HELMINTH FAUNA OF THE FIVE (5) PHENOTYPES OF THE NIGERIAN LOCAL CHICKEN IN NSUKKA, ENUGU STATE, NIGERIA.

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Abstract

With the rise in the rearing of local chicken in Nigeria, it becomes pertinent to study various aspects of diseases affecting this type of chicken. In this study five phenotypes (normal and frizzle feathered, wild type, naked and crested neck) of the Nigerian local chicken in Nsukka, Enugu state, Nigeria were screened for the helminth parasites. An overall prevalence of 84% (95% CI = 0.6473 to 0.9421) was recorded. The helminth fauna of the five phenotypes were observed to be made up of *Ascaridia galli* (OP 32%), *Raillietina sp.* (OP 64%) and *Tetrameres sp.* (OP 16%). Single and mixed infections were observed in the study; single infections of *Raillietina sp.* was the highest occurring (40%) while a mixed infection of Ascaridia galli and Raillietina sp. occurred most (20%). Crested neck showed the highest prevalence (100%) of helminth infection (95% CI = 0.5109 to 1.0000) while the other four (4) phenotypes had 80% prevalence of helminth infections (95% CI = 0.3596 to 0.9797) each. The high prevalence reported across all the phenotypes was likely attributed to the poor management and feeding habit of the Nigerian local chicken. It is recommended that farmers practice better management and regular anthelmintic treatment of their birds.

Keywords: Nigerian local chicken, *Ascaridia galli, Raillietina sp., Tetrameres sp.*, avian helminthosis

Introduction

Poultry is widely distributed across Africa and worldwide in general. Of all the members of the poultry family, chicken is the most common and accounts for approximately 98% of the total poultry population in Africa (Solomon and Udoh, 2017). In Nigeria, indigenous local birds take up about 80% (120 million) of the total population of poultry (150 million), while the exotic birds make up the remaining 20% (30 million) (RIM, 1992).

Generally, poultry production is hindered by poor management system and diseases (Adang *et al.*, 2014). Gastrointestinal parasitism constitutes a major threat to poultry production especially in the extensive and semi-extensive systems which are the major systems of production used for the Nigerian local chicken NLC (Adang *et al.*, 2014). Helminthosis has been reported to result to weight loss, depression and reduced egg production in avian species.

Rearing of indigenous birds serves as a source of protein and major source of income to mostly inhabitants of rural communities in the tropical and subtropical areas (Odubote, 2015; Padhi, 2016). They are thought to be delicacies as they are considered much tastier, flavourful and lean (Ajayi, 2010). They are also hardy; expressing high level of disease resistance and adaptability to the adverse tropical climatic conditions, and exhibiting slow maturity and growth rate (Padhi, 2016).

Five phenotypes of the Nigerian local chicken has been described based on their feather arrangement, plumage colour, body size and structure and colour variants. These phenotypes are divided into three (3) common phenotypes of normal feathered, frizzle feathered and naked neck and two (2) less common phenotypes of crested neck and wild type. The normal feathered is the highest occurring followed by the naked neck and frizzled feathered while the crested neck and wild types are the least occurring (Ajayi and Agavieozor, 2009).

Various researchers have observed variations in the production, maturity, weight gain, haematological parameters, adaptation etc among the 5 phenotypes. Frizzle feathered and naked neck were observed to produce bigger and greater number of eggs, greater body weight gain and earlier maturity than the normal feathered (Ajayi, 2010). Frizzle feathered showed superior haematological parameters, indicating greater cell mediated immunological prowess and feed conversion efficiency (Solomon and Udoh, 2017). Thus it can be inferred that the Frizzle feathered will be more resistant to infections than other phenotypes.

The paucity of information on the helminth parasite fauna of the Nigerian local chicken prompted this study.

Materials and method

A total of twenty-five (25) Nigerian local chickens made up of five males from each of the five phenotypes were examined post mortem. The birds were eviscerated and the gastrointestinal tract (GIT) placed in labeled petri dishes. Normal saline was added to the petri dishes containing the intestines. The GI tracts were split open using a dissecting knife, the parasites found were viewed under a stereomicroscope and were identified according to Soulsby (1982).

Statistical analysis

The prevalence rates were analyzed using descriptive statistical analysis and presented in tables. The mean intensity and mean abundance were equally calculated. Chi square test was used to determine the existence of any association between the phenotypes ad infection.

Results

Three helminth parasites (2 nematodes; *Ascaridia galli* and *Tetrameres sp.* and 1 cestode; *Raillietina sp.*) were observed in the study. The overall prevalence (OP) of helminth infections was 84% (95% CI = 0.6473 to 0.9421). *Raillietina sp.* had the highest OP of 64% followed by *Ascaridia galli* with OP of 32% and *Tetrameres sp.* with OP of 16% (Table 1).

The overall prevalence of helminth infection among the five phenotypes is represented in table 2. Crested neck had the highest helminth infection prevalence of 100% while the other 4 phenotypes recorded 80% prevalence each.

Table 1: Overall prevalence of helminth infections in the NLC

	Number of NLC infected	Number of NLC screened	Overall prevalence
Raillietina sp.	16	25	64%
Ascaridia galli	8	25	32%
Tetrameres sp.	4	25	16%
Overall prevalence	21	25	84%

Table 2: Overall prevalence of helminth infection in the 5 phenotypes of NLC

Phenotype	Overall Prevalence of helminth infection (N = 25)	
Normal feathered	80%	(95% CI = 0.3596 to 0.9797)
Naked neck	80%	(95% CI = 0.3596 to 0.9797)
Frizzle feathered	80%	(95% CI = 0.3596 to 0.9797)
Wild type	80%	(95% CI = 0.3596 to 0.9797)
Crested neck	100%	(95% CI = 0.5109 to 1.0000)

Table 3 shows the prevalence rate, mean intensity and mean abundance of the 3 helminth parasites recovered from the five phenotypes. *Raillietina sp.* in the crested neck phenotype had the highest prevalence rate of 100% followed by the frizzle feathered with a prevalence of 80% (Table 3).

Table 3: prevalence of the various helminthes recovered in the 5 phenotypes of the NLC.

	Phenotype	Helminth parasite	Prevalence	Mean intensity	Mean abundance
1.	Normal feathered	*Raillietina sp.*	60%	5	2
		Ascaridia galli	40%	1	0.4
2.	Naked neck	*Raillietina sp.*	60%	10	6
		Ascaridia galli	20%	30	12
		Tetrameres sp.	40%	NA	NA
3.	Frizzle feathered	*Raillietina sp.*	80%	7.25	5.8
		Ascaridia galli	20%	1	0.20
4.	Wild type	*Raillietina sp.*	40%	16.5	6.6
		Ascaridia galli	20%	2	0.4
		Tetrameres sp.	40%	NA	NA
5.	Crested neck	*Raillietina sp.*	100%	7.2	7.2
		Ascaridia galli	40%	6	2.4

Single and mixed infections were observed in this study. Mixed infections with *Ascaridia galli* and *Raillietina sp*. Occurred most with a prevalence of 20% (table 4); while the single infection of Raillietina sp was observed to have the highest prevalence of 40% (Table 5).

Table 4: Mixed infection rate with two or more parasites.

Helminthes	No. Infected	No. examined	**Prevalence (N = 25)**
Ascaridia galli* + *Raillietina sp.	5	25	20%
Raillietina sp.* + *Tetrameres sp.	1	25	4%
Ascaridia galli* + *Raillietina sp.* + *Tetramere sp	1	25	4%

Ascaridia galli + Tetrameres sp.	0	25	nil

Table 5: Single infection

Helminthes	Number infected	Number examined	Prevalence (N = 25)
Ascaridia galli	**2**	**25**	8%
Raillietina sp.	**10**	**25**	40%
Tetrameres sp.	**2**	**25**	8%

Discussion and Conclusion

The results of the study revealed the helminth fauna of the Nigerian local chicken in Nsukka to be made up of 3 helminthes namely; *Ascaridia galli, Raillietina sp.* and *Tetrameres sp.* A very high prevalence for helminth infection (84%) was observed in the NLC in Nsukka and though it could be attributed to the small sample size, it is consistent with the prevalence rates recorded by some other researchers across Nigeria; 81.3% in Gombe state (Adang *et al.,* 2014), 87.8% in Bauchi (Yoriyo *et al.,* 2008) and 96.8% in Nsukka Enugu state (Idika *et al.,* 2015). But higher than that of Dawet *et al.,* (2012) who reported 37.85% in Jos, Plateau state. The high prevalence recorded can be related to the fact that the NLC are mostly left to roam and scavenge for food during which they pick up insects which may be intermediate hosts of various parasites such as *Raillietina sp.* and *Tetrameres sp.* These roaming birds are equally exposed to contaminated soil containing infective stages of parasites. Gastrointestinal parasitism interferes with host's metabolism, thus resulting in poor feed utilization, reduced growth and rarely death in severe cases (Dawet *et al.,* 2012). *Raillietina sp*., which causes nutrient depletion, was the highest occurring followed by *Ascaridia galli*, which interferes with the intestinal surface area for absorption of nutrients and also blockage when they occur in large numbers. These two parasites have been reported to be the most common helminthes of birds.The massive infection rate of helminth parasites is the most likely reason why the NLC are thought to have slow growth rate and feed conversion. It is possible that under better management systems and regular anthelmintic treatments they may do better.

In conclusion, farmers should be enlightened on the need for better management system for the rearing of local chickens and the need for an anthelmintic regimen/schedule for their birds.

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