

Review Article



Notes on Lice (Psocodea: Phthiraptera) Species in Domestic and Wild Mammals in Türkiye: Some Corrections and New Additions

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Abstract

Introduction: There is scant research on the mammalian lice fauna in Türkiye. This article was prepared due to the presence of some deficiencies and inaccuracies in previous studies on this subject and the presence of species for the first time in other studies. In this article, shortcomings and inaccuracies that could be identified are corrected, and new references, photos, and the checklist of mammalian lice in Türkiye are added.

Keywords: Louse, Türkiye, Mammalia, Fauna, Faunistic list

Received: April 11, 2024, Accepted: June 17, 2024, ePublished: June 29, 2024

Introduction

It has been reported that there are 1279 vertebrate species in Türkiye, 160 of which are mammals (1). On the other hand, another source (2) states that the number of documented species is 142, and 29 species have not yet been documented. In Türkiye, only approximately 30 mammalian species have been examined for lice so far. Therefore, the number of lice species that are reported in this article constitutes a very small portion of Türkiye's lice fauna.

Dik (3), in his book titled "*Lice (Phthiraptera) Species of Domestic and Wild Mammals in Türkiye*" explained the morphological characteristics and taxonomic positions of 38 lice species in detail and added photos of these species at the end of the book. Although some lice species on mammals in Türkiye were previously reported (4,5), they were not included in the book because they were overlooked. What is more, some errors were noticed in the book. Thus, this article aims to report the species reported in articles authored by other scholars (6,7,8).

New Data and Corrections of Some Mammalian Lice in Türkiye

Enderleinellus krochinae Blagoveschtchensky, 1965 (Figure 1) is one of the species previously reported in Türkiye but not included in Dik's (3) book. Blagoveschtchensky (5) described *Enderleinellus krochinae* from Anatolian squirrels (Caucasian squirrel and Persian squirrel) (*Sciurus anomalus* and Gmelin) sampled from Azerbaijan and Artvin in Türkiye, and Durden et al (8) reported that this species was observed in Azerbaijan,

Türkiye, and Syria. Thus, the family Enderleinellidae in the order Anoplura, the genus *Enderleinellus*, and *Enderleinellus krochinae* were included in the mammalian lice fauna in Türkiye. Although previously reported in Türkiye, *Cervicola meyeri* is one of the species that was inadvertently omitted from Dik's (3) book (4). Açıcı et al (4) collected 164 specimens of *Cervicola meyeri* from 17 roe deer (*Capreolus capreolus*) examined in Samsun and identified this species for the first time in Türkiye.

After the publication of Dik's (3) book, two other publications on this subject were found in Türkiye (6,7). Eren et al (6) reported *Felicola (Suricatoecus) vulpis* (Denny) in a red fox (*Vulpes vulpes*), and Keskin and Dik (7) reported *Stachiella retusa* (Burmeister) in stone marten (*Martes foina*) for the first time.

Dik (3) published a *Haematopinus* specimen collected from a pig as *Haematopinus suis* (see Figure 23B) in his book. This specimen was later examined in detail and identified as *Haematopinus apri* Goureau. Ferris (9) indicated the distinction between these two species in his diagnostic key. According to Ferris (9), when *H. suis* occurs in domestic pigs, the body is large, robust, and well developed. The paratergal plates and dorsal area of the abdomen are normally chitinized. In *H. apri*, the body is slender and poorly developed. The dorsal aspect of the abdomen is membranous, the paratergal plates are underdeveloped, and this species occurs in wild boars. Both species were previously considered subspecies of *H. suis* and were also mentioned as *H. suis suis* and *H. suis apri* (10,11).

In Dik's (3) book, it was noticed that some of the photos



were also inaccurate, and the photo of *Linognathus africanus* was labeled as *Linognathus stenopsis* (see Figure 18A) and the photo of *Bovicola bovis* was labeled as *Bovicola ovis* (see Figure 32B). The original photos of *Linognathus stenopsis* (Figures 2-4) and *Bovicola ovis* (Figures 5 and 6) have been added to this article to correct the inaccuracies concerning the images.

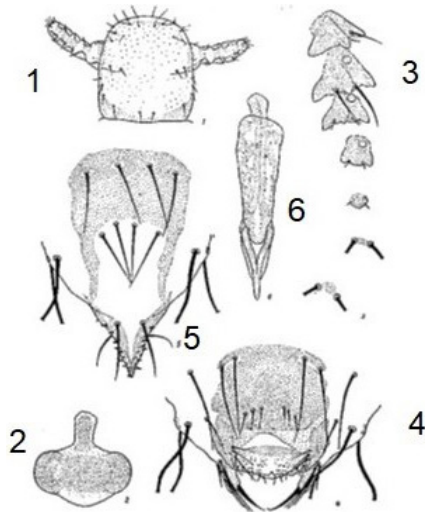


Figure 1. *Enderleinellus krochinae*, female (1-4): 1) head, dorsal; 2) sternal thoracic plate, ventral; 3) pleural abdominal plates; 4) posterior end of abdomen, ventral; male (5-6): 5) posterior end of abdomen, ventral; 6) genitalia (from Blagovestchensky, 1965)



Figure 3. *Linognathus stenopsis*, female, head, original



Figure 2. *Linognathus stenopsis*, female, original

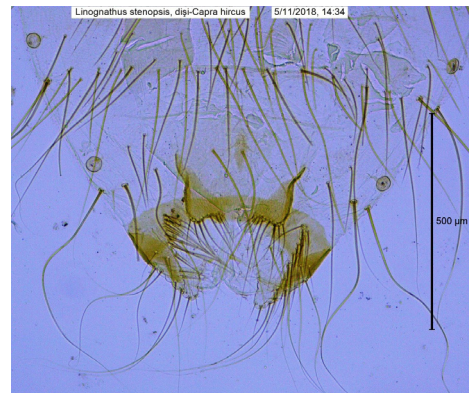


Figure 4. *Linognathus stenopsis*, female, posterior end of abdomen, original

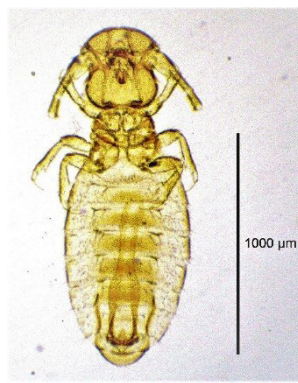


Figure 5. *Bovicola ovis*, male, ventral, original

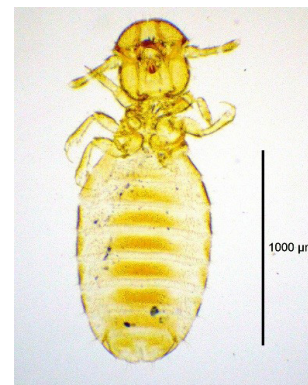


Figure 6. *Bovicola ovis*, female, ventral, original

Conclusion

As a result of the studies in Türkiye, 42 lice species in nine families (6 Anoplura, 2 Amblycera, 1 Ischnocera) and 17 genera can be identified in mammals (Table 1). As can be seen in this table, 25 of the identified species are in the suborder Anoplura, 14 in the suborder Ischnocera, and three in the suborder Amblycera. Since the hosts of

Table 1. Mammalian Lice (Psocodea: Phthiraptera) Fauna of Türkiye^a

Suborder	Family	Genus	Species	Host in Türkiye	
Anoplura	Enderleinellidae	<i>Enderleienellus</i>	<i>E. krochinae</i>	Caucasian squirrel (Persian squirrel): <i>Sciurus anomalus</i>	
			<i>H. apri</i>	Wild boar: <i>Sus scrofa</i> ^b	
			<i>H. asini</i>	Donkey: <i>Equus asini</i> ; Horse: <i>Equus caballus</i> ; Mule: <i>Equus mulus</i>	
	Haematopinidae	<i>Haematopinus</i>	<i>H. eurysternus</i>	Cattle: <i>Bos taurus</i>	
			<i>H. quadripartus</i>	Cattle: <i>Bos taurus</i>	
			<i>H. tuberculatus</i>	Bubalis: <i>Bubalis bubalis</i> , Cattle: <i>Bos taurus</i>	
	Hoplopleuridae	<i>Hoplopleura</i>	<i>Hop. acanthopus</i>	European snow vole: <i>Chionomys nivalis</i>	
			<i>Hop. affinis</i>	Steppe field mouse: <i>Apodemus witherbyi</i> ; Lesser blind mole-rat: <i>Nannospalax leucodon</i>	
			<i>L. africanus</i>	Sheep: <i>Ovis aries</i> ; Goat: <i>Capra hircus</i>	
	Linognathidae	<i>Linognathus</i>	<i>L. ovillus</i>	Sheep: <i>Ovis aries</i>	
<i>L. pedalis</i>			Sheep: <i>Ovis aries</i>		
<i>L. setosus</i>			Köpek: <i>Canis familiaris</i>		
Anoplura	Linognathidae	<i>Linognathus</i>	<i>L. stenopsis</i>	Goat: <i>Capra hircus</i> ; Sheep: <i>Ovis aries</i> ^c	
			<i>L. vituli</i>	Cattle: <i>Bos taurus</i> ; Sheep: <i>Ovis aries</i> ^c	
	Solenopotes	<i>Solenopotes</i>	<i>S. capillatus</i>	Cattle: <i>Bos taurus</i>	
			Microthoraciidae	<i>Microthoracicus</i>	<i>M. cameli</i>
	<i>H. leporis</i>	European hare: <i>Lepus europaeus</i>			
	<i>Haemodipsus</i>	<i>H. lyriocephalus</i>			European hare: <i>Lepus europaeus</i>
		<i>H. setoni</i>	European hare: <i>Lepus europaeus</i>		
	Polyplacidae	<i>Neohaemotopinus</i>	<i>H. ventricosus</i>	Chicken: <i>Gallus gallus domesticus</i> ^{d,c}	
			<i>N. syriacus</i>	Caucasian squirrel(Persian squirrel): <i>Sciurus anomalus</i>	
				<i>P. borealis</i>	Common vole: <i>Microtus arvalis</i>
<i>P. reclinata</i>				Lesser white-toothed shrew: <i>Crocidura suaveoleus</i>	
<i>Polyplax</i>				<i>P. serrata</i>	Ural field mouse: <i>Apodemus uralensis</i> ; Brown rat: <i>Rattus norvegicus</i> ^d ; Black rat: <i>Rattus rattus</i> ^d ; House mouse: <i>Mus musculus</i>
	<i>P. spinulosa</i>	Brown rat: <i>Rattus norvegicus</i> ; Black rat: <i>Rattus rattus</i> ; Ural field mouse: <i>Apodemus uralensis</i> ; European house mouse: <i>Mus musculus</i> ^d			
Amblycera	Gyropidae	<i>Gyropus</i>	<i>Gy. ovalis</i>	Guinea pig: <i>Cavia porcellus</i>	
		<i>Gliricola</i>	<i>Gl. porcelli</i>	Guinea pig: <i>Cavia porcellus</i>	
	Trimenopidae	<i>Trimenopon</i>	<i>T. hispidum</i>	Guinea pig: <i>Cavia porcellus</i>	
Ischnocera	Trichodectidae	<i>Bovicola</i>	<i>B. bovis</i>	Cattle: <i>Bos taurus</i> ; Goat: <i>Capra hircus</i> ^c	
			<i>B. caprae</i>	Goat: <i>Capra hircus</i> ; Cattle: <i>Bos taurus</i> ^c ; Sheep: <i>Ovis aries</i> ^c	
			<i>B. crassipes</i>	Goat: <i>Capra hircus</i> ; Sheep: <i>Ovis aries</i> ^c	
			<i>B. limbatus</i>	Goat: <i>Capra hircus</i>	
			<i>B. (Werneckiella) equi</i>	Horse: <i>Equus ferus caballus</i>	
			<i>B. (Werneckiella) ocellatus</i>	Donkey: <i>Equus asini</i>	
			<i>B. ovis</i>	Sheep: <i>Ovis aries</i> ; Goat: <i>Capra hircus</i> ^c ; Cattle: <i>Bos taurus</i> ^c	
			<i>Cervicola</i>	<i>C. meyeri</i>	Roe deer: <i>Capreolus capreolus</i>
		<i>Felicola</i>	<i>F. subrostratus</i>	Cat: <i>Felis catus</i>	
			<i>F. (Suricatoecus) vulpis</i>	Red fox: <i>Vulpes vulpes</i>	
			<i>Stachiella</i>	<i>S. retusa</i>	Beech marten: <i>Martes foina</i>
				<i>T. canis</i>	Dog: <i>Canis familiaris</i>
		<i>Trichodectes</i>	<i>T. melis</i>	European badger: <i>Meles meles meles</i> ; Caucasian badger: <i>Meles meles canescens</i>	
			<i>T. pinguis</i>	Brown bear: <i>Ursus arctos</i>	

^a Taxonomy based on NCBC Taxonomy browser (Psocodea) (nih.gov).^b Previously reported as *Haematopinus suis* (Linnaeus) (3).^c This species is thought to be transmitted incidentally by close contact from the original host to other animal species in the same environment.^d The cited source does not specify the host species name (binominal nomenclature) and perhaps the host species description is incorrect.

the species have been previously mentioned in Dik's (3) book, only the identified louse species and their hosts in Türkiye are presented in this table. Some explanations about the lice and host species found in hosts other than their normal hosts whose identification cannot be made with certainty are also included in the table.

As a result, approximately one fifth of the mammalian fauna in Türkiye could be examined when the latest data were added. It is necessary to carry out studies on mammalian species that have not yet been examined for lice infestation or have been examined but no louse has been detected. Furthermore, new studies should be carried out to determine the mammalian lice fauna. For this reason, it is important to carry out studies in coordination with the General Directorate of Nature Conservation and National Parks and biologists working on the mammalian fauna in Türkiye in order to complete the deficiencies on this topic.

Acknowledgements

I would like to thank Assoc. Prof. Adem Keskin from the Department of Biology, Faculty of Science and Letters, Gaziosmanpaşa University, Tokat, for sending me the article about *Enderleinellus krochinae*, which can be accessed in the journal of *Entomological Review* (1965; 44: 85-91): <https://phthiraptera.myspecies.info/sites/phthiraptera.info/files/47794.pdf>.

Competing Interests

None declared.

Ethical Approval

Not applicable.

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