

## Case Report

# The First Report of *Rhipicephalus (Boophilus) kohlsi* (Hoogstraal and Kaiser 1960) from Wild Goats (*Capra hircus aegagrus*) in Iran

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### Abstract

**Background:** Studies concerning ticks were of interest to evaluate the distribution and composition of species affecting livestock, thus it was a main step in our knowledge of the pathogens that they may transmit by tick.

**Methods:** A collection of 21 adult female and 15 male hard ticks, all representing a single species of tick collected under the tail of wild goat. The specimens preserved in 70 % alcohol in glass vial and brought to laboratory for identification. In order to distinguish species relationships between wild and domestic animals, tick sampling has been achieved in 7 different places located around Kolah Qazi national park in Isfahan Province.

**Results:** Important descriptions of ticks isolated from wild goat strongly supported that the tick species in this collection was only *Rhipicephalus (Boophilus) kohlsi*.

**Conclusion:** It seems that this is the first report of *Rh. (Boophilus) kohlsi* in Iran. Wild sheep and goats live throughout Iran except in forest and other tall vegetation areas. Although, both animals has pastured occasionally in same open rangeland but we could not find any tick of *Rh. (Boophilus) kohlsi* in domestic animals.

**Keywords:** Tick, *Rhipicephalus (Boophilus) kohlsi*, Goat, Iran

### Introduction

In the recent years, the number of researches about the effects of climatic factors affecting the interactions between vectors, hosts and pathogens are increased. In this sense many studies have been conducted to understand the tick species composition. Fantastic studies concerning ticks were of interest to evaluate the distribution and composition of species affecting livestock, thus it was a main step in our knowledge of the pathogens that they may transmit by tick and cause economic effects on animal production and public health (1). The comprehensive list of ixodid ticks of different host is documented by some authors in Iran. Mazlum, described a list of adult ticks collected from domestic animals in different regions (2), Hoogstraal *et al.* reported some data on 17 species of ixodid and argasid ticks from wild sheep (*Ovis orientalis*) and wild

goat (*Capra hircus aegagrus*) in Iran (3, 4) and Filipova *et al.* presented data for 642 specimens of ixodid ticks taken from small-size wild mammals (chiefly rodents) in different ecological and zoogeographical zones of this country (5). All of these studies has confirmed that *B. annulatus* has just only species of this genus which recorded from animals in Iran (6).

The aim of this study was to evaluate possible relationship of tick fauna between wild and domestic animals

### Materials and Methods

In summer time of 2004, during the research that has been conducting on tick fauna in central part of Iran, we encountered a six year old dead male wild goat (*Capra hircus aegagrus*) from Kolah Qazi national park in Isfahan Province. The goat was examined for ectoparasites.

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However, a collection of 21 adult female and 15 male hard ticks, all representing a single species of tick collected under the tail. The specimens preserved in 70% alcohol in glass vial and brought to laboratory for identification. In order to distinguish species relationships between wild and domestic animals, tick sampling has been achieved in 7 different places located around Kolah Qazi national park. More than one hundred sheep and goats belonging to 15 different herds were inspected. Tick sampling was performed on the whole body of each animal. Stereoscopic microscope (Zeiss) was used to determine the main characters of each tick and speciation has been done according to criteria which have been described by Walker *et al.* (7).

## Results

The comparison of ticks obtained from sampled animals showed no differences in each of these 7 places. Our observations demonstrated that the most of sampled animals in the area were infested. *Ornithodoros canesterinii* was the only soft tick which has been found. *Rhipicephalus turanicus*, *Hyalomma marginatus*, *H. anatolicum anatolicum* and *H. asiaticum asiaticum* were presented as ixodid tick fauna of domestic animals in these places. Important descriptions of ticks isolated from wild goat strongly supported that the tick species in this collection was *Rh. (Boophilus) kohlsi*.

### Tick descriptions

#### Males

Hypostome with 4+4 columns of teeth (Fig.1) palpal article 1 with an internal protuberance which has a distinct seta, caudal appendage present., coxa 1 with a medium external spur and a short internal spur, adanal and accessory ventral plates have distinct spurs but these spurs do not extend beyond the posterior margin of the body (thus they are not visible from the dorsal view). Ventral plates and conscutum both have large and irregular punctuations. Genital aperture is

wider (from side to side) than it is long from anterior to posterior (Fig. 2, 3).

#### Females

Hypostome with 4+4 columns of teeth, palpal article 1 with an internal protuberance which has a distinct pectinate seta, basis capituli has a posterior dorsal margin which is convex, basis capituli has small but distinct cornua at the posterior dorsal margin eyes are of medium size (similar in size to the porose areas), porose areas are piriform (shaped like a pear or dripping water), coxa 1 with short spurs of equal length.



**Fig. 1:** Hypostome with 4+4 columns of teeth, palpal article 1 with an internal protuberance which has a distinct seta



**Fig. 2:** *Rhipicephalus (Boophilus) kohlsi*, male, dorsal view, caudal appendage present, conscutum has large and irregular punctuations



**Fig. 3:** *Rhipicephalus (Boophilus) kohlsi*, male, ventral view, ventral plates has large and irregular punctuation. coxa 1 with a medium external spur and a short internal spur, adanal and accessory ventral plates have distinct spurs

### Discussion

Previous works by Hoogstraal *et al.* (3, 4) and Filipova *et al.* (5) presented data for 24 species of ixodid ticks taken from wild animals in Iran. All of these studies have confirmed that *B. annulatus* species has just occurred in animals in Iran. It seems that it is the first report of *Rh. (Boophilus) kohlsi* in Iran. Wild sheep and goats occur throughout Iran except in forest and other tall vegetation but goats prefer rocky, precipitous terrain. Both animals inhabit high altitude over than 3000m in many of national park and protected regions. Although open rangeland has been grazed occasionally by wild and domestic animals but in this survey, we could not find any tick of *Rh. (Boophilus) kohlsi* in domestic animals. *Rh. (Boophilus) kohlsi* is a typical species within the sub-genus *Boophilus* (8, 9). Aeschliman and Morel have described the morphological characteristic of *Boophilus geigy* and *Boophilus kohlsi* (10). *Rh. (Boophilus) kohlsi* is restricted to sheep and goats and occasionally horses and reported from Syria, Iraq, Israel, Jordan (11), Western Saudi Arabia (12). It is also endemic to West Africa (7).

All ticks isolated from domestic animals except *Rh. turanicus* which was previously reported (2). The distribution of *Rhipicephalus* species in

Iran showed that *Rh. turanicus* is a minor species among three species of *Rhipicephalus* that recorded in different parts of Iran but this species is dominant in mountainous area in central part of the country (13). It can be concluded that, the rangeland where has been grazed occasionally by wild and domestic animals, could not be a main factor of distribution of *Rh. (Boophilus) kohlsi* in Iran.

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