalence of ectoparasites and endoparasites.

Table 1. Specie-specific prevalence of ectoparasites in chickens across communities in YELGA during January, 2020 to March, 2020.

N = 35		
Ectoparasite species	**Number counted**	**Percentage counted**
Fleas	28	32.94
lice	32	37.65
mites	25	29.41
Total	**85**	**100**
Fleas + lice	29	34.12

Table 2. Specie-specific prevalence of endoparasites in chickens across communities in YELGA during January, 2020 to March, 2020.

N = 35		
Endoparasite species	**Number counted**	**Percentage counted**
Nematodes		
Ascaridia galli	28	44.4
Capillaria spp.	14	22.2
Heterakis gallinarum	21	33.3
Total	**63**	**71.59**
Cestodes		
Davainea proglottina	14	56
Raillientina spp.	11	44
Total	**25**	**28.41**

Area of Bayelsa State were commonly infested with wide range of parasites. This observation had been reported among village chickens elsewhere [6] [11] [17] [18].

The three ectoparasite; lice, mites and fleas encountered in this present study is an indication that the environment and the weather condition of the chickens were favorable for their proliferations and development [19]. More Lice (37.65%) than the other ectoparasites were recovered. This observation agrees with the reports of Bala, *et al.* [13]. The higher prevalence of lice than the other ectoparasites highlight their ability to adapt favorably in both hot and humid weather conditions. The recovery of Fleas and mites in this present study has also been reported elsewhere [6]. However, Bala, *et al.* [13] and [20] gave a contrary report that fleas were the least occurring ectoparasites in chicken. The least prevalence of mites in the present study agrees with Nnadi and George [6].

More nematodes than cestodes were encounter in this present study. This difference is consistent with [17]. The higher prevalence of nematodes is an indication that the village chicken is more predisposed to nematodes infections. Most gastrointestinal parasites have direct life cycle pattern which correspond with the scavenging habit of the chicken. The lower cestode prevalence in this study is consistent with Marizvikuru and Patrick [17]). The Lower cestode prevalence may probably be associated with the environment. Cestodes require an intermediate host for transmission. The intermediate host may be rare in the environment to initiate transmission.

Studies in some part of Nigeria have shown a wide range of gastrointestinal parasite species in village chickens [11] [6]. The five species of gastro intestinal parasites recovered from chickens in this present study highlight the uncontrolled scavenging nature of these birds in different dumpsites, thereby exposing them to wide range of parasites [17]. Village chickens are less attended to by the veterinarian and are hardly treated or vaccinated may be responsible for parasite

establishment.

Ascaridia galli, was more prevalent than other gastrointestinal parasites. Similar study reported that the higher prevalence of *Ascaridia galli may be associated with* their direct mode of transmission [21]. The implication of the wide range of parasites in the village chicken is that gastrointestinal parasites may lower the chicken feed efficiency and nutrient utilization, hence reducing the size of the birds and their protein contents [22] while the ectoparasites may cause discomfort, anaemia and loss of feathers in chicken, thus reducing the economic value of village chickens.

4. Conclusion and Recommendation

This present study has provided an insight into the parasitic status of village chickens across communities in Yenagoa Local Government Area of Bayelsa State Nigeria. There was a wide range of both ectoparasites and endoparasites recovered from the birds. These parasites were not only known to reduce size of birds, their protein contents and lower income value of the birds, but can be responsible for the initiation of zoonotic infections in humans. This study therefore calls for public health intervention.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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