Parasites of domestic pigeons (*Columba livia domestica*) in Sebele, Gaborone, Botswana

E Z Mushi[a], M G Binta[b], R G Chabo[a], R Ndebele[a] and R Panzirah[a]

ABSTRACT

The following parasites were found in apparently healthy pigeons kept in Sebele: a haemoprotozoan, *Haemoproteus columbae* (80 %); endoparasite metazoan nematodes, *Ascaridia columbae* (30 %) and *Dispharynx spiralis* (10 %); a cestode, *Raillietina* sp. (80 %) and coccidian oocysts (40 %); 2 ectoparasites, namely the pigeon fly, *Pseudolynchia canariensis* (50 %) and the louse, *Columbicola columbae* (30 %). The pigeons also had high antibody titres, (1:256) to the protozoan parasite *Toxoplasma gondii* (100 %). The latter infection in these domestic pigeons has public health implications.

Key words: Botswana, ectoparasites, endoparasites, haemoparasites, pigeons, *Toxoplasma gondii*, zoonosis.

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Domestic and feral pigeons (*Columba livia domestica*) are associated with human habitation, often occupying and soiling premises where people work and live[9]. Pigeons are kept for meat production, racing, as performers and for showing as fancy pigeons. In Botswana, pigeons are kept mainly for meat. Pigeons may be infected with many organisms, some of which are pathogenic to humans[9].

This preliminary study was carried out with the aim of determining the presence of endo-, ecto- and haemoparasites of pigeons, some of which may be of zoonotic importance.

The study was carried out in Sebele, 12 km north of Gaborone, and samples were collected from the households of members of staff of the Botswana College of Agriculture who kept pigeons. Blood smears were prepared from the brachial veins of 24 pigeons from several households. They were air-dried, fixed in ethanol, stained with 10 % Giemsa stain and microscopically examined for haemoparasites.

Blood for serum was also collected from the brachial veins of 16 pigeons into vacutainer tubes without anticoagulant. The tubes were kept on the bench for one hour to allow the blood to clot and the sera were separated by centrifugation and stored at –20 °C. The sera were tested for antibodies to *Toxoplasma gondii* by an indirect haemagglutination test using commercial kits (Cellognost Toxoplasmosis, H Behringwerke AG, Germany).

The level of parasitaemia was established by counting the number of parasitised erythrocytes out of a hundred in the same microscopic field. An average parasitaemia was obtained by evaluating the parasitaemia in 5 microscopic fields.

Faecal samples were collected from the floors of the pigeons lofts. Worm egg and coccidian oocyst counts were carried out using McMaster slides after flotation in saturated sodium chloride solution[6].

Twelve pigeons purchased from different homesteads were screened both for ecto- and endoparasites. The pigeons were examined for external parasites such as lice, fleas and mites. Parasites found were preserved in 70 % ethanol before identification as described by Soulsby[6]. In order to demonstrate the presence of internal parasites, the pigeons were euthanased and the respiratory and digestive tracts were isolated and separated into trachea, oesophagus, crop, proventriculus, gizzard, small and large intestines. The contents of each organ or section were dispensed into Petri dishes and the mucosa washed thoroughly with tap water and subsequently scraped off with the blunt edge of a scalpel blade. The material was preserved in 5 % formalin and the parasites collected and identified as previously described by Soulsby[6].

Two ectoparasites, the pigeon fly, *Pseudolynchia canariensis,* and a louse, *Columbicola columbae,* were recovered from some pigeons. *P. canariensis* was seen on 5 of the 12 pigeons examined and *C. columbae* on 3 pigeons. While the lice were found on the wing feathers, the pigeon flies were found on the skin. The ectoparasites were found in low numbers, which could partly be attributed to the weather, because the pigeons were sampled during a cold and dry spell. This assumption, however, should be verified. The parasites may cause loss in condition, because they are blood suckers. This emphasises the need to dust the birds with an insecticide. Since the pigeon fly is a vector of *Haemoproreus columbae*[1], its presence on the pigeons should be controlled.

Haemoproteus columbae was the most common parasite found, as has been reported previously[5]. *H. columbae* was seen in blood smears from 19 of 24 (79.2 %) pigeons. Parasitaemia was high, ranging from 75 % to 90 % of the erythrocytes in all 19 pigeons. Although the parasite was not associated with clinical disease and is usually considered to be non-pathogenic[6], *H. columbae* may cause disease in stressed pigeons[8].

Flotation in saturated sodium chloride solution did not yield any worm eggs, but coccidian oocysts were recovered in 5 of 20 faecal samples examined. Upon *post mortem* examination of 12 adult pigeons, 3 species of helminths, namely 2 nematodes, *Ascaridia columbae* and *Dispharynx spiralis,* and a cestode belonging to the genus *Raillietina* were recovered (Table 1). *Raillietina* sp. was the most frequent and was mainly found in the small intestine, but sometimes occurred in both the small and large intestines in large numbers. Adult *D. spiralis* were found in the proventriculus contents but they were not associated with any mucosal lesions. *A. columbae* was found in both the small and large intestines, either singly or in pairs. The pigeons infested with *A. columbae* were concurrently infested with *Raillietina* sp. Failure to detect worm eggs may have been because most of the worms were male.

[a]Botswana College of Agriculture, Private Bag 0027, Gaborone, Botswana.

[b]National Veterinary Laboratory, Private Bag 0035, Gaborone, Botswana.

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Table 1: **Helminth parasites recovered from 12 pigeons.**

Parasite	Number infected	Percent infected
Nematoda		
Dispharynx spiralis	1	8.3
Ascaridia columbae	3	25
Cestoda		
Raillietina sp.	8	75

Worm burdens were generally low, possibly because the pigeons were examined during a cold and dry period. Since some of these helminths may infect chickens, pigeons and chickens should not be raised together. Although the worm burdens were low, the pigeons should be treated with a broad spectrum anthelmintic, since the level of infection may increase seasonally.

All the pigeons were found to be serologically positive for *T. gondii* at titres of 1:256 (Table 2). This was interesting since the pigeons were apparently healthy. *T. gondii* is a common parasite of many animal species and humans, in whom it causes an influenza-like illness, but may cause congenital infections with serious consequences[7]. Toxoplasmosis is a common cause of abortions in sheep and goats in Botswana[2] and is a potential human health problem of great concern. There are other reports of isolation of *T. gondii* from birds[3,4]. Pigeons that carry *T. gondii* may be considered to be a potential source of infection to pigeon keepers, particularly those who are immunosuppressed by HIV/AIDS.

Table 2: **Seroprevalence of antibodies to *Toxoplasma gondii.***

Household	Number tested	Percent positive
1	4	100
2	6	100
3	6	100
Total	16	100

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Book review — Boek resensie

Diseases of poultry: world trade and public health implications

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With the expansion of global trade in especially animals and animal products, harmonisation of the regulations applicable to trade in animals and animal products is of paramount importance. While animal diseases must not be used as unjustified non-tariff trade barriers, the danger of expanded trade resulting in the dissemination of animal disease into areas of the world that had previously been free of the disease or threatening public health in any way must never be underestimated.

It is with the above in mind that this review was compiled to act as an international standard to facilitate the control of poultry diseases and trade in poultry and poultry products among nations

This review is a compilation of chapters, written by experts of world renown, on poultry diseases considered important for trade purposes (many of which are included in Lists A and B of the OIE). Chapters include: the paratyphoid salmonellae, campylobacteriosis, fowl typhoid and pullorum disease, fowl cholera, avian chlamydiosis, avian mycoplasmosis, Newcastle disease and other avian paramyxoviruses, highly pathogenic avian influenza, infectious laryngotracheitis, infectious bronchitis, infectious bursal disease, Marek's disease, leukosis and reticuloendotheliosis, poult enteritis complex, rhinotracheitis virus, adenoviruses, reo virus and a final chapter on ostrich diseases.

While the coordinators state that this publication is not intended to replace any of the existing texts on poultry diseases, it still stands as one of the most recent reviews of all the main poultry diseases in the world and is to be highly recommended. Areas covered within the chapters include a summary, historical background, isolation and identification of the organism, epidemiology, pathology, control and prevention and public health and international trade implications. The chapters are well referenced and are up to date.

This review is to be recommended to everybody involved in the trade of poultry and poultry products. Included in this group must be the veterinarians who are responsible for the certification of freedom from disease, which 'is only as good as the competence and honesty of those who provide it' (quote taken from the concluding remarks of the coordinators).

Neil Duncan
Faculty of Veterinary Science
University of Pretoria