

Short notes

Haemo- and endoparasites of indigenous chickens reared in Gwagwalada Area Council, Abuja, Nigeria

Balarabe R. Mohammed, Ayodeji A. Ojo, Maxwell N. Opara, Olorunfemi C. Jegede, Rowland I.S. Agbede

Department of Veterinary Parasitology and Entomology, Faculty of Veterinary Medicine, University of Abuja, P.M.B 117 Abuja, Nigeria

Corresponding Author: Balarabe R. Mohammed; e-mail: balarabemohammed161@yahoo.co.uk

ABSTRACT. Poultry production as one of the major sources of protein in Nigeria is constrained by parasitic diseases including haemo- and gastrointestinal (GI) parasites. The haemo- and endoparasites of indigenous chickens reared in Gwagwalada market, Gwagwalada Area Council, Abuja, Nigeria were studied. Blood and fecal samples were collected from 108 chickens (*Gallus gallus domesticus*) between April–August, 2017. Thin blood smear, and floatation and sedimentation techniques were used for the blood and fecal samples, respectively. Of the 108 local chickens examined, 49 were males, while 59 were females. Overall, female chickens had higher infection rate with haemoparasites (53.1%) than males (46.9%). The blood parasites found mostly were *Plasmodium* spp., with a prevalence 54.6%, occurring in both male and female chickens examined. It was further revealed that endoparasites infected 60.8% of the female local chicken and 39.2% of the male. The mostly occurred *Ascaridia* spp. with prevalence 35.2%; the least was *Strongyloides avium* (0.9%). Also, *Eimeria* spp. oocysts were found in 8 (7.4%) of the chickens. This study provides basic information on the haemo- and endoparasites constantly infecting local breed of chickens reared in Gwagwalada Area Council, FCT- Abuja

Keywords: *Eimeria* oocysts, *Plasmodium* spp., *Strongyloides* spp., Nigeria

Introduction

In Nigeria, poultry population is estimated to be about 160 million; with chickens comprising about 72.4 million [1,2]. Poultry is one of the most accepted important sources of animal protein and manure for man [3,4]. It serves as a source employment, family nutrition and income (sale of eggs and birds) [5]. Most poultry birds are kept under free range system thus exposing them to so many parasitic infections [6,7]. External and internal parasites can be classified into several types based on their body types, life cycle and damage to their hosts [8]. Intestinal parasites of poultry include nematodes, cestodes, trematodes, and protozoa. Also, blood and tissue protozoan parasites were reported.

The most common intestinal parasites in chicken are the nematodes: *Ascaridia galli*, *Heterakis* spp., *Gongylonema ingluvicola* and *Acuaria humulosa*. The cestodes include *Raillietina* spp., *Davainea*

proglottina, *Choanotaenia* spp. and *Hymenolepis* spp., while the trematodes include *Prosthogonimus* spp. and *Echinostoma revolutum*. The most common haemoparasites are *Leucocytozoon* spp., *Plasmodium* spp., *Haemoproteus* spp., *Aegyptinella* spp., *Eperythrozoon* spp., *Haemobartonella* spp., and *Trypanosoma* spp. [8]. These parasites have been responsible for restlessness, skin damage, retarded growth, loss of weights in chickens, as a result of their bites [9], they can also cause severe dermatitis and allergy [10], anaemia due to loss of blood [11] and may also act as vectors for pathogenic agents, such as Rickettsia disease (Murine typhus), bacterial disease (Plague) and viral disease (Myxomatosis) resulting in serious diseases.

Previous studies revealed that mortalities of chickens, due to parasitic diseases are higher than those attributed to Newcastle disease and other viral infections of poultry [12].

Hence, a comprehensive study of haemo- and endoparasites of chickens is quintessential for its

effective management and control. In spite of the fact that poultry production is fast growing and becoming a major enterprise in Gwagwalada in particular and Nigeria in general, accurate information on the prevalence of these parasites is still scanty.

The aim of this study therefore, is to determine the haemo- and endoparasites of local chickens reared in Gwagwalada Area Council, Abuja. This information could be useful to commercial and local poultry farmers in Gwagwalada Area Council of the Federal Capital Territory (FCT).

Materials and Methods

This study was conducted in Gwagwalada Area Council, in the Federal Capital Territory, Abuja, Nigeria. It is located geographically at the North Central part of Nigeria between latitude 8.941° and longitude 7.092°, with a population of 158,618 people [13]. The temperature of the area ranges from 30–37°C yearly with the highest temperature experienced in the month of March and with mean total rainfall approximately 1,650 mm per annum [14]. The area as a whole is located within the northern boundary of the guinea savannah [14,15]. The rainy season begins from April and ends in October, while day time temperature reaches 28°C

to 30°C and night time temperature of 22°C to 23°C. The rainy season is from March to November with a mean annual rainfall of about 1400 mm [16].

Sample collection and procedures. A total of 108 local chickens were randomly selected from the Gwagwalada Area Council, Federal Capital Territory (FCT), Nigeria between April and August, 2018 (early rainy season). Blood and fecal samples were taken from the wing vein and rectum, respectively from each of the birds randomly selected and examined for parasites, using standard parasitological techniques [2,7,8]. Thin smear was prepared from the blood, stained with Giemsa and observed microscopically at ×100, using oil immersion. The fecal samples were subjected to both the simple floatation and sedimentation methods using [17] to observe the helminth ova and oocyst in them. The slides were thereafter examined under the microscope at ×10 magnification. Data obtained for blood and gastrointestinal parasites were analyzed using % simple averages and parasite identified according to the criteria by [18].

Results

Of the 108 chickens examined, 49 (45.4%) were males while 59 (54.6%) were females. Females had higher prevalence of haemoprotozoan parasites

Table 1. Prevalence of different haemoprotozoans in local breed of chickens

Haemoparasites	Number of birds infected	Prevalence (%)
<i>Plasmodium</i> spp.	59	54.6
<i>Leucocytozoon</i> spp.	1	0.9
<i>Haemoproteus</i> spp.	1	0.9
<i>Plasmodium</i> spp. and <i>Leucocytozoon</i> spp.	14	13
<i>Haemoproteus</i> spp. and <i>Leucocytozoon</i> spp.	1	0.9
<i>Plasmodium</i> spp. and <i>Haemoproteus</i> spp.	5	4.6

Table 2. Prevalence of different endoparasites in local breed of chickens

Endoparasites	No. infected	Prevalence (%)
<i>Syngamus trachea</i>	8	7.4
<i>Strongyloides avium</i>	1	0.9
<i>Ascaridia galli</i>	38	35.2
<i>Heterakis galli</i>	6	5.6
<i>Heterakis galli</i> and <i>Syngamus trachea</i>	2	1.9
<i>Ascaridia galli</i> and <i>Strongyloides avium</i>	1	0.9
<i>Ascaridia</i> and <i>Heterakis galli</i>	7	6.5
<i>Ascaridia galli</i> and <i>Syngamus trachea</i>	3	2.8
<i>Eimeria</i> spp.	8	7.4

(53.1%) that males (46.9%) *Plasmodium* spp. were most frequent (54.6%) while *Leucocytozoon* spp. and *Haemoproteus* spp. were found in one chicken (Table 1).

Females had the higher prevalence of endoparasites (60.8%) compared with males (39.2%). The highest prevalence had *Ascaridia galli* (35.2%); only one specimen was infected with *Strongyloides avium* (Table 2)

Discussion

In the present study, the overall prevalence of haemoparasites in chickens was found to be 75%, with *Plasmodium* spp. (54.6%), *Leucocytozoon* spp. (0.9%) and *Haemoproteus* spp. 0.9%). This result is higher than [19], who reported a prevalence of 12% among local chickens reared in Owerri State and who also reported [20] a prevalence of 14% among local and exotic breeds of chickens reared both in Imo state, Nigeria. This huge difference might be attributed to difference in environmental conditions for the birds and parasites and management practices adopted by the farmers in these areas. However, this study agrees with the study of [21], who reported a prevalence of 71% in Malawi. Moreover, a prevalence of 61.9% has been reported in Uganda [22].

The overall prevalence of endoparasites for chickens reared in Gwagwalada Area Council was 68.5%. This result concurs with that of [23] who reported a prevalence of 87.0% in free range chickens in Bauchi, Savannah zone of Nigeria. However, high prevalence of endoparasitism (100%) was reported in free range chickens reared in Abeokuta, Ogun state [24]. This wide difference in the prevalence of endoparasites in these studies could be due to the differences in the feeding patterns of the birds, incidence of the infective stages and intermediate hosts of the parasites picked up by the birds or found in places where the chickens free-ranged. The prevalence and intensity of helminths infections may be influenced by several factors such as distribution of intermediate hosts and/or their infection rate and the number of infective parasite eggs or larvae [19]. It has also been reported that absence of biosecurity and scavenging habits of chickens in free range conditions can also contribute to high helminth infections [21,25].

The occurrence of haemoparasites was higher in female (53.1%) than male (46.9%) chickens. The

reason for this huge difference cannot be explained here and this might be an area for a future research. Also, the occurrence of endoparasites was more in the female than male chickens. The reasons for the higher infection could be attributed to the fact that male chickens under any condition of management, tend to court the females by allowing them to feed first before the males and even more. In so doing, they are more likely to easily acquire infective pathogens than the males [19]. In addition, stress due to egg laying and other reproductive activities could reduce the immunity of the females to infections [26].

The result of the present study has shown that the local chickens studied in Gwagwalada Area Council is mainly infected with *Plasmodium* spp. This result is in agreement with an earlier report [8] that the haemoparasites mainly found infecting poultry include; *Plasmodium* spp., *Leucocytozoon* spp., *Haemoproteus* spp., *Aegyptinella* spp. and *Trypanosoma* spp. However, *Aegyptinella* spp. and *Trypanosoma* spp were not encountered in this study. *Plasmodium* spp. causes avian malaria in poultry. Lesions found include; progressive emaciation, anaemia and enlargement of spleen and liver in affected birds [25]. Also paralysis may be observed where there are massive numbers of erythrocytic forms in endothelial cells of the brain capillaries, and death in untreated cases [27]. Generally, avian malaria is not of major veterinary importance in commercial production systems, but may cause losses [19]. However, among free ranging chickens high mortality rates can be seen due to *Plasmodium* spp. infections and more importantly, immunosuppression might take place [19]. The chickens examined were mostly infected with the nematode *Ascaridia* spp., this agrees with [28] that the population of nematodes, far outweighs those of trematodes and cestodes and they establish themselves in their hosts faster than the others. Most species of nematodes and cestodes are also involved in parasitic-gastroenteritis in animals [19].

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