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Notes and Comments

Cytogenetic analysis in different populations of *Rhodnius prolixus* and *R. nasutus* from different countries of South America

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1. Scientific Note

Currently 153 species of Triatominae subfamily are known, divided in 18 genera and six tribes (Alevi et al., 2016; Rosa et al., 2017). The Rhodniini consisted of 23 species: three of the *Psammolestes* genus and 20 of the *Rhodnius* genus.

Cytogenetic analysis on the species of the *Rhodnius* genus showed chromosomal homogeneity, since all species are the same karyotype, namely, 2n = 22 (20 autosomes + XY) (Pita et al., 2013; Alevi et al., 2015a; Rosa et al., 2017) and FISH markings with the 45S probe restricted to the sex chromosomes (Pita et al., 2013). However, chromosomal intraspecific variation have been identified in *R. ecuadoriensis* (Pita et al., 2013) and *R. pallescen*s (Gomez-Palacio et al., 2008).

Rhodnius prolixus is one of the main species of *prolixus* complex because it has a wide geographic distribution, being found in Brazil, Bolivia, Colombia, Costa Rica, El Salvador, Ecuador, Guatemala, Guyana, French Guyana, Honduras, Mexico, Nicaragua, Panama, Suriname, Trinidad and Venezuela (Galvão et al., 2003). *R. nasutus* is a species of *prolixus* complex observed in different Brazilian states and Argentina (Galvão et al., 2003). This species and *R. taquarussuensis* are the only species of *prolixus* complex which presents dispersed heterochromatin in the nucleus and autosomes (Pérez et al., 1992; Rosa et al., 2017).

Thus, this study aimed to analyze whether different populations of *R. prolixus* from Venezuela, Costa Rica and Colombia, and *R. nasutus* from Brazil and Argentina, present chromosomal intraspecific variation.

Five adult males of the *R. prolixus* of Venezuela, Colombia and Costa Rica and *R. nasutus* of Brazil and Argentina were analyzed the cytogenetically. The insects were provided by FCFAR/UNESP, Campus Araraquara, São Paulo, Brazil and FIOCRUZ, Rio de Janeiro, Brazil. The testicles were removed, the slides containing the seminiferous tubules were prepared by crushing and cell stained with classical cytogenetic techniques Orcein Lacto-acetic and C- Banding and examined under a light microscopy.

Chromosomal intraspecific variation was not observed for the specimens of *R. prolixus* and *R. nasutus* from different countries, because all specimens showed the same karyotype, the same morphological characteristics for the autosomes and sex chromosomes and the same pattern of constitutive heterochromatin (Table 1).

Absence of chromosomal intraspecific variation was also observed for *R. neglectus* (Alevi et al., 2015b), *Panstrongylus megistus* (Alevi et al., 2015c), *Triatoma brasiliensis* (Panzera et al., 2000) and *T. pseudomaculata* (Imperador et al., 2016). On the other hand, chromosomal intraspecific variation was already reported in Triatominae subamily for the following species: *T. sordida* (Panzera et al., 1997) *T. infestans* (Panzera et al., 2004), *T. dimidiata* (Panzera et al., 2006), *P. geniculatus* (Crossa et al., 2002), *R. ecuadoriensis* (Pita et al., 2013) and *R. pallescens* (Gomez-Palacio et al., 2008).

The chromosomal homogeneity observed between *R. prolixus* from different locations corroborates the results of Pita et al. (2013) and Monteiro et al. (2003) who described the absence of polymorphism in the position of the 45S gene and low variability for *R. prolixus,* respectively. Furthermore, Alevi et al. (2015d) did not observe significant differences between the reproductive aspects of these vectors, since the analysis of cystic spermatogenesis of *R. prolixus* originating in Colombia and Costa Rica, were similar.

R. nasutus although it also does not show intraspecific variation, can be easily distinguished from other members of the complex by heterochromatin in chromatin and chromosomes. The wealth of heterochromatin is quite peculiar in Rhodniini tribe, which could be a source of variability between populations of different countries under different evolutionary pressures, as well as observed for *R. pallescens* (Gomez-Palacio et al., 2008).

Thus, we observed that *R. prolixus* from Venezuela, Colombia and Costa Rica and *R. nasutus* from Brazil and Argentina presents chromosomal homogeneity. Our results together with the literature data for *R. prolixus* (Monteiro et al., 2003; Pita et al., 2013) can direct the

Table 1. Chromosomal characteristics of different populations of the *R. prolixus* and *R. nasutus.*

R. prolixus	Karyotype	Size of Sex Chromosome	Heterocromatin in Autosomes	Heterocromatin in Sex Chromosomes
Venezuela	2n = 20A + XY	X>Y	Absent	Only in the Y
Colombia	2n = 20A + XY	X>Y	Absent	Only in the Y
Costa Rica	2n = 20A + XY	X>Y	Absent	Only in the Y
R. nasutus				
Brazil	2n = 20A + XY	X>Y	Present	Only in the Y
Argentina	2n = 20A + XY	X>Y	Present	Only in the Y

development of specific control mechanisms by the low genetic and chromosomal variation presented in this vector.

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