

A NEW SEMIFOSSORIAL SNAKE SPECIES (DIPSADIDAE: *ATRACTUS* WAGLER, 1828) FROM THE LARA-FALCÓN MOUNTAINOUS SYSTEM, NORTHWESTERN VENEZUELA

LUIS FELIPE ESQUEDA^{1,2}

¹Investigador Asociado, Laboratorio de Biogeografía, Facultad de Ciencias Forestales y Ambientales. Universidad de Los Andes. Mérida 5101. Venezuela.

Abstract: A new species of semifossorial snake assigned to the genus *Atractus* is described based on a juvenile specimen collected in a tropophilous forest at about 1050 m elevation from Serranía de Parupano, Lara State, Venezuela. This taxon can be clearly distinguished from the rest of its congeners from Venezuela, and those cis-Andean, by possessing a reddish ventral coloration in life, with a midventral row of black dots, defined better towards its anterior third; adjacent to these there are two lateroventral rows of well-defined dots, smaller and rounded; dorsum uniformly reddish brown; one posterior elongated supratemporal scale; 17-17-17 dorsal scales without apical pits; four infralabial scales in contact with chin shields; frontal scale length shorter than distance to the rostral; rostral slightly visible when viewed from above; frontal shield hexagonal; six maxillary teeth. This discovery represents the first record of the genus for the Lara-Falcón mountainous system, northwestern Venezuela.

Key Words: Taxonomy, Ophidia, Colubroidea, Serranía de Parupano, Lara State.

Resumen: L.F. Esqueda. “Una nueva especie de serpiente semifosorial (Dipsadidae: *Atractus* Wagler, 1828) del sistema montañoso Lara-Falcón, Noroeste de Venezuela”. Se describe una nueva serpiente semifosorial perteneciente al género *Atractus*, con base en un solo ejemplar juvenil coleccionado en un bosque tropófilo a unos 1050 msnm en la Serranía de Parupano, Estado Lara, Venezuela. Este taxón se distingue claramente del resto de sus congéneres de Venezuela y de aquellos cis-Andinos por poseer una coloración ventral rojiza en vida, la cual tiene una hilera medioventral de puntos negros, mejor definidos hacia su primer tercio; adyacentes a éstos tiene dos hileras lateroventrales de puntos bien definidos, más pequeños y redondeados; dorso pardo rojizo uniforme; una escama supratemporal posterior alargada; 17-17-17 escamas dorsales sin fosetas apicales; cuatro escamas infralabiales en contacto con geneiales; largo de la escama frontal más corta que la distancia a la rostral; rostral ligeramente visible desde arriba; escudo frontal hexagonal; seis dientes maxilares. Este hallazgo representa el primer registro del género al nor-occidente de Venezuela, correspondiente al sistema montañoso Lara-Falcón.

Palabras claves: Taxonomía, Ophidia, Colubroidea, Serranía de Parupano, Lara State.

INTRODUCTION

The Lara-Falcón mountainous system comprises a complex of separate small mountain chains located between the Venezuelan Andes, the Venezuelan Coastal Range and the eastern savannas of Lake Maracaibo depression (Huber and Alarcón 1988). In spite of being one of the less studied biogeographic regions in the country, preliminary studies reveal its true diversity and endemism of amphibians and reptiles species (Yústiz 1976, 1978, Yústiz 1991a-b; Markezich *et al.* 1997, Mijares-Urrutia 1997, Mijares-Urrutia 1998, Mijares-Urrutia and Arends 1999a-b, Mijares-Urrutia *et al.* 1999, Mijares-Urrutia and Rivero 2000a, Péfaur and Rivero 2000, Wüster *et al.* 2001). Nowadays, *Atractus* is one of the most diverse, specious and widely distributed neotropical genera of snakes in Venezuela; however, its occurrence has not been confirmed for these northern Venezuelan

environments (Roze 1966, Savage 1960, Peters and Orejas-Miranda 1970, Bisbal 1990, Yústiz 1991b, Kornacker 1999, Mijares-Urrutia and Arends 2000a, Esqueda and La Marca 2005).

In 2002, I had the opportunity to explore the Serranía of Parupano, a mountainous formation located in the northeastern Venezuelan Lara-Falcón mountain system, near the border with Falcón State (at about 26 Km from Sierra Churuguara). In a pioneer herpetological expedition to this area, I managed to collect a small sample of reptiles and amphibians, of which some represent new records of distribution that will be treated elsewhere. Among the sample, it was a juvenile specimen of the genus *Atractus*, which represents an undescribed taxon that will be described in this work.

² Send correspondence to / Enviar correspondencia a:
 luisfesqueda@gmail.com

MATERIALS Y METHODS

Preparation of the text regarding the terminology, morphological attributes and format employed in the description is a result of various considerations given by Savage (1960), Hoogmoed (1980), Cuhna and Nascimento (1983), Schargel and García-Pérez (2002), Hoogmoed and Prudente (2003), Myers (2003), Campbell and Lamar (2004), Esqueda and La Marca (2005), Jorge Da Silva *et al.* (2005), Zaher *et al.* (2005), Myers and Schargel (2006), Myers (2008), and Passos *et al.* (2009a). The following abbreviations are employed in the text: total length (TL); tail length (TL); head length (HL, measured from the anterior part of the rostral until posterior edge of the supralabials); head width (WH, measured at the level of the labial commissure); frontal scale length (FL), measured between the anterior edge of the frontal and its posterior edge; frontal scale width (WF), taken at its posterior edge; rostral to frontal distance (RFD), longitudinal distance from the posterior edge of the frontal until posterior edge of the rostral; parietal suture length (PSL), taken between the parietal scales; prefrontal suture length (PRSL), measured between prefrontal scales; horizontal length of eye (HLE); eye-to-nostril distance (END), measured between anterior edge of the eye to the posterior margin of nostril, chin shields groove (CG), distance taken between chin shields and distance to rostral scale (DR), from anterior edge of frontal scale until posterior edge of rostral scale.

Measurements given in Table 1 were taken with a vernier Helius® (appreciation \pm 0.01 mm), while those measurements above 100 mm were taken with a metric tape (appreciation 0.1 mm). The ventral scale counting, excluding the gular scales, follows Dowling (1951). Drawings were made under a Wild® dissection microscope with a drawing camera attachment. Sex was determined by dissection of the subcaudal region, to verify presence or absence of the hemipenial abductor muscle. Type specimen is deposited in the Collection of Amphibians and Reptiles, Laboratory of Biogeography of the Universidad de Los Andes (ULABG) at Mérida, Venezuela. Additional material employed for comparisons is indicated in Appendix I.

TAXONOMIC ACCOUNT

Atractus ayeush sp. nov.
(Figs. 1,2)

Holotype

Juvenile female, ULABG 5461, collected by Luis Felipe Esqueda on 27 December 2002, at the stream "Quebrada La Concepción", sector 5, San Felipe, near Finca El Cocoricho, approx. 10°36'95"N and 69°29'62"W. Altitude 1050 m.a.s.l., Municipio Urdaneta, Lara State, Venezuela.

Etymology

The specific name, used here as a noun in apposition, is derived from the word "ayeush", of masculine gender, which means "brother" in the language of the Ayamanes (Ayama, or Yama, or Wayama)(Querales 2001), an Arawak ethnic group

whose territory extended to current municipalities of the Falcón State (Democracia, Sucre, Federación and Unión) and Lara State (Iribarren, Torres, Crespo and Urdaneta), where it is located the Serranía de Parupano, type locality of the new species. The name is meant to be dedicated to my late friend and appreciated colleague Rommel Azuaje, outstanding member of the Forest Fireman Group of the University of The Andes deceased in 2006.

Definition and diagnosis

This *Atractus* can be distinguished from the rest of its congeners distributed in Venezuela by the combination of the following morphological and morphometric characters: (1) 17-17-17 dorsal scales, lacking apical spits, first paraventral row not enlarged; (2) rostral slightly visible when viewed from above; (3) loreal long, approximately three times longer than high, with latero-inferior edge slightly straight; (4) internasals with similar sides, almost squared; (5) frontal scale length shorter than DR; (6) 1+2 temporal formula, first temporal scale disposed between fifth and sixth supralabials (1.2 mm long), 0.4 mm shorter than second posterior temporal adjacent to supralabials; (7) 7(3,4)/7(3,4) supralabials; (8) 7(4)/7(4) infralabials; (9) 155 ventral scales; (10) 23/23 subcaudal scales; (11) dorsum reddish-brown in life; (12) belly reddish in life, with a midventral row of black dots, better defined towards the first third of venter; (13) cloacal scale slightly sprinkled with dark brown, subcaudals completely stained with dark brown; (14) 6/6 maxillary teeth; (15) caudal spine absent; (16) 183 ventrals + subcaudals.

Atractus ayeush is readily distinguished from all species in the genus having 15 dorsal scales at midbody, by possessing 17 dorsals. Of those species having 17 dorsals scales at midbody, it is easily differentiated from the ones possessing lines and/or cross blotches on the dorsum of the body, by having a uniform dorsum without lines or blotches. The new species differs from the other *Atractus* with 17 scales at midbody and not possessing lines or cross blotches on the dorsum, as follows: *A. fuliginosus* (Hallowell, 1845), *A. guentheri* (Wucherer, 1861), *A. ronnie* Passos *et al.*, 2007 and *A. surucucu* Passos and Prudente, 2008, since these have immaculate belly (spotted in the new species) (Roze 1966, Passos *et al.* 2007, Prudente and Passos 2008); from *A. modestus* Boulenger, 1894 and *A. natans* Hoogmoed and Prudente, 2003; since these have a pale nuchal collar (absent in the new species)(Hoogmoed and Prudente 2003, Passos *et al.* 2007a); *Atractus thalesdelemai* Passos *et al.*, 2005 and *A. lucilae* Silva Haad, 2004, have one postocular (Silva Haad 2004, Passos *et al.* 2005)(while the new species have two).

Comparatively, *A. acheronius* Passos *et al.*, 2009; *A. eriki* Esqueda *et al.*, 2007; *A. macondo*, and *A. matthewi*, can be confused with the new species by sharing some attributes. In this regard, *Atractus ayeush* sp. nov. can be distinguished from *A. acheronius* and *A. macondo*, since these have three infralabial scales in contact with geneials and a caudal spine (Passos *et al.* 2008, Passos *et al.* 2009b) (while the new species have four scales in contact, and caudal spine absent); *Atractus eriki* Esqueda *et al.*, 2007 has a cream belly, two posterior supratemporal

scales and latero-inferior edge of the loreal scale concave (while the new species has a reddish belly, one elongated supratemporal scale and latero-inferior edge of the loreal scale nearly straight). Finally, the new species can be differentiated from *Atractus matthewi*, since this species has the ventrolateral dorsal scale rows 1 and 2 consisting of scales with both brown and the pale cream color of the surface, pale brown spots on each parietal, ventral surface with pale and dark transverse bands and the latero-inferior edge of the loreal concave (Markezich and Barrios-Amorós 2004), as opposed to the new species, which possesses the dorsum and laterodorsal scales adjacent to the ventral scales uniformly brown, ventral pattern without bands, but showing dark rounded blotches towards midventral surface of the body, and having the latero-inferior edge of loreal scale slightly straight.

According to phenetic characters observed, as well as the current diversity of the genus *Atractus* coming from highland environments that seems to respond to a pattern of allopatric speciation (geographical replacement of species) and the current knowledge concerning most of species in Venezuela (comparative analysis), there are arguments conclusive to justify a description in this taxon based on the single specimen known.

Description

A juvenile female SVL 199 mm, HL 7.0 mm (0.36 times TL), HW 5.0 mm (0.71 times HL); TL 19 mm (9.5% SVL). Scales on dorsal and lateral region of head as follows: Head straight in lateral view, wider posteriorly, slightly compressed forwards; snout short, rounded in dorsal view and convex in lateral view; rostral slightly wider than high, slightly visible when viewed from above; distance to the rostral 2.4 mm; two small internasals, more or less equal in size, almost squared; shorter than prefrontals, medial suture 0.7 mm (0.46 times length of prefrontal suture); prefrontal scales longer than wide in dorsal view, trapezoidal, widened posteriorly, suture 1.5 mm (0.16 shorter than frontal length); frontal scale hexagonal (Fig. 1A), slightly longer than wide (1.8 mm frontal length and 1.6 mm frontal width), 0.25 shorter than (DR); nasals divided, each nostril located between prenasal and postnasal edges; prenasals smaller than postnasals, with the later also being higher; horizontal length of eye 1.0 mm (0.55 times eye-to-nostril distance); pupil round; interorbital width 3.2 mm; eye-to-nostril distance $\frac{1}{4}$ of head length (1.8 mm), similar to frontal length; loreal long (1.3 mm), approximately three times longer than high (0.19 times HL), slightly narrow than the eye, longer than supraocular scale, with latero-inferior edge slightly straight; two postoculars, upper larger than lower scale; preocular absent; 1/1 supraocular scale, disposed obliquely (0.7 mm) in dorsal view, forming a wedge between frontal and parietal edge; 1+2 temporal formula; first temporal scale enlarged, disposed between fifth and sixth supralabial (1.2 mm long), 0.4 times shorter than second posterior temporal that is adjacent to supralabials; 1/1 posterior elongated supratemporal reaching the final portion of parietals (Fig. 1B); two parietals with a suture of 2.6 mm (0.38 times HL). Scales that comprise

dorsal and lateral region of head as follows: mental (symphysial) small, 0.7 mm long and 0.3 mm high, subtriangular, separated of chin shield by first infralabial pair; 7(3,4)/7(3,4) supralabial scales, third upper labial enlarged; 7(4)/7(4) infralabial scales (Fig. 1C), fourth begins a little after posterior edge of the third supralabial; a single chin shield pair (suture 2.0 mm), two times longer than high, suture 0.1 longer than frontal length; three gular scales; two preventrals; 6/6 maxillary teeth, curved posteriorly, little spaced, decrease posteriorly, without diastema. Scales arranged on body and tail as follows: 17-17-17 dorsal scale rows, smooth, apical pits absent, paraventral row not enlarged; three gular scales medially between chin shields and preventral scale; two preventral scales; 155 ventral scales; cloacal plate entire; 23/23 subcaudal scales, dorso-caudal keels absent; tail without spine.

Coloration in life

Dorsum of head dark brown, ventrally cream, sprinkled with some dark brown spots; upper labial scales mostly cream. Dorsal region of body uniformly reddish brown; ventral region reddish with black dots located centrally on the scale. Dorsal-caudal region dark brown and ventral-caudal region completely stained with dark brown (LFE, field notes; 27 December 2002).

Coloration in preservative (ethanol 70% v/v)

Dorsal region of head dark brown, although it is cream-colored towards its ventral part; rostral scale cream, slightly sprinkled with dark brown; supralabial scales cream, although the seventh scale is stained with dark brown almost totally; third and fourth supralabial scales slightly dark brown, pigmented in its upper part; infralabial scales cream with some dark brown irregular spots. Chin shields stained with dark brown. Dorsal scales mostly dark brown, but toward apex of the scale are stained with reddish brown. Belly reddish, a rounded spot on each ventral scale (except some towards head), thus forming a midventral row that starts becoming better defined towards first third of the belly; a well defined row of spots on belly, more irregulars and greater in size; adjacent to the later row there is a series of smaller round spots, forming two well-defined lateroventral rows; cloacal scale reddish, slightly sprinkled with dark brown; subcaudal scales stained with dark brown.

Natural history and distribution

The only known specimen of the species was captured under a rock, approximately at 16:30 hours, at about three meters away from the stream called La Concepción. The tree cover that lies around the stream is strongly intervened and fragmented, even towards its headwaters, the later showing an almost intermittent flow. There were other herp species at the type locality, namely *Mannophryne* cf. *caquetio* Mijares-Urrutia and Arends, 1999, and a specimen of *Gonatodes falconensis* Schreve, 1947 (LFE field notes, 27-29 December 2002).

Ecogeographically, the species comes from the Serranía de Parupano, a small mountain range located in Municipio Urdaneta at the northern part of Lara state, close to the border with Falcón

state, northwestern Venezuela (Fig. 3), at geographic coordinates $10^{\circ}38'N$ and $69^{\circ}19'W$. This mountain range is part of a more complex mountain system comprising the ranges of Bobare, Baragua, Sirarigua, Agua Negra and Matatere, all belonging to the Lara-Falcón mountain system. Parupano mountain range reaches altitudes over 1000 m.a.s.l. and, due to its location, it is influenced by moisture-laden trade winds, which condense to form fog in the forests, whose effect allows the establishment of vegetation similar to nearby high subtropical environments. According to Huber and Alarcón (1988), this orographic feature is characterized by low and medium size trophophilous semideciduous forests. These environments are distinguished by being in an altitudinal range from 100 m to near 1000 m elevation. The rainfall regime is tetra-seasonal (meaning to have two dry and two wet seasons, which is a major feature of the nearby Lake Maracaibo region), reaching up to 1200 mm of total annual rainfall. The highest stratum of the forest comes to be approximately

15 m high, open and with dense undergrowth, and a discreet number of armed plants, among which we find *Tabebuia bilbergii* (Bureau & K. Schum) Standl and *Bulnesia arborea* (Jacq.). Additionally, with the aid of settlers in the region, and posterior verification in the lab, we identify some representative arboreal species of the vegetation in situ, like Cedro (*Cedrela* sp.), Apamate (*Tabebuia* sp.), Matapalo (*Ficus* sp.), Bucare (*Erythrina* sp.) and several palms. On the forest canopy there were abundant epiphytes, like orchids of the genera *Epidendrum*, *Cattleya* and *Schromburgkia*, and some Bromeliads (Bromeliaceae).

Apparently, the new snake species seems to be circumscribed to the hills formations located North of Lara State, although its distribution probably ranges along the whole system of mountainous chains of Lara and Falcón State (to the Sierra de Churuguara). Nevertheless, to present it has not been indicated any species of *Atractus* from Falcón State (Mijares-Urrutia and Arends 2000a).

REMARKS

Yústiz (1976) published a small list of amphibians and reptiles species from Yacambú National Park, in Lara State. From there, he indicated a specimen of *Atractus* that he assigned to *A. badius*, which represented the first Lara Andean record known for the genus. According to the illustration included in his paper (Yústiz 1976:78), we can appreciate a most likely juvenile specimen whose dorsal pattern is formed by dark and pale spots, arranged transversally, a condition similar to *A. erythromelas* Boulenger, 1903, *A. meridensis* Esqueda and La Marca, 2005, *A. micheleae* Esqueda and La Marca, 2005, *A. lancingii* Roze, 1961 and *A. riveroi* Roze, 1961; all Venezuelan species with 17 midbody scale count (Roze 1966, Esqueda and La Marca 2005). However, I could not determine its specific status, since the private collection that housed the animal is now lost, after Yústiz death (Ing. Hugo Chávez, UCLA, pers. comm.). The dorsal pattern of the pictured specimen, displaying aposematic mimicry, does not correspond with the pattern exhibited by *A. ayeush* sp. nov.

Although Yústiz (1978) identified the specimen as *A. badius*, a name that was already used by Roze (1960) for other Andean specimen, I follow Esqueda and La Marca (2005) in excluding its presence from Venezuela, especially the Venezuelan Andes; although it cannot be discarded that it may occur toward the southern part of the country, a supposition not confirmed until now (see Hoogmoed 1980). However, the specimen identified by Roze (1960) and that comes from Mérida State, probably corresponds to *A. meridensis*, a species described based on material from several Andean intramontane localities (Esqueda and La Marca 2005). Today we understand a little better the complexity of the Venezuelan Andean herpetofauna, in particular that of the genus *Atractus*, to the point that this taxon could be considered a complex of species associated to *A. erythromelas*, *A. lancingii* and *A. wagleri* Prado, 1945 (Passos and Arredondo 2009). Particularly, an interesting case is *A. lancingii* and *A. riveroi*, which look very similar, therefore deserve a better revision about it.

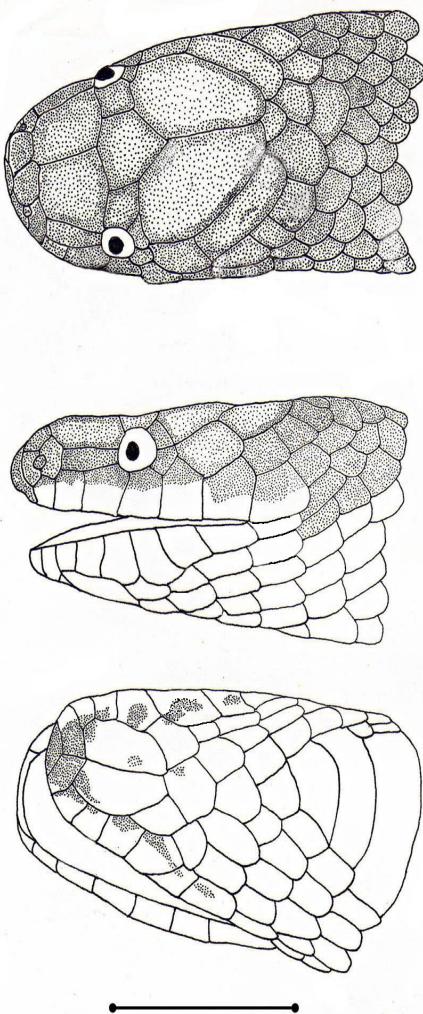


FIG. 1. Schematic drawings of head in dorsal, lateral and ventral views of *Atractus ayeush* sp. nov., ULABG 5461. Scale: 5 mm.

Dibujos esquemáticos de la cabeza en vista dorsal, lateral y ventral de *Atractus ayeush* sp. nov., ULABG 5461. Escala: 5 mm

Atractus ayeush, in biogeographical terms, has a strong transcendence since its record fills a gap between the Venezuelan Andean Cordillera and the Venezuelan Coastal Range. Furthermore, the unusual dorsal-ventral pattern of coloration in life of the new taxon is unique in Venezuela, except for a few specimens assigned to *A. erythromelas*, which have a reddish belly strongly stained, while other species only possess the dorsum uniform dark brown or with spots, such as *A. turicensis*, species confined to highlands of the Perijá mountain range, about 300 Km northwestern of the type locality of the new taxon, and *A. matthewi*, restricted to the Turimiqure Massif, eastern stretch of the Coastal Range, about 560 Km northeastern (Barros 2000, Markezich and Barrios-Amorós 2004). Up to now, in the absence of an explicit phylogeny, it is impossible to be certain regarding the relationships of all these members of the *Atractus* genus.

Although the Lara-Falcón mountain system, from an orographic standpoint, is considered a transition zone between the Cordillera de la Costa and the Andean Cordillera de Mérida, its reptile and amphibian fauna might be more related to those of the Venezuelan Coastal Range and those from the southern part

of the country (see Mijares et al. 2000), while these relations would tend to be weaker with the Venezuelan Andes (see Péfaur y Rivero 2000).

ACKNOWLEDGEMENTS

I would like to thank the family Pérez, which allowed me to use their Finca as a base-camp for the expedition to the Serranía de Parupano. Abraham Mijares-Urrutia, Paulo Passos and Enrique La Marca kindly facilitated some bibliographical references. Francisco Bisbal and Ramón Rivero (Museum of the Biological Station of Rancho Grande, EBRG, Aragua State, Venezuela); Jesús Manzanilla-Puppo (Museum of the Institute of Agricultural Zoology, MIZA, Faculty of Agronomy, Central University of Venezuela, Maracay, Aragua State, Venezuela); and Marco Natera-Mumaw (Museum of Vertebrates of the University Rómulo Gallegos, San Juan de Los Morros, Guárico State, MVURG), all very generously allowed me to study *Atractus* specimens under their care.

REFERENCES



FIG. 2. Dorsal and ventral view of the body of *Atractus ayeush* sp. nov., ULABG 5461.
Vista dorsal y ventral del cuerpo de *Atractus ayeush* sp. nov., ULABG 5461.

- Barros B., T.R. 2000. Una nueva especie de *Atractus* (Serpentes: Colubridae) de la Sierra de Perijá, Estado Zulia, Venezuela. Anartia (Publicaciones Ocasionales del Museo de Biología de la Universidad del Zulia) 11:1-10.
- Bisbal J., F.E. 1990. Inventario preliminar de la fauna del Cerro Santa Ana, Península de Paraguaná, Estado Falcón, Venezuela. Acta Científica Venezolana 41:177-185.
- Campbell, J.A. and W.W. Lamar. 2004. The Venomous Reptiles of the Western Hemisphere. 2 Volumes. Comstock Publishing Associates, Ithaca and London. 870 pp. 1500 plates.
- Esqueda, L.F. and E. La Marca. 2005. Revisión taxonómica y biogeográfica (con descripción de cinco nuevas especies) de serpientes del género *Atractus* (Colubridae: Dipsadinae) en Los Andes de Venezuela. Herpetotropicos 2(1):1-32.
- Hoogmoed, M.S. 1980. Revision of the genus *Atractus* in Surinam, with the resurrection of two species (Colubridae, Reptilia). Notes on the herpetofauna of Surinam VII. Zoologische Verhandelingen 175:1-47.
- Hoogmoed, M.S. and A.L.C. Prudente. 2003. A new species of *Atractus* (Reptilia: Ophidia: Colubridae: Dipsadinae) from the Amazon forest region of Brazil. Zoologische Mededelingen, Leiden, 77:425-439.
- Huber, O and C.E. Alarcón. 1988. Mapa de vegetación de Venezuela. IUCN-Ministerio del Ambiente y los Recursos Naturales Renovables. Oscar Todtmann Editores, Caracas.
- Jorge Da Silva Jr., N., H.L. Rodrigues S., R. Silveiro R., I. Souza and C. do Amaral S. 2005. Uma nova espécie do Gênero *Atractus* Wagler, 1928 (Colubridae: Dipsadinae) do Cerrado do Brasil Central. Papéis Avulsos de Zoologia 45(3):33-39.
- Kornacker, P.M. 1999. Checklist and Key to the Snakes of Venezuela. Lista Sistemática y Clave para las Serpientes de Venezuela. Pako-Verlag, Rheinbach, Alemania. 270 p + 90 figs.
- Markezich, A., C.J. Cole and H.C. Dassauer. 1997. The blue and green whiptail lizards (Squamata: Teiidae: *Cnemidophorus*) of

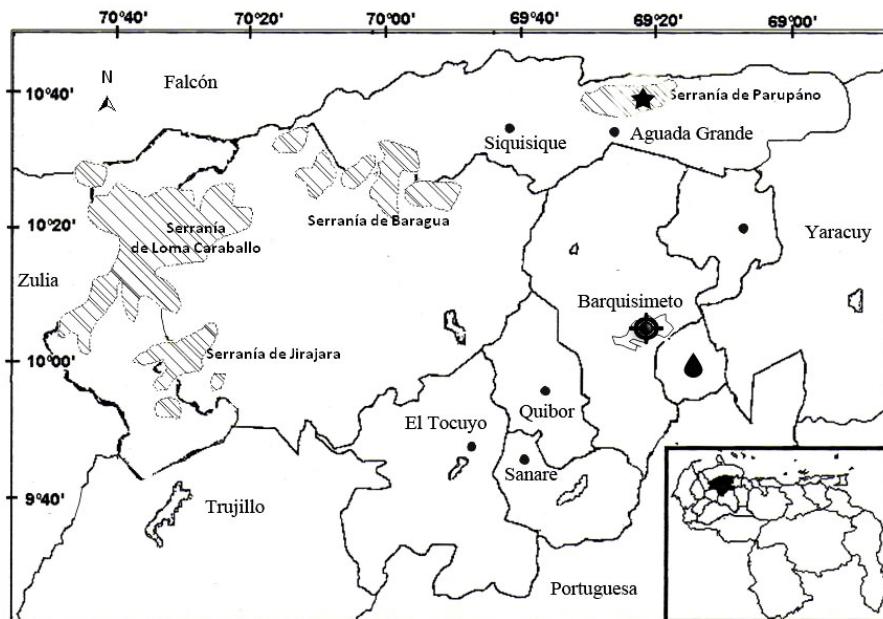


FIG. 3. Geographic location of *Atractus ayeush* sp. nov. in Venezuela.
Ubicación geográfica de Atractus ayeush sp. nov. en Venezuela.

- the Peninsula de Paraguana, Venezuela: systematics, ecology, descriptions of two new taxa, and relationships to whiptails of Guianas. American Museum Novitates 3207:1-60.
- Markezich, A. and C.L. Barrio-Amorós.** 2004. A new species of *Atractus* (Serpentes: Colubridae) from northeastern Venezuela. Bulletin of the Maryland Herpetological Society 40(3):111-119.
- Martins, M. and M.E. Oliveira.** 1993. The snakes of the genus *Atractus* Wagler (Reptilia: Squamata: Colubridae) from the Manaus region, central Amazonia, Brazil. Zoologische Mededelingen 67:21-40.
- Mijares-Urrutia, A.** 1997. Un nuevo *Mabuya* (Squamata: Scincidae) de la costa semiárida del norte de Venezuela. Revista Brasileira de Biología 57(4):595-601.
- Mijares-Urrutia, A.** 1998. Una nueva especie de rana arborícola (Amphibia: Hylidae: *Hyla*) de un bosque nublado del oeste de Venezuela. Revista Brasileira de Biología 58(4):659-663.
- Mijares-Urrutia, A. and A. Arends R.** 1999a. A new *Mannophryne* (Anura: Dendrobatidae) from western Venezuela, with comments on the generic allocation of *Colostethus larandinus*. Herpetologica 55(1):106-114.
- Mijares-Urrutia, A. and A. Arends R.** 1999b. Un nuevo *Mannophryne* (Anura: Dendrobatidae) del estado Falcón, con comentarios sobre la conservación del género en el norte de Venezuela. Caribbean Journal of Science 35(3-4):231-237.
- Mijares-Urrutia, A. and A. Arends R.** 2000a. Herpetofauna of Estado Falcón Northwestern Venezuela: A Checklist with Geographical and Ecological Data. Smithsonian Herpetological Information Service, 123:1-30.
- Mijares-Urrutia, A. and R. Rivero.** 2000b. A new treefrog from the Sierra de Aroa, northern Venezuela. Journal of Herpetology 34(1):80-84.

Mijares-Urrutia, A., J. Manzanilla-Puppo and E. La Marca. 1999.

Una nueva especie de *Tepuihyla* (Anura: Hylidae) del norte de Venezuela, con comentarios sobre su biogeografía. Revista de Biología Tropical 47(4):1099-1100.

Mijares-Urrutia, A., J. Manzanilla-Puppo & E. La Marca. 2000.

Una nueva especie de *Tepuihyla* (Anura: Hylidae) del norte de Venezuela, con comentarios sobre su biogeografía. Revista de Biología Tropical 47(4):1099-1110.

Myers, C.W. 2003. Rare snake-Five new species from eastern Panama: reviews of northern *Atractus* and southern *Geophis* (Colubridae: Dipsadinae). American Museum Novitates 3391:1-47.

Myers, C.W. 2008. The summit herpetofauna of Auyantepui Venezuela: report from the Robert G. Goelet American Museum-Terramar expedition. Bulletin of the American Museum of Natural History 308:1-147.

Myers, C.W. and W.E. Schargel. 2006. Morphological extremes—two new snakes of the genus *Atractus* from northeastern South America (Colubridae: Dipsadinae). American Museum Novitates 3532:1-13.

Passos, P., D.F. Cisneros-Heredia and D. Salazar-V. 2007a. Rediscovery and redescription of the rare Andean snake *Atractus modestus*. Herpetological Journal 17:1-6.

Passos, P., D.S. Fernandes and D.M. Borges-Nojosa. 2007b. A new Species of *Atractus* (Serpentes: Dipsadinae) from a relictual forest in northeastern Brazil. Copeia 2007:788-797.

Passos, P. and R. Fernandes. 2008. A new species of the colubrid snake genus *Atractus* (Reptilia: Serpentes) from the central Amazon of Brazil. Zootaxa 1849:59-66.

Passos, P., R. Fernandes and N. Zanella. 2005. A new species of *Atractus* (Serpentes: Colubridae) from Southern Brazil. Herpetologica 61:209-218.

- Passos, P., J.D. Lynch and R. Fernandes.** 2008. Taxonomic status of *Atractus sanctaemartae* and *Atractus nebularis*, and description of a new *Atractus* from the Atlantic coast of Colombia. Caribbean Journal of Science 35(3-4):231-237.
- Passos, P., and J.C. Arredondo.** 2009. Rediscovery and redescription of the Andean earth-snake *Atractus wagleri* (Reptilia: Serpentes: Colubridae). Zootaxa 1969:59-68.
- Passos, P., J.C. Arredondo, R. Fernandes and J.D. Lynch.** 2009a. Three new *Atractus* (Serpentes: Dipsadidae) from the Andes of Colombia. Copeia 2009(3):425-436.
- Passos, P., G. Rivas Fuenmayor and C. Barrios-Amorós.** 2009b. Description of two new species from Venezuela in the highly diverse dipsadine genus *Atractus* (Serpentes: Colubridae). Amphibia-Reptilia 30:233-243.
- Péfaur, J. and J.A. Rivero.** 2000. Distribution, species-richness, endemism, and conservation of Venezuelan amphibians and reptiles. Amphibiam and Reptiles Conservation 2:42-70.
- Prudente, A.L.C. and P. Passos.** 2008. A new species of *Atractus* Wagler, 1828 (Serpentes: Dipsadinae) from Guyana plateau in northern Brazil. Journal of Herpetology 42:723-732.
- Pérez-Santos, C. and A.G. Moreno.** 1988. Ofidios de Colombia. Museo Regionale di Scienze Naturali, Torino. Pp. 1-517 + 46 pls.
- Peters, J.A. and B. Orejas-Miranda.** 1970. Catalogue of Neotropical Squamata: Part I. Snakes. Smithsonian Institution Bulletin 297: i-viii+1-293.
- Querales, R.** 2001. Glosario de Voces Indígenas y Etnias Prehispánicas del Estado Lara. Alcaldía del Municipio Iribarren, Barquisimeto, Venezuela. 280 Pp..
- Rodrigues da Cuhna, O. and F.P. Nascimento.** 1983. Ofidios da Amazonia XX. As especies de *Atractus* Wagler, 1928, na Amazonia Oriental e Maranhão (Ophidia: Colubridae). Boletim do Museu Emílio Goeldi, nova série, Zoologia, 123:1-38.
- Roze, A. J.** 1966. La Taxonomía y Zogeografía de los Ofidios en Venezuela. Universidad Central de Venezuela. Ediciones de la Biblioteca. Caracas. Venezuela.
- Sánchez, D., L. De Sousa, L.F. Esqueda and J. Manzanilla.** 2004. Especie nueva de *Atractus* (Serpentes: Colubridae) del Macizo del Turimiquire, tramo oriental de la Cordillera de la Costa, Venezuela. Saber (Universidad de Oriente) 16(2):92-98.
- Savage, J. M.** 1960. A revision of the Ecuadorian snakes oh the colubrid genus *Atractus*. Miscellaneous Publication, Museum of Zoology, University Michigan, 112:1-86.
- Schargel, W.E and J.E. García-Pérez.** 2002. A new species and record of *Atractus* (Serpentes: Colubridae) from the Andes of Venezuela. Journal of Herpetology 36(3):398-402.
- Wüster, W., J.L. Yrausquin and A. Mijares-Urrutia.** 2001. A new species of indigo snake from north-western Venezuela (Serpentes: Colubridae: *Drymarchon*). Herpetological Journal 11:157-165.
- Yústiz, E.** 1976. Anfibios y Ofidios del Parque Nacional Yacambú. Tarea Común. Revista de la Universidad centro-occidental de Barquisimeto 2:75-80.
- Yústiz, E.** 1978. Ofidios (Reptilia: Serpentes) de Barquisimeto. Sinopsis taxonómica. Tarea Común, Revista de la Universidad Centro Occidental de Barquisimeto 6:75-81.
- Yústiz, E.** 1991a. La Herpetofauna de las zonas áridas y semiáridas del Estado Lara. Pp. 59-66 In R.F. Smith, A. Rivero M., F. Ortega and J.A. Catalán (Eds.). Ecología del Estado Lara. Biollania. Ed. Especial No. 1. Guanare, Venezuela.
- Yústiz, E.** 1991b. Un nuevo *Colostethus* (Amphibia: Dendrobatidae) de la Sierra de Barbacoas, Estado Lara, Venezuela. Bioagro 3: 145-150.
- Zaher, H., I. Souza., D.J. Gower., E. Hinost-Zaher and N. Jorge Da Silva Jr.** 2005. Redescription of *Atractus albuquerquei* (Serpentes: Colubridae: Dipsadinae), with comments on geographical distribution and intraspecific variation. Papéis Avulsos de Zoologia 45(2):19-32.

Appendix I.

Material examined

All specimens from Venezuela, South America.

Atractus fuliginosus. ULABG 4138, Guárico State, Municipio J.G. Roscio, San Juan de Los Morros,

Atractus mariselae. Paratype. ULABG 3792, Trujillo State, Municipio Boconó, Boconó, 1225 m.

Atractus matthewi (type material of *A. nororientalis*). EBRG 4453, Anzoátegui State, Municipio Freites, Hacienda cafetalera La Orquídea, Cerro La Laguna, Massif of Turimiquire, 1600 m; EBRG 4454, Anzoátegui State, Municipio Freites, Hill La Laguna, Massif of Turimiquire, 2130 m.

Atractus mijaresi. Holotype, ULABG 4697, Mérida State, Municipio Rangel, Mucurubá, upper high.

Atractus multidentatus. ULABG 3182, Mérida State, Municipio Andrés Bello, Alto Capaz, Monte Frío, 2400 m.

Atractus ochrosetrus. Holotype, ULABG 4698, Mérida State, Municipio Tovar, Road Tovar-Guaraque, before Paramito de San Francisco; ULABG 6745, Táchira State, Municipio Jáuregui, 9.3 Km on the road Zumbador to Queniquea, 2705 m.

Atractus taphorni. ULABG 6594-6595, Mérida State, Municipio Andrés Bello, La Carbonera, 2280 m.

Atractus univittatus. ULABG 2945, Portuguesa State, Municipio Ospino, "La Estación", La Costa, 14 Km NNW of Ospino; ULABG 4329, Barinas State, Municipio Bolívar, Barinitas, Park Moromoy.

Atractus vittatus. ULABG 5499, Aragua State, Municipio Tovar, Colonia Tovar, 700 m.

Atractus sp1. EBRG 1524, 1526, Amazonas State, Municipio Atures, Puerto Ayacucho, 90 m.

Atractus sp2. ULABG 4870, Lara State, Municipio Morán, Guacó, 17 km S of Guarico, on road to Chabasquén, 1345 m.

Atractus sp3. ULABG 2672, Mérida State, Municipio Arzobispo Chacón, Pueblos del Sur, farm coffee, near of Canaguá.

Atractus sp4. ULABG 2932, 2965, Mérida State, Municipio Andrés Bello, La Azulita, 915 m.

Atractus sp5. ULABG 6594-6595, Mérida State, Municipio Rivas Dávila, Las Playitas to 30 m of intersection with road to El Rincón.

Atractus sp6. MIZA (Museum number not assigned yet). Sucre State, Municipio Valdez, Cerro "El Humo", N of the Península de Paria.