

# DECIPHERING AN ENIGMA: FIRST RECORD OF *ERYTHROLAMPRUS AENIGMA* (SQUAMATA: DIPSADIDAE) IN COLOMBIA

## DECIFRANDO UN ENIGMA: PRIMER REGISTRO DE *ERYTHROLAMPRUS AENIGMA* (SQUAMATA: DIPSADIDAE) EN COLOMBIA

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**Resumen.**– La culebra guardacamino de sabana *Erythrolamprus aenigma* se distribuye en el norte de Brasil, Guyana y Venezuela. Aquí presento los primeros registros de esta especie en el este de Colombia, extendiendo la distribución conocida más de 1000 km al este de su área de distribución más cercana conocida.

**Palabras claves.**– Nuevo registro de país, distribución geográfica, Orinoquía, Guardacamino de sabana.

**Abstract.**– The Savanna Racer snake *Erythrolamprus aenigma* is found in northern Brazil, Guyana and Venezuela. Here I present the first records of this species in eastern Colombia, extending the known distribution more than 1000 km east of its nearest range.

**Keywords.**– New country record, geographic distribution, Orinoco region, Savannah Racer Snake.

*Erythrolamprus* is one of the most diverse snake genera both in Central and South America, with 55 currently recognized species (Ascenso et al., 2019; Nogueira et al., 2019; Torres-Carvajal & Hinojosa, 2020; Entiauspe-Neto et al., 2021; Uetz et al., 2022). In Colombia, this genus comprises 16 species distributed throughout the country (Dunn, 1944; Wallach et al., 2014; Ascenso et al., 2019; Uetz et al., 2022): *Erythrolamprus aesculapii* (Linnaeus, 1758), *Erythrolamprus albiventris* (Jan, 1863), *Erythrolamprus bizona* Jan, 1863, *Erythrolamprus breviceps* (Cope, 1860), *Erythrolamprus epinephelus* (Cope, 1862), *Erythrolamprus lamona* (Dunn, 1944), *Erythrolamprus melanotus* (Shaw, 1802), *Erythrolamprus miliaris* (Linnaeus, 1758), *Erythrolamprus mimus* (Cope, 1868), *Erythrolamprus pseudocorallus* Roze, 1959, *Erythrolamprus pyburni* (Markezich & Dixon, 1979), *Erythrolamprus pygmaeus* (Cope, 1868), *Erythrolamprus reginae* (Linnaeus, 1758), *Erythrolamprus taeniogaster* (Jan, 1863), *Erythrolamprus typhlus* (Linnaeus, 1758) and *Erythrolamprus vittii* (Dixon, 2000).

The Savanna Racer Snake *Erythrolamprus aenigma* Entiauspe-Neto, Abegg, Koch, Nuñez, Azevedo, Moraes, Tiutenko, Bialves & Loebmann, 2021, was recently described for the open savanna-like areas in Brazil, Guyana and Venezuela, between 90 and 900 m asl (Entiauspe-Neto et al., 2021). This species was initially

hidden within the *E. poecilogyrus* complex, mainly based on shared dorsal scale counts, and *E. reginae* complex based on its geographic location and colorations. However, the recent molecular evidence allocates this species as a close relative of *E. almadensis* and *E. taeniogaster* (Entiauspe-Neto et al., 2021). Here, I report the first known occurrences of *E. aenigma* in Colombia, for the Orinoco region.

I explored the databases of the collection of Museo de la Salle (Bogotá, Colombia), the Instituto de Ciencias Naturales of the National University of Colombia (Bogotá, Colombia), and of the Alexander von Humboldt Institute (Villa de Leyva, Colombia) looking for misidentified specimens, following the same filtering criteria previously defined (specimens registered as *Erythrolamprus* or *Liophis*, especially those with similar distribution such as *E. reginae* and *E. melanotus*, or similar morphological characters as *E. typhlus*). Only two specimens described here were found.

I examined two specimens of the genus *Erythrolamprus* deposited in the reptile collection of the Alexander von Humboldt Institute (IAvH), previously identified as *E. typhlus*. Specimen identification was performed following the original



**Figura 1.** *Erythrolamprus aenigma* de Colombia. A-C: Vista general del dorso y el vientre, y vista lateral de la cabeza de IA VH-R-5764. D-E: Vista general del dorso y el vientre de IA VH-R-03158..

**Figure 1.** *Erythrolamprus aenigma* from Colombia. A-C: General dorsal and ventral view, and lateral view of head of IA VH-R-5764. D-E: General dorsal and ventral view of IA VH-R-03158.

description of Entiauspe-Neto et al. (2021) and previous records were mapped from the same source. As none of the new specimens for Colombia had associated coordinates with the locality information, I used coordinates of other specimens recorded in the same localities where they were collected. Scales were counted according to Dowling (1951). A flexible ruler to the nearest 1.0 mm was used to measure total, snout-vent and tail length. Sex was determined by the presence/absence of hemipenes (individuals were sexed prior to examination).

**Record 1:** IAvH-R-5764, 24th May 1982, Yopal, Casanare, Colombia (5.3134° N, 72.3796° W; WGS84; 302 m a.s.l.), collected by the group “Guías del Casanare”. One adult female (Figs. 1A-1C).

**Record 2:** IAvH-R-03158, 31th December 1983, Estación biológica El Guafal, Puerto Rondón, Arauca, Colombia (6,2812° N, 71.1048° W; WGS84; 137 m a.s.l.), collected by José Clavijo Bustos. One adult female (Fig. 1D-1E).

Specimens IAvH-R-5764 and IAvH-R-03158 are identified as *Erythrolamprus aenigma* according to the following characteristics, respectively: total length 504 mm and 419 mm, snout-vent length 430 mm and 326 mm, tail length 74 mm and 93 mm; dorsal scales in 19-19-15, all scales smooth, preocular present, in contact with loreal, temporals 1+2; supralabials eight, 4th and 5th in contact with ocular orbit; infralabials ten, first pair in contact behind

mental, 1st to 5th in contact with anterior chinshields; ventral scales 148 and 150, anal plate divided, subcaudal pairs 41 (tail incomplete) and 50. Cephalic dorsal coloration light gray with black borders and ventrally white, with black and light gray-white nuchal collar; supralabials white with black upper borders, infralabials white; dorsum gray with black borders and bluish gray on scales; ventral and subcaudal scales white (with small dots in IAvH-R-03158). Specimens can be differentiated from other closely distributed *Erythrolamprus* species by the scales counts (Table 1) and coloration (Fig. 3).

Entiauspe et al. (2021) mention that this species probably lives in open environments in northern Brazil, Guyana and Venezuela, however they mention that it is also possible that it is distributed in nearby countries. These new records extend the known geographic distribution by more than 1000 km from the nearest known locality in Venezuela, being the first records of the species for Colombia (Fig. 2). The distribution of *Erythrolamprus aenigma* in the savannas of northern South America is similar to that recorded for other snake species such as *Leptophis coeruleodorsus* (Albuquerque & Fernandes 2022), *Epicrates maurus* (Passos & Fernandes, 2008), *Leptodeira ashmeadii* (Costa et al., 2022), *Phimophis guianensis* (Entiauspe-Neto et al., 2018), and for some of its genus such as *E. reginae* (Ascenso et al., 2019). However, there is a gap of records in northern and western Venezuela.

**Tabla 1.** Comparación de conteos entre IAvH-R-5764, IAvH-R-03158 y otras especies de *Erythrolamprus*. Sc: subcaudales, Slb: supralabiales; llb: infralabiales; T: temporales; Po0c: postoculares; Poc: preoculares.

**Table 1.** Meristic comparison of IAvH-R-5764, IAvH-R-03158 and other *Erythrolamprus* species. Sc: subcaudals, Slb: supralabials; llb: infralabials; T: temporales; Po0c: postoculares; Poc: preoculares.

Character	Dorsals	Ventrals	Sc	Slb	llb	T	Po0c	Poc	Reference
IAvH-R-5764	19-19-15	148	41	8	10	1+2	2	1	Present study
IAvH-R-03158	19-19-15	150	50	8	10	1+2	2	1	Present study
<i>E. aenigma</i>	19-19-15	149-154	45-50	8	10	1+2	2	1	Entiauspe-Neto et al., 2021
<i>E. typhlus</i>	19-19-15	133-172	41-61	7-9	8-11	1+2	1-3	1	Dixon, 1987
<i>E. reginae</i>	17-17-15	125-164	54-96	7-8	8-11	1+2	1-2	1-2	Ascenso et al., 2019; Esqueda et al., 2005
<i>E. dorsocorallinus</i>	17-17-15	147-153	69-80	8	8-9	1+2	2	1-2	Esqueda et al., 2005
<i>E. melanotus</i>	17-17-15	144-155	56-62	7-9	7-10	1+2	2	1	Dixon & Michaud 1992; Murphy et al., 2019
<i>E. taeniogaster</i>	17-17-15	128-162	46-57	7-9	8-11	1+2	2	1	Fernandes et al., 2022
<i>E. pygmaeus</i>	17-17-15	122-133	29-38	6-7	8-9	1+2	1-1	1	Markezich & Dixon, 1979

These new records increase to 17 the number of species of the genus *Erythrolamprus* for Colombia. Pérez-Santos & Moreno (1988) and Uetz et al. (2022) mention the presence of *E. taeniurus* in Colombia, however there are currently no known records of the species for the country. In fact, Dunn (1944) mentions that this species is not found in Colombia and that the specimens previously cited for the country by Niceforo-Maria (1942) are

probably *Erythrolamprus epinephelus bimaculatus*. Subsequently, Dixon & Markezich, based on Dunn's mention, restrict the species to Peru in their work on the redescription of *E. taeniurus*.

Reviews of collected material and field work in the Orinoco region may be of great importance for the study of lowland snakes associated with savannas and plains, not only to fill

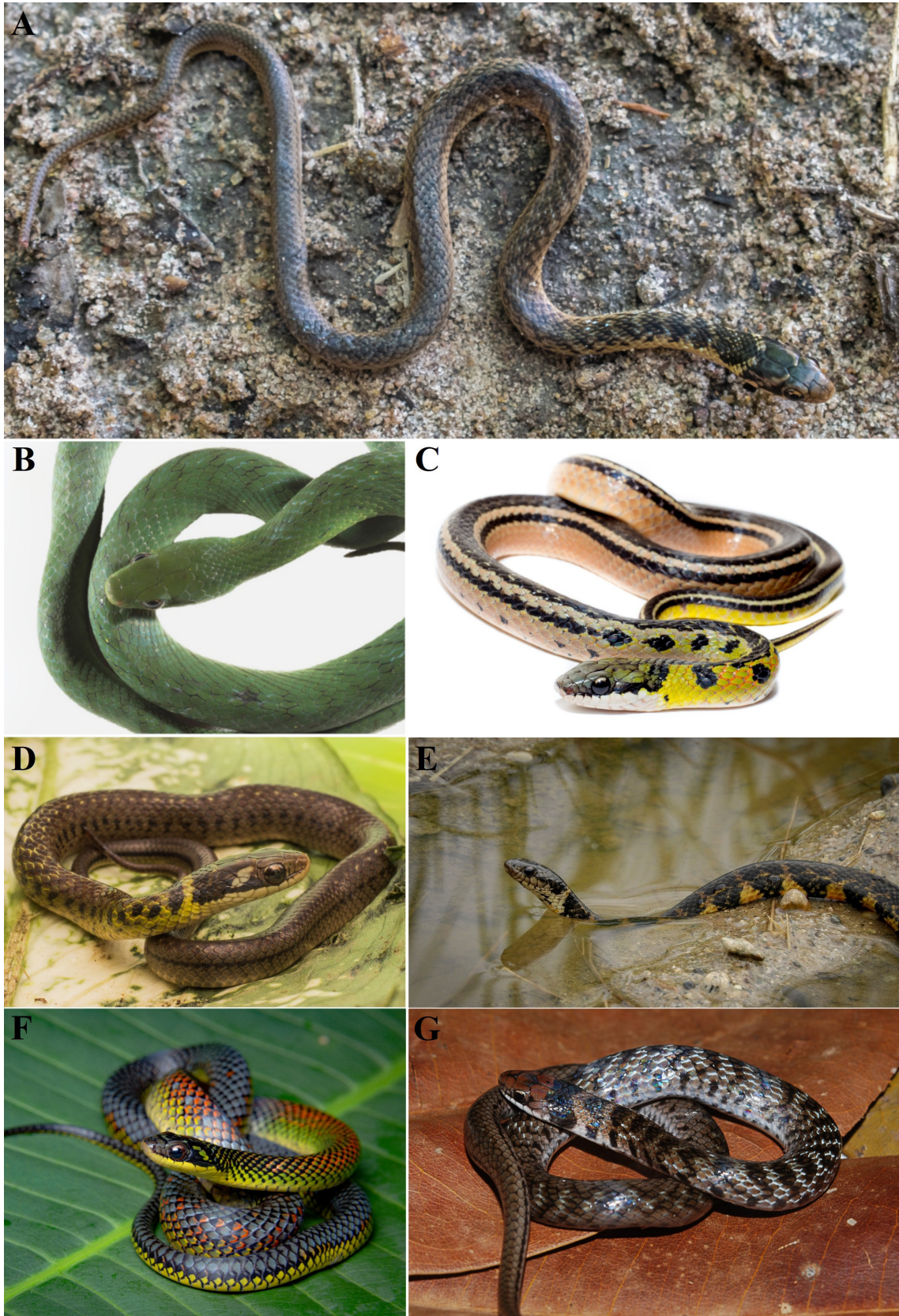


**Figura 2.** Mapa de distribución de *Erythrolamprus aenigma*. Los puntos rojos indican los registros previos en Brasil, Guyana y Venezuela (Entiaspe et al., 2021). La estrella roja indica la localidad tipo. Los triángulos amarillos indican las nuevas localidades en Arauca y Casanare, Colombia. Fotos: A. Walter N.; B. Luis Alejandro Rodríguez; C. Whaldener Endo.

**Figure 2.** Distribution map of *Erythrolamprus aenigma*. Red dots indicate previous records of the species in Brazil, Guyana and Venezuela (Entiaspe et al., 1982). The red star indicates the type locality. Yellow triangles indicate new localities in the departments of Arauca and Casanare, Colombia. Photos: A. Walter N.; B. Luis Alejandro Rodríguez; C. Whaldener Endo.

**Figura 3 (página siguiente)** . Comparación de especies de *Erythrolamprus* presentes en la Orinoquía colombiana. A) *E. aenigma*, B) *E. typhlus*. C) *E. melanotus*. D) *E. reginae*. E) *E. taeniogaster*. F) *E. dorsocorallinus*. G) *E. pygmaeus*. Fotos: A. Whaldener Endo; B. María José Quiroz-BIOWEB, <https://bioweb.bio>; C-D. Andrés Montes-Correa; E. Fernanda Hernández; F. Henrique Nogueira; G. Yeny López.

**Figure 3 (next page).** Comparison of *Erythrolamprus* species present in the Orinoco region of Colombia. A) *E. aenigma*, B) *E. typhlus*. C) *E. melanotus*. D) *E. reginae*. E) *E. taeniogaster*. F) *E. dorsocorallinus*. G) *E. pygmaeus*. Photos: A. Whaldener Endo; B. María José Quiroz-BIOWEB, <https://bioweb.bio>; C-D. Andrés Montes-Correa; E. Fernanda Hernández; F. Henrique Nogueira; G. Yeny López.



distribution gaps, but also for the knowledge of the life history of the snake species present in the region. In the case of *E. aenigma*, it has been described from female individuals only (as in this work), so it is important to be able to record male specimens since the characteristics of this sex are not currently known for the species. The specimens presented here have been collected in open areas of the plains in the Orinoco region, with anthropogenic intervention at present.

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## CITED LITERATURE

- Albuquerque, N.R. & D.S. Fernandes. 2022. Taxonomic revision of the parrot snake *Leptophis ahaetulla* (Serpentes, Colubridae). *Zootaxa* 5153:1-69.
- Ascenso, A.C., J.C.L. Costa & A.L.C. Prudente. 2019. Taxonomic revision of the *Erythrolamprus reginae* species group, with description of a new species from Guiana Shield (Serpentes: Xenodontinae). *Zootaxa* 4586:65-97.
- Costa, J.C.L., R. Graboski, F.G. Grazziotin, H. Zaher, M.T. Rodrigues & A.L.C. Prudente. 2022. Reassessing the systematics of *Leptodeira* (Serpentes, Dipsadidae) with emphasis in the South American species. *Zoologica Scripta* 51:1-19.
- Cunha, O.R. & F.P. Nascimento. 1993. Ofidios da Amazônia. As cobras da região leste do Pará. *Boletim do Museu Paraense Emílio Goeldi, Série Zoológica* 9:1-191.
- Dixon, J.R. 1987. Taxonomy and geographic variation of *Liophis typhlus* and related “green” species of South America (Serpentes: Colubridae). *Annals of Carnegie Museum* 56:173-191.
- Dixon, J.R. & E.J. Michaud. 1992. Shaw’s Black-Backed Snake (*Liophis melanotus*) (Serpentes: Colubridae) of Northern South America. *Journal of Herpetology* 26:250-259.
- Dixon, J.R. & A.L. Markezich. 1979. Rediscovery of *Liophis taeniurus tshudi* (Reptilia, Serpentes Colubridae) and its relationship to other Andean colubrid snakes. *Journal of Herpetology* 13:317-320.
- Dowling, H.G. 1951. A proposed standard system of counting ventrals in snakes. *British Journal of Herpetology* 1:97-99.
- Dunn, E.R. 1944. A revision of the Colombian snakes of the genera *Leimadophis*, *Lygophis*, *Liophis*, *Rhadinaea*, and *Pliocercus*, with a note on Colombian *Coniophanes*. *Caldasia* 2:479-495.
- Entiauspe-Neto, O.M., A.D. Abegg, C. Koch, L.P. Nuñez, W.S. Azevedo, L.J.C.L. Moraes, A. Tiutenko, T.S. Bialves & D. Loebmann. 2021. A new species of *Erythrolamprus* (Serpentes: Dipsadidae: Xenodontini) from the savannas of northern South America. *Salamandra* 57:196-218.
- Entiauspe-Neto, O.M., W.S. Azevedo, V.O. Pereira, A.D. Abegg, A.M. Rocha & D. Loebmann. 2018. New records of the rare Troschel’s Pampas Snake, *Phimophis guianensis* (Serpentes: Dipsadidae) in Brazil. *Anais da Academia Brasileira de Ciências* 90:3023-3029.
- Esqueda, L.F., M. Natera, E. La Marca & M. Elija-Fistar. 2005. Nueva especie de serpiente (Reptilia: Colubridae: *Liophis*) de un bosque tropical relictual en el estado Barinas, Venezuela. *Herpetotropicos* 2:95-103.
- Fernandes, D.S., V.J. Germano, R. Fernandes & F.L. Franco. 2002. Taxonomic status and geographic distribution of the lowland species of the *Liophis cobella* group with comments on the species from the Venezuelan tepuis (Serpentes, Colubridae). *Boletim do Museu Nacional de Rio de Janeiro* 481:1-14.
- Markezich, A.L. & J.R. Dixon. 1979. A new South American species of snake and comments on the genus *Umbrivaga*. *Copeia* 1979:698-701.
- Murphy, J.C., A.L. Braswell, S.P. Charles, R.J. Auguste, G.A. Rivas, A. Borzée, R.M. Lehtinen & M. Jowers. 2019. A new species of *Erythrolamprus* from the oceanic island of Tobago (Squamata, Dipsadidae). *ZooKeys* 817:131-157.
- Niceforo-Maria, H. 1942. Los ofidios de Colombia. *Revista de la Academia Colombiana de Ciencias Exactas* 5:84-101.
- Nogueira, C.C., A.J.S. Argôlo, V. Arzamendia, J.A. Azevedo, F.E. Barbo, R.S. Bérnils, B.E. Bolochio, M. Borges-Martins, M. Brasil-Godinho, H. Braz, H., M.A. Buononato, D.F. Cisneros-Heredia, G.R. Colli, H.C. Costa, F.L. Franco, A. Giraud, R.C. Gonzalez,



- T. Guedes, M.S. Hoogmoed, O.A.V. Marques, G.G. Montingelli, P. Passos, A.L.C. Prudente, G.A. Rivas, P.M. Sanchez, F.C. Serrano, N.J. Jr. Silva, C. Strüssmann, J.P.S. Vieira-Alencar, H. Zaher, R.J. Sawaya & M. Martins. 2019. Atlas of Brazilian snakes: verified point-locality maps to mitigate the Wallacean shortfall in a megadiverse snake fauna. *South American Journal of Herpetology* 14:1-274.
- Passos, P. & R. Fernandes. 2008. Revision of the *Epicrates cenchria* complex (Serpentes: Boidae). *Herpetological Monographs* 22:1-30.
- Pérez-Santos, C. & A.G. Moreno. 1988. Ofidios de Colombia. Torino, Italia. Museo Regionale di Scienze Naturali, Monograph 6:1-517.
- Torres-Carvajal, O. & K.C. Hinojosa. 2020. Hidden diversity in two widespread snake species (Serpentes: Xenodontini: *Erythrolamprus*) from South America. *Molecular Phylogenetics and Evolution* 146:106772.
- Uetz, P., P. Freed & J. Hosek (Eds.). 2022. The reptile database. <http://www.reptile-database.org>, [Accessed on December 11, 2022].
- Wallach, V., K.L. Williams & J. Boundy. 2014. *Snakes of the world: A catalogue of living and extinct species*. CRC Press, Taylor and Francis Group, Boca Raton.

