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Haemoproteus Columbae in *Columba livia domestica* of Three Areas in Iran in 2010

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Abstract: Pigeons are cosmopolitan birds and can be found easily in every area except poles. Several species of parasites infect pigeons throughout their global range. Among these are order *Haemosporida*, including *Haemoproteus columbae*, which louse fly (*Pseudolynchia canariensis*) is a vector for them. 120 pigeons were investigated in three different locations (Babol, lahijan and Firouz Koh) in Iran. Blood smears were stained with geimsa and examined under microscope using immersion oil. The prevalence rate was 30% (36/120) and in 3 of the 120 pigeons vectors were seen. There is not enough information about prevalence of avian blood parasites in the three areas. Hence, more surveys seem to be necessary for increasing knowledge about epidemiology of these parasites.

Key words: *Haemoproteus columbae* · Pigeon · Babol · Firouz Koh · Lahijan

INTRODUCTION

Two *Haemoproteus* species, *H.columbae* and *H.sacharovi*, infect pigeons. Their gamonts are seen in red blood cells. The gamonts of *H. columbae* develop from tiny forms to elongated, crescent-shaped forms, which partially encircle the nucleus of the host cell. The host cell's nucleus may be displaced but not to the edge of cell. The mature gamonts of *H.sacharovi* occupy the host cell completely. They distort it and push the host cell's nucleus to one side. The vector of *H.columbae* is *P. canariensis*. Both *H.columbae* and *P.canariensis* are widely distributed in the world, particularly in warm and temperate climates [1].

Furthermore, Pigeons of the order Columbiformes are ubiquitous birds and can be found in virtually every town and city around the globe [2]. Studies, to date, have determined that the most common blood parasite found in pigeons is *H. columbae* and the infection rate may be as high as 75% ranging from 6 to 86% [3-8]. *H. columbae* and its vector, *P.canariensis*, are present in North Iran [9].

There is very limited number of studies on pigeons blood parasites in Iran. Thus, the aim of this study was to determine the frequency of *H.columbae* in pigeons in North of Iran.

MATERIALS AND METHODS

The study was carried out from September to November 2010, involving 120 pigeons from three localities including Babol (latitude, 36° 32' 39" N and longitude, 52° 40' 44" E), Firouz Koh (latitude, 35° 34' 31" N and longitude, 53° 23' 39" E) and Lahijan (latitude, 37° 12' 33" N and longitude, 50° 0' 2" E) in north of Iran. Birds were captured in mist nets and then released after a small amount of blood (~50µl) via brachial vein puncture was taken. Sex and age of all pigeons were recorded. Pigeons reach sexual maturity at approximately 6 months old and their sex is determined on the basis of reproductive behaviors. Blood smears were air dried and fixed in absolute methanol for 3 minutes immediately after sample collection and later stained with giemsa stain for 45 min. Then the slides were carefully studied and positive cases were recorded. Louse flies were monitored carefully by observing birds while they were captured.

RESULTS

120 pigeons from three different locations comprising 64 (53%) males and 56(47%) females. Blood samples were collected and and its examination resulted in 36 (30%) pigeons were infected by *H.columbae* that 20(31.2%) were

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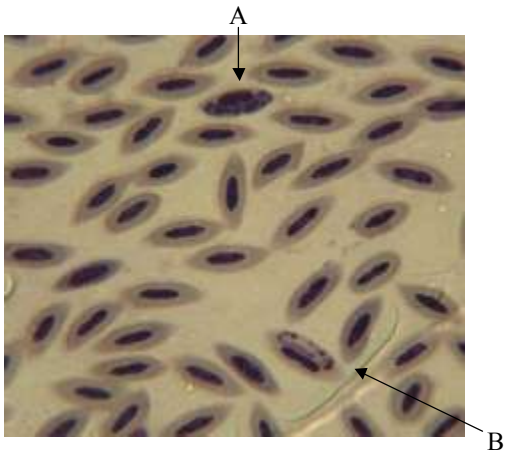

Fig. 1: Haemoproteus columbae Micro (B) and Macro(A) gametocytes in the blood of the Columbia livia domestica

Table 1: Locality, number, age and sex of examined pigeons

		Age		Sex	
Locality	Number of pigeons	(6-24)*	(24<x)*	Female	Male
Babol	40	17	23	18	22
Lahijan	40	10	30	21	19
Firouz Koh	40	34	6	17	23
Total	120	61	59	56	64

*Month

Table 2: Infection rate according to locality and sex

Locality	No. infected male	No. infected female	Infection rate%
Babol	13 (59%)	9 (50%)	22 (55%)
Lahijan	5 (26.3%)	4 (19%)	9 (22.5%)
Firouz Koh	2 (8.7%)	3 (17.6%)	5 (12.5%)
Total	20 (31.2%)	16 (28.5%)	36 (30%)

males and 16(28.5%) were females. In 3 pigeons (2.5%) *P.caranienesis* was observed. In stained blood smears, only gametocytes of *H. columbae* were seen within red blood cells (Figure 1). Usually one gametocyte was seen in each red blood cell. Comprehensive data is shown in Tables 1 and 2.

DISCUSSIONS

In Queensland [10], Colombia [11], Bulgaria [12] and the United States [13], the prevalence rate for *Hemoterous spp*. ranged from 20% to 32%. The prevalence of blood parasite in pigeons and birds in Japan [14], Costa Rica [15] and Alaska [16] was shown to be lower than 10%.

H. columbae infects pigeons which are associated with human settlements. Throughout the world prevalence of *H. columbae* in feral pigeons in different geographical area varies from 14 to 100% [17].

Yunus and Arsalan [18] reported 74% (73/98) of pigeons collected from a local zoo were infected with blood parasites. Moreover, 105 *Columba livia* in Galapagos Island were investigated and 89% were infected with *Hemoterous spp*. [19]. Dranzoa. [20] examined 34 pigeons and the survey of ectoparasites revealed that *P. canariensis* was the most prevalent parasite (100%).

In our previous study in Gonbad, in Golestan province, on 103 *C. Livia* the infection rate was17.4% [18] which is lower than current study, 30%. According to our investigations in the mentioned locations, the results were variable. Infection rate in Babol, Lahijan and Firouz Koh were 55%, 22.5 and 12.5% respectively. In the present investigation just three birds vectors (*P. canariensis*) were observed, which in comparison to our previous survey in Gonbad was lower. In the current study there is not any significant difference between prevalence rate of females and males and the number of infected pigeons in both sexes was almost equal. In conclusion, our survey indicated that more studies are required owing to different prevalence rates in different parts of North of Iran, particularly on turkeys, chickens and ducks.

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