A study on the prevalence of Endoparasites of domestic Pigeons (Columba livia domestica) inhabiting in the Green Mountain Region of Libya

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Abstract: This study was carried out to determine endo-parasites in green mountain region from free range pigeons. Fecal and blood samples were collected from different pigeons species and evaluated for the presence of gastrointestinal parasites and heamoparasites. Microscopic studies of eggs and faecal egg counts were done using the salt flotation technique. Blood smears were stained with Giemsa and used to detect heamoparasites. ***Protozoa (90% for Eimeria spp*** and **1%** for ***Haemoproteus spp***) and **nematodes** (**20% for *Capillaria spp*** and ***10% for Heterakis spp***) were detected in number of the cases, whereas 5% of the fecal samles were infected by multiple parasites. This is the first report of parasites in the **green mountain (El- Jabal Akhtar) region.** The presence of coccidian oocysts was revealed in the most of fecal samples.
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1. Introduction

Domestic and feral pigeons (Columba livia domestica) are often found along with human habitation, occupying and soiling places where people work and stay. Columba livia species descended from wild rock pigeons, that live in Mediterranean Europe. Pigeons are reared throughout the world for meat production, racing, performing and fancy purposes. In Libya, pigeons are mainly kept for fancy and performing purposes. Pigeons may be infected with many organisms, some of which are pathogenic to humans **(Zwart., 1986).** Humans are infected by inhaling fecal dust from cages or from sites that have been contaminated with dry feces, urine and other droppings. Domestic pigeons are among poultry species and like other domestic poultry these are part of subsistence farming done by most families. Due to perceived little importance of pigeons no attention in terms of research has been directed towards the species in Libya. Investigation in chicken and ducks managed under similar conditions like pigeons have shown high prevalence of gastrolitestinal parasites **(Magwisha et al., Muhairwa et al., 2007).** Understanding of parasitic diseases of pigeons will help in devising the measures to improve health and utility of these birds in Libya. Investigation elsewhere demonstrated the presence of gastrointestinal and heamoparasite **(Sol et al., 2000; Adriano and Cordeiro, 2001).** This preliminary study was carried out with the aim of determining the presence of endoparasites and haemoparasites of pigeons, some of which may be of zoonotic importance.

2. Materials and Methods

The pigeons selected for this study were surveyed from the households and markets of the green mountain region of El-Jabal Akhtar Region of Libya. They were captured with a fine mesh net after authorization and the study was approved by the Research Ethics Committee of University. The pigeons were tagged with a leg ring to avoid multiple sampling. A total of 30 male and female, different-aged pigeons were captured at different times. Blood samples were initially taken from the pigeons. The blood samples were collected using an insulin syringe inserted through a brachial veincatheter. Each sample provided two blood smears,fixed with methanol and stained with Quick Panoptic and Giemsa dyes **(FORONDA, et al. 2004).** The slides were analyzed under light microscopy using an oil Thereafter, the pigeons were caged and taken to the Animal Facility, where they were given water ad libitum until their stools could be sampled.

Fecal egg counts were carried out using the salt flotation teqchnique, as described by **Soulsby (1982).** The method involved taking 2 g of faecal sample into a test tube, adding 21 ml of water and the tube throughly shaken to mix the contents. The mixture was filtered using muslin cloth to discard the large debris particles and the resulting filtrate was centrifuged at 300 g for 3 min to settle the heavier parasite eggs. The supernatant was discarded and the tubes re-filled with saturated salt solution and re-centrifuged for 2 min at 3000 g. a glass rod was then used to transfer the floating eggs in the supernatant onto a microscope slide where they were viewed under both low and high power.

For the heamoparasites investigation, the blood was collecetd from wing vien by using 5 ml syringe and needle, the site was disinfected by 70% methyl alchohol. The blood smear were prepared, air dried and fixed with Methanol and stained with Giemsa. the heamoparasite were identified by examining the blood smear under oil immersion as described by **Soulbsy (1986).**

3. Results and Discussion

The results of this study show out of a total of 30 fecal samples examined 5% were found to be positive for one or more species of helminthes and protozoan parasites. A total of two different helminthes and two protozoan parasites were isolated from the faecal and blood samples and identified. The identified helminthes were Heterakis spp, Capillaria spp. The intestinal protozoan parasites was Eimeria spp. and heamproteus. Whereas in other studies the overall prevalence was high for gastrointestinal parasites that was 74.14% (43/58), with 86.05% (37/43) for protozoa, with the detection of Eimeria sp oocysts in all positive samples. Of these samples, 27.9% (12/43) were infected by multiple parasites, showing associations between Eimeria sp. and Ascaridia sp and Ascaridia species**(SANDRA et al., 2007)**. The other comparable results showed prevalence of blood parasites in pigeons and other birds in Costa Rica **(VALKIUNAS, et al., 2004),** Alaska, **(DEVICHE, et al., 2001)** and Japan **(MURATA etal., 2002).** revealed rates lower than 10%; in the United States **(GARVIN, et al. 1993),** Colombia **(RODRIGUEZ, and MATTA., 2001)**, Bulgaria **(SHURULINKOV, and GOLEMANSKY 2002**) and in Queensland of Australia (**ADLARD, et al., 2004)** where the prevalence rates ranged from 20 to 32% for Haemoproteus sp.

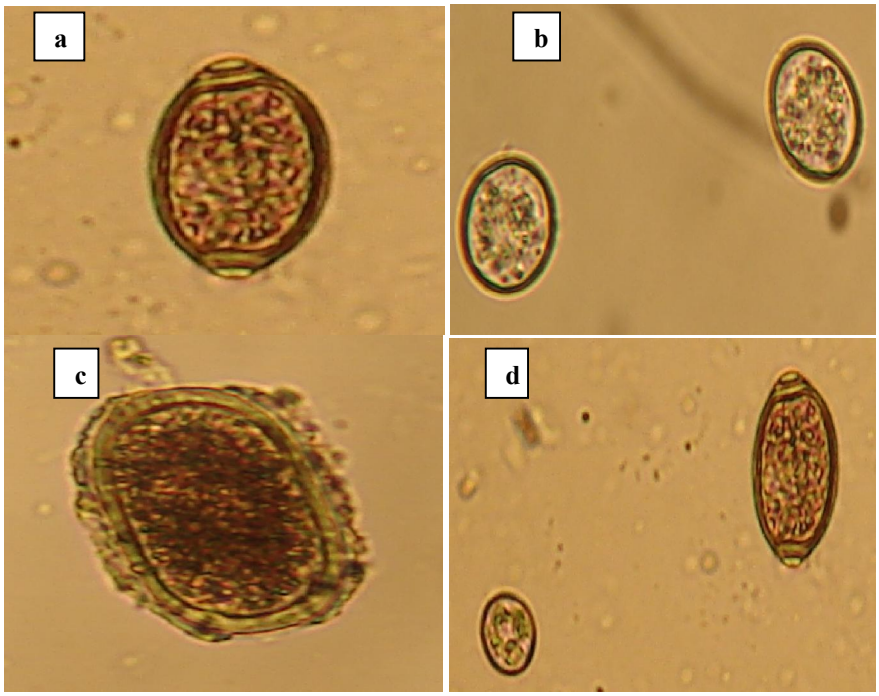

Figure 1: Eggs of parasites recovered from free range pigeons Capillaria spp (a), Eimeria sp (b), Heterakis gallinarum(c) Eimeria spp and Capillaria spp. (d)

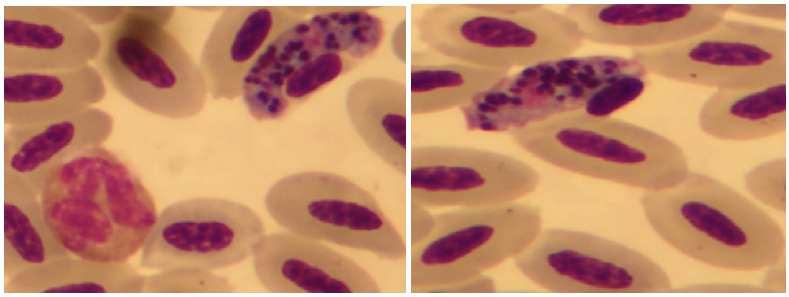

Figure 2: Blood smear of pigeons infected by Heamoproteus spp

The present study demonstrated two predominant helminthes and two protozoan parasites and marks the first report of gastro-intestinal parasites of pigeons in Green Mountain Region of Libya. The gastro-intestinal parasites encountered in pigeons are common parasites of domestic chicken that were observed in other studies also (Fowler, 1996**;** Muhairwa *et al*., 2007). This might be due to the fact that areas used by pigeons were also used by domestic chickens with free access of wild birds. In some cases the pigeons shared the same or close habitation with chicken and also shared the same food and water. Majority of pigeons have single parasitic infection. Mixed infections with up to two parasites were also found.

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