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Mini Review

Introduction of the exotic tick *Hyalomma truncatum* on a human with travel to Ethiopia: A case report

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**A R T I C L E   I N F O**

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**A B S T R A C T**

An Oregon resident returned from a photography trip to Ethiopia with a male *Hyalomma truncatum* tick attached to the skin on his lower back. The tick was identified morphologically and deposited in the U.S. National Tick Collection housed at Georgia Southern University, Statesboro, Georgia. The public health importance of *Hyalomma* species of ticks and diagnostic dilemmas with identifying exotic ticks imported into the U.S. are discussed.

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**C a s e   r e p o r t**

A 59-year-old previously healthy male presented to his primary care clinic on December 9, 2013, after discovering a tick on his lower back the preceding day. He had initially mistaken the tick for a skin tag and bluntedly removed it. After identifying it as a possible tick, he placed it in a plastic bag with moistened napkin and placed it in the refrigerator. The patient had returned from a photography trip to Ethiopia where he had visited several rural towns and villages approximately 5 days prior to presentation. After returning to the U.S., he had spent time in California but did not hike nor camp. The patient had reported a self-limiting headache the previous day and chills during the flight home. He was otherwise asymptomatic and had not experienced arthralgias or myalgias. On examination, the patient was afebrile and appeared well. The area surrounding the attachment site was raised, firm, and tender, surrounded by a reddened, concentric rash that was three inches in diameter [Fig. 1]. The case was discussed with the local infectious disease specialist via telephone. Given the patient's mild symptoms, serologies were not recommended unless he developed worsening symptoms. However, because of the risk of acquiring rickettsial diseases with this species of tick, the patient was started on 100 mg doxycycline twice daily for a total of 21 days.

The tick was sent to the Oregon State University Plant Clinic for identification, where it was determined to be a genus or species of hard tick not commonly occurring in the Pacific Northwest. Digital images of the tick were shared with the first author, who made the tentative identification of an adult stage *Hyalomma*. Diagnostic features supporting the genus-level identification included the presence of eyes, irregular festoons, elongate mouthparts, an inornate dorsal shield, and a characteristic banding pattern seen on the legs of many *Hyalomma* species [Fig. 2], as well as having the spurs on the forecoxae subequal in length [Fig. 3] (Mathison and Pritt, 2014). Digital images were shared with Dr. Dmitry Apanaskevich at the U.S. National Tick Collection (USNTC) at Georgia Southern University who suggested an identification of *H. truncatum*. The specimen was forwarded to the Centers for Disease Control and Prevention, Division of Parasitic Diseases and Malaria, where the identification of *H. truncatum* was confirmed based on the following morphologic criteria: a dorsal shield irregularly punctate, denser posteriorly; lateral grooves [Fig. 2] deep and reaching the eyes; subanal plates in-line with the anal plates [Fig. 3] (Apanaskevich and Horak, 2008c). The specimen (a male) was deposited in the USNTC for archiving.
Discussion

Hyalomma is one of the most medically important tick genera in the Old World. Species in this genus have been reported to transmit a variety of viral, bacterial, and parasitic diseases of medical and veterinary importance (Bakheit et al., 2012). One of the most important human viral agents transmitted by Hyalomma spp. is Crimean-Congo hemorrhagic fever (CCHF) virus. Sexually and transovarially transmission of CCHF virus was observed experimentally in Hyalomma truncatum (Gonzalez et al., 1992). In addition, extensive documentation exist showing that several tick species transmit this virus in different geographical areas of the world: H. marginatum in southern Russia, Turkey, and the Balkan and Crimean Peninsulas, H. anatolicum in Iran, Pakistan, Turkmenistan, and Tajikistan, H. asiaticum from central Asia to China, and H. rufipes in Africa (Hoogstraal, 1979; Bakheit et al., 2012; Goddard, 2012).

Other important disease agents of humans and their documented vectors include Rickettsia conorii (H. rufipes and H. truncatum), R. aeschlimannii (H. marginatum, H. truncatum, and H. scupense), R. sibirica (H. asiaticum, H. excavatum, and H. truncatum), Anaplasma phagocytophilum (H. lusitanicum), and Coxiella burnetii (H. aegyptium and H. scupense) (Beati et al., 1997; Bakheit et al., 2012; Goddard, 2012), and Dugbe virus (Hoogstraal et al., 1981). Kumsa et al. (2014) detected R. aeschlimannii in H. marginatum and H. truncatum in Ethiopia. Paștiu et al. (2012) found H. aegyptium naturally infected with Ehrlichia canis and A. phagocytophilum in Romania. Hyalomma truncatum has been suggested as a possible vector of Rift Valley fever virus (Linthicum et al., 1989; Nchu and Rand, 2013). Hyalomma species have also been implicated in tick paralysis in humans (Edussuriya and Weilgama, 2003; Gürbüz et al., 2010; Doğan et al., 2012). In general, prophylaxis is not recommended for prevention of rickettsial or viral tickborne infections (Wormser et al., 2006; Bakken et al., 2006). However, a course of ribavirin may be considered for prophylaxis of CCHF in individuals at high risk of severe disease (Appananaavar and Mishra, 2011).

There are scattered reports in the literature of Hyalomma species being imported into the United States, most-commonly on animals and animal products. Mertins and Schlater (1991) documented five species of Hyalomma on ostriches imported from Africa and Europe. Burridge and Simmons (2003) documented H. aegyptium imported on Greek tortoises to New York, Florida, and North Carolina. Becklund (1968) and Keirans and Durden (2001) presented comprehensive overviews of imported ticks into the U.S. Most of the records for Hyalomma spp. are from animals or products made from animals (e.g. trophy hides), but Keirans and Durden (2001) did report one case of H. marginatum being found on a human with travel history to Greece. In the USNTC, there is a specimen of H. truncatum collected from a human in Illinois following travel to Botswana (Dmitry Apanaskevich, pers. comm. 2013). Hyalomma truncatum has a wide host range; Apanaskevich and Horak (2008c)
documented seven mammalian hosts for the immature stages and 18 mammalian hosts (including humans) for adults in South Africa. As such, the risk for a person to acquire this tick in an endemic area would be greater than for those species whose normal hosts are tortoises and fossorial or other wild animals that have less human contact.

Because *Hyalomma* species are not native to North America, medical practitioners and diagnostic microbiologists and parasitologists may not consider them in the differential diagnosis when identifying ticks removed from patients treated in the U.S. Given their morphologic features (elongate mouthparts, eyes present, festoons present), *Hyalomma* spp. might be misidentified as *Amblyomma* in most keys to North American ticks. *Hyalomma* can best be separated from *Amblyomma* by having festoons of varying size, an inornate dorsal shield (scutum), and spurs on the coxae I roughly equal in length (Mathison and Pritt, 2014). Many *Hyalomma* species also have a characteristic banding pattern on their legs whereby the legs are dark with white maculae at the joints (Fig. 2).

Regional keys for *Hyalomma* are available for the United Kingdom (Arthur, 1963), Russia [former U.S.S.R.1] (Pomerantz et al., 1950), Sudan (Hoogstraal, 1956), Uganda (Matthysse and Colbo, 1987), Saudi Arabia (Hoogstraal et al., 1981), Pakistan and the Indian subcontinent (Kaiser and Hoogstraal, 1964), and Iran (Hosseini-Cheghini et al., 2013). Recent systematic treatments are available for the subgenera *Euhyalomma* (Apanaskevich and Horak, 2005a,b, 2007, 2008a,b,c,d, 2009, 2010a,b) and *Hyalommina* (Apanaskevich et al., 2009). As with other ectoparasites, detailed travel history can be important for obtaining a definitive diagnosis of ticks, as well as to help assess the risk of vector-borne diseases.

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**References**


