

Oligoryzomys stramineus Bonvicino and Weksler, 1998 (Mammalia: Rodentia: Sigmodontinae): New records in northeastern Brazil

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ABSTRACT: After morphological and karyological analysis, we identified 12 specimens of the Straw Colored Pigmy Rice Rat, *Oligoryzomys stramineus* (Bonvicino and Weksler, 1998) in northeastern Brazil. Karyotypic analysis showed $2n=52$, $FNa=68$, with 9 biarmed and 16 acrocentric autosome pairs, similar to those reported for *O. stramineus* in others studies. Pregnant females were captured during the wet season, corroborating that the reproductive period is not restricted to the dry season. We report the northernmost record for *O. stramineus* in Russas municipality (04°56'25" S, 37°58'33" W), state of Ceará, Brazil, located in the Caatinga domain, extending the range of the species ca. 330 km N. Together with the record from Salenópolis municipality (07°18'33" S, 39°73'33" W), they are the first records of *O. stramineus* in Ceará.

The genus *Oligoryzomys* Bangs, 1900 is widely distributed in Central and South America with 17 species recognized in the last mammal compilation (Musser and Carleton 2005). Recently, Bonvicino *et al.* (2008) recognized nine species occurring in Brazil: *Oligoryzomys chacoensis* (Myers and Carleton, 1981), *Oligoryzomys flavescens* (Waterhouse, 1837), *Oligoryzomys fornesi* (Massoia, 1973), *Oligoryzomys fulvescens* (Saussure, 1860), *Oligoryzomys microtis* (J.A. Allen, 1916), *Oligoryzomys nigripes* (Olfers, 1818), *Oligoryzomys moojeni* Weksler and Bonvicino, 2005, *Oligoryzomys rupestris* Weksler and Bonvicino, 2005 and *Oligoryzomys stramineus* Bonvicino and Weksler, 1998.

Some species of this genus can attain high population densities and become agricultural pests or represent important hantavirus hosts. In fact, infected specimens, mainly of *Oligoryzomys nigripes*, *O. fornesi* and *O. utiaritensis*, have been detected by serological and molecular methods in different Brazilian regions (Agrellos *et al.* 2012; Lemos *et al.* 2004; Suzuki *et al.* 2004; Oliveira *et al.* 2009; Rosa *et al.* 2010; Rosa *et al.* 2011). The role in hantaviruses cycles reinforce the importance of taxonomic studies in this genus, whose classification at species level is still problematic (Weksler and Bonvicino 2005, Rivera *et al.* 2007). Karyological studies have helped in the identification of species of this complex group, which presents diploid numbers ranging from $2n=44$ to $2n=70$ (Andrades-Miranda *et al.* 2001).

Oligoryzomys stramineus, with type locality in Teresina de Goiás, Goiás state, occurs from Goiás and Minas Gerais states to Paraíba, Pernambuco and Piauí states (Bonvicino *et al.* 2008). In the Cerrado and Caatinga domains, *O. stramineus* primarily inhabits the gallery forests (Bonvicino and Weksler 1998; Geise *et al.* 2010). In the

Cerrado of Central Brazil, *O. stramineus* can be sympatric with other congeneric species in some localities: with *O. fornesi* in the same trapline, and *O. nigripes* in different traplines (Weksler and Bonvicino 2005).

During zoological surveys conducted in six municipalities in Bahia (January 10-16/2000, June 10-15/2003), Ceará (February 23-26/2010) and Piauí (October 21-26/2000, November 30 to December 3/2001) states, several specimens of *Oligoryzomys* were collected. Fieldwork was carried out with ICMBio (Instituto Chico Mendes de Conservação da Biodiversidade) authorization (License number 13373, to P.S. D'Andrea).

These small mammals were karyotyped to confirm morphologic identification. Chromosome preparations were obtained from short-term bone marrow cultures (80% RPMI 1640, 20% fetal calf serum, 5 mg/ml ethidium bromide and colchicines 10^{-6} M) for 2 hours at 37°C, following by hypotonic shock with KCl (0.075M) for 30 minutes, pre fixation and fixation with Carnoy (3 methyl alcohol:1 acetic acid).

After morphological and karyological analysis, we identified twelve specimens corresponding to *O. stramineus*, and these were collected in six localities: (1) São Raimundo Nonato, Piauí state (male, MN 66005); (2) Coronel José Dias, Piauí state (female, MN 63328); (3) Caetité, Bahia state (males, MN 63370, MN 63416); (4) Curaçá, Bahia state (males, LBCE 5224, LBCE 4899; females, LBCE 4924, 4925, 5220, 5221); (5) Russas, Ceará state (female, LBCE 13935); and (6) Santanopole, Ceará state (sex unknown, USNM 304583).

Individuals from Piauí and Ceará were examined and diagnosed as negative for *Trypanosoma cruzi* (Kinetoplastida, Trypanosomatidae), the Chagas disease parasite (Ana. M. Jansen, personal communication).

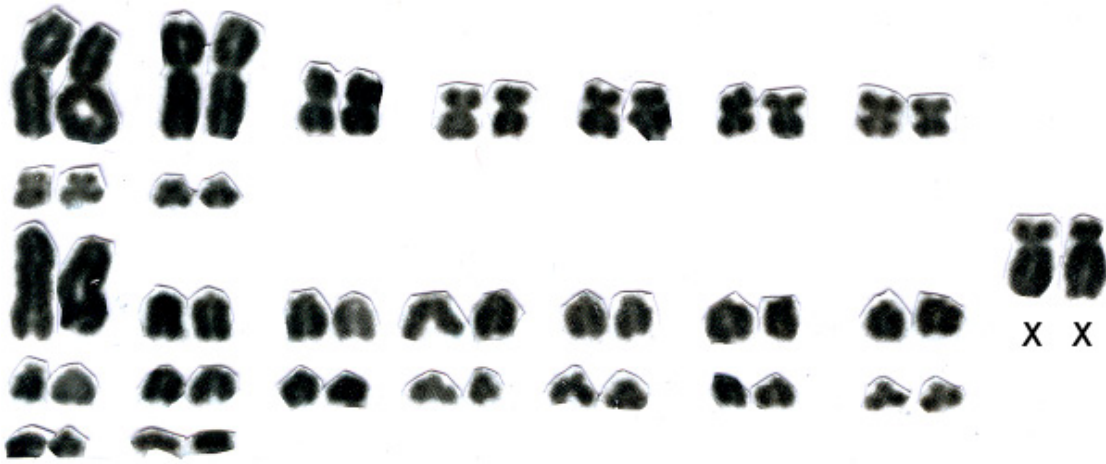


FIGURE 1. Karyotype of *Oligoryzomys stramineus* (female LBCE 13935) from Russas, Ceará state, in conventional Giemsa staining.

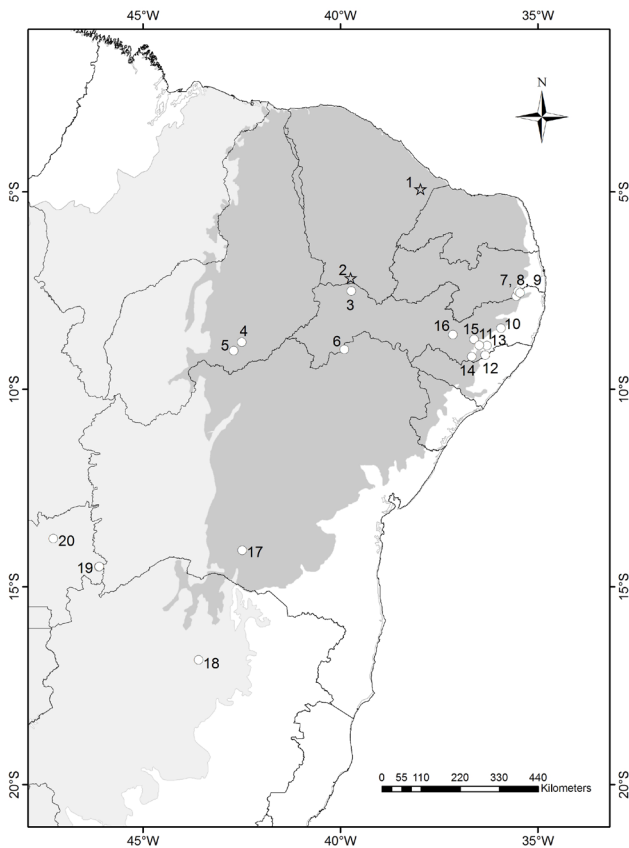


FIGURE 2. Collecting localities (circles) and new records (star) of *Oligoryzomys stramineus*. Localities from 1 to 16 are in Caatinga domain (dark gray); 17 is in the transition between Cerrado/Caatinga domain, and localities from 18 to 20 are in Cerrado domain (light gray). Localities in Ceará state: 1) Russas (LBCE 13935, the northern most locality of the geographic distribution), 2) Santanopole (USNM 304583); Pernambuco state: 3) Exú (USNM 528416), 9) Macaparana (UFPB 2020), 10) Angelim (UFPB 62), 11) Garanhuns (UFPE 57), 12) Correntes (UFPB 1863), 13) Agrestina (UFPE 62), 14) Bom Conselho (UFPB 360), 15) Capoeiras (UFPE 56), 16) Buíque (UFPE 147); Piauí state: 4) Coronel José Dias (MN 63328), 5) São Raimundo Nonato (MN 66005); Bahia state: 6) Curaçá (LBCE 4899), 17) Caetité (MN 63370); Paraíba state: 7) Natuba (UFPB 2049), 8) Pirauá (UFPB 49); Minas Gerais state: 18) Juramento (LV-FC 10); Goiás state: 19) Mambai (UFPB 1824), and 20) Teresina de Goiás (MN 34439, holotype). Mammal Collection Institutions: LBCE – Laboratório de Biologia e Parasitologia de Mamíferos Reservatórios Silvestres, Instituto Oswaldo Cruz, FIOCRUZ, Rio de Janeiro, Brazil; MN – Museu Nacional – Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; UFPB – Universidade Federal da Paraíba, Paraíba, Brazil; UFPE – Universidade Federal de Pernambuco, Pernambuco, Brazil; LV-UFRJ – Laboratório de Vertebrados, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; USNM – United States National Museum, Washington, DC, USA.

Karyotypic analysis showed $2n=52$, $FNa=68$, with 9 biarmed and 16 acrocentric autosome pairs (Figure 1). The X chromosome was a large submetacentric, between pairs 3 and 4 in size, and the Y chromosome was a medium-sized metacentric. This karyotype is similar to those reported for *O. stramineus* in others studies (Bonvicino and Weksler 1998; Andrades-Miranda *et al.* 2001; Weksler and Bonvicino 2005; Geise *et al.* 2010), considering the variation already described in the autosome fundamental number ($2n=52$, $FNa=68-69$) due to an inversion of a small acrocentric pair (Bonvicino and Weksler 1998).

One female was pregnant with four embryos in February, in Russas, and another one was captured with five embryos in March, in Curaçá. One pregnant female was also captured in March, in Pernambuco state, during the rainy season (Geise *et al.* 2010). This data indicates a different reproduction period for Caatinga populations in relation to those reported for Cerrado populations by Weksler and Bonvicino (2005). In the latter study, juveniles were captured in August and a pregnant female in September, suggesting that reproduction took place only around June-July (dry season).

Until this study, *O. stramineus* was only recorded in localities in Cerrado and Caatinga domains in the states of Goiás, Minas Gerais, Bahia, Paraíba, Pernambuco and Piauí (Andrades-Miranda *et al.* 2001; Weksler and Bonvicino 2005; Bonvicino *et al.* 2008; Geise *et al.* 2010). In this study, we extend the geographic range of this species to the Caatinga domain that occurs in the Ceará state, approximately 330 km N of the hitherto northernmost known locality.

Given the distribution presented here (Figure 2), the identification of one *O. stramineus* specimen as hantavirus positive, collected in Aguaí, São Paulo state (Figueiredo *et al.* 2009), needs to be reevaluated because we do not have information about other *O. stramineus* specimens recorded for São Paulo state, in spite of the intense captured effort there (see de Vivo *et al.* 2011).

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