

Distribution extension of *Abrawayaomys ruschii* Cunha and Cruz, 1979 (Rodentia: Cricetidae) with the first records in the state of Paraná, southern Brazil

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ABSTRACT: *Abrawayaomys ruschii* is a rare sigmodontinae rodent with fewer than 10 known localities distributed in the states of Espírito Santo, Minas Gerais, Rio de Janeiro and Santa Catarina. Herein we report the first records for the state of Paraná in southern Brazil. These records expand the species distribution more than 450 km westwards from previous known localities.

DOI: 10.15560/10.3.660

Abrawayaomys ruschii Cunha & Cruz, 1979 is a rare Atlantic forest endemic species. It is one of the few Sigmodontinae with spiny pelage together with *Abrawayaomys chebezi* Pardiñas, Teta & D'Elía, 2009; *Rhagomys longilingua* Luna & Patterson, 2003; and species of the genera *Scolomys* and *Neacomys*. They also present an overall dark yellowish dorsal coloration weakly contrasting with the lighter-grayish and non-spiny ventral pelage. The skull is also peculiar, with a short rostrum and a robust and rounded overall aspect (Pardiñas *et al.* 2009). Since the species description in the state of Espírito Santo (Cunha and Cruz 1979) few records have been reported in the literature (Fonseca and Kierulff 1989, Stallings *et al.* 1991; Cunha and Rajão 2007; Pereira *et al.* 2008; Pardiñas *et al.* 2009; Cherem *et al.* 2011; Passamani *et al.* 2011), most of them in southeastern Brazil in the States of Minas Gerais ($n = 4$), Espírito Santo ($n = 1$) and Rio de Janeiro ($n = 1$), and one record in southern Brazil in the state of Santa Catarina. The species has been also reported in the state of São Paulo (Bonvicino *et al.* 2008; de Vivo *et al.* 2011), but no specific localities or coordinates were provided. Some specimens collected in Argentina were previously treated as *A. ruschii* (Massoia 1988, 1993, 1996; Massoia *et al.* 1991), but subsequent investigations resulted in the description of a new species, named *A. chebezi* (Pardiñas *et al.* 2009).

Here we report on two new specimens of *A. ruschii* (DZUP 584 and DZUP 591) collected in two localities in the state of Paraná, southern Brazil. Both localities are in a transition between Moist and Semi-deciduous Atlantic

Forests. Skins (Figure 1) and skulls (Figure 2) are housed in the mammal collection of the Department of Zoology in Paraná's Federal University (Coleção de Mastozoologia, Departamento de Zoologia, Universidade Federal do Paraná — DZUP). Specimen DZUP 584 was collected on October 19, 2012 at RPPN Monte Sinai, in the municipality of Mauá da Serra ($23^{\circ}47' S$, $50^{\circ}30' W$, elevation 1021 m above sea level). It is an old adult, age class 5 following the age classes of Voss (1991), male, captured using pitfalls (100 liter buckets, sampling effort of 96 buckets-nights). The other specimen, DZUP 591, is an adult (as specified in the specimen field tag), male, collected on September 8, 2011 by M. Rodrigues near a hydroelectric dam (UHE Mauá) in the municipality of Telêmaco Borba ($23^{\circ}09' S$, $50^{\circ}42' W$), and it was recently deposited at DZUP. No information on capture method was provided with specimen DZUP 591. We identified the specimens from Paraná as *A. ruschii* due to their larger incisive foramina length and width (IFL, IFW), smaller rostrum length (RL), larger zygomatic plate width (ZPW), and larger mandible length (ML) when compared to *A. chebezi* specimens (Table 1). Both specimens show a dark apical tail tuft, a character that has been revealed to be polymorphic in *A. ruschii* and present in *A. chebezi* (Pardiñas *et al.* 2009).

The records from the state of Paraná reported here are so far the westernmost in the species distribution and the nearest to the distribution range of *A. chebezi* from Argentina (Figure 3). As a rare rodent not commonly captured during field inventories, few specimens of *Abrawayaomys* are available in scientific collections. The morphological

descriptions of both species within the genus were based on the respective holotypes, but morphological traits are variable among specimens of *Abrawayaomys* (see Pardiñas *et al.* 2009). Therefore, geographical patterns are not likely to be easily detected and the taxonomy of the genus is still

preliminary. Further field efforts can help increase the number of specimens in scientific collections, which could allow morphological analysis to elucidate taxonomy and within/among species variations across the distribution of the genus *Abrawayaomys*.



FIGURE 1. Dorsal (a), ventral (b) and lateral (c) views of specimen DZUP 591 (adult male) of *Abrawayaomys ruschii*.



FIGURE 2. Dorsal, ventral and lateral views of skull and lateral view of mandible of specimen DZUP 584 (old adult male) of *Abrawayaomys ruschii*. Scale bar = 10 mm.

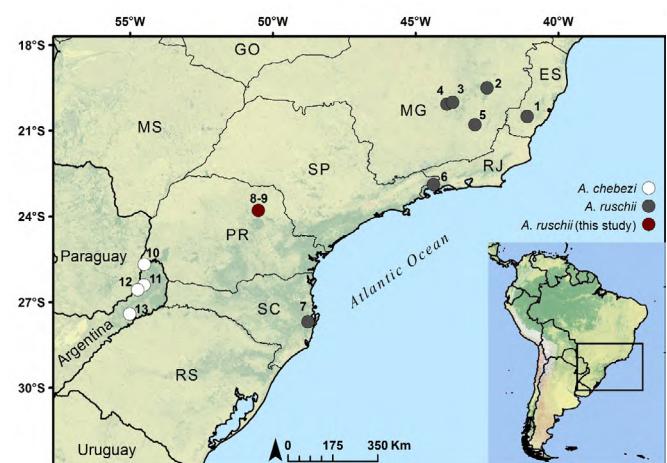


FIGURE 3. Distribution map of the species of *Abrawayaomys* with the new records of *A. ruschii* in the state of Paraná. Geographic coordinates of other specimens were obtained from Pardiñas *et al.* (2009) and Passamani *et al.* (2011). Localities of *A. ruschii*: Brazil: Espírito Santo: 1. Reserva Biológica de Forno Grande ($20^{\circ}30' S$, $41^{\circ}06' W$). Minas Gerais: 2. Parque Estadual do Rio Doce ($19^{\circ}30' S$, $42^{\circ}31' W$); 3. Viçosa ($20^{\circ}47' S$, $42^{\circ}55' W$); 4. Caeté ($20^{\circ}00' S$, $43^{\circ}42' W$); 5. São Sebastião das Águas Claras ($20^{\circ}04' S$, $43^{\circ}54' W$). Rio de Janeiro: 6. Angra dos Reis, Aldeia Sapucaí ($22^{\circ}53' S$, $44^{\circ}23' W$). Santa Catarina: 7. Santo Amaro da Imperatriz ($27^{\circ}41' S$, $48^{\circ}46' W$). Paraná: 8. RPPN Monte Sinai, Mauá da Serra ($23^{\circ}47' S$, $50^{\circ}30' W$); 9. UHE Mauá, Telêmaco Borba ($23^{\circ}9' S$, $50^{\circ}42' W$). Localities of *A. chebezi* – Argentina: Misiones: 10. Conjunction arroyo Mbocai and route 12 ($25^{\circ}40' S$, $54^{\circ}30' W$); 11. Eldorado ($26^{\circ}24' S$, $54^{\circ}31' W$); 12. Montecarlo ($26^{\circ}34' S$, $54^{\circ}44' W$); 13. Campo Ramón ($27^{\circ}25' S$, $55^{\circ}1' W$). The background image in the map is a raster dataset representing a satellite image of Earth, freely distributed by Natural Earth (<http://www.naturalearthdata.com/>).

TABLE 1. External and cranial measurements¹ from adult specimens DZUP 584 and DZUP 591 of *Abrawayaomys ruschii* collected in the state of Paraná, southern Brazil, and other specimens² of *Abrawayaomys*. Cranial measurements from specimens DZUP 584 and DZUP 591 were taken with a digital caliper to the nearest 0.01 mm. - data not reported or not available due to partially broken skull.

	<i>Abrawayaomys ruschii</i>						<i>Abrawayaomys chebezi</i>	
	DZUP 584	DZUP 591	CMUFLA 906	MN 23075	MN 67557	UFMG 2492	CEM 9970	MACN 20253
Sex	Male	Male	Female	Female	Male	Male	-	Male
Age ³	5	-	-	3	3	4	-	4
Weight	50 g	65 g	40 g	46 g	55 g	63 g	-	-
HBL	135.6	106.5	95	116	135	128	-	120
TL	151.1	127	-	85	-	146	-	133
HFL	-	27.7	20	-	-	-	-	27.5
HFLC	33.5	-	-	29	32	31	29	29
EL	18.5	17	19	20	16	20	-	17
T/HB	1.11	1.19	-	0.73	-	1.14	-	1.10
CBL	26.77	-	24.45	27.46	28.64	27.64	-	27.67
OCW	7.05	-	-	8.01	8.00	7.07	-	6.53
DL	8.60	-	8.98	7.57	8.43	7.97	-	7.68
PBL	5.74	5.13	5.32	5.46	5.21	5.87	-	5.25
IFL	4.87	5.14	5.35	5.33	5.56	4.83	4.40	4.65
IFW	1.59	1.75	1.66	1.72	1.63	1.68	1.20	1.44
UMRL	3.91	-	4.57	4.51	4.25	4.62	3.30	3.96
M1B	1.18	-	-	1.32	1.29	1.39	-	1.16
BM1	5.31	-	-	5.67	5.33	5.82	-	5.32
CH	10.00	9.91	-	9.94	10.34	10.22	-	9.68
RL	8.54	8.60	-	8.26	8.41	9.15	-	10.94
RW	5.50	5.80	4.82	5.04	5.34	5.44	5.60	5.62
LIB	6.14	5.73	5.82	6.29	6.21	6.23	5.90	6.02
IOL	10.42	10.78	-	10.10	11.06	10.70	-	9.81
ZB	16.70	17.18	15.99	17.20	17.40	16.00	16.00	16.99
BW	13.15	-	13.24	13.18	13.57	13.08	-	13.67
ZPW	3.82	4.06	3.76	4.34	4.31	3.70	-	3.56
MH	9.14	9.23	-	9.18	9.23	9.45	-	9.03
ML	16.89	17.33	16.78	17.30	17.70	17.41	-	16.56

¹Measurements in mm: HBL – head and body length; TL – Tail length; HFL – hind foot length without claw; HFLC – hind foot length with claw; EL – ear length; T/HB – ratio between TL and HBL; CBL – condylobasal length; OCW – occipital condyle width; DL – diastema length; PBL – palatal bridge length; IFL – incisive foramina length; IFW – incisive foramina width; UMRL – upper molar row length; M1B – M1 breadth; BM1 – breadth between M1; M1L – M1 length; CH – cranial height; RL – rostral length; RW – rostral width; LIB – least interorbital breadth; IOL – internal orbital length; ZB – zygomatic breadth; BW – braincase width; ZPW – zygomatic plate width; MH – mandible height; ML – mandible length.

²Measurements obtained from Pardiñas et al. (2009): *A. ruschii* – MN 23075, MN 67557 and UFMG 2492; *A. chebezi* – CEM 9970 and MACN 20253. Measurements obtained from Passamani et al. (2011): *A. ruschii* – CMUFLA 906.

³Age classes following toothwear classes proposed by Voss (1991).

ACKNOWLEDGMENTS: Financial support for this study was granted by “Fundação Araucária” (17311) and “Conselho Nacional de Desenvolvimento Científico e Tecnológico” (CNPq – 479072/2011-6). CNPq also provided a grant to FCP (303757/2012-4) and a scholarship to TBZ. “Coordenação de Aperfeiçoamento de Pessoal de Nível Superior” (CAPES) provided a scholarship to RASC.

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RECEIVED: July 2013

ACCEPTED: April 2014

PUBLISHED ONLINE: July 2014

EDITORIAL RESPONSIBILITY: Ana Paula Carmignotto