



Nota Científica

First records of the ticks *Amblyomma calcaratum* and *A. pacae* (Acari: Ixodidae) parasitizing mammals of Mexico

Primeros registros de las garrapatas *Amblyomma calcaratum* y *A. pacae* (Acari: Ixodidae) parasitando mamíferos de México

Carmen Guzmán-Cornejo^{1*}, Tila M. Pérez¹, Santiago Nava² y Alberto A. Guglielmone²

¹ Colección Nacional de Ácaros, Instituto de Biología, UNAM, 3er Circuito exterior s/n Ciudad Universitaria, Coyoacán, 04510 México D.F., México.

*Correspondent: cguzman@ibiologia.unam.mx

² Instituto Nacional de Tecnología Agropecuaria, CC 22, C.P. 2300 Rafaela, Santa Fe, Argentina

Abstract. Based on study of ticks deposited in the Colección Nacional de Ácaros, Instituto de Biología, Universidad Nacional Autónoma de México, we report the first records in Mexico for two species of *Amblyomma*: *Amblyomma calcaratum* ex *Tamandua mexicana*, and *Amblyomma pacae* ex *Tapirus bairdii*. These new records increase the number of species recorded for the genus *Amblyomma* in Mexico to 26.

Key words: *Amblyomma calcaratum*, *Amblyomma pacae*, Ixodidae, Mexico.

Resumen. Basado en la revisión de garrapatas depositadas en la Colección Nacional de Ácaros, Instituto de Biología, Universidad Nacional Autónoma de México, establecemos los primeros registros en México para 2 especies del género *Amblyomma*: *Amblyomma calcaratum* ex *Tamandua mexicana* y *Amblyomma pacae* ex *Tapirus bairdii*. Estos nuevos registros incrementan a 26 el número de especies del género *Amblyomma* distribuidas en México.

Palabras clave: *Amblyomma calcaratum*, *Amblyomma pacae*, Ixodidae, México.

The genus *Amblyomma* (Koch, 1844) is one of the largest within Ixodida, and includes 130 species (Horak et al., 2002). Twenty four species have been recorded in Mexico parasitizing amphibians (2 species), reptiles (6), birds (2) and mammals (14), distributed mainly in the Neotropical region (18 tick species) (Table 1).

As a part of a program to catalogue the ticks deposited in the Colección Nacional de Ácaros (CNAC), Instituto de Biología, Universidad Nacional Autónoma de México, specimens belonging to the genus *Amblyomma* were studied: *Amblyomma coelebs* Neumann, 1899 ex *Tamandua mexicana* (Saussure, 1860) from Catemaco, Veracruz, and *Amblyomma pacae* Aragão, 1911 ex *Tapirus bairdii* (Gill, 1865) from Tuxtla Gutiérrez, Chiapas.

Tick species were re-identified following Jones et al. (1972), Guimarães et al. (2001), and descriptions of Robinson (1926), Boero and Prosen (1955), Aragão and Fonseca (1961), and Boero and Delpietro (1971). For comparative purposes, photographs of *Amblyomma calcaratum* Neumann, 1899 and *Amblyomma nodosum* Neumann, 1899 were kindly provided by D. M. Barros-Battesti (Instituto Butantan, São

Paulo, Brazil).

The specimens identified originally as *A. coelebs* were re-identified as *A. calcaratum*, while identification of *A. pacae* was confirmed. Additionally, we present morphological diagnoses of both species, discussing briefly the main characteristics used in their determination.

Amblyomma calcaratum Neumann, 1899

Male: Scutum long and oval, with numerous punctations, largest in the antero-lateral fields; flat eyes, dentition of hypostome 3/3, marginal groove absent, dorsal base of capitulum broad, with strong cornua. Coxa I with two spurs almost equal in length; coxae II and III with one short, triangular spur; coxa IV with a spur at least three times longer than spurs on coxae II and III (Fig. 1); palps short and thick with a posterodorsal point on palpal article II.

Female: As for male except: scutum cordiform; dorsal base of capitulum triangular; spur on coxa IV about two times longer than spurs on coxae II and III; palps long and slender; palpal article II with a slight oblique ridge.

Host: *Tamandua mexicana* (Myrmecophagidae).

Locality: Catemaco (18°25'N 95°06'W), May 29, 1964.

Material studied: 1 male and 3 females labeled as *A. coelebs*

Table 1. Species of the genus *Amblyomma* recorded in Mexico.

Tick species	Hosts group	Distribution in Mexico	Reference
<i>A. americanum</i> (Linnaeus, 1758) †	Mammals	Nearctic	Hoffmann and López-Campos, 2000
<i>A. auricularium</i> (Conil, 1878)	Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. cajemense</i> (Fabricius, 1787)	Mammals, Reptiles	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. coelebs</i> Neumann, 1899	Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. dissimile</i> Koch, 1844	Amphibians, Mammals, Reptiles	Neotropical	Hoffmann and López-Campos, 2000
<i>A. imitator</i> Kohls, 1958	Birds, Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. inornatum</i> (Banks, 1909)	Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. longirostre</i> (Koch, 1844)	Birds, Mammals	Neotropical	Hoffmann and López-Campos, 2000
<i>A. maculatum</i> Koch, 1844	Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000; Woodham et al., 1983
<i>A. nodosum</i> Neumann, 1899	Mammals	Neotropical	Keirans, 1982
<i>A. oblongoguttatum</i> Koch, 1844	Mammals	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. ovale</i> Koch, 1844	Mammals	Neotropical	Hoffmann and López-Campos, 2000
<i>A. parvum</i> Aragão, 1908	Mammals	Neotropical	Hoffmann and López-Campos, 2000
<i>A. pecarium</i> Dunn, 1933	Mammals	Neotropical	Hoffmann and López-Campos, 2000
<i>A. rotundatum</i> Koch, 1844	Amphibians, Reptiles	Nearctic, Neotropical	Hoffmann and López-Campos, 2000
<i>A. sabanerae</i> Stoll, 1894	Reptiles	Neotropical	Hoffmann and López-Campos, 2000
<i>A. triste</i> Koch, 1844	Mammals	Nearctic	Woodham et al., 1983 †; Guzmán-Cornejo et al., 2006
<i>A. breviscutatum</i> Neumann, 1899 = (<i>A. cyprium</i> Neumann, 1899; <i>A. quasicyprium</i> Robinson, 1926) *	Mammals	Neotropical	Keirans, 1985
<i>A. elaphense</i> (Price, 1959) = (<i>Aponoma elaphense</i> Price, 1959)	Reptiles	Nearctic	Degenhardt, 1986
<i>A. scutatum</i> Neumann, 1899 = (<i>A. castañedai</i> Vargas and Hoffmann, 1952)	Reptiles	Neotropical	Hoffmann and López-Campos, 2000
<i>A. humerale</i> Koch, 1844 ‡	?	?	Vargas, 1955
<i>A. multipunctum</i> Neumann, 1899 ‡	?	?	Vargas, 1955
<i>A. tigrinum</i> ‡ Koch, 1844	?	Neotropical	Graham et al., 1975
<i>A. tuberculatum</i> Marx, 1894 †	?	Neotropical	Woodham et al., 1983
<i>A. varium</i> Koch, 1844 ‡	?	?	Vargas, 1955
New records			
<i>A. calcaratum</i> Neumann, 1899	Mammals	Neotropical	This work
<i>A. pacae</i> Aragão, 1911	Mammals	Neotropical	This work

†The distribution of these species is essentially Nearctic; the record of *A. americanum* from Veracruz by Hoffmann and López-Campos (2000), lacks information about locality and host, and the record in Chiapas by Ortega Gutiérrez (1979) needs to be confirmed. Likewise, the record of *A. tuberculatum* from Quintana Roo, Campeche and Yucatán needs also be confirmed. ‡ These records lack information dealing with locality, hosts and reference specimens. * *A. quasicyprium* was described parasitizing primates from Mexico by Robinson (1926). However, Keirans (1985) stated that the specimens of *A. quasicyprium* from Mexico correspond to *A. cyprium* (Type depository: NMHN), and the locality and host used to describe it were incorrect. Currently *A. cyprium* is considered synonymous of *A. breviscutatum*, but the records for this species are for the Oriental and Australian Faunal Regions (Camicas et al., 1998). We consider that Mexican material needs to be re-evaluated, and for that reason we do not include it in the list of species recorded for Mexico.



Figure 1. *Amblyomma calcaratum* male, ventral aspect of article I of palps and spurs coxae I-IV.



Figure 2. *Amblyomma nodosum* male, ventral aspect of article I of palps and spurs coxae I-IV.

(CNAC002037).

Collectors: Halfter and Reyes.

The specimens studied, originally identified as *A. coelebs*, lack the diagnostic characteristics of this species such as: marginal groove in males and a large, elongate, flattened plate ventrally of palpal article I in females (see Boero and Prosen, 1955; Jones et al., 1972). These specimens most closely resemble *A. nodosum* and *A. calcaratum*, which frequently are found simultaneously on the same individual host (Fairchild et al., 1966); however, the male analyzed in this study does not have rugose palps (present in *A. nodosum*), and has a faint ridge on dorsal article II (which is strong in *A. nodosum*); in addition, article I of the palps in males of *A. nodosum* has a large ventral process (vs. small ventral process in the specimen from Catemaco), and a spur on coxa IV shorter than the spurs on coxae II and III, while in our specimen the spurs are at least three times longer (Figs. 1-2). Finally, the base of the capitulum in females originally identified as *A. coelebs* is triangular whereas in *A. nodosum* it is slightly rectangular. Based on these traits, we re-identified the specimens deposited under the accession number CNAC002037 as *A. calcaratum*.

The scutal ornamentation is also used to separate *A. calcaratum* and *A. nodosum* (Aragão and Fonseca, 1961; Jones et al., 1972) but the ornamentation of the Mexican specimens has faded after decades of preservation in alcohol and only small reddish spots remain.

Amblyomma calcaratum usually is found on *Myrmecophaga tridactyla* Linnaeus, 1758 and *Tamandua tetradactyla* (Linnaeus, 1758) from Belize to Argentina (Guglielmo et al., 2003). *Tamandua mexicana* represents

a new host record, but is not surprising considering that this tick species usually parasitizes members of the family Myrmecophagidae. The most northerly record of this species is a male collected from a flannel drag in Kentucky, USA; however, the occurrence of this tick has been referred as accidental by Bloemer et al. (1987).

Amblyomma pacae Aragão, 1911

Female: Scutum with numerous small punctations evenly distributed (Fig. 3); flat eyes. Dorsal base of capitulum subtriangular, without cornua; hypostome with dentition 3/3; two subequal and stout spurs on coxa I (the external slightly longer than the internal); coxae II and III with small and broad spur; coxa IV with a short triangular spur. Trochanters and tibiae without spurs.

Host: *Tapirus bairdii* (Tapiridae)

Locality: Tuxtla Gutiérrez (16°44'N 93°06'W), Chiapas, September 10, 1979.

Material studied: 2 females labeled as *A. pacae* (CNAC002273).

Collector: M. A. Ocampo.

Reexamination of this material allowed us to confirm its original identification, despite the fact that one of the specimens lacks scutal ornamentation, which is considered diagnostic (Aragão and Fonseca, 1961; Guimarães et al., 2001). However, inornate specimens of this tick species have been described (see Jones et al., 1972), and for this reason, the taxonomic validity of this character needs to be confirmed.

The common host of *A. pacae* is *Cuniculus paca* (Linnaeus, 1766), whose range includes southern Mexico (Wilson and Reeder, 1993). The finding of this tick species



Figure 3. *A. pacae* female, scutum.

on *T. bairdii* is the first on this host; however, *A. pacae* has been also found on wild pigs, peccaries (Santos Dias, 1986) and *Tamandua tetradactyla* (Jones et al., 1972) in Suriname and Venezuela. Before the present work, its known range included Belize, Brazil, Colombia, Costa Rica, Guyana, Panama, Paraguay, Suriname, and Venezuela (Guglielmone et al., 2003).

Although the findings of *A. calcaratum* and *A. pacae* are not only the first for Mexico but for North America (due to the record of *A. calcaratum* from Kentucky is considered accidental), they were to be expected. These species are found in South and Central America (Guglielmone et al., 2003) and the current Neotropical localities in southern Mexico appear to be a natural continuation of their distribution range. Both species have been reported infesting humans (Jones et al., 1972; Smith, 1974). Because information is lacking regarding whether or not they act as vectors of pathogens, further studies are needed.

We acknowledge the support of INTA the Asociación Cooperadora INTA Rafaela to AG and SN, and to DGAPA-UNAM for the postdoctoral scholarship of the senior author. To Ricardo Paredes-León and Luis García-Prieto for the revision of the manuscript.

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