Original Research Article

INVESTIGATION OF GASTROINTESTINAL PARASITES OF LOCAL CHICKENS (*Gallus domesticus*) IN UGEP, YAKURR LOCAL GOVERNMENT AREA, CROSS RIVER STATE, NIGERIA.

ABSTRACT

Background: Investigation of gastrointestinal parasites of local chicken (Gallus domesticus) was conducted in four council wards of Ugep in Yakurr Local Government Area, between October 2017 and June 2018.

Aim: The aim of this study was to investigate the parasitic load of male and female scavenging chickens.

Materials and methods: Digestive tracts of scavenging chickens were obtained and processed by parasitological means.

Results: From a total of 320 local scavenging chickens examined 240 (75.0%) were parasitized by helminthes. Out of the 180 male and 140 female chickens examined, 75 (52.8%) and 120 (85.7%) were positive for helminth parasite eggs respectively. There was statistical significant difference ($p < 0.05$) in the prevalence of helminth parasites between male and female chicken. A total of 12 helminth parasite species were recovered in this study, comprising of 7 nematodes and 5 cestodes.

Conclusion: The high prevalence of helminth parasites among local chickens was attributable to lack of periodic deworming and climatic factors. Local breeds are tastier than exotic breeds and people prefer them more than exotic ones during Christmas celebrations. Occasional deworming exercise is advocated to reduce their worm burden and zoonotic infection.

Key words: Gastrointestinal, helminthes, Local chickens, Ugep, Yakurr

INTRODUCTION

In Nigeria, every household owns some form of poultry, but majority of the birds are unimproved local types which are kept mainly as scavengers and managed under the open range system (Ogbaje et al., 2012). An average of 5 to 100 birds per household are kept extensively with little financial or labour imput (Mukaratirwa et. al., 2001). They can thrive under adverse conditions, such as poor management, diseases, lack of feeding and parasites, which might cause low productivity (Ohaeri & Okwum, 2013; Akinwumi et al., 1979). Besides being an important source of income and cheap protein to the village/rural people, the free-range poultry is an integral part of village life and has an important social value (Ikpi and Akinwumi, 1981; Ogbaje et al., 2012; Ohaeri & Okwum, 2013). There has been a lot of emphasis placed on modern poultry production using exotic breeds of chicken in Nigeria (Yoriyo et. al., 2008). However, since the inception of commercial poultry in 1956 in Nigeria to bridge the protein deficiency gap, it has been bedeviled by so many problems (Ikpi & Akinwumi, 1981). Helminthiasis was considered to be an important problem of local chicken and helminth parasites have been incriminated as a major cause of ill-health and loss of productivity in different parts of Nigeria (fakae & Paul-Abiade, 2003). Parasitism is one of the major problems which inflict heavy economic loses to the poultry in the form of retard growth, reduced weight gain, emaciation, decreased egg production, diarrhea, obstruction of intestine, poor feathers, anaemia, paralysis, catarrh, morbidity and mortality (Dube et. al., 2010; Sofi et. al., 2016; Nair & Nadakal, 1981; Fatihu et. al., 1991). Despite information on helminthiasis of birds in northern and southern parts of Nigeria (Fatihu et. al., 1991; Riise et. al., 2004), there is paucity of information on infection of

indigenous fowl in Cross River State, especially in Ugep. However, in studies by Ruff (1999), 100% of rural scavenging chickens examined in Cross River Nigeria were positive for one or more helminthes parasites. Various studies have reported a wide range of helminthes distribution worldwide (Sofi et. al., 2016 40.14 % in Gurez valley of Jammu and Kashmir, India; Ebrahim et. al., 2015 34.8% in Khorramabad, West India; Idika et. al., 2016 96.8% in Nsukka, Nigeria; Mukaratirwa et. al., 2001 64.8% and 64.1% of different species in Zimbzbwe and Adang et. al., 2014 63.3% in Gombe, Nigeria. Despite much work on helminthiasis on scavenging chickens in other parts of the world and Nigeria in particular, there is scarce information on helminth infection of local scavenging chickens in Ugep, Yakurr Local GovernmentArea of Cross River State, Nigeria. The aim of this study is to determine the prevalence of helminthes species in male and female local scavenging chickens in Ugep, Cross River State, Nigeria.

2.Materials and methods

2.1 The study area.

This study was conducted in four council wards of Ugep, in Yakurr Local Government Area. Ugep is one of the largest native towns in Eastern Nigeria, and people of all works of life are resident here, and therefore high demand for poultry products. Ugep lies between latitudes 4^0 and 6^0 north of the equator and longitudes 6^0 and 8^0 East of the Greenwich Meridian. The area is in the equatorial rainforest of Nigeria. Subsistence farming is the main occupation of farmers. Household practice local poultry farming with a range of 2 to 40 local scavenge chickens per household.

Sample collection

Digestive tracts of 320 local scavenging chickens were collected from four council wards of Ugep in Yakurr Local Government Area between October 2017 and June 2018. These digestive

tracts were put into labeled plastic vials indicating council ward and sex of the chicken, before transportation to the parasitological laboratory of Cross River University of Technology, Calabar, for processing.

Isolation and identification of parasites.

The digestive tract of each chicken was separated by ligation into oesophagus, crop, proventriculus, gizzard, small and large intestines and caecum. Each section was slit open in a separate petri dish, and the content washed thoroughly under running tap water over a 200µm sieve. The mucosae surfaces were rubbed between fingers to remove any parasites on the surface (Fatihu et. al., 1991). Examination of samples for eggs of helminthes was based on the floatation technique (Soulsby, 1982). The preparations were examined under the microscope using x10 and x40 magnifications.

Data analysis

Chi-square test (x2 was used to compare infection between male and female chickens and council wards.

Results

From a total of 320 local scavenging chickens examined 240 (75.0%) were parasitized by helminthes, comprising of nematodes 155 (48.4%) and cestodes 85 (26.6%) ((Table 1).

Table 1. Overall prevalence of helminth eggs.

Parasites	Chickens examined	Parasites recovered	% infection
Nematodes	190	155	48.4%
Cestodes	130	85	26.6%
Total	320	240	75.0%

Table 2. Prevalence of helminth egg infection according to sex

Sex	Number examined	Number positive	% prevalence
Male	180	95	52.8
Female	140	120	85.7

Table 2 reveals prevalence of infection of helminthes according to sex. Out of 180 male and 140 female chickens examined, 95(52.8%) males and 120 (85.7%) females were positive for helminthes parasites. There was statistical significant difference ($p < 0.05$) in the prevalence of helminthes between male and female scavenging chickens.

In table 3, the number of local scavenging chickens infected, the preferred site of infection and the council wards are shown. A total of seven (7) species of nematodes and five (5) species of cestodes were recorded from the various sections of the digestive tracts. Of the 214 local chickens infected with helminthes, 62 (19,4%) were *Ascaridia galli*, 28 (8.8%) *Heterakis gallinarum*, 11 (3.4%) *Gongylonema congolense*, 25 (7.0%) each for *Tetrameres ameriana* and *Subulura brumpi*, 24 (7.5%) *Cheilospirura haamulosa*, 14 (4.4%) *Capillaria contorta*, 7 (2.2%) *Choanotaenia infundulum*, 19 (5.9%) *Raillietina echinobothrida*, 6 (1.9%) *Reillietina tetragonia*, 14 (4.4%) *Hymenoslepis cantaniana* and 5 (1.6%) *Hymenolepis carioca* (Table 3). The most frequently encountered nematode was *Ascarida galli* in the intestine, while the least was *Gongylonema congolense* in the crop. Nematodes were prevalent in all sections of the digestive tract. Cestodes prevalence was restricted to the small intestine and duodenum.

Prevalence of helminthes in the four council wards revealed that 88 local scavenging chickens in Ijom ward were infected by ten species of helminthes. In Bikobiko, Ijiman, and Ikpakapit wards

41, 76, and 35 scavenging chickens were parasitized by 7, 6, and 7 species of helminthes respectively (Table 3).

Table 3. No of scavenging chickens infected and site of helminth recovery according to council wards

Species	Site of recovery					
Nematodes		Ijom N = 120	Bikobiko N = 65	Ijiman N = 80	Ikpakapit N = 50	Overall Infection
Ascarida galli	Small intestine	22 (18.3)	15 (23.1)	19 (23.8)	6 (12.0)	62 (19.4)
Heterakis gallinarum	Caecum	12 (10.0)	9 (13.8)	0	7 (14.0)	28 (8.8)
Congylonema congolense	Crop	2 (1.7)	4 (6.2)	0	5 (10.0)	11 (3.4)
Tetrameres americana	Proventriculus	10 (8.3)	0	15(8.8)	0	25 (7.8)
Subulura brumpi	Caecum	9 (7.5)	0	12 (15.0)	4 (8.0)	25 (7.8)
Cheilospirura hamulosa	Gizzard	5 (4.2)	0	13 (16.3)	6 (12.0)	24 (7.5)
Capillaria contorta	Oesophagus	6 (5.0)	5 (7.7)	0	3 (6.0)	14 (4.4)
Cestodes						
Choanotaenia infundulum	Small intestine	4 (3.3)	3 (4.6)	0	0	7 (2.2)
Reillietina echinobothrida	Small intestine	7 (5.8)	0	12 (15.0)	0	19 (5.9)
Reillietina tetrgonia	Small intestine	0	2 (3.1)	0	4 (8.0)	6 (1.9)
Hymenolepis cantaniana	Duodenum	11 (9.2)	3 (4.6)	0	0	14 (4.4)
Hymenolepis carioca	Duodenum	0	0	5 (6.3)	0	5 (1.6)
Total number of chickens		88	41	76	35	240
Total species			7	6	7	

Discussion

This study revealed that local chicken breed by households in Ugep are heavily parasitized by two classes of helminthes, namely nematodes and cestodes. Similar findings have been reported earlier by different researchers in Africa (Fatihu et. al., 1991; Mukaratirwa and Khumalo, 2010; Idika et. al., 2016; Beruktayet and Marsha, 2016).

The overall prevalence of helminthes infection (75.0%) recorded in this study is in agreement with 76.1% reported by Ogbaje et.al., (2012) in Markurdi Township, Benue State, Nigeria. The reported 75.0% prevalence of helminth infection in this study revealed a relative decrease from previously observed prevalence of 100% by Ruff (1999), 95.2% by Fatihu et. al., (1991), 90.0% by Fabiyi (1972) and 96.8% by Idiki et. al., 2016). The decease prevalence is attributable to the level of proper management information to most local chicken breeders as earlier reported by Ogbaje et. al., (2012). Domestic chickens have indiscriminate scavenging behavior of seeking food from diverse diets containing infective stages of helminth parasites, which predisposes them to parasitic infections (Smyth, 1976). This gives a clue for the high prevalence rate observed in free-range chickens in this study. The result is in consonance with previous reported work (Permin et. al., 1997, Abubakar and Garba, 2000, and Luka and Ndams, 2007). From this study, nematodes have a higher prevalence rate of 48.4% with *Ascaridia galli* having a very reasonable prevalence of 19.4 compared with cestodes having a prevalence of 26.6%. This finding buttress the report of several studies (Berhanu et. al., (2010), Beruktayet and Marsha (2016), Ohaeri and Okwum (2013) and Yoriyo et. a., (2008), who agreed that nematodes are always higher in prevalence than cestodes. They reasoned that nematodes do not require intermediate hosts and thus transmitted directly from the soil, while cestodes transmission is dependent on the availability of intermediate hosts.

Ascaridia galli showed the highest infection rate in this study. This high rate of infection may be due to moist environmental factors around the study area which has enhanced larval development and subsequent transmission (Kenndy, 1975; Audu et. al., 2004). This study reported a higher prevalence rate of helminthes infection in female scavenging chickens (85.7%) than males (52.8%). Explanation to this difference in infection could be that because female chickens dissipates much energy during egg production and incubation, it induces their voracious and indiscriminate feeding habit on diverse diets containing infective stages of the parasites. But male chickens are selective and therefore less infected than females. This observation is in line with the report of Matur et. al., (2010) and Uhuo et. al., (2013), but in sharp contrast with that of Yoriyo et. al., (2008). Nematode parasites were found in all the sections of the digestive tracts, with *Ascaridia galli* frequently encountered in the small intestine. This finding is in agreement with the report of Fatihu et. al., (1991) & Ohaeri and Okwum (2013). The small intestine and duodenum harboured all the cestodes encountered in this study. The reason for their occupation of these sections of the digestive tracts is to acquire the available food nutrients here. This observation conforms to Smyth (1976) who posited that it was to complement their physiological osmotic feeding nature. The overall prevalence of helminth parasites of scavenging chickens showed a significant statistical difference ($p < 0.001$) between council wards. This could be due to variation in climatic factors such as soil moisture and humidity in the council wards, which facilitate development and subsequent transmission. This finding is similar to several studies (Buriro et. al., 1992; Kenndy, 1975; Audu et. al., 2004).

CONCLUSION

In conclusion, this study revealed that local chickens breed from the four council wards of Ugep are heavily parasitized by two classes of helminth parasites, namely nematodes and cestodes. A

total of twelve (12) helminth parasites were recovered during the study, that is, seven nematodes and five cestodes. The high prevalence of helminth parasites in the study area is not unconnected with climatic factors and lack of occasional deworming. Periodic deworming of local scavenging chickens to reduce their worm burden is highly recommended.

Conflict of interest.

There was no financial or material contribution by any organization for this investigation, and therefore no conflict of interest.

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