

Survey on Ixodidae Tick Population in Domestic Ruminants in East Azerbaijan, Iran

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Abstract: The population and diversity of Ixodidae ticks in domestic ruminants in East-Azarbaijan (Northwest of Iran) were studied from September of 2009 to August 2010. A total of 1668 ticks were collected from 3025 animals consist 1250 cattle, 850 sheep and 925 goats. Mean intensity for each animal was 0.55. The overall prevalence of ticks was recorded as 12.96% and 13.17% and 18.91% in cattle, sheep and goats respectively. Five genera and 13 species were identified as *Hyalomma*, *Dermacentor*, *Haemaphysalis* and *Rhipicephalus*. In cattle the most diversity of tick's species determined within genus *Hyalomma* with three species, *H. anatolicum anatolicum* (47.61%) and *H. anatolicum excavatum* (12%) and *H. asiaticum asiaticum* (1.9%). In sheep and goat, *Dermacentor marginatus* (28.7%) and *Rhipicephalus bursa* (29.2%) have the most diversity respectively. *Ixodes* was not observed in this study. Because the importance of ticks, in transmission of protozoan and other infectious diseases to human and animals, prevention with strict control measures should be emphasized.

Key words: *Ixodidae* · Tick · Prevalence · Cattle · Sheep · Goat · Tabriz · Iran

INTRODUCTION

Parasitic infestations are wide spread and affect different livestock species throughout the world. Theses cause considerable economic losses in terms of low productivity and mortality in ruminants [1]. Ticks as ectoparasites are important in human and veterinary medicine. Ticks of Ixodidae family not only cause lower production of animals but also transmit a number of bacterial, protozoal, rickettsial, spirochaetal and viral diseases to human and domestic animals [2]. Also, they are considered as agents of tick paralysis, tick bite abscesses, tick-induced dermatophilosis in man and animals, probably due to secretion of toxic substances in their saliva [1]. There are several works on biology, distribution, systematics of hard and soft ticks in Iran. The aim of present study was to determine the infection rate of tick species (Ixodidae) in cattle, sheep and goats in Tabriz, North West of Iran.

MATERIALS AND METHODS

The study was conducted in seasonal activity of ticks in East Azarbaijan province which is located in

(26°39'- 36°45'N and 45°5'- 48°22'E). In the study area, the total numbers of 14 villages were selected randomly and survey conducted in these villages. These are mountainous, with altitudes 1351.4 m. The climate is temperate. Summers are relatively hot and dry while winters are cold.

Ticks were collected from 4 regions of animal's surface. These were consist of head (head, ears and neck), shoulder (shoulder and axillaries area), anal (anal and perianal region) and udder (udder and groin around). Theses samples were collected from 1250 cattle, 850 sheep and 925 goats from September 2009 to August 2010. Animals were examined on a table and ticks were removed. The collected specimens were transferred into the holding tubes and preserved in 70% alcohol and brought to the Parasitology laboratory for further studies. The ticks were subjected to boiling treatment in 10% potassium hydroxide (KOH) solution to render the non-chitinous portions transparent. Treated ticks were thoroughly washed with water and desiccated by paper. Determination was done using a stereomicroscope according to identification key of Kerians and Litwak [3].

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Table 1: Prevalence of ticks in domestic ruminants of East-Azerbaijan

No. of cattle			No. of sheep			No. of goats		
Examined	Infested (%)	Isolated ticks	Examined	Infested (%)	Isolated ticks	Examined	Infested (%)	Isolated ticks
1250	162 (12.96%)	525	850	112 (13.17%)	454	925	175 (18.91%)	603

Table 2: Number and percentage of tick species collected from domestic ruminants in East-Azerbaijan

Tick species identified	No and percentage (%) of isolated ticks in animals		
	Cattle	Sheep	Goat
<i>Hyalomma anatolicum anatolicum</i>	250 (47.61%)	82 (15.18%)	85 (14.09%)
<i>Hyalomma anatolicum excavatum</i>	63 (12%)	55 (10.18%)	35 (5.8%)
<i>Hyalomma asiaticum asiaticum</i>	10 (1.9%)	15 (2.77%)	14 (2.32%)
<i>Hyalomma detritum</i>	-	16 (2.96%)	12 (1.99%)
<i>Hyalomma marginatum</i>	-	-	67 (11.11%)
<i>Rhipicephalus bursa</i>	95 (18/06%)	102 (18.88%)	165 (27.36%)
<i>Rhipicephalus sanguineus</i>	60 (11.42%)	86 (15.92%)	140 (23.21%)
<i>Rhipicephalus turanicus</i>	4 (0.75%)	-	-
<i>Dermacentor marginatus</i>	36 (6.85%)	155 (28.7%)	60 (9.95%)
<i>Boophilus annulatus</i>	7 (1.33)	-	-
<i>Haemaphysalis sulcata</i>	-	21 (3.88)	-
<i>Haemaphysalis inermis</i>	-	8 (1.48)	-
<i>Haemaphysalis punctata</i>	-	-	25 (4.14)
Total	525	454	603

RESULTS

A total of 1668 ticks were collected from 3025 animals, so mean intensity for each animal was 0.55. Most of ticks were collected in warm seasons and all of them were from Ixodidae ticks. In the present study, the overall prevalence of ticks was recorded as 12.96% and 13.17% and 18.91% in cattle, sheep and goat respectively (Table 1).

Ticks collected from ruminants belonged to five genera and 13 species. The genres were *Hyalomma*, *Dermacentor*, *Haemaphysalis*, *Rhipicephalus* and *Haemaphysalis*. In cattle the most diversity of tick species determined within genus *Hyalomma* with three species, *H. anatolicum anatolicum* (47.61%) and *H. anatolicum excavatum* (12%) and *H. asiaticum asiaticum* (1.9%). In case of sheep and goats *Dermacentor marginatus* (28.7%) and *Rhipicephalus bursa* (29.2%) have the most diversity respectively (Table 2).

DISCUSSION

In this study, the overall prevalence of ticks was recorded as 12.96% and 13.17% and 18.91% in

cattle, sheep and goats respectively. These rates show that infestation to hard ticks in goat was higher than other ruminants in this province.

The results of this study show the occurrence of 13 species of Ixodidae ticks in East-Azerbaijan. The population and variation frequency of the species of genus *Hyalomma* was higher than other ticks. In variant species of this genus, *Hyalomma anatolicum anatolicum* was most frequent higher and the host preference of main hard tick was cattle, goat and sheep respectively.

Hyalomma marginatum, *Rhipicephalus turanicus*, *Boophilus annulatus*, *Haemaphysalis sulcata*, *Haemaphysalis inermis* and *Haemaphysalis punctata* were observed only in one species of the animals.

In another study, about tick infestation in east-Azerbaijan, only the seven species of genera *Hyalomma* (*Hy. marginatum*, *Hy. detritum*, *Hy. anatolicum anatolicum*), *Rhipicephalus* (*Rh. bursa*), *Haemaphysalis* (*Hae. sulcata*), *Dermacentor* (*D. marginatus*) and *Boophilus* (*B. annulatus*) were reported [4]. Mazlum (1971) was not able to find *Haemaphysalis inermis* in Azerbaijan province [5] but Telmadarraiy *et al.*, (2004) findings from this genus in Azerbaijan were agreeable with our findings [6].

Hyalomma anatolicum anatolicum was recorded over widely in Iran such as north provinces, west Azerbaijan, Yazd and Zagros mountainous areas [4, 7-9]. This is a vector of causative organism of tropical theileriosis and transmits a variety of pathogenic organism such as *Theileria lestoquardi*, *Th. equi*, *Babesia cabali*, *Trypanosoma theileri* and Crimean-Congo hemorrhagic fever virus [10].

According to Mazlum (1971), Jabbari *et al.* (2001) and Ranjbar Bahadori (2003) emphasized that *Rhipicephalus bursa* occurred as a dominant tick in most areas keep in they sheep and goats [5, 8, 11]. In present study, *Rh. bursa* was dominant tick in goats but *D. marginatus* was dominant in sheep. Also, in mentioned studies *H. anatolicum excavatum* was identified as dominant tick in cattle but in our study *H. anatolicum anatolicum* was dominant tick in cattle [5, 8, 11]. In a study that was done by Razavi and Seifi (2006), *Boophylus anulatus* was identified as dominant tick in cattle [12].

Our results showed that there is not any Ixodes in the ruminant in east-Azerbaijan. This is similar to the results of three studies which were done in West Azerbaijan [13]. Ixodes was reported in tick fauna of north of Iran by Nabbian *et al.*, (2007) and Razavi and Seifi [7, 12]. Therefore is seemed that this genus is specific for north of Iran with upper humidity and mild temperature. This condition is not available in Azerbaijan with low humidity and cold temperature in most months of year.

Based on the results, it is concluded that most reported ticks in other studies in Iran was observed in East Azerbaijan and should be noted for their ability in transmission of infectious agents.

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