

Status of tick infestation of cattle in the Kayseri region of Turkey

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Abstract This study was carried out to determine the status of tick infestation of cattle in the Kayseri region in Turkey. Eight hundred and sixty-six cattle and their barns in 12 localities were examined during the period of June 2000–November 2001, where 188 (21.7%) of which were infested by ticks. A total of 1,585 ticks consisting of *Rhipicephalus turanicus* (2.27%), *R. bursa* (2.14%), *R. sanguineus* (0.94%), *Hyalomma marginatum* (17.16%), *H. anatolicum excavatum* (24.73%), *H. a. anatolicum* (19.62%), *Dermacentor niveus* (1%), *Boophilus annulatus* (16.71%), *Ornithodoros lahorensis* (0.25%), *Hyalomma* sp. nymphs (7.31%), and *Boophilus annulatus* nymphs (7.82%) were collected. Seasonal fluctuation of ticks was also determined in this region. *Rhipicephalus* species were generally found in spring, others like *Hyalomma* in late spring, summer, and early autumn, *B. annulatus* in September, October, and December, *D. niveus* in December, January, and February, and *O. lahorensis* in December. Immature forms (nymphs) of *Hyalomma* species were found in summer and autumn, while *B. annulatus* nymphs were observed in October, November, and December.

Introduction

Ticks are widespread in most parts of the world, including Turkey. In previous studies conducted in Turkey, 32 tick species were identified (Kurtpinar 1954; Mimioglu 1954; Mimioglu and Yazar 1961; Goksu 1967; Merdivenci 1969; Hoffmann et al. 1971). Ticks and tick-borne diseases such as tropical theileriosis and cattle babesiosis are common in the Kayseri region. Thus, *Rhipicephalus bursa*, *R. turanicus*, *R. sanguineus*, *Hyalomma marginatum*, *H. anatolicum excavatum*, *Boophilus annulatus*, *Haemaphysalis parva*, *Hae. sulcata*, *Hae. otophila*, and *Dermacentor niveus* have been reported (Inci et al. 2002a, b, c, 2003). This present study has been carried out to determine the tick species infesting cattle and shelters in Kayseri.

Materials and methods

Area of study

Kayseri lies between 37 and 38° North latitude and 34 and 36° East longitude, with an altitude of 1,050 m. This area consists of mountains, high plateaus, plains, valleys, two rivers, and two small lakes. There is no forest area, but it is very rich in plant diversity. The major part of this area is covered with short-lived steppe plants. The herds from the many villages are moved to pasture for daytime grazing in the morning and are brought back to the village in the evening. Grazing season of the animals extends from March to November. The animals are subjected to indoor feeding during the winter months. The shelters where the cattle are kept during the indoor feeding time are constructed with sun-dried bricks and are not hygienic. Acaricides are irregularly applied to the animals.

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Table 1 Tick infestations in collection points

Collection point	Number of infested/examined cattle
Develi	
Sindelhoyuk	16 ^a /102 ^b
Cayırozu	12/61
Soysalli	8/26
Saray Hali Fabrikasi	0/154
Kulpak	7/7
Sahmelik	4/8
Yagdanli	3/15
Musahacili	23/119
Ovaciftligi	17/51
Cadirkaya	4/10
Dokuzpinar	55/90
Subasi	2/12
Senirkoy	10/62
Bunyan	
Tuzhisar	7/23
Melikgazi	
Yesilyurt	0/15
Gesi	0/11
Erkilet	
Kemer	0/10
Kocasinan	
Yazir	4/20
Elagoz	3/7
Pinarbasi	
Elmali	1/6
Kadili	2/5
Talas	
Kocagiz	0/14
Kamber	0/10
Felahiye	
Hobek	5/13
Sarioğlan	
Palas	5/15
Total	188/866

^a Infested cattle^b Examined cattle

Collection of ticks

Ticks were collected from 25 localities in 9 towns. These areas were visited every month between June 2000 and October 2001. Ticks were obtained during 18 months from 866 cattle. Randomly chosen stables of these cattle at each collection point were also inspected. Adult ticks were kept in 70% alcohol until identification. Nymphs were placed in an incubator at 28°C and 85% relative humidity to molt into adults before preservation either directly or after feeding on rabbits. Adult ticks collected from cattle were morphologically examined under the stereomicroscope and identified using the key of Hoogstraal (1956).

Results

A total of 866 cattle were examined for infestation of ticks; among which, 188 proved to be infested. Ticks were found in nine towns, where the infestation rates varied between 13.40 and 55.88% (Table 1). No ticks were found in the shelters. A total of 1,585 tick specimens were collected belonging to nine species, and the prevalence is summarized in Table 2. *H. anatolicum excavatum* was the dominant species in the region (24.73%), whereby other *Hyalomma* species were also common.

From the geographical point of view, *Hyalomma* species were more common in Develi, Yesilhisar, Incesu, and Yahyali, while *B. annulatus* was more common in Bunyan and Kocasinan.

Seasonal fluctuations of tick species were also determined. In this region, *Rhipicephalus* species were generally found in spring, whereas *Hyalomma* species were found in late spring, summer, and early autumn. On the other hand, *B. annulatus* were detectable in October, November, and December. *D. niveus* and *Ornithodoros lahorensis* were usually found in winter time. Immature forms of *Hyalomma* species were found in summer and autumn. *B. annulatus* nymphs were also found in the same time as adults.

Discussion

The tick fauna in Turkey is composed of about 32 species in ten genera and two families. These genera are *Ixodes*, *Amblyomma*, *Haemaphysalis*, *Hyalomma*, *Rhipicephalus*, *Boophilus*, *Dermacentor*, *Ornithodoros*, *Argas*, and *Otobius* (Kurtpinar 1954; Mimioglu 1954; Mimioglu and Yazar 1961; Goksu 1967; Merdivenci 1969; Hoffmann et al. 1971). *Haemaphysalis*, *Hyalomma*, *Boophilus*, *Rhipicephalus*, and *Dermacentor* species are widespread in Central Anatolia (Sayin et al. 1997). Furthermore, in Kayseri, a number of

Table 2 Prevalence of tick species in the Kayseri region

Tick species	Number of ticks	Prevalence (%)
<i>Rhipicephalus turanicus</i>	36	2.27
<i>Rhipicephalus bursa</i>	34	2.14
<i>Rhipicephalus sanguineus</i>	15	0.94
<i>Hyalomma marginatum</i>	272	17.16
<i>Hyalomma a. excavatum</i>	392	24.73
<i>Hyalomma a. anatolicum</i>	311	19.62
<i>Boophilus annulatus</i>	265	16.71
<i>Dermacentor niveus</i>	16	1
<i>Ornithodoros lahorensis</i>	4	0.25
<i>Hyalomma</i> sp. nymphs	116	7.31
<i>B. annulatus</i> nymphs	124	7.82
Total	1,585	100

tick species have been reported to infest cattle in the Kayseri region such as *R. turanicus*, *R. bursa*, *R. sanguineus*, *H. marginatum*, *H. a. excavatum*, *B. annulatus*, *D. niveus*, and *O. lahorensis* (Inci et al. 2002a). In other studies conducted in the same region, *R. turanicus*, *R. bursa*, *R. sanguineus*, *D. niveus*, *H. marginatum*, *Hae. parva*, *Hae. sulcata*, and *Hae. otophila* tick species could be collected from sheep and goats (Inci et al. 2002b; 2003).

In the present study, eight *Ixodid* ticks such as *R. turanicus*, *R. bursa*, *R. sanguineus*, *H. marginatum*, *H. a. excavatum*, *H. a. anatolicum*, *B. annulatus*, and *D. niveus* and one *Argasid* tick *O. lahorensis* were identified. This study showed that *Hyalomma* species and *B. annulatus* are the major tick species of cattle in the Kayseri region.

Hyalomma species were more common in Develi, Yesilhisar, Incesu, and Yahyali districts. This abundant tick infestation results in a high prevalence of tropical theileriosis leading to a high mortality among the infected animals (Inci et al. 2002c). The other major tick species *B. annulatus* was common in Bunyan and Kocasinan locations, where *Babesia bigemina* infection in the region has been reported (Inci et al. 2002a).

Seasonal fluctuation of tick species in Central Anatolia was reported in a previous study (Sayin et al. 1997). According to this study, *Rhipicephalus* species were found in spring, summer, and fall. They were more prevalent in summer. The adults of *Hyalomma* species were found in spring, summer, and autumn with a peak in summer. *Haemaphysalis* species were found in autumn, winter, and spring. *O. lahorensis* occurred in autumn, winter, and spring with a peak in winter. *Dermacentor marginatus* appeared in all seasons. *B. annulatus* prevailed in spring.

In conclusions, tick species infesting cattle were determined in the Kayseri region where tick-borne diseases are

common. These data will be useful for mapping and determination of potential risks for tick-borne disease.

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References

- Goksu K (1967) Bazı Karadeniz Bolgesi illerinde sigirlarda musahade edilen *Babesia* enfeksiyonları ve kene enfestasyonları. *Ank Univ Vet Fak Derg* 15:46–57
- Hoffmann G, Horchner F, Schein E, Gerber H (1971) Saisonales auftreten von Zecken und Piroplasmen bei Haustieren in den Asiatischen Provinzen der Türkei. *Berl Munch Tierarztl Wochenschr* 94:152–156
- Hoogstraal H (1956) African Ixodidae I. Ticks of the Sudan (with special reference to the Equatorial Province and with preliminary reviews of the genera *Boophilus*, *Margaropus* and *Hyalomma*). Department of the Navy, Bureau of Medicine and Surgery, US Naval Medical Research Unit 3, Cairo, Egypt, p 1101
- Inci A, Cakmak A, Karaer Z, Dincer S, Sayin F, Ica A (2002a) Seroprevalence of bovine babesiosis around Kayseri. *Turk J Vet Anim Sci* 26:345–350
- Inci A, Karaer Z, Ica A (2002b) Babesiosis in sheep and goats around Kayseri. *F U Saglik Bil Dergisi* 16:79–83
- Inci A, Cakmak A, Ica A, Gunay O (2002c) A statistical analysis of tropical theileriosis around Kayseri. *T Parazitol Derg* 26:38–41
- Inci A, Nalbantoglu S, Cam Y, Atasever A, Karaer Z, Cakmak A, Sayin F, Yukari BA, Ica A, Deniz A (2003) Theileriosis and tick infestations in sheep and goats around Kayseri. *Turk J Vet Anim Sci* 27:57–60
- Kurtpinar H (1954) Türkiye Keneleri. Guven Matbaasi, Ankara
- Merdivenci A (1969) Türkiye Keneleri Uzerine Arastirmalar. Istanbul Cerrahpasa Tip Fak. Yayini, pp 1448–1443
- Mimioglu M (1954) Die Schildzecken (Ixodeae) der Haustiere in der Türkei. *Ank Univ Vet Fak Derg* 1:20–35
- Mimioglu M, Yazar MT (1961) Türkiye’de ilk *Amblyomma variegatum* Fabricius, 1794 olayi. *Ank Univ Vet Fak Derg* 8:239–240
- Sayin F, Dincer S, Karaer Z, Dumanli N, Cakmak A, Inci A, Yukari BA, Vatansever Z (1997) Status of tick infestation of sheep and goats in Turkey. *Parassitologia* 39:145–152