

## Taxonomic Status of the False Coral Snake Genus *Simophis* (Peters, 1860) (Serpentes: Colubridae: Colubrinae) from Paraguay and Brazil

PIER CACCIALI,<sup>1,2</sup> NORMAN J. SCOTT JR.,<sup>3</sup> RAINER GUENTHER,<sup>4</sup> RICARDO J. SAWAYA,<sup>5</sup> FRANCISCO BRUSQUETTI,<sup>6</sup> AND  
 FREDERICK BAUER<sup>7</sup>

<sup>1</sup>Departamento de Paleontología, Facultad de Ciencias, Universidad de la República, Iguá 4225, CP 11400, Montevideo, Uruguay and Estación Ecológica San Rafael, Alto Verá, Itapúa, Paraguay; E-mail: pier\_cacciali@yahoo.com

<sup>2</sup>Research Associate, Smithsonian Institution, P.O. Box 307, Creston, California 93432 USA;  
 E-mail: amphibscott@gmail.com

<sup>4</sup>Museum für Naturkunde, Humboldt-Universität zu Berlin, Invalidenstr 43, 10115 Berlin, Germany; E-mail:  
 rainer.guenther@museum.hu-berlin.de

<sup>5</sup>Laboratório Especial de Ecologia e Evolução, Instituto Butantan, Avenida Dr. Vital Brazil 1500, 05503-900 São Paulo, Brazil; E-mail: sawaya@butantan.gov.br

<sup>6</sup>Departamento de Herpetología, Instituto de Investigación Biológica del Paraguay, del Escudo 1607, 1429 Asunción, Paraguay; E-mail: franbrusquetti@gmail.com

<sup>7</sup>Fundación Dracaena, Cervantes 911, 1702 Asunción, Paraguay; E-mail: frebauer@hotmail.com

**ABSTRACT.**—The genus *Simophis* includes Brazilian and Paraguayan colubrid snakes with color patterns mimetic with triad-banded coral snakes of the genus *Micrurus*. Currently *Simophis* is thought to include two species: *Simophis rhinostoma*, described from Brazil and recorded in the literature from Paraguay, and *Simophis rohdei*, considered to be a Paraguayan endemic. The species are differentiated by the number of scale rows at midbody (15 in *S. rhinostoma* and 17 in *S. rohdei*) and the number of supralabial scales (7 in *S. rhinostoma* and 8 in *S. rohdei*). A review of specimens from Paraguay and Brazil indicate variation in the number of supralabial scales, and a reexamination of the holotype of *Rhinaspis rohdei* showed that it actually has 15 middorsal scale rows and not 17 as was indicated in the original description. A single specimen from Brasília has 17 dorsal scale rows. The genus *Simophis* must be considered to be monotypic (*S. rhinostoma*), having 15 dorsal scale rows (rarely 17) and between 7 and 9 supralabials (rarely 5). The species has a unique combination of characters, some associated with arboreality (slender body, long tail, laterally keeled ventral scales), and one found in fossorial snakes (shovel-shaped rostral).

**RESUMEN.**—El género *Simophis* incluye serpientes de Brasil y Paraguay, las cuales poseen un patrón de coloración mimético con serpientes de coral con triadas. Actualmente se cree que el género contiene dos especies: *Simophis rhinostoma*, descrita de Brasil y también registrada en la literatura paraguaya, y *Simophis rohdei* considerada como una especie endémica de Paraguay. Las especies se diferencian por el número de hileras de escamas dorsales al medio cuerpo (15 en *S. rhinostoma* y 17 en *S. rohdei*) y por el número de escamas supralabiales (7 en *S. rhinostoma* y 8 en *S. rohdei*). La revisión de ejemplares de Paraguay y Brasil indica que existe variación en el número de escamas supralabiales, y la reexaminación del holotipo de *Rhinaspis rohdei* muestra que tiene en realidad 15 hileras de escamas dorsales al medio cuerpo y no 17 como se indica en la descripción original. Sólo un ejemplar procedente de Brasilia fue confirmado que posee 17 hileras de escamas dorsales. El género *Simophis* debe ser considerado como monotípico (*S. rhinostoma*), el cual tiene 15 hileras de escamas dorsales (raramente 17) y entre 7 y 9 supralabiales (raramente 5). La especie tiene una única combinación de caracteres, algunos de ellos asociados a hábitos arborícolas (cuerpo delgado, cola larga, escamas ventrales lateralmente quilladas) y uno encontrado en serpientes fosoriales (escama rostral modificada en forma de pala).

The colubrid snake genus *Simophis* (Peters, 1860) belongs to the subfamily Colubrinae (Lawson et al., 2005) and currently includes two valid species with coral snake color patterns. It is distinguished by a rostral scale modified by a horizontal keel into the shape of a spade and its coloration (Peters and Orejas Miranda, 1970; Amaral, 1976). Besides its mimetic color pattern, *Simophis rhinostoma* performs defensive behaviors similar to those displayed by elapid coral snakes of the genus *Micrurus* (Sazima and Abe, 1991; Marques, 2000). Boulenger (1894) pointed out that the lateral angle in ventral scales of the genus *Simophis* is

similar to those found in some semiarboreal genera, such as *Elaphe*.

The two nominal species of this genus are *S. rhinostoma* and *Simophis rohdei* (Peters and Orejas Miranda, 1970). They are distinguished by the number of dorsal scale rows (15 in *S. rhinostoma* and 17 in *S. rohdei*) and supralabials (7 in *S. rhinostoma* and 8 in *S. rohdei*; Peters and Orejas Miranda, 1970). Schlegel (1837) described *Heterodon rhinostoma* based on a specimen from the "Interior of Brasil." Peters (1860) proposed a new genus, *Simophis*, for this species. Boettger (1885) described *Rhinaspis rohdei*, from Paraguay. It differs in pholidosis from *S. rhinostoma*, but external appearances are similar, especially coloration and the shape of the snout, and both species were allocated to the genus *Simophis* by Boulenger (1894).

<sup>2</sup>Corresponding Author.

TABLE 1. Dorsal scale rows at midbody and numbers of supralabial scales of *Simophis rhinostoma* from Paraguay and Brazil recorded from some naturalists in the XIX century. Notice that holotype of *Simophis rohdei* (ZISP 6658) has actually 15 dorsal scale rows and not 17 as is mentioned in the original description.

Specimen	Dorsal scale rows	Supralabials
Schlegel, 1837 <i>Heterodon rhinostoma</i>	15	7/7
Boettger, 1885 <i>Rhinaspis Rohdei</i> (ZISP 6658)	15	8/8
Boulenger, 1894 <i>Simophis rohdii</i>	15	—
Koslowsky, 1898 <i>Simophis rhinostoma</i>	15	8/8

*Simophis rohdei* was thought to be endemic to Paraguay. Peters and Orejas Miranda (1970) considered *S. rhinostoma* to be restricted to Brazil although it was recorded from Paraguay by Serié (1919), Bertoni (1914, 1939), and Schouten (1937). None of the specimens supporting those Paraguayan records are extant. In Brazil, *S. rhinostoma* is widely distributed from central (Distrito Federal and the state of Goiás), western (states of Mato Grosso and Mato Grosso do Sul), and southeastern Brazil (states of Minas Gerais and São Paulo; Peters and Orejas-Miranda, 1970; pers. obs., data from Coleção Herpetológica do Instituto Butantan, and Museu de História Natural Capão do Imbuia).

Although *S. rhinostoma* and *S. rohdei* have been treated as distinct species by many authors, Koslowsky (1898) thought that possibly both should be regarded as a single species because he found a specimen from Mato Grosso do Sul (Brazil) with characteristics of both (15 dorsal scale rows and 8 supralabials). Also, Amaral (1929a,b, 1976) thought that there was only one species in the genus, with two subspecies. Gatti (1955), following Koslowsky (1898), stated that "... *Simophis rhinostoma* (Schgl.) y, su tal vez sinónimo, *S. rohdei* (Böttg.) se encuentran en Paraguay" [Translation: ... *Simophis rhinostoma* (Schgl.) and, possibly a synonym, *S. rohdei* (Böttg.) are found in Paraguay]. Later, only *S. rohdei* has been recognized

for the Paraguayan herpetofauna (Peters and Orejas Miranda, 1970; Talbot, 1979). Koslowsky's (1898) idea of a single species in the genus was possibly ignored because he based it on only one specimen.

#### MATERIALS AND METHODS

We review the relevant taxonomic characters of 46 specimens of both nominal species from Brazil and Paraguay, including the holotype of *R. rohdei*, and discuss the taxonomic status of both taxa. Snout-vent length (SVL) and total length (TL) were recorded in the preserved specimens. Measurements are given in millimeters. In ventral scales counts, first ventral was considered the first scale wider than long following Peters (1964). Subcaudal counts included neither the pair contacting the vent nor the terminal spine of the tail. Symmetric characters in cephalic pholidosis are presented as right/left. Museum acronyms and specimens examined are listed in Appendix 1. Dorsal scales were recorded anterior (about one head length behind the head), medial (center of body), and posterior (about one head length anterior to the cloaca).

#### RESULTS

Table 1 presents data of specimens recorded by previous researchers. Examination of 46 specimens from Brazil and Paraguay confirms the supposition of Koslowski (1898) that a single species is involved (Table 2).

#### *Simophis rhinostoma* Schlegel, 1837

1837. *Heterodon rhinostoma* Schlegel, Essai Physion. Serpens, 2: 100, pl. 3, figs. 17-19. Type Locality: Interior of Brazil. Holotype: ZISP 6658.

1858. *Rhinostoma schlegelii* Günther, Cat. Sn. Brit. Mus.: 8. Type locality: North America.

1860. *Simophis Rhinostoma*: Peters, Monats. Akad. Wiss. Berlin, 1860: 521.

1863. *Rhinaspis proboscideus* Jan, Arch. Zool. Anat. Fis., 2: 215. Type locality: Brazil.

1885. *Rhinaspis Rohdei* Boettger, Zeits. für Naturwiss., 58: 231. Type locality: Paraguay.

1894. *Simophis rohdii*: Boulenger, Cat. Snakes Brit. Mus., 2: 254.

1929a. *Simophis rhinostoma rhinostoma*: Amaral, Mem. Inst. Butantan, 4:92.

1929b. *Simophis rhinostoma rohdei*: Amaral, Mem. Inst. Butantan, 4:182.

*Diagnosis*.—Head differentiated from the neck, tip of the snout flattened, rostral with a horizontal keel. Aposematic coloration consisting of triads of black

TABLE 2. Pholidosis of *Simophis rhinostoma*, including variation. Data of supralabials and infralabials are given in right/left direction.

Dorsals (N = 41)	Ventrals (N = 46)	Subcaudals (N = 46)	Supralabials (N = 40)	Infralabials (N = 39)
15-15-13 (3)	169-191	60-74	5(3)/5(3) (1)	8/9 (1)
17-15-13 (37)			7(3-4)/7(3-4) (15)	9/9 (35)
17-17-15 (1)			7(3-4)/8(4-5) (5)	10/9 (3)
			8(4-5)/7(3-4) (2)	
			8(4-5)/8(4-5) (15)	
			8(4-5)/9(4-5) (2)	

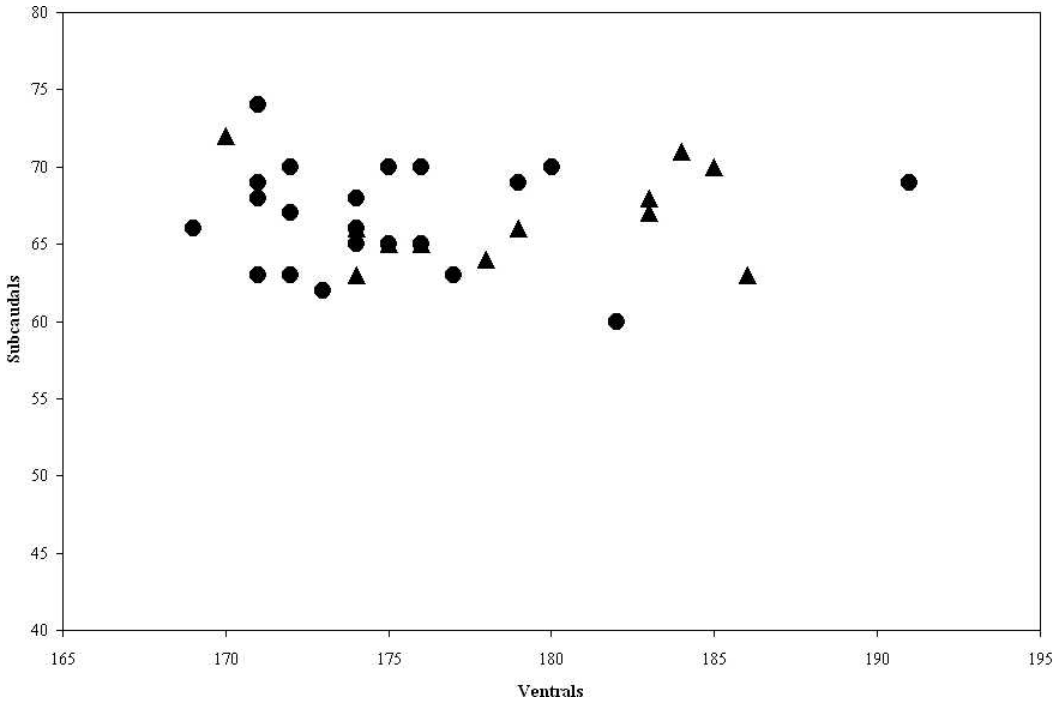


FIG. 1. Relationship between subcaudals and ventrals in males and females of *Simphis rhinostoma*. Circles: males. Triangles: females.

and white rings separated by red rings mimetic with coral snakes of the *Micrurus frontalis* complex. Belly variable. Body of medium size, tail moderately long. A diastema dividing in half the row of maxillary teeth. The combination of red, black, and white rings, a diastema in the middle of the maxillary row of teeth, and a rostral with a horizontal keel distinguishes it from all other Colubridae.

**Description.**—A medium-sized snake. The species can reach 1 m in total length (Jordão and Bizerra, 1996). The biggest specimen analyzed by us was a male 887 mm in total length (SVL 691 mm), and the smallest was 335 mm in total length (SVL 275 mm). The tail represents between 0.21% and 0.28% of the body length. Jordão and Bizerra (1996) only reported sexual dimorphism in the SVL, stating that females were bigger than males. There are no differences in the ratio of tail lengths in males and females.

Maxillae (based on left maxillary bone of specimen MUHINA 1903) relatively long (8.3 mm), it extends from the suture between nasal and first supralabial scale to the middle of supralabial under the first postocular (sixth supralabial in analyzed specimen). Diastema present but very short, located at the level of the maxillary palatine process. Eighteen total teeth. Nine prediastemal teeth very curved, projecting backward. Size of prediastemal teeth approximately half of postdiastemal ones. Nine postdiastemal teeth slightly increasing in size posteriorad. Postdiastemal teeth less curved than prediastemal ones, and further apart. Maxillary palatine process extended forward, reaching the level of the sixth tooth. Internal extreme of maxillary palatine process

curved downward, ending in abroad articulation with ectopterygoid.

Head pointed with snout flattened. Rostral scale wider than high and modified by a horizontal keel, projecting backward in a triangle partially dividing internasals. Internasals pentagonal. Prefrontals larger than internasals. Frontal as wide as long. Supraoculars long. Parietals only a little longer than broad. Nasals divided. Loreal almost square, approximately half size of the eye. Preocular high, with pointed superior margin. Two postoculars, upper a little bigger than lower. Supralabials increase in size from the first to the penultimate, which can be of same size as the last or last can be a bit smaller than the penultimate. Mental triangular and small. Infralabials follow the normal colubrid pattern. First genials smaller than posterior ones.

Traits of pholidosis given in Table 2. Supralabials 7–9 (exceptionally 5), 3–4, or 4–5 reaching the orbit; commonly 9 infralabials, rarely 8 or 10. Temporals 1 + 2 or 2 + 2. Dorsal scales smooth without apical pits, in 15 middorsal rows (exceptionally 17) with reduction (normally 17–15–13). Ventrals 169–191 (mean = 177,  $\sigma = 5.44$ ,  $N = 47$ ) and subcaudals 60–74 (mean = 67,  $\sigma = 2.98$ ,  $N = 42$ ) divided. No obvious sexual dimorphism in numbers of ventrals and subcaudals (Fig. 1). Anal plate divided.

Top of head black with scale sutures white. Temporals and scales behind temporals red with some posterior scales edged with black. Supralabials and infralabials white, with posterior edges black. First genials white in first half and black in posterior half, and second genial white. Dorsal body coloration and

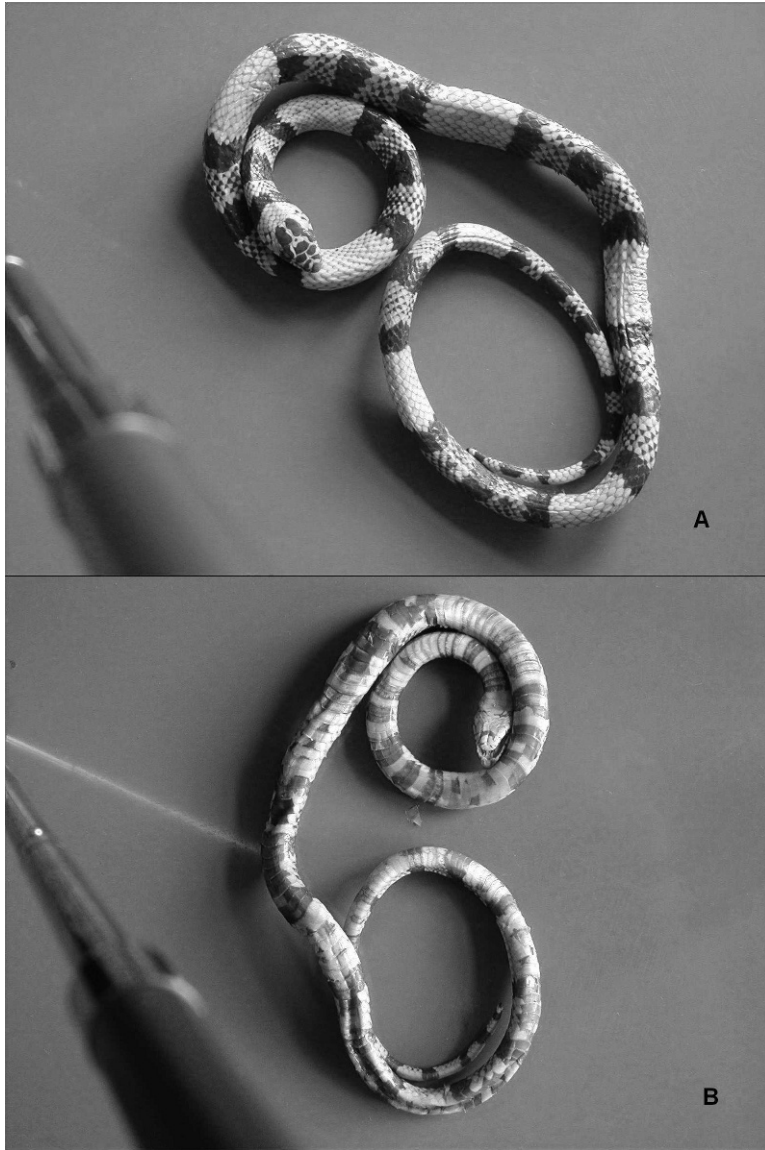


FIG. 2. (A) Dorsal view of holotype of *Simophis rohdei*, and (B) ventral view of the same specimen (ZISP 6658).

tail consisting of black, red, and white rings (Fig. 2A). Black rings disposed in triads, separated by white rings. Triads separated by red rings. White and red rings generally speckled with black dots. Ventral coloration with complete rings (as in true coral snakes) or reticulated with black and white. Holotype of *S. rohdei*, rings are partially complete on the belly (Fig. 2B).

*Distribution and Habitat.*—*Simophis rhinostoma* is distributed in eastern Paraguay, central, western, and southeastern Brazil. Records are from the Paraguayan Departments of Caaguazú and Alto Paraná; and the Brazilian states of Distrito Federal, Goiás, São Paulo, Mato Grosso, Mato Grosso do Sul and Minas Gerais; and its presence in Paraná state is probable

(see Fig. 3). The species has affinities with the Atlantic Forest ecosystem (from Serra do Mar in Brazil westward to Alto Paraná Atlantic Forest in Paraguay). However, in all Brazilian states where it was recorded, the species is also found in Cerrado areas (Fig. 3; Colli et al., 2002; Costa et al., 2007; Sawaya et al., 2008).

*Biology.*—Other than Serié's (1919) observation of frogs of the family Leptodactylidae in a Paraguayan specimen, nothing is known of the biology of *Simophis* from Paraguay. The morphological characters of a long tail, lateral angle in ventral scales, and a slender racer-like habitus, characteristic of arboreal species, combined with a spadelike rostral scale, usually associated with fossorial snakes, appear to be unique



FIG. 3. Map showing distribution of examined specimens (black dots).

among snakes. However, available published data on *S. rhinostoma* suggest it is a diurnal and terrestrial species (Sazima and Abe, 1991; Sawaya et al., 2008), lays two to seven eggs (Jordão and Bizerra, 1996), and feeds on anurans (Bizerra et al., 1994; França et al., 2008; Sawaya et al., 2008) although some authorities have also suggested lizards and small rodents as prey items (Amaral, 1976; Freitas, 1999).

#### DISCUSSION

Our specimens confirm that the genus *Simophis* is monotypic. The number of supralabial scales (7 in *S. rhinostoma* and 8 in *S. rohdei*; Boulenger, 1894; Peters and Orejas Miranda, 1970) was thought to be a difference between the taxa, but this character is shown to be variable (Table 2). The holotype of *S. rhinostoma* as well as several other specimens has seven supralabials. Several specimens have eight supralabials, and two have nine supralabials on the left side. Some specimens show different numbers of supralabials on each side of the head. And one specimen has only five supralabials on each side.

There was thought to be a difference in the number of scale rows at midbody (15 in *S. rhinostoma* and 17 in *S. rohdei*; Boulenger, 1894; Peters and Orejas Miranda, 1970). The only specimen recorded with 17 dorsal scale rows was the holotype of *S. rohdei* by Boettger (1885) in his original description. N. Ananjeva and I. Danilov (pers. comm.) examined the holotype and counted only 15 midbody dorsal scale rows. Boettger

(1885) obviously made his counts on the anterior part of the body; the formula of the dorsal scales in the holotype is 17-15-13. Only one specimen (IB 38977) from Brasília has 17-17-15 dorsal scales rows.

*Acknowledgments.*—We extend thanks to M. Motte (MNHNP), A. Duré (MAI), and S. Carreira (MUHINA) for letting us examine specimens in their care, to N. Ananjeva and I. Danilov (Collection of the Zoological Institute of St. Petersburg, Russia) for providing photographs and scale counts of the holotype of *Rhinaspis rohdei*, and to D. Embert and G. Köhler for their help with information regarding German museums. Also T. Doan, F. França, and one anonymous reviewer provided important comments to improve this work.

#### LITERATURE CITED

- AMARAL, A. DO. 1929a. Contribuição ao conhecimento dos ophidios do Brasil. IV-Lista remissiva dos ophidios do Brasil. *Memorias do Instituto Butantan* 4:71–125.
- . 1929b. Estudos sobre ophidios neotropicos. XVIII-Lista remissiva dos ophidios da região neotropica. *Memorias do Instituto Butantan* 4:126–271.
- . 1976. *Serpentes do Brasil: Iconografia Colorida [Brazilian Snakes: A Color Iconography]*. Editora da Universidade de São Paulo, São Paulo, Brasil.

- BERTONI, A. DE W. 1914. Fauna paraguaya. Catálogos sistemáticos de los vertebrados del Paraguay. Peces, batracios, reptiles, aves y mamíferos conocidos hasta 1913. In M. S. Bertoni (ed.), Descripción Física y Económica del Paraguay 59, pp. 1–86. Establecimiento Gráfico M. Brossa, Asunción, Paraguay.
- . 1939. Catálogos sistemáticos de los vertebrados del Paraguay. Revista de la Sociedad Científica del Paraguay 4:3–60.
- BIZERRA, A. F., R. DOS S. JORDÃO, AND I. SAZIMA. 1994. *Simophis rhinostoma* (NCN). Diet. Herpetological Review 25:72–73.
- BOETTGER, O. 1885. Liste von Reptilien und Batrachiern aus Paraguay. Zeitschrift für Naturwissenschaft 58:213–248.
- BOULENGER, G. A. 1894. Catalogue of the snakes in the British Museum. Vol II. London.
- COLLI, G. R., R. P. BASTOS, AND A. F. B. ARAUJO. 2002. The Character and Dynamics of the Cerrado Herpetofauna. In P. S. Oliveira and R. J. Marquis (eds.), The Cerrados of Brazil: Ecology and Natural History of a Neotropical Savana, pp. 223–241. Columbia University Press, New York.
- COSTA, G. C., C. NOGUEIRA, R. B. MACHADO, AND G. R. COLLI. 2007. Squamate richness in the Brazilian Cerrado and its environmental-climatic associations. Diversity and Distributions 13:714–724.
- FRANÇA, F., D. O. MESQUITA, C. C. NOGUEIRA, AND A. F. B. ARAUJO. 2008. Phylogeny and ecology determine morphological structure in a snake assemblage in the central Brazilian Cerrado. Copeia 2008:23–38.
- FREITAS, M. A. DE. 1999. Serpentes da Bahia e do Brasil. Editora DALL, Feira de Santana, Bahia, Brazil.
- GATTI, C. 1955. Las culebras venenosas del Paraguay. Revista Médica del Paraguay 1:81–100.
- JORDÃO, R. DOS S., AND A. F. BIZERRA. 1996. Reprodução, dimorfismo sexual e atividade de *Simophis rhinostoma* (Serpentes, Colubridae). Revista Brasileira de Biologia 56:507–512.
- KOSLOWSKY, J. 1898. Ofidios de Matto-Grosso (Brazil). Revista del Museo de La Plata 8:25–34.
- LAWSON, R., J. B. SLOWINSKI, B. I. CROTHER, AND F. T. BURBRINK. 2005. Phylogeny of the Colubroidea (Serpentes): new evidence from mitochondrial and nuclear genes. Molecular Phylogenetics and Evolution 37:581–601.
- MARQUES, O. 2000. Tail displays of the False Coral Snake *Simophis rhinostoma* (Colubridae). Amphibia-Reptilia 22:127–129.
- PETERS, J. A. 1964. Dictionary of Herpetology. Hafner Publishing Company, New York and London.
- PETERS, J. A., AND B. OREJAS MIRANDA. 1970. Catalogue of the Neotropical Squamata: part I, snakes. Bulletin of the U.S. National Museum 297:1–347.
- PETERS, W. C. H. 1860. Drei neue Schlangen des k. zoologischen Museums aus America und Bemerkungen über die generelle Unterscheidung von anderen bereits bekannten Arten. Monatsberichte der königlich Akademie der Wissenschaften zu Berlin 1860:517–521.
- SAWAYA, R. J., O. A. V. MARQUES, AND M. MARTINS. 2008. Composition and natural history of a Cerrado snake assemblage at Itirapina, São Paulo state, southeastern Brazil. Biota Neotropica 8:127–149.
- SAZIMA, I., AND A. S. ABE. 1991. Habitats of five Brazilian snakes with coral-snake pattern, including a summary of defensive tactics. Studies on Neotropical Fauna and Environment 26:159–164.
- SCHLEGEL, H. 1837. Essai sur la physiologie des serpens. Partie Descriptive. La Haye.
- SCHOUTEN, G. B. 1937. Fauna herpetológica del Paraguay. Sociedad Argentina de Patología Regional del Norte, Novena Reunión 2:1218–1232.
- SERIÉ, P. 1919. Notas sobre la alimentación de algunos ofidios. Revista del Jardín Zoológico de Buenos Aires 15:307–328.
- TALBOT, J. J. 1979. Una nueva lista sistemática de los reptiles del Paraguay. Informes Científicos del Instituto de Ciencias Básicas 2:76–94.

Accepted: 23 January 2009.

#### APPENDIX 1

##### Materials Examined

Museum abbreviations are as follows: IBSP: Instituto Butantan (Brazil), MAI: Museo Ambiental Itaipú (Paraguay), MUHINA: Museo de Historia Natural y Antropología (Uruguay), MNHNP: Museo Nacional de Historia Natural del Paraguay, ZISP: Zoological Institute of St. Petersburg (Russia), and ZMB: Zoologisches Museum of the Humboldt-Universität, Berlin (Germany).

*Simophis rhinostoma*.—BRAZIL: (MUHINA 1903, ZMB 2414, 2418); DISTRITO FEDERAL: Brasília (IBSP 20612, 38977); GOIÁS: Ipameri (IBSP 23310), Anápolis (IBSP 54133), Mineiros (IBSP 62687), Corumbá de Goiás (IBSP 52367), Jataí (IBSP 44301), Itumbiara (IBSP 42859, 42861), Chapada do Céu (IBSP 55888, 58867); MATO GROSSO: Alto Taquari (IBSP 43067), São Félix do Araguaia (IBSP 56220); MATO GROSSO DO SUL: Ponta Porã (IBSP 16179, 18595, 19420, 33705), Campo Grande (IBSP 33207), Dourados (IBSP 41414), Paranaíba (IBSP 45855), Vazante (IBSP 43049); MINAS GERAIS: São João da Serra Negra (IBSP 24618), Prata (IBSP 58299), Pouso Alegre (IBSP 54009), Paraisópolis (IBSP 54112), Machado (IBSP 18303), Itajubá (IBSP 54187), Fronteira (IBSP 68977), Araguari (IBSP 67938), Arceburgo (IBSP 73257); SÃO PAULO: Assis (IBSP 37292), Nazaré Paulista (IBSP 68832), Santa Isabel (IBSP 23244), Joanópolis (IBSP 61925), Porto Feliz (IBSP 67974), Matão (IBSP 4365), Guarulhos (IBSP 68228), Socorro (IBSP 62397), Botucatu (IBSP 32697), Itapeverica da Serra (IBSP 42437). PARAGUAY: (ZISP 6658, holotype of *Rhinaspis rohdei*); ALTO PARANÁ: (MAI no catalogue number); CAAGUAZÚ: Coronel Oviedo (MNHNP 3451).