

Research Application Summary

Determination of seasonal parasite carriage of village chicken in Mbeere, antiparasitic treatments used and effectiveness of selected anthelmintics

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Abstract

The overall objective of the study is to determine parasite carriage of village chicken of Mbeere district, Eastern province of Kenya. The study was conducted for over two seasons, the dry (January to March) and wet (October to December) season. Subsequently efficacy testing of selected antiparasitic drugs will be conducted. Twenty four birds of three age groups (chicks, growers and adults) were randomly selected from homesteads. The study showed that all chicken (100%) harboured ecto and endoparasites and 79.1% were infected with haemoparasites. With respect to ectoparasites, all the birds (100%) were infested, with lice, while 75% were infected with mites, 66.7% with ticks and 54.1% with fleas. The most prevalent nematodes were the caecal worms (91.7%), *Tetramere* species (54.1%), *Gonglylonema* (29.1%) and Coccidial oocyst (20.8%). Cestodes were also present in 91.7% of the samples. Haemoparasites had a prevalence of 83.3%. This study has shown that endo and ectoparasites are a common health problem in the village chicken in Mbeere District, Kenya. The studies for wet season and for drug sensitivity testing are still on-going.

Key words: Cestodes, ectoparasites, intensity, hemoparasites, nematodes, prevalence

Résumé

L'objectif global de l'étude est de déterminer le transfert des parasites de poulet du village du district de Mbeere, en province orientale du Kenya. L'étude a été menée au cours de deux saisons, la saison sèche (de Janvier à Mars) et la saison humide (d'Octobre à Décembre). Par la suite, les tests d'efficacité des médicaments antiparasites sélectionnés seront effectués. Vingt-quatre oiseaux de trois groupes d'âge (poussins, producteurs et adultes) ont été choisis au hasard des fermes. L'étude a montré que tous les poulets (100%) étaient infestés d'ectoparasites et d'endoparasites et 79,1% étaient infectés d'hémoparasites. En ce qui concerne les ectoparasites, tous les oiseaux (100%) étaient infestés de poux, tandis que 75%

ont été infectés par des mites, 66,7% de tiques et 54,1% de puces. Les nématodes les plus prévalents étaient les vers du caecum (91,7%), les espèces *Tetramere* (54,1%), les *Gongylostrongylus* (29,1%) et les coccidialoocystes (20,8%). Les cestodes étaient également présents dans 91,7% des échantillons. Les hémoparasites présentaient une prévalence de 83,3%. Cette étude a montré que les endoparasites et les ectoparasites constituent un problème de santé fréquent pour le poulet du village dans le district de Mbeere au Kenya. Les études pour la saison des pluies et pour les tests de sensibilité aux médicaments sont toujours en cours.

Mots clés: Cestodes, ectoparasites, intensité, hémoparasites, nématodes, prévalence

Background and Literature Summary

In Kenya, poultry production is a growing and economically important sector for rural smallscale holder families. Diseases, especially parasite infestations, are common among the indigenous/village chicken although they are not well documented (Nzioka, 2009). Parasites cause stress to the birds through nutrient consumption, blood sucking and irritation. This results in lowering of production (growth, egg production, hatchability) and also to immune-suppression. This study was carried out to establish the parasite carriage of the village chicken of Mbeere district in the Eastern province of Kenya during dry season; with respect to both endo- and ecto-parasites.

According to Permin and Hansen (1998), the most common parasites in chicken are nematodes that include *Ascaridial galli*, *Heterakis* spp., *Gongylostrongylus* and *Acuaria humulosa*. The cestodes include *Railletina* spp., *Davaenia ploglottina* *Choanotaenia* species and *Hymenolepis* species. The trematodes include *Prostogonimus* species and *Echinostomum revolutum*. The most common ectoparasites are ticks (*Argas persicus*), mites (*Dermanyssus gallinae* and *Cnemidocoptes mutans*) and lice (*Menopon gallinae*, *Menacanthus stramineus*, and *Cuclotogaster heterographus*).

The most common haemoparasites are *Leucocytozoon* spp. , *Plasmodium* spp., *Haemoproteus*, *Aegyptinell*, *Eperythrozoon* spp., *Haemobatonella* and *Trypanosoma*. Different anthelmintics are used like Piperazine citrate and Levamisole (Permin and Hansen, 1998).

Study Description

The present study was carried out in Mbeere district, latitude 0° 20' and 0°50' South and longitude 37°16' and 37°56' East. It has a bimodal pattern of rainfall with long rains between mid March and June while the short rains occur from October to December. The area has a high population of indigenous chicken approximately 165,090 (KBS, 2009). The study was conducted during the dry season, using 24 birds, consisting of three age groups (chicks <2months, growers 2-8 months and adults >8months). Post-mortem examination of birds, following the method of Charlton *et al.* (2006) was done to determine parasite types and their respective intensities. Examination of bird's skin for ectoparasites was carried out as described by Sabuni *et al.* (2010). Faecal egg counts was done using faecal floatation technique of MAFF (1986). Stained blood smears were examined for haemoparasites (Sabuni *et al.*, 2010).

Research Application

A total of 24 birds (100%) had lice infestation. Lice occurred singly or in combination with other parasites (Table 1). There were 17 birds that were found to have mites on their body surface or their legs. The most prevalent mite species, was *Dermanyssus gallinae*, recorded in 82.3% of the samples as shown in Table 1. *C.mutans* was only found in four adults, none was recovered in chicks and growers. Out of the 24 birds examined, 15 birds (62.5%) had fleas (*Echdnophaga gallinacean*). *Argas persicus* was the only species of tick found. Six birds had *A. persicus* (25%) while all the birds had more than one species of gastrointestinal helminths. The parasites recovered from gastrointestinal tract were nematodes (96%), cestodes (87.5%) and coccidian (25%) as shown in Table 1. Out of the 24 birds examined 19 birds (79.16%) were infected with haemoparasites. Three species of haemoparasites were found- *Plasmodium* species, *Leucocytozoon* spp. and *Aegyptinella* spp. *Plasmodium* was the most prevalent. Some birds had single or multiple infections. Table 2 is a summary of ectoparasites harboured by different chicken age groups.

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Table 1. Different types of lice, mites, nematodes and haemoparasites found on village chicken in Mbeere.

Parasite species	Birds number	Ages of birds	Prevalence (%)
Lice			
<i>M. gallinae</i>	0	none	0
<i>M. stramineus</i>	1	A	4.17
<i>L. caponis</i>	0	None	0
<i>G. gigas</i>	0	none	0
<i>M. gallinae, M. stramineus, L. caponis, G. gigas</i>	2	A and G	8.33
<i>M. gallinae, M. stramineus</i>	14	A,C,G	58.3
<i>M. gallinae, M. stramineus, L. caponis,</i>	1	A,G	4.17
<i>M. gallinae, M. stramineus, G. gigas</i>	5	A,G	20.8
<i>L. caponis, G. gigas</i>	1	A,G	4.17
Mites			
<i>Knemidocoptes mutans</i>	4	A	23.5
<i>D. gallinae</i>	14	C,G,A	82.3
<i>K. mutans and D. gallinae</i>	3	A,G	21.4
Fleas/Ticks			
<i>E.gallinacea</i>	15	A,G,C	62.5
<i>A.persicus</i>	6	A,G,C	25
Nematode species			
<i>Tetramere</i> species	13	A,G,C	54.2
<i>Heterakis</i> species	23	A,G,C	95.8
<i>Heterakis gallinarum</i>	5	A,C	20.8
<i>H.isolonche</i>	18	A,G,C	76.17
<i>Gongylonema ingluvicola</i>	7	A,G,C	29.1
<i>Subulura brumpti</i>	17	A,G,C	70.8
Cestode species			
<i>R.echinobothrida</i>	19	A,G,C	79.2
<i>R.tetragona</i>	14	A,G,C	54.2
<i>Choanotaenia infundibulum</i>	2	A,C	0.08
<i>Hymenolepis cantaniana</i>	1	G	0.04

Key: A=Adults; G=Growers; C= Chicks; Chicks<2months; Growers 2-8months; Adults>8months.

Table 2. Occurrence of ectoparasites in different age groups of village chicken.

Age	Sample	Flea		Lice			Ticks	Mites	
		<i>E. gallinacea</i>	<i>M. gallinae</i>	<i>M. Stramineus</i>	<i>L. caponis</i>	<i>G. gigas</i>	<i>A. persicus</i>	<i>D. gallinae</i>	<i>K. mutans</i>
Chicks	7	5	4	7	-	-	3	5	-
Growers	8	4	9	8	2	2		5	-
Adults	9	6	9	8	2	6	3	4	4
Total	24	15	22	23	4	8	6	14	4

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