Prevalence of *Haemoproteus columbae* and *Trichomonas gallinae* in pigeons (*Columba domestica*) in Isfahan, Iran

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Abstract The aim of this study was to determine the prevalence of *Haemoproteus columbae* and *Trichomonas gallinae* in pigeons (*Columba domestica*) in Isfahan, Iran. Study was done on 100 pigeons from January to June 2010 in Isfahan located in south of Iran. Oropharyngeal swabs were taken from all birds. Also blood samples were obtained from wing vein and thin smears were prepared from them. All smears were stained by Giemsa and were examined by immersion. Out of 100 Oropharyngeal swab smears 57 (57%) were positive for *T. gallinae* and *Haemoproteus gallinae* were detected in 62 pigeons (62%) from which blood smear were taken. The present study is in close agreement with other studies in Iran. But infestation rate to these parasite in world are very different. These differences were probably linked to geographical variations and differences in the feeding habitat and abundance of vehicles of *Haemoproteus*.

Keywords *Haemoproteus columbae* · *Trichomonas gallinae* · Pigeons · Isfahan · Iran

Introduction

Pigeons and doves are distributed everywhere on Earth and relationship between pigeons and human is very old. The pigeons have been domesticated for hundreds of years. Pigeons have been used for a long time as a food resource, pets or cultural and religious symbols. They also make good laboratory animals, as in the diagnosis of fowl cholera (Cooper 1984). In other hands pigeons act as reservoir or carrier and an important source of infection for other avian host, which share the common parasitic fauna (Kumar 1998). Also the role of pigeons in the transmission of diseases to humans and to domestic animals, especially in connection with intensive poultry production, has been well documented. Many species of parasites infect pigeons, resulting in reduced performance and mortality of the host (Rupiper 1998; Dranzoa et al. 1999; Eckert 2000). There are large number of pathogens related to hygiene and management of pigeons. The most important pathogens that threat pigeon's life are ecto and endoparasites. Many species of parasites infect pigeons, resulting in reduced performance and mortality of the host (Rupiper 1998; Dranzoa et al. 1999; Eckert 2000) and are cause for clinical and sub-clinical diseases. *Haemoproteus columbae* and *Trichomonas gallinae* is pathogenic protozoan that effecting blood circulatory and alimentary systems of pigeons, respectively. *H. columbae* is transmitted by Hypoboscidae flies and culicoides mosquitoes but the life cycle of *T. gallinae* is direct and the pathogen is transmitted by water, food and orally. Anemia, loss of body weight, anorexia, diarrhea, dehydration and finally death are the probably results of infection with these parasites. The incidence of *H. columbae* and *T. gallinae* has been studied in world. In Iran, the infection was reported only in few reports. The present study was undertaken to evaluate

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prevalence of *H. columbae* and *T. gallinae* in pigeons (*Columba domestica*) in Isfahan, Iran.

Materials and methods

Birds

This survey was carried out from January to June 2010 in Isfahan (major city of Isfahan's province) located in south of Iran. Due to lack of any information about the prevalence of *Trichomonas* and *Haemoproteus* in the Isfahan, we assumed for large sampling procedures an infection prevalence of 50%. Sample size calculation was based upon prevalence, accepting desired absolute precision of 5% and a confidence level of 99% (Thrusfield 1997). Base on this calculation 100 pigeons were handled in the same manner by using keep net. All captured pigeons were included in examinations.

Collection of samples for *Trichomonas*

Oropharyngeal swabs were taken from all birds and swabs samples were stained with Giemsa. The examination was done under 400× and 1000× magnification for *Trichomonas*.

Collection of samples for *Haemoproteus*

Blood samples were obtained from wing vein and thin blood smears were prepared from them. Smears were stained by Giemsa and were examined by immersion.

Results and discussion

Out of 100 Oropharyngeal swab smears 57 (57%) were positive for *T. gallinae*. The organism were pyriform in shape and measured $632 \times 32 \mu\text{m}$, which have four anterior flagella arising from a belpharoplast and one posterior flagellum attached to an undulating membrane. A prominent axostyle was also present at the posterior end of the organism. Infection to *T. gallinae* in pigeon is cause for diphtheritic lesions in mouth have been reported by several authors (Grimes). In the present study, these lesions were not detected and did not show any clinical signs. Only few studies have been done on *T. gallinae* and *H. columbae* of pigeons in Iran. Radfar et al. (2011) reported 57.84% infestation rate to *T. gallinae* in pigeons of Khorasan province, Iran. This rate is in quite agreement by our study. In an investigation conducted in center of Iran, Pirali-

Kheirabadi et al. (2008) found that 79.11% of pigeons were infected with *T. gallinae*.

Haemoproteus gallinae were detected in 62 pigeons (62%) from which blood smear were taken. Length and width of macrogametocytes and microgametocytes of *Haemoproteus* were $3\text{--}5 \times 13\text{--}15 \mu\text{m}$ and $3\text{--}4 \times 12\text{--}13 \mu\text{m}$, respectively.

Similarly to prior parasite, study about infestation to *H. columbae* in Iran is rare. Recently two studies were done about the parasite. Youssefi et al. (2010) reported 17.47% infestation rate in pigeons of north of Iran to *H. columbae* and Razmi and Andalibian (2006) found that 33% of pigeons in Mashhad (Northeast of Iran) were infected with *H. columbae*.

The present study is in close agreement with other studies in Iran. But infestation rate to theses parasite in world are very different. These differences were probably linked to geographical variations and differences in the feeding habitat and abundance of vehicles of *Haemoproteus*.

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