



Ectoparasites of Domestic Pigeons (*Columba livia domestica*) in Antakya Region

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Received: 24.10.2018

Accepted: 15.11.2018

ABSTRACT

Objectives: Besides the yield loss of the pigeons those are infested with ectoparasites they are also susceptible against the other infections because of weakened immunity. Thus it has been evaluated the situation of ectoparasites of domestic pigeons and determined the prevalence in Antakya region.

Materials and Methods: Totally 100 domestic pigeons (*Columba livia domestica*) which are fed for hobby in Antakya region were examined with respect of ectoparasites. The prevalence of ectoparasites of domestic pigeons has been determined and identified according to the literature.

Results: The prevalence of ectoparasites of domestic pigeons was determined as 52% and three different ectoparasites were detected. *Columbicola columbae* was the dominant species with a percentage of 45%, *Argas reflexus* and *Pseudolynchia canariensis* were also detected with a percentage of 5% and 2%, respectively. Despite the higher percentage of infestation in female pigeons (54,5%) when compared with males (48,9%) and adults (56,9%) when compared with juveniles (42,9%) no significant difference was found statistically ($p>0.05$). But louse infestation of adult pigeons (58,3%) was significantly higher than the juvenile pigeons (28,5%) statistically ($p<0.05$).

Conclusion: The yield and performance loss in domestic pigeons should not be ruled out. Therefore hygiene of shelters and ventilation is crucially important. Ectoparasite situation should be monitored and gotten under control.

Keywords: Domestic pigeons, *Columbicola columbae*, *Argas reflexus*, *Pseudolynchia canariensis*, Antakya.

INTRODUCTION

Pigeons in order Columbiformes are the birds which live with humans almost all around the world since earliest (B.C. 3000-5000). They are one of the first animals which domesticated by humans generally for hobby and also used for carrying message, cultural and religious symbols, nutritional sources, as laboratory animals for diagnosis of some diseases

(Tiğın, 1973; Sari et al., 2008). In addition pigeons have a role in spreading parasitary disease to other animals which have economic importance and zoonotic diseases to humans (Gunder, 1989; Mushi et al., 2000; Adang et al., 2008; Begum and Sehrin, 2011).

Pigeons can be infested by many ectoparasites like louse, fly and tick (Winter and Funk, 1996). These parasites can survive in several environment

conditions and live in body, skin and between the feather of birds (Jahantigh et al., 2016). Related to annoyance of infested birds decrease in food intake occurs. In relation to that weight loss, growth failure, decrease in brood time and egg producing occur (Gıcık, 1999; Mullen and Durden, 2002; Begum and Sehrin, 2011; Saikia et al., 2017). In this period the susceptibility of bird against the infections is increasing with regards to the negative changes in immun system (Saika et al., 2017).

The number of studies on parasitic investigations are increasing day by day but the studies on ectoparasites of domestic pigeons (*Columba livia domestica*) are still quite limited. *Columbicola columbae* as the most prevalent ectoparasite was detected in pigeons according to the studies (Tiğın, 1973; Gıcık, 1999; Köroğlu and Şimşek, 2001; Senlik et al., 2005; Değer et al., 2010; Dik, 2010; Dik, 2012). Because of this infestations caused by this species irritation, feather loss, yield and performance loss was reported (Değer et al., 2010; Jahantigh et al., 2016).

The shelter tick which exists on pigeons not only causes irritations on skin when sucking blood but also they are the vectors of bacteria, viruses and parasitic agents. As well as transferring the pathogens they can also cause anaphylactic reactions. Moreover due to severe infections loss of blood, anaemia and even death can occur (Khoury and Maroli, 2004; Nnadi and Gorge, 2010; Tavassoli et al., 2011; Radfar et al., 2012).

Pseudolynchia canariensis, feeding through sucking blood from pigeons, is the vector of *Haemoproteus columbae* which is a blood protozoa. It also represents contribution on spreading *Columbicola columbae* between the pigeons (Owiny and French, 2000; Dik, 2012).

In this study it is aimed to determine the ectoparasites of domestic pigeons in Antakya region.

MATERIALS AND METHODS

Totally 100 (45 male, 55 female) domestic pigeons which are fed for hobby in different neighborhoods in Antakya were included in this study and examined with respect to ectoparasites. Besides their gender they were separated two individual groups; first group contained less than 4 months age as juvenile pigeons and the second contained more than 4 months age as adult pigeons (Gıcık, 1999; Senlik et al., 2005; Radfar et al., 2012). Including the wings and tail bottoms, all body feather was well examined with respect to ectoparasites, on a white floor. The flies and ticks were collected by hand when detected (Radfar et al., 2012) and they were put in a cotton included petri dish after applying insecticide (Dik, 2012). The louses

were transferred to parasitology laboratory for identification in a bottle which contained 70% alcohol and they were exposed to lactophenol for transparency (Senlik et al., 2005). All ectoparasites were identified according to relevant literatures (Tiğın, 1973; Soulsby, 1982; Saikia et al., 2017).

This study was approved by Hatay Mustafa Kemal University Animal Experiments Local Ethics Committee in accordance with the decision number 2017/10-4.

Statistical analyses were made by using SPSS software programme version 22. for Windows. Non-parametric Chi Square method was used to compare the statistical data between parameters. The value of $p < 0.05$ was evaluated as statistically significance level at the end of the calculations.

RESULTS

Fifty two of 100 pigeons (52%) (45 male, 55 female: 35 juvenile, 65 adult) which are all observed in this study were infested with only one species of ectoparasites. While 45 pigeons (45%) were infested with *C. columbae* (Fig. 1), 5 of those were infested with *Argas reflexus* and 2 were infested with *P. canariensis* (Fig. 2). The 132 of 220 louses (60%) were female and others (88; 40%) were male; 3 of 5 argasid ticks were female and 2 were nymphs and 2 of 2 flies were female. The species of ectoparasites in pigeons has shown in Table 1 and the ectoparasite infestation prevalence in pigeons has shown in Table 2.

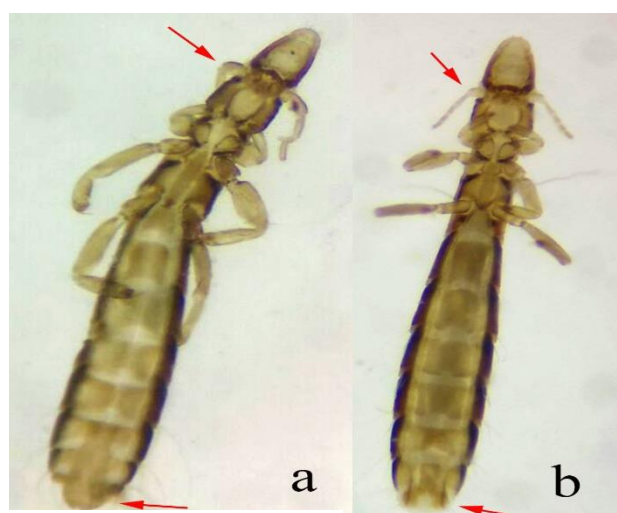
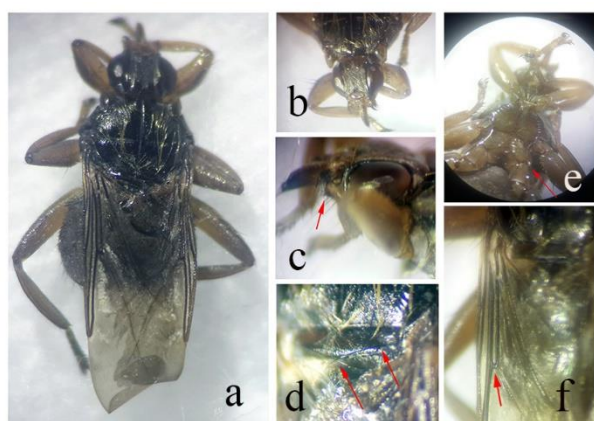


Figure 1. *Columbicola columbae*

Figure 2. *Pseudolynchia canariensis*

Pigeon	(n)	Adult n/(%)	Juvenile n/(%)	Female n/(%)	Male n/(%)
Infested	52	37 (56,9)	15 (42,9)	30(54,5)	22(48,9)
Non infested	48	28 (43,1)	20 (57,1)	25(45,5)	23(51,1)
Total	100	65	35	55	45

Table 1. Control group and before and after

When examined the relationship between age and infestation it was determined that 15 of 35 juvenile pigeons (42,9%) and 37 of 65 adult pigeons (56,9%) were infested with ectoparasites. Although the infestation rate was higher in adults when compared with juveniles, no significant difference was detected statistically ($p < 0.05$). When looked at the relationship between louse infestation and age, 35 of 65 adult (53,8%) and 10 of 35 juvenile pigeons (28,5%) were found infested. Louse infestation was higher in adults when compared with juvenile pigeons and a significant difference between louse infestation and age was observed statistically ($p < 0.05$).

Species of ectoparasite	Adult pigeon (n)	Juvenile pigeon (n)	Female pigeon (n)	Male pigeon (n)
<i>Columbicola columbae</i>	35	10	25	20
<i>Argas reflexus</i>		5	5	
<i>Pseudolynchia canariensis</i>	2	-	-	2
Total	37	15	30	22

Table 2. The prevalence of ectoparasite infestations in pigeons (n: number)

Related with gender 22 of 45 male pigeons (48,9%) and 30 of 55 females (54,5%) were infested with ectoparasites. Infestation rate was higher in female pigeons but there was no significant difference was detected statistically ($p < 0.05$). Twenty of 45 male pigeons (44,4%) and 25 of 55 female (45,4%) were infested with *C. columbae*. Relationship between gender and louse infestation was examined and although the rate was higher in females, no significant difference was recorded ($p < 0.05$).

DISCUSSION

Ectoparasite prevalence was reported as 39,8-100% in pigeons according to the studies which were researched all around the world. The species of ectoparasites were identified as *Menopon gallinae*, *Menacanthus stramineus*, *Colpocephalum turbinatum*, *C. columbae*, *Lipeurus caponis*, *Goniodes gallinae*, *Goniodes gigas*, *Goniocotes bidentatus*, *P. canariensis*, *A. reflexus*, *Dermanyssus gallinae* (Begum and Sehrin, 2011; Musa et al., 2011; Radfar et al., 2012; Radfar et al., 2012; Ghosh et al., 2014; Jahantigh et al., 2016; Rezaei et al., 2016; Ahmed et al., 2017; Saikia et al., 2017). According to the studies those were researched in Turkey the prevalence of ectoparasitary infestation with a value of 27,33-100%. The ectoparasites of domestic pigeons in Turkey identified as *C. columbae*, *M. gallinae*, *G. bidentatus*, *Megnina columbae*, *Goniocotes hologaster*, *D. gallinae*, *P. canariensis* ve *A. reflexus* (Tiğın, 1973; Gıcık, 1999; Köroğlu and Şimşek, 2001; Senlik et al., 2005; Değer et al., 2010; Dik, 2010). The most prevalent species was *C. columbae* in pigeons (Tiğın, 1973; Gıcık, 1999; Değer et al., 2010; Dik, 2010; Begum and Sehrin, 2011; Musa et al., 2011; Radfar et al., 2012; Radfar et al., 2012; Jahantigh et al., 2016; Rezaei et al., 2016). Several studies showed the infestation rate of *C. columbae* between 12,03% and 100% (Tiğın, 1973; Gıcık, 1999; Köroğlu and Şimşek, 2001; Senlik et al., 2005; Değer et al., 2010; Dik, 2010; Begum and Sehrin, 2011; Musa et al., 2011; Radfar et al., 2012; Radfar et al., 2012; Ghosh et al., 2014; Jahantigh et al., 2016; Rezaei et al., 2016; Ahmed et al., 2017; Saikia et al., 2017). In this study the rate of 52% infestation was found and three different species of ectoparasites were diagnosed. *Columbicola columbae* was the dominant species with a rate of 45% and followed by *A. reflexus* and *P. canariensis* with the rates of 5% and 2%, respectively. In one study 706 *C. columbae* collected from pigeons were identified as 331 male and 375 female (Tiğın, 1973). In our study 132 of 220 collected lice were female (60%) and the others (88;40%) were male. *Columbicola columbae* was the most prevalent species with a concordance

with other studies. According to some studies it was reported that the high rates of louse infestations in domestic pigeons were due to environment conditions such as season, lack of hygiene and host immunity (Begum and Sehrin, 2011; Ghosh et al., 2014; Jahantigh et al., 2016). We think that the high prevalence of louse infestations are originated from some reasons such as crowded shelters which the domestic pigeons exist, insufficient hygiene of shelters, high temperature and humidity of room, lower sun light.

According to studies about adult and juvenile pigeons with regard to ectoparasitic conditions it was found higher infestation rates in adults when compared with juvenile pigeons but no significant difference was found statistically (Gıcık, 1999; Senlik et al., 2005; Radfar et al., 2012; Ghosh et al., 2014). In one study the prevalence of infestation was higher in juvenile pigeons but no significant difference was reported statistically (Radfar et al., 2012). Even so the prevalence of infestations is higher in adult pigeons in this study, no significant difference was recorded statistically ($p > 0.05$). However relationship between the higher rates of louse infestations in adults and age represents significant differences statistically ($p < 0.05$). We think that the reason of higher prevalence of infestations in adults might be due to their presence in free areas and more contact with other birds. Beside this in the period of breeding, keeping the mother bird with her eggs and the chicks who have to be fed by mother in an isolated part of shelter might decrease the louse infestations in chicks.

Evaluating the gender and ectoparasitic conditions in pigeons, as it has been found the higher infestation rates in males (Senlik et al., 2005; Jahantigh et al., 2016) but females also in some studies (Gıcık, 1999; Radfar et al., 2012). However according to these studies, it was reported that this difference is not statistically significant (Gıcık, 1999; Senlik et al., 2005; Begum and Sehrin, 2011; Radfar et al., 2012; Radfar et al., 2012; Ghosh et al., 2014; Jahantigh et al., 2016). Despite we found higher infestation prevalence in females, there was no significant difference between males and females statistically ($p < 0.05$). Aleya and Sabrina reported that infestation rates can not be related with gender physiognomy, male and female pigeons all have equal exposure to ectoparasites (Begum and Sehrin, 2011). When thought male and female pigeons sharing the same environmental conditions, gender difference doesn't cause significant difference between both ectoparasitary infestations and louse infestations.

CONCLUSION

As a result, domestic pigeons those were included in this study were examined and detected with regard to ectoparasitic infestation and while *C. columbae* was predominantly isolated with a percentage of 45%. *A. reflexus* and *P. canariensis* species followed *C. columbae* with the rates of 5% and 2%, respectively. No significant difference detected between infestation rates and age/gender statistically. But the infestation rate in adult pigeons was significantly higher than juveniles. It should not be ruled out the economic loss which caused by these ectoparasites, particularly the louses. To prevent the yield and performance loss of domestic pigeons hygiene of shelters and ventilation should be remarked, ectoparasitary situation should be observed and gotten under controlled when needed.

ACKNOWLEDGMENTS

Conflict of Interest: The authors declare that there is no conflict of interest in this study.

Financial Disclosure: The authors declare that there is no funding support in this study.

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