Prevalence of ixodid ticks on cattle and sheep northeast of Iran

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Abstract A survey was carried out to investigate the prevalence of hard tick species (Acari: Ixodidae) on cattle and sheep north of Iran. The aim of study was to determine the prevalence of hard ticks on cattle and sheep in the mountainous areas of Golestan province and their geographical distribution. A total of 26 ticks were collected from 22 infested cattle and 26 ticks were collected from 12 infested sheep during activating seasons of ticks in 2013–2014. The species collected from cattle and sheep were *Hyalomma marginatum*, *Hyalomma anatolicum*, *Hyalomma asiaticum*, *Rhipicephalus bursa* and *Rhipicephalus sanguineus*. The results show that these are dominant tick species in the surveyed area.

Keywords Ticks · Sheep · Cattle · Season · Golestan

Introduction

Hard ticks as blood sucking ectoparasites and also vectors of human and animal diseases are considered as one of the most important arthropods. Ticks can transmit a variety of diseases such as Crimean Congo hemorrhagic fever, anaplasmosis, babesiosis, rickettsiosis, borreliosis and

ehrlichiosis. It is important to know the prevalence of the tick species involved on the transmission as well as their geographical distribution for the control of tick and tick-borne diseases (Mazlum 1971; Dehaghi et al. 2011; Vahedi-Noori et al. 2012). Since thus far only few studies were accomplished on tick fauna in different areas of Iran, it seems to be a gap in our knowledge about distribution of tick species in the Iran. In addition there is lack of finding about the frequency of ixodid tick species from domestic ruminants in Golestan Province. The aim of this study is to determine the frequency of tick infestation in cattle and sheep of Golestan area, Iran.

Materials and methods

During the spring and summer of 2013–2014, the tick samples were collected using tweezers and rubber gloves from infested cattle and sheep. After collection, the tick samples were separately stored in a vial with 70 % ethyl alcohol. Labeling for all specimens included location, host, and date until the species determination. The ticks were brought to the laboratory and adults identified under a stereomicroscope according to general identification keys (Dehaghi et al. 2011).

Results

During the study period among several villages the total number of 26 ticks were collected and identified, the occurrence of ticks on sheep and cattle horses were 46.1 and 53.9 %, respectively. A total of 26 ixodid ticks were found on 34 different hosts including 12 sheep and 22 cows. Five hard tick species from two genera were found to

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parasitize animal hosts in mountainous area of Golestan including *Rhipicephalus sanguineus*, *Rhipicephalus bursa*, *Hyalomma marginatum*, *Hyalomma anatolicum* and *Hyalomma asiaticum* (Nabian et al. 2009).

Discussion

It seems that collecting comprehensive information about how the regional distribution and abundance of species ticks is essential. In the present study, three genus and seven species of Ixodidae ticks were observed to infest cattle and sheep in the Golestan area. The results were approximately similar to those of another study that was performed southeast of Iran (Mazlum 1971; Rahbari et al. 2007; Salim Abadi et al. 2010). The results of this study showed that *H. marginatum*, *H. anatolicum*, *H. asiaticum*, *R. bursa* and *R. sanguineus* were the dominant ticks on cattle and sheep. Other researchers described its distribution from the Mediterranean, steppe climatic regions of North Africa to steppe climatic regions elsewhere in its wide range, including Iran and Turkmenistan (Walker et al. 2003; Javanbakht et al. 2014a, b).

Geographical information system has been used with analytical and descriptive approach to determine tick distributions and also for modeling their occurrence in space and time. Such information including predictive maps are very useful tools for health authorities in order to monitor and control tick and tick-borne diseases. Although, in this study there were no significant differences between tick species and the environmental factors, but the descriptive maps provided. The reason could be due to the movement of flocks from mountainous area to lowlands in different seasons by rural people and shepherds. As three different zones are recognized in Golestan province, therefore we suggest conducting a similar research in lowlands and coastal areas of the province. However, the result of this study is considered as the essential starting points to generate distribution maps.

In conclusion, the distribution and abundance of hard ticks as vector of man and animal diseases are very important issue from epidemiological point of view. Such research provides necessary information for human and animal health service managers to have a better understanding of prevention and control.

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