PREVALENCE OF PARASITIC HELMINTHS ISOLATED FROM EXOTIC BROILER CHICKENS IN GWAGWALADA AREA COUNCIL OF ABUJA, NORTH CENTRAL NIGERIA

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ABSTRACT

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The alimentary tracts of 84 exotic broiler chickens slaughtered in an abattoir in Gwagwalada area of Abuja, North central Nigeria were examined for gastrointestinal parasites. Out of 84 alimentary tracts examined, 82.1% (69) were infected with helminths parasite accounting for the months of June and July. The extracted helminths parasite was nematode, which was isolated from duodenum, mid-intestine, ceaca and rectum of the investigated exotic chickens. After fixing the nematode in 70% alcohol, identification of parasite was done through examination of different morphological characteristics of anterior mid-gut and posterior region. Raillietina tetragona (60.2%) was the highest parasite isolated. Other parasitic helminths found were Raillietinae chinobothrida (3.9%), Choanotaenia infundibulum (16.0%), Devainea proglottina (3.9%) and Heterakis gallinarum (11.0%). Out of the 31 cocks examined, 10 cocks harboured Ascardia galli (32.3%) while 15 cocks harboured Raillietinae spp (48.4%). However, 3 cocks were found to harbor Chanotaenia infundibulum (18.4%) and Devainea poglotinna (13.2%) each. Although parasitic helminths infection was more prevalent in July (59.42%) as compared to June (40.6%), the prevalence rate of parasitic helminths infection between male and female exotic chickens was not significantly different ($p<0.05$).This study revealed a high infection rate of parasitic helminths in exotic broiler chickens examined. However, molecular-based identification of parasites is recommended for diagnosis of parasitic helminthes in exotic broiler chickens.

Keywords*: Prevalence, Helminths, Exotic Broilers, Parasite*

INTRODUCTION

Poultry is kept in backyards or commercial production systems in most areas of the world. It is one of the most vital sources of animal protein and farm manure for man (Kekeocha, 1984; Frantovo, 2000). The bird offers man with products of high nutritional value and other socio-economic benefits which cannot be underscored (Matur, 2002). Poultry is one of the most intensively raised birds out of the domesticated species and one of the most advanced and lucrative animal production enterprises (Obiora, 1992). Its significance in national economies of developing countries and its role in improving the nutritional status and income of many small scaled farmers cannot be undervalued. Beside these benefits, Helmisthiasis is a significant limitation in poultry keeping in Nigeria (Fabiyi, 1972). Parasitic diseases are difficulties run into wherever poultry is raised whether in huge commercial operations or in minor backyard flocks and economic fatalities can be momentous (Fatihu *et al*., 1991). These parasites produce a major factor limiting dynamic production in poultry industry by affecting the growth rate of the flock causing organ malfunctioning and finally death (Soulsby, 1982). However, effective control measures can be realistic if based on a detailed knowledge of the epidemiology of the endemic infectious agents. Limited studies carried out on commercial farms which raise principally exotic birds showed that helminths infection is a threat to the Nigerian poultry industry (Oyeka, 1989). It is against this backdrop that this study was conducted so as to determine the prevalence of parasitic helminths in exotic breed of chickens sold in the rainy season for human consumption in Gwagwalada Area Council of Federal Capital territory, Abuja in Nigeria.

MATERIALS AND METHOD

Study area

Gwagwalada town is around 45 km away from the Federal Capital Territory (FCT). It is one of the six area council headquarters of the FCT that lies in the downstream of river Usuma and situated between latitude 8° 55´ and 9° 00´ N and longitudinal 7° 00´ and 7° 05´ E (Balogun, 2001). Jegede *et al*. (2015) reported that Gwagwalada is geographically located in the central part of Nigeria, between latitudes 8° and 9° N and longitudes 6° and 7° E. The author further reiterated that the town has a guinea savannah type of vegetation, with rainy season extending from April to October and dry season, stretching from November to March. The temperature of Gwagwalada ranges from 30-37 °C annually with the highest witnessed in the month of March (Jegede *et al.*, 2015).

Collection of sample

Between the months of June and July on daily basis, alimentary tracts of already slaughtered exotic chickens were collected for gastro intestinal analysis from the Abattoir in Gwagwalada market. Eighty four (84) guts that were taken from their slaughter slabs consisted of exotic chickens brought for sales by domestic farmers. The specimens were collected in specimen bottles containing 10% Formalin. The sexes of the exotic chickens were noted. The collected samples were taken to the University of Abuja Biological Science Laboratory for parasitological examination. In the samples, the alimentary tracts; ranging from the oesophagus to the cloaca were extracted intact. Each intestine was detached from its mesenteric attachment into corresponding organs made up of system which included the duodenum, mid-intestine, caeca and rectum. Each section of the alimentary tract was separated and positioned in separate petri-dishes. Each section was subsequently slit open. The contents were finally examined for the presence of the parasite.

Fixing and identification of nematode parasite

The nematode was preserved in 70% alcohol with a view to killing and fixing it. Few drops of Lacto phenol were added to make the specimen attain optimum clarity. Identification of worms was completed through examination of different morphological characteristics of the anterior mid-gut and posterior region of the worms according to Soulby (1982) using x10 and x40 objectives of light microscope.

Data analysis

Data collected were analysed using Statistical Package for Social Science (SPSS Chicago, IL, USA). Version 18.0 window based program. Prevalence and intensity were expressed according to Margolis *et al*. (1982). Student T test was used to determine level of significance between sex and infection. Statistical significant difference was considered at value of ($p<0.05$)

RESULTS

The results obtained from the prevalence of helminthes parasite in exotic broiler chickens examined between June and July is as shown in Table 1. It can be observed from this result that out of the 36 exotic chickens examined in the month of June, 28 exotic chickens were infected with parasitic helminths and thereby having a prevalence rate of 33.3% (Table 1). However, during the month of July, out of the 48 exotic broiler chickens examined for the presence of parasitic helminths, 41 exotic broiler chickens (48.8%) were infected (Table 1). The prevalence rate of each isolated parasite is as shown in Table 3. It can be observed that *Railietina treteragona* (60.2%) has the highest prevalence followed by *Chanotaenia infundibulum* (17.8%), *Ascardia galli* (11.0%), *Devainea poglotinna* (3.9%), *Raillietinae chinobothrida* (3.9%) and *Heterkis gallinarum* (3.2%) (Table 3).

Sex differentiation of gastrointestinal parasite in exotic broiler chickens examined is as shown in Table 2. Out of the 31 broiler cocks examined, 10 broiler cocks haboured *Ascardia galli* with prevalence rate of 32.3% (Table 2). 5 broiler cocks harboured *Raillietinae spp* with 48.4% prevalence rate (Table 2). However, 3 broiler cocks had *Chanotaenia infundibulum* (18.4%) and *Devainea poglotinna* (13.2%) each. As shown in Table 2, the prevalence rate of parasitic helminths infection between male and female exotic chickens was not significantly different ($p<0.05$).

Table 1: Prevalence of helminthes parasite in exotic broiler chickens examined during rainy season

Month	Number examined	Number infected	Number non-infected	Prevalence (%)
June	36	28	8	33.3
July	48	41	8	48.8
Total	84	69	16	82.1

Table 2: Sex differentiation of gastrointestinal parasite in exotic chickens examined

Parasite	Number of infected cock	Prevalence rate of infected cock (%)	Number of infected hen	Prevalence rate of infected hen (%)
Ascaridiagalli	10	32.3	5	13.2
Chanotaenia infundibulum	3	9.7	7	18.4
Heterakiagallinarum	0	0.0	2	5.3
Devaineaproglotinna	3	9.7	5	13.2
Raillietine spp.	15	48.4	19	50.0
Total	31	100	38	100

DISCUSSION

The overall prevalence rate (82.1%) of parasitic helminths infection derived from this study is in close association with earlier study of Adano (2014) conducted in Gombe (North East Nigeria). The author reported overall prevalence (81.3%) of parasitic helminths infection on domestic chickens and submitted that there was no

significant difference ($p<0.05$) in infection rate between male and female domestic chickens as found in this study. Furthermore, the work of Jegede *et al*. (2015) is in agreement with the present findings who revealed that there was no significant difference in prevalence rate of infection among sexes.

The most widely distributed parasites discovered in this study were *Raillietina tetragona*, *Ascaridia galli* and *Chanotaenia infundibulum. Raillietina tetragona* being one of the mostly distributed parasites isolated in this study has been reported by Baker (2008) to cause reduced weight loss and decreased production of eggs in chickens. In this study, the less common helminths parasites occurring in less than 5% of the exotic chickens examined were *Raillietinae chinobothrida*, *Devainea proglottina* and *Heterakis gallinarum*. These helminths are closely related to the helminthes reported in the study conducted by Matur (2010). The higher prevalence rate of *Ascaridia galli* (11.0%) against that of *Heterakis gallinarum* (3.2%) reported in this study is in consonance with earlier reports of 48.4% and 35.5% in Nigeria (Nnadi and George, 2010); 35.6% and 17.3% in Central Ethiopia (Eshetu *et al*., 2001); 25.7% and 8.3% from Pakistan (Sayyed *et al*., 2000) 25.6% and 1.4%, in home-grown chickens in Kenya (Kaingu *et al*., 2010)

Table 3: The prevalence rates of isolated parasites in the study area

Parasite	Prevalent rate %
Chanotaenia infundibulum	17.8
Ascardia galli	11.0
Devainea poglotinna	3.9
Raillietinae chinobothrida	3.9
Heterkis gallinarum	3.3

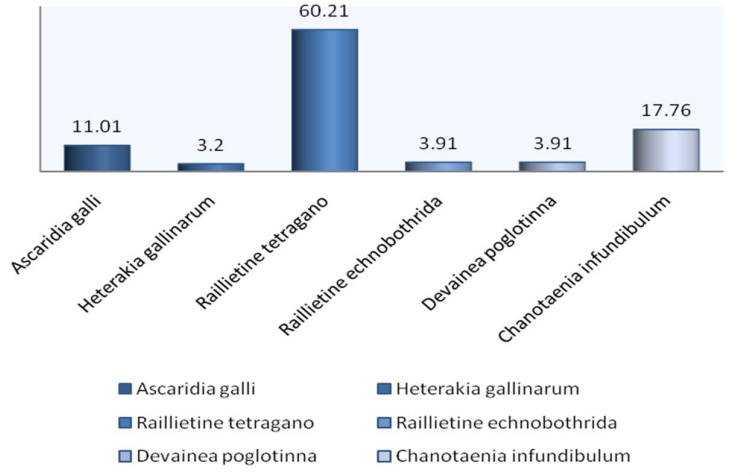

Fig. 1: Prevalence rate of parasitic helminths

In this study, female broiler chickens harboured more parasite than cock; this could be as a result of sexual dimorphism. This finding coincides with the result obtained in the study conducted by Matur (2010). Again, this study corroborates the finding of Matur (2010) that the prevalence rate of infection was higher in hen than cock. The high prevalence rate of helminths parasite recorded in our study during rainy season in Gwagwalada could be attributed to poor poultry management system adopted by the farmers, poorly constructed zinc metal materials having little or no ventilation thereby resulting in high humidity and temperature which could favour helminthic growth as reported by Mwale (2011). Furthermore, the influence of temperature and humidity reported by Magwisha *et al*. (2002) could have led to a change in the population dynamics of the parasites, thereby causing intense changes in the prevalence and intensity of helminths infections witnessed in this current study. The finding of this study is in agreement with the earlier works of Dube *et al*. (2010) who reported that temperature and humidity favour the growth and spread of nematodes and cestode species in poultry during rainy season.

CONCLUSION AND RECOMMENDATION

This study revealed high infection rate of parasitic helminths in the exotic breed of broiler chickens examined during the months of June (40.6%) and July (59.4%) in the study area with *Railietina treteragona* having highest prevalent rate of 60.2% followed by *Chanotaenia infundibulum* (17.8%), *Ascardia galli* (11.0%), *Devainea poglotinna* (3.9%), *Raillietinae chinobothrida* (3.9%) and *Heterkis gallinarum* (3.2%). Therefore, there is need

for a sustainable control strategy with a view to achieving improved control measures on poultry management system towards healthy production of livestock chickens for human consumption. Again, since this current study was conducted during the rainy season, there is a need to carry out same study in the dry season with a view to comparing the rate of infection across seasons. However, molecular-based identification of parasites is highly recommended so as to increase the efficiency of screening.

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