

Clinical, Parasitic, and Histopathological Study of Pigeons Infested with *Raillietina* spp in Al-Qadisiyah Province, Iraq

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ABSTRACT

Pigeons, in Al-Qadisiyah Province-Iraq, were investigated Clinically, parasitically, and histopathologically for the presence of *Raillietina* spp in their intestines. For these reasons, 5 cities from the mentioned province above were sampled as 150 (100 males and 50 females) pigeons were studied. The general clinical inspection, intestinal exploration and slides for the worms, and histopathological slide sections for the infested intestines were performed. The results of the clinical studies revealed delay growth in the young birds and emaciation in the adult pigeons. For the parasitic characteristics in the intestines, the results showed clearly the presence of *Raillietina* spp, declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestines. In the case of histopathological pictures, intestines revealed grossly small-intestine-wall-based enlargement and obstruction via intussusception caused by the tapeworm presence with huge amounts of mucus and air bubbles and the parasitic white convoluted tracks in the intestinal mucosa. Microscopically, the results recognized that mucosa had mechanical disintegration, marked sloughing of the epithelial layers that belonged to the villi and crypts, epithelial-cell-based desquamation of the villi that were affected by dwarfism, mucosa and submucosa infiltration with mononuclear cells. This study provides important clinical, parasitic, and histopathological data of pigeons infested with *Raillietina* spp in Al-Qadisiyah Province, Iraq.

Keywords: Histopathology, pigeons, *Raillietina* spp.

INTRODUCTION

The tapeworm, *Raillietina* spp, affects vary numbers of birds such as chickens. The tapeworm is considered as a very pathogenic parasite, and the disease caused by this worm is called nodular tapeworm disease¹. The disease replaces the healthy situation of a bird with weakness, emaciation, retardation of growth, and obstructions in the affected intestines². The tapeworm belongs to the genus of *Raillietina* that contains 4 subgenera of *Raillietina*, *Paroniella*, *Skrjabinia*, and *Fuhrmann*³. For morphological features, tapeworms are characterized using scolex-based sizes and shapes, single or double rows of hooks in the rostellum, and armed or unarmed suckers, genital-based pores/segment different in numbers, egg capsule with vary numbers of eggs in a gravid proglottid^{4,5}. The lifecycle of this tapeworm is maintained by 2 host which are ants and birds, and birds affected by this tapeworm are from wild or domestic lives^{1,6}. The main affected sites by the worm are the small intestines, and the disease caused by these parasites in chickens, in heavy infestation, is noticed with clear intestinal nodules and granuloma-based enteritis in these sites^{7,8}. Treatment of the disease can be done using

certain anthelmintic medicines such as albendazole⁹⁻¹¹. Praziquantel was also found to be effective against *Raillietina echinobothrida* employing the oxidative-based stress in the cells of the parasite¹². Pigeons, in Al-Qadisiyah Province-Iraq, were investigated Clinically, parasitically, and histopathologically for the presence of *Raillietina* spp in their intestines.

MATERIALS AND METHODS

Pigeons, in Al-Qadisiyah Province-Iraq, were investigated Clinically, parasitically, and histopathologically for the presence of *Raillietina* spp in their intestines. For these reasons, 5 cities (Diwaniyah, Hamza, Dagharah, Ghamas, and Al-Shamiyah) from the mentioned province above were sampled as 150 (100 males at ages of 1 month and 50 females at ages of 6 months) pigeons were studied. After sacrificing the birds, intestines were inspected directly by incising them longitudinally. The histopathological sections were made using 1-2 cm³ of the affected parts of the intestines and fixed with 10% formalin solution. The processes of histological preparation were performed according to¹³⁻¹⁴.

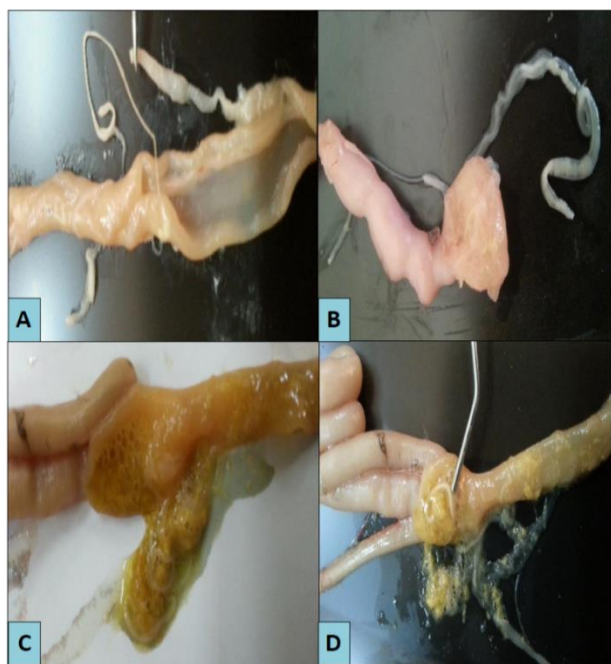


Figure 1: Intestine exploration for the presence of *Raillietina* spp. A. The presence of *R. spp*, declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestine. B. The parasitic white convoluted tracks in the intestinal mucosa.

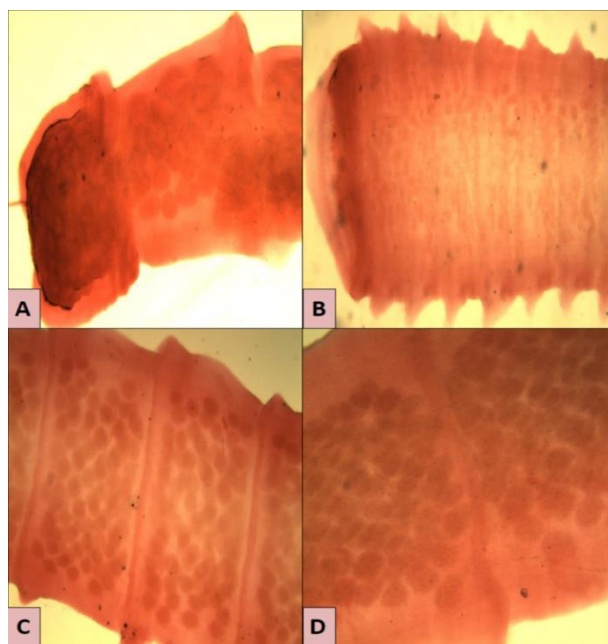


Figure 2: *Raillietina* spp slide section. C and D show the gravid proglottide, which appears in width more than length, with one marginal genital pore. In general worm like rubber bands, whose length and width can stretch and shrink (A and B).

The worms were examined for the key features present in¹⁵⁻¹⁷.

RESULTS

The results of the clinical studies revealed delay growth

Table 1: The infection rates of females and males.

Sex	Infect ed	Percentage (%)	Non-infect ed	Percentag e (%)
Male	120	80	30	20
Fem ale	50	33	100	67

Table 2: The infection rates according to the age of the infected birds.

Sex	Older than 2 years of old	Percenta ge (%)	Younger than 2 years of old	Percent age (%)
Male	100	83	20	17
Fem ale	35	70	15	30

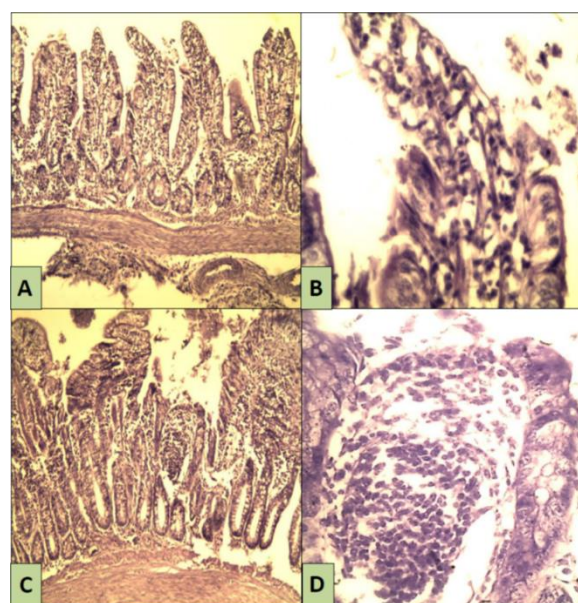


Figure 3: intestine sites affected by *Raillietina* spp. The mucosa has mechanical disintegration, marked sloughing of the epithelial layers that belongs to the villi and crypts.

in the young birds and emaciation in the adult pigeons. Tables 1 and 2 show some statistics related to the infection by this worm.

For the parasitic characteristics in the intestines, the results showed clearly the presence of *Raillietina* spp, declaring by their firmly attachment to the mucosa by their suckers and showing their segments, in the lumens of the small intestines. In the case of histopathological pictures, intestines revealed grossly small-intestine-wall-based enlargement and obstruction via intussusception caused by the tapeworm presence with huge amounts of mucus and air bubbles and the parasitic white convoluted tracks in the intestinal mucosa, figure 1 and 2.

Microscopically, the results recognized that mucosa had mechanical disintegration, marked sloughing of the epithelial layers that belonged to the villi and crypts, epithelial-cell-based desquamation of the villi that were

affected by dwarfism, mucosa and submucosa infiltration with mononuclear cells, figure 3.

DISCUSSION

The tapeworm, *Raillietina* spp, affects vary numbers of birds such as chickens. The tapeworm is considered as a very pathogenic parasite, and the disease caused by this worm is called nodular tapeworm disease¹. The disease replaces the healthy situation of a bird with weakness, emaciation, retardation of growth, and obstructions in the affected intestines². The tapeworm belongs to the genus of *Raillietina* that contains 4 subgenera of *Raillietina*, *Paroniella*, *Skrjabinia*, and *Fuhrmann*³. For morphological features, tapeworms are characterized using scolex-based sizes and shapes, single or double rows of hooks in the rostellum, and armed or unarmed suckers, genital-based pores/segment different in numbers, egg capsule with vary numbers of eggs in a gravid proglottid^{4,5}. The results revealed the presence of this tapeworm in the intestines of the tested pigeons. These results agree with¹⁸ who found 6 rock pigeons were infested out of 35 pigeons. In a study, feral pigeons (*Columba livia*) were found to be infected with this tapeworm at 84 (61.76 %) out of 136 adult pigeons from Greece¹⁹. From Iran, a study revealed that (28.26 %) out of 46 domestic pigeons were infected with *R. echinobothrida*²⁰. The reason of the common infection with this type of worms might belong to the high presence of ants close to the infected pigeons²⁰. A study used 240 *Columba livia domestica* pigeons to check for the presence of different species of worms and found that 26 (10.6%) were infected with the current study investigated worm²¹. The results of histopathological examination showed some changes in the affected tissues in the intestines, and these findings agree with¹⁵ who found similar to the current study results such as the increase in numbers of goblet cells. This study provides important clinical, parasitic, and histopathological data of pigeons infested with *Raillietina* spp in Al-Qadisiyah Province, Iraq.

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