PREVALENCE OF INTESTINAL PARASITE OF POULTRY CHICKEN IN UYO URBAN, AKWA IBOM STATE, NIGERIA

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ABSTRACT

A study was conducted between May 2016 and October 2016 to identify intestinal helminth, in commercial broiler chicken and then estimated prevalence in Uyo Akwa Ibom State Nigeria. Three hundred and fifty intact intestine of commercial broiler chicken were purchased from six major streets in uyo. The faecal sample from each of the intestine was examined by Direct Wet Mount and Concentration method. Six different intestinal helminth parasites belonging to the group of Cestoda and Nematoda were identified. Among these parasites *Ascaridia galli* was found to be the most prevalence (15.0%) among the chickens other parasites encountered included; *Heterakis gallinarum* (12.0%) *Capillaria* sp (10.3%); *Raillientina cesticillus* (10.7%) *Raillietina tatregonal* (10.7%) and *Amoebotaenia sphenoides* (8.0%). The overall prevalence was 194 (64.7%) out of 300 chicken examined. Parasite prevalence with respect to sex indicates that females were more infected than male, 94(31.3%) had single infection, 28 (9.3%) had double infection and 15 (5.0%) had triple infection. The significance and implication of these parasites cannot be over emphasized. There is need for intensive husbandry practices, sustenance and implementation of appropriate preventive measures.

INTRDUCTION

There are about 20 billion poultry worldwide, a great percentage of which is found in developing country, of these approximately 800 million chickens are found on the African continent. Village chickens (*Gallus gallus*) are the predominant species in the rural poultry sector in Africa (Kitalyi, 2007). Although village chickens have a slow growth rate, they are of paramount importance to the African rural farmers because they improve the nutritional status and income of rural households and landless communities by provision of meat and eggs and serving as a source of cash (Enyenihi and Daraine, 2010. Village chickens also fulfil a number of other functions for which it is difficult to assign any monetary value. These include the fact that rural chickens play active role in pest control and are also used for socio-cultural purposes like traditional ceremonies and festivals. Moreover, besides providing man with high nutritional value, employment ,income, for small scale farmers (particularly in the off-cropping season) and other socio economic benefit which cannot be over emphasized poultry integrates into other farming activities like cropping and fish farming (Aini, 2010). Despite the usefulness and tremendous benefits derived from poultry, however, a lot of losses have been recorded. For examples, approximately 80% of chickens in Africa kept under tradition village production system have been reported to have mortality as high as 80-90% within the first year after hatching (Kitalyi, 2007; Margolis *et al*., 2013).

These losses have attributed to diseases causing agent like viruses, bacteria, helminthes and other parasites. Gastrointestinal parasites are however, the most prevalent and most devastating parasites affecting chickens productivity. It is one of the major problems which inflict heavy economic

losses to poultry inform of retarded growth, poor feathers, replacement birds that take long to reach maturity and reduced weight gain. These gastrointestinal parasites especially helminthes causes anaemia due to blood loss, and can cause damage directly by causing diarrhoea, poor absorption of nutrients, anorexia and enteritis, thereby affecting bird growth and egg production (Yadav and Tandon, 1991). Poultry are kept in backyards or commercial production systems in most area of the world. It is one of the most important sources of protein and farm manure for man. Factors which hinders the development poultry to its fullest capacity includes; poor management system and diseases. Intestinal parasitism is a major problem in poultry especially those reared under the extensive system (Banage, 2012).

Ajayi and Ayayi (1991) found that the major constraint to poultry production in Nigeria is helminthiasis. He also reported that helminth parasites constitute a serious problem and great economic loss to poultry production. The diet of chicken consists of grains, seeds, larva and adult stages of various arthropods, earthworms and snails. A considerable number of arthropods, earthworms and sails, have been implicated as intermediate hosts of helminthes. Helmith causes helminthiasis which is a disease of economic and public heath importance, as it may affect animal health and human nutrition, as a result of losses in egg production and heavy mortality in chickens. It can be a potential epizoonosis for animals that consume contaminated faeces. Moreover, some indirectly transmit disease for examples, *Heterakis gallinarum* is an intermediate host of *Histomonas meleagridis* which causes histomoniasis in turkey and chicks. The disease is characterized by low growth rates, low egg production and high mortality in chicks (Adang *et al*., 2014).

The effective control measures however can be realistic if based on a thorough knowledge of the epidemiology of the epidemic infectious agent. Limited studies undertaken on commercial farm which raise mainly exotic birds indicated that helminth infection is a threat to the Nigerian poultry industry (Ayayi and Ayayi, 1991). There is a definite paucity of information on infections of indigenous fowl. However, some major studies have been carried out in southern and northern Nigeria (Adang *et al*., 2014, Ayayi and Ayayi, 1991, Matur *et al*., 2010, Yoriyo *et al*., 2008).

In Nigeria, some of the documented evidence include; from Zaria, Fatihu, *et al*., (1999) recorded a prevalence of 90.2% in a study to provide information on the prevalence of helminth parasites of chickens with prevalence. The following helminthes were identified *Ascaridia gatli* (51.60%), *Raillietina echinobothrida* (91.60%), *Rallietina tetragona* (22.20%), *Heretakis gallinarum* (31.6%), *Hymenolepis carioca* (23.0%) and *Syngamus trachea* (1.80%). *Ascaridia galli* has been incriminated as the most common and most important helminth parasite of poultry (Hodasi, 2005). The cestodes of significant importance are of two genera *Rallietina* and *Hyrenolepis*. Yoriyo *et al*., (2008) reported a prevalence of 19.2% while surveying for gastrointestinal helminth of free ranging chickens in Bauchi and its environs. The following helminthes were identified; *R. tetragona*, *R. echinobothrida*, *R. cesticillus*, *C. infundibulum*, *Amoebotaenia* species, *H. carioca*, *Subulura spp*, *Ascaridia* species and *Heterakis* species.

Enyenihi and Davaine (2010) worked on 30 commercial poultry chickens in this study of parasites of commercial poultry houses in Calabar. He recorded the following parasite; *Ascaridia galli*, *Heterakis*, *Heterakis gallinae* 33.3%, *Strongyloide savium* 23.3%, *Raillietina echinobotherida* with overall percentage of 76.6%. Troncy (2011) in plateau state investigated and reported the following parasite of domestic chickens with various incidence percentage being; *Ascaridia styphocera* 50%, *Heterakis breviphculum* 30%, *Tretramerefissipina* 43.3%, *Strongyloidesavium* 5%, *Raillietina tetragona* 60%, *Hyrenolopsis carioca* 43.3% and *Amoebotaenia sphenoides* 20%. In the southern part of Nigeria, there are few reports on parasites of chicken.

Parasitic diseases are the problems whenever poultry are raised whether in large commercial operations or in small backyard flocks and economic losses can be significant. These parasites constitute a major factor limiting fruitful production in poultry industry by affecting the growth rate of the flock resulting organ malfunctioning and finally death.

The importance of poultry in the national economic of developing countries and its role in improving the nutritional status and income of both subsistent and commercial farmers as well as consumers can never be overemphasized. Since intestinal parasites are very common in poultry flocks and interfere with their feed absorption, it is therefore pertinent to study and identify these parasites. This will serve to educate farmers and the rural community in better husbandry practice to preserve poultry population.

The aim of the study was to determine prevalence of gastrointestinal parasites in poultry chickens slaughtered within Uyo metropolis and the specific objectives were to:

(1) identify the species of parasite infecting them
(2) determine the overall prevalence of gastrointestinal parasites in the poultry chickens
(3) determine the sex specific prevalence of the parasites
(4) determine the parasite specific prevalence of infection.

MATERIALS AND METHODS

The study was conducted in Uyo Local Government Area which is also the capital of Akwa Ibom State. It lies between latitude 5 and 5'N and longitude 80E. It is within the tropical semi-seasonal equatorial rain forest belt. However it has a short dry season period from late October to March and a longer lasting raining season period that commences from March persisting through to the middle of October. The annual rainfall in this area average between 500mm. The humidity is high and the temperature moderately high. These variables coincide with what is obtained across the tropical region.

Collection of Samples

A total of 300 gastrointestinal tracts of chickens were collected from the dressing roasted chicken sellers along some major street in Uyo, Akwa Ibom State, Nigeria. The specimens were transported in a small cooler to the department of Animal and Environmental Biology Laboratory University of Uyo. The intestinal tracts collected from the slaughtered chickens were examined for gastrointestinal parasite.

Laboratory Examination

The following methods were employed in the examination of the gut contents:

(1) **Physical Examination:** The alimentary canal of each chicken was opened from oesophagus down to the rectum (Fatihu *et al*., 1991) and all worms visible to the naked eye were collected using a pair of forcept. Recovered nematodes were preserved in 70% alcohol while cestode were fixed with haematoxylin and mounted in Canada balsam.

(2) **Direct Wet Mount Method:** The faecal sample was scrapped into a petri dish. The sample was apply to a small area of microscopic slide, immediately 2 to 3 drops of saline water was added with a pipette mixed together using applicator stick. The specimen was covered with a coverslip then examined under microscope with the low power magnification (10x).

(3) Sedimentation Method: 1gm of faeces was placed in a centrifuge tube, emulsify with a distil water of 5-6ml and stirred. Centrifuged at 3000rpm for 15mins.The supernatant was discarded and the sediment was drawn with the help of a pipette and placed on a clean slide and examine under the microscope. (Sloss and Kemp 2002).

Identification of Parasite

The parasites were identified directly under the microscope using the helminthological keys described by Soulby (2002).

RESULTS

Table 1: Monthly prevalence of intestinal helmith infection of broiler in Uyo

		Prevalence of Parasite Infection						
			Nematode			Cestode		
Month	No. Exam-ined	No. Infected (%)	Ascaridia galli No (%)	Heterakis gallinarum	Capillaria spp	Raillietina cesticillus No (%)	Raillietina tatregonal No(%)	Amoebo-taenia sphenoide No(%)
May	50	35(70.0%)	9(18)	8(16)	4(8)	8(16)	3(6)	3(6)
June	50	29(58.0)	6(12)	4(8)	6(12)	4(8)	5(10)	4(8)
July	50	24(48.0)	5(10)	5(10)	4(8)	4(8)	3(6)	3(6)
August	50	35(70.0)	9(18)	7(14)	7(14)	3(6)	5(10)	4(8)
Sept.	50	32(64.0)	8(16)	5(10)	6(12)	5(10)	4(8)	4(8)
October	50	39(78.0)	8(16)	7(14)	4(8)	8(16)	6(12)	6(12)
	300	194 (64.7%)	45(15.0%)	36(12.0%)	31(10.3%)	32(10.7%)	26(8.6%)	24(8.0%)

Calculated χ^2 = 2.7018 Df = 5, P < 0.05

The result in table 1 indicates that out of 300 poultry (broilers) chicken examined between May and October 2016 for intestinal helminth infection 194(64.7%) were infected with intestinal parasite. The highest prevalence infection 78% was recorded in the month of October follow by the prevalence 70% each recorded in the month of May and August. The month of July recorded the least prevalence of 48%. There was no significance difference in the monthly prevalence of infection. The parasite spectrum revealed that Nematode encountered were *Ascaridia galli* 45(15.0%), *Heterakis gallinarum* 36(12.0%) and *Capillaria* spp 31(10.3%) while cestode was specific prevalence were as follows *Raillietina cesticillus* 32(10.7%), *Raillietina tatregonal* 26(8.6%) and *Amoebotaenia sphenoides* 24(8.0%). There was no significance prevalence (> 0.05) with respect to monthly infection.

Table 2: Prevalence of gastrointestinal parasites in relation to sex

PARASITE	Male n =140 No. infected (%)	Female n =160	% Prevalence
Ascaridia galli	21(15.1)	24(15)	15.0
Heterakis gallinarum	16(11.4)	20(12.5)	12.0
Capillaria spp	13(9.2)	18(11.3)	10.3
Raillietina cesticillus	14(10.0)	18(11.3)	10.3
Raillietina tatregonal	10(7.1)	16(10)	8.6
Amoebotaenia sphenoides	13(9.2)	11(6.9)	8.0
Total n = 300	87(29.0)	107(35.7)	64.7

Calculated χ^2 = 1.071, χ^2 Tab 0.95347 Df = 5, P < 0.05

Table 2: indicates parasites preference in relation to sex. It was observed that *Ascaridia galli* had equal prevalence in both male and female 15% each was and *Amoebotaenia sphenoide* was more prevalent in male (9.29%) than in female 6.9% while *Heterakis gallinarum*, *Capillaria spp*, *Raillietina cesticillus* and *raillietina tetragonal* had the highest preference for female bird than

male (12.5%, 11.3%, 11.3%, 10.0%). However the overall prevalence shows that female (35.7%) were more infected than male (29.0%). There was a significant different between male and female prevalence of infection.

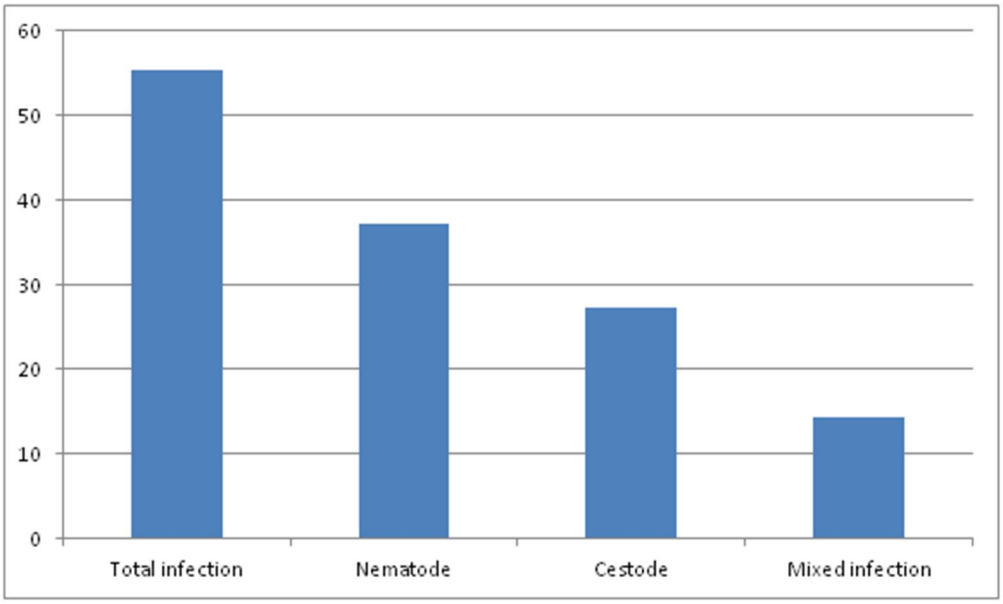

Figure 2: Histogram graph showing prevalence of parasite infection

The result in figure 2 showed that out of 300 broilers examined for intestinal parasite infection, the total infection 64.7% out of where Nematode was 112(37.3%), Cestode 82(27.3%) and mixed infection 14.3%.

The broilers had higher prevalence of single infection 94(26.9%) compared to double 28(8.0%) and triple infection was 15(4.3%). The difference in the prevalence of single, double and triple infection was significant ($p<0.05$).

DISCUSSION

The result revealed the prevalence of 64.7% infection of broiler chicken with intestinal helminth in uyo Akwa Ibom State. This result is lower than the 78.3% by Matur *et al*., (2010) and 70% by Yoriyo *et al*., (2008). The probable reason for such prevalence might be regular use of the helmintics on the farm by integrated broilers company. Also the short life span and confinement of commercial broilers might be the other causes. However the source of infection cold be from contamination of poultry feed with the environment. The higher prevalence recorded by other authors could be trace to the type their chickens which comprise of free range local chicken that were more exported and parasitic infestation are often neglected (Matur *et al*., 2010 and Adang *et al*., 2004. The significant difference in the prevalence of infection between different authors may due to differences in the intensity of care between the farms. Six species of helminth parasites encountered in this study are similar to these previously recorded by Matur *et al*., (2002), Adang *et al*., (2014) and of the six species of helminth recoreded Ascaridia galli had the highest prevalence rate. This species had been reported in several studies as the commonest and the most important helminth infection of poultry bird Luka and Ndams 2007, Matur *et al*., (2010). These reports incriminated the nematode and cestode as very important parasites of poultry bird.

Table 3: Prevalence of single, double and triple infection in broilers in Uyo

Infection type	Parasites	Frequency of occurrence
Single		
	Ascaridia galli	27(7.7)
	Heterakis gallinarum	18(5.1)
	Capillaria spp	15(4.3)
	Raillietina cesticillus	15(4.3)
	Raillietina tetragonal	8(2.3)
	Amoebotaenia sphenoides	11(3.1)
Double	*Ascaridia galli + Heterakis gallinarum*	2(0.6)
	Ascaridia galli + Capillaria spp	1(0.3)
	Ascaridia galli + Raillietina tetragonal	5(1.4)
	Ascaridia galli + Amoebotcaenia sphenoides	2(0.6)
	Heterakis gallinarum + Capillaria spp	1(0.3)
	Heterakis gallinarum + Raillietina cesticillus	4(1.1)
	Heterakis gallinarum + Raillietina tetragonal	3(0.9)
	Heterakis gallinarum + Amoebotaenia sphenoides	2(0.6)
	Capillaria spp + c	1(0.3)
	Capillaria spp + Amoebotaenia sphenoides	3(0.9)
	Raillietina cesticillus + Raillietina tetragonal	2(0.6)
	Raillietina tetragonal + Amoebotaenia sphenoides	2(0.6)
Tripple	*Heterakis gallinarum + Raillietina cesticillus + Amoebotaenia sphenoides*	1(0.3)
	Ascaridia galli + Capillaria spp + Raillietina cesticillus	1(0.3)
	Ascaridia galli + Heterakis gallinarum+ Raillietina tetragonal	2(0.6)
	Heterakis gallinarum + Capillaria spp + Raillietina cesticillus	2(0.6)
	Heterakis gallinarum + Capillaria spp + Raillietina tetragonal	2(0.06)
	Capillaria spp + Raillietina cesticillus + Raillietina tetragonal	1(0.3)
	Capillaria spp + Raillietina cesticillus + Amoebotaenia sphenoides	2(0.3)
	Raillietina cesticillus + Raillietina tetragonal + Amoebotaenia sphenoides	1(0.3)
	Ascaridia galli + Capillaria spp + Amoebotaenia sphenoides	2(0.6)
	Ascaridia galli + Capillaria spp + Raillietina tetragonal	1(0.3)
Sub Total		15(4.3)

Calculated χ^2 = Tab χ^2 = 0.317 $P < 0.05$

This is not uncommon but in line with the report of Borgsteede *et al*., (2012). Although there was significant prevalence of infection of the female than the male chicken, this could be because female broilers are more voravious in feeding, they are reared in the same condition and environment, normal with their male counterparts. It is plausible that the higher prevalence frequency of single infection recorded in this study agrees with the observation of Adang *et al*., (2009) and this could depend on the order of initiation of the infection in the host, as the first

parasite to infect the host may acquire higher micro habitat and establishment than the late entrance. Banage (2012) agreed that food preference at a particular time may determine the establishment of single or mixed infections and other birds tent to challenge parasites immunologically. The limitation of mixed infection, to only a maximum of three helminth per bird indicate that host species could be less susceptible to mixed infections. It is likely the parasite burden may affect the health and growth rate of the chicken.

CONCLUSION

The study revealed the prevalence of intestinal helminth infection of broiler chicken in uyo. Six species of helminth parasites; three species of Cestode and three species of Nematode were identified. The Nematodes are the most common helmith parasite of broiler chicken as *Ascaridia galli* read in the prevalence rate. The present study showed that mixed warm infestation are less frequently seen than single warm infection and mixed infection were limited to three species of helminth parasite. The finding recorded that much is still describe to the parasite burden in poultry chicken.

RECOMMENDATION

i. Poultry farm manager must practice separation of infected chickens from non-infected ones during an outbreak of diseases.
ii. Those that are going into poultry business should seek and obtained experts assistance from relevant agencies of government.
iii. Good environmental practice should be encouraged in poultry management.
iv. Proper monitory of the birds for sign of parasite infection and timely proper treatment for the infection is an effective measure of control.
v. The use of anticestodal and anti nematodal drug in poultry chicken should be practiced.
vi. Administration of drug such as piperazing hydrochloride 100% and ASP bacteria powder could help ameliorate the problem of helminthiasis.
vii. Education of poultry farmers on effective farm management practices as integrated control of parasitic diseases need to be intensified to reduce the infection rate.
viii. Frequent sanitary inspection of dressing unit of road side poultry chicken sellers in Uyo and Uyo main market is necessary to prevent the contamination of meat with helminth eggs.
ix. There is need for intensive husbandry practice and supervision and the implementation of appropriate preventive medicine programmes for poultry and free range chicken in Uyo.

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