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ECTOPARASITES AND HAEMOPARASITES OF INDIGENOUS CHICKEN (*GALLUS DOMESTICUS*) IN IBADAN AND ENVIRONS.

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Abstract

This research undertook the study of ectoparasites and haemoparasites found on and in the body of indigenous chicken (*Gallus domesticus).* Six hundred and nineteen ectoparasites were collected from 375 chicken from 28 households in and around Ibadan city between February and November, 1999. Of these, 455 (72.72%) were lice, among which 253 (40.12%) were *Menopon gallinae,* 53 (8.4%) were *Columbicola columbae*, 48 (7.75%) were *Goniocotes hologaster*, 33 (5.33%) were *Goniodes gigas, 31 (5%)* were *Chelopistes meleagridis*, 23 (3.7%) were *Liperus caponis* and 15 (2.42%) were *Cuclotogaster heterographus.* One hundred and twenty one (19.55%) were identified as the soft tick *Argas persicus.* Fourty three (6.94%) mites, identified as *Dermanyssus gallinae* were also found. Giemsa stained smears from 150 uncoagulated chicken blood samples examined at x 1,000 magnification, revealed presence of *Plasmodium* species (spp.) in 48 (32%) of the samples. *Leucocytozoon* spp accounted for 30 (20%), while *Haemoproteus* spp was identified in two (1.3%) of the samples. Mixed infection with *Plasmodium* spp and *Leucocytozoon* spp were identified in 14 (9.33%), while *Leucocytozoon* spp and *Haemoproteus* spp were identified in four (2.67%) of the blood samples. Six (4%) of the blood samples have the three haemoparasites. The need to control these ectoparasites was stressed.

Introduction

Domestic fowls (*Gallus domesticus*) are household birds raised locally in most villages and cities of Nigeria. This enables peasant farmers as well as low income earners to upgrade the level and quality of protein available to them. The factors leading to low productivity and performance of this specie of birds is multifactorial in dimension. The limitation imposed on the productivity and performance of chicken by the infestation and infection with disease agents can not be overemphasized. The problem of low productivity and performance associated with indigenous chicken have called for improved and highly performing breed for rearing under intensive system of management (Nwajinbu, 1998). Surprisingly, intensive system of management has not eliminated these parasites altogether, rather it alters which organism(s) survive(s) better under that system of management (Arend, 1997). This means that parasites of indigenous birds raised locally that will survive intensive system of management will probably through some means find their way into a flock of exotic birds raised intensively thereby limiting their performance. Therefore attention must not only be concentrated on exotic breeds but also on local chickens.

Adene and Dipeolu (1975) observed and recorded the association between the incidence

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of some blood parasites like *Aegyptinella pullorum*, *Plasmodium* spp and *Leucocytozoon* spp in chickens with the pressure of avian ectoparasites. Their direct effects on the bird and the disease agent, which they transmit, have high production loss implication to poultry production. Roberts and Smith (1956) estimated the annual loss caused by the ectoparasites to poultry industry in the United States of America (USA) at 80 million US Dollars. Because of the importance of these parasites, there is need to upgrade the rather scanty information available on the ecto- and haemoparasites of our local chickens.

Materials and Methods

A total of 375 domestic chickens from 28 households within and around Ibadan city were examined for ectoparasites. Ectoparasites found on the body of the chickens were collected into universal bottles containing 10% formalin and the predilection sites on the body noted. Skin scrapings of chickens with scaly lesions were collected using scalpel blades into universal bottles containing 10% potassium hydroxide. Blood samples were collected from 150 local domestic chickens in Ibadan and environs into universal bottles containing ethylene diamine tetra acetic acid (EDTA) as anticoagulant. These were taken to the laboratory on ice and examined for parasites that same day. The ectoparasites were examined with dissecting microscope and identification carried out according to guidelines described by Soulsby (1982).

Thin smear of the blood samples were made on glass slide, fixed in alcohol and stained with geimsa (Jain, 1986). The smears were then examined under high power magnification (x1000), and the haemoparasites detected were identified according to Soulsby (1982).

Results

Six hundred and nineteen ectoparasites were collected from all the birds examined. Four hundred and fifty-five (72.72%) of the ectoparasites were identified as lice, 121 (19.55%) as ticks and the remaining 43 (6.94%) as mites. Table 1 shows the ectoparasites found and their predelection sites. The genus of the lice identified are listed in decreasing order, *Monopon gallinae* 253 (40.12%); *Columbicola columbae*, 53 (8.4%); *Goniocotes hologaster*, 48 (7.75%);

Table 1: External parasites and their predilection sites in domestic fowls in Ibadan.

Ectoparasites	Common Predilection sites	No. collected	% of total
Lice			
Menopon gallinae	Shaft louse, also found all Over the body	253	40.12
Columbicola Columbae	Feathers and body	53	8.40
Goniocotes hologaster	All over the body	48	7.75
Goniodes gigas	Feathers and body	33	5.33
Chelopistes gigas	Cloaca	31	5.00
Liperus caponis	Wings	23	3.70
Cuclotogaster Hetergraphus	Skin and feather of the head and neck	15	2.42
Soft tick			
Argas parsicus	Head	121	19.55
Mite			
Dernanyssus gallinae	Hock joint and the plantar surface of the foot	43	6.94
Total	-	619	100

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Gonoides gigas, 33 (5.33%); *Chelopistes meleagridis* 31 (5%); *Liperus caponis*, 23 (93.7%) and *Cuclotogaster heterographus* 15 (2.42%). *Agas persicus* was the only soft tick encountered and the total number identified were 121 (19.55%). *Dermanyssus gallinae* (mite) accounted for 43 (6.94%).

Table 2 shows the haemoparasites found in 150 blood samples examined. *Plasmodium* spp were detected in 48 (32%) samples; *Leucocytozoon* spp were detected in 30 (20%) and *Haemoproteus* spp were detected in 2 (1.3%) samples. Mixed infections were also observed. Mixed infections with two parasites *Plasmodium* spp and *Leucocytozoon* spp were detected in 14 (9.33%) of the sample, while 4 (2.67%) of the birds were infected with *Leucocytozoon* spp and *Haemoproteus* spp. Six (4%) of the birds were infected with three haemoparasites spp.

The distribution of parasites found in this study did not show any specific pattern (Table 3).

Table 2: Prevalence of haemoparasites in 150 adult indigenous chicken in Ibadan.

Parasites	No. of birds infected	% of birds infected
Plasmodium Species (spp)	48	32.0
Leucocytozoon Spp.	30	20.0
Haemoproteus spp*	2	1.30
Plasmodium spp. & *Leucocytozoon* spp**	14	9.33
Plasmodium spp. & *Leucocytozoon* spp**	4	2.67
Plasmodium spp., *Leucocytozoon* spp** & *Haemoproteus* spp	6	4.0
Total	104	6.33

Discussion

From the result obtained from this study, *Menopon gallinae* was the commonest ectoparasites found on free range chickens in Ibadan and its environs. This is agreement with the work done by Adene and Dipeolu (1975). However in a similar work done earlier by Shoyinka and Dibby (1967), *Gonoides gigas* and *Liperus caponis* were encountered more than other ectoparasites. The type of management and the season of their study might have contributed to the difference observed in the types of lice that predominated. Arend (1997) noted that management and season of study influence the lice that are predominant in poultry flock. Those workers (Shoyinka and Dibby, 1967) also reported the occurrence of *Menacanthus stramineus*, which was not encountered in this study. Fabiyi (1980) reported *Liperus caponis* as the most abundant specie of lice infesting domestic fowls in Jos, this louse was second to the last found in this study. The difference in geographical and climatic factors could probably be the reason for the differences observed between the present study and the last one highlighted.

There was variation in the distribution of the ectoparasites found on the body of domestic chicken. In general, the distribution of the ectoparasites encountered in this study closely followed the observation made by Shoyinka and Dibby (1967). The distribution of the ectoparasites could be related to the variation in the regional body temperature, relative humidity and protection offered by the presence or absence of feathers (Brown and Cross, 1941).

The result obtained from the examination of the blood samples clearly revealed the presence of three haemoparasites (*Plasmodium* spp, *Leucocytozoon* spp and *Haemoproteus* spp) infecting poultry in our locality. *Plasmodium* spp were commonly encountered. Mixed infections

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Table 3: Distribution of parasites found in indigenous birds in Ibadan and environs

Flock	No. birds examined	Number of birds infested/infected											
		Mg	Cc	Gh	Gg	Cm	Lc	Ch	Ap	Og	P	L	H
I	12	5	0	1	0	1	0	0	2	0	3	1	1
II	10	4	1	0	1	1	0	0	0	1	2	0	0
III	15	5	0	0	0	1	0	0	0	0	4	2	0
IV	10	0	1	2	1	0	0	0	0	0	0	3	2
V	10	1	0	1	1	1	2	0	3	0	2	0	0
VI	8	2	0	0	2	0	0	1	1	0	0	3	0
VII	15	3	1	0	0	0	3	0	5	1	5	1	1
VIII	10	5	0	0	0	2	1	1	0	0	0	4	1
IX	16	2	2	0	1	0	0	0	1	0	3	0	0
X	15	1	0	0	2	0	2	0	2	0	3	5	1
XI	10	0	0	1	0	1	1	1	1	2	2	2	0
XII	14	3	1	0	1	0	0	2	3	0	0	5	0
XIII	18	0	2	0	0	1	0	0	0	0	3	0	0
XIV	15	4	0	3	2	0	0	0	0	0	6	1	1
XV	13	3	0	1	0	0	0	0	0	0	0	3	0
XVI	10	1	0	1	1	0	0	0	0	1	3	0	0
XVII	20	5	1	0	3	1	0	0	4	0	6	1	1
XVIII	11	3	0	1	2	0	1	0	0	2	4	0	0
XIV	14	0	1	0	0	0	0	1	0	0	0	4	0
XX	10	0	0	0	0	0	0	0	1	0	2	0	0
XXI	14	0	1	1	0	0	0	0	0	0	3	0	0
XXII	12	1	0	2	0	0	0	0	0	0	0	0	2
XXIII	13	5	1	1	2	1	1	0	1	0	1	4	1
XXIV	11	3	0	2	1	0	0	0	0	1	2	4	0
XXV	16	2	1	1	0	0	0	0	0	0	4	1	1
XXVI	15	0	2	0	0	0	0	0	0	0	0	5	0
XXVII	18	1	0	1	0	0	0	0	0	0	4	0	0
XXVIII	16	2	0	2	0	1	0	0	1	0	2	1	0

Mg *Menopon gallinae*; Cc *Colubicola columbae*; Gh *Gonoicotes hologaster*; Gg *Goniodes gigas*; Cm *Chelopistes meleagridis*; Lc *Liperus caponis*; Ch *Cuclotogaster heterographus*; Ap *Argas parsicus*; Dg *Dermanyssus gallinae*; P *Plasmodium*; L *Leucocytozoon*; H *Haemoproteus* spp.

with two or more of these haemoparasites were encountered. The presence, transmission and maintenance of these parasites in the locality is due to environmental factors that favour the survival of the insect vectors and the presence of susceptible hosts. Adene and Dipeolu (1975) found a positive correlation between the external parasite load and the occurrence of certain diseases of poultry. However, *Haemoproteus* species was not reported in their study.

The effects of lice on host stem from the vicious cycle started by irritation on the host. The birds become restless, do not sleep or feed well, self-inflicted injury and damaged feather. In laying birds with heavy infestation, egg production may fall (Soulsby, 1982). The effect is not much pronounced in adult birds but in young chicks infested by lice are unthrifty, more

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susceptible to various poultry diseases and may eventually die (Metcalf, 1962).

Ticks (*A. Parsicus*) infestation led to blood loss leading to progressive and may be total anaemia. The blood loss to a lesser degree will cause emaciation, weakness, slow growth and lowered production. The birds appeared ruffled with poor appetite and diarrhoea. It produces tick paralysis in chicken. Similarly, the effects of *D. gallinae* also follow almost the same pattern to that of tick infestation. It causes much irritation, and heavy blood loss which leads to anaemia and possibly death (Arend, 1997).

Of the three haemoparasites encountered in the course of this study, it is the *Plasmodium* species of which *P. durae*, *P. gallinaecum* and *P. juxtancleare* are the most pathogenic (Springer, 1997). Soulsby (1982) cited progressive emaciation, anaemia, enlargement of spleen and liver. Paralysis may be observed where there are massive numbers of exoerythrocytic forms in the endothelia cells of the brain capillaries and death in untreated cases. *Leucocytozoon* spp infection in chicken cause anaemia, thickened oral discharge and paralysis of the legs (Springer, 1997). On the other hand, Haemoproteus infection is not particularly pathogenic in domestic chicken (Soulsby, 1982).

Some of the importance of these ectoparasites transcends the direct impact on poultry production. It directly limits the protein available to man. Some of these parasites encountered in this study are noted either to infest man or cause annoyance especially in rural areas where there is close association between man and domestic fowls. *A. parsicus* is known to infest man especially children (Arend, 1997). The effective control of these parasites will allow the indigenous chicken to perform optimally thereby increase the quality and quantity of protein available to the community. It will also reduce the possibility of human infestation by these parasites and other infectious agents associated with them.

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