

RANGE EXTENSION OF *SIBON AYERBEORUM* VERA-PÉREZ, 2019 (SERPENTES: COLUBRIDAE) IN COLOMBIA

AMPLIACIÓN DE LA DISTRIBUCIÓN DE *SIBON AYERBEORUM* VERA-PÉREZ, 2019 (SERPENTES: COLUBRIDAE) EN COLOMBIA

JONARD DAVID ECHAVARRÍA-RENTERÍA^{1,2} & GUIDO FABIÁN MEDINA-RANGEL^{3*}

¹Grupo de Investigación en Manejo y Gestión de la vida Silvestre del Chocó, Facultad de Ciencias Básicas, Programa de Biología, Universidad Tecnológica del Chocó, carrera 22 # 18B-10, Quibdó, Chocó, Colombia.

²Grupo de Investigación en Herpetología, Facultad de Ciencias Básicas, Programa de Biología, Universidad Tecnológica del Chocó, Colombia. Universidad Tecnológica del Chocó, carrera 22 # 18B-10, Quibdó, Chocó, Colombia.

³Grupo de Morfología y Ecología Evolutiva, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Carrera 30 No 45-03, Ciudad Universitaria, edificio 425, oficina 307, Bogotá D.C., Colombia. .

Correspondence: guidofabianmedina@gmail.com

Received: 2020-08-14. Accepted: 2020-08-14.

The genus *Sibon* Fitzinger, 1826 belongs to the family Colubridae (Pyron et al., 2013; Zheng & Wiens, 2016; Uetz et al., 2021). They are generally small to moderately sized terrestrial-arboreal snakes with a Neotropical distribution which extends from central Mexico through Central America to northern and central South America in Colombia, Venezuela, French Guiana, Ecuador, Brazil and Peru (Peters, 1960; Peters & Orejas-Miranda, 1970; Wallach, 1995; Savage, 2002; Köhler et al., 2010; Arteaga et al., 2018). *Sibon* is currently comprised of 18 species which are placed in three well-defined groups: *annulatus*, *argus*, and *nebulatus* (Peters, 1960; Kofron, 1990).

Three species of *Sibon* are currently known in Colombia: *S. nebulatus* (Linnaeus, 1758), distributed in the three Andean mountain ranges, the valley of the Cauca and Magdalena rivers, the Caribe region, Sierra Nevada de Santa Marta, and the Amazon basin, from 0-2630 m above sea level (Peters, 1960; Pérez-Santos & Moreno, 1988); *S. annulatus* (Günther, 1872), distributed in the Chocó-Magdalena region and the western slopes of the Cordillera Oriental between 320-1500 m (Moreno-Arias, 2010; Meneses-Pelayo et al., 2016, 2018); and *Sibon ayerbeorum* Vera-Pérez, 2019, endemic to Colombia which was recently described from La Playa and La Cueva sites in Parque Nacional Natural Munchique, municipality of El Tambo, department of Cauca between 1135-1400 m (Vera-Pérez, 2019).

Here we expand the geographical distribution of *Sibon ayerbeorum* in Colombia, based on a single specimen deposited at the herpetological collection of the Universidad Tecnológica del Chocó. We found one specimen of genus *Sibon* from the Colección Científica de Referencia Zoológica del Chocó-Herpetología de la Universidad Tecnológica del Chocó “Diego

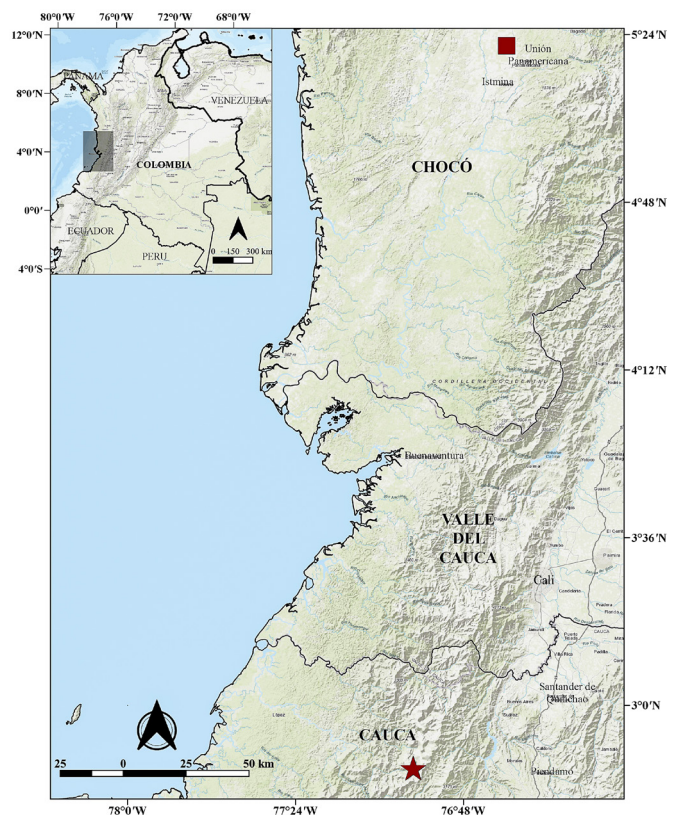


Figura 1. Distribución geográfica de *Sibon ayerbeorum*. Estrella roja: localidad tipo. Cuadrado rojo: nuevo registro (UTCH: COLZOOCH-H 1173). Datum WGS 84.

Figure 1. Geographic distribution of *Sibon ayerbeorum*. Red star: type locality. Red square: New record (UTCH: COLZOOCH-H 1173). Datum WGS 84.

Luis Córdoba” (UTCH: COLZOOCH-H 1173), whose taxonomic determination has been in doubt for several years. We made

comparisons with other *Sibon* species by using the available literature on the genus: Peters (1960), Kofron (1990), Savage & McDiarmid (1992), Solórzano (2001), Savage (2002), Frazier et al. (2006), Lewis et al. (2010) and Vera-Pérez, (2019). Scale nomenclature and dorsolateral coloration patterns follow Peters (1960, 1964), Savage (2002) and McCranie (2006, 2007).

Scale counts such as ventral and subcaudal follow Dowling (1951), the counts were done using a stereoscope. Measurements of snout-vent length (SVL) and tail length (TL) were taken with a flexible ruler. Sex was determined by the presence or absence of hemipenes.

New Record (Fig. 1). Colombia, department of Chocó, municipality of Unión Panamericana, vereda Salero, Parcela Permanente de Investigación Biológica (5.360°N, 76.646°W, 96 m); June 19 2005; collected by Anilio Castro Pérez. 1 adult female. UTCH-COLZOOCH-H 1173.

Identification. An adult female, this specimen corresponds for the most part with the description of Vera-Pérez (2019) (Table 1). It has dorsal scale rows without enlarged vertebral row; non-

protuberant eyes; first pair of infralabials in contact posterior to symphyseal; the counts of dorsal scale rows, preocular, postocular, anterior and posterior temporal, and postmental are within the limits described for *S. ayerbeorum* (Table 1). Some scale counts are different from those described for the type series (Table 1), it has more ventral scales, however within range if you consider the male count; only one more subcaudal scale; and this has more supralabials and infralabials scales. With this new data, we can confirm that the species has slightly more morphological variation than previously reported.

Specimen body coloration pattern with smoke gray backing composed by sienna irregular middorsal and ventrolateral dark-bordered ocelli, back scales dotted with dark ocelli, anterior portion of the body and upper surface of head colored mainly with the ocelli border dark brown color. Ventral coloration is dark with light spots in each ventral scale. The dorsal reddish spots reach the ventral areas interspersed laterally with the clear spots; the iris is golden with dark reticulations.

Sibon ayerbeorum (Fig. 2) was described based on four specimens obtained in the western slopes of the Cordillera

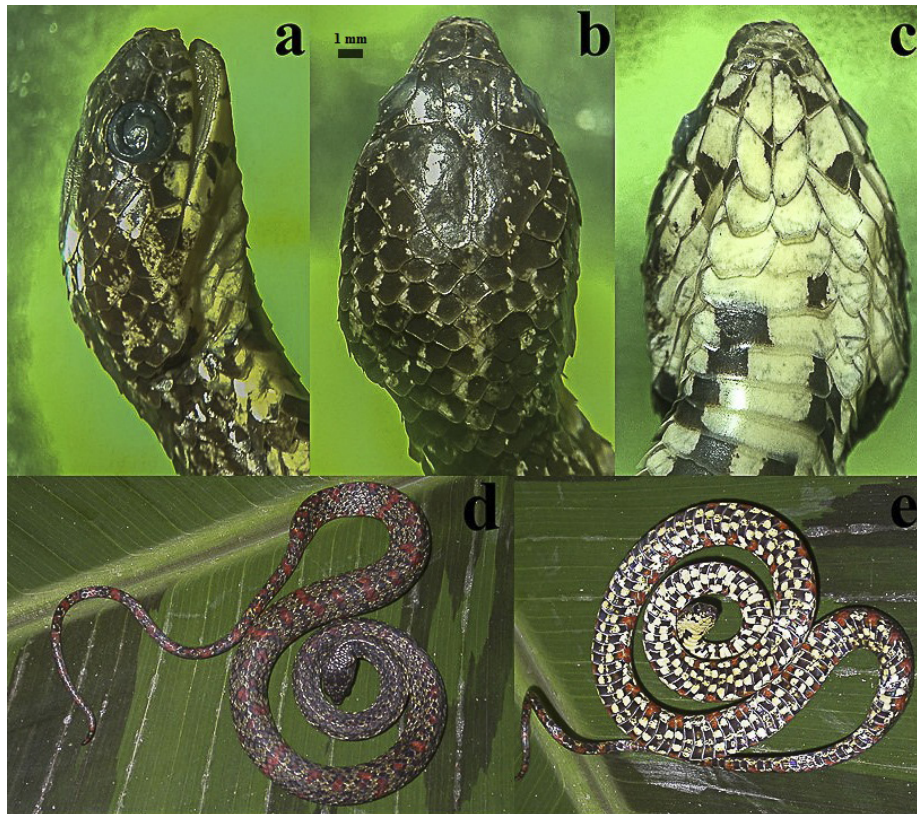


Figura 2. Espécimen UTCH: COLZOOCH-H 1173 de *Sibon ayerbeorum*. Cabeza: a (vista lateral), b (vista dorsal), c (vista ventral). Individuo en vivo: d (vista dorsal), e (vista ventral).

Figure 2. Specimen UTCH: COLZOOCH-H 1173 of *Sibon ayerbeorum*. Head: a (lateral view), b (dorsal view), c (ventral view). Live individual: d (dorsal view), e (ventral view).

Tabla 1. Características comparadas *Sibon* spp (únicamente hembras). Referencias: Este estudio¹, Vera-Pérez (2019)², Lewis et al. (2006)³, McCraine (2006)⁴, Lotzkat et al. (2012)⁵, Lewis et al. (2013)⁶, Peters (1960)⁷, Savage & McDiarmid (1992)⁸, Frazier et al. (2006)⁹, Savage (2002)¹⁰.

Table 1. Comparative characteristics of *Sibon* spp (females only). References: This study¹, Vera-Pérez (2019)², Lewis et al. (2006)³, McCraine (2006)⁴, Lotzkat et al. (2012)⁵, Lewis et al. (2013)⁶, Peters (1960)⁷, Savage & McDiarmid (1992)⁸, Frazier et al. (2006)⁹, Savage (2002)¹⁰.

Characters	(UTCH: COLZOOCH-H 1173) (♀) ¹	<i>Sibon ayerbeorum</i> (♀) ²	<i>S. annulatus</i> (♀) ^{2, 3, 4, 5, 10}	<i>S. longifrenis</i> (♀) ^{2, 6, 10}	<i>Sibon nebulatus</i> (♀) ^{7, 8, 9, 10}	<i>Sibon argus</i> (♀) ^{7, 8, 9, 10}
Total max. (mm)	357	417	576	541	1013	690
SVL max. (mm)	255	293	362	-	779	-
TL max. (mm)	102	124	214	-	234	-
Ventral scales	148	136-140	161-186	147-168	161-193	182-192
Subcaudal	80	78-79	107-124	95-106	64-100	95-108
Dorsal rows	15/15/15	15-15-15, 15-17-15	15/15/15	15-15-15	15-15-15	15-15-15
Preocular	Absent	Absent	Usually, absent	Usually, absent	Usually, absent	Absent
Postocular	2-3	2-3	0-2	1-3	1-4	2-3
Anterior temporal	2	1-2	1-2	1-2	1	1-2
Posterior temporal	2	2-3	1-3	1-3	01-Feb	2-3
Supralabial (supralabial in contact with eye)	7 (4-5)	6 (3-4, 3-5)	6-9 (5-6, 6-7)	7-9 (4-6, 5-7)	5-9 (4-5)	7-9 (4-7)
Infralabial	7	6	6-10	6-9	6-10	7-12
1st infralabials behind mental	In contact	Usually in contact	Separated	Separated	In contact	Separated
Postmental	0	0	1-2	0-1	0	0
Dorsolateral coloration pattern	Ocellated	Ocellated	Banded	Ocellated	Banded	Ocellated
Eyes color	Golden with dark reticulations	Golden rod with dark reticulations	Red or dark reddish brown	Green-grey or olive green speckled with dark pigment	Spotted grey or gray, speckled with dark pigment	Greenish gray

Occidental, municipality of El Tambo, department of Cauca (Vera-Pérez 2019). The present record constitutes the fifth known specimen of the species, the first from the department of Chocó, and the third locality in Colombia. Its geographical distribution is extended northwards in around 288 km, also extending its occurrence between the Andean humid premontane forests to the tropical rainforest, and an altitudinal variation of 1039 m above sea level, which represents a larger use of different habitats

and altitudinal distribution compared than those reported by Vera-Pérez (2019).

Unlike the type series, this specimen was obtained in the rainforests of the Chocó Biogeographic plateau and increases the number of snake species registered for the department of Chocó; however, further exploration of the lowlands west of Cordillera Occidental could potentially extend the distribution of the species as suggested by Vera-Pérez (2019).

Sibon ayerbeorum is still poorly known and there is a large gap in its distribution, autecology, habitat preferences, and population dynamics. Since its description is so recent, it has not yet been assessed in any of the IUCN threat categories, however, we propose it being listed as Data Deficient according to the IUCN guidelines as recommended by Vera-Pérez (2019). Potential threats to this species include habitat fragmentation or loss and illegal mining (Macuacé-Otero & Cortés-Landázury, 2013; Ayala-Mosquera et al., 2019), human activities that are increasing in areas where the species can be distributed.

Acknowledgments.— We are grateful to the Colección Científica de Referencia Zoológica del Chocó-Herpetología de la Universidad Tecnológica del Chocó, for allowing us access to the collection. We thank Universidad Tecnológica del Chocó «Diego Luis Córdoba» for being one of the institutions that support scientific research in the department of Chocó. We thank Juan David Fernández for the English revision. Finally, we thank the groups Investigaciones en Manejo y Gestión de la Vida Silvestre del Chocó and Herpetología, both from the Universidad Tecnológica del Chocó.

CITED LITERATURE

- Arteaga, A., D. Salazar-Valenzuela, K. Mebert, N. Peñafiel, G. Aguiar, J.C. Sánchez-Nivicela, R.A. Pyron, T.J. Colston, D.F. Cisneros-Heredia, M.H. Yáñez-Muñoz, P.J. Venegas, J.M. Guayasamin & O. Torres-Carvajal. 2018. Systematics of South American snail-eating snakes (Serpentes, Dipsadini), with the description of five new species from Ecuador and Peru. *ZooKeys* 766:9-147.
- Ayala-Mosquera, H., M. Cabrera-Leal, A.J. Cadena-Galvis, C. Castaño-Urbe, S.M. Contreras-Rodríguez, L.C. Díaz-Mueque, et al. 2019. Diagnóstico de la información ambiental y social respecto a la actividad minera y la extracción ilícita de minerales en el país. Documento de Investigación científica y sociológica respecto a los impactos de la actividad minera y la explotación ilícita de minerales, en los ecosistemas del territorio colombiano. Sentencia T 445 de 2016 Corte Constitucional de Colombia (Resolución 0931 de mayo de 2017). Ministerio de Ambiente y Desarrollo Sostenible, al Ministerio del Interior, a la Unidad de Parques Nacionales Naturales, al Instituto de Investigación de Recursos Biológicos Alexander Von Humboldt y a la Contraloría General de la República. Bogotá D.C. Colombia. 372 p.
- Dowling, H.G. 1951. A proposed standard system of counting ventrals in snakes. *British Journal of Herpetology* 1:97-99.
- Fitzinger, L.J.F.J. 1826. Neue Classification der Reptilien nach ihren Natürlichen. Viena: Verwandschaften. 66 p.
- Frazier, J.A., C.E. Montgomery & K.R. Lips. 2006. *Sibon nebulatus* (Common Snail-eater). Maximum size. *Herpetological Review* 37:235.
- Kofron, C.P. 1990. Systematics of Neotropical gastropod-eating snakes: the dimidiata group of the genus *Sibon*, with comments on the nebulata group. *Amphibia-Reptilia* 11:207-223.
- Köhler, G, S. Lotzkat & A. Hertz. 2010. A new species of *Sibon* (Squamata: Colubridae) from Western Panama. *Herpetologica* 66:80-85.
- Lewis, T.R, G. David, P. Grant, T.C. LaDuke & C. Ryall. 2010. *Sibon annulatus* (Ringed Snail-eater): Maximum size. *Herpetological Review* 41:98.
- Lewis, T.R, R.K. Griffin, P.B.C. Grant, A. Figueroa, J.M. Ray, K.E. Graham & G. David. 2013. Morphology and ecology of *Sibon* snakes (Squamata: Dipsadidae) from two Neotropical forests in Mesoamerica. *Phyllomedusa* 12:47-55.
- Lotzkat, S, A. Hertz & G. Köhler. 2012. A new species of *Sibon* (Squamata: Colubroidea: Dipsadidae) from the Cordillera Central of western Panama, with comments on other species of the genus in the area. *Zootaxa* 3485:26-40.
- Macuacé-Otero, R.A. & R. Cortés-Landázury. 2013. El Cauca, la mesoeconomía del oro y la retroactividad de la dependencia: anotaciones sobre coyuntura y desequilibrio territorial. *Civilizar* 13:103-120
- McCranie, J.R. 2006. New species of *Sibon* (Squamata: Colubridae) from northeastern Honduras. *Journal of Herpetology* 40:16-21.
- McCranie, J.R. 2007. A second new species of *Sibon* (Squamata: Colubridae) from La Mosquitia, northeastern Honduras. *Herpetologica* 63:213-218.
- Meneses-Pelayo, E. J.D. Echavarría-Rentería, J.D. Bayona-Serrano, J.R. Caicedo-Portilla & J.T. Rengifo-Mosquera. 2016. New records and an update of the distribution of *Sibon annulatus* (Colubridae: Dipsadinae: Dipsadini) for Colombia. *Check List* 12:1931.
- Meneses-Pelayo, E., J.D. Echavarría-Rentería, J.D. Bayona-Serrano, J.R. Caicedo-Portilla, & J.T. Rengifo-Mosquera. 2018. *Sibon*

- annulatus* (Günther, 1872). Catálogo de anfibios y reptiles de Colombia 4:70-77.
- Moreno-Arias, R.A. 2010. Geographic distribution: *Sibon annulatus*. Herpetological Review 41:382.
- Pérez-Santos, C & G.A. Moreno. 1988. Ofidios de Colombia. Museo Regionale di Scienze Naturali, Torino, Italia.
- Peters, J.A. 1960. The snakes of the subfamily Dipsadinae. Miscellaneous Publications of the Museum of Zoology. University of Michigan, USA. 224 p.
- Peters, J.A. 1964. Dictionary of Herpetology. Hafner, New York. 392 p.
- Peters, J.A & B. Orejas-Miranda. 1970. Catalogue of the Neotropical Squamata. Part 1. Snakes. Bulletin - United States National Museum 297:1-134.
- Pyron, R.A, F.T Burbrink & J.J. Wiens. 2013. A phylogeny and revised classification of Squamata, including 4161 species of lizards and snakes. BMC Evolutionary Biology 13:1-54.
- Rovito, S.M, T.J. Papenfuss & C.R Vásquez-Almazán. 2012. A new species of *Sibon* (Squamata: Colubridae) from the mountains of eastern Guatemala. Zootaxa 3266:62-68.
- Savage, J.M. 2002. The amphibians and reptiles of Costa Rica. A herpetofauna between two continents, between two seas. University of Chicago Press, Chicago, Illinois, USA. 954 p.
- Savage, J.M. & R.W. McDiarmid. 1992. Rediscovery of the Central American colubrid snake, *Sibon argus*, with comments on related species from the region. Copeia 1992:421-432.
- Solórzano, A. 2001. Una nueva especie de serpiente del género *Sibon* (Serpentes: Colubridae) de la vertiente del Caribe de Costa Rica. Revista de Biología Tropical 49:1111-1120.
- Uetz, P, P. Freed & J. Hošek (Eds.). 2021. The Reptile Database. <http://www.reptile-database.org> [Consultado en enero 2021].
- Vera-Pérez, L.E. 2019. A new species of *Sibon* Fitzinger, 1826 (Squamata: Colubridae) from Southwestern Colombia. Zootaxa 4701:443-453.
- Wallach, V. 1995. Revalidation of the genus *Tropidodipsas* Günther, with notes on the Dipsadini and Nothopsini (Serpentes: Colubridae). Journal of Herpetology 29:476-481.
- Zheng, Y & Wiens, J.J. 2016. Combining phylogenomic and supermatrix approaches, and a time-calibrated phylogeny for squamate reptiles (lizards and snakes) based on 52 genes and 4162 species. Molecular Phylogenetics and Evolution 94:537-547.

