



Analysis of the geographical distribution of *Psammolestes* Bergroth (Hemiptera: Heteroptera: Reduviidae: Triatominae) in South America, with new records of *Psammolestes tertius* Lent & Jurberg

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Abstract

The genus *Psammolestes* is comprised of three recognized Rhodniini species: *P. arthuri*, *P. coreodes*, and *P. tertius*. The geographical distribution of these triatomines in South America was analyzed using ecological niche modeling. Additionally, temperature, precipitation, and altitude limits for these species were estimated. The genetic algorithm for rule-set production (GARP) was applied to predict their geographical distribution. The models used were able to predict, with high probabilities, the occurrence of *P. tertius* in open woodlands of South America (mainly Cerrado and Caatinga ecoregions), making it the *Psammolestes* species with the widest distribution. *P. arthuri* presented a discontinuous potential distribution covering the Venezuelan Llanos and southeastern/southwestern fringes of Amazonia. *P. coreodes* presented the southernmost area of distribution, occurring mainly in the Argentinean Chaco. The models also support potential areas of co-occurrence for *P. tertius* and *P. coreodes* in southwestern Brazil. Clear ecological niche differences were observed for the three species: while *P. arthuri* occurred in warm and humid areas, *P. coreodes* occupied the driest and coldest areas. *P. tertius* presented intermediate climatological limits and occurred in the highest altitudes. Although climatic factors may determine the triatomine distribution, biotic factors, such as the association with thornbirds (*Phacellodomus*), may also influence the geographical distribution of *Psammolestes* species. Finally, this study confirms the usefulness of ecological niche modeling as a tool for studies on biogeographical aspects of triatomines.

Key words: Triatomine, Rhodniini, GARP, predictive maps, Furnariidae

Introduction

The genus *Psammolestes* Bergroth is comprised of three recognized Rhodniini species: *P. coreodes* Bergroth, *P. arthuri* Pinto, and *P. tertius* Lent & Jurberg (Galvão *et al.* 2003). These species seem to have specialised to exploit bird nest microhabitats in open woodlands (Lent & Wygodzinsky 1979; Abad-Franch *et al.* 2009).

P. arthuri is the northernmost representative of *Psammolestes*, widely distributed in Venezuela, but with additional occurrence records in Colombia (Carcavallo *et al.* 1999). It is primarily associated with the thornbird *Phacellodomus rufifrons* Wied-Neuwied (Lent & Jurberg, 1965) in the Venezuelan Llanos and Venezuelan coast biogeographical provinces (Abad-Franch & Monteiro 2007).

P. tertius is widely distributed in Brazil, where it is found in association with *P. rufifrons* (Lent & Jurberg, 1965; Sherlock & Guitton 1974; Silva & Lustosa 1993), *Phacellodomus ruber* Vieillot (Gurgel-Gonçalves *et al.* 2004; Gurgel-Gonçalves & Cuba 2007), and *Anumbius annumbi* Vieillot (Barretto & Carvalheiro 1968;