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SHORT COMMUNICATION

First report of *Amblyomma dubitatum* (Acari: Ixodidae) parasitizing the crab-eating raccoon, *Procyon cancrivorus* (Carnivora: Procyonidae)

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SUMMARY. In October 2015, a tick nymph was collected from a male *Procyon cancrivorus* found dead at the roadside of the National Road 119 near Mercedes city, Corrientes province, Argentina. The nymph collected was morphologically and molecularly identified as *Amblyomma dubitatum* and it was found infected with the alpha-proteobacterium *Rickettsia bellii*. To the best of our knowledge, this report constitutes the first record of the *A. dubitatum* - *P. cancrivorus* association.

RESUMEN. **Primer reporte de *Amblyomma dubitatum* (Acari: Ixodidae) parasitando al aguará popé, *Procyon cancrivorus* (Carnivora: Procyonidae)**. En octubre de 2015, una ninfa de garrapata fue colectada sobre un ejemplar macho de *Procyon cancrivorus* hallado muerto a la vera de la Ruta Nacional 119 en las cercanías de la ciudad de Mercedes, provincia de Corrientes, Argentina. La ninfa colectada fue identificada morfológica y molecularmente como *Amblyomma dubitatum*, y la misma se encontró infectada con la alfa-proteobacteria *Rickettsia bellii*. Este reporte constituye el primer registro de la asociación *A. dubitatum P. cancrivorus*.

Key words: Amblyomma dubitatum, crab-eating racoon, *Procyon cancrivorus*, Argentina.

Palabras clave: Amblyomma dubitatum, aguará popé, *Procyon cancrivorus*, Argentina.

Introduction

Amblyomma dubitatum is a South American tick with most of the records concentrated in the northeast of Argentina, southeast of Brazil, east of Paraguay and northern half of Uruguay (Nava et al., 2010). The capybara (*Hydrochoerus hydrochaeris*) is the principal host for both immature and adult stages of *A. dubitatum*, but recent findings suggest that small rodents (subfamilies Caviinae and Sigmodontinae) and marsupials (Didelphidae) can be alternative hosts for the larvae and nymphs of this tick (Debárbora et al. 2012; Nava et al. 2010). Adults of *A. dubitatum* were occasionally found in domestic and wild large mammals as cattle, horses, *Tapirus terrestris*, *Mazama gouazoubira*, *Tayassu pecari*, *Axis axis* and *Sus scrofa* (Debárbora et al., 2012; Nava et al., 2010) and all stages of this tick species were recorded biting humans (Labruna et al., 2007; Nava et al., 2010). In addition, *A. dubitatum* has been recently reported as a possible vector of the pathogen *Rickettsia* sp. strain *Atlantic rainforest* and also of *Rickettsia* sp. strain COOPERI, which has unknown pathogenicity but is closely related to the pathogen *Rickettsia parkeri* (Monje et al., 2015).

Procyon cancrivorus, also known as the crab-eating raccoon or Aguará popé, belongs to the Procyonidae family and it is distributed from Central America to the southern cone of South America. In Argentina, it occurs in several provinces from the northern and central region such as Catamarca, Córdoba, Corrientes, Chaco, Entre Ríos, Formosa, Jujuy, Misiones, Salta, Santa Fe, Santiago del Estero and Tucumán (Barquez et al., 2006). This mammal inhabits different environments, from Chaco to jungle, but always near water courses (Redford and Eisenberg, 1992). Currently, the conservation status of this species in Argentina is classified as vulnerable (Ojeda et al., 2012).

The objective of this study is to report the occurrence of *A. dubitatum* parasitizing *P. cancrivorus* in north-eastern Argentina.

Materials and Methods

In October 2015, a male *P. cancrivorus* was found dead at the roadside of the National Road 119 in the surroundigs of a bridge over a small watercourse, 50 km south of Mercedes city, Corrientes province, Argentina (29°36'47"S 58°7'7"W). The site is located in Ñandubay district, part of El Espinal province where the landscape is predominantly soft plain to gently undulating, occupied by lowland forests, savannas and grasslands, now largely converted to agriculture (Burkart et al., 1999). After careful external physical exam, an immature tick (nymph) was recovered from the dead animal and kept in ethanol 96%. The tick collected was taken to the laboratory where it was identified by using the taxonomic keys reported by Martins et al. (2014). The specimen was compared with reference material and it was deposited in the Wildlife Parasite Collection of the Universidad Nacional del Litoral, Esperanza (Santa Fe, Argentina) (Accession number CR00012). Tick species was confirmed by studying the 16S rRNA gene as previously described (Mangold et al., 1998) and the presence of rickettsial DNA was evaluated by gltA PCR (Monje et al., 2016). For this purpose, two tick legs were excised under a stereoscopic microscope and placed in a microtube with 10 µl of TE buffer (pH 8.0). The sample was then heated at 95°C for 20 min in a thermocycler (Ivema T-18) and stored at -20°C until used. PCR products were checked by electrophoresis in a 1.5% agarose gel, column purified and sequenced directly in both directions using amplifying primers.

Results and Discussion

The nymph collected was morphologically identified as *A. dubitatum*. The diagnostic characters were the punctuations in the scutum (large and deep punctuations in the lateral fields, and smaller punctuations in the central field), cervical grooves (long and well forward of the level of the posterior margin of the eyes) and the number and the length of spurs in Coxa I (two spurs, external spur less than twice as long as internal spur). The 16S rRNA gene reported a sequence of 389 bp for the tick nymph analyzed (KX009409), which was 99.7% identical to the corresponding sequence of *A. dubitatum* (GU301911). The gltA PCR resulted in a sequence of 756 bp (KX009409) which was 100% identical to the corresponding sequence of *Rickettsia bellii* (AY375161).

To the best of our knowledge, this report constitutes the first record of the *A. dubitatum* - *P. cancrivorus* association. In addition, the *A. dubitatum* nymph was found infected with *R. bellii*. In a recent study Monje et al. (2015) reported a high prevalence of this bacterium in questing *A. dubitatum* ticks in the same region. *Rickettsia bellii* has never been associated with human or animal infection; however, it could play a significant role in the ecology of pathogenic rickettsiae by interacting with them within ticks.

In conclusion, this new record is of sanitary relevance since all stages of *A. dubitatum* were recorded biting humans (Labruna et al., 2007; Nava et al., 2010), highlighting the need of eco-epidemiological studies involving wild carnivores and its parasites in Argentina.

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