



# *Rhinobothryum lentiginosum* (Scopoli, 1788) (Serpentes, Colubridae): additional country record and first list of voucher specimens for Bolivia

Randy L. Powell<sup>1\*</sup>, Cord B. Eversole<sup>2</sup>, Dennis Lizarro<sup>3,4</sup>, Ashton V. Crocker<sup>1</sup>, Gonzalo Calderón Vaca<sup>5</sup>, Elizabeth A. Surovic<sup>1</sup>

<sup>1</sup> Department of Biology, Texas A & M University-Kingsville, Kingsville, TX, USA. • RLP: [randy.powell@tamuk.edu](mailto:randy.powell@tamuk.edu) • AVC: [ashton.crocker@tamuk.edu](mailto:ashton.crocker@tamuk.edu) • EAS: [elizabeth.surovic@students.tamuk.edu](mailto:elizabeth.surovic@students.tamuk.edu)

<sup>2</sup> Department of Biology and Chemistry, Texas A&M International University, Laredo, TX, USA • [cord.eversole@tamiu.edu](mailto:cord.eversole@tamiu.edu)

<sup>3</sup> Centro de Investigación de Recursos Acuáticos, Campus Universitario Hernán Melgar Justiniano, Trinidad, Beni, Bolivia • [dennis\\_fr@hotmail.com](mailto:dennis_fr@hotmail.com)

<sup>4</sup> Universidad Autónoma del Beni “José Ballivián”, Campus Universitario Hernán Melgar Justiniano, Trinidad, Beni, Bolivia

<sup>5</sup> Carrera de Biología, Universidad Amazónica de Pando, Campus Universitario, Cobija, Pando, Bolivia • [gonzalobio@gmail.com](mailto:gonzalobio@gmail.com)

\* Corresponding author

## Abstract

We present an additional country record and a list of voucher specimens for *Rhinobothryum lentiginosum* (Scopoli, 1788) (Serpentes, Colubridae) from Bolivia. Very little published information on museum specimens and locality data from Bolivia exists for this species. This account contributes to the knowledge of its distributional status by summarizing all available data.

## Keywords

Reptile, Squamata, Snake, Pando, Primary rainforest

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## Introduction

*Rhinobothryum lentiginosum* (Scopoli, 1788) is a strikingly colorful and charismatic, medium to large in size (up to ~1.75 m; see Duarte 2010 for a discussion of its maximum size) Amazonian snake species (Pérez-Santos and Moreno 1988; Martins and Oliveira 1998; Bernarde et al. 2012; Catenazzi et al. 2013). It is associated with terrestrial and arboreal microhabitats in primary and secondary forests (Duellman 1990; Zimmerman and Rodrigues 1990; Martins and Oliveira 1998; Bernarde and Abe

2006; Miranda et al. 2009; Duarte 2010; Catenazzi et al. 2013). The data indicate that *R. lentiginosum* is nocturnal (Duellman 1990; Zimmerman and Rodrigues 1990; Bernarde and Abe 2006; Miranda et al. 2009; Duarte 2010); however, Martins and Oliveira (1998) reported that it can also be active during the day. Examined stomach contents indicates that *R. lentiginosum* feeds predominantly on lizards (Martins and Oliveira 1998; Oliveira and Martins 1998; Bernarde and Abe 2006; Arruda et al.

2015); however, other references include birds and mammals (Avila-Pires et al. 2010) and amphibians (Duellman 1990; Zimmerman and Rodrigues 1990).

*Rhinobothryum lentiginosum* was first described by Scopoli (1788); however, a type locality was not designated. The species has been documented (with location data or reference specimens) to occur in the following countries: Colombia (Pérez-Santos and Moreno 1988), Ecuador (Orcés and Almendáriz 1994), Guyana (Reynolds and MacCulloch 2012), French Guiana (Gasc and Rodrigues 1980), Peru (Catenazzi and May 2013), Venezuela (Rivas et al. 2012), Suriname (Hoge 1960), and the Brazilian states of Amapá, Acre, Amazonas, Rondônia, Pará, and Mato Grosso (Zimmerman and Rodrigues 1990; Cunha and Nascimento 1993; Martins and Oliveira 1998; Oliveira and Martins 1998; Bernarde and Abe 2006; Lima 2008; Miranda et al. 2009; Arruda et al. 2015).

Frequently cited historical references include Bolivia in the distribution range for *R. lentiginosum* (Amaral 1929; Cunha and Nascimento 1978; Cunha and Nascimento 1993, Fugler and Cabot 1995); however, none of these publications refers to reference specimens or detailed geographic information from Bolivia as the basis for this inclusion. Furthermore, few specimens have been collected from Bolivia.

Here, we describe a specimen of *R. lentiginosum* collected from the department of Pando (Centro de Investigación de Recursos Acuáticos, CIRA-823) and present a list of eight specimens (including CIRA-823) collected from Bolivia and deposited in museum collections which we were able to locate.

## Methods

Scale counts, scutellation, and terminology follow Dowling (1951) and Peters (1964). Paired subcaudals were counted on one side only, as were head scale counts for paired scales. Dorsal scale row counts taken at the three standardized locations; head length behind occiput, mid body, and head length anterior to cloaca and separated by a slash (/). Measurements were taken using a flexible ruler to the nearest millimeter. Sex was determined by the probe method following McDiarmid et al. (2012). Specimen identification was determined by comparing and analyzing meristic data, morphometrics, coloration, figures, drawings, and photographs from description and taxonomic information by Cunha and Nascimento (1978; 1993), Dixon and Soini (1986), Prado and Hoge (1947), and Pérez-Santos and Moreno (1988). The datum used for geographic coordinates is WGS84. All specimens except Colección Boliviana de Fauna CBF-3905 and American Museum of Natural History AMNH-R 101897 are associated with specific coordinates. Coordinates for AMNH-R 101897 were inferred from the location of its verbally given collection locality, “Puerto Cap. Vásquez”, on Mapa Armada Boliviana. For CBF-3905, no more detailed locality information than the

Departamento La Paz is available, so we could not georeference this specimen.

Abbreviations for museum collections are as follows: American Museum of Natural History (AMNH), Museo Nacional de Historia Natural, Colección Boliviana de Fauna (CBF), Museo de Historia Natural Alcide d’Orbigny (MHNC), Museo de Historia Natural “Noël Kempff Mercado” (MHNNKM), Colección de Historia Natural de Herpetología, Centro de Investigación de Recursos Acuáticos, Universidad Autónoma del Beni “José Ballivián” (CHNH CIRA-UABJB), and Estación Biológica Abuná - Centro de Investigación y Producción para la Amazonía (EBA-CIPA).

A comprehensive search for voucher specimen information consisted of reviewing published scientific papers, journals, books, and government reports. Online databases (i.e., VertNet, <https://vertnet.org>, ARCTOS, <https://arctosdb.org/>, Global Biodiversity Information Facility (GBIF), <https://www.gbif.org/>, SpeciesLink, <https://smlink.cria.org.br/>) were also searched. In addition, Bolivian museums (i.e. CBF, MHNC, MHNNKM, CHNH CIRA-UABJB, and EBA-CIPA) were contacted for voucher specimen information.

The specimen was deposited at the herpetology collection of Centro de Investigación de Recursos Acuáticos (CHNH CIRA-UABJB) in Trinidad, Beni, Bolivia (see Eversole et al. 2019 for additional information). Specimen collection was approved by the TAMUK (#2018-05-22) and TAMIU (#2018-3) Animal Care and Use Committees and permitted by the Dirección General de Biodiversidad y Áreas Protegidas Bolivia.

## Results

### *Rhinobothryum lentiginosum* (Scopoli, 1788)

Figure 1

**New record. BOLIVIA — Departamento Pando • Provincia Abuná;** 10.8017°S, 066.4806°W; 3.75 km northwest of the community of Humaita; 19.VI.2019; RL Powell, CB Eversole, D Lizarro, EA Surovic, G Calderón-Vaca leg.; at 22:40 h; 1 ♂; specimen found crossing trail in primary forest during a herpetofaunal survey; specimen CIRA-823; snout to vent length, 117.3 cm; tail length, 30.0 cm; live weight, 180.0 g.

**Identification.** The specimen was identified following relevant literature and was based on the following diagnostic characters: dorsals smooth except for the strongly keeled vertebral and paravertebral rows. Dorsal scale row counts 21/19/17. Scales of the head: eight supralabials (fourth and fifth in contact with the orbit) and 10 infralabials (five in contact with the anterior chin shield). The loreal scale is present. One preocular scale and two postoculars. Internasal scales triangular and completely separated from each other by the rostral scale. Single nasal scale, partially divided into anterior and posterior.



**Figure 1.** Adult male *Rhinobothryum lentiginosum* (CIRA-823) collected in Bolivia, Department Pando, Province Abuná. **A.** Live photograph. **B.** dorsal view. **C.** ventral view.

Two anterior temporal scales and two posterior temporal scales. Ventral scales = 263, divided cloacal scale, divided subcaudal scales = 106. Large eye with vertically elliptical pupil.

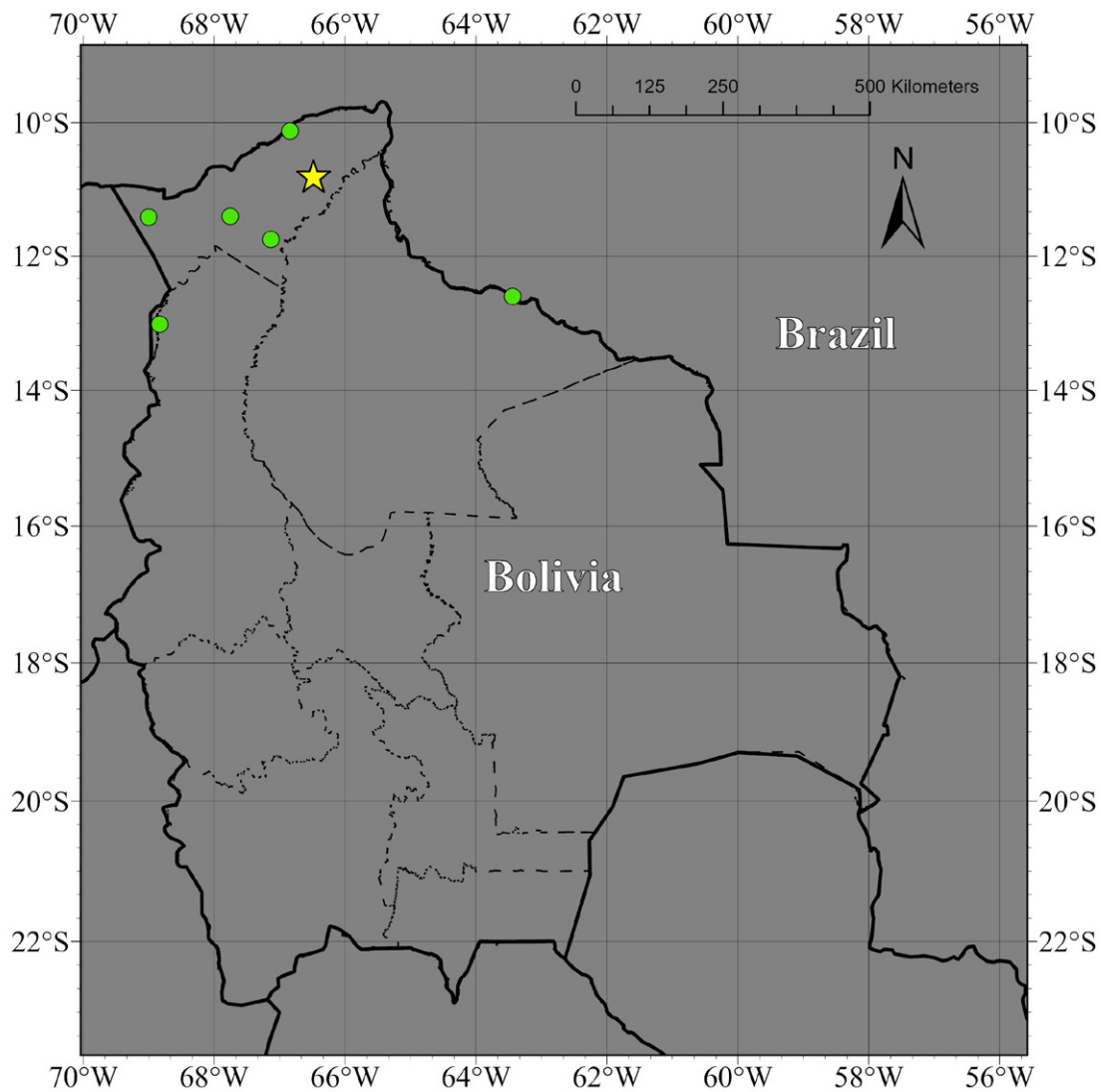
Color and pattern: tricolor, consisting of black rings (8–12 scales in length), separated by narrower white rings (4–6 scales long), that are in turn interrupted in their middle by a ring of reddish orange (1–3 scales in length) with black scale splashes. Ventral pattern continuation of black rings separated by white rings (some white rings with light orange tinting). White nuchal ring. Head scales reddish orange to white, with variably sized black blotches in their centers (sometimes covering almost the entire scale).

## Discussion

This additional record of *Rhinobothryum lentiginosum* (CIRA-823, Fig. 1) together with the specimen collected

from Estación Biológica Abuná - Centro de Investigación y Producción para la Amazonía (EBA-CIPA) represents the northeasternmost distributional record in Bolivia (Fig. 2) and fills the distribution gap among the known Brazilian and Bolivian populations. Eight specimens of *R. lentiginosum* are documented herein to have been collected from Bolivia and deposited in museum collections (Table 1). The species seems to be distributed throughout northern Bolivia in the departments of Pando, Beni (northern region) and La Paz (northern region). Clearly, more specimens are needed to delimit the complete geographic range within Bolivia and help develop a better understanding of the species' natural history.

Regularly cited incorrectly as 1785; the correct date for the original description of *Rhinobothryum lentiginosum* (listed as *Coluber lentiginosus*) is 1788 and appears in the third volume of the series *Deliciae florae et faunae insubricae* by Scopoli. Historical references have included Bolivia in the distribution range of



**Figure 2.** Distribution of *Rhinobothryum lentiginosum* in Bolivia. Green circles = previously collected specimens. Yellow star = New specimen reported herein (CIRA-823).

**Table 1.** Voucher specimens of *Rhinobothryum lentiginosum* collected from Bolivia based on literature and museum data (including new record). Specimen CI-70315 (field ID number) is recorded at MHNNKM.

Specimen	Date collected	Department	Province	Locality	Latitude	Longitude
AMNH-R-101897	8 Oct. 1964	Beni	Iténez	Río Iténez, Puerto Cap. Vásquez	-12.6019	-63.4442
CI-70315 (Alverson et al. 2000)	2000	Pando	Nicolás Suárez	Río Tahuamanu region	-11.4167	-69.0000
CBF-864 (Nogueira et al. 2019)	20 Oct. 1991	Pando	Manurípi	Camacho	-11.4049	-67.7540
CBF-2044	4 Apr. 1997	La Paz	Abel Iturralde	Ixiamas, Puerto Moscoso	-13.0166	-68.8333
CBF-2832	Jan./Feb. 2006	Pando	Madre de Dios	El Sena, Canadacito	-11.7500	-67.1333
CBF-3905 (not included in map)	No data	La Paz	No data	No data	No data	No data
EBA-CIPA (no museum number issued)	30 Oct. 2015	Pando	Abuná	Estación Biológica Abuná	-10.1243	-66.8402
CIRA-823	19 June 2019	Pando	Abuná	Near the community of Humaita	-10.8017	-66.4806

*R. lentiginosum* (see Amaral 1929; Cunha and Nascimento 1978, 1993; Fugler and Cabot 1995). The inclusion of Bolivia in the distribution of *R. lentiginosum* by Amaral (1929) seems to be uncritically cited from Boulenger (1896) or Scopoli (1788), neither of which provides a reference or museum voucher for this species in Bolivia. Cunha and Nascimento (1978, 1993) included Bolivia in the distribution; however, there are no reference specimens (collected in Bolivia) cited in these works. Fugler and Cabot (1995) also referred to Amaral (1929) for

inclusion (see explanation above).

There is very little published information on voucher specimens from Bolivia for this species. We were able to locate a technical report by Alverson et al. (2000) that refers to a specimen of *R. lentiginosum* collected in Bolivia and an additional recent publication by Nogueira et al. (2019) listing one reference specimen with voucher information from Bolivia. However, this is the first complete list of published reference specimens with detailed distributional data for *R. lentiginosum* for Bolivia.

Although the distribution of *R. lentiginosum* certainly includes Bolivia, it is important to clarify and elucidate the provenance of this inclusion.

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## Authors' Contributions

RLP, CBE, DL, EAS, and GCV conducted fieldwork, collected the specimen, participated in specimen processing, and data collection. RLP, AVC, DL, and CBE led writing. RLP, CBE, and DL collected photo vouchers. RLP and AVC composed and edited the photo submissions. CBE designed the map. All authors reviewed the final paper before submission.

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