

Chewing lice (Phthiraptera) Found on Wild Birds in Turkey

Bilal DİK *  Elif ERDOĞDU YAMAÇ ** Uğur USLU *

* Selçuk University, Veterinary Faculty, Department of Parasitology, Alaeddin Keykubat Kampusü, TR-42075 Konya - TURKEY

** Anadolu University, Faculty of Science, Department of Biology, TR-26470 Eskişehir - TURKEY

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Summary

This study was performed to detect chewing lice on some birds investigated in Eskişehir and Konya provinces in Central Anatolian Region of Turkey between 2008 and 2010 years. For this aim, 31 bird specimens belonging to 23 bird species which were injured or died were examined for the louse infestation. Firstly, the feathers of each bird were inspected macroscopically, all observed louse specimens were collected and then the examined birds were treated with a synthetic pyrethroid spray (Biyo avispray-Biyoteknik®). The collected lice were placed into the tubes with 70% alcohol and mounted on slides with Canada balsam after being cleared in KOH 10%. Then the collected chewing lice were identified under the light microscope. Eleven out of totally 31 (35.48%) birds were found to be infested with at least one chewing louse species. Eighteen lice species were found belonging to 16 genera on infested birds. Thirteen of 18 lice species; *Actornithophilus piceus piceus* (Denny, 1842); *Anaticola phoenicopteri* (Coincide, 1859); *Anatoecus pygaspis* (Nitzsch, 1866); *Colpocephalum heterosoma* Piaget, 1880; *C. polonum* Eichler and Zlotorzycza, 1971; *Fulicoffula lurida* (Nitzsch, 1818); *Incidifrons fulicia* (Linnaeus, 1758); *Meromenopon meropis* Clay ve Meinertzhagen, 1941; *Meropoecus meropis* (Denny, 1842); *Pseudomenopon pilosum* (Scopoli, 1763); *Rallicola fulicia* (Denny, 1842); *Saemundssonina lari* Fabricius, O, 1780), and *Trinoton femoratum* Piaget, 1889 have been recorded from Turkey for the first time.

Keywords: Chewinglice, *Anaticola*, *Fulicoffula*, *Incidifrons*, *Pseudomenopon*, *Meropoecus*, *Meromenopon*, *Rallicola*, *Colpocephalum*, *Actornithophilus*, *Saemundssonina*, *Trinoton*, Turkey

Türkiye'deki Yabani Kanatlılarda Bulunan Çiğneyici Bit (Phthiraptera) Türleri

Özet

Bu çalışma 2008-2010 yılları arasında Türkiye'nin iç Anadolu Bölgesinde yer alan Konya ve Eskişehir'deki bazı yabani kanatlıların bitlerini belirlemek amacıyla yapılmıştır. Bu amaçla 23 kanatlı hayvan türüne ait 31 ölü veya yaralı kuş örneği bit yönünden incelenmiştir. Kuşların tüyleri makroskopik olarak dikkatli bir şekilde incelenmiş, daha sonra sentetik pretroidli (Biyo avispray-Biyoteknik®) bir insektisit ile ilaçlanmıştır. Toplanan bitler içinde %70 alkol bulunan tüplere konulup %10 KOH'de saydamlaştırıldıktan sonra Kanada balsam ile lamlara yapıştırılarak ışık mikroskopunda teşhis edilmişlerdir. İncelenen 31 kuşun 11 (35,48%)'i en az bir bit türü ile enfeste bulunmuştur. Enfeste kuşlarda 16 cinse ait 18 bit türü tespit edilmiştir. Bu türlerden 13'ü; *Actornithophilus piceus piceus* (Denny, 1842); *Anaticola phoenicopteri* (Coincide, 1859); *Anatoecus pygaspis* (Nitzsch, 1866); *Colpocephalum heterosoma* Piaget, 1880; *C. polonum* Eichler and Zlotorzycza, 1971; *Fulicoffula lurida* (Nitzsch, 1818); *Incidifrons fulicia* (Linnaeus, 1758); *Meromenopon meropis* Clay ve Meinertzhagen, 1941; *Meropoecus meropis* (Denny, 1842); *Pseudomenopon pilosum* (Scopoli, 1763); *Rallicola fulicia* (Denny, 1842); *Saemundssonina lari* Fabricius, O, 1780) ve *Trinoton femoratum* Piaget, 1889 Türkiye'den ilk kez bu çalışmayla bildirilmiştir.

Anahtar sözcükler: Çiğneyici bit, *Anaticola*, *Fulicoffula*, *Incidifrons*, *Pseudomenopon*, *Meropoecus*, *Meromenopon*, *Rallicola*, *Colpocephalum*, *Actornithophilus*, *Saemundssonina*, *Trinoton*, Türkiye

INTRODUCTION

Chewing lice (Ishnocera, Amblycera) are permanent obligate ectoparasites mostly parasitic on bird species and they feed on feathers and skin scales. Although they have

mouthparts designed for chewing, some of the species of Ishnocera can cause skin irritations and suck blood. Chewing lice have harmful effects that lead to decrease in



İletişim (Correspondence)



+90 332 2232736



bdik@selcuk.edu.tr

productivity on the host.

About 4.000 lice species were recorded on birds in the world ¹. The number of louse species recorded from birds in Turkey is limited ². On the other hand, the studies on the identification of lice on bird species have been increasing over the last years in Turkey. Approximately 50 new records for the bird louse fauna of Turkey have been recorded in recent 10 years. Up today 82 chewing lice were described from birds in the limited studies in Turkey ².

In some of these studies, most chewing lice were collected from injured or died birds that were found accidentally ³⁻⁹. On the other hand, recent studies have focused on louse species of Songbirds (Passeriformes) ¹⁰ and Shorebirds (Charadriiformes) ¹¹. In spite of the records on chewing lice on birds have already indicated limited number of louse species, the studies on the lice have a big potential for new discoveries. The objective of this study was to investigate and identify louse species on birds and provide data on the chewing lice list from Turkey.

MATERIAL and METHODS

This study was performed in Eskişehir and Konya provinces between 2008 and 2010 years. The collection of chewing lice was carried out from 31 birds (of 23 species

in 19 genera, 16 families and 9 orders) that were found to be injured or died in the field (*Table 1*). In order to collect the lice, the feathers of each bird were carefully examined and rubbed over a white piece of paper with a synthetic pyrethroid insecticide (Biyo avispray®: 0.09 g tetramethrin and 0.45 g piperonyl butoxide 100 g (w/w); Biyoteknik Chemistry, Turkey) harmless to vertebrates. Then the birds were placed in breathable paper bags for 15 min. All lice preserved in 70% alcohol, cleared in 10% KOH, then washed with distilled water, passed in alcohol series 70%, 80%, 90% and 99% in four consecutive days. They were mounted on slides in Canada balsam and examined by a light microscope. The identification of the louse species was carried out according to relevant literatures ^{1,12-28}.

RESULTS

Eleven out of totally 31 (35.48%) examined birds were found to be infested with at least one chewing louse species and 18 lice species from 16 genera were identified. Although, no louse was found on 9 birds of 8 species belong to Passeriformes and Strigiformes, 11 of 22 birds belong to 15 species in 7 orders were parasitized (*Table 2*).

Ischnocera

Anaticola phoenicopteri: Examined materials: 14 ♀, 10

Table 1. Studied bird orders, families, genera and species

Tablo 1. İncelenen kuş takım, aile, cins ve türleri

Order	Family	Genus	Species	Number of Examined Bird
Ciconiiformes	Ciconiidae	<i>Ciconia</i>	<i>C. ciconia</i>	2
Phoenicopteriformes	Phoenicopteridae	<i>Phoenicopterus</i>	<i>P. ruber</i>	1
Falconiformes	Accipitridae	<i>Accipiter</i>	<i>A. gentilis</i>	1
		<i>Circus</i>	<i>C. gallicus</i>	1
		<i>Buteo</i>	<i>B. buteo</i>	1
			<i>B. rufinus</i>	3
	Falconidae	<i>Falco</i>	<i>F. columbarius</i>	1
Gruiformes	Rallidae	<i>Fulica</i>	<i>F. atra</i>	3
Charadriiformes	Laridae	<i>Larus</i>	<i>L. genei</i>	1
	Recurvirostridae	<i>Himantopus</i>	<i>H. himantopus</i>	1
	Scolopacidae	<i>Calidris</i>	<i>C. alba</i>	1
		<i>Tringa</i>	<i>T. totanus</i>	1
	Sternidae	<i>Chlidonias</i>	<i>C. leucopterus</i>	1
Columbiformes	Columbidae	<i>Columba</i>	<i>C. livia</i>	3
Strigiformes	Strigidae	<i>Asio</i>	<i>A. otus</i>	1
Coraciiformes	Meropidae	<i>Merops</i>	<i>M. apiaster</i>	1
Passeriformes	Fringillidae	<i>Carduelis</i>	<i>C. carduelis</i>	2
		<i>Loxia</i>	<i>L. curvirostra</i>	1
		<i>Serinus</i>	<i>S. canaria</i>	1
	Paridae	<i>Parus</i>	<i>P. caeruleus</i>	1
	Passeridae	<i>Passer</i>	<i>P. domesticus</i>	1
	Sylviidae	<i>Sylvia</i>	<i>S. melanocephala</i>	1
	Turdidae	<i>Luscinia</i>	<i>L. megarhynchos</i>	1
Total				31

♂, 10 N, 03.07.2010, Akşehir, Konya (Fig. 1). Host: Greater Flamingo (*Phoenicopterus ruber*). It was reported for the first time in Turkey.

Anatoecus pygaspis: Examined materials: 5 ♀, 3 ♂, 03.07.2010, Akşehir, Konya (Fig. 2, 3). Host: Greater Flamingo (*Phoenicopterus ruber*). It was reported for the first time in Turkey.

Ardeicola ciconiae: Examined materials: 2 ♀, 1 N, 07.09.2009, Konya Metropolitan Municipality Animal Shelter, Selçuklu-Konya; 2 ♀, 1 ♂, 1 N, 01.04.2010, Selçuk University, Clinics of Veterinary Faculty, Konya. Host: White Stork (*Ciconia ciconia*).

Columbicola columbae: Examined materials: 1 ♀, 1 N, 25.09.2009; 2 ♀, 18.11.2009 Konya. Host: Rock Pigeon

(*Columba livia*).

Fulicoffula lurida: Examined materials: 7 ♀, 3 N, 13.08.2010-1, Akşehir, Konya, 9 ♀, 5 N 13.08.2010-2, Akşehir, Konya (Fig. 4). Host: Eurasian Coot (*Fulica atra*). It was reported for the first time in Turkey.

Incidifrons fulicae: Examined materials: 1 ♂, 13.08.2010-1, Akşehir, Konya (Fig. 5). Host: Eurasian Coot (*Fulica atra*). It was reported for the first time in Turkey.

Meropoecus meropis: Examined materials: 2 N, 13.08.2010, Eskişehir (Fig. 6). Host Bee-eater (*Merops apiaster*). It was reported for the first time in Turkey.

Neophiloaterus incompletus: Examined materials: 1 ♀, 1 ♂, 07.09.2009, Konya; 1 ♀, 1 N, 01.04.2010, Konya. Host:

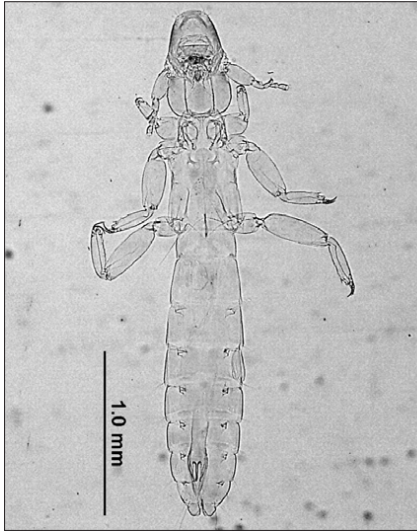


Fig 1. *Anaticola phoenicopteri*, male, orig.

Şekil 1. *Anaticola phoenicopteri*, erkek, orijinal

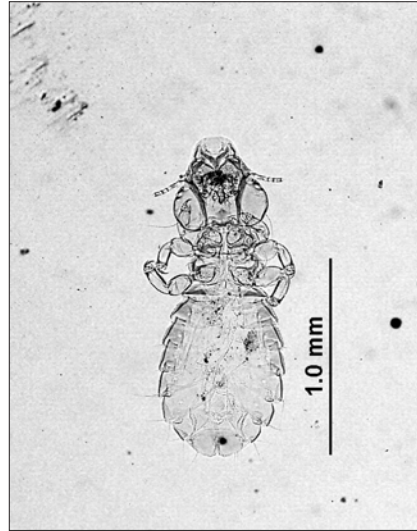


Fig 2. *Anatoecus pygaspis*, female, orig.

Şekil 2. *Anatoecus pygaspis*, dişi, orijinal

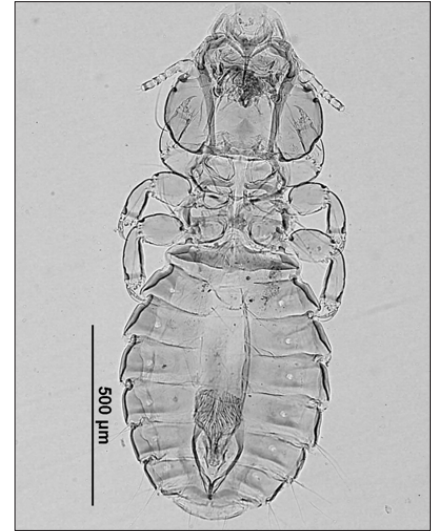


Fig 3. *Anatoecus pygaspis*, male, orig.

Şekil 3. *Anatoecus pygaspis*, erkek, orijinal



Fig 4. *Fulicoffula lurida*, female, orig.

Şekil 4. *Fulicoffula lurida*, dişi, orijinal

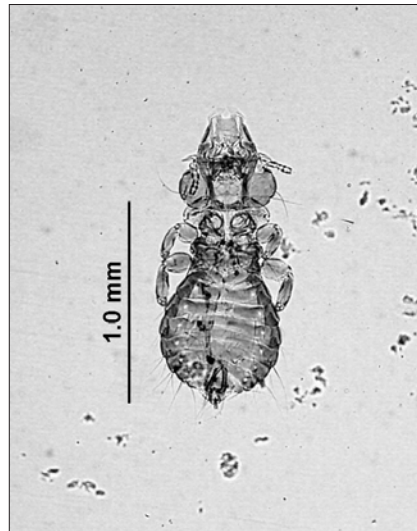


Fig 5. *Incidifrons fulicae*, male, orig.

Şekil 5. *Incidifrons fulicae*, erkek, orijinal

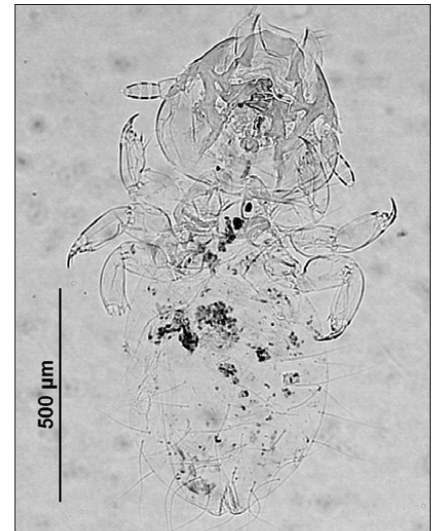


Fig 6. *Meropoecus meropis*, nymph, orig.

Şekil 6. *Meropoecus meropis*, nimf, orijinal

Table 2. Studied bird species, infestation rates and louse species on avian host**Table 2.** İncelenen kuş türleri, enfestasyon oranları ve saptanan bit türleri

Bird Species	Date/Locality	Number of Examined Bird	Number of Infested Bird	Louse Species
Nightingale (<i>Luscinia megarhynchos</i>)	10.05.2008 Beyyayla/Eskişehir (live)	1	-	-
Sardinian Warbler (<i>Sylvia melanocephala</i>)	11.05.2008 Beyyayla/Eskişehir (live)	1	-	-
Blue Tit (<i>Parus caeruleus</i>)	14.11.2009 Gürleyik/ Eskişehir (live)	1	-	-
Bee-eater (<i>Merops apiaster</i>)	13.08.2010 Eskişehir (died)	1	1	<i>Meromenopon meropis</i> <i>Meropoecus meropis</i>
Common Crossbill (<i>Loxia curvirostra</i>)	13.08.2010 Eskişehir (injured)	1	-	-
Goldfinch (<i>Carduelis carduelis</i>)	08.02.2008; 13.02.2008 Eskişehir (live)	2	-	-
White-winged Black Tern (<i>Chlidonias leucopterus</i>)	03.07.2010 Akşehir-Konya (died)	1	1	<i>Actornithophilus piceus piceus</i>
Buzzard (<i>Buteo buteo</i>)	01.07.2010 Eskişehir Zoo (injured)	1	-	-
Long-legged Buzzard (<i>Buteo rufinus</i>)	01.07.2010 Eskişehir Zoo (injured)	1	-	-
	17.05.2010 Konya (injured)	1	-	-
	21.06.2010 Konya (injured)	1	-	-
Goshawk (<i>Accipiter gentilis</i>)	08.08.2010 Kızılınler village-Eskişehir (injured)	1	1	<i>Colpocephalum polonum</i>
Greater Flamingo (<i>Phoenicopterus ruber</i>)	03.07.2010 Akşehir-Konya (died)	1	1	<i>Trinoton femoratum</i> <i>Colpocephalum heterosoma</i> <i>Anaticola phoenicopteri</i> <i>Anatoecus pygaspis</i>
Eurasian Coot (<i>Fulica atra</i>)	03.07.2010 Akşehir-Konya (2 lives, 1 died)	3	2	<i>Fulicoffula lurida</i> <i>Rallicola fulica</i> <i>Incidifrons fulica</i> <i>Pseudomenopon pilosum</i>
Slender-billed Gull (<i>Larus genei</i>)	03.07.2010 Akşehir-Konya (died)	1	1	<i>Saemundssonaria lari</i>
Merlin (<i>Falco columbarius</i>)	01.02.2010 Beyşehir-Konya (injured)	1	-	-
House Sparrow (<i>Passer domesticus</i>)	28.05.2010 Konya (live)	1	-	-
White Stork (<i>Ciconia ciconia</i>)	07.09.2009; 01.04.2010 Konya (injured)	2	2	<i>Colpocephalum zebra</i> <i>Ciconiphilus quadripustulosus</i> <i>Ardeicola ciconiae</i> <i>Neophilopterus incompletus</i>
Long-eared Owl (<i>Asio otus</i>)	19.09.2009 Karaman (died)	1	-	-
Rock Pigeon (<i>Columba livia</i>)	29.06.2009; 25.09.2009; 18.11.2009 Konya (live)	3	2	<i>Columbicola columbae</i>
Short-toed Eagle (<i>Circaetus gallicus</i>)	31.07.2009 Ürgüp-Nevşehir (died)	1	-	-
Canary (<i>Serinus canaria</i>)	30.12.2009 Konya (live)	1	-	-
Black-winged Stilt (<i>Himantopus himantopus</i>)	03.07.2010 Akşehir-Konya (died)	1	-	-
Sanderling (<i>Calidris alba</i>)	03.07.2010 Akşehir-Konya (died)	1	-	-
Redshank (<i>Tringa totanus</i>)	03.07.2010 Akşehir-Konya (died)	1	-	-

White Stork (*Ciconia ciconia*).

Rallicola fulica: Examined materials: 10 ♀, 11 ♂, 4 N, 13.08.2010-1, Akşehir, Konya, 5 ♀, 3 ♂, 2 N, 13.08.2010-2, Akşehir, Konya (Fig. 7, 8). Host: Eurasian Coot (*Fulica atra*). It was reported for the first time in Turkey.

Saemundssonaria lari: Examined materials: 1 ♀, 2 ♂, 3 N, 03.07.2010, Akşehir, Konya (Fig. 9). Host: Slender-billed Gull (*Larus genei*). It was reported for the first time in Turkey.

Amblycera

Actornithophilus piceus piceus: Examined materials: 2 ♀, 03.07.2010 Akşehir, Konya (Fig. 10). Host: White-winged Black Tern (*Chlidonias leucopterus*). It was reported for the first time in Turkey.

Ciconiphilus quadripustulosus: Examined materials: 29 ♀, 17 ♂, 6 N, 07.09.2009, Konya; 2 ♀, 1 ♂, 01.04.2010, Konya. Host: White Stork (*Ciconia ciconia*).

Colpocephalum zebra: Examined materials: 1 ♀, 07.09.2009, Konya. Host: White Stork (*Ciconia ciconia*).

Colpocephalum heterosoma: Examined materials: 13 ♀, 9 ♂, Akşehir, Konya (Fig. 11, 12). Host: Greater Flamingo (*Phoenicopterus ruber*). It was reported for the first time in Turkey.

Colpocephalum polonum: Examined materials: 16 ♀, 6 ♂, 12 N, 08.08.2010, Eskişehir (Fig. 13, 14). It was reported for the first time in Turkey. Host: Goshawk (*Accipiter gentilis*).

Meromenopon meropis: Examined materials: 1 ♂, 13.08.2010, Akşehir, Konya (Fig. 15). Host: Bee-eater (*Merops*

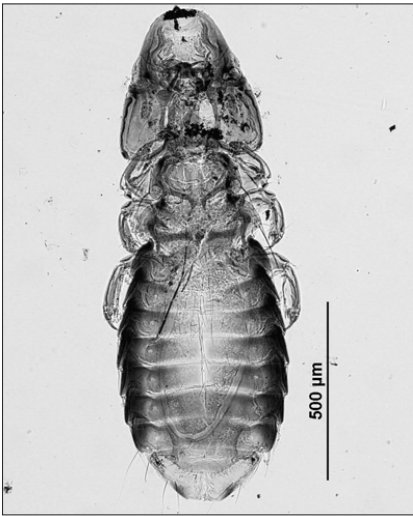


Fig 7. *Rallicola fulcia*, female, orig.

Şekil 7. *Rallicola fulcia*, dişi, orijinal

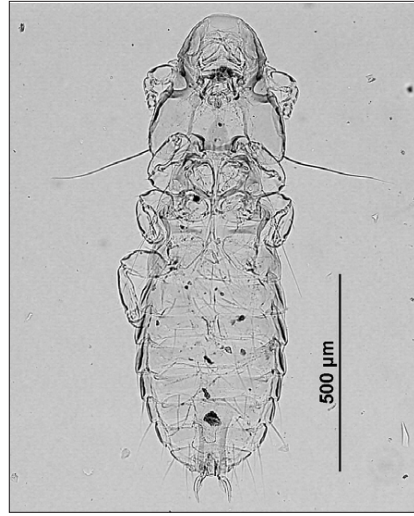


Fig 8. *Rallicola fulcia*, male, orig.

Şekil 8. *Rallicola fulcia*, erkek, orijinal

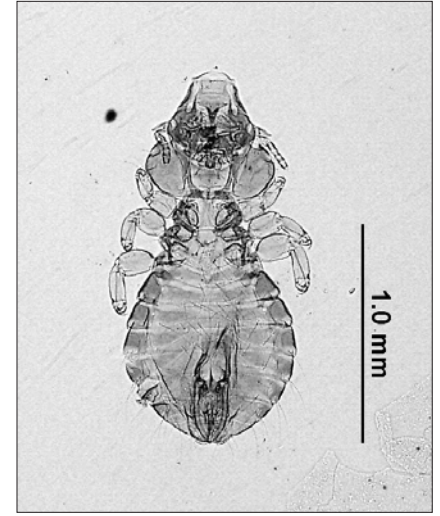


Fig 9. *Saemundssonina lari*, male, orig.

Şekil 9. *Saemundssonina lari*, erkek, orijinal

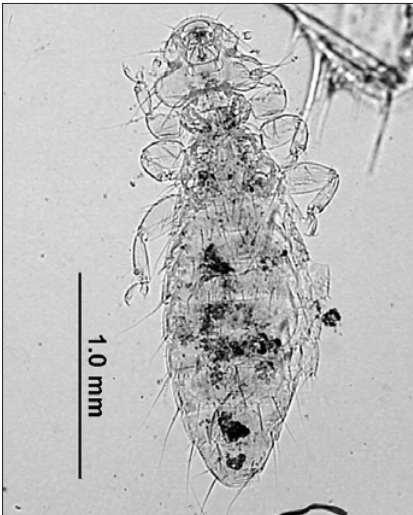


Fig 10. *Actornithophilus piceus piceus*, female, orig.

Şekil 10. *Actornithophilus piceus piceus*, dişi, orj.

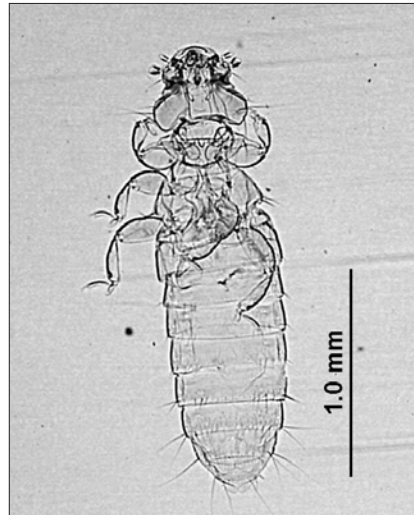


Fig 11. *Colpocephalum heterosoma*, female, orig.

Şekil 11. *Colpocephalum heterosoma*, dişi, orj.

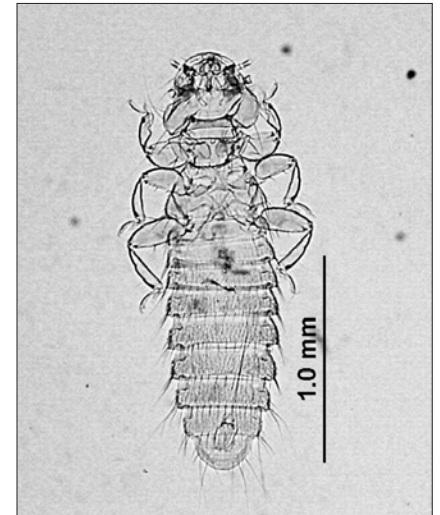


Fig 12. *Colpocephalum heterosoma*, male, orig.

Şekil 12. *Colpocephalum heterosoma*, erkek, orj.

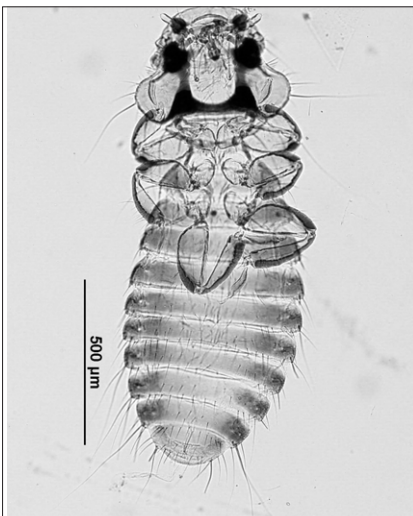


Fig 13. *Colpocephalum polonum*, female, orig.

Şekil 13. *Colpocephalum polonum*, dişi, orijinal



Fig 14. *Colpocephalum polonum*, male, orig.

Şekil 14. *Colpocephalum polonum*, erkek, orj.

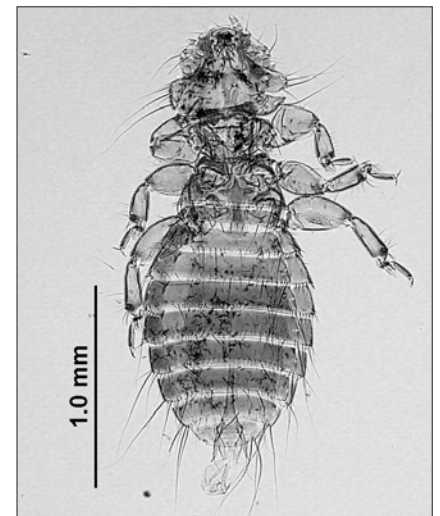


Fig 15. *Meromenopon meropis*, male, orig.

Şekil 15. *Meromenopon meropis*, erkek, orijinal

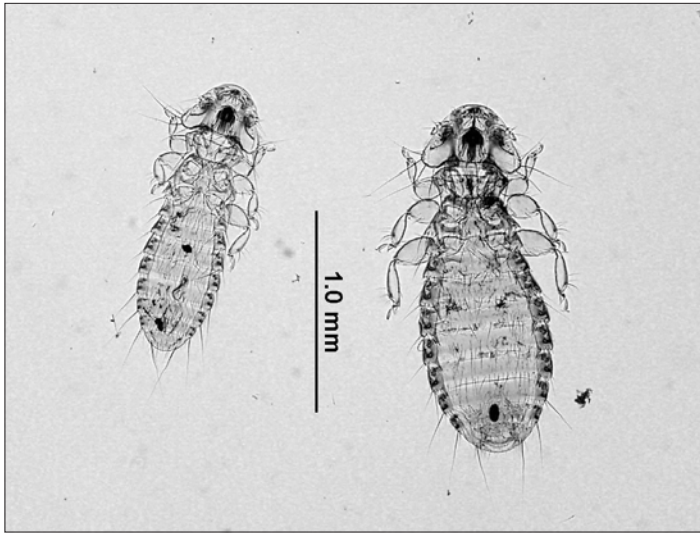


Fig 16. *Pseudomenopon pilosum*, male (at left), female (at right), orig.
Şekil 16. *Pseudomenopon pilosum*, erkek (solda), dişi (sağda), orijinal



Fig 17. *Trinoton femoratum*, female, orig.
Şekil 17. *Trinoton femoratum*, dişi, orijinal

apiaster). It was reported for the first time in Turkey.

Pseudomenopon pilosum: Examined materials: 8 ♀, 8 ♂ 2 N, 13.08.2010-1, Akşehir, Konya, 2 ♀, 4 ♂, 13.08.2010-2 Akşehir, Konya (Fig. 16). It was reported for the first time in Turkey. Host: Eurasian Coot (*Fulica atra*).

Trinoton femoratum: Examined materials: 1 ♀, 3 N, 03.07.2010, Akşehir-Konya (Fig. 17). It was reported for the first time in Turkey. Host: Greater Flamingo (*Phoenicopterus ruber*).

DISCUSSION

Approximately 4000 valid lice species have been found on the birds in the world ¹. Until now, 465 bird species were recorded from Turkey ^{11,29}. However, almost all of the louse fauna of these birds are still unknown. Until today approximately 100 bird species were investigated for the louse infestation and 82 chewing lice species belonging to 37 genera were identified ². *Colpocephalum zebra*, *Ciconiphilus quadripustulosus*, *Ardeicola ciconiae* and *Neophilopterus incompletus* on white storks (*Ciconia ciconia*) ⁷, *Austromenopon atrofulvum*, *Quadriceps anagrapsus* and *Saemundssonina lobaticeps* on white-winged black tern (*Chlidonias leucopterus*) ¹¹, *Strigiphilus barbatus* on long-eared owl (*Asio otus*), *Kurodaia fulvofasciata* on buzzard (*Buteo buteo*), *Laemobothrion maximum*, *Colpocephalum nanum*, *Colpocephalum sp*, *Degeeriella fulva* and *Craspedorrhynchus platystomus* on long-legged buzzard (*Buteo rufinus*) were reported from Turkey in these studies. The presence of some louse species except *C. columbae* recorded from rock pigeons (*Columba livia*) was suspect and it has already been discussed by Dik ⁵ in a previous work. On the other hand, no louse specimen was found on sparrow (*Passer domesticus*) ⁵ and short-toed eagle

(*Circaetus gallicus*) ⁹. It was investigated some specimens of the bird species which their names were mentioned above in the present study, and only one species; *C. columbae* was found on rock pigeon, while all of the lice species recorded from white storks were detected. Two female samples of *Actornithophilus piceus piceus* were collected on white-winged black tern in this study, while *Austromenopon atrofulvum*, *Quadriceps anagrapsus* and *Saemundssonina lobaticeps* were recorded in a previous study ¹¹.

Clay ¹⁷ reported five lice species; *Colpocephalum heterosoma* Piaget, 1880; *Colpocephalum salimalii* Clay, 1951; *Trinoton sp*, *Anaticola phoenicopteri* (Coincide, 1859) and *Anatoecus keleri* Clay, 1962 from greater flamingo (*Phoenicopterus ruber*). In addition, Price et al.¹ recorded eight species; *Anaticola candidus* (Rudow, 1869); *Anaticola phoenicopteri* (Coincide, 1859), *Anatoecus keleri* Clay, 1962; *Anatoecus pygaspis* (Nitzsch, 1866); *Colpocephalum heterosoma* Piaget, 1880; *Colpocephalum rosei* Price and Emerson, 1974; *Colpocephalum salimalii* Clay, 1951 and *Trinoton femoratum* Piaget, 1889 on greater flamingo. Morphological features of the genus *Anatoecus* and some species were found in this genus studied in detail by Keler ²². Clay ¹⁶ described *A. keleri* from greater flamingo and reported that morphologic characters of this species similar to *A. pygaspis*, however distinguish from *A. pygaspis* by the characters of the male genital sac, the sclerite being long and stout and lying in the centre. It was detected that the morphological characters of abdominal tergites, lateral sclerites and male genitalia of the all male specimens examined in this study were observed to be similar to those of *A. pygaspis*.

Clay ¹³ described the morphological characters of *Colpocephalum heterosoma* Piaget, 1880 and *Colpocephalum salimalii* Clay, 1951 in detail, and reported that resemble of these species each other. This investigator ¹³ indicated

that the characters of male genitalia of *C. salimalii* are quite different from *C. heterosoma* and there are some differences in the shape of the metathorax and abdomen and the protergal, mesotergal and abdominal chaetotaxy. In addition, Price and Beer²⁵ explained the morphological characters and identification key of the *Colpocephalum* species found on Ciconiiformes and reported that there were many short or medium long seta on abdominal tergites IV-VIII of male *C. heterosoma* while male specimens of *C. salimalii* had rare and short seta on the abdominal segments IV-VIII. Same authors²⁵ recorded that abdomen was rounded in *C. heterosoma* while attenuated in *C. salimalii*, in the females. In the present study, it was detected that the morphologic characters of all *Colpocephalum* specimens collected from greater flamingo resemble to *C. heterosoma*.

Price et al.¹ stated that six lice species; *Colpocephalum nanum* Piaget, 1880; *C. polonum* Eichler and Zlotorzycza, 1971; *Craspedorrhynchus haematopus* (Scopoli, 1763); *Degeeriella vagans* (Giebel, 1874); *Laemobothrion maximum* (Scopoli, 1763) and *Nosopon lucidum* (Rudow, 1869) were found on goshawk (*Accipiter gentilis*). Price and Beer²⁴ reported that *Colpocephalum nanum* was occurred on goshawk in addition to the other prey birds. Eichler and Zlotorzycza²⁸ identified that the lice specimens were collected from goshawks as *C. polonum* (= *Neocolpocephalum polonum*). The morphologic characters of *C. polonum* were not described by Eichler and Zlotorzycza²⁸ in detail, however they were pointed out that this species resembles to *C. turbinatum* and *C. germanum*. Thus in this study, the all collected louse specimens from goshawk were identified as *C. polonum*. Some authors^{5,30} recorded that *Strigiphilus barbati* was found on long-eared owl (*Asio otus*) in Turkey. Dik et al.¹⁰ stated that the louse infestations were occurred on songbirds' (Passeriformes) very low rates, and five lice species were detected in their study in Turkey. Although, only one bird species (long-eared owl) belonging to the order Strigiformes was examined, no louse specimen was detected, in this study. Besides, eight bird specimens belonging to the order Passeriformes were examined but it was no louse obtained from these birds.

Three lice specimens collected from bee-eater were identified as *Meropoecus meropis* (two nymphs), and *Meromenopon meropis* (male). Other species occurring on bee-eater, *Brueelia apiastri* was not detected in this study. In previous studies were performed to detect lice of bee-eaters showed that the lice specimens on the bee-eaters were low numbers^{12,31}. Similarly, a few lice specimens were collected on the bee-eaters in this study.

It was determined that relatively more lice specimens were obtained on great flamingo, goshawk and Eurasian coot while a little numbers of the lice on the other examined birds which examined in the study. Sixty-eight lice samples from greater flamingo, 34 from goshawk and 84

from Eurasian coot, while two lice specimens from white-winged black tern, five from slender-billed gull, three from bee-eater, six from two white storks and four from two rock pigeon were collected in the present study.

In conclusion, 13 lice species; *C. polonum* Eichler and Zlotorzycza, 1971; *Meromenopon meropis* Clay and Meinertzhagen, 1941; *Meropoecus meropis* (Denny, 1842); *Actornithophilus piceus piceus* (Denny, 1842); *Trinoton femoratum* Piaget, 1889; *Colpocephalum heterosoma* Piaget, 1880; *Anaticola phoenicopteri* (Coincide, 1859); *Anatoecus pygaspis* (Nitzsch, 1866); *Fulicoffula lurida* (Nitzsch, 1818); *Rallicola fulicia* (Denny, 1842); *Incidifrons fulicia* (Linnaeus, 1758); *Pseudomenopon pilosum* (Scopoli, 1763) and *Saemundssonaria lari* Fabricius, O, 1780) detected in this study were recorded for the first time in Turkey with this study.

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