Etlik Vet Mikrobiyol Derg, 2016; **27 (1):** 5-7 **Araştırma Makalesi** / Research Article

Prevalence of *Hyalomma aegyptium* (Linneaus, 1758) on Tortoises (*Testudo graeca*) in Izmir and Aydin Province, Turkey

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Geliş Tarihi / Received: 03.09.2015, **Kabul Tarihi** / Accepted: 10.02.2016

Abstract: In this study, a total of 228 adult ticks were collected from twelve tortoises between 07.05.2007 and 08.07.2008 in Izmir and Aydin, Turkey. All ticks were identified as *Hyalomma aegyptium*. The proportion of adult ticks collected from Izmir and Aydin provinces were 60,08% (n=137) and 39,92% (n=91), respectively.

Key words: *Hyalomma aegyptium*, ticks, tortoise, Turkey

İzmir ve Aydın İlindeki Kaplumbağalarda *Hyalomma aegyptium* (Linneaus, 1758)'un Yaygınlığı

Özet: Bu çalışmada, 07.05.2007 ve 08.07.2008 tarihleri arasında İzmir ve Aydin illerinde yakalanan 12 kaplumbağadan toplam 228 adet erişkin kene toplanmıştır. Toplanan tüm keneler *Hyalomma aegyptium* olarak identifiye edilmiştir. İzmir ve Aydin illerinden toplanan kenelerin oranı sırasıyla %60,08 (n=137) ve %39,92 (n=91) olarak belirlenmiştir.

Anahtar kelimeler: *Hyalomma aegyptium*, kaplumbağa, kene, Türkiye

Introduction

Ticks are the most prominent vectors within pests after mosquitoes. The genus *Hyalomma* Koch, 1844, like all other tick species, are ectoparasites that feed on animals and humans and transmit a great variety of parasitic, ricketsial, bacterial and viral agents to both humans and animals including; Lyme disease, babesiosis, ehrlichiosis, tularemia, Crimean-Congo hemorrhagic fever [7,16]. There are 30 *Hyalomma* species known to exist throughout the world. The genus *Hyalomma* distributed in Asia, southern Europe and Africa [8,14]. Among these, nine spp. have been identified in Turkey: *H. aegyptium*, *H. anatolicum*, *H. dromedarii*, *H. excavatum*, *H. impeltatum*, *H. marginatum*, *H. rufipes*, *H. scupense* (syn *H. detritum*), *H. turanicum* [3,6,10].

Tortoises are known as the common hosts for adult *H.aegyptium* in the Mediterranean region, Balkan countries, Middle East, Central Asia, Northern Africa, Afghanistan and Pakistan [1,17,18]. The species *Testudo graeca* Linnaeus, 1758, is a tortoise inhabiting in Northern Africa, Middle East and Europe [16]. *H.aegyptium* is known as a three-host life cycle tick and infests tortoises, lizards, hedgehogs, birds, small mammals and even human. However, tortoises of the genus *Testudo* are the main hosts of adult *H.aegyptium* [1,6,18-20]. In this study, the ticks on *T.graeca* living in natural areas in Aydin and Izmir province were determined.

Material and Methods

This study was carried out between 07.05.2007 and 08.07.2008 on a total twelve tortoises found in Izmir and Aydin, Turkey (Figure 1). Tortoises were captured in forested areas, roadsides, vegetable gardens and all were inspected for the presence of ticks. Ticks were collected manually from alive tortoises and preserved in 70% ethanol for identification. All collected ticks were identified based on morphological differences of each species using the methods described by Hoogstraal [14] and Apanaskevich [1].

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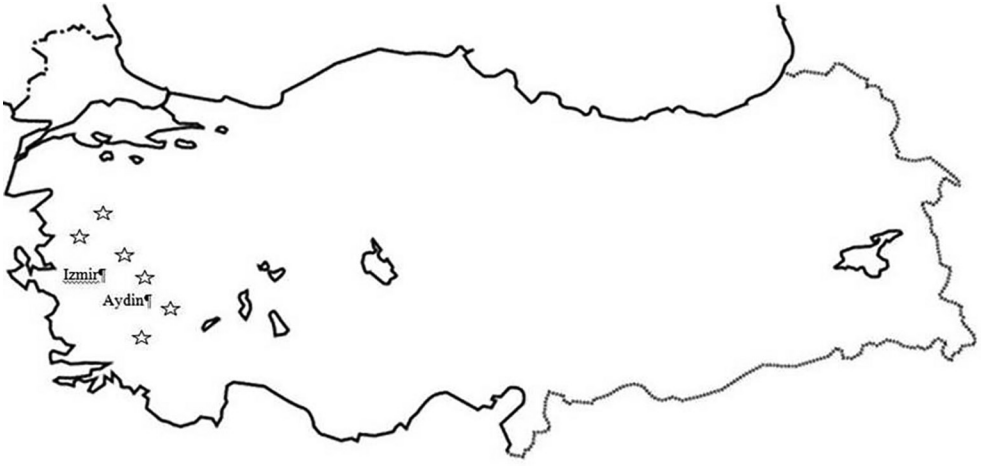

Figure 1. Turkey, and locations of sampling areas (small stars) within Izmir and Aydin province.

Results

During the study a total of 228 adult ticks were collected from tortoises. Attached ticks were found on the skin parts of hind legs and neck of tortoises. All collected ticks were identified as *H.aegyptium* (Figure 2). It was found that 147 (64,47%) out of 228 identified ticks were male and 81 (35,53%) out of 228 were found to be female (Table 1). The proportion of adult ticks collected from Izmir and Aydin provinces were 60,08% (n=137) and 39,92% (n=91), respectively (Table 1). Evaluation of the distribution of ticks attached on a montly base indicated that infestation by *H.aegyptium* increased May - July with the highest numbers of attached occuring during the summer season.

Figure 2. *Hyalomma aegyptium* male (A), *Hyalomma aegyptium* female (B)

Table 1. Distribution of *Hyalomma aegyptium* according to study area

	İzmir		Aydın		
	♂	♀	♂	♀	Prevalence %
March	-	-	11	-	4,8
May	41	40	7	3	39,91
June	32	9	28	12	35,53
July	14	1	14	16	19,74
Total	87	50	60	31	100

Discussion

Hyalomma aegyptium is known as dominant species among ticks parasitizing tortoises in Mediterranean region, Northern Africa, Balkan countries, Pakistan, Russia, India, Middle East [1,12,17,19], having a typical three-host life cycle. In Balkan countries and southern Europe the hosts of *H.aegyptium* are primarily tortoises but also lizards, dog, horse, hedgehog, cattle [12,14,17]. On the other hand the adult form *H.aegyptium* were reported from cattle and

buffaloes from Balkan countries, Pakistan, Turkey, India [2,5,12,19]. While larvae and nymph forms of *H.aegyptium* mostly attack on partridges, lizards and a wide variety of rodents, the adults parasitize mainly on turtles [1,6,17]. The adult forms of *H.aegyptium* are also demonstrated to parasitize on humans [6,11,15,20]. In feeding, hosts of ticks and predilection sites on host body vary depending on tick species and instars [6,15]. In the present study, the predilection sites of *H.aegyptium* were mainly observed on hind limbs of tortoises and some were found on the neck.

Increasing number of human tick infestation rates raise the question about the importance of *H.aegyptium* as a vector of pathogens [6,15,20]. *H.aegyptium* threatens human health and animal production as they are shown to transmit pathogens like *Borrelia burgdorferi*, *Theileria annulata*, *Pasteurella tularensis*, *Ricketsia aeschlimannii* [9,16,19]. A spirochete, *Borrelia turcica* was also isolated from *H.aegyptium* collected from tortoises in Turkey [13].

In previous studies, *H.aegyptium* adults were reported from tortoises, lizards, hedgehog, cattle and human in Turkey [2,4,6,12,16]. Results obtained in this study, showed that *H.aegyptium* was the only tick species on tortoises in our study area. In previous studies, *H.aegyptium*, *Haemaphysalis sulcata*, *H.inermis* and *Rhipicephalus sanguineus* were reported from tortoises in Balkan countries [19]. Existence of eight different tick species belonging to three different genus on cattle has been demonstrated in Aydin province, in which *H.aegyptium* species could not be determined on cattle in Aydin province [7].

In conclusion, this study demonstrated the existence of *H.aegyptium* on tortoises in Aydin and Izmir provinces. However, in terms of determining the true prevalence of this tick on both tortoises and other animals and its potential role on transmitting diseases more studies need to be performed.

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