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## Short Communication

# Tick Infestation Rate of Sheep and Their Distribution in Abdanan County, Ilam Province, Iran, 2007-2008

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## Abstract

**Background:** Ticks are hematophagous arthropod belonging to the Class of Arachnids. Ticks are also one of the major vectors of pathogens to animal and human. This study was conducted to determine tick infestation rate of sheep in Abdanan during 2007–2008.

**Methods:** Sampling was performed seasonally in 19 villages during spring 2007 until winter 2008. A total of 1095 sheep were selected and tested for tick infestation. After collection, all ticks were transported to laboratory of Medical Entomology and were identified with appropriate identification keys.

**Results:** Totally, 864 hard ticks were collected. The ticks were classified into two genera and 5 species including: *Hyalomma marginatum* (44.67%), *Hy. anatolicum* (43.17%), *Hy.asiaticum* (6.37%), *Hy. dromedarii* (5.55%), *Haemaphysalis sulcata* (0.24%). The highest seasonal activity was observed in spring (36.46 %) and the lowest seasonal was in winter (11.57%). The rate of tick frequency in mountainous region was 48.15% and it was 51.85% in plateau regions. In this study, tick infestation of sheep was 11.41%.

**Conclusion:** *Hy.marginatum* has the more frequent density in the study area.

**Keywords:** Ticks, sheep, Abdanan, Iran

## Introduction

In the Arachnids arthropods, ticks are the main important vectors of disease to human and animals (Morel 1989). Ticks play a significant role as vectors of pathogens of domestic animals and human in Iran as well. The major losses caused by ticks are related to transmission of babesiosis, theileriosis, and Anaplasmosis in ruminants. There are several reports on, distribution, public health importance in the country. The tick study was started by Delpy (Delpy 1936) in Iran. Abbasian and Mazlum described a list of adult ticks collected from domestic animals in different region (Abbasian 1961, Mazlum 1971). Rodents which play as host of ticks also reported from different zoogeographical

zones of the country (Filipova et al. 1976). Hoogstraal and Wassef studied ixodid ticks parasitizing wild sheep and goat in Iran (Hoogstraal et al.1979). The ecology of different species of ticks on domestic animals also is emphasized (Rahbari 1995). Razmi et al 2002 published a list of tick species of domestic animals in northeast of Iran (Razmi et al. 2002). Distribution of soft ticks (Argasidae) collected from human dwellings, poultrys, and animal shelters in Hamadan Province, exhibited that they belong to the genus *Argas* and *Ornithodoros* (Vatandoost et al. 2003). The fauna of hard and soft ticks (families: Ixodidae and Argasidae) were studied in west Azerbaijan Province (Tel-

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madarraiy et al.2004). Salari Lak et al. studied the seasonal activity of ticks and their importance in tick borne infectious diseases in west Azerbaijan (Salari Lak et al. 2008). Distribution of tick fauna in Iran was also performed (Rahbari et al. 2008). Nabian and Rahbari studied the soft and hard ticks on ruminants in Zagros mountainous areas of Iran to determine the species and distribution of ticks infesting ruminants (Nabian et al. 2008). Distribution of ticks Meshkinshahr and Ardabil were carryout out (Telmadarraiy et al. 2009, 2010). Ilam Province including Abdanan City is one of the most important husbandry centers in western region of Iran.

This study was conducted to determine tick infection rate of sheep in the Abdanan.

## Materials and Methods

### Study area

Ilam Province is located in the western part of Iran and Abdanan County is located in the southeast of Ilam Province and has mild mountainous and tropical climate. This county is an important sheep breeding area in Ilam Province. This region comprises two parts differing in topography. The mountain and plateau region and the highest altitude considered as 880 m and its population is 47370 people.

### Tick collection

Sampling was performed seasonally in 19 villages through one year during spring 2007 until winter 2008. A total of 1095 sheep were selected and were checked for tick infestation. After collection ticks from each

sheep were kept alive in separate labeled holding tubes and were kept alive in labeled tubes and their history containing location, age, sex was recorded .The collection ticks in labeled holding tubes were transferred to the Entomology laboratory, School of Public Health, Tehran University of Medical Science for species identification. They were identified by morphological characteristic using stereomicroscope and key identification guide (Kaiser et al. 1963, Walker et al. 2003).

## Results

During this study, 864 hard ticks were collected from 1095 sheep. The ticks were classified into two genera and 5 species including *Hy. marginatum* (44.67%), *Hy. anatolicum* (43.17%), *Hy. asiaticum* (6.37%), *Hy. dromedarii* (5.55%), *H. sulcata* (0.24%) (Table 1). Tick infestation was detected in 125 (11.41%) out of 1095 sheep. Table 1 shows the seasonal activity of tick and the spatial infestation rate was (36.8%) in spring, (16.8%) in summer, (32.8%) in autumn and (13.6%) in winter, respectively. The highest tick seasonal activity was observed in spring (36.8 %) and the lowest seasonal were in winter (13.6%). The rate of tick frequency in mountainous region was 48.15% and it was 51.85% in plateau regions (Table 2). Table 3 shows relatively percentage of tick infestation of sheep in different seasons of year. Tick infestation of sheep was 11.41%. The sexual ratio of hard ticks, shows that the frequency of male ticks were (77%) and female ticks were (23%).

**Table 1.** Number of tick in the different seasons collected in Abdanan 2007–2008

Species	Seasons				Total%
	Spring	Summer	Autumn	Winter	
<i>Hyalomma marginatum</i>	101	145	125	15	386(44.67)
<i>Hyalomma anatolicum</i>	131	22	157	63	373(43.17)
<i>Hyalomma asiaticum</i>	49	0	0	6	55(6.37)
<i>Hyalomma dromedarii</i>	34	0	0	14	48(5.55)
<i>Heamaphysalis sulcata</i>	0	0	0	2	2(0.24)
<b>Total</b>	315(36.8)	167(16.8)	282(32.8)	100(13.6)	864(100)

**Table 2.** Topographical status of ticks collected in Abdanan 2007–2008

	Species					Total	Percentage
	<i>Hy. marginatum</i>	<i>Hy. anatolicum</i>	<i>Hy. asiaticum</i>	<i>Hy. dromdareii</i>	<i>H. sulcata</i>		
Mountain	148	195	44	27	2	416	48.15
Plateau	238	178	11	21	0	448	51.85

**Table 3.** Infectivity of sheep to ticks in Abdanan 2007–2008

Seasons	Surveyed sheep	Infected sheep	Percentage
Spring	235	46	19.57
Summer	249	21	8.4
Autumn	285	41	14.38
Winter	326	17	5.2
Total	1095	125	11.41

## Discussion

During this study 864 ticks from Ixodidae family were collected indicating the occurrence of 5 species of hard ticks in Abdanan. The frequency of the species of *Hyalomma marginatum* were higher than the other species, and only 2 genera were collected. Seasonal activity of hard ticks in spring was more than other seasons. The occurrence of hard ticks in plateau area was a few more than mountainous area. Piazak reported the seven species of genera *Hyalomma* (*Hy. marginatum*, *Hy. detritum detritum*, *Hy. anatolicum anatolicum*), *Rhipicephalus* (*Rh. bursa*), *Haemaphysalis* (*H. sulcata*), *Dermacentor* (*D. marginatus*), and *Boophilus* (*B. annulatus*) in East Azerbaijan (Piazak 1991). Tavakoli et al. carried out a study in Lorestan Province, and found that genus *Hyalomma*, was active during summer, and in our study, also this genus was the highest frequency and active in summer (Tavakoli 1997). Telmadarraiy et al. carried out a study in west Azerbaijan Province, and reported 13 species of ticks including: *Boophilus annulatus*, *Rh. bursa*, *Rh. sanguineus*, *Dermacentor marginatus*, *D. niveus*, *H. sulcata*, *H. inermis* and *Hy. asiaticum*, *Hy. marginatum*, *Hy. aegyptium*, *Hy. dromdarii*, *H. schulzei*, *Hy. detritum*, that percentage of *Hyalomma* genus

were 41% (Telmadarraiy et al. 2004). Nabian et al. emphasized that *Hy. marginatum* occurred as a dominant tick in the north of Iran. Their finding was similar to our results. In their study, thirteen hard tick species were identified as *Hy. anatolicum anatolicum*, *Hy. marginatum*, *Hy. detritum*, *H. punctata*, *H. parva*, *H. concinna*, *H. holdkovsky*, *Ixodes ricinus*, *Rh. sanguineus*, *Rh. bursa*, *Boophilus annulatus*, *D. niveus*, *D. marginatus* (Nabian et al. 2007). Telmadarraiy et al. (2009) also carried out a study in Meshkinshahr district and in this study, genus *Hyalomma* was the most frequent and seasonal activity of ticks was in spring. Salim abadi et al. carried out a study in Yazd Province and reported that genus *Hyalomma* was the most frequent (salim abadi et al. 2010). This and others studies showed that tick infestation of sheep in Iran are around 10% and *Hyalomma* species was reported as a dominant tick in different part of Iran.

In this survey, several tick species, which are important in diseases transmission in sheep and human, are identified. The seasonal and geographical activity of ticks will help authorities to provide appropriate strategy for tick control program.

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