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SHORT COMMUNICATION

Infestation of thornbird nests (Passeriformes: Furnariidae) by *Psammolestes tertius* (Hemiptera: Reduviidae) across Brazilian Cerrado and Caatinga ecoregions

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ABSTRACT. *Psammolestes tertius* Lent & Jurberg, 1965 is a sylvatic triatomine bug species that occurs in thornbird nests in Brazil. We studied infestation of 527 nests of *Phacellodomus rufifrons* Wied, 1821 and *Phacellodomus ruber* Vieillot, 1817 by *P. tertius* in eight Brazilian states across the Cerrado and Caatinga ecoregions. *Psammolestes tertius* occurred in 44% of the nests, mainly in those of *P. ruber*. Overall, 3,261 specimens (52% nymphs) were captured, with an average of 14 bugs per infested nest (range 1-75). While *P. tertius* occurrence and age structure (percentage of nymphs) were similar in Cerrado and Caatinga nests, infestation intensity (bugs/infested nest) was higher in the Cerrado. Last-stage nymphs and adults were predominant in *P. tertius* populations from both *P. ruber* and *P. rufifrons* nests. The results indicate that *Phacellodomus* nests are favourable habitats for *P. tertius* in the open/dry ecoregions of Brazil. The percentage of adult *P. tertius* specimens (48%) was higher than that observed in other triatomine species (usually less than 5% under either experimental or natural conditions), suggesting that adult bugs tend to remain in thornbird nests. The stable blood supply provided by resident/breeding birds would favor steady *P. tertius* infestation of thornbird nests across Brazilian Cerrado and Caatinga ecoregions.

KEY WORDS. Triatominae; Rhodniini; Synallaxinae; Brazil.

Psammolestes tertius Lent & Jurberg, 1965 is a sylvatic triatomine species widely distributed in Brazil (Gurgel-Gonçalves & Silva 2009), where it is found in association with various bird species (Di Iorio & Turienzo 2009). Furnariids such as *Phacellodomus rufifrons* Wied, 1821 (Lent & Jurberg 1965, Sherlock & Guitton 1974, Silva & Lustosa 1993), *Phacellodomus ruber* Vieillot, 1817 (Gurgel-Gonçalves *et al*. 2004, Gurgel-Gonçalves & Cuba 2007), and *Anumbius annumbi* Vieillot, 1817 (Barretto & Carvalheiro 1968, Turienzo & Di Iorio 2008) are the main hosts of this blood-sucking bug. Although *P. tertius* has been experimentally infected with *Trypanosoma cruzi* Chagas, 1909, the bird-feeding habit and strictly sylvatic habitats of this species suggest that it is not involved in the transmission of this protozoan parasite (Silva & Lustosa 1993).

Several aspects of *P. tertius* biology and ecology, including distribution, have already been described (see references above). However, the patterns of furnariid nest infestation by this triatomine species remain poorly understood. The aim of this study was to analyze infestation of thornbird nests (*P. ruber* and *P. rufifrons*) by *P. tertius* populations across the Brazilian Cerrado and Caatinga ecoregions.

The Cerrado is characterized by savanna vegetation (ranging from open grasslands to closed gallery forests) and a marked seasonality with a dry season between May and September. The Caatinga is the largest dry forest ecoregion in South America; vegetation ranges from low shrubby Caatinga, associated with shallow sandy soils, to tall Caatinga forest associated with eutrophic soils. Climate is hot and dry, with low annual precipitation values and 6 to 11 dry months (WWF 2001). Further ecological characteristics of the areas where *P. tertius* occurs were detailed elsewhere (Gurgel-Gonçalves & Silva 2009).

Nests of *P. ruber* were collected in *Mauritia flexuosa* L. palm tree crowns according to Gurgel-Gonçalves *et al*. (2003). Nests of *P. rufifrons* were sampled after cutting branches of the support trees (Silva & Lustosa 1993). The nests were inspected on a white cloth to assist in the detection of bugs. Between July 2005 and September 2010, we sampled 39 nests (36 of *P. ruber* and 3 of *P. rufifrons rufifrons*) in 16 Cerrado localities of 6 Brazilian states (Goiás, Mato Grosso, Bahia, Minas Gerais, São Paulo, and Maranhão) and the Federal District. Bugs were separated by sex (adults) and stage (nymphs) and counted. Additionally, we reviewed the literature and retrieved bug infestation

data for 318 *P. rufifrons rufifrons* nests from 20 Cerrado localities (states of Minas Gerais, São Paulo and Goiás) (Barretto & Carvalheiro 1968, Mello 1981, 1982, Silva & Lustosa 1993) and 170 *P. rufifrons specularis* nests from 27 Caatinga localities (state of Pernambuco) (Lucena & Lucena 1965).

Psammolestes tertius occurred in 44% of the thornbird nests surveyed, mainly in those of *P. ruber* (Tab. I). Overall, 3,261 specimens (52% nymphs) were collected, with an average of 14 bugs per infested nest. Both *P. tertius* occurrence and age structure (measured as the percentage of nymphs) were similar in nests sampled in either the Cerrado or Caatinga ecoregions. Infestation intensity (measured as the average number of bugs per infested nest) was nonetheless higher in Cerrado thornbird nests (Tab. I). The number of adult and immature bugs was also similar in the nests of *P. ruber* and *P. rufifrons*; in both cases, last-stage nymphs and adults predominated (Fig. 1).

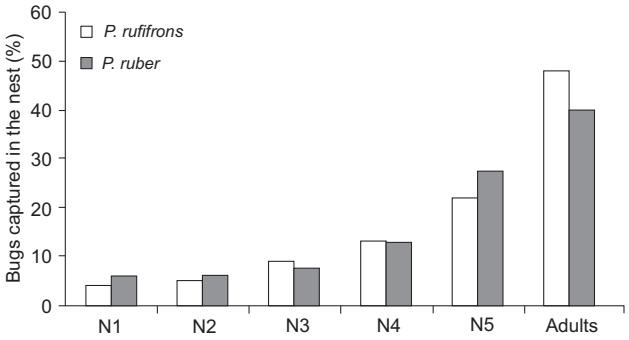

Figure 1. Percentage of *Psammolestes tertius* specimens captured in the nests of *Phacellodomus rufifrons* and *P. ruber*, according to their development stages. (N) Nymphs.

These results indicate that, as previously suggested (Lent & Jurberg 1965, Sherlock & Guitton 1974, Silva & Lustosa 1993, Gurgel-Gonçalves *et al*. 2004, Gurgel-Gonçalves & Cuba 2007) *Phacellodomus* nests are favourable habitats for *P. tertius* populations in the open/dry ecoregions of Brazil. As noted by Abad-Franch *et al*. (2009), both *Psammolestes* spp. and Synallaxinae furnariids are trans-Amazonian vicariants; these authors proposed that the *Psammolestes* arose from a single lineage within the genus *Rhodnius* in association with ancestral synallaxines that built large vegetative nests in open, semi-arid woodland and savannas. Some biological and behavioral features of these thornbirds may result in suitable conditions for *P. tertius* colonies; thus, thornbirds: a) build large nests, which can reach 2 m long and a width of about 40 cm; b) are territorial, with up to several individuals using their nests throughout the year to sleep and breed, with the offspring remaining in their in parental territory for several months; and c) reuse the same nests over several breeding seasons. Additionally, thornbird nests are often used by several other birds (inquilines) (Skutch 1969, Carrara & Rodrigues 2001). The lower abundance of *P. tertius* in the nests of *P. rufifrons specularis* may be related to the semi-arid conditions of the Caatinga ecoregion.

Regarding *P. tertius* population age structure, 48% of all specimens collected in thornbird nests were adults. Considering only our field data from nests sampled in the rainy season, the percentage of adults was as high as 51%. According to Bar *et al*. (1999), *Psammolestes coreodes* Bergroth, 1911 populations that occur in bird nests in Argentina are composed mainly of adult specimens (63% of all bugs caught). *Psammolestes tertius* and *P. coreodes* populations therefore differ sharply from other triatomine bug populations, in which immature stages are predominant and adults generally account for less than 5% under either experimental (Rabinovich 1972, Cabello *et al*. 1987, Oscherov *et al*. 1996, 2005) or natural conditions (Bar *et al*. 1992, 1993, Diotaiuti *et al*. 1993).

The high proportion of adults in *P. tertius* populations from thornbird nests could be explained by a combination of high longevity and low dispersal of adult bugs from the nests. As described by Silva & Lustosa (1993), the average longevity of *P. tertius* nymphs (fifth stage) and adults under experimental starvation conditions is approximately 99 and 42 days, respectively; this would favour their survival in the nests for long periods. The stable occupation of thornbird nests (both by resident thornbirds and inquilines) probably provides a year-round blood supply for the bugs. This may even apply for nests that are not occupied by breeding birds, because *P. tertius* can also feed on invertebrate hemolymph (Noireau *et al*. 2005), which are common in the nests of thornbirds (Silva & Lustosa 1993, Gurgel-Gonçalves *et al*. 2006, Di Iorio & Turienzo 2009). Thus, continuous food availability would favor the permanence of *P. tertius* in thornbird nests across the Brazilian Cerrado and Caatinga ecoregions.

Table I. Entomological indices of *P. tertius* in thornbird nests in Brazilian Cerrado and Caatinga ecoregions.

Species	Ecoregion	Nests surveyed	Infested nests (%)	Bugs captured	Nymphal instars (%)	Bugs/infested nest (range)
P. ruber	Cerrado	36	26 (72)	484	60	19 (1-59)
P. rufifrons rufifrons	Cerrado	321	136 (42)	2024	50	15 (1-75)
P. rufifrons specularis	Caatinga	170	70 (40)	753	51	11 (1-35)

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