

Research Article

An Infestation by *Hyalomma Aegyptium* (Acari: Ixodidae) on the Lesions of Break Carapace of a Turtle (*Testudo Graeca Ibera*)

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- *Testudo graeca*
- Zoonotic pathogens

Abstract

The main goal of this study is showing that parasites can be in uncommon locations compared to their common choice localities on the host's body. With this in mind, if we don't pay attention to this subject, it is possible that humans get infested by pet's parasites and these parasites may carry the zoonotic pathogen. A damaged turtle (*Testudo graeca iberica*) with the broken carapace referred to Faculty of veterinary medicine of Shahrekord University (it should be said here which country is it), for treatment of the fracture of carapace. During the first examination of carapace, 6 ticks were removed from lesions and the samples were sent to the laboratory. Ticks species were identified and confirmed as *Hyalomma aegyptium* (Acari: Ixodidae). This study has revealed that recognition of this parasite should be considered, because they can infested many different animals including turtles, and could carry zoonotic pathogens. A suitable control of these parasites is recommended, as they could represent an important vector of infectious agents for livestock and humans.

INTRODUCTION

Testudo graeca Linnaeus, the Spur-Thigh Tortoise, can be found in North Africa, from Morocco to Libya, as well as in Europe, from southern Spain, the Balearic Islands, to Sardinia and Sicily; east of a gap in the Italian and western Balkan Peninsula, the range area continues from eastern Romania, Serbia, Bulgaria, Macedonia and Greece across most of Turkey, into the Transcaucasia countries, and as far as Lebanon, Syria, Jordan, Iraq and Iran in the Near East is distributed [1,2] the whole sentence needs to be rephrased and cut into 2 or 3. *Testudo graeca* lives from sea level to about 2700 m and occurs on dry open steppes, barren hillsides and wastelands, where vegetation varies from sea dune grasses to scrub thorn or dry woodlands [3], but also in vineyards and gardens. What about Iran in particular – they are kept as pets or not? Can you find them in a nature?

Hyalomma ticks are often the most abundant tick parasites of livestock, in warm, arid, and semiarid, generally harsh lowland and middle altitude biotopes, and those with long dry sea-

sons, from central and southwest Asia to southern Europe and southern Africa. Of the 30 known *Hyalomma* spp., over 15 are important vectors of infectious agents to livestock and humans. Hyalommines are mostly moderately large to large ticks with long mouthparts [4].

Hyalomma aegyptium is a hard-tick with a typical three-host life cycle. The main hosts for adults are Pale arctic tortoises of the genus *Testudo* [5]. Also rare cases of adult stage ticks were reported in other hosts, like hedgehogs and hares. Nevertheless, larvae and nymphs of *H. aegyptium* are less host-specific and feed on various vertebrates: tortoises, lizards, birds, small mammals and even humans [6]. Is this the situation also in Iran? How is it? Can *Hyalomma aegyptium* be found? Where, which hosts?

Several pathogens were detected in *H. aegyptium* contain *Theileria annulata* [7], *Borrelia turcica* [8], Rickettsia spp and *Borrelia burgdorferi* [9]. Experimental trials are usually long and difficult to perform, hence the need for a preliminary assessment of the carrier status in natural populations. Until

now, experimental proof of the vector capacity of *H. aegyptium* was shown for several pathogens: *Hemolivia mauritanica* [10], *Hepatozoon kisrae* [11], *Rickettsia aeschlimannii* [12] and *Coxiella burnetii* [13].

The aim of this study was to describe a rare report of *Hyalomma aegyptium* in a turtle with damaged carapace which sometime lives near humans and is even kept as pet animal in homes, and to point out that *Hyalomma aegyptium* may carry many important zoonotic pathogens, and know the facts about *Hyalomma aegyptium* and its diagnosis. Why is this important or unusual?

MATERIAL AND METHODS

On October 2012, a damaged turtle (*Testudo graeca iberica*) with the braked carapace and about 8 years old (Figure 1) was found in the mountains around of Shahrekord town (latitude, 32° 19' 32" N and longitude, 50° 51' 52" E), in Southwest of Iran. It was brought to the Faculty of Veterinary Medicine, Shahrekord University for the treatment of the fracture of carapace. In first examination of carapace, 6 ticks were removed from lesions. For the confirmation of identification, ticks were sent in ethanol 70%, containing 5% glycerine to the laboratory. There were no any other ticks in other parts of turtle's body. Removed ticks were washed by Potassium hydroxide 10% then imaged by optical microscope.

RESULTS AND DISCUSSIONS

Removed ticks species were identified and confirmed as *Hyalomma aegyptium* (Acari: Ixodidae), according to the Walker

et al. 2003, 4 ticks were female (Figure 2) and 2 ticks were male (Figure 3).

Figure 4 shows the mouth appendix and arrow shows external spur and internal spur of ticks. In figure 5 broad ad-anal plates and reduced sub-anal plates are marked with an arrow.

Ticks belong to suborder named meta-stigmata, the order of Acarina that can be found on reptiles. These ticks are not usually dangerous to humans, although they can bite humans and pets, and also can carry several pathogens, which cause relapsing fever and western equine encephalitis viruses in humans. Results of current studies have shown the case with which exotic ticks have been introduced into other countries carried on imported reptiles and disseminated from importers to breeders, zoos, wildlife theme parks, pet stores and private hobbyists [14].

Hyalomma aegyptium has been commonly recorded in cattle and buffaloes from Balkan countries, Pakistan, Russia, India, and southern Marmara Region of Turkey by various authors [15]. Also there is a rare report of infestation by *Hyalomma aegyptium* on Spur-thighed Tortoise (*Testudo graeca*) in Urmia Region in West Azerbaijan province in north-east of Iran [16].

Ticks can be vectors of important pathogens of humans and animals and serve as indicators of infection in nature [17]. The geographical distribution and habitats of several generalist tick species have expanded in the recent years. Major drivers for this trend include land use, climate changes and globalization [18]. However, in general, a decrease in the availability of natural host populations could lead to host-switching behavior [19].



Figure 1 Damaged carapace of turtle (*Testudo graeca iberica*).

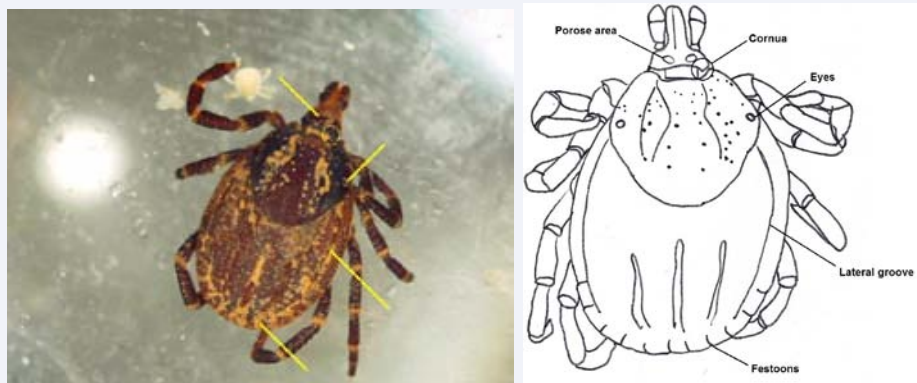


Figure 2 Female tick.

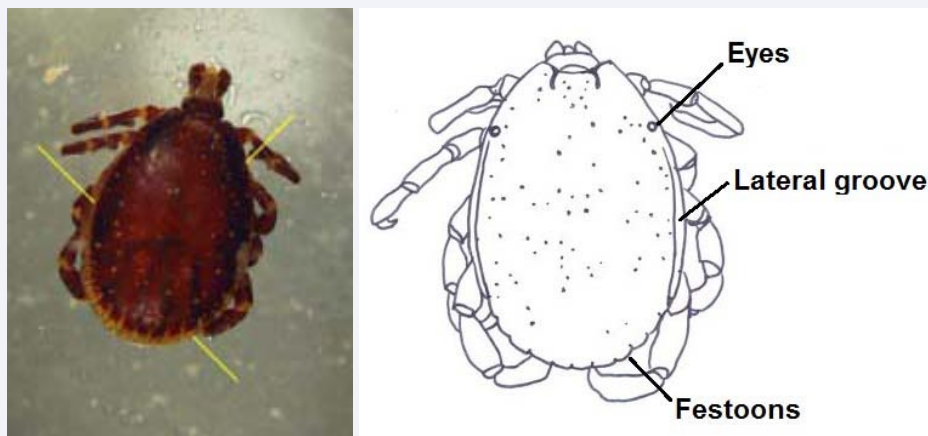


Figure 3 Male tick.

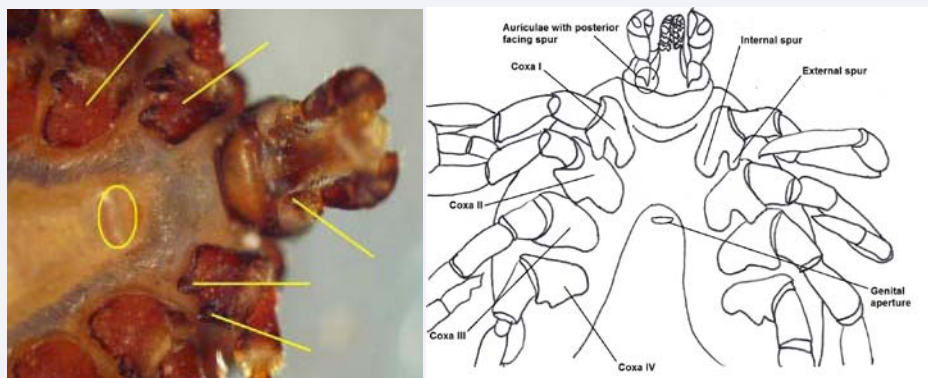


Figure 4 Mouths appendix of tick.

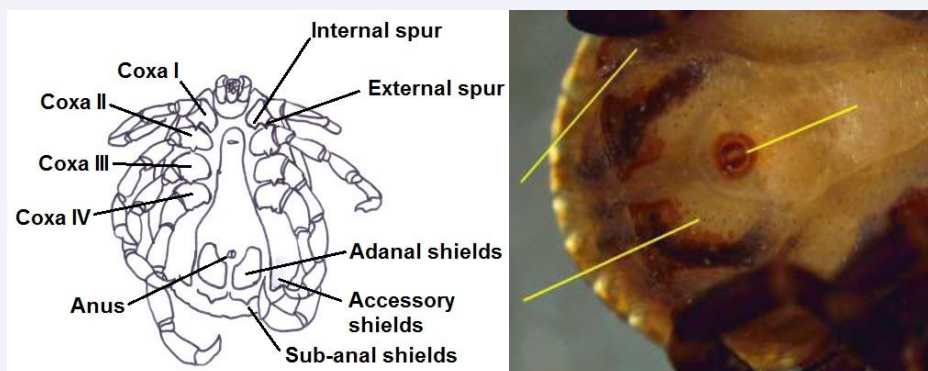


Figure 5 Broad adanal plates and reduced subanal plates.

In Romania, all stages of *H. aegyptium* were found on only two hosts, the Spur-thigh tortoise, *Testudo graeca* and the Northern White-breasted hedgehog, *Erinaceus roumanicus* and its distribution matches the one of the tortoise host [20]. Reptiles can serve as reservoirs for numerous important pathogens [21].

In southern Europe the hosts of *H. aegyptium* are primarily tortoises but also lizards, dog, horse, hedgehog, hamster and birds. In Italy *H. aegyptium* has occurred on partridge, in Egypt, on quail, pigeon, chats and warblers [22]. *H. aegyptium* were

reported from cattle and buffaloes from, Pakistan, Turkey and India [23].

In 1935, Brumpt had conducted a study on tick genus *Ornithodoros* [24]. Subsequently, Delpy published a paper on the family of Ixodidae genus *Hyalomma* in 1936 [25]. Baltazard explained the characteristics of *Ornithodoros* ticks [23]. Abbasian listed the name of Iranian ticks in 1960 [26] this can be listed here as comparison.

It has been known for many years that reptiles imported into

other locations were on occasion infested with ticks [27]. At least eight exotic tick species were being imported into Florida on reptiles [28].

In this study Removed ticks species were identified and confirmed as *Hyalomma aegyptium* (Acari: Ixodidae), according to the Walker et al. 2003. This study shows that ectoparasites can infest every species of animals in every climate, even in cold climates such as Shahrekord.

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