

M.Y. Fatihu <sup>1\*</sup>V.C. Ogbogu <sup>2</sup>C.O. Njoku <sup>1</sup>D.I. Saror <sup>1</sup>

## Comparative studies of gastrointestinal helminths of poultry in Zaria, Nigeria

FATIHU (M.Y.), OGBOGU (V.C.), NJOKU (C.O.), SAROR (D.I.). Études comparatives des helminthes gastrointestinaux chez les poulets à Zaria, Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1991, 44 (2) : 175-177

Les auteurs ont procédé à l'examen parasitaire de 413 tubes digestifs : 210 provenaient de poulets indigènes élevés à Zaria et dans ses environs, au nord du Nigeria, selon la technique extensive du parcours en liberté, et 203 de poulets d'importation élevés en mode intensif ; 201 (95,7 p. 100) poulets indigènes étaient infectés contre 24 (11,8 p. 100) pour les poulets importés. Parmi les poulets indigènes, 12 espèces de nématodes et 7 de cestodes ont été trouvées contre un seul nématode et un seul cestode chez les poulets importés. La prévalence des infections à helminthes était significativement différente pour les deux types d'élevage. *Mots clés* : Poulet - Helminthe gastro-intestinal - Élevage intensif - Élevage extensif - Nigeria.

### INTRODUCTION

Intestinal parasitism is a common problem in poultry, and especially when nematode and cestode infections occur at times in high proportions in animals reared in intensive management systems (3). In Nigeria, the poultry industry is developing in both local and exotic chickens, but only a few surveys have been carried out to determine the burden of helminth parasites of chickens in this country (1, 2, 5). Therefore, it is essential to have a current knowledge of this problem. This research was conducted to determine the prevalence of gastrointestinal parasites of poultry raised under two systems of management.

### MATERIALS AND METHODS

#### Source of samples

Digestive tracts of 210 adult local chickens reared under the extensive native free range system were purchased from the Zaria abattoir. Two-hundred and three digestive tracts of intensively reared exotic chickens, were obtained from 3 poultry breeding farms in Zaria and the poultry dia-

gnosis clinic of the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria. Others were obtained from commercially slaughtered broiler chickens at the Zaria abattoir.

The intensively managed birds consisted of broiler and layer breeders, commercial broilers reared on deep litter as well as battery-raised commercial layers.

#### Examination of samples

The digestive tracts were extracted intact and the various sections separated in Petri dishes. Segments of the oesophagus were slit open, the crop was emptied, both were washed and examined under light for embedded helminths. The contents were examined for free parasites.

The contents of the proventriculus and gizzard were washed separately in Petri dishes and the mucosae were scrapped off and examined for parasites. Parasitic nodules were incised and embedded parasites were squeezed out (2).

The gastrointestinal tract, namely the duodenum, jejunum, ileum, caecum and rectum were examined separately in a similar manner. They were opened on a sieve. Parasites in the lumen were picked up. The contents were washed thoroughly over a sieve under running tap water. The mucosal surfaces were rubbed carefully between fingers to remove adhering parasites. The mucosae were scrapped into Petri dishes and observed under a dissecting microscope for smaller helminths, which were picked up.

Helminths were collected in Petri dishes and counted. The nematodes were killed in hot 70 % ethanol and the cestodes allowed to stretch in tepid water. The parasites were fixed and preserved in labelled sample bottles containing 10 % buffered formalin.

The nematodes were mounted in lactophenol and the cestodes were stained with Mayer's paracarmine. Identification was done according to SOULSBY (7), REID (5) and RUFF (6).

### RESULTS

#### Local chickens

Out of the 210 local chickens examined, 201 (95.7 %) were infected with parasites. Eighteen species of helminths were identified, of which 11 were nematodes and

1. Faculty of Veterinary Medicine, Department of Pathology and Microbiology, Ahmadu Bello University, Zaria, Nigeria.

2. Faculty of Veterinary Medicine, Department of Parasitology and Entomology, Ahmadu Bello University, Zaria, Nigeria.

\* Present address : Faculty of Veterinary Sciences, Usmanu Danfodiyo University, Sokoto, Nigeria.

Reçu le 27.11.1990, accepté le 9.4.1991.

7 cestodes. The most prevalent nematode was *Tetrameres americana*, which was recovered from 140 (66.7 %) chickens. *Raillietina tetragona* was the most common cestode, found in 81 (38.6 %) chickens. The total number of helminths recovered and their prevalences are given in tables I and II.

**TABLE I** Prevalence of gastrointestinal nematodes in local chickens from Zaria (n = 210).

Parasites (11)	Location	No. of infected chickens	Prevalence (%)	Mean/ bird	Range
<i>Gongylonema ingluvicola</i>	Crop	28	13.3	3.1	1-10
<i>Capillaria contorta</i>	Crop	1	0.5	1.0	1
<i>Tetrameres americana</i>	Proventriculus	140	66.7	7.0	1-38
<i>Tetrameres fissispina</i>	Proventriculus	13	6.2	5.6	1-8
<i>Dispharynx spiralis</i>	Proventriculus	2	1.0	7.5	1-14
<i>Cheilosporira hamulosa</i>	Gizzard	12	5.2	1.9	1-6
<i>Ascaridia galli</i>	Intestine	53	25.2	3.4	1-23
<i>Heterakis gallinarum</i>	Caecum	13	6.2	5.4	1-23
<i>Subulura brumpti</i>	Caecum	36	17.1	17.6	1-110
<i>Subulura strongylina</i>	Caecum	10	4.8	6.4	1-20
<i>Strongyloides avium</i>	Caecum	1	0.5	12.0	12

**TABLE II** Prevalence of gastrointestinal cestodes in local chickens from Zaria (n = 210).

Parasites (7)	Location	No. of infected chickens	Prevalence (%)	Mean/ bird	Range
<i>Hymenolepis cantianiana</i>	Duodenum	5	2.4	13.8	1-40
<i>Hymenolepis carioca</i>	Duodenum	20	9.5	14.8	2-38
<i>Hymenolepis</i> sp.	Duodenum	14	6.7	21.3	1-60
<i>Choanotaenia infundibulum</i>	Small intestine	34	16.2	8.1	1-26
<i>Raillietina cesticillus</i>	Small intestine	50	23.8	13.2	1-60
<i>Raillietina echino-bothrida</i>	Small intestine	38	18.1	13.4	1-80
<i>Raillietina tetragona</i>	Small intestine	81	38.6	13.8	1-70

## Exotic chickens

Among the 203 exotic chickens examined, 24 (11 %) were infected with helminth parasites. *Ascaridia galli* (5.4 %) and *R. tetragona* (6.4 %) were the only nematode and cestode, respectively, present in the chickens (tabl. III).

**TABLE III** Species of helminths recovered from exotic chickens in Zaria (n = 203).

Parasites (2)	Location	No. of infected chickens	Prevalence (%)	Mean/ bird	Range
<i>Ascaridia galli</i>	Intestine	11	5.4	10.0	1-44
<i>Raillietina tetragona</i>	Small intestine	13	6.4	1.5	1-4

In exotic chickens, the prevalence of helminth infections were very low compared to local chickens. Statistical analysis indicate significant difference ( $P < 0.001$ ).

## DISCUSSION

The overall prevalence of helminth infections recorded in this study in local chickens (95.2 %) is in agreement with the prevalence of 90 % recorded by FABIYI (1), 91.2 % by GADZAMA and SRIVASTAVA (2) and 100 % by OKON and ENYENIHI (4). *Raillietina tetragona* the most prevalent cestode in this survey was equally reported with a high prevalence of 53.3 % (1), 40.7 % (2) and 93.3 % (4). This shows a wide distribution of the parasite across geographic zones.

Although some of the helminths identified in this study had been recorded by the above mentioned authors, OKON and ENYENIHI (4) reported the presence of the cestode *Davainea proglottina* in the duodenum of 30 % of the local chickens they examined. Similarly, they reported a prevalence of 13.3 % with the caecal trematode, *Postharmostomum* sp.

The low prevalence of helminth infection in the exotic chickens is certainly associated with the management system, where the chickens have restricted contact with the various intermediate hosts of the parasites. In addition, the periodic deworming carried out in some farms may have contributed to the low prevalence. On the other hand, the extensive system led to infections with the largest variety of helminths due to the increased contact with a larger area of land and different intermediate hosts. Moreover, medication is rarely applied to this category of chickens.

The largest *A. galli* worm burden recorded in the exotic chickens has been reported in a previous study (8). For parasites with a direct life-cycle such as *A. galli*, intensive systems on deep litter are very favourable to their development, especially when the litter is damp.

FATIHU (M.Y.), OGBOGU (V.C.), NJOKU (C.O.), SAROR (D.I.). Estudios comparativos de helmintos gastrointestinales en pollos de Zaria, Nigeria. *Revue Elev. Méd. vét. Pays trop.*, 1991, **44** (2) : 175-177

Los autores procedieron al examen parasitario de 413 tractos digestivos. De éstos, 210 provenían de pollos criollos, criados en Zaria y sus alrededores, al norte de Nigeria, según la técnica extensiva de recorrido libre y 203 de pollos de importación criados intensivamente. 201 (95,7 %) de los pollos criollos estaban infectados, contra 24 (11,4 %) de los importados. Doce especies de nemátodos y siete de céstodos fueron encontradas en los pollos criollos, contra un sólo nemátodo y un sólo céstodo en los animales importados. La prevalencia de las infecciones helmínticas mostró una diferencia significativa entre los dos tipos de crianza. *Palabras claves* : Pollo - Helminto gastrointestinal - Cria intensiva - Cria extensiva - Nigeria.

## ACKNOWLEDGEMENTS

The authors wish to thank SALEH USMAN for the technical assistance.

FATIHU (M.Y.), OGBOGU (V.C.), NJOKU (C.O.), SAROR (D.I.). Comparative studies of gastrointestinal helminths of poultry in Zaria, Nigeria. *Revue Elev. Méd. vét. Pays trop.*, 1991, **44** (2) : 175-177

Two-hundred and ten digestive tracts of local chickens reared in and around Zaria, Northern Nigeria, under the extensive native free range system of management and 203 digestive tracts of exotic chickens raised under the intensive system of management were examined for parasites. Two hundred and one (95.7 %) of the local chickens were infected and 24 (11.8 %) of the exotic chickens also. Among the local chickens, 12 species of nematodes and 7 species of cestodes were recovered. Only one nematode and one cestode species were recovered from the exotic chickens. The prevalence of helminth infections between local and exotic chickens was significantly different at 1 %. *Key words* : Chick - Gastrointestinal helminth - Extensive system - Intensive system - Nigeria.

## REFERENCES

1. FABIYI (J.P.). Incidence of the helminth parasites of the domestic fowl in the Vom Area of Benue-Plateau State, Nigeria. *Bull. epizoot. Dis. Afr.*, 1972, **20** : 229-234.
2. GADZAMA (E.N.), STRIVASTAVA (G.C.). Prevalence of intestinal parasites of market chickens in Borno State. *Zariya Vet.*, 1986, **1** (2) : 126-128.
3. HUNGERFORD (T.G.). Diseases of poultry. Sydney, Angus and Robertson, 1969.
4. OKON (E.D.), ENYENIHI (N.U.). A study of parasites of local fowls in Oron, Cross River State, Nigeria. *Niger. J. Parasit.*, 1980, **1** (2) : 82-86.
5. REID (W.M.). Cestodes. In : HOFSTAD (M.S.), BARNES (J.H.), CALNEK (B.W.), REID (M.W.), YODER (H.W.), eds. Diseases of poultry. Ames, Iowa State University, 1984.
6. RUFF (M.D.). Nematodes and Acanthocephalans. In : HOFSTAD (M.S.), BARNES (J.H.), CALNEK (B.W.), REID (M.W.), YODER (H.W.), eds. Diseases of poultry. Ames, Iowa State University, 1984.
7. SOULSBY (E.J.L.). Helminths, arthropods and protozoa of domesticated animals. London, English Language Book Society and Baillière Tindall, 1982.
8. WAKELIN (D.). A survey of the intestinal helminths parasitic in British domestic fowl. *J. Helminth.*, 1964, **38** (1-2) : 191-200.