Check List 9(1): 099–103, 2013

ISSN 1809-127X (available at *www.checklist.org.br*)

Check List
Journal of species lists and distribution

Notes on Geographic Distribution

New records of snakes (Reptilia: Squamata) in Minas Gerais, Brazil

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Abstract: We report new records of three poorly-known species of snakes in Minas Gerais: *Bothrops lutzi* (Miranda-Ribeiro, 1915), *Psomophis joberti* (Sauvage, 1884), and *Trilepida brasiliensis* (Laurent, 1949). The new records represent important filling gaps for all three species or even southern extensions in the geographic distribution of *B. lutzi* and *P. joberti*. The new records are located in areas indicated as priority regions for biodiversity conservation in Cerrado. Maps of known records of these snakes are also provided considering literature data and new records from collections.

The Brazilian state of Minas Gerais comprises an area of approximately 587,000 km^2, presenting high physical heterogeneity. The soil and elevation characteristics, in addition to its vast length and breadth, climate and relief provide a diversity of vegetation types, three of them considered world's biodiversity hotspot: Mata Atlântica, Caatinga and Cerrado (Mittermeier *et al.* 2005; Drummond *et al.* 2009). However, large extentions on the Cerrado of Minas Gerais state remain to be inventoried (Drummond *et al.* 2009)

Considering the reptile fauna, there are few published studies on richeness, composition and biogeography of Minas Gerais state (*e.g.* Brites and Bauab 1998; Recoder and Nogueira 2007; Novelli *et al*. 2012). Here, we provide new records of three poorly-known snake species in the Cerrado of Minas Gerais – *Bothrops lutzi* (Miranda-Ribeiro, 1915), *Psomophis joberti* (Sauvage, 1884), and *Trilepida brasiliensis* (Laurent, 1949). Maps of the geographic distribution are also presented considering the literature data available. New data presented are based on collection records. We examined specimens from Minas Gerais and Bahia deposited in the following Brazilian herpetological collections: Coleção Herpetológica da Universidade de Brasília (CHUNB), in Brasília, DF; Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), in Rio de Janeiro, RJ; Fundação Ezequiel Dias (FUNED), in Belo Horizonte, MG; and Museu de Zoologia João Moojen, Universidade Federal de Viçosa (MZUFV), in Viçosa, MG. No records were found at Museu de Ciências Naturais, Pontifícia Universidade Católica de Minas Gerais (MCNR), Belo Horizonte, MG; Coleção Herpetológica da Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, MG; and Coleção de Répteis do Centro de Ciências da Saúde, Universidade Federal do Rio de Janeiro (ZUFRJ), Rio de Janeiro, RJ.

Bothrops lutzi (Viperidae) (Figure 1) is a medium sized venomous snake allocated on *B. neuwiedi* complex species with seven other species. *Bothrops lutzi* is distinguished from other species of this complex mainly by the presence of supralabial scales ornamented with small white spots prolonged vertically, usually more conspicuous in the posterior half of the mouth and by the weakly defined contour of the borders of dorsolateral blotches (Silva and Rodrigues 2008). This species is widely distributed from northeastern Brazil, in Ceará state (Borges-Nojosa and Gascon 2005; Loebmann 2009), throughout Central Brazil to São Paulo state (Silva and Rodrigues 2008). Considering the Minas Gerais state, the species is known only from Januária municipality (15°42'S, 44°36'W) (Silva and Rodrigues 2008). The taxonomic nomenclature of this pitviper follows Carrasco *et al*. (2012).

Figure 1. *Bothrops lutzi* (MZUFV 1948; 627 mm total length) from Brasilândia de Minas municipality, Minas Gerais state, Brazil. Photo by M.R. Moura.

Psomophis joberti (Colubridae) (Figure 2) is a small to medium sized snake, distinguished from other congeneric species by the postocular/temporal coloration which continues in a straight line to the neck (Myers and Cadle 1994). This species is widely distributed from northern and northeastern Brazil to Paraguay, occurring in Mata Atlântica, Cerrado and Caatinga (Myers and Cadle 1994; Uetz *et al*. 2011). It is known from two localities in Minas Gerais state:

Pirapora municipality (17°21'S, 44°56'W, Myers and Cadle 1994) and from Pandeiros river, near Januária municipality (*ca*. 15°42'S, 44°36'W, Recoder and Nogueira 2007).

Figure 2. *Psomophis joberti* (MZUFV 1899; 333 mm total length) from Urucuia municipality, Minas Gerais state, Brazil. Photo by M.R. Moura.

Trilepida brasiliensis (Leptotyphlopidae) (Figure 3) is a small sized threadsnake described based on a single specimen from Brazil, without further information. Rodrigues and Puorto (1994) and Wallach (1996) reported a second and third specimen of *T. brasiliensis* from the municipality of Barreiras, Bahia. Curcio *et al*. (2002), based on four additional specimens, registered the species in the Estação Ecológica Uruçuí-Una, Baixa Grande do Ribeiro municipality, Piauí state, and also demonstrated the intraspecific variation on the number of supralabial scales. Pinto *et al.* (2005) reported an additional record in Três Marias municipality, Minas Gerais (18°12'21" S, 45°14'31" W), the southernmost record. Silveira (2010) recorded the species from João Pinheiro municipality (17°48'14" S, 46°08'29" W), what represent the fifth locality in Minas Gerais where *T. brasiliensis* was found. Pinto and Curcio (2011) analyzed 42 specimens of *T. brasiliensis* and presented a wider geographic distribution from northern Minas Gerais to northern Tocantins state reaching the Maranhão state, and also a more continental distribution in Mato Grosso and Mato Grosso do Sul states. The taxonomic nomenclature of this genus follows Hedges (2011).

Our new records are located in areas indicated by the Brazilian Ministry of Environment as priority regions for biodiversity conservation in Cerrado (MMA 2007).

Figure 3. *Trilepida brasiliensis* (MZUFV 1891, 237 mm total length) from Urucuia municipality, Minas Gerais state, Brazil. Photo by M.R. Moura.

Bothrops lutzi new records are located in the "Três Marias, Paracatu" region (Brasilândia de Minas municipality); *Psomophis joberti* in the "Ouro Preto region / Serra do Caraça mountain" region (Nova Lima municipality) and in the "Upper São Francisco Basin" region (Urucuia municipality); *Trilepida brasiliensis* from the "Upper São Francisco Basin" region (Urucuia municipality). The new records of *Bothrops lutzi* in Brasilândia de Minas (16°52'31" S, 46°10'24" W) and Riachinho (16°13'08" S, 46°00'03" W) are located at *ca.* 185 and 250 km respectively from the southwestern record, in Januária municipality, Minas Gerais. The record from Brasilândia de Minas are inserted in the "Três Marias, Paracatu" priority region (MMA 2007). If the doubtful record of *B. lutzi* in Americana municipality, São Paulo state, is proved to be a misunderstanding (Silva and Rodrigues 2008), the occurrence at "Três Marias, Paracatu" region should be considered the southernmost record of the species. The new records of *Psomophis joberti* from municipalities of Nova Lima and Urucuia (16°02'15" S, 45°42'45" W) correspond to the third and fourth localities from which this species is known in Minas Gerais. The record from Nova Lima represents a range extension of 305 km from the closest record, in Pirapora municipality (Figure 5). The new records are located in "Ouro Preto / Serra do Caraça

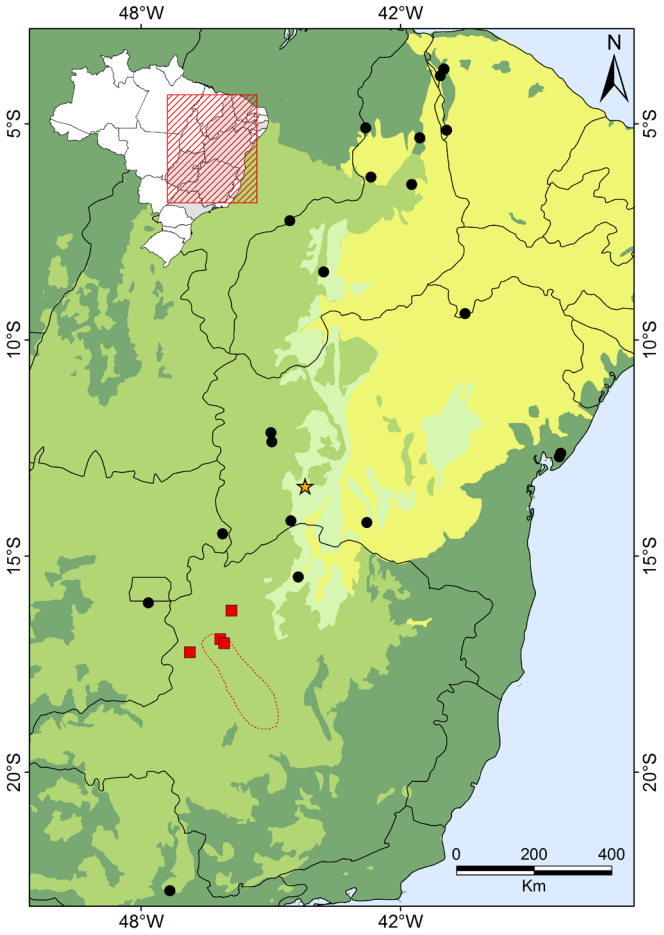

Figure 4. Known records of *Bothrops lutzi* in Brazilian states. Symbols: circles = literature records (Borges-Nojosa and Cascon 2005; Freitas and Silva 2007; Silva and Rodrigues 2008; Loebmann 2009; Loebmann and Haddad 2010; Rodrigues and Prudente 2011); squares = new records; star = type locality. Red dashed line: boundaries of the "Três Marias, Paracatu" region. Ecoregions according Olson *et al.* (2001): Tropical and subtropical moist forests; Tropical and subtropical savannas; Deserts and xeric formations; Tropical and subtropical dry forests.

mountain" priority region (Nova Lima municipality) and in "Upper São Francisco Basin" priority region (Urucuia municipality) (MMA 2007). The new records of *Trilepida brasiliensis* from municipality of Urucuia (two localities, near the Tabocas stream at 16°07'03" S, 45°46'00" W and Sabões stream, at 16°02'17" S, 45°42'47" W) represent the sixth occurrence in Minas Gerais, inserted in "Upper São Francisco Basin" priority region (MMA 2007) (Figure 6). Biological importance for these priority regions are considered "very high" or "extremely high" (MMA 2007). All records fill gaps in the distribution of these poorly known species in Minas Gerais, being their first records within the mentioned priority regions for biodiversity conservation in Cerrado of Minas Gerais.

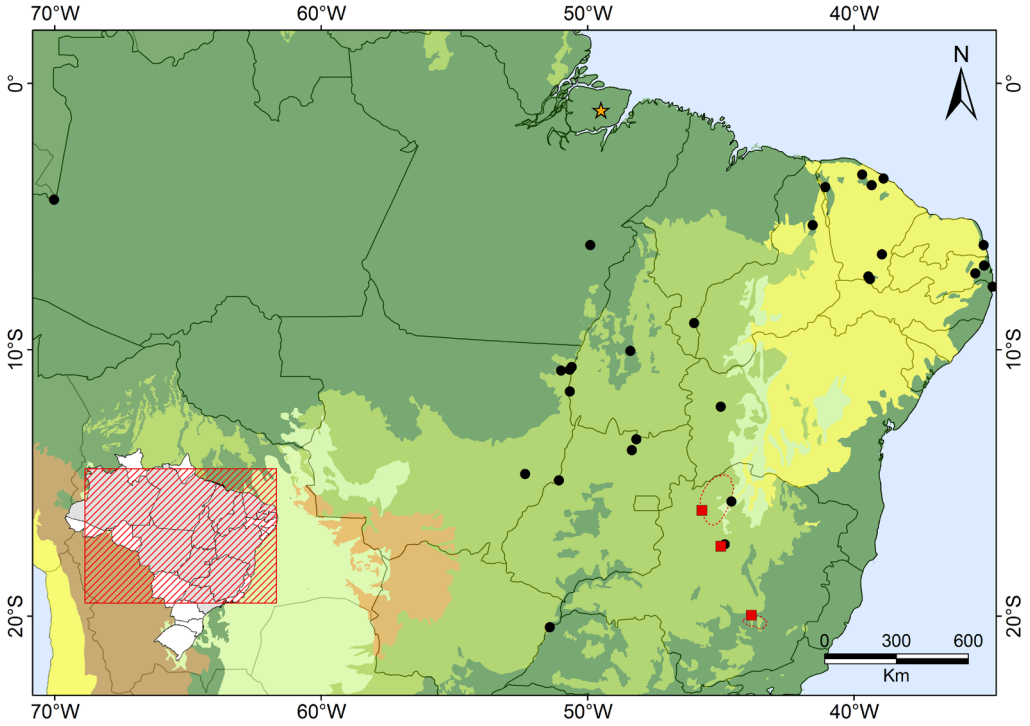

Figure 5. Known records of *Psomophis joberti* in Brazilian states. Symbols: circles = literature records (Myers and Cadle 1994; Passos and Fernandes 2002; Vitt *et al.* 2002; Pavan and Dixo 2004; França *et al.* 2006; Recoder and Nogueira 2007; Ribeiro *et al.* 2008; Moreira *et al.* 2009; Lima *et al.* 2010; Loebmann and Haddad 2010; Mesquita *et al.* 2011; Rodrigues and Prudente 2011); square = new record; star = type locality; red dashed line = boundaries of priority regions for conservation in the Cerrado. Ecoregions according Olson *et al.* (2001): Tropical and subtropical moist forests; Tropical and subtropical savannas; Deserts and xeric formations; Floodplains; Tropical and subtropical dry forests.

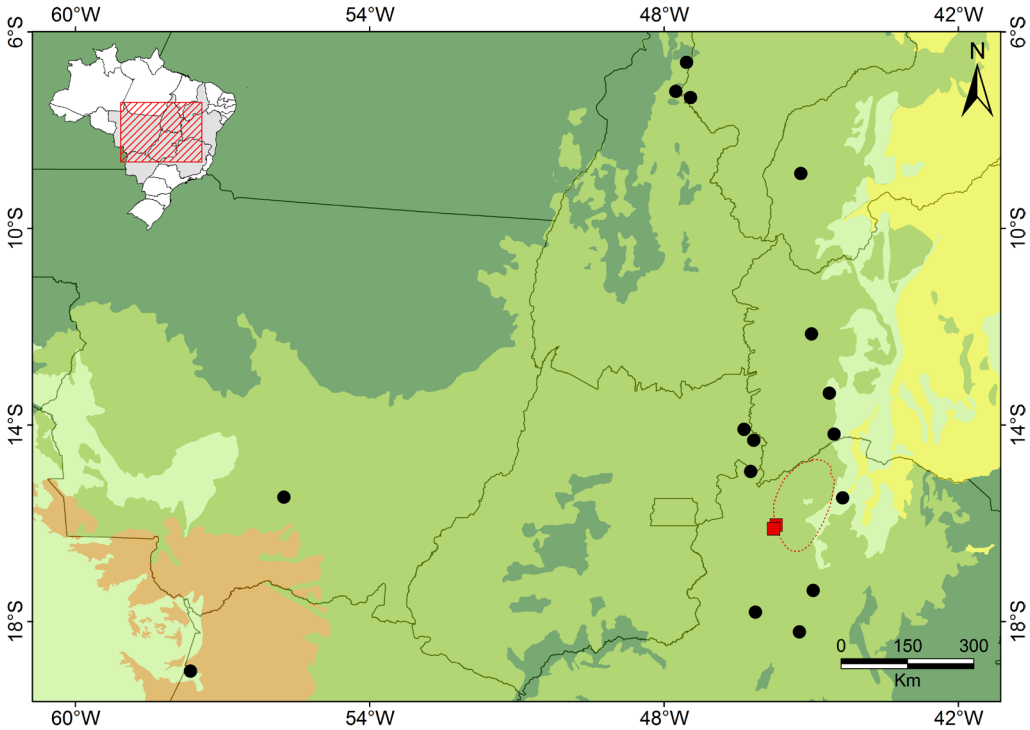

Figure 6. Known records of *Trilepida brasiliensis* in Brazilian states. Symbols: Circles = literature records (Rodrigues and Puorto 1994; Wallach 1996; Curcio *et al.* 2002; Pinto *et al.* 2005; França *et al.* 2008, Silveira 2010; Pinto and Curcio 2011); square = new record; star = type locality. Red dashed line: boundaries of the Upper Francisco Basin region. Ecoregions according Olson *et al.* (2001): Tropical and subtropical moist forests; Tropical and subtropical savannas; Deserts and xeric formations; Floodplains; Tropical and subtropical dry forests.

About 14% of 139 snake species recorded in Minas Gerais are considered Data Deficient (DD), including *Psomophis joberti* (Biodiversitas 2007; Bérnils *et al*. 2009). The number of DD species is probably greater because several areas in Minas Gerais still miss basic information such as the reptile richness and composition (*e.g.* Sousa and Novelli 2009; Fernandes *et al*. 2010; Moura *et al.* 2010; Costa 2011). We presented complementary information on the distribution of *B. lutzi*, *P. joberti* and *T. Brasiliensis*, that can be useful in future assessments of the conservation status of these species in the Cerrado, mainly in Minas Gerais.

Acknowledgments: We thank Heliomar Cazelli and Carolina Coelho-Augusto for helping during the fieldwork. James Hesson, Breno Hamdan, Davi L. Pantoja, Roberta R. Pinto and Francisco Franco for revision of the manuscript. Henrique Caldeira Costa and Leonardo Tedeschi for examining the P. joberti specimens of herpetological collections of the FUNED and CHUNB, respectively. Gisele Cotta (FUNED), Luciana Barreto Nascimento (MCN), Paulo Christiano de Anchietta Garcia (UFMG), Renato Neves Feio (MZUFV) and Ronaldo Fernandes (MRNJ) for allowing the examination of the specimens. Fundação de Amparo à Pesquisa do Estado de Minas Gerais (FAPEMIG) for financial support (APQ 03549-09 - Programa Biota Minas). Agroflor Engenharia e Meio Ambiente for financial and the field support. AcademicEnglishSolutions.com revised the English.

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Received: February 2012
Accepted: November 2012
Published online: March 2013
Editorial responsibility: Davi Pantoja

Appendix 1. Voucher specimens of the new records presented in this study.

Bothrops lutzi (n = 4) – Brazil: Minas Gerais state, Brasilândia de Minas municipality (MZUFV 1868, MZUFV 1948), Paractu municipality (CHUNB 3584), Riachinho municipality (MZUFV 1908).
Tripelida brasiliensis (n = 2) – Brazil: Minas Gerais State, Urucuia municipality (MZUFV 1891, MZUFV 1893).
Psomophis joberti (n = 4) – Brazil: Minas Gerais state, Buritizeiro municipality (CHUNB 44480), Nova Lima municipality (FUNED 2010), Paracatu municipality (FUNED 1028), Urucuia municipality (MZUFV 1899).