

First record of *Siphonops paulensis* Boettger, 1892 (Gymnophiona: Siphonopidae) in the state of Sergipe, northeastern Brazil

Daniel Oliveira Santana^{1*}, **Crizanto Brito De-Carvalho**², **Evellyn Borges de Freitas**², **Geziana Silva Siqueira Nunes**² and **Renato Gomes Faria**²

1 Universidade Federal da Paraíba, Programa de Pós Graduação em Ciências Biológicas (Zoologia). Cidade Universitária, Avenida Contorno da Cidade Universitária, s/n°, Castelo Branco. CEP 58059-900. João Pessoa, PB, Brazil

2 Universidade Federal de Sergipe, Programa de Pós-graduação em Ecologia e Conservação. Cidade Universitária Prof. José Aloísio de Campos, Avenida Marechal Rondon, s/n°, Jardim Rosa Elze. CEP 49100-000. São Cristóvão, SE, Brazil

* Corresponding author: E-mail: danielbioufs@yahoo.com.br

Abstract: Siphonopidae is represented by 25 caecilians species in South America. In Brazil, *Siphonops paulensis* is found in the states of Maranhão, Rio Grande do Norte, Bahia, Tocantins, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, São Paulo, Rio de Janeiro, Rio Grande do Sul, and in the Distrito Federal. Herein, we report the first record of *Siphonops paulensis* in the state of Sergipe, Brazil, Simão Dias municipality. This record significantly expands the distribution of the species in northeastern Brazil.

Key words: caecilians, Siphonopidae, geographic distribution, *Siphonops paulensis*, Simão Dias

Siphonopidae is represented by 25 species in South America, being widely distributed in the continent, occurring in Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela (Dunn 1942; Taylor 1968; Lynch 1999; Frost 2014).

In Brazil, the genus *Siphonops* is represented by five species: *Siphonops annulatus* (Mikan, 1820); *Siphonops hardyi* Boulenger, 1888; *Siphonops insulanus* Ihering, 1911; *Siphonops leucoderus* Taylor, 1968; and, *Siphonops paulensis* Boettger, 1892. *Siphonops paulensis* Boettger, 1892 is found in Argentina, Bolivia, Brazil, Paraguay and Uruguay (Taylor 1968; Aquino *et al.* 2004).

Siphonops paulensis was described from São Paulo municipality, state of São Paulo by Boettger (1892). Currently, it is registered in the states of Maranhão (Miranda *et al.* 2013), Rio Grande do Norte (Schmidt and Inger 1951), Tocantins (Valdujo *et al.* 2011), Goiás (Schwartz *et al.* 2003; Vaz-Silva *et al.* 2007; Cintra *et al.* 2009; Souza *et al.* 2002), Mato Grosso (Faria and Mott 2011), Mato Grosso do Sul (Dunn 1942; Silva-Júnior *et al.* 2009), Minas Gerais (Kokubum and Menin, 2001), São Paulo (Dunn 1942; Forlani *et al.* 2010), Rio de Janeiro (Sawaya 1937), Rio Grande do Sul (Braun and Braun 1980; Lema and Martins 2011), and in the Distrito Federal (Kokubum and Menin 2001). *Siphonops paulensis* is a subterranean species living in forest, savannahs, shrubland and grassland. It adapts well to anthropogenic disturbance, and has

even been found in urban gardens. It is oviparous with terrestrial eggs and direct development, and not dependent on water for breeding (Aquino *et al.* 2004). We present a distribution map (Figure 1) and data in Table 1 of the current known distribution of this species based on literature.

Herein, we report the first record of *Siphonops paulensis* (Figure 2) for the state of Sergipe, Brazil. The observation occurred on 28 February 2009. The casual encounter was made in municipality of Simão Dias (10°44'20" S, 037°48'36" W; 250 m above sea level) (Figure 1). The specimen of *Siphonops paulensis* (SVL: 340.02 mm) was collected in vicinities city, was fixed in 10% formalin and preserved in 70% alcohol, and deposited in the Herpetological Collection of the Universidade Federal de Sergipe (CHUFS - Voucher Co0378), São Cristóvão municipality, Sergipe state, Brazil.

The specimen was collected under the license permit

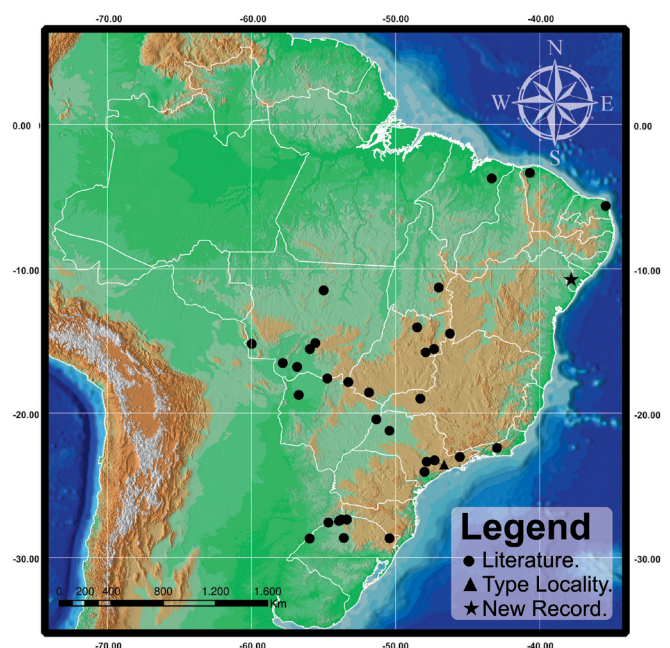


Figure 1. Geographic distribution of *Siphonops paulensis* in Brazil.

Table 1. Localities of the known distribution of *Siphonops paulensis* in Brazil.

State	Municipality	Latitude (S)	Longitude (W)	Reference
Ceará	Ibiapaba	03°20'00"	040°42'00"	Loebmann and Haddad (2010)
Distrito Federal	Brasília	15°46'47"	047°55'47"	Kokubum and Menin (2001)
Goiás	Formosa	15°32'14"	047°20'04"	Schwartz et al. (2003)
Goiás	Aporé	18°40'26"	051°52'50"	Vaz-Silva et al. (2007)
Goiás	Mambai	14°21'15"	046°11'40"	Cintra et al. (2009)
Goiás	Minaçu	14°00'30"	048°24'53"	Souza et al. (2002)
Maranhão	Chapadinha	03°44'41"	043°19'36"	Miranda et al. (2013)
Mato Grosso	Alto Taquari	17°49'40"	053°17'38"	Faria and Mott (2011)
Mato Grosso	Cáceres	16°30'59"	057°50'12"	Faria and Mott (2011)
Mato Grosso	Chapada dos Guimarães	15°06'25"	055°32'22"	Faria and Mott (2011)
Mato Grosso	Cláudia	11°26'46"	055°02'57"	Faria and Mott (2011)
Mato Grosso	Cuiabá	15°28'48"	055°53'21"	Faria and Mott (2011)
Mato Grosso	Poconé	16°47'04"	056°56'54"	Faria and Mott (2011)
Mato Grosso	Vila Bela da Santíssima Trindade	15°11'15"	059°58'58"	Faria and Mott (2011)
Mato Grosso do Sul	Sonora	17°34'47"	054°44'37"	Silva et al. (2009)
Mato Grosso do Sul	Corumbá	18°43'51"	056°43'23"	Dunn (1942)
Minas Gerais	Uberlândia	18°59'00"	048°18'00"	Kokubum and Menin (2001)
Rio de Janeiro	Teresópolis	22°24'44"	042°57'59"	Sawaya (1937)
Rio Grande do Norte	Ceará Mirim	05°38'07"	035°25'13"	Schmidt and Inger (1951)
Rio Grande do Sul	Frederico Westphalen	27°21'27"	053°23'40"	Lema and Martins (2011)
Rio Grande do Sul	Porto Mauá	27°34'12"	054°39'55"	Species Link
Rio Grande do Sul	Três Passos	27°27'31"	053°55'49"	Species Link
Rio Grande do Sul	Bom Jesus	28°40'09"	050°26'05"	Species Link
Rio Grande do Sul	Tenente Portela	27°22'15"	053°45'28"	Braun and Braun (1980)
Rio Grande do Sul	Cruz Alta	28°38'22"	053°36'22"	Braun and Braun (1980)
Rio Grande do Sul	São Borja	28°40'58"	055°58'39"	Braun and Braun (1980)
São Paulo	São Miguel Arcanjo	24°03'00"	047°56'00"	Forlani et al. (2010)
São Paulo	Itú	23°15'57"	047°17'57"	Species Link
São Paulo	Tatuí	23°21'00"	047°51'00"	Species Link
São Paulo	Taubaté	23°01'51"	045°32'54"	Dunn (1942)
São Paulo	Ilha Solteira	20°25'52"	051°20'17"	Species Link
São Paulo	Araçatuba	21°12'41"	050°25'34"	Species Link
São Paulo	São Paulo	23°32'51"	046°38'10"	Boettger (1892) <i>Type Locality</i>
Tocantins	Almas	11°16'00"	047°00'00"	Valdujo et al. (2011)
Sergipe	Simão Dias	10°44'20"	037°48'36"	New Record

#10504-1 granted by the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA).

The specimen had their identification confirmed based on absence of splenial teeth, eye more or less distinct, in a socket, its orbits continuous with the tentacular groove, its distance from nostril more than three times as far as its distance from eye. The eyes are rather indistinct but visible as grayish-white spots. The head is short, the snout is oval, and body is plump and subcylindrical. Terminal part of body unsegmented, color slate, based on the description of Taylor (1968). The number of annuli following the collars is 114. According to Taylor (1968) *S. paulensis* presents variation of from 101 to 118 annuli. The nomenclature used in this study follows the taxonomy suggested by Segalla et al. (2013).

Our record extends the geographic distribution of *Siphonops paulensis* by about 1,700 km northeast of its type locality and 630 km from the nearest locality in municipality of Ceará Mirim, Rio Grande do Norte state (Schmidt and Inger 1951). The new record reported in this study fills a distributional gap of the poorly known *S. paulensis* in northeastern Brazil.

ACKNOWLEDGMENTS

We sincerely thank to Universidade Federal de Sergipe for logistic. Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), and Coordenação de Aperfeiçoamento

de Pessoal de Nível Superior (CAPES) for fellowships. We also thank the anonymous reviewer for comments and suggestions in this manuscript.



Figure 2. *Siphonops paulensis* (C00378). Photo by Crizanto Brito De-Carvalho.

LITERATURE CITED

- Aquino, L., S. Reichle, G.R. Colli, N. Scott, J. Faivovich, M. Wilkinson and J. Measey. 2004. *Siphonops paulensis*. In IUCN 2012 IUCN Red List of Threatened Species. Version 2012.2. Electronic Database accessible at <http://www.iucnredlist.org>. Captured on 17 January 2014.
- Braun, P.C. and C.A.S. Braun. 1980. Lista prévia dos anfíbios do Estado do Rio Grande do Sul, Brasil. *Iheringia Série Zoologia* 56: 121–146.
- Cintra, C.E.D., H.L.R., Silva and N.J. Silva-Júnior. 2009. Herpetofauna, Santa Edwiges I and II hydroelectric power plants, state of Goiás, Brazil. *Check List* 5(3): 570–576. (<http://www.checklist.org.br/getpdf?SL113-08>).
- Dunn, E.R. 1942. The American caecilians. *Bulletin of the Museum of Comparative Zoology* 91: 437–540 (<http://biodiversitylibrary.org/page/4788854>).
- Faria, H.A.B. and T. Mott. 2011. Geographic distribution of caecilians (Gymnophiona, Amphibia) in the state of Mato Grosso, Brazil with a new state record for *Caecilia mertensi* Taylor 1973. *Herpetology Notes* 4: 053–056. (http://www.herpetologynotes.seh-herpetology.org/Volume4_PDFs/Faria&Mott_Herpetology_Notes_Volume4_pages053-056.pdf).
- Forlani, M.C., P.H. Bernardo, C.B.F. Haddad and H. Zaher. 2010. Herpetofauna do Parque Estadual Carlos Botelho, São Paulo, Brasil. *Biota Neotropica* 10(3): 265–309. (<http://www.biotaneotropica.org.br/v10n3/en/abstract?inventory+bn00210032010>).
- Frost, D.R. 2014. *Amphibian Species of the World: an Online Reference*. Version 5.6 (9 January, 2013). New York: American Museum of Natural History. Accessible at <http://research.amnh.org/vz/herpetology/amphibia>. Captured on 17 April 2014.
- Kokubum, M.N.C. and M. Menin, 2001. Geographic Distribution. *Siphonops paulensis*. *Herpetological Review* 32(1): 53–53.
- Lema, T. and L.A. Martins. 2011. *Anfíbios do Rio Grande do Sul. Catálogo, Diagnose, Distribuição e Iconografia*. Porto Alegre: ediPUCRS. 196 pp.
- Lynch, J.D. 1999. Una aproximacion a las cuebras ciegas de Colombia (Amphibia: Gymnophiona). *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales* 23: 317–337. (http://www.accefyn.org.co/revista/Vol_23/supl/317-337.pdf).
- Miranda, J.P., R.F. Matos, F.M. Scarpa and C.F.D. Rocha. 2013. New record and distribution extension of *Siphonops paulensis* (Gymnophiona: Siphonopidae) in the state of Maranhão, Northeastern Brazil. *Herpetology Notes* 6: 327–329. (http://www.herpetologynotes.seh-herpetology.org/Volume6_PDFs/Miranda_HerpetologyNotes_volume6_pages327-329.pdf).
- Sawaya, P. 1937. Sobre o gênero *Siphonops* Wagler 1828- Amphibia-Apoda- com descrição de duas variedades novas: *S. annulatus* (Mikan) var. *marmoratus* e *S. paulensis* Boettg. var. *maculatus*. *Boletim da Faculdade de Filosofia Ciências e Letras da Universidade de São Paulo* 1: 225–263.
- Schmidt, K.E. and R.F. Inger. 1951. Amphibians and reptiles of the Hopkins–Branner expedition to Brazil. *Fieldiana, Zoology* 31(42): 439–465 (<http://biodiversitylibrary.org/page/2826872>).
- Schwartz, E.F., A. Stucchi-Zucchi, C.A. Schwartz and L.C. Salomão. 2003. Skin secretion of *Siphonops paulensis* (Gymnophiona, Amphibia) forms voltage-dependent ionic channels in lipid membranes. *Brazilian Journal of Medical and Biological Research* 36: 1279–1282. (doi: 10.1590/S0100-879X2003000900020).
- Silva-Júnior, N.J., C.E.D. Cintra, H.L.R. Silva, M.C. Costa, C.A. Souza, A.A. Pachêco-Júnior, F.A. Gonçalves. 2009. Herpetofauna, Ponte de Pedra Hydroelectric Power Plant, states of Mato Grosso and Mato Grosso do Sul, Brazil. *Check List* 5(3): 518–525. (<http://www.checklist.org.br/getpdf?SL114-08>).
- Souza, I.F., H.L.R. Silva and N.J. Silva Jr. 2002. Geographic Distribution. *Siphonops paulensis*. *Herpetological Review* 33(2): 146–47.
- Taylor, E.H. 1968. *The Caecilians of the World. A Taxonomic Review*. Lawrence. University of Kansas Press. 122 pp.
- Valdujo P.H., A. Camacho, R.S. Recoder, M. Teixeira Jr., J.M.B. Ghellere, T. Mott, P.M.S. Nunes, C. Nogueira and M.T. Rodrigues. 2011. Anfíbios da Estação Ecológica Serra Geral do Tocantins, região do Jalapão, Estados do Tocantins e Bahia. *Biota Neotropica* 11: 251–262. (<http://www.biotaneotropica.org.br/v11n1/pt/abstract?article+bn03511012011>).
- Vaz-Silva, W., A.G. Guedes, P.L. Azevedo-Silva, F.F. Gontijo, R.S. Barbosa, G.R. Aloisio and F.C.G. Oliveira. 2007. Herpetofauna, Espora Hydroelectric Power Plant, state of Goiás, Brazil. *Check List* 3(4): 338–345 (<http://www.checklist.org.br/getpdf?SL018-07>).

Authors' contribution statement: DOS, CBC, EBF and RGF wrote the text, GSSN collected the data.

Received: September 2014

Accepted: November 2014

Editorial responsibility: Natan Medeiros Maciel