

## Case Presentation

# *Amblyomma* spp. Tick Parasitizing a Veterinarian, an Occupational Risk

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## Abstract

Ticks of the genus *Amblyomma* are blood-sucking arthropods that parasitize humans and potentially transmit pathogens of public health relevance. In the event of a tick bite, it is imperative to understand the correct method for removing, preserving, identifying and potentially utilizing them for the purpose of pathogen detection. Healthcare professionals and the public should be aware of the health implications associated with these ectoparasites. Specimen handling could have been improved to facilitate precise species determination and screening of pathogens with public health significance.

## Background

Ticks are classified within the taxonomic order Ixodidae, which comprises a diverse group of hematophagous arthropods that have the capacity to parasitize humans and domestic and wild animals. There are three families of ticks, which compose the order Ixodidae; the soft ticks (Argasidae), the hard ticks (Ixodidae) and a family, consisting of a species that combines characteristics of hard and soft ticks (Nuttalliellidae) [1]. The genus *Amblyomma* has the highest number of described species among hard ticks worldwide except Antarctica, are known for their aggressiveness and play a very important role in veterinary public health [2]. For example, ticks of the genera *Haemaphysalis*, *Ixodes*, and *Rhipicephalus* are known to wait for their potential host by perching on vegetation; in contrast, ticks of the genera *Amblyomma* are proactive hunters, searching for their potential host by moving along the ground [3].

Ticks of the genus *Amblyomma* can parasitize any terrestrial vertebrate, including amphibians, birds, mammals and reptiles [4]. Worldwide, the genus *Amblyomma* has 136 species [5], while in Mexico is represented by 26 species [4]. Several species of the genus *Amblyomma* has been reported

parasitizing humans worldwide [6-11] and Mexico is not the exception as for this type of reports [12-16]. In this study, we present a case of an *Amblyomma* tick feeding on a veterinarian while working in a field setting.

## Case presentation

The infestation was first documented on 4 November 2024 on a farm in the municipality of Marquelia, in the state of Guerrero, Mexico. Subsequent to the termination of the working day at the aforementioned location, the veterinary surgeon observed the ectoparasite attached to the skin of his hand after a brief period of managing cattle. The ectoparasite was observed in the fold of the junction of the between the metacarpal and trapezium bones (Figure 1). At the time of the incident, the individual did not possess any materials with which to preserve the specimen. Consequently, he was only able to obtain a photograph, and subsequently removed the specimen from his hand, crushing it between two stones. The area was thoroughly cleaned with soap and water, with the addition of iodine solution to ensure disinfection. The attachment site had not become inflamed or painful, and consequently, the individual did not show symptoms of tick-borne disease or that would raise suspicion of such a

## More Information

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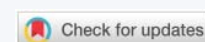
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**Figure 1:** The image shows the tick hypostome embedded in the fold of the junction in the right hand (November 4, 2024). The tick has pale rings on its legs and ornamentation on its shield, characteristic of the *Amblyomma* genus.

condition. Following the collection of photographic evidence, an approximate estimation of the tick gender could be made.

## Discussion

As general features, adult ticks of the genus *Amblyomma* usually measure between 6-7 mm, their mouthparts are elongated, their legs have pale rings, and their shield is ornate [17]. Ticks of this genus have a three-host life cycle, it is slow and can last from a few months to several years; larvae emerge from eggs, feed once on a host, then detach and burrow into the soil or vegetation to molt to nymph; on this stage feeds once and molts into either a female or a male; the female feeds once, mates, detaches to lay eggs, and then dies, whereas the male may feed several times, mate, and eventually die; the life cycle of three-host ticks is slow, from six months to several years in natural conditions [17]. Under laboratory conditions, variations in the life cycle of some *Amblyomma* species have been reported; for more specific details regarding the duration of life cycle developmental events, please consult the listed references [18-23].

It is known the potential of *Amblyomma* spp. ticks on pathogen transmission [24-27]. In view of the above, individuals involved in high-risk outdoor activities to pay attention to any bites by one or more ticks, as well as to any possible signs consistent with a disease transmitted by these ectoparasites [28]. Especially, some ticks can carry multiple pathogens simultaneously, capable of producing coinfections [29,30]. There are records of the genus *Amblyomma* parasitizing humans in various parts of the world, among these, the species *A. americanum* [8], *A. albolimbatus* [7], *A. hebraeum* [11], *A. parkeri* [6], *A. neumani*, *A. parvum* and *A. tigrinum* [10] have been mentioned; while in Mexico the species *A. americanum* [16], *A. cajenense* [16], *A. dissimile* [15,16], *A. maculatum* [16], *A. mixtum* [12,13], *A. parvum* [13] are mentioned.

According to the general prevention rules, any tick that is located on the body should be removed immediately and completely [31]. Normally, the mechanical method is employed, using the fingers; however, if the proper knowledge is not available, the head or mouthparts of the

tick may remain in the skin, with the resulting complications [32,33]. Even depending on the species of tick and its location, surgical removal may be necessary [34]. There is evidence that a feeding tick can begin transmitting pathogens from 15 minutes to 72 hours post-attachment, depending on the pathogen [35-40]. Regardless of how the tick was removed from the skin, people should be monitored for up to 30 days for signs and symptoms of a possible tick-borne illness [22].

Ticks are blood-feeding arthropods known to parasitize humans, particularly those exposed to natural or animal environments. The public should be educated on proper tick bite management, including the safe removal of the tick and the utilization of specialist services. In order to accurately identify the genus and species of arthropod, it is imperative to take appropriate measures to ensure the proper preservation of the specimen. If circumstances permit, a diagnostic test should be conducted in order to whether the arthropod is harboring a pathogen of medical significance. Furthermore, it is imperative that health professionals receive adequate training to offer proper guidance to individuals who have suffered a tick bite. It is evident that the appropriate handling of the specimen, including its collection and preservation, would have greatly improved species identification of the species in question. Moreover, its potential utilization in the identification of pathogens that may pose a public health risk would have been greatly enhanced.

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