DETECTION OF GASTROINTESTINAL HELMINTHS IN INDIGENOUS FOWLS REARED IN JOS METROPOLIS

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Abstract

Production of local chickens has contributed immensely to the growth of poultry subsector in national economy. Sadly, helminths have been identified as a major cause of decreased feed conversion, reduced weight gain, poor egg lay and mortality in indigenous chickens. Yet, there is a constant spread of this disease with less control and treatment measures hence, this study to ascertain the helminthic status of indigenous fowls reared in Jos metropolis. Faecal samples from 384 fowls, consisting of adults and growers of both sexes, were investigated for helminths burden using standard procedures. It was observed that *Syngamus trachea, Heterakis gallinarum, Ascaridia galli, Subulura brumpti, Capillaria annulate, Capillaria columbae* and *Strongyloides avium* were detected in (42 positive cases representing 10.9%) with *H. gallinarum* (33.3%) and *A. galli* (31.5%) more prevalent in the study area. Positive cases were more in cocks (7.81%) than in hens (3.13%), the adults had more helminthic burdens (9.37%) than the young ones (1.56%). The birds in Terminus (3.91%) and Kugiya (3.65%) were highly infested with helminths compared to other areas studied. Therefore, periodic surveillance and treatment of poultry species in Jos metropolis is imperative.

Keywords: Fowl droppings, helminthiasis, local chicken, parasites, veterinary care.

Introduction

The poultry industry occupies an important position in the provision of animal protein (meat and egg) to man and generally plays a vital role in the national economy as a revenue provider. Given the protein demand and supply situation in developing countries such as Nigeria, the poultry industry is one of the pillars on which the future of improved protein supply rests. In most areas of the world including Nigeria, poultry production is very much separated into intensive and free-range management systems. The commercial poultry sector has poultry farms that may or may not be mechanized but are usually large scale and deals with improved/exotic breeds of poultry with an intensive system of management. On the other hand, the free-range poultry is un-mechanized and, in most cases, the birds are left to roam from place to place scavenging for feed which is basically, insects and seeds. The local chickens are reared in a free-range system in the tropics with little or no supplementary feeding and veterinary care (Ola-Fadunsin *et al*., 2019; Ferdushy *et al*., 2016; Uhuo *et al*., 2013).

Besides being an important source of income and a cheap source of protein to the rural dwellers, the free-range poultry is an integral part of village life, and has an important social value. Unfortunately, parasitism especially helminthic parasites have been reported to lower productivity in local chickens. For instance, in Nigeria and other Africa countries, studies have shown that the prevalence of gastrointestinal parasitic infestation in indigenous chicken flocks is close to 100 % and individual birds may harbour more than one parasite species (Uhuo *et al*., 2013; Mukaratirwa and Khumaloa, 2010; Yoriyo *et al*., 2008).

Yet, little is known about the helminthic status of indigenous birds raised in Plateau state hence the present study focused on the prevalence of gastrointestinal helminths in indigenous birds reared in Jos metropolis.

Materials and Methods

Freshly voided faecal samples were collected from 384 indigenous fowls, consisting of adults and growers of both sexes, at 4 selected markets each in Yankaji, Terminus, Kugiya and Gyel, all located at Jos North and South Local Government Areas of Plateau State. The collected samples were placed in well labelled nylon, kept in a cooler and immediately transported to the Central Diagnostic Parasitology Laboratory, National Veterinary Research Institute, Vom, Jos, Plateau State, Nigeria, for helminths determination using Soulsby (1982) floatation technique. Data collected were analysed using simple descriptive statistics and where applicable, Chi Square of SPSS (2011) was adopted to obtain mean and probability values.

Results and Discussion

Table 1 shows the gastrointestinal helminths detected in indigenous fowls reared in Jos metropolis. In a total of 42 helminths cases detected in the fowls, as high as 14 positive cases representing 33.3%, were *Heterakis gallinarum*, followed by 13 cases of *Ascaridia galli* (31.0%). Also, as low as 5 cases of *Subulura brumpti* (11.9%), 4 cases of *Capillaria annulata* (9.52%), 3 cases of *Syngamus trachea* (7.14%), 2 cases of *Capillaria columbae* (4.76%) and a case of *Strongyloides avium* (2.38%) were detected.

Table 1: Gastrointestinal helminths detected in indigenous fowls reared in Jos metropolis

Detected helminths	Helminths infestation rate	Percentage
Syngamus trachea	3	7.14
Heterakis gallinarum	14	33.3
Ascaridia galli	13	31.0
Subulura brumpti	5	11.9
Capillaria annulata	4	9.52
Capillaria columbae	2	4.76
Strongyloides avium	1	2.38
Total	**42**	**100.0**

Number of birds studied: 384

The prevalence of *A. galli, H. gallinarum, S. trachea, C. annulate* were higher than 30.15%, 24.79%, 5.86%, 5.19% recorded in a similar study in Ilorin. But, a case of *S. avium* (2.38%) detected was lower than 7.54% reported in that study (Ola-Fadunsin *et al*., 2019). The disparities could be purely attributed to the studies' environmental and climatic variations and partly due to the population size used in both studies. This observation seemingly lent more credence to several reports that *H. gallinarum* and *A. galli* were the predominant helminth species among poultry birds (Afolabi *et al*., 2016; Ebrahimi *et al*., 2014; Uhuo *et al*., 2013; Nnadi and George, 2010).

Prevalence of gastrointestinal helminths based on sex, age and location of the indigenous fowls is presented in table 2. There were no statistical differences in all the parameters monitored. A total of 42 positive cases, representing an overall burden of 10.9%, were observed among the indigenous fowls investigated. Meanwhile, 30 positive cases (71.4%) of gastrointestinal helminths were detected in the cocks compared to 12 cases (28.6%) recorded in the hens. More positive cases (36 representing 85.7%) were recorded in the adults and only 6 cases (14.3%) were recorded in growers. The examined indigenous fowls in Terminus, had more helminths burden (3.91%), followed by Kugiya (3.65%), Yankaji (1.82%) and Gyel (1.56%), in that order.

It was observed that the overall burden of 10.9% recorded in this study, was much more lower than 100.0% (Uhuo *et al*., 2013), 81.0% (Adang *et al*., 2014) and 42.5% (Jegede *et al*., 2015) reported in poultry species at different locations in Nigeria and 91.9% cases recorded in Iran (Alam *et al*., 2014), as well as 84.6% reported in Bangladesh (Ferdushy *et al*., 2016). This observation could be due to

seasonal variabilities in the study locations, that Fakae and Paul-Abiade (2003) reported could influence helminths burden in local chickens.
Interestingly, more cocks (30) were observed to have gastrointestinal helminths (7.81%) compared to 12 cases representing 3.13% recorded in hens, buttressing the observation of Fakae and Paul-Abiade (2003), that male birds carried more helminths burden than the females. The domineering role of cocks in a flock reared in free-range, may predispose them to picking up more helminth vectors than the hens. Meanwhile, this observation apparently contradicted the report of Ola-Fadunsin *et al*. (2019), who discovered 36.7% prevalent rate in hens and 29.0% in cocks. The adults had more helminths burden (9.37%) compared to 1.56% detected in the growers, which somewhat disagreed with the report of Ola-Fadunsin *et al*. (2019) who recorded 46.47% in young and 27.4% in adult birds.

Consequently, it could be presumed that adult birds may serve as reservoir for continuous contamination of the environment and circulation of helminthic infestations, among poultry species especially those on free-range system. The higher prevalence of gastrointestinal helminths detected in indigenous fowls reared in Terminus and Kugiya may be a mere coincidence, because similar poultry breeds at similar age were studied in all the locations. Hence, the study locations may not influence gastrointestinal helminths burden in poultry birds.

Table 2: Gastrointestinal helminths prevalence based on sex, age and location of the birds

Parameters	No of birds examined	Positive cases	Prevalent rate	Overall burden	P-value
Sex					
Cocks	296 (77.1) †	30 (71.4) †	10.1	7.81	
Hens	88 (22.9)	12 (28.6)	13.6	3.13	
Total	384 (100.0)	42 (100.0)	23.7	10.9	0.229
Age					
Adults	305 (79.4)	36 (85.7)	11.8	9.37	
Growers	80 (20.6)	6 (14.3)	7.5	1.56	
Total	384 (100.0)	42 (100.0)	19.3	10.9	0.184
Location					
Kugiya	96 (25)	14 (33.3)	14.5	3.65	
Gyel	96 (25)	6 (14.3)	6.3	1.56	
Yankaji	96 (25)	7 (16.7)	7.3	1.82	
Terminus	96 (25)	15 (35.7)	15.6	3.91	
Total	384 (100.0)	42 (100)	43.7	10.9	0.073

†Values in parenthesis are the percentages of the respective total values.

Conclusion and Recommendation

Gastrointestinal helminths were detected in indigenous fowls reared in Jos metropolis. The helminths species included *S. trachea, H. gallinarum, A. galli, S. brumpti, C. annulate, C. columbae* and *S. avium*. Among these species, *H. gallinarum* and *A. galli* were prevalent in the study areas. Helminths positive cases were more in the cocks than in the hens and the adults had more burdens than the young ones. Helminths prevalent rate was seemingly higher in Terminus and Kugiya therefore, urgent treatments and control strategies in the localities, to reduce further spread to other areas in Jos metropolis are imperative. More importantly, studies should be carried out on poultry breeds helminths resistance potentials in order to reduce mortality and increase productivity.

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