



# Asian Journal of **Poultry Science**

ISSN 1819-3609



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## Gastro-intestinal Parasites of Domestic Ducks (*Anas platyrhynchos*) in Ibadan Southwestern Nigeria

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### ABSTRACT

A six month study (January to July, 2008) was carried out to determine the prevalence of gastro-intestinal parasites of domestic ducks (*Anas platyrhynchos*) in Ibadan and environs. A total of 175 faecal samples were collected from ducks in six different locations and examined using formol-ether concentration method and modified Ziehl Neelsen staining technique, sodium chloride floatation and zinc sulphate sedimentation methods. Out of the 175 faecal samples examined 167 (95.4%) were positive for Gastro-intestinal parasites. A total of five different helminths and three different protozoan parasites were isolated from the faecal samples and identified. Among the helminths identified, *Ascaridia galli* 82 (46.8%) was the most frequently observed followed by *Heterakis gallinarum* 41 (23.4%), *Capillaria* sp. 38 (21.7%), *Echinuris uncinata* 20 (11.4%) and *Syngamus trachea* 13 (7.4%). For intestinal protozoa, *Eimeria* sp., 60 (34.3%) was the most frequently encountered followed by *Tyzzeria* sp. 29 (16.6%) and *Cryptosporidium* sp. 27 (15.4%). Mixed infections with two or more parasites were common. A total of 75 (42.9%) had single infection, 38 (21.7%) double infection and 54 (30.8%) triple infection. We recommend intensive system of management for rearing ducks as well as adequate Veterinary care for the ducks and strict hygiene for the owners and/or attendants.

**Key words:** Duck, gastro-intestinal, ibadan, parasite, prevalence

### INTRODUCTION

The types of poultry that are commonly reared in Nigeria are chickens, ducks, guinea fowl, turkeys, pigeons and more recently ostriches. The chickens are however the most predominant in terms of economic importance (Nnadi and George, 2010). In Nigeria ducks fulfill a great proportion of animal protein deficiency as in any other developing countries of the world in the form of meat and eggs (Hai *et al.*, 2008). The population of duck in Nigeria is about 3.3 million (NBS, 2006). In Oyo State it is 1.1 million and about 10,588 ducks are slaughtered annually (NBS, 2006). Hence, ducks contribute immensely to household food security in this area. Parasitic diseases come first among other diseases that cause reduction in productivity of rural poultry. However, these diseases are often neglected because they are insidious and rarely result into epidemics like the viral and bacterial diseases (Eshetu *et al.*, 2001). Helminth and protozoan parasites have been incriminated as major causes of reduced growth, decreased egg production, anaemia, emaciation, morbidity and mortality in poultry (Permin *et al.*, 2002; Phiri *et al.*, 2007; Nnadi and George, 2010). The available few reports show that gastro-intestinal parasites of poultry are common in Nigeria

(Nnadi and George, 2010) and generally in the tropics where the standard of husbandry is poor and climatic conditions are favourable for the development of parasites (Permin *et al.*, 1997; Muhairwa *et al.*, 2007; Yousuf *et al.*, 2009). The suitable climatic condition of adequate rainfall of over 95 mm and average daily temperature of 32°C in Ibadan and environ favours the rearing of duck. This suitable climate also favours the development, survival and spread of parasites.

The system of management of duck is semi-intensive whereby ducks are left to roam and fend for themselves in the daytime and then come into their habitation at night. This system of management coupled with ecology of parasites and their host-parasite relationship exert great influence on the occurrence of gastro-intestinal parasites of ducks (Farjana *et al.*, 2004; Muhairwa *et al.*, 2007). In Nigeria, there is a dearth of information on parasitism in ducks. This study was carried out to obtain information on the gastro-intestinal parasites of ducks in Ibadan and environ. Knowledge about these parasites would help elucidate the dynamics of parasite infection of ducks in this area.

## **MATERIALS AND METHODS**

The ducks population under study comprised six flocks in different locations in Ibadan and environ between January and July 2008. The sampling included all the ducks in the locations.

All ducks in the study areas were housed in wooden cages placed on the farm or backyards of houses and were allowed to scavenge freely during the day at the homestead and the area around and return to their habitation at night. The ducks were also provided with water, left-over foods and occasionally chicken growers mash.

The farms had no special programme of routine internal parasites control. Faecal samples from individual duck were collected with the help of the farmer/owner and/or attendants from the six locations into universal bottles. The samples were taken in insulated containers to the parasitology laboratory section of the Department of Veterinary Microbiology and Parasitology University of Ibadan, Nigeria for processing or stored in a refrigerator at 4°C until examined within 48 h.

Faceal smears were prepared from fresh faecal samples by formol-ether concentration (Chesborough, 1987) and stained using modified Ziehl-Neelsen technique and examined under the microscope for cryptosporidal oocysts (Henrikson and Pohlenz, 1981). Three gram of each faecal sample was also emulsified in water and poured through a fine mesh sieve as described by Urquhart *et al.* (1988). The emulsion was centrifuged at 2000 rpm for 2 min and the sediment redissolved in saturated sodium chloride solution. Test tubes were subsequently filled with the preparation, covered with cover slips, allowed to stand for 5 min and thereafter examined under the microscope for helminth ova and protozoan oocysts. Faceal sedimentation method using Zinc sulphate solution was also carried out to detect trematode eggs as described by Urquhart *et al.* (1988).

Samples positive for helminth ova were cultured according to the method of Sellers and Dipeolu (1975) to identify the species of helminth. Larvae from each culture were identified using the criteria described by Soulsby (1982) and Taylor *et al.* (2007).

Positive faecal samples for oocysts were also cultured in potassium dichromate (BDH Ltd. England) and kept at room temperature as described by Adams *et al.* (1979) in order to identify genera and species of coccidian involved. Identification was based on the number of sporozoites per sporocyst as described by Soulsby (1982). No attempt was made to categorize the ducks into age groups.

All data obtained were analysed using simple averages, percentages, descriptive and quantitative statistics.

## RESULTS AND DISCUSSION

The results of this study show out of a total of 175 ducks examined 167 (95.4%) were found to be positive for one or more species of helminth and protozoan parasites. A total of five different helminths and three different protozoan parasites were isolated from the faecal samples and identified. The identified helminths were *Ascaridia galli*, *Heterakis gallinarum*, *Capillaria* sp., *Syngamus trachea* and *Echinuris uncinata*. The intestinal protozoan parasites were *Tyzzzeria* sp., *Eimeria* sp. and *Cryptosporidium* sp., Among the helminths *A. galli* 82 (46.8%) was the most frequently observed followed by *H. gallinarum* 41 (23.4%), *Capillaria spp* 38 (7.4%), *E. uncinata* 20 (11.4%), *S. trachea* 13 (7.4%). For intestinal protozoan parasites *Eimeria* sp., 60 (34.3%) was the most frequently encountered followed by *Tyzzzeria* sp., 29 (16.6%) and *Cryptosporidium* sp., 27 (15.4%) (Table 1).

Mixed infections with two or more parasites were common. A total of 75 (42.9%) had single infection, 38 (21.7%) double infection and 54 (30.8%) triple infection (Table 2). Trematodes and cestodes were not encountered throughout the course of this investigation.

The present study demonstrated five different helminths and three different intestinal protozoa and marks the first report of gastro-intestinal parasites of ducks in Ibadan Southwestern Nigeria. Majority of ducks harboured single parasite. Mixed infections with up to three parasites were also found. The gastro-intestinal parasites encountered in ducks are common parasites of domestic chickens (Fowler, 1996; Muhairwa *et al.*, 2007). This might be due to the fact that areas used by ducks were also used by domestic chickens with free access of wild birds. In some cases the ducks shared the same or close habitation with chicken and also shared the same food and water. Hence, the possibility of sharing the same parasitic infections.

Table 1: Gastro-intestinal parasites of ducks in different locations in Ibadan and environs

| Location           | No sampled | Helminths No. and (%) positive |                             |                       |                         |                           | Intestinal protozoa No. and (%) positive |                    |                            |
|--------------------|------------|--------------------------------|-----------------------------|-----------------------|-------------------------|---------------------------|------------------------------------------|--------------------|----------------------------|
|                    |            | <i>Ascaridia galli</i>         | <i>Heterakis gallinarum</i> | <i>Capillaria</i> sp. | <i>Syngamus trachea</i> | <i>Echinuris uncinata</i> | <i>Tyzzzeria</i> sp.                     | <i>Eimeria</i> sp. | <i>Cryptosporidium</i> sp. |
| Mirth agric        | 29         | 12 (6.8)                       | 5 (2.8)                     | 8 (4.6)               | 0 (0)                   | 0 (0)                     | 4 (2.3)                                  | 7 (4.0)            | 2 (1.1)                    |
| Sasa duck Market   | 32         | 20 (11.4)                      | 13 (7.4)                    | 7 (4.0)               | 3 (1.7)                 | 5 (2.8)                   | 9 (5.1)                                  | 11 (6.3)           | 5 (2.8)                    |
| Molete duck market | 28         | 17 (9.7)                       | 10 (5.7)                    | 10 (5.7)              | 7 (4.0)                 | 3 (1.7)                   | 7 (4.0)                                  | 13 (7.4)           | 8 (4.6)                    |
| Hope farm          | 30         | 9 (5.1)                        | 2 (1.1)                     | 1 (0.6)               | 0 (0)                   | 2 (1.1)                   | 3 (1.7)                                  | 5 (2.8)            | 2 (1.1)                    |
| I.A.R. and T       | 33         | 13 (7.4)                       | 3 (1.7)                     | 6 (3.4)               | 1 (0.6)                 | 4 (2.3)                   | 0 (0)                                    | 10 (5.7)           | 3 (1.7)                    |
| House- holds       | 23         | 11 (6.3)                       | 8 (4.6)                     | 6 (3.4)               | 2 (1.1)                 | 6 (3.4)                   | 6 (3.4)                                  | 14 (8.0)           | 7 (4.0)                    |
| Total              | 175        | 82 (46.8)                      | 41 (23.4)                   | 38 (21.7)             | 13 (7.4)                | 20 (11.4)                 | 29 (16.6)                                | 60 (34.3)          | 27 (15.4)                  |

Table 2: Infection per number of different species per duck

| Location           | No. Examined | No. positive | Single     | Double     | Triple     |
|--------------------|--------------|--------------|------------|------------|------------|
| Mirth Agric.       | 29           | 29           | 20         | 9          | -          |
| Sasa duck market   | 32           | 32           | 12         | 7          | 13         |
| Molete duck market | 28           | 28           | -          | 9          | 19         |
| Hope farm          | 30           | 24           | 20         | 4          | -          |
| I.A.R. and T       | 33           | 31           | 23         | 7          | 1          |
| Households         | 23           | 23           | -          | 2          | 21         |
| Total              | 175          | 167 (95.4%)  | 75 (42.9%) | 38 (12.7%) | 54 (30.8%) |

The high prevalence of gastro-intestinal parasites observed in this study might be due to the semi-intensive management system of keeping ducks as suggested by Muhairwa *et al.* (2007). In this system ducks were exposed to the acquisition of eggs, oocysts, larvae or segment of helminths and intestinal protozoa from the soil while fending for themselves. In addition, overcrowding of ducks in their habitation which prevent proper cleaning and disinfection as well as contamination of food and water and the environment through indiscriminate disposal of faecal droppings containing eggs, oocysts, larvae and worm segments coupled with the favourable condition of adequate rainfall and optimum temperature which favours the survival and spread of gastro-intestinal parasites in these areas could push for the high prevalence (Farjana *et al.*, 2004).

Utpal and Biswas (1997) in their study of endoparasitic infection of ducks in West Bengal India found 34.3% of endoparasitic infection in ducks and obtained a total of nine different species of helminths. Their study showed trematodes to be more than 26% of the helminths and 9 and 5% were cestodes and nematodes respectively in the area. This is contrary to our findings in this study but in agreement with the observations of Muhairwa *et al.* (2007) and Farias and Canaris (1986), who despite the high prevalence of gastro-intestinal helminths did not find trematodes and cestodes in adult ducks. They attributed their findings to inavailability of free water in form of rivers, ponds or lakes which are habitats of snail intermediate hosts of trematodes as it was the case in this study.

Since some of these parasites have been found to be pathogenic to chickens (Fowler, 1996) further studies on the health status, haematology and plasma serum biochemistry, feed conversion efficiency and growth rate to determine the effect of these parasites in ducks are on-going in our laboratory.

## RECOMMENDATION

We recommend intensive management system for keeping ducks in which adequate care in terms of good housing, routine deworming programme, regular use of anticoccidial drugs and prevention of contamination of environment through hygiene in duck pens and proper disposal of duck faeces and dead ducks could be carried out. These would eliminate or reduce to low level incidence of gastrointestinal parasites and increase duck productivity through increased weight gain, increased feed conversion efficiency and decrease time to reach market weight leading to increase economic gain to farmers (Corwin *et al.*, 1986).

Since some of the parasites encountered are zoonotic particularly *Cryptosporidium spp* both man and ducks stand the risk of infection, we also recommend strict hygiene in rearing ducks by the owners and/or attendants and adequate veterinary care for the ducks.

## ACKNOWLEDGMENTS

The authors are grateful to the Managers and attendants of Mirth Agric. Ikire, Sasa Duck Market, Molete Duck market, Hope Farm, I.A.R. and T., Farm, Households at Apata and Agbowo all in Ibadan and environs for their assistance in collecting faecal samples from their ducks and Mr. J.O. Olanrele for his technical assistance.

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