

Histopathologic Study of Intestinal Parasites in Domestic Pigeons (*Columba Livia*) and Laughing Doves (*Streptopelia Senegalensis*) in Diyala Province

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Abstract

The present study aims to detect the infestations by intestinal parasites in the domestic pigeons (*Columba livia*) and laughing doves (*Streptopelia Senegalensis*) and their effects on each other in Diyala province. (50) birds of domestic pigeons (*Columba livia*) purchased from the local markets and (20) laughing doves hunted near the coup of domestic pigeons are collected in period of November 2020 to February 2021 in different areas in Diyala province. The birds shows the clinical signs of parasites infestations as normal appetite with low weights, paleness and emaciation. The droppings examinations under microscope show deferent types of worms eggs and protozoan Oocysts and autopsy applied on dead birds. Results shows the birds infested by round worms *Ascaridia galli* in rate 32% (16 birds) in domesticated pigeons and 16% (3 birds) in laughing doves. And tape worms *Raillietina tetragona* in 26% (13 birds) in domesticated pigeons and 25% (6 birds) in laughing doves. And *Eimeria columbarum* in 47% (24 birds) in domesticated pigeons and 36% (7 birds) in laughing doves, *Capillaria spp* 2% (1 birds) in domesticated pigeons and 10% (2 birds) in laughing doves. the intestinal endothelium tested under histopathologic lesions to determines the effects of the parasites on it and showed many lesions that appeared increase in thickness of endothelium to sloughing it. The conclusions of the study showed high ability to the laughing doves to play an important role to transmit the internal parasites to the domesticated pigeons by direct contact between the two species or indirectly by contamination of the coups of pigeons with droppings of doves.

Keywords : Histopathologic, intestinal parasites, *Columba livia*, *Streptopelia Senegalensis*

Introduction

domestic pigeons (*Columba livia*) and laughing doves (*Streptopelia Senegalensis*) widely distributed except for the poles. Pigeons (Order Columbiformes) are commonly birds and can be found in virtually every town and city around the globe, *Columba livia* is a species that existed by breeding the high origin of these birds from wild rock pigeons (Marques *et al.*, 2007). live side by side with other animal species in the nature. Also, causes contamination of surroundings with their droppings. in our country Iraq generally used for fancy and performing purposes and may in other countries food and for research purposes especially in diyala

province. And contact with other domestic birds increases risk of parasitic infestation in birds (Piasecki, 2006; Sari *et al.*, 2008).

The intestinal parasites infestation including trematodes, helminthes and protozoa. Omer *et al.*, 2015 found (22%) of fecal samples were found positive for internal parasites (*Raillietina tetragona*), whereas no trematod and nematode were found. A total of 19 (19%) infected pigeons in Duhok province. Laku *et al* 2018 found Three intestinal helminth parasite species were recovered and they were one cestode, *Raillietina tetragona*, one nematode, *Ascaridia columbae* and one protozoa, *Eimeria spp.* The prevalence rates of infection of these intestinal helminth parasites were 38%, 6% and 2%, respectively. Both single and multiple infections were observed in Nigeria.

Alkharigy *et al.*, (2018) prevalence of intestinal helminths in examined pigeons were 56% (56/100). Three species of Cestoda (2% *Raillietina tetragona*, 32% *R. echinobothrida* and 4% *R. cesticillus*) and three species of Nematoda (18% *Heterakis gallinarum.*, 22% *Ascaridia galli* and 4% *Capillaria spp.*) were identified. Also, this study revealed that the pigeons examined were found infected with mixed parasites in Libya.

The aims of present study determines the rate of infestation by internal parasites and the ways to avoid these organisms and the interaction between in life style of pigeons (*Columba livia*) and laughing doves (*Streptopelia Senegalensis*) in diyala province with effects on the digestive system of birds.

Materials and methods

Birds

(50) birds of domestic pigeons (*Columba livia*) purchased from the local markets and (20) laughing doves hunted near the coup of domestic pigeons are collected in period of November 2020 to February 2021 in different areas in Diyala province. The birds shows the clinical signs of parasites infestations as normal appetite with low weights, paleness and emaciation.

Housing

The birds of this study were housed in separated cages in veterinary medicine college in Diyala University Iraq. A total of 50 Adults different aged Domestic pigeons and laughing doves and supplied by proper amounts of seeds and fresh tap water, and kept clean and dry by good litter.

Faecal samples

The droppings collected and tested in laboratory by flotation method using saturated salt solution.

The intestinal worms and Oocysts

The sacrifices by sample of birds the post mortem lesions were showed high deferent *spp.* Of intestinal worms and protozoan infestation recorded in many birds in deferent parts of intestine. Morphological description and identification of the collected worms were conducted using

mounted specimens. Ten worms in each case were measured while their mean sizes were calculated except when the number of parasites was small. The collected trematodes were identified according to Yamaguti (1957). The species of tapeworms were identified according to Khalil *et al.* (1994). Nematodes were identified according to Yamaguti (1961).

Microscopic lesions

Intestinal portions fixed in 10 % neutral buffered formalin. Tissues were dehydrated in different concentration of ethanol, cleared in xylene and embedded in paraffin wax at melting point 56-58 C for preparation to make a paraffin blocks Section were made at 5 micrometers with rotary microtome, then slides were stained with H & E Stain according to (Luna, 1968).

Faecal stool samples were removed by gently squeezing the anal cloacal orifice onto a microscope slide, smeared and a drop of 0.72% normal saline was added to it for direct examination under a light microscope of x 10 objective. Parasitic identification was carried out according to the keys developed by (Soulsby 1982). Prevalence and mean intensity of infection were computed according to Bush *et al.*, (1997).

Results :

After purchased (50) birds of domestic pigeons(*Columba livia*) purchased from the local markets and(20) laughing doves hunted near the coup of domestic pigeons are collected in period of November 2020 to February 2021 in different areas in Diyala province. The birds shows the clinical signs of parasites infestations as normal appetite with low weights, paleness and emaciation. The droppings examinations under microscope show deferent types of worms eggs and protozoan Oocysts and autopsy applied on dead birds. Results shows thè birds infested by round worms *Ascaridia galli* in rate 32% (16 birds)in domesticated pigeons and 16%(3 birds) in laughing doves. And tape worms *Raillietina tetragona* in 26%(13 birds) in domesticated pigeons and 25%(6 birds) in laughing doves. And *Eimeria columbarum* in 47%(24 birds) in domesticated pigeons and 36%(7 birds) in laughing doves. *Capillaria spp* 2% (1 birds)in domesticated pigeons and 10%(2 birds) in laughing doves.the intestinal endothelium tested under histopathologic lesions to determines the effects of the parasites on it and showed many lesions that appeared increase in thickness of endothelium to sloughing it. The autopsy applied and the intestinal contents tested grossly to find the large worms and lesions in deferent parts of intestine that showed large numbers of worms in the two *spp*. And tested microscopic showed *Oocysts* of *Eimeria* and eggs of larger worms. Then the intestines cuts from deferent part takes to histopathologic to study the lesions which showed deferent lesions too. Includes effects of the parasites on it and showed many lesions that appeared increase in thickness of endothelium to sloughing it.

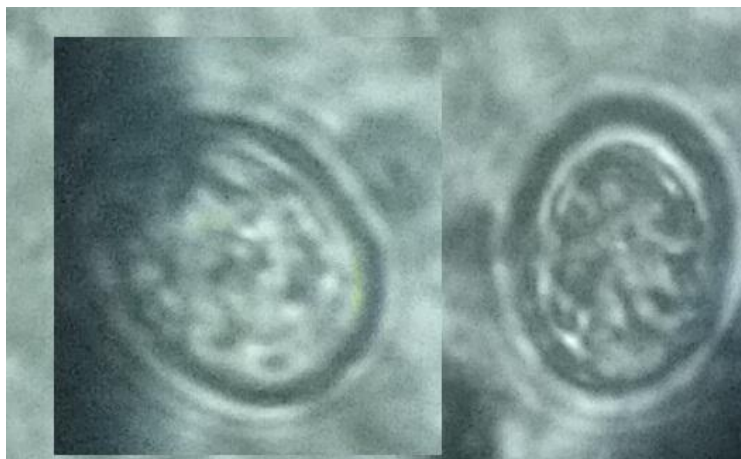


Fig. (1): Showing the direct smear of dropping contain unsporulated Oocysts of *Eimeria columbarum*

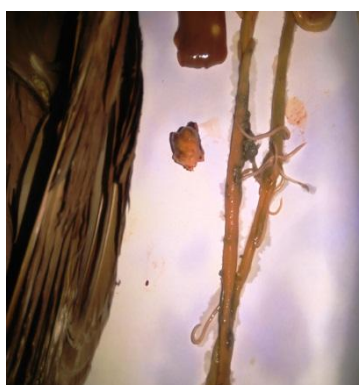


Fig. (2): Showing the dead birbs contain high numbers of nematodes (*Ascaridia galli*) and cestodes (*Raillietina tetragona*)



Fig. (3): Showing the microscopic ova of *Ascaridia galli*

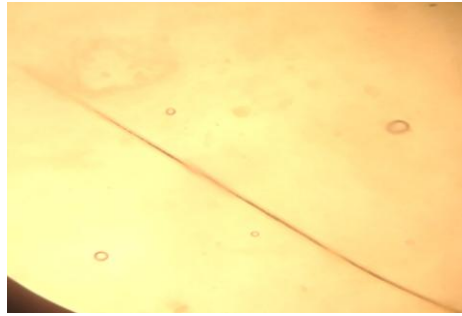


Fig. (4): Showing the *capillaria spp.*

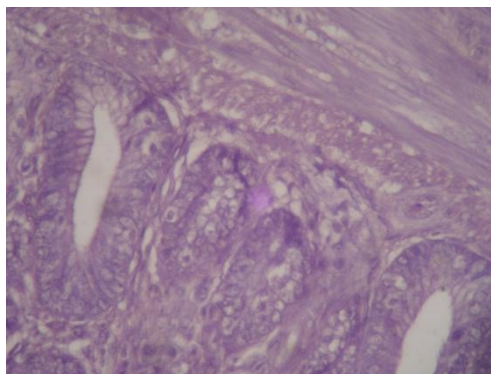


Fig. (5): Showing the Histopathologic section of intestine of domestic pigeon show mild thickness in mucosa and infiltration of inflammatory cells

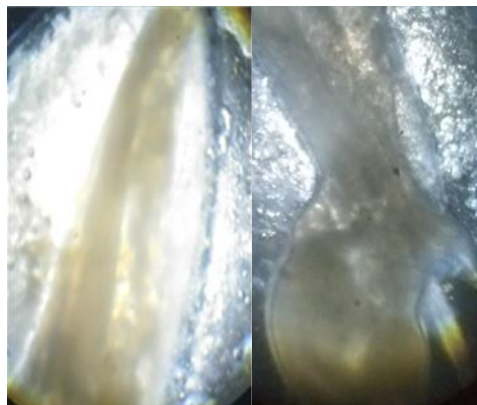


Fig. (6): Showing the posterior and anterior ends of *Ascaridia galli*

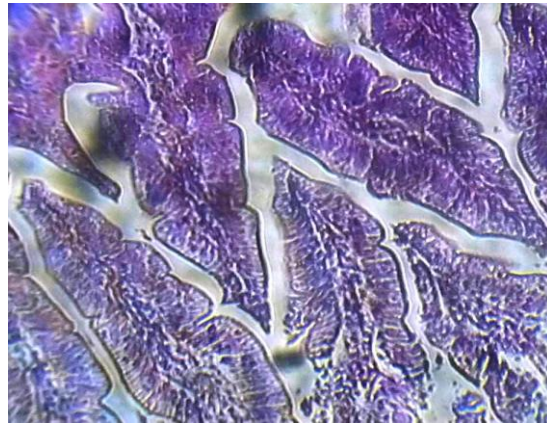


Fig. (7): Showing the Histopathologic section of intestine of domestic pigeon sloughing in mucosa

Discussion:

domestic pigeons (*Columba livia*) and laughing doves (*Streptopelia Senegalensis*) world widely population affected by deferent types of intestinal parasitic worms and protozoa that effects the body performance and re-infestation of internal parasites to each other types the two *spp*. Can transport the parasites to the other types .in previous other studies in Iraq the showed results agree with present study like Abed *et al .*, 2014 domesticated pigeon of 95(66.31%)were parasitized with tape worms 19(20%) belongs to *Cotugnia spp*, and 44 (46.31%)belongs to *Raillietina spp* .37/95(38.94%) with *nematodes* (*Ascaridia spp*.) in Al-Dewaniya city.

And Al-Bayati mentioned in 2011 The total prevalence were 73.01%. Three genera of cestodes were diagnosed and identified (*Aporina delafondi* , *Cotugnia intermedia* and *Raillientina microcantha*). Parasitological findings of feces and guts examined for all type of cestodes in birds revealed three degree of inflections depending on the number of worms/bird in Diyala province .

domestic pigeons (*Columba livia*) higher morbidity rate comparing with laughing doves (*Streptopelia Senegalensis*) because of rearing systems which used increase the ability to contaminate the food and water by the faeces of the affected birds .

the multiple intestinal parasites higher in domestic pigeons (*Columba livia*) than laughing doves (*Streptopelia Senegalensis*).

In conclusion the laughing doves (*Streptopelia Senegalensis*) can transport the infestations with parasites to the domestic pigeons (*Columba livia*) but the rearing systems and coups of domestic pigeons increase the morbidity rate of intestinal parsites in domestic pigeons.

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