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SHORT COMMUNICATION

Distribution extension of *Phimophis guerini* (Serpentes: Dipsadidae: Xenodontinae) in the Brazilian Amazon

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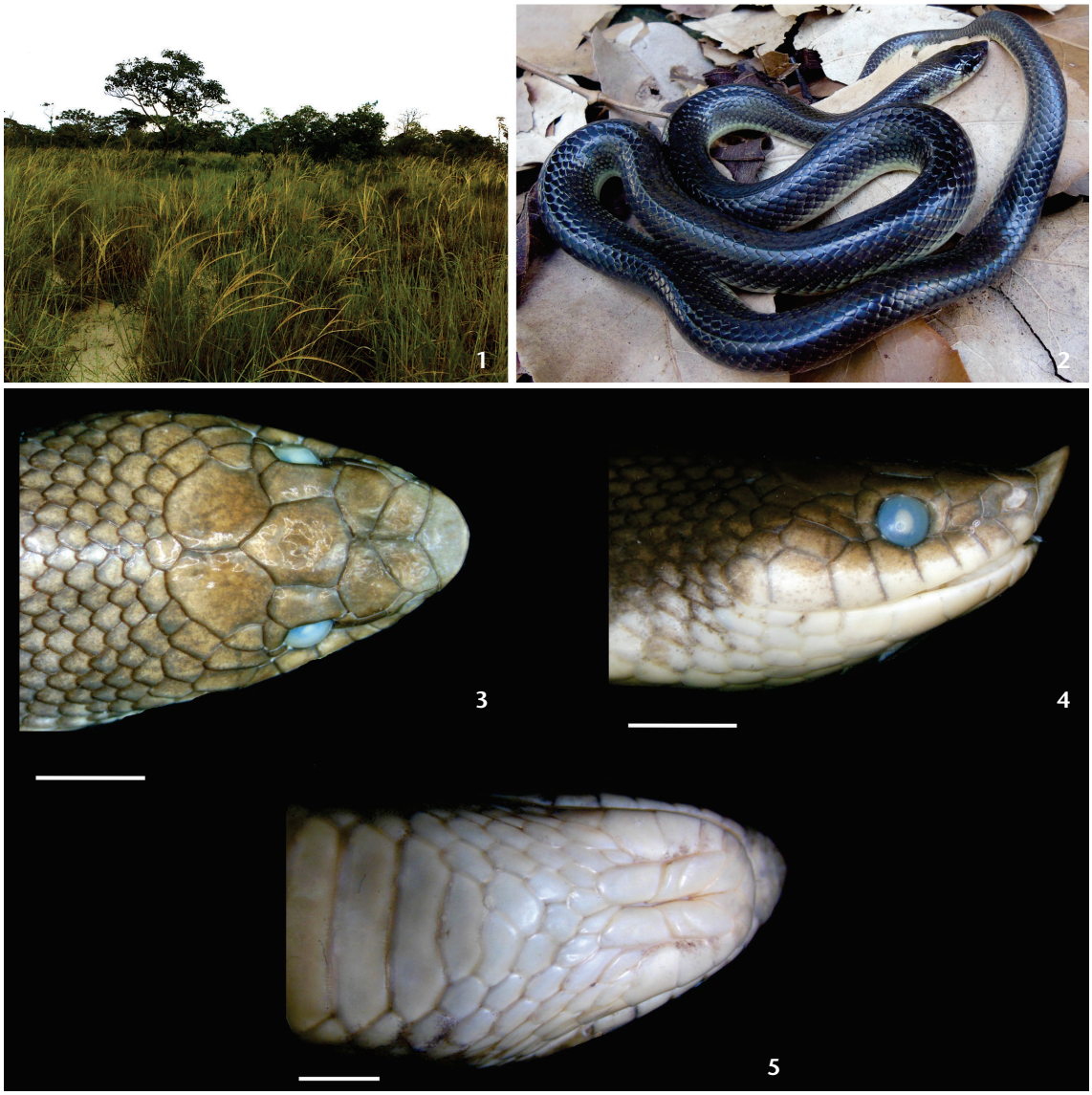
ABSTRACT. *Phimophis guerini* Duméril, Bibron & Duméril, 1854 is a Xenodontinae snake distributed in Argentina, Brazil and Paraguay. In Brazil, the species is broadly distributed, occurring mainly in open areas of the Cerrado, but also in the Amazon, Atlantic forest and Caatinga. We provide a new record for this species from the municipality of Santarém in the western portion of the state of Pará (Brazil). Five specimens were collected in a small area covered with Amazonian Savanna vegetation. We also provide the description of the morphological variation for the collected specimens. The new record extends the northern limit of the distribution by some 640 km (from Floresta Nacional de Carajás, Parauapebas municipality, eastern Pará). The record from Santarém provides a third locality for *P. guerini* within the Amazon biome and supports the hypothesis of a past ecological corridor linking the Cerrado and the open habitats within the Amazon.

KEY WORDS. Amazonian savanna, morphological data, Pará state, Pseudoboini.

Phimophis and 11 other genera compose the South American tribe Pseudoboini (Zaher et al. 2009, Grazziotin et al. 2012). Currently, the genus is represented by three known species: *Phimophis guerini* (Duméril, Bibron & Duméril, 1854), *Phimophis guianensis* (Troschel, 1848), and *Phimophis vittatus* (Boulenger, 1896). Within the genus, the species with the widest known distribution is *P. guerini* with confirmed records for Argentina, Paraguay and Brazil (Peters and Orejas-Miranda 1970, Tavares et al. 2012, Atkinson et al. 2017). In Brazil, *P. guerini* has a broad distribution, occurring mainly in open areas of the Cerrado, but also in the Mata Atlântica, Caatinga and Amazonian Savanna (Costa et al. 2010, Pereira-Filho et al. 2012, França et al. 2006, 2013, França et al. 2012, Marques et al. 2012, Maschio et al. 2012, Santos and Vaz-Silva 2012, Tavares et al. 2012).

The Amazonian savanna is composed of isolated patches of open vegetation within the Amazon forest. The floristic composition of the Amazonian savannas is less rich than the savannas in central Brazil. However, both formations present several species of herbaceous and woody plants in common (Magnusson et al. 2008). The areas are occasionally affected by fire, but the vegetation is adapted to recover in a cycle that includes fire as an intrinsic and regular phenomenon (Faria et al. 2004). Compared to other Amazonian ecosystems (e.g., 'terra-firme' Forest), Amazonian savannas are poorly studied (Carvalho and Mustin 2017). Biogeographic studies have proposed past ecological corridors interconnecting these fragments with the central region of the South American's open diagonal, including the Caatinga, Cerrado and Chaco biomes (Werneck et al. 2012). Here we present a new geographic record and morphological data for five specimens of *P. guerini* collected in the central Amazonian Savanna.

The study was undertaken in a small area of Amazonian Savanna (Fig. 1) in the community of Tapari, municipality of Santarém, western portion of the state of Pará, Brazil (2°26.827'S; 54°53.577'W), where four specimens of *P. guerini* were collected in pitfall traps (see a photo of one of the specimens alive in Fig. 2). The study was carried out from October 2012 to September 2013, as part of a broader inventory project to catalog the species of snakes present in the Amazonian savanna of the western Pará. An additional specimen (Figs 3–5) was collected in May 2015



Figures 1–5. Habitat and specimens of *Phimophis guerini* collected in an amazon savanna area in Santarém, Pará, Brazil: (1) specimen collection environment; (2) living specimen MPEG 2638; (3–5) dorsal, lateral and ventral views, respectively, of the head of specimen UFOPA-H 0249. Scale bars: 5 mm.

on an unpaved road near one of our sampling sites (2°28.546'S; 54°53.827'W). The Amazonian Savanna in the studied area consists largely of herbaceous vegetation, varying in height and density, accompanied by shrub and tree strata, presenting abrupt edges between the open areas and the forests, with a small ecotone area where soil is predominantly sandy (Magnusson et al. 2008). All collected specimens were deposited in the collections of the Museu Paraense Emílio Goeldi (MPEG 26538, MPEG 26539, MPEG 26540) and of the Universidade Federal do Oeste do Pará (UFOPA-H 0249, UFOPA-H 1237).

The extent and nature of the morphological variation of *P. guerini* is not very well known. Therefore, we present here the morphometric and meristic data from the collected specimens (Table 1). Records of *P. guerini* from western Pará extends the previously known distribution of the species by approximately 640 km from the nearest locality (Floresta Nacional de Carajás, Parauapebas municipality, eastern Pará state; Maschio et al. 2012). This record from Santarém provides a third locality for *P. guerini* within the Amazonian biome (França et al. 2006, Maschio et al. 2012) (Fig. 6). All Amazonian records are restricted to open

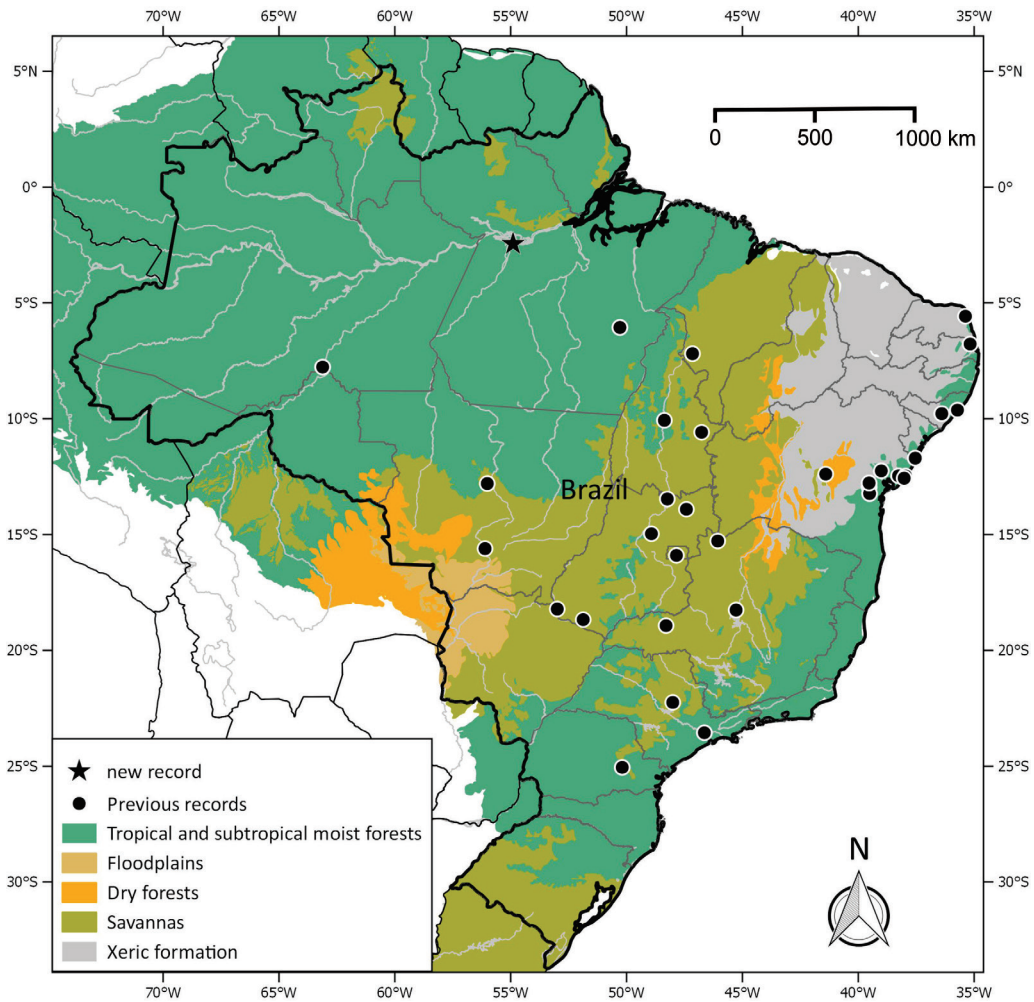


Figure 6. Updated geographic distribution of *Phimophis guerini* in Brazil, showing the new record (star) in western Pará, Brazil. Previous records (circles) were taken from the following publications: Costa et al. (2010), Pereira-Filho et al. (2012) França et al. (2006, 2013), França et al. (2012), Marques et al. (2012), Maschio et al. (2012), Santos and Vaz-Silva (2012) Tavares et al. (2012).

Table 1. Morphometric and meristic data of specimens of *Phimophis guerini* collected in the community of Tapari, Santarém Pará, Brazil. The snout-vent length and tail length are given in millimeters. Bilateral variation is reported as "right/left".

Characters	Specimens				
	MPEG 26538	MPEG 26539	MPEG 26540	UFOPA-H 1237	UFOPA-H 0249
Sex	Male	Male	Female	Female	Female
Snout-vent length	465	540	560	587	669
Tail length	115	135	101	121	127
Supralabials	8/8	8/8	8/8	8/8	8/9
Infralabials	09/09	10/10	10/09	10/09	09/09
Oculars	1+2/1+2	1+2/1+2	1+2/1+2	1+2/2+2	1+2/1+2
Temporals	3+3/2+3	2+3/2+3	2+3/2+3	2+3/3+3	3+3/2+3
Dorsal scales	21+19+17	21+19+17	21+19+17	21+19+17	21+19+17
Ventrals	195	195	207	205	207
Subcaudals	73	73	63	67	61

habitats. The specimen UFOPA-H 0249 was collected at night while foraging and had the third-most part of its body inserted in a lizard hole in the sand, probably excavated by *Ameiva ameiva* (Linnaeus, 1758), which can indicate the saurophagous habit of the species (Sawaya et al. 2008).

Phimophis guerini is a relatively common species in the cerrado of Central Brazil, although the species seems to be rare in the Amazon domain. We present here the second record for this snake in the state of Pará, reinforcing the importance of inventorying biological diversity of the poorly known Amazonian Savanna. These areas can be considered particularly important for the conservation of the Amazonian fauna, since they can encompass communities composed of forest and savanna dwellers, and even present endemics species (Carvalho and Mustin 2017). The presence of *P. guerini* in Amazonian savannas supports the idea that past open corridors may have connected central Brazil to the extreme north of the Amazon during the Last Glacial Maximum (c. 21 ka) (Werneck et al. 2012). Such corridors were most likely temporary and the transitory connection among these regions is also supported by the disjunct distribution of other species of snake, including *Taeniophallus occipitalis* (Jan, 1863) and *Oxyrhopus rhombifer septentrionalis* Vellard, 1943 (Peters and Orejas-Miranda 1970, França et al. 2006, Santos-Jr et al. 2008).

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