

# New records for *Amblyomma sculptum* (Ixodidae) on non-passerine birds in Brazil

Novos registros de *Amblyomma sculptum* (Ixodidae) em aves não-passeriformes no Brasil

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## Abstract

The aim of this paper was to provide new records of *Amblyomma sculptum* on two species of terricolous birds in two areas of the Cerrado (savannah-like) bioma: two specimens of *Cariama cristata* were captured in the state of Goiás and one specimen of *Crax fasciolata* was captured in the state of Minas Gerais. One of the *C. cristata* was parasitized by 15 larvae, six nymphs, one male and two females whereas the *C. fasciolata* was parasitized by seven larvae and eight nymphs. This paper presents a new locality for occurrence of parasitism *A. sculptum* in *C. cristata* and a new host for *C. fasciolata*.

**Keywords:** *Amblyomma sculptum*, Ixodidae, Terricolous, Cerrado, Brazil.

## Resumo

O objetivo deste trabalho foi apresentar novos registros de *Amblyomma sculptum* em duas espécies de aves terrícolas em duas áreas do bioma Cerrado: dois espécimes de *Cariama cristata* foram capturados no Estado de Goiás e um exemplar de *Crax fasciolata* foi capturado no Estado de Minas Gerais. Um dos exemplares de *C. fasciolata* estava parasitado por 15 larvas, seis ninfas, um macho e duas fêmeas, enquanto *C. fasciolata* estava parasitada por sete larvas e oito ninfas. Neste registro são apresentados nova localidade para ocorrência do parasitismo de *A. sculptum* em *C. cristata* e novo hospedeiro para *C. fasciolata*.

**Palavras-chave:** *Amblyomma sculptum*, Ixodidae, Terrícolas, Cerrado, Brasil.

The association of ticks, wild birds and the pathogens they disperse worldwide, which may infect humans and domestic animals, has been known for a long time (HOOGSTRAAL, 1961; LUZ & FACCINI, 2013; MARTINS et al., 2014; LUGARINI et al., 2015).

In the last 10 years, numerous studies have highlighted the association of ticks, wild birds and pathogens carried by ticks in Brazil (LABRUNA et al., 2007; OGRZEWSKA et al., 2008, 2009, 2010; TOLESANO-PASCOLI et al., 2010; LUZ et al., 2012; MARTINS et al., 2014; LUGARINI et al., 2015). In this context, the order Passeriformes has the largest number of tick species described in comparison with non-passerine birds. However, this difference might be due to the capture methods employed, which generally use mist nets that are considered inadequate for capture of non-passerines (LUZ & FACCINI, 2013). To date, the non-passerine group of birds in Brazil is represented by approximately 809 species, with few records of parasitism by ticks (LUZ & FACCINI, 2013; CBRO, 2014).

The tick *Amblyomma sculptum* (formerly *A. cajennense*) is probably the most important vector of *Rickettsia rickettsii*, the causative agent of the Brazilian Spotted Fever. According to Beati et al. (2013) and Nava et al. (2014) this species is primarily distributed in southeastern and central regions of Brazil, although further research is needed to exactly delimit its boundaries. As already pointed out by Labruna et al. (2007) previous identifications of *A. sculptum* from wild birds should be view with caution because ticks were not identified by current reliable methods such as rearing ticks to the adult stage or molecular methods. In this paper, we report new host and locality records of *A. sculptum* parasiting two non-passerines birds, *Cariama cristata* Linnaeus, 1766 (Cariamidae) and *Crax fasciolata* Spix, 1825 (Cracidae).

Three specimens of birds were captured in a wild environment in the Cerrado biome, two specimens of *C. cristata* (State of Goiás, GO, municipality of Morrinhos, 17° 42' 15"S; 49° 10' 47"W) and one *C. fasciolata* (State of Minas Gerais, MG, municipality of Três Marias, 18° 20' 22"S; 45° 21' 18"W) during a survey of bird fauna carried out during 2009 and 2012. Birds were identified according to Sigrist (2007) and classified

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according to the recommendations of the Brazilian Committee of Ornithological Records (CBRO, 2014). Ticks were identified according to morphological criteria: females (NAVA et al., 2014), larvae (FAMADAS et al., 1997; BARBIERI et al., 2007) nymphs (MARTINS et al., 2010) and males (ONOFRIO et al., 2006). All larvae, nymphs and males identified as *A. cajennense* were considered as *A. sculptum* for reasons of their geographic origin. Specifically, we used the U-shaped genital aperture of both females to identify them as *A. sculptum* (NAVA et al., 2014). In addition, we supposedly consider the remaining specimens as *A. sculptum* based on their distribution (NAVA et al., 2014).

Mounted larvae used to porotaxy in this study were deposited in the Butantan Institute collection, São Paulo, Brazil (IBSP) under the access numbers (IBSP12101) and (IBSP12102).

In total, we collected 39 ticks: 22 larvae, 14 nymphs, one male and two females from the neck (7 larvae and nymphs 8), head (15 larvae, nymphs 6) and mentum (3 adults) of the birds. Only one of the two specimens of *C. cristata* was parasitized by 15 larvae, six nymphs, one male and two females whereas the *C. fasciolata* was parasitized by seven larvae and eight nymphs. This paper provides details of a new host and locality records of *A. sculptum* in *C. fasciolata* and new host for larvae and adults (1 male, 2 females) and locality records in *C. cristata*.

The tick *A. sculptum* was resurrected recently from within the *A. cajennense* complex which is composed of six species, distributed from the southern USA to northern Argentina. To date, two species have been found in Brazil: *A. cajennense* s.s., primarily from the Amazon region and *A. sculptum*, mainly from the Southeast and Central West regions (NAVA et al., 2014), although their exactly range still needs to be determined.

Based on our current knowledge it appears that *A. sculptum* is a very well adapted tick in the Cerrado biome and in anthropized area of Atlantic Forest, having as preferential hosts capivaras and horses (SZABÓ et al., 2009; VERONEZ et al., 2010; BEATI et al., 2013; NAVA et al., 2014). Prior to the current report, parasitism by ticks in *C. cristata* has been related by Labruna et al. (2007) (one nymph of *A. cajennense* s.l.) from the State of São Paulo. Regarding the hosts, both *C. cristata* and *C. fasciolata* are terricolous birds which are characterized by seeking food and shelter and, in most cases, nesting directly on the ground (FERREIRA et al., 2010). The first species is widely distributed in Brazil, but rarely recorded from Amazon, whereas *C. fasciolata* has a concentrated distribution in the Central-West Region of the country, until the West of São Paulo, Paraná and Minas Gerais states (SICK, 1997). These birds have great importance as dispersers of seeds throughout the Brazilian Cerrado (SICK, 1997; DIAS et al., 2010), a behavior that might help with dispersion of *A. sculptum* through the Cerrado biome.

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## References

- Barbieri FS, Chacón SC, Labruna MB, Barros-Battesti DM, Faccini JLH, Famadas KM. Topographical and numerical study of the idiosomal integumentary structures of the larva of four Neotropical species of *Amblyomma* Koch, 1844 (Acari: Ixodidae) species. *Syst Parasitol* 2007; 68(1): 57-70. <http://dx.doi.org/10.1007/s11230-006-9078-y>. PMID:17417718.
- Beati L, Nava S, Burkman EJ, Barros-Battesti DM, Labruna MB, Guglielmone AA, et al. *Amblyomma cajennense* (Fabricius, 1787) (Acari: Ixodidae), the Cayenne tick: phylogeography and evidence for allopatric speciation. *BMC Evol Biol* 2013; 13(1): 267. <http://dx.doi.org/10.1186/1471-2148-13-267>. PMID:24320199.
- Comitê Brasileiro de Registros Ornitológicos – CBRO. *Epi Info* [online]. Atlanta: CDC; 2014 [cited 2015 Jan 09]. Available from: <http://www.cbro.org.br/CBRO/index.htm>.
- Dias ES, Martins AC, Pessutti C, Barella W. Enriquecimento Ambiental no Recinto do Mutum-de-Penacho (*Crax fasciolata*) do Parque Zoológico Municipal “Quinzinho de Barros”, Sorocaba-SP. *Rev Eletron Biol* 2010; 3(3): 20-38.
- Famadas KM, Serra-Freire NM, Lanfredi RM. Redescription of the larva of *Amblyomma cajennense* (Fabricius) (Acari: Ixodidae) using optical and scanning electron microscopy. *Acarologia* 1997; 38(2): 101-109.
- Ferreira I, Ventura PEC, Luz HR. *Aves no campus da UFRRJ*. Rio de Janeiro: EDUR; 2010. 320 p.
- Hoogstraal H. Migrating birds and their ectoparasites in relation to disease. *East Afr Med J* 1961; 38: 221-238. PMID:13715712.
- Labruna MB, Sanfilippo LF, Demetrio C, Menezes AC, Pinter A, Guglielmone AA, et al. Ticks collected on birds in the state of São Paulo, Brazil. *Exp Appl Acarol* 2007; 43(2): 147-160. <http://dx.doi.org/10.1007/s10493-007-9106-x>. PMID:17882514.
- Lugarini C, Martins TF, Ogrzewalska M, Vasconcelos NCT, Ellis VA, Oliveira JB, et al. Rickettsial agents in avian ixodid ticks in northeast Brazil. *Ticks Tick Borne Dis* 2015; 6(3): 364-375. <http://dx.doi.org/10.1016/j.ttbdis.2015.02.011>. PMID:25800099.
- Luz HR, Faccini JLH, Landulfo GA, Berto BP, Ferreira I. Bird ticks in an area of the Cerrado of Minas Gerais State, southeast Brazil. *Exp Appl Acarol* 2012; 58(1): 89-99. <http://dx.doi.org/10.1007/s10493-012-9572-7>. PMID:22729500.
- Luz HR, Faccini JLH. Ticks on Brazilian birds: overview. In: Ruiz L, Iglesias F. *Birds: evolution and behavior, breeding strategies, migration and spread of disease*. Nova York: Nova Publishers; 2013. p. 97-126.
- Martins TF, Onofrio VC, Barros-Battesti DM, Labruna MB. Nymphs of the genus *Amblyomma* (Acari: Ixodidae) of Brazil: Descriptions, redescrptions, and identification key. *Ticks Tick Borne Dis* 2010; 1(2): 75-99. <http://dx.doi.org/10.1016/j.ttbdis.2010.03.002>. PMID:21771514.
- Martins TF, Fecchio A, Labruna MB. Ticks of the genus *Amblyomma* (Acari: Ixodidae) on wild birds in the Brazilian Amazon. *Syst Appl Acarol* 2014; 19(4): 385-392. <http://dx.doi.org/10.11158/saa.19.4.1>.
- Nava S, Beati L, Labruna MB, Cáceres AG, Mangold AJ, Guglielmone AA. Reassessment of the taxonomic status of *Amblyomma cajennense* (Fabricius, 1787) with the description of three new species, *Amblyomma tonelliae* n. sp., *Amblyomma interandinum* n. sp. and *Amblyomma patinoi* n. sp., and reinstatement of *Amblyomma mixtum*, and *Amblyomma sculptum* (Ixodida: Ixodidae). *Ticks Tick Borne Dis* 2014; 5(3): 252-276. <http://dx.doi.org/10.1016/j.ttbdis.2013.11.004>. PMID:24556273.

- Ogrzewalska M, Pacheco R, Uezu A, Ferreira F, Labruna MB. Ticks (Acari: Ixodidae) infesting wild birds in an Atlantic Forest area in the state of São Paulo, Brazil, with isolation of *Rickettsia* from the tick *Amblyomma longirostre*. *J Med Entomol* 2008; 45(4): 770-774. <http://dx.doi.org/10.1093/jmedent/45.4.770>. PMID:18714882.
- Ogrzewalska M, Pacheco RC, Uezu A, Richtzenhain LJ, Ferreira F, Labruna MB. Ticks (Acari: Ixodidae) infesting birds in an Atlantic rain forest region of Brazil. *J Med Entomol* 2009; 46(5): 1225-1229. <http://dx.doi.org/10.1603/033.046.0534>. PMID:19769058.
- Ogrzewalska M, Uezu A, Labruna MB. Ticks (Acari: Ixodidae) infesting wild birds in the eastern Amazon, northern Brazil, with notes on rickettsial infection in ticks. *Parasitol Res* 2010; 106(4): 809-816. <http://dx.doi.org/10.1007/s00436-010-1733-1>. PMID:20140452.
- Onofrio VC, Venzal JM, Pinter A, Szabó MPJ. Família Ixodidae: características gerais, comentários e chaves para gêneros. In: Barros-Battesti DM, Arzua M, Bechara GH. *Carrapatos de importância médico-veterinária da região neotropical: um guia ilustrado para identificação de espécies*. São Paulo: Vox/ICTTD-3; 2006. p. 29-39.
- Szabó MPJ, Labruna MB, Garcia MV, Pinter A, Castagnolli KC, Pacheco RC, et al. Ecological aspects of the free-living ticks (Acari: Ixodidae) on animal trails within Atlantic rainforest in South-eastern Brazil. *Ann Trop Med Parasitol* 2009; 103(1): 57-72. <http://dx.doi.org/10.1179/136485909X384956>. PMID:19173777.
- Sick H. *Ornitologia brasileira*. São Paulo: Nova Fronteira; 1997. 504 p.
- Sigrist T. *Guia de campo, aves do Brasil oriental*. São Paulo: Avisbrasilis; 2007. 448 p.
- Tolesano-Pascoli GV, Torga K, Franchin AG, Ogrzewalska M, Gerardi M, Olegário MMM, et al. Ticks on birds in a forest fragment of Brazilian cerrado (savanna) in the municipality of Uberlândia, State of Minas Gerais, Brazil. *Rev Bras Parasitol Vet* 2010; 19(4): 244-248. <http://dx.doi.org/10.1590/S1984-29612010000400010>. PMID:21184702.
- Veronez VA, Freitas BZ, Olegário MMM, Carvalho WM, Pascoli GVT, Thorga K, et al. Ticks (Acari: Ixodidae) within various phytogeographies of a Cerrado reserve in Uberlândia, Minas Gerais, Brazil. *Exp Appl Acarol* 2010; 50(2): 169-179. <http://dx.doi.org/10.1007/s10493-009-9294-7>. PMID:19693680.