



DISTRIBUTION EXTENSION OF THE BLACK-HEADED SNAKE *Tantilla boipiranga* SAWAYA & SAZIMA, 2003 IN THE STATE OF MINAS GERAIS, BRAZIL

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Abstract: *Tantilla boipiranga* is a rare vulnerable snake found in the Atlantic Forest, distributed in the phytophysognomy of rocky grasslands (*campos rupestres*), in southeastern Brazil. Here, we update the known geographic range of the species to eight new localities in the state of Minas Gerais, Brazil, extending its distribution approximately 400 km northwards to the municipality of Almenara, from the previous northernmost record, and 703 km from the type locality.

Keywords: Serra do Espinhaço, snake, Squamata, Colubridae.

The black-headed snake *Tantilla boipiranga* Sawaya & Sazima 2003 (Squamata, Colubridae) (Figure 1) is a Vulnerable species of colubrid (Morato 2010, IUCN 2020), belonging to the *Tantilla melanocephala* group that occurs at high elevations (648–1300 m) in the rupestrian grasslands of the Cerrado biome and in the Atlantic Forest domain (Sawaya & Sazima 2003, Silveira *et al.* 2009). This species is characterized by its reddish-orange body-color, high number of ventral (147 - 167) and subcaudals (58 - 70) scales and by the single and columnar hemipenis morphology (Sawaya & Sazima 2003, Silveira *et al.* 2009).

According to Sawaya & Sazima (2003), *T. boipiranga* was considered endemic to the region of the Parque Nacional da Serra do Cipó, Minas Gerais, Brazil. After that, the species' distribution included three new localities: the municipalities of Ouro Preto, and Alvorada de Minas (Silveira

et al. 2009) and to the municipality of Caratinga (Nogueira *et al.* 2020), all of them in the state of Minas Gerais.

In this paper, we compiled all data found in the literature related to the old known localities and, from the examination of 12 specimens, we present eight new localities for *T. boipiranga*. The new localities presented extends to the known species' geographic distribution northwards in the Espinhaço Mountain Range, as proposed by Silveira *et al.* (2009), to the *Quadrilátero Ferrífero* and to the Rio Doce basin (Figure 2). The new records of *T. boipiranga* came from different localities in the state of Minas Gerais, and are housed in three herpetological collections: Coleção de Répteis do Centro de Coleções Taxonômicas do ICB/UFMG (UFMG), Coleção de Serpentes da Fundação Ezequiel Dias (FUNED), and Coleção de Répteis do Museu de Ciências Naturais da Pontifícia Universidade Católica



Figure 1. Live specimen of *Tantilla boipiranga* from the municipality of Morro do Pilar, Minas Gerais, Brazil. Photo by Pedro H. Martins

de Minas Gerais (MCNR). Specimens were morphologically analyzed by the characters proposed by Sawaya & Sazima (2003), and Silveira *et al.* (2009) (Table 1). Measurements of the body were taken with a measuring ruler (1 mm precision) for total length, and a digital caliper (0.02 mm precision) for head length, head width, interocular distance, and internasal distance. The specimen mentioned by Nogueira *et al.* (2020) for the locality of Caratinga - MG (UFMG 1402), was also examined and we update its voucher number to UFMG 121. In addition to the analyzed specimens, we compared them with two paratypes of the species housed at the UFMG collection, which were formally cited by Sawaya & Sazima (2003) as UFMG 1034 and 1048. However, due to a reformulation in the collection, these specimens had their vouchers changed to UFMG 123 and 124 respectively (Table 1).

Silveira *et al.* (2009) revealed a variation in the number of ventrals and subcaudals scales proposing a new diagnosis for *T. boipiranga*, complementing the description of Sawaya & Sazima (2003). In our morphological review, we

also found variation in these morphological traits: 149-175 ventral scales, and 68 subcaudal scales in one female specimen (Table 1), which corroborates the first hypothesis of Silveira *et al.* (2009) that the species presents populations with varied states of characters in each, as we can see in the specimens from Brumadinho and Congonhas that borders with the municipality of Ouro Preto. Moreover, we also found similar number of ventral scales between males and females (Table 1).

The municipalities of Almenara and Berilo are located northeastern Minas Gerais, in the Espinhaço Mountain Range, and represent the northernmost distribution in the state of Minas Gerais (703 and 471 km from the type locality, respectively). The municipality of Almenara is influenced by deciduous and semi-deciduous physiognomies of the Atlantic Forest domain, which was indicated as a priority area for conservation (Drummond *et al.* 2005, Melo 2005, MMA 2018). Berilo is dominated by rocky grasslands (*campos rupestres*), a physiognomy of Cerrado (Lara & Fernandes 1996).

The municipalities of Santa Luzia, Morro do

Table 1. Morphological characters of the analyzed specimens of *T. boipiranga* in this study. (*) paratypes (Sawaya & Sazima 2003) of the species housed at UFMG used only for comparison and were mentioned in Sawaya & Sazima (2003) as UFMG 1034 and UFMG 1048 respectively. (**) specimen with a partial tail. In dark vertebral line: (a) absent; (p) present, (v) vestigial; and in dark temporal blotch: (a) absent; (c) continuous with dorsal black cephalic staining; (i) isolated; (v) vestigial.

Specimens	FUNED 1921	FUNED 1953	FUNED 2103	FUNED 3391	FUNED 3405	MCNR 6316	UFMG 121	UFMG 123*	UFMG 124*	UFMG 1175	UFMG 1936	UFMG 2539	UFMG 3230	UFMG 3251
Gender	F	F	F	F	F	F	F	M	M	F	F	F	F	F
Municipality/State	See text	Santa Luzia - MG	Berilo - MG	São Sebastião do Rio Preto - MG	Ipatinga - MG	Joaquim - MG	Caratinga - MG	Santana do Riacho - MG	Santana do Riacho - MG	Congonhas - MG	Almenara - MG	Brumadinho - MG	Morro do Pilar - MG	Brumadinho - MG
Coordinates	49.8783 -6.49694	-43.8514 -19.7697	-42.4656 -16.9517	-43.2976 -19.3372	-42.5367 -19.4683	-42.1392 -19.7897	-41.8167 -19.7333	-43.6050 -19.3383	-43.5310 -19.2596	-43.8500 -20.4055	-40.6944 -16.1836	-44.0018 -20.0520	-43.5289 -19.2631	-43.9857 -20.1003
Dorsal scales	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15	15:15:15
Gular scales	3	3	3	3	3	3	4	4	3	4	4	3	4	4
Pre-ventral scales	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Ventral scales	167	165	149	149	172	173	153	156	155	159	170	162	175	152
Subcaudals	62	60	60	63	35**	58	63	64	64	68	56	52	52	62
Infralabial	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6	6/6
Supralabial	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7	7/7
Anterior temporal scales	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Posterior temporal scales	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Preocular scales	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	2/2	1/1	1/1	2/2	1/1	1/1
Postocular scales	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Dark vertebral line	a	a	a	a	a	a	a	p	v	a	p	p	a	a
Dark temporal blotch	v	p	v	a	v	i	i	a	a	a	i	c	a	i
Dark nuchal band extension	1-5	1-5	1-4	1-5	1-4	1-5	1-4	1-5	1-5	1-5.5	1-4.5	1-5	1-5.5	1-4
Total length (cm)	35	49	40	37	59,5	57	37,95	46,5	19,5	38	41	22	46,5	27
Tail length (cm)	7,2	8,0	9,5	8,5	6	11,5	9,5	9,5	4,5	9,5	8,6	4,5	11,5	6,5
Head length (mm)	8,01	5,0	9,32	6,1	9,30	12,77	9,31	6,83	6,47	9,74	11,11	3,86	11,33	6,80
Head width (mm)	6,23	4,0	5,32	4,0	6,1	7,52	5,75	3,67	4,4	5,74	6,96	1,39	6,92	4,11
Interocular distance (mm)	2,3	3,1	3,1	3,0	4,4	4,75	3,55	2,64	2,86	3,65	4,04	2,43	4,04	2,89
Internasal distance (mm)	1,61	2,0	2,0	2,0	2,2	1,73	1,48	2,28	1,59	2,31	2,05	1,61	2,65	1,91

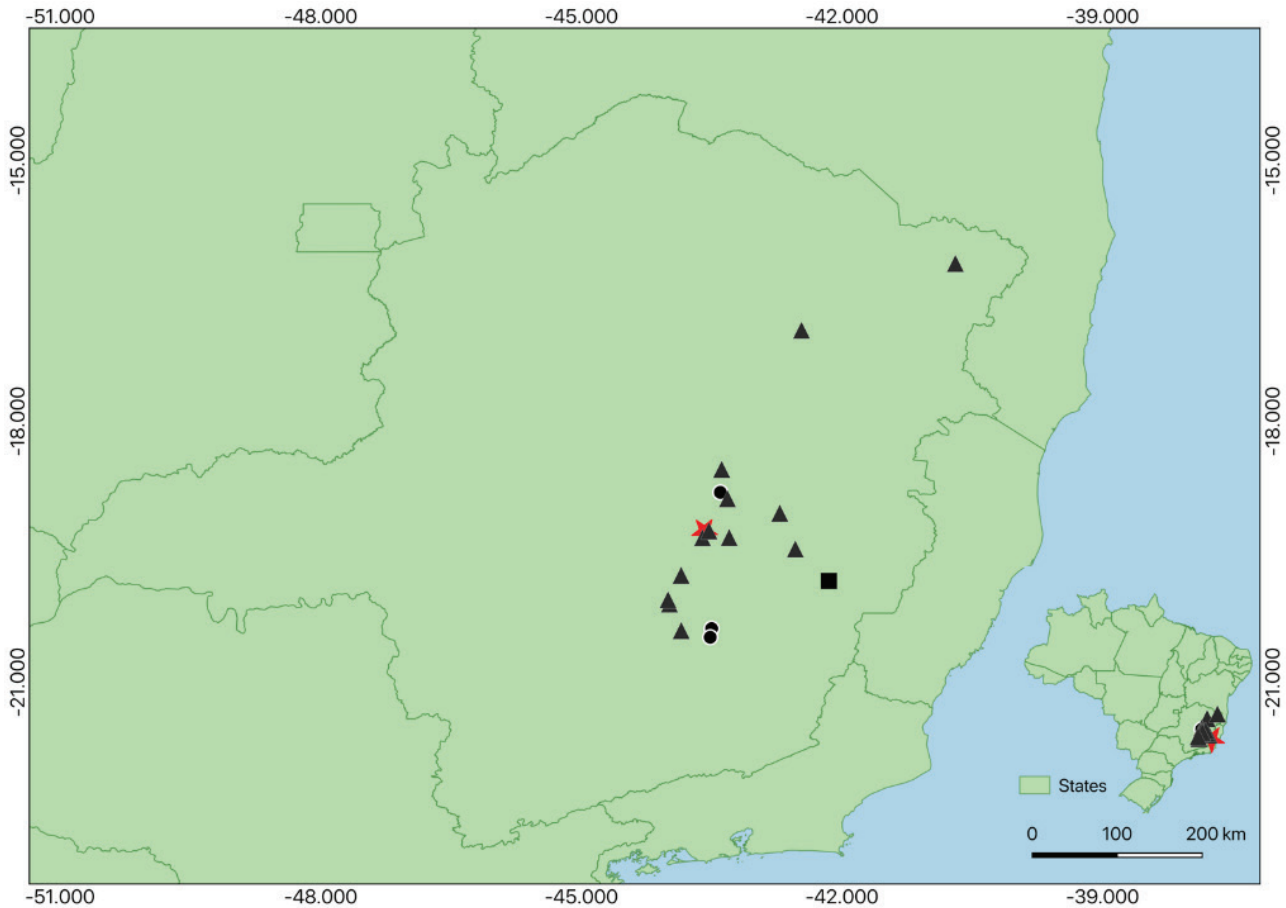


Figure 2. Geographic distribution of *Tantilla boipiranga*. Previous records (circles - Silveira *et al.* 2009; square - Nogueira *et al.* 2020) - and new localities (triangles) The type locality is represented by the red star.

Pilar, Conceição do Mato Dentro and Serro are the closest to Parque Nacional da Serra do Cipó (distant 83, 56, 71 and 131 km, respectively) and are influenced by the Cerrado and Atlantic Forest domains, and by the Rio das Velhas basin, one of the most important basins in the state of Minas Gerais (Alves & Pompeu 2005). In the east portion of the state is located the municipality of Ipatinga, 252 km from the type locality of *T. boipiranga*, it is influenced by the Rio Doce basin, which is another important basin in Minas Gerais. Furthermore, Nogueira *et al.* (2020) pointed to a voucher of the species on its distribution map in the municipality of Caratinga, but did not mention this municipality is approximately 340 km from the type locality of *T. boipiranga*. Moreover, these municipalities are inserted in the Atlantic Forest domain (Lombardi & Gonçalves 2000, Gonçalves & Lombardi 2004). Finally, the municipality of Brumadinho is inserted in an ecotone between Atlantic Forest and Cerrado, located 150 km southwards of the type locality. The municipality belongs to the *Quadrilátero Ferrífero*, a region with important

deposits and intensive extraction of iron, beyond agricultural activities (Marent *et al.* 2011). This region became, unfortunately, internationally relevant due to a tragic rupture of the tailings dam in January of 2019, which killed 260 people.

We also found another specimen (UFMG 2715) in the municipality of Braúnas, 166 km from the type locality, housed in Coleção de Répteis do Centro de Coleções Taxonômicas do ICB/UFMG, which we did not include in Table 1 because of the poor conservation condition of the specimen. Furthermore, among the new records of *T. boipiranga*, we found one specimen (FUNED 1921) outside the state of Minas Gerais, which is recorded for the municipality of Canaã dos Carajás, state of Pará, at the Serra dos Carajás ferruginous highlands. We strongly believe that this discrepancy in distance from the nearest record (the municipality of Almenara - MG) is that the specimen in question may have been collected at another locality nearest to the other records in the state of Minas Gerais. However, its data got switched with another animal leading to a false

geographic discrepancy between the populations of the species. Moreover, we decided to include this specimen in our morphological review only for comparison purposes, and we do not encourage our peers to use this location as part of the range distribution of the species.

As previously mentioned in this paper, *T. boipiranga* is considered Vulnerable (VU) according to the IUCN and the Brazilian Red List of snakes due to the severe population fragmentation and lack of information available (Morato 2010). These new records for *T. boipiranga* cover several new localities outside the Espinhaço Mountain range, but also in the *Quadrilátero Ferrífero* region and in the Vale do Rio Doce area, contributing to the reduction of Wallacean shortfall among Neotropical snakes. Moreover, the wide variation of morphological characters in the populations of *T. boipiranga* may difficult the species diagnosis, thus, we believe that more studies with this group should be done in order to elucidate the intra and interrelationships among this species.

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