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A PRELIMINARY SURVEY ON THE PARASITES OF FREE RANGE CHICKEN IN ABEOKUTA, OGUN STATE, NIGERIA

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ABSTRACT

A preliminary study was carried out to assess the parasitic burden of domesticated and free range chicken in Abeokuta, Ogun State, Nigeria. A total of twenty birds where purchased from five popular markets in Abeokuta namely, Itoku, Kuto, Lafenwa and Osiele and examined for presence of parasites. The skin and feathers of the birds were also combed to check for ectoparasites. Afterward, the birds were slaughtered and the intact gastro-intestinal tract were then separated and opened to check for endoparasites. All parasites found were collected into petri-dishes and examined under microscope for identification. Two species of ectoparasites *Menacanthus stramineus* with a prevalence of 90.0% and *Lipeurus caponis* with a prevalence of 60.0% were recovered. Three species of endoparasites found consisted of two nematodes (*Ascaridia galli* and *Heterakis gallinarum*) and one cestode (*Raillietina echinobothridia*). *Ascaridia galli* and *Raillietina echinobothridia* were seen in the small intestine and *Heterakis gallinarum* in the caecum. *Raillietina echinobothridia* had the highest prevalence of 80.0% followed by *Ascaridia galli* and *Heterakis gallinarum* each with 60.0% prevalence. The results show that free-range chickens in Abeokuta carry high parasitic burden which could be a big constraint to their productivity and commercial value.

Key words: Endoparasite, Ectoparasites, Free range, chickens, Abeokuta, Nigeria

INTRODUCTION

The poultry industry has an important position in the provision of animal protein (meat and egg) to man and plays a vital role in the national economy as a source of revenue. Poultry is one of the most intensively reared of the domesticated species and one of the most developed and profitable animal production enterprises (Obiora, 1992).
In Nigeria, backyard poultry represents about 60.0% of the 140 million poultry population, thus, the most important form of poultry production (Ikpi and Akinwunmi, 1981). It is estimated that this provide 12kg of poultry needs per inhabitants per year whereas cattle provides 5.3kg (Forsido, 1986). This means that by comparison, poultry meat is more available to the people than beef.

Parasitism has been identified as one of the major factors that threatens village free-range chicken production (Adene and Dipeolu, 1975). Reports have shown that mortality due to parasitic diseases is higher than those attributed to Newcastle disease,

and other viral infection of poultries. Common poultry parasites range from lice, mites, fleas, ticks, and helminths to gnats and coccidia (Nnadi and George, 2010). Parasitic infection or their concurrent infections has been known to result in immunosuppression**,** especially in response to vaccines against some poultry diseases (Horning *et al.,* 2003). Helminths infestations are known to cause interference with host metabolism resulting in poor feed utilization and reduced growth rate as well as size and age at maturity (Nnadi *et al.,* 2007). Studies in other countries had shown that the prevalence of parasitic infestations in village chicken flocks is close to 100.0%**,** and in most cases individual birds' harbour more than one parasite type (Permin *et al.,* 1997). It is believed that, understanding of parasitic diseases of birds will help in devising the measures to improve health and utility of these birds (Msoffe *et al*., 2010). The present study is therefore a preliminary survey to determine the prevalence of ecto and endo parasites of local chicken in Abeokuta.

MATERIALS AND METHODS

Study animals

Twenty adult free range chickens were bought from Osiele, Itoku, Lafenwa and Kuto markets. Five chickens were bought from each market. They were of indigenous breed of both sexes of which 40.0% of the birds were brown, 30.0% were black, 20.0% were grey and 10.0% were white.

Examination of chicken for ectoparasites

The body of the chickens, including the head, cloacal, bronchial, ventral and femoral areas were combed for ectoparasites. The parasites were removed with camel hair brush, transferred and preserved in 10% formol saline.

Examination of chicken for endoparasites

The chickens were then slaughtered and the intact gastro-intestinal tracts were then separated into oesophagus, crop, proventiculus, gizzard, intestine and caecum. Each part was opened and its content was emptied separately into labelled beakers. Contents were washed into petri-dishes and examined under a stereo microscope. Parasites found were counted and stored in bottles containing formalin.

Identification of parasites

Identification of parasites was carried out at the Department of Veterinary Microbiology and Parasitology, College of Veterinary Medicine, University of Agriculture, Ogun State. Nigeria. All parasites were identified under light microscope with 40x - 100x magnification, using identification keys of Walker *et al*., (2003).

Data Analysis

The data collected from the study were entered and analysed with SPSS version 11. Chi square analysis was used to compare differences in prevalence of parasites.

RESULTS

Of the 20 chickens examined, nine (45%) were males while 11(55%) were females. The prevalence of ecto and endo parasite in the chicken population by sex is shown in Table1. Statistical analysis at ($p>0.05$) shows no significant difference in infection status among the sexes for both ecto and endoparasite. All (100%) the chickens examined were infected with endoparasites. Three species of endoparasites were identified and these consist of two nematodes (*Ascaridia galli* and *Heterakis gallinarum)* one cestode (*Raillietina echinobothridia).* There was no trematode infection. The prevalence of the spe-

cies of endoparasite is significantly different (p=0.025) among parasite species. The most common infection observed in the chicken population is with the cestode; *Raillietina echinobothridia* 16 (80%) and the least common were nematodes *Ascaridia galli* 12 (60%) and *Heterakis gallinarum* 12(60%).

Out of two nematodes identified one was found in the small intestine and the other in the caecum and the only cestode parasite was found in the small intestine (Table 2). There was no parasite in the gizzard and trachea. The prevalence of nematode parasites was significantly higher than that of cestode parasite (p= 0.0000).

Also all the chickens examined were infected with one or two species of ectoparasites. These were lice. Infestation with *Menacanthus stramineus* was significantly higher (p=0.028) than infestation with *Lipeurus caponis* with prevalence of 18 (90%) and 12 (60%) respectively. Also the number of *Menacanthus stramineus* (71) collected was significantly (p=0.0000) more than *Lipeurus caponis* (21).

The pattern of infection with ecto and endo parasite is shown in Table 3.Mixed infections with endoparasites were found in 75% of the chickens, while 25% had single infections. Among the mixed infections, 25% had triple infection 50% had double infection. Mixed infections with ectoparasites occurred as double infections in 50% of the chickens while 50% had single infections. There was no significant difference in the pattern of infection in both ecto (p=0.653) and endo (p= 0.413) parasites.

Table 1: Prevalence of infection by sex of free range chicken examined in Abeokuta

Parasites	MALE			FEMALE			
Endoparasite	Number examined	Number infected	% infected	Number examined	Number infected	% infected	P value
Ascaridia galli	9	3	33.33	11	9	81.82	0.081
Raillietina echinobothridia	9	7	77.78	11	9	81.82	0.736
Heterakis gallinarum	9	6	66.67	11	6	54.55	0.927
Ectoparasite							
Menacanthus stramineus	9	8	88.89	11	10	90.91	
Lipeurus Caponis	9	5	55.56	11	7	63.64	0.927

Table 2: Prevalence of infection by location in the chicken's body in Abeokuta n (Endoparasite) =122, n (Ectoparasite)=98

Parasite Endoparasite	Location of parasite in the body	Parasite count	Number of Infected chickens	% prevalence of parasite in chicken population	% prevalence of parasite spp
Ascaridia galli	Small intestine	51	12	60	41.80
Raillietina echinobothridia	Small intestine	40	16	80	32.79
Heterakis gallinarum	Caecum	31	12	60	25.41
P value				0.3012	0.025
Ectoparasite					
Menacanthus stramineus	Skin	71	18	90	72.45
Lipeurus caponis	Feather	27	12	60	27.55
P value				0.028	0.000

Table 3: Pattern of infection with Ecto and Endo parasites of free range chicken in Abeokuta

Endoparasite	Male	Female	Total (%)
Single Infection	3	2	5 (25)
Double infection	5	5	10 (50)
Triple infection	1	4	5 (25)
P value			0.413
Ectoparasite			
Single Infection	5	5	10(45)
Double infection	4	6	1050
P value			0.653

The mean parasite burden with endo and ecto parasite in chicken population sampled is shown in Table 4. There was no significant difference in mean parasite burden for all parasite species between sexes of chicken.

All the chicken irrespective of type of plumage were infected with both ecto and endo parasite (Table 5). A comparison between endo and ecto - parasites collected from the chicken population revealed that infection with endoparasite is significantly higher (p=0.02) than infestation with ectoparasite.

Table 4: Mean Parasite, standard deviation and range of parasites in Male and Female chickens

Parasites	MALE			FEMALE			
Endoparasite	Mean	SD	Range	Mean	SD	Range	P value
Ascaridia galli	1.2222	1.9221	3-5	3.6363	2.2482	2-6	0.1841
Raillietina echinobothridia	1.6667	1.1180	1-3	2.2727	1.4894	1-4	0.324
Heterakis gallinarum	1.6667	1.8028	1-5	1.4545	1.6949	1-5	0.7891
Ectoparasite							
Menacanthus stramineus	3.7778	1.7159	3-6	3.3636	1.6293	2-6	0.5863
Lipeurus caponis	1.3333	1.3229	2-3	1.3636	1.2060	1-3	0.9578

Table 5: Prevalence of ecto and endo parasites by Plumage of free range chicken in Abeokuta

	Ectoparasite			Endoparasite		
Plumage	Number examined	Number infected	% infected	Number examined	Number infected	% infected
Black	6	6	100	6	6	100
White	2	2	100	2	2	100
Brown	8	8	100	8	8	100
Grey	4	4	100	4	4	100

DISCUSSION

The result of this study showed the presence of parasitic infestations among free range chickens in Abeokuta. The high prevalence of endoparasitism (100%) in the present study might be a result of open range conditions that facilitate infection of birds. Local chickens satisfy their nutrient requirement by roaming from place to place and they usually seek their food in the superficial layers of the soil which is often contaminated with parasites eggs and larva of all kinds, including various insects or earthworm that serve as paratenic or intermediate hosts for endoparasites that infest poultry (Muhairwa *et al.*, 2007 Puttalakshmamma *et al.*, 2008). The prevalence reported here is similar to those of (Hove *et al.,* 2002; Sam-Wobo and Mafiana, 2003) who reported 100 and 98% respectively of endoparasite infec-

tion. The presence of multiple endoparasitic infections shows the serious risk of infection in local chickens kept in Africa (Kimani, *et al*., 1999; Ashenafi and Eshutu, 2004). Studies have also shown that almost 100% of local chickens are infected with helminths parasites (Permin *et al*., 1997; Horning *et al*., 2003). The total numbers of intestinal helminths observed in this study are lower than those reported by Sam-Wobo and Mafiana (2003) in Abeokuta, Nigeria and Permin *et al*., (2002) in Zimbabwe and Ashenafi and Eshutu (2004) in Ethiopia, this may be due to the small number of chicken examined in this study. The three species of intestinal helminths identified in this study are most prevalent intestinal helminths of birds reported (Horning *et al*., 2003). The percentage prevalence of *Raillietina echinobothridia* observed from this study is higher than the observations of Sam-Wobo and Mafiana (2003) and Ashenafi and Eshutu (2004) with prevalence of 35.9 and 65.3% respectively. The percentage prevalence of *Ascaridia galli*, 60% was lower compared to similar observations by Permin *et al*., (2002) and Sam-Wobo and Mafiana (2003) which had 69 and 73.4% respectively but was higher than the studies done by Kimani *et al.* (1999) and Ashenafi and Eshutu (2004) with prevalence of 10.03 and 55.3% respectively. The prevalence of *Heterakis gallinarum* was 60% which was found to be higher than those done by Kimani *et al.* (1999) and Ashenafi and Eshutu (2004) with a prevalence of 21.33 and 32.6% respectively. However in the present study none of the birds harboured trematode parasites, (this might be due to non accessibility of infected snails. (Puttalakshmamma *et al.,* 2008).

All the chickens examined for ectoparasites were infected (100%). This result is similar to those of Hove *et al.* (2002), Njunga (2003) and Salam *et al.* (2006), which had prevalence of 100 and 97.69% respectively. The two species of ectoparasite identified from the study were lice out of which *Menacanthus stramineus* was more prevalent. Earlier reports of similar studies have indicated lice infestation as the most outstanding infestation among ectoparasite of chickens (Benbrook, 1965 and Fabiyi, 1988) *Menacanthus stramineus* had a prevalence of 90% which was higher than the observations of Mungube *et al.* (2005) in Kenya and Belihu (2009) in Ethiopia with prevalence of 79.4 and 65.5% respectively but was similar to the reports of Hove *et al.* (2002) with a prevalence of 88%. *Lipeurus caponis* had a prevalence of 60% which was higher than the percentages reported by (Salam *et al.* 2006) in India with, (Lalitha *et al*., 2008) and (Eneanya *et al*., 2008) in South East Nigeria with a prevalence of 39.66, 29.1 and 41.61% respectively. There was no observations of infestation with fleas in this study this is similar to the findings of (Adene and Dipeolu, 1975). However, Nnadozie and George (1996) reported fleas as the dominant ectoparasites in domestic chickens in their survey of blood and ecto-parasites of domestic fowls in Ibadan, Western Nigeria while Salfina (1990) reported fleas as the least occurring of ectoparasites of birds.

The result of this study shows that there was no significant difference in infection status for sex and plumage of the chickens. It means that chickens of all sexes and colours are vulnerable to parasite infection.

CONCLUSION

This study clearly indicated that free range chickens in Abeokuta, Nigeria carry high burden of parasitic infections. This is associated with their indiscriminate scavenging behaviour. Despite the absence of any veteri-

nary care for free range village birds, their contribution to supply of eggs, meat for household consumption and income generation cannot be mistreated. It is therefore; necessary that control and preventive measures with better management system should be provided for keepers of local chickens so as to boost the poultry production sector of agriculture.

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