



Research Article – Parasitology

Prevalence of gastrointestinal parasites (helminth) found in the feces of some selected domestic birds, chickens (*Gallus gallus*) and pigeons (*Columba livia domestica*)

Hafsat M. Shehu, M.M. Shah*, U. Sharif

Department of Biological Sciences, Faculty of Science, Yusuf Maitama Sule University, Kano State, Nigeria

(Received: 07-06-2018; Accepted 01-08-2018; Published Online 14-08-2018)

*Corresponding author (E-mail: mmanjurshah@gmail.com)

Abstract

Domestic birds have significant contributory role in national economy and social world. In Kano, especially in rural areas farmers and agriculturists still depend economically on these animals. The study was conducted to find out various gastrointestinal parasites and their prevalence in domestic birds using Specimens processed through Sedimentation and Flootation method. The result shows that there is high rate of infection in pigeons. On the other hand a low rate of infection was observed in chickens. The helminthes found in the domestic birds were of five species: *S. intercalatum*, *Paragonimus sp.*, *H. nana*, *Taenia spp* and *S. stercoralis* larva. This study indicated that there was a significant difference in the prevalence of helminths between pigeons and chickens. It indicated that pigeons are most affected among districts.

Keywords: Domestic birds, prevalence, pigeons, Kano

Introduction

Domestic pigeons (*Columba livia domestica*) are ubiquitous in nature and associated with humans in every place around the world. Pigeons can carry many parasites and pathogens to different flocks (Opara *et al.*, 2010). They can also serve as a source for different zoonotic diseases for humans. Birds can be parasitized by a wide variety of ecto and endoparasites that is nematodes, trematodes, cestodes, acanthocephalans. A good knowledge about the parasitic disease of the pigeons would aid in the development of possible control measures, which may help in enhancing its survival and complement efforts towards public enlightenment. However, there is a huge literature on avian medicine including parasitic diseases little has been documented about the parasites in pigeons.

Chicken and pigeons are most birds that are kept as domestic bird in rural environments. Any changes in intestinal health, performance and production will be disrupted. There are risk factors of parasitic infection (including protozoa, arthropods, worms, etc) in rural poultry because they are in contact with outdoor environments. Santoro *et al.*, (2010) detected helminth infestation at post mortem examination in 95% of birds and pathological changes associated with helminthes in 74% of infected birds in Southern Italy.

Capillaria is a nematode of small intestines of domestic and wild birds such as chicken, geese, duck, guinea fowl that cause weight loss, diarrhea and economic losses in severe infections (Hoque *et al.* 2014). *Ascaridia gali* is a nematode of small intestines of domestic and wild birds which worldwide distribution and in severe infections causing diarrhea, decreased egg production, emaciation and anemia (Yadav *et al.*, 1991). *Echinostoma* is a trematode of small intestine of birds and the infections are in areas of the world where there are suitable conditions for the growth of intermediate host (snails). *Raillietina tetragona* and *Raillietina echinobothrida* are parasites in the small intestines of birds (including

chicken, turkey, quail and pheasant) and these infections have been spread worldwide (Vattanodorn *et al.*, 1984).

The present study is made to find out various gastrointestinal parasites and their prevalence in domestic birds. It aims to study and observe and identify the gastrointestinal parasites in the feces of some selected domestic birds (Chicken and pigeons) of Tarauni LGA, Kano state.

Materials and methods

Samples Collection

Faecal samples of 20 domestic chickens and 20 domestic pigeons will be collected aseptically in sterile plastic containers with unique identification numbers from four areas (North, South, East and West of Tarauni market). Study sites, age and sex will be recorded. Age will be accessed according to seller's interview and close examination of domestic chickens based on characteristics described by Grimmett *et al.* (2011).

Experimental procedure

Macroscopy: The physical appearance (consistency, colour, presence of blood or mucus and presence of worms) of the fecal samples will be observed and recorded.

Microscopical examination: The microscopic experiment will be conducted using two procedures; Sedimentation, Iodine and Flootation method to ensure accuracy of results.

Sedimentation method: Feces will be collected in a sterilized specimen bottle, about 50mg of feces are weighed, distilled water is added and mixed in a beaker with a glass rod to loosen the debris. Then the entire sample is passed through sieve and put into centrifuge bottles and centrifuge for five minutes. Centrifugation is repeated until the supernatant fluid remains clear and then the final supernatant fluid is poured off and 10% formalin is added and shaken. A pipette

will be used to pick a drop of the mixture into a free greased clean glass slide and will be covered with a cover slip and viewed under microscope.

Flotation method: 1g of the fecal sample will be crush with applicator sticks mix the fecal sample with NaCl fluid thoroughly with a sticks pour the fecal sample suspension through a tea strainer into container pour the fecal suspension into the test tube in a stand or rack from container 2 the NaCl will be added to fill the tube carefully place a coverslip on the top the test tube leave the test tube to stand for 20 minute carefully lift the cover slip off the test tube together with the drop of fluid adhering to it place the

cover slip in a clean glass slide examine using a compound microscope.

Results and Discussion

The prevalence of Gastro Intestinal parasites found in faeces of some selected domestic birds (Pigeons and Chickens) is shown in Table 1. The two-way table shows the total number of infected and un-infected pigeons and chickens and the total number of pigeons and chickens collected shown in Table 2. Chi-square of GI Helminth parasite among chicken and pigeon of Tarauni LGAs is presented in Table 3.

Table 1: Prevalence of GI parasites found in faeces of some selected domestic birds (Pigeons and Chickens)

Location	No examined (%)		No infected (%)		Parasites encountered		Prevalence (%)	
	Chicken	Pigeon	Chicken	Pigeon	Chicken	Pigeon	Chicken	Pigeon
North and East of Tarauni	10(50)	10(50)	5(20.83)	7(29.16)	<i>S. intercalatum</i>	<i>Paragonimus Sp.</i>	50	70
South and West of Tarauni	10(50)	10(50)	4(16.66)	8(33.33)	<i>H. nana</i>	<i>Taenia Spp.</i> <i>S. stercoralis</i> larvae	40	80
Total	20(100)	20(100)	9(37.49)	15(62.49)			45%	75%

Table 2: A two-way table showing the total number of infected and non infected pigeons (*Columba liviadomestica*) and chickens and the total number of pigeons and chickens (*Gallus gallus*) collected

Category	Number infected	Number non infected	Total
Chicken	9	11	20
Pigeon	15	5	20
Total	24	16	40

Table 3: Chi-square of GI Helminth parasite among chicken and pigeon of tarauni LGAs

Category	O	E	O_E	(O_E)	(O_E/E)	X ² =(O-E)/E	Total
Chicken infected	9	12	7	49	4.1	0.341	
Chicken non infected	11	12	1	1	0.083	0.006	
Pigeon infected	15	8	7	49	6.125	0.765	
Pigeon non infected	5	8	3	9	1.125	0.140	1.252

The result shows that there is high rate of infection in pigeons which correlated with the work of Muhairwat *et al.* (2007) which also showed a high rate of infections in pigeons. On the other hand a low rate of infection was observed in chickens which do not correlate with the work of Marques *et al.* (2007) which showed a medium rate of infection in chickens. The helminthes found in the domestic birds were of five species: *S. intercalatum*, *Paragonimus sp.*, *H. nana*, *Taenia spp* and *S. stercoralis* larva. The common parasites are *S. intercalatum*, *Taenia sp* and *S. stercoralis* larvae which correlated with the work of Muhairwat *et al.* (2007) but did not correlated with the work of Marques *et al.* (2007).

Conclusions

This study indicated that there was a significant difference in the prevalence of helminths between pigeons and chickens. It indicated that pigeons are most affected among districts.

Based on the study, the following recommendations are forwarded:

- Since most of the gastrointestinal parasites have a subclinical occurrence, studies in focus of these ideas should be conducted.
- The public should be aware about occurrence and economic significance of gastrointestinal parasites.

Better if experimental studies be conducted on the conjoint prevalence and economical effect gastrointestinal

helminthes and *Eimeria* species affecting chickens.

Reference

- Grimmett, R., Inskipp, C. and Inskipp, T. (2011) Birds of the Indian Subcontinent. 2nd Ed. London: Oxford University Press & Christopher Helm. pp. 528.
- Hoque, M.A., Hassan, M.M., Haque, E, Shaikat A.H., Khan S.A., Alim A., Skerrat, L.F., Islam, A., Tun, H.M., Dissanayake, R., Day, T.K., Debnath, N.C. and Yamage, M. (2014). A survey of gastro-intestinal parasitic infection in domestic and wild birds in Chittagong and Greater Sylhet, Bangladesh. *Preventive Veterinary Medicine*, 117, 305-312.
- Marques, S.M., Quadros, R.M., Da-Silva, C.J. and Baldo, M. (2007): Parasites of pigeons (*Columba livia domestica*) in urban areas of langes, Southern Brazil. *Parasitology Latinoamericana*, 62, 183-187.
- Muhairwa, A.P., Msoffe, P.L., Ramadhani, S., Mollel, E.L., Mtambo, M.M.A., and Kassuku, A. A. (2007). Prevalence of gastro-intestinal helminths in free-range ducks in Morogoro Municipality, Tanzania. *Livestock Research for Rural Development*, 19(48), 1-5.
- Opara, M.N., Osuji, C.T., and Opara, J.A. (2010). Gastrointestinal Parasitism in captive animals at the zoological garden, Nekede Owerri, Southeast Nigeria. *Report and Opinion*, 2(5), 21-28.

- Santoro, M., Tripepi, M., Kinsella, J.M., Panebianco, A., and Mattiucci, S. (2010). Helminth infestation in birds of prey (Accipitriformes and Falconiformes) in Southern Italy. *The Veterinary Journal*, 186; 119-122.
- Vattanodorn, S., Inder-Singh, K. and Krishnasamy, M. (1984). A preliminary survey of helminthendoparasites of the domestic fowl *Gallus domesticus* L. from aborigine settlements with some new records. *Malaysian Veterinary Journal*, 8, 13-18.
- Yadav, A.K. and Tandon, V. (1991). Helminth parasitism of domestic fowl (*Gallus domesticus* L.) in a subtropical high- rainfall area of India. *Beitr Trop Landwirtsch Veterinarmed*, 29; 97-104.