



Parasites of Pigeons (*Columba Livia Domestica*) in the Hilly Region of Meghalaya

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Received: February 24, 2022

Published: March 09, 2022

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Abstract

The purpose of the review was to find out the prevalence of endo and ecto parasites in the pigeons of hilly region of Meghalaya. A total of 195 nos. of fecal samples were examined for four months using flotation and McMaster techniques. The overall prevalence of gastrointestinal parasitic infections in pigeons of Umiam, Meghalaya was 44.10%. Eggs of *Ascaridia columbae* (18.60%), *Paratanaisia bragai* (15.11%), *Capillaria obsignata* (9.30%), *Strongyloides avium* (12.79%), *Raillietina cesticillus* (6.97%), *Raillietina tetragona* (11.62%), *Eimeria sp.* (8.13%) and mixed infection (17.44%) were recorded. Examination of blood smear revealed presence of *Haemoproteus columbae* (6.63%). Necropsy of 6 nos. of pigeons revealed presence of *Raillietina tetragona* (33.33%), *Raillietina echinobothrida* (16.66%), *Cotugnia sp.* (16.66%), *Cysticercus sp.* (16.66%), *Paratanaisia bragai* (16.66%). Two species of ectoparasites, *Menopon gallinae* (16.66%) and *Columbicola columbae* (33.33%) observed. The present findings have significance because these parasites have detrimental effect on the infected birds and also serve as a potential reservoir of zoonotic parasites.

Keywords: Parasite; Pigeons; Hilly Region; Meghalaya

Introduction

Pigeon of the order Columbiformes are ubiquitous bird and can be found in virtually every town and city around the world [1], live side by side with human as a source of food, hobby and experimental purposes [2]. Its interaction with man and other domestic and wild birds, portends it as a potential carrier of zoonotic parasites [3]. Humans are infected by inhaling fecal dust from cages or from sites that have been contaminated with dry feces, urine and other droppings [1], sometime transmit zoonotic agents also [4]. Gastrointestinal nematodes are the most deleterious parasites responsible for the occurrence of clinical and sub-clinical infections. They are also severely affected by ecto-parasites which are responsible for nuisance, anemia, general debility and some of them have a significant role in the transmission of various infectious agents. The losses caused by them are retarded growth rate, unthriftiness, production loss, cost associated with therapeutic and preventive measures and also increase susceptibility to other infectious diseases which may ultimately lead to higher mortality of the pigeons [5]. On the other hand, pigeons are able to fly long distance, thus

carry many parasites and pathogens to other poultry flocks such as coccidiosis, cryptosporidiosis, newcastle disease and histoplasmosis [6]. Since, there is no information available on the prevalence of parasites in the pigeons of hilly region of Meghalaya, so the present study was undertaken to find out the prevalence of ecto and endo parasites in the pigeons of hilly region of Meghalaya.

Materials and Methods

Pooled fecal samples (195 nos.) of pigeons were collected for four months from the hilly regions of Umiam, Meghalaya. Qualitative tests were done by direct smear, flotation and sedimentation techniques [7]. Intensity of the infections i.e., egg per gram (EPG) of feces was estimated by the modified McMaster technique [8]. Necropsy of pigeons (6nos.) was done for identification of parasites in the gastrointestinal tract, kidney, lung and other organs. Nematodes were preserved in 70% ethanol, cleared with lactophenol and identified based on Vicente., et al. [9] while cestodes and trematodes were preserved in 10% formalin. Birds were also examined for presence of any ectoparasites. Haemoprotozoan parasites in the heart blood smear are identified by Giemsa staining [10].

Results and Discussion

The overall prevalence of gastrointestinal parasitic infections in pigeons of Umiam, Meghalaya was 44.10%. Eggs of *Ascaridia columbae* (18.60%) was recorded highest followed by *Paratanaisia bragai* (15.11%), *Strongyloides avium* (12.79%), *Raillietina tetragona* (11.62%), *Capillaria obsignata* (9.30%), *Eimeria* sp. (8.13%) and *Raillietina cesticillus* (6.97%). Mixed infections with more than two species were recorded in 17.44% birds. Examination of blood smear revealed presence of *Haemoproteus columbae* (6.63%). Necropsy of 6 nos. of pigeons revealed presence of *Raillietina tetragona* (33.33%), *Raillietina echinobothrida* (16.66%) and *Cotugnia* sp. (16.66%) in small intestine; *Cysticercus* sp. (16.66%) in the mesentery of small intestine; *Paratanaisia bragai* (16.66%) in kidneys (Fig.1). Only two species of ectoparasites, *Menopon gallinae* (16.66%) and *Columbicola columbae* (33.33%) were observed. In the present study, both ecto and endo parasites are found in the pigeons of Umiam, Meghalaya. Earlier, Ghosh., *et al.* [11] from Bangladesh reported 67% and 72% ecto and endo parasites in pigeons, respectively while Khan., *et al.* [12] from Pakistan, reported 86.66% and 66.66% ecto and endo parasites in pigeons, respectively. Multiple species of endoparasites were recorded in the present study which was in agreement with the findings of Mehmood., *et al.* [13], Mohammed., *et al.* [14] and Parsani., *et al.* [15] from Jammu, Nigeria and Gujarat, respectively. Tu., *et al.* [16] from China also reported *Capillaria obsignata*, *Heterakis* and coccidia in pigeons. This may be due consumption of beetles, snails, earthworms and ants along with grains, which are intermediate host of many parasites. Moreover, the contaminated premises or soil acts as an important reservoir and transmission media for soil transmitted helminthes [17]. Localization of helminths in the intestines of birds significantly affect the functional activity of the immune system, cause immunodeficiency, and reduce the natural reactivity of the infected organism [18,19]. The prevalence of *Ascaridia columbae* was highest in the present study which was in accordance with the findings of Bogach., *et al.* [20] and Ghosh., *et al.* [11] which may be due to consumption of feed, slugs, earthworms etc from the contaminated areas. According to Bahrami., *et al.* [21] the PCV, WBC, MCV, MCH, neutrophil and lymphocyte values were significantly ($p < 0.05$) different in infected young pigeons. Mild congestion was also seen in the tissue of small and large intestine, histopathological and degenerative changes in the epithelial tissues also observed. Localization of cestodes in the small intestine promotes the absorption of nutrients through the surface of the body [20] as well as causes its obstruction, which leads to high level of depletion, weight loss and even death of the bird [22]. In the present study, *Menopon galli-*

nae (16.66%) and *Columbicola columbae* (33.33%) were observed. Earlier studies from Assam [23], Uganda [24], Pakistan [25] and Spain [26] reported 12.03%, 94.1%, 30% and 100% prevalence of *Columbicola columbae* in pigeons, respectively. Ghosh., *et al.* [11] and Ali., *et al.* [27] reported 13% and 100% prevalence of *Menopon gallinae* in pigeons, respectively. The percent prevalence of infections was different from the present study which may be due to difference in the geographical region, climate etc. Lice infestation causes ill health of birds due to blood sucking behavior, weight loss at the rate of about 711gms per bird and decreases the egg yield at the rate of about 66 egg per bird/year and lameness is associated with heavy infestation [28]. Infestation with ectoparasite causes distress, allergies, and transmit infectious diseases [29]. *Haemoproteus columbae* (6.63%) was observed in the blood smear. Rosyadi., *et al.* [30] and Roy., *et al.* [31] also reported 62.5-100% and 60% prevalence of *Haemoproteus columbae* in pigeons, respectively. It is responsible for macrocytic hypochromic anemia with hypoproteinemia and hyperfibrinogenemia in the infected pigeons [30]. Moreover, according to Tayyub., *et al.* [32] wild rock pigeon infested with multiple species of ectoparasites could be the potential source of infestations in domesticated birds if they come in contact with them.

The present study has significance because these parasites have detrimental or debilitating effect on the infected birds, growth retardation, reduced productivity and prevents healthy development, as well as making adult birds prone to secondary infections [33]. According to Vaz., *et al.* [34] and El-Dakhly., *et al.* [35] cities and suburbs are home to a large number of pigeons, which are permanent residents of parks, playgrounds, markets etc and can serve as carrier of infections. Moreover, due to their close interaction with humans and other domestic and wild birds, they serve as a potential reservoir of zoonotic parasites [4,36]. *Raillietina* sp. in humans was reported from different regions of the world [37-40]. Thus, continuous monitoring of the parasites is necessary because they come in contact with other species of the poultry and might act as a source of infection. There was no report on the prevalence of parasites in the pigeons of hilly region of Meghalaya and this report may be considered as the first report.

Conclusions

Both ecto and endo parasites are prevalent in the pigeons of hilly region of Meghalaya and should not be neglected because they may transmit the infections to other poultry birds and humans. Regular screening of fecal samples and deworming of birds are necessary to prevent spread of infections.

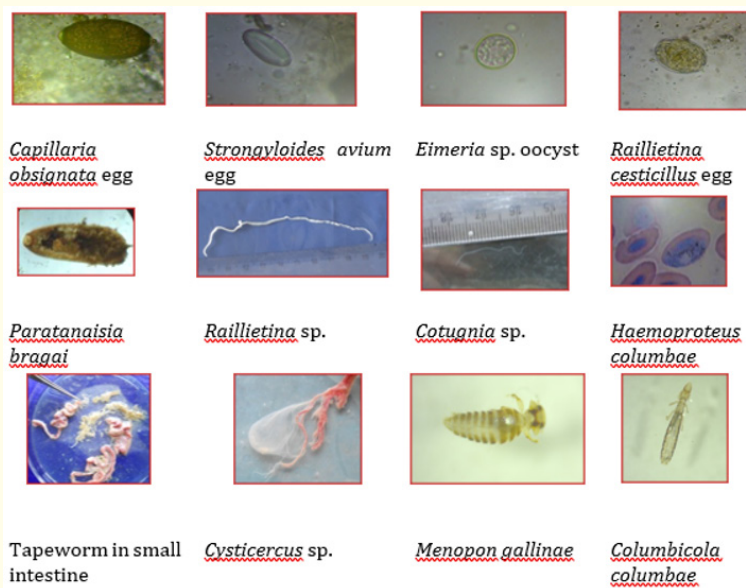


Figure 1: Parasites of pigeons in hilly region of Meghalaya.

Acknowledgments

We are thankful to Director, ICAR Research Complex for NEH Region, Umiam, Meghalaya for providing facilities to conduct this study.

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