

# RHINELLA MAJOR MULLER & HELMICH, 1936 (ANURA: BUFONIDAE): NEW HOST OF AMBLYOMMA ARGENTINAE NEUMANN, 1905 (ACARI: IXODIDAE) IN THE DRY CHACO OF ARGENTINA

RHINELLA MAJOR MULLER & HELMICH, 1936 (ANURA: BUFONIDAE): NUEVO HOSPEDERO DE AMBLYOMMA ARGENTINAE NEUMANN, 1905 (ACARI: IXODIDAE) EN EL CHACO SECO DE ARGENTINA

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**Abstract.**— During herpetofauna monitoring in Misión Nueva Pompeya locality, Chaco province, Argentina, an adult individual of the toad *Rhinella major* was captured. We examined the specimen and found a tick attached to the ventral surface of its body. The tick was identified as a nymph of *Amblyomma argentiniae*, an ectoparasite considered specific to reptiles. This finding is the first record of this parasite-host association, and increases the host range of *A. argentiniae* up to 16 species.

**Key words.**— Chaco, ticks, toad, parasite-host association.

**Resumen.**— Durante el monitoreo de la herpetofauna en la localidad de Misión Nueva Pompeya, provincia del Chaco, Argentina, se capturó un individuo adulto del sapo *Rhinella major*. Examinamos el espécimen y encontramos una garrapata adherida en la superficie ventral del cuerpo. La garrapata fue identificada como una ninfa de *Amblyomma argentiniae*, un ectoparásito considerado específico de reptiles. Este hallazgo representa el primer registros de esta asociación parásito-hospedador y amplía el rango de hospederos de *A. argentiniae* hasta 16 especies.

**Palabras claves.**— Chaco, garrapatas, sapo, asociación parásito-hospedador.

Currently, the genus *Rhinella* includes 92 species distributed in the Neotropical region (Pereyra et al., 2021), of which 18 are present in Argentina (Vaira et al., 2012). *Rhinella major* Müller & Helmich, 1936 occurs in the Chaco region, Argentina, Bolivia and Paraguay, and in open formations along the rivers Beni, Madeira, Amazonas, Tapajós, and Xingú, and in the Amapá state, Brazil (Narvaez & Rodrigues, 2009). Its distribution in Argentina includes the provinces of Chaco, Corrientes, Formosa, Jujuy, Salta, Santiago del Estero, and Santa Fe. This toad is categorized as a non-threatened species (Vaira et al., 2012). It is moderately sized, insectivorous and inhabits grasslands near water bodies (Zaracho et al., 2011).

The genus *Amblyomma* comprises a group of hard ticks distributed widely across Neotropical and Afrotropical regions (Nava et al., 2017). *Amblyomma* contains 136 species, 25 of which

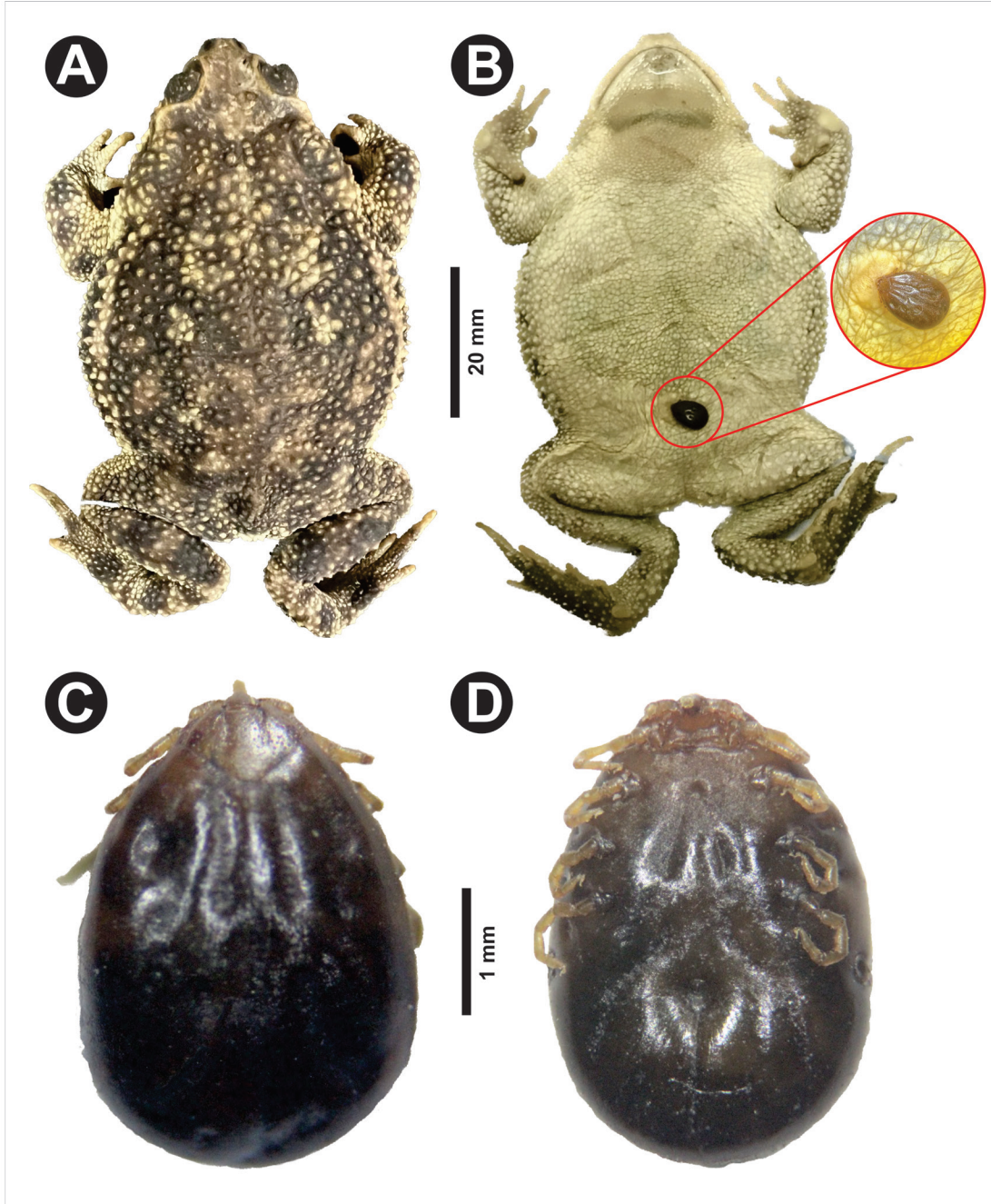
have been recorded in Argentina (Guglielmone et al., 2021). *Amblyomma argentiniae* Neumann, 1905 only has been reported in some Argentinean provinces, in the domain and province of Chaco with predominance in the Chaco and Serrano districts, and the province of Monte (Guglielmone & Nava, 2006; Guglielmone et al., 2021). This tick parasitizes a few species of turtles, lizards, snakes, and on single species of the Amphibia Class, the toad *Rhinella* sp. belonging to the family Bufonidae (see Guglielmone et al., 2021; Ruiz García et al., 2023). Herein, we report the first record of ectoparasitism of *R. major* by the tick *A. argentiniae* in the Dry Chaco of Argentina.

On February 25, 2013, during a reptilian and amphibian survey in Misión Nueva Pompeya locality (24.9388°S, 61.4908°W, 158 m s.n.m.), General Güemes Department, Chaco province, Argentina, an adult male granulated toad *R. major* was collected

by JARG and JAC (70.93 mm SVL; Fig. 1A). According to Morello et al. (2012), this locality belongs to Dry Chaco Ecoregion (Semi-arid Chaco Subregion), complex Bermejito-Teuco-Bermejo. In this complex, the mean annual rainfall varies between 800 mm to the East and 600 mm to the West, concentrated in summer.

Annual mean temperatures varies between 21 °C to the East and 23 °C to the West.

We examined this specimen and found one tick attached to the ventral surface of the toad's body (Fig. 1B). The tick



**Figura 1.** Macho adulto de *Rhinella major* (A) vista dorsal y (B) vista ventral (el círculo rojo indica el sitio donde se encontró la garrapata). Ninfa de *Amblyomma argentiniae* (C) vista dorsal and (D) vista ventral.

**Figure 1.** Adult male of *Rhinella major* (A) dorsal view and (B) ventral view (red circle indicates the site where the tick was found). Nymph of *Amblyomma argentiniae* (C) dorsal view and (D) ventral view.

**Tabla 1.** Lista de anfibios y reptiles parasitados por *Amblyomma argentiniae* y estado de conservación de sus hospedadores. M = machos, F = hembras, N = ninfas, y L = larva. \* De acuerdo a Giraudo et al. (2012), Prado et al. (2012) y Vaira et al. (2012); NT = No amenazada, VU = Vulnerable, T = Amenazada.

**Table 1.** List of amphibian and reptiles parasitized by *Amblyomma argentiniae* and conservation status of their hosts. M = males, F = females, N = nymphs, and L = larvae. \* According to Giraudo et al. (2012), Prado et al. (2012) and Vaira et al. (2012); NT = Not-threatened, VU = Vulnerable, T = Threatened.

Host species	Tick stage	Conservation status in Argentina*	Reference
<b>Amphibia</b>			
<b>Anura</b>			
<b>Family Bufonidae</b>			
<i>Rhinella</i> sp.	MF	?	Guglielmone et al. (2021)
<i>Rhinella major</i>	N	NT	This work
<b>Reptilia</b>			
<b>Squamata</b>			
<b>Sauria</b>			
<b>Family Teiidae</b>			
<i>Teius teyou</i>	NL	NT	Debárbora et al. (2015)
<b>Family Tropiduridae</b>			
<i>Tropidurus etheridgei</i>	N	NT	Debárbora et al. (2015)
<i>Tropidurus spinulosus</i>	N	NT	Debárbora et al. (2015)
<b>Serpentes</b>			
<b>Family Boidae</b>			
<i>Boa constrictor</i>	MFN	T	Guglielmone et al. (2021)
<i>Epicrates cenchria</i>	F	T	Guglielmone et al. (2021)
<i>Eunectes notaeus</i>	MF	V	Guglielmone et al. (2021)
<b>Family Viperidae</b>			
<i>Bothrops neuwiedi</i>	M	NT	Guglielmone et al. (2021)
<i>Crotalus durissus</i>	MFN	NT	Guglielmone et al. (2021)
<b>Family Colubridae</b>			
<i>Chironius maculoventris</i>	N	NT	Ruiz García et al. (2023)
<b>Family Dipsadidae</b>			
<i>Philodryas erlandi</i>	N	NT	Ruiz García et al. (2023)
<i>Philodryas psammophidea</i>	N	NT	Ruiz García et al. (2023)
<b>Testudines</b>			
<b>Family Chelidae</b>			
<i>Acanthochelys pallidipectori</i>	M	T	Ruiz García et al. (2023)
<i>Phrynops hilarii</i>	F	NT	Guglielmone et al. (2021)
<b>Family Testudinidae</b>			
<i>Chelonoidis chilensis</i>	MFNL	V	Guglielmone et al. (2021)

was removed using tweezers, preserved in 70% ethanol, and deposited in the Parasites Collection of Facultad de Ciencias Exactas y Naturales y Agrimensura de la Universidad Nacional del Nordeste, Corrientes, Argentina (UNNEP 173). The toad was fixed in 10% formalin, stored in 70% ethanol, and deposited in the Herpetological Collection Blanca Beatriz Álvarez de la Universidad Nacional del Nordeste, Corrientes, Argentina (UNNEC 13924).

The tick was identified as a nymph of *A. argentiniae* (Fig. 1C and 1D) according to Martins et al. (2014) and Nava et al. (2017). The characteristic morphological structures used to identify this immature stage are the presence of the coxa II with only one spur and the scutum with deep punctations evenly distributed, larger and deeper laterally. The length and breadth of the scutum are: 0.71 mm and 1.02 mm, respectively. The main host of the *A. argentiniae* is the Chaco tortoise *Chelonoidis chilensis*, with which it shares the distribution range and its abundance probably reflects the population dynamics of its principal host (Guglielmone et al., 2001; Nava et al., 2017).

Recent records mention the importance of lizards and snakes as the natural host of *A. argentiniae* (Debárbora et al., 2015; Ruiz García et al., 2023). In Brazil, *R. major* is a common and relevant host of *A. dissimile* and *A. rotundatum* (Guglielmone & Nava, 2010; Calcavante Torres et al., 2018; Alves Coêlho, et al., 2019; Pedroso-Santos et al., 2020). However, although *R. major* is a frequently recorded species in the dry Chaco of the Chaco province, we do not know the role of this species on the populations of *A. argentiniae* due to the little ecological information regarding this tick. In this sense, Guglielmone et al. (2001) mention that it is unclear whether amphibians have the potential to contribute to the maintenance of *A. argentiniae* populations or only represent spillover onto ecologically associated hosts.

Although the majority of records of *A. argentiniae* are associated with reptiles, in Neotropical hard ticks strict host specificity is not common (Nava & Guglielmone, 2013). Five species (33%) of *A. argentiniae* hosts are under some degree of threat (Table 1), therefore, although this report is based on an occasional finding, it is necessary to increase sampling efforts in the study area to obtain more ecological information on these associations, and to update the hosts of this species.

Finally, our study reports for the first time *R. major* parasitized by *A. argentiniae*. Moreover, it represents the second record of an amphibian as a host for this species and extends the number of hosts up to 16 species (Table 1).

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