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MUSTAFA AÇICI

CENK SONER BÖLÜKBAŞ

YUNUS EMRE BEYHAN

GÖKMEN ZAFER PEKMEZCİ

ALİ TÜMAY GÜRLER

See next page for additional authors

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Ectoparasites on roe deer (*Capreolus capreolus*) in Samsun, Turkey

Authors

MUSTAFA AÇICI, CENK SONER BÖLÜKBAŞ, YUNUS EMRE BEYHAN, GÖKMEN ZAFER PEKMEZCİ, ALİ TÜMAY GÜRLER, and ŞİNASI UMUR

Ectoparasites on roe deer (*Capreolus capreolus*) in Samsun, Turkey*

Mustafa AÇICI, Cenk Soner BÖLÜKBAŞ**, Yunus Emre BEYHAN, Gökmen Zafer PEKMEZCİ,

Ali Tümay GÜRLER, Şinasi UMUR

Department of Parasitology, Faculty of Veterinary Medicine, Ondokuz Mayıs University, Samsun - TURKEY

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Abstract: The aim of this study was to identify ectoparasites of wild roe deer (*Capreolus capreolus*) living in natural areas of Samsun Province that were wounded by car accidents or hunters between 2007 and 2010. A total of 90 ticks, 60 lice, and 5 deer keds were collected from 17 animals. Five tick species (*Ixodes ricinus*, *Rhipicephalus bursa*, *Rhipicephalus turanicus*, *Haemaphysalis punctata*, and *Haemaphysalis concinna*), 1 louse species (*Cervicola meyeri*), and 1 deer ked species (*Lipoptena cervi*) were identified. *Cervicola meyeri* and *L. cervi* were identified for the first time in Turkey.

Key words: Roe deer, tick, *Cervicola meyeri*, *Lipoptena cervi*, Turkey

The roe deer (*Capreolus capreolus*) is an artiodactyl existing in most parts of Europe, Asia Minor, and Caspian coastal regions and generally lives in wild nature, coniferous, mixed, or deciduous woodland. In Turkey, they mostly occur in the forests of the Black Sea region, from Kocaeli to the Georgian border, as well as in the woods and marshes located around Amasya, Çorum, and Tokat provinces and in the forests in Ardahan (Göle), Kars (Sarıkamış), and Oltu. The increasing awareness of the importance of wildlife in society and the direct support of the Directorate of Nature Conservation and National Parks resulted in an increase in the roe deer population in Turkey.

Various ectoparasites such as tick, louse, and deer ked species can be identified from deer. *Lipoptena*

spp., *Ixodes ricinus*, and *Cervicola meyeri* were common species living on deer (1,2).

Lipoptena cervi is the most common hippoboscid deer ked species living on roe deer in Europe (3,4). The main hosts of the deer ked are moose and other cervids but they can occasionally bite humans (4,5).

In this study, we aimed to identify ectoparasites living on roe deer injured in traffic accidents or by illegal hunting.

The study was conducted on 17 (12 males and 5 females) wounded roe deer that were brought to the clinics of the Faculty of Veterinary Medicine of Ondokuz Mayıs University by the Directorate of Nature Conservation and National Parks for treatment of injuries, between 2007 and 2010. Collected

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** E-mail: cbolukbas@omu.edu.tr

ectoparasites were preserved in 70% ethyl alcohol. Ticks were cleaned with a brush under a stereomicroscope. Lice were placed into the Andre's solution (glacial acetic acid 1/3, chloral hydrate 1/3, and distilled water 1/3) for the transparency. All of the species were identified under the microscope according to the related literature (5-9) and photographed.

In the present study, 9 (52.94%) of the 17 roe deer were infested with 5 tick, 1 louse, and 1 deer ked species. The number of infested animals and collected ectoparasites are presented in Table 1.

Among the collected ticks (46 males and 44 females) 55.6% were identified as *Ixodes ricinus*, 31.1% as *Rhipicephalus bursa*, 7.8% as *Haemaphysalis concinna*, 3.3% as *Rhipicephalus turanicus*, and 2.2% as *Haemaphysalis punctata*.

Three roe deer were infested with *Cervicola meyeri* and 2 were infested with *Lipoptena cervi*. Morphological measures and photographs of *Cervicola meyeri* and *Lipoptena cervi* are presented in Table 2 and Figure 1, respectively.

Table 1. Parasite species, number of infested animals, and collected ectoparasites.

Parasite species	Number of infested animals/total animals (Prevalence %)	Number of collected ectoparasites			
		Nymph	Female	Male	Total
<i>Lipoptena cervi</i>	2/17 (11.76)	0	5	0	5
<i>Cervicola meyeri</i>	3/17 (17.65)	6	129	29	164
<i>Ixodes ricinus</i>	7/17 (41.18)	0	34	16	50
<i>Haemaphysalis concinna</i>	2/17 (11.76)	0	0	7	7
<i>Rhipicephalus bursa</i>	1/17 (5.88)	0	7	21	28
<i>Rhipicephalus turanicus</i>	1/17 (5.88)	0	2	1	3
<i>Haemaphysalis punctata</i>	1/17 (5.88)	0	1	1	2

Table 2. Morphological measures of *Cervicola meyeri* and *Lipoptena cervi*.

	<i>Cervicola meyeri</i>		<i>Lipoptena cervi</i>
	♀ (n = 10)	♂ (n = 10)	♀ (n = 5)
Head length	0.39-0.45 (0.43)	0.33-0.45 (0.40)	0.63-0.82 (0.74)
Head width	0.42-0.50 (0.47)	0.35-0.46 (0.42)	1.28-1.43 (1.34)
Head index	0.89-0.95 (0.92)	0.91-0.97 (0.96)	-
Thorax length	0.21-0.29 (0.25)	0.19-0.25 (0.21)	1.12-1.56 (1.41)
Thorax width	0.36-0.41 (0.38)	0.28-0.38 (0.35)	1.61-1.89 (1.76)
Abdomen length	1.04-1.33 (1.18)	0.69-1.20 (0.97)	2.61-2.97 (2.83)
Abdomen width	0.58-0.66 (0.61)	0.41-0.63 (0.53)	2.47-2.75 (2.60)
Total length	1.71-2.03 (1.87)	1.18-1.87 (1.56)	4.77-5.22 (4.99)



Figure 1. a) Dorsal view of female *Lipoptena cervi*, and b) Ventral view of female *Cervicola meyeri*.

In a survey (2) conducted on reintroduced roe deer in Israel, 3 deer ked (*Lipoptena capreoli*, *Hippobosca equina*, and *H. longipennis*), 4 tick (*Rhipicephalus sanguineus*, *R. turanicus*, *R. kohlsi*, and *Hyalomma marginatum*) and 1 trombiculid mite species were identified. Vor et al. (10) identified 2 tick species (*Ixodes* sp. and *Dermacentor* sp.) from roe deer in Germany. In another survey (11) conducted on roe deer in Italy, only 1 tick species (*Ixodes ricinus*) was recorded. *Lipoptena cervi* was identified in water deer in the Republic of Korea by Kim et al. (12) and in roe deer and red deer in Germany by Dehio et al. (4). In

the current study, we detected 5 tick (*Ixodes ricinus*, *Rhipicephalus bursa*, *R. turanicus*, *Haemaphysalis punctata*, and *H. concinna*), 1 louse (*Cervicola meyeri*), and 1 deer ked species (*Lipoptena cervi*) on the roe deer.

In recent years, the importance of *L. cervi* has increased because of its role in the transmission of *Bartonella* infections in humans. The bites of *L. cervi* may also cause dermatitis in humans (4). This is the first report on the detection of *C. meyeri* and *L. cervi* on roe deer in Turkey.

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