



On the identity of *Chironius flavolineatus* (Serpentes: Colubridae)

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Abstract

The snake genus *Chironius* Fitzinger, 1826 is endemic to the Neotropical region, occurring from Honduras to Uruguay and northeastern Argentina. Some species of the genus have taxonomic and/or nomenclatural problems, such as *C. flavolineatus* which lacks agreement in the literature about its authorship and type locality. Some researchers have been suggesting Jan (1863) as the author of the species since he first described *C. flavolineatus* based on two specimens. However, other researchers report that Jan's description is so incomplete that it is not possible to ascertain what snake he had in mind and therefore suggest Boettger (1885) as the author, since he was the first to provide a detailed description of the species. In the present study one of the syntypes of *C. flavolineatus*, supposedly destroyed in Second World War, was found. Thus, the taxonomic identity of *C. flavolineatus* was redefined, its lectotype was designated and the authorship of the taxa is attributed to Jan (1863).

Key words: taxonomy, nomenclature, authorship, Jan, lectotype

Resumo

O gênero *Chironius* Fitzinger, 1826 possui distribuição Neotropical, se estendendo de Honduras ao Uruguai e nordeste da Argentina. Algumas de suas espécies apresentam problemas taxonômicos e/ou nomenclaturais, tais como *C. flavolineatus* que apresenta divergências em relação à autoria e localidade-tipo da mesma. Alguns pesquisadores sugerem que Jan (1863) deve ser considerado autor da espécie por ter sido o primeiro a descrevê-la com base em dois exemplares. Entretanto, alguns autores sugerem que a descrição de Jan não possibilita a associação inequívoca de *C. flavolineatus* a tal descrição e sugerem que a autoria do táxon deve ser dada a Boettger (1885), pois este foi o primeiro autor a fornecer uma descrição detalhada da espécie. No presente estudo um dos síntipos de *C. flavolineatus*, que se acreditava ter sido destruído na segunda guerra mundial, foi encontrado. Desta forma a identidade taxonômica de *C. flavolineatus* foi redefinida, seu lectótipo designado e a autoria do táxon creditada a Jan (1863).

Palavras-chave: taxonomia, nomenclatura, autoria, Jan, lectótipo

Introduction

Fitzinger (1826) revised the type material of Linnaeus (1758) and proposed the genus *Chironius* to allocate some species morphologically distinct from *Coluber* Linnaeus, 1758: *Coluber exoletus*, *C. fuscus*, *C. saturninus* (= *C. fuscus*), and *C. carinatus*, the latter nominated the type species of *Chironius*.

Boie (1826) described *Erpetodryas* to accommodate the same species of Fitzinger (1826), while Wagler (1830) altered the spelling of the name proposed by Boie (1826) to *Herpetodryas*, being followed by several authors (e.g. Jan 1863; Jan & Sordelli 1869; Boettger 1885, 1898; Boulenger 1894). Dixon *et al.* (1993) highlighted that only

Ruthven (1922) recovered the name *Chironius* Fitzinger, 1826, emphasizing that *Coluber carinatus* was the type species by original designation.

Amaral (1927) corroborated the priority of *Chironius* Fitzinger, 1826 over *Erpetodryas* Boie, 1826 or *Herpetodryas* Wagler, 1830, arguing that Fitzinger (1826), unlike Boie (1826), designated a type species. Finally, Dixon *et al.* (1993) elucidated that the manuscript of Fitzinger (1826) was actually published before the manuscript of Boie (1826), confirming the validity of the genus *Chironius* Fitzinger, 1826 over the name proposed by Boie (1826).

Chironius Fitzinger, 1826 has a Neotropical distribution, extending from Honduras south to Uruguay and northeastern Argentina, in altitudes from sea level up to 2.800m.a.s.l. (Bailey 1955; Dixon *et al.* 1993; Kok 2010). Twenty species of *Chironius* are currently recognized, although some taxa have taxonomic issues, such as *C. flavolineatus*, which has an unstable nomenclature due to divergences regarding the authorship and type locality of the taxon (Bailey, 1995; Dixon *et al.*, 1993).

Boie (1826) recorded *Coluber flavolineatus* Reinw. n. sp. to Java Island, mentioning no descriptive information. As highlighted by Dixon *et al.* (1993), this name is not valid considering the International Code of Zoological Nomenclature (ICZN 2000), being considered a *nomen nudum*. Jan (1863) described two specimens (one from Brazil, and the second from the state of Bahia, Brazil), as a snake with 10-12 scale rows, and applied the epithet *Herpetodryas carinatus* var. *flavolineata* to these specimens, crediting the authorship of the taxon to Fitzinger. Dixon *et al.* (1993) argued that Jan mistakenly credited the authorship to Fitzinger (1826), since the taxon cited by the latter author was *C. flavolineatus* Reinwardt, a *nomen nudum*. However, the nomenclatural act of Jan (1863) represents the association of the epithet *Herpetodryas carinatus* var. *flavolineata* to the two specimens he analyzed.

Boettger (1885) described in detail two specimens from Paraguay and, based on edition 31, plate 11, and figure 3 of the *Iconographie* by Jan & Sordelli (1869), identified these specimens as *Herpetodryas flavolineatus*, and attributed the authorship to Jan.

Bailey (1955) considered the description of Jan (1863) very succinct, precluding the binding of *Chironius flavolineatus* to any of the four varieties of *Herpetodryas carinatus* presented in the plate of Jan & Sordelli (1869). Furthermore, Bailey (1955) reinforced that Jan & Sordelli (1869) illustrated the taxon as a variety of *Herpetodryas carinatus*, without mentioning the name *flavolineata*. According to these points, combined with the supposition that the syntypes of Jan were destroyed during the Second World War, Bailey (1955) considered *H. carinatus* var. *flavolineata*, described by Jan (1863), a *nomen nudum*. The author claimed that Boettger (1885), by having described the taxon in detail, must be considered the author of *Herpetodryas flavolineatus* and, accordingly, the type locality of this taxon should be Paraguay. However, Bailey (1955) disregarded that even Boettger (1885) credited the authorship of *Herpetodryas flavolineatus* to Jan.

Dixon *et al.* (1993) argued against Bailey (1955) pointing out that Boettger (1885) described and identified the specimens from Paraguay as “*Herpetodryas flavolineatus* Jan”. Based on these evidences, Dixon *et al.* (1993) suggested that the name proposed by Jan (1863) should not be considered *nomen nudum*, but a valid name, with the authorship of the taxon credited to Jan (1863), with Boettger (1885) representing the first reviser of the taxon. Besides, Boettger (1898, p. 55) cited *Herpetodryas carinatus* var. *flavolineata* and once again considered Jan as the author of the taxon, maintaining the epithet *flavolineata* as originally described by Jan (1863).

Independently of the arguments of both, Bailey (1955) and Dixon *et al.* (1993), the main issue is that without examining the syntypes used by Jan (1863), one cannot unequivocally associate the name *H. carinatus* var. *flavolineata* to a single taxon. These syntypes were supposedly destroyed or lost in the Zoologisches Museum Hamburg, Hamburg, Germany, and in the Museo Civico di Storia Naturale di Milano, Milan, Italy.

Due to the aforementioned problems, *C. flavolineatus* has been reported by some authors as described by Jan (1863), with its type locality “Bahia”, “Brazil” (e.g. Pinto *et al.* 2008; Santana *et al.* 2008; Bérnills & Costa 2012; Hamdan & Lira-da-Silva 2012), while other authors credit the authorship to Boettger (1885), with the type locality “Paraguay” (e.g. Peters & Orejas-Miranda 1970; Bernarde *et al.* 2012; Uetz & Hošek 2013).

The present study aims to elucidate this nomenclatural problem by examining bibliographic data, specimens deposited in scientific collections, as well as the original appointments of the naturalist Giorgio Jan. Furthermore, the curators of the Senckenberg Gesellschaft für Naturforschung, Frankfurt, Germany, and Zoologisches Museum Hamburg, Hamburg, Germany, were also consulted in order to obtain any information on the syntypes of *H. carinatus* var. *flavolineata* or the specimens examined by Boettger (1885).

Material and methods

Specimens examined are listed in appendix 1. Museum abbreviations are as follow: Coleção Herpetológica da Universidade de Brasília (CHUNB), Brasília, Brasil; Coleção Zoológica Gregório Bondar (CZGB), Ilhéus, Brazil; Coleção Herpetológica da Universidade Federal do Ceará (CHUFC), Fortaleza, Brazil; Coleção Herpetológica da Universidade Federal da Paraíba (UFPB), João Pessoa, Brazil; Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), Rio de Janeiro, Brazil; Coleção de Répteis da Universidade Federal do Rio de Janeiro (ZUFRJ), Rio de Janeiro, Brazil; Museu de Zoologia da Universidade Federal de Viçosa (MZUFV), Viçosa, Brazil; Museu de Ciências Naturais da Pontifícia Universidade Católica de Minas Gerais (MCN-R), Belo Horizonte, Brazil; Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, Brazil; Fundação Ezequiel Dias (FUNED), Belo Horizonte, Brazil; Coleção Herpetológica da Universidade Federal de Sergipe (UFS), Aracaju, Brazil; Coleção Herpetológica do Museu de Zoologia, Universidade Estadual de Feira de Santana (UEFS), Feira de Santana, Brazil; Coleção de Répteis do Museu de Zoologia da Universidade Federal da Bahia (MZUFBA), Salvador, Brazil; Coleção Herpetológica da Universidade Federal de Mato Grosso (UFMT), Cuiabá, Brazil; Coleção Herpetológica da Universidade Federal do Rio Grande do Norte (UFRN), Natal, Brazil; Museo de Historia Natural Noel Kempff Mercado (MNKM), Santa Cruz de La Sierra, Bolivia; Museo Nacional de Historia Natural del Paraguay (MNHNP), Asunción, Paraguay; Museo Civico di Storia Naturale di Milano (MSNM), Milan, Italy.

Terminology for cephalic shields follows Peters (1964) and the method of ventral counting follows Dowling (1951). Biometric measurements follow Dixon *et al.* (1993) with these modifications: rostro-orbital distance corresponding to the distance between the anteriormost portion of the snout and the anteriormost portion of the orbit; and snout width was taken in the median portion of internasals. Measurements for snout-vent (SVL), and tail lengths (TL) were taken with a flexible ruler to the nearest 1.0 mm by stretching carefully the specimens along the ruler, while the following measures were taken with a dial caliper to the nearest 0.05 mm: head length, head width, rostro-orbital distance, rostro-orbital width, horizontal and vertical diameter of the eyes, length of interprefrontal and interparietal sutures, length of the frontal-supraocular contact, and length and width of prenasals, postnasals, internasals, prefrontals, frontals, parietals, supraoculars, preoculars, postoculars, loreals, temporals, chin shields, and physysial.

On the syntypes of *Herpetodryas carinatus* var. *flavolineata* Jan, 1863

We confirmed that the syntype of *Herpetodryas carinatus* var. *flavolineata* Jan, 1863 (= *C. flavolineatus*) from the state of Bahia, Brazil, deposited in the Zoologisches Museum Hamburg, Hamburg, Germany, was destroyed during the Second World War (Jakob Hallermann, curator of Zoologisches Museum Hamburg, pers. comm. 2012). Nevertheless, the second syntype used by Jan (1863) to propose this taxon, from “Brazil”, and which was also supposedly destroyed during the Second World War, was recently found by one of us (S. Scali) during a survey in the herpetological collection of the Museo Civico di Storia Naturale di Milano, Milan, Italy.

Through the examination of the handwritten catalogs we found that this is the only specimen assigned to this taxon deposited in this collection. The examination of this specimen (MSNM Re2729) revealed the presence of a label attached to it in which is written: *Herpetodryas carinatus* var. *flavolineatus* Jan (Fig 1A). On the back of the label is written “Rio Grande do Sul” (Fig. 1B). One of us (S. Scali) checked the calligraphy and confirmed that the handwriting of the label is not of Giorgio Jan. Another evidence that reinforces this statement is that Jan (1863) credited the authorship of the taxon to Fitzinger (not to himself) and used the epithet *flavolineata* (not *flavolineatus*, as is written in the label), demonstrating that this label was attached to the specimen at a later time. This fact also leads to another point: Rio Grande do Sul is a state in southernmost Brazil, and this annotation could be interpreted as the type locality of this taxon. However, in the work of Jan (1863), specific localities are explicitly recorded for a series of taxa described or cited by the author. Regarding the description of *H. carinatus* var. *flavolineata* (Jan 1863; p. 80) there is no mention of a more specific locality than “*Brasile*” (to the referred specimen), and “Bahia” (to the other syntype that was destroyed). We argue that if Jan (1863) had a more specific or reliable information about the type locality of this taxon, one could suppose that this information would be cited in the work, as he did to the other syntype, since Bahia and Rio Grande do Sul are both states from Brazil. Furthermore, as previously explained, the label was attached to the specimen at a later time increasing the

probabilities of labeling errors since during nineteenth century a huge amount of specimens were concomitantly received for identification and deposition in the Museo Civico di Storia Naturale di Milano. A survey in the records of all specimens deposited in the Museo Civico di Storia Naturale di Milano throughout its history also revealed that this specimen (MSNM Re2729) is the only with the epithet *flavolineatus* or *flavolineata*, confirming that this was one of the exemplars used by Jan (1863) to describe the taxon.

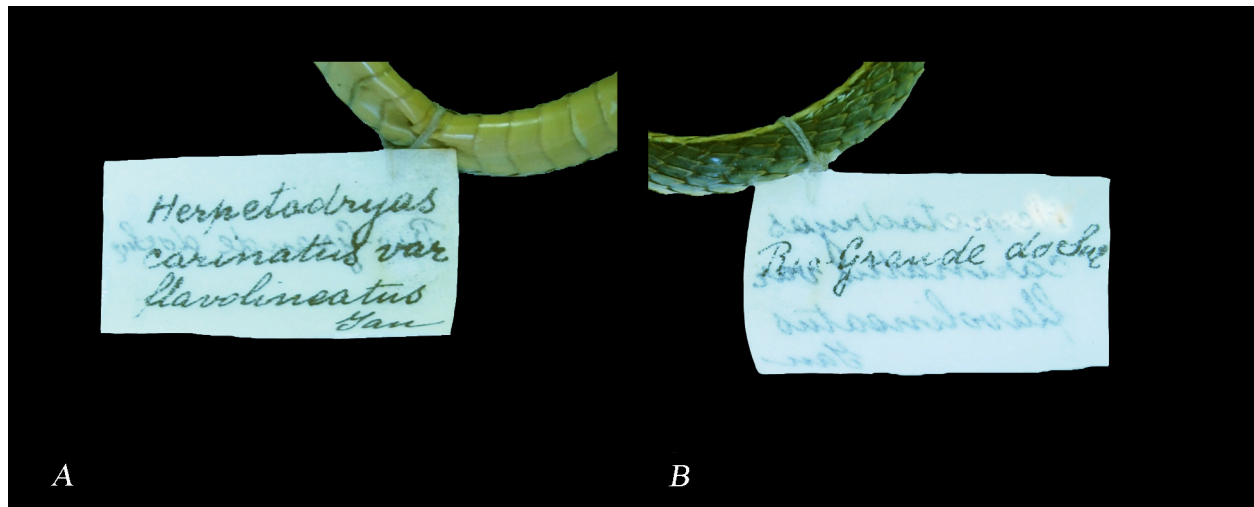


FIGURE 1. (A–B). Label attached to specimen MSNM Re2729.

Another relevant point is that through the analysis of the work of Jan (1863; p. viii), we concluded that the specimen used to produce the illustration of *H. carinatus* var. *flavolineata*, published by Jan & Sordelli (1869), was the syntype (MSNM Re2729) Fig. 2). Jan (1863; p. viii) explicitly states that specimens would be latter described and illustrated in the Iconographie of Jan & Sordelli (1869): “L’indicazione della patria siriferisce sempre a quelli esemplari che furono descritti e disegnati” (The indication of the country always refers to those specimens that were described and illustrated). The specimen of *H. carinatus* var. *flavolineata* associated to a country (“*Brasile*”) is the one deposited in the collection of the Museo Civico di Milano (MSNM Re2729) as one can see in the work of Jan (1863).

This illustration, referred to edition 31, plate 11 of Jan & Sordelli (1869), has four specimens cited as varieties of *Herpetodryas carinatus* (Fig. 2). Comparing these illustrations with meristic and qualitative characters of the syntype (MSNM Re2729), we were able to confirm that, specifically the figure 3 of this plate represents this specimen. The following combination of characters corroborates this statement: temporal formula 1+1; presence of a pale paravertebral line with black edges starting just behind the head, and extending to the posterior third of body; dorsal scales smooth to the distance of a head length from the occipital region towards the posterior portion of the body (Fig. 2).

All these findings endorse that the specimen (MSNM Re2729) is indeed one of the syntypes used by Jan (1863) to propose the name *H. carinatus* var. *flavolineata* and that its type-locality must remain “Brazil”. Below we designate this individual (MSNM Re2729) as the lectotype of *H. carinatus* var. *flavolineata* and present a redescription of this specimen.

Finally, the specimens of *Herpetodryas flavolineatus* examined by Boettger (1885) were deposited, at that time, in the private collection of Mr. H. Rohde. This collection was later sold to another private collector and is currently lost (Gunther Koehler, curator of Herpetology, Senckenberg Gesellschaft für Naturforschung, pers. comm. 2012).

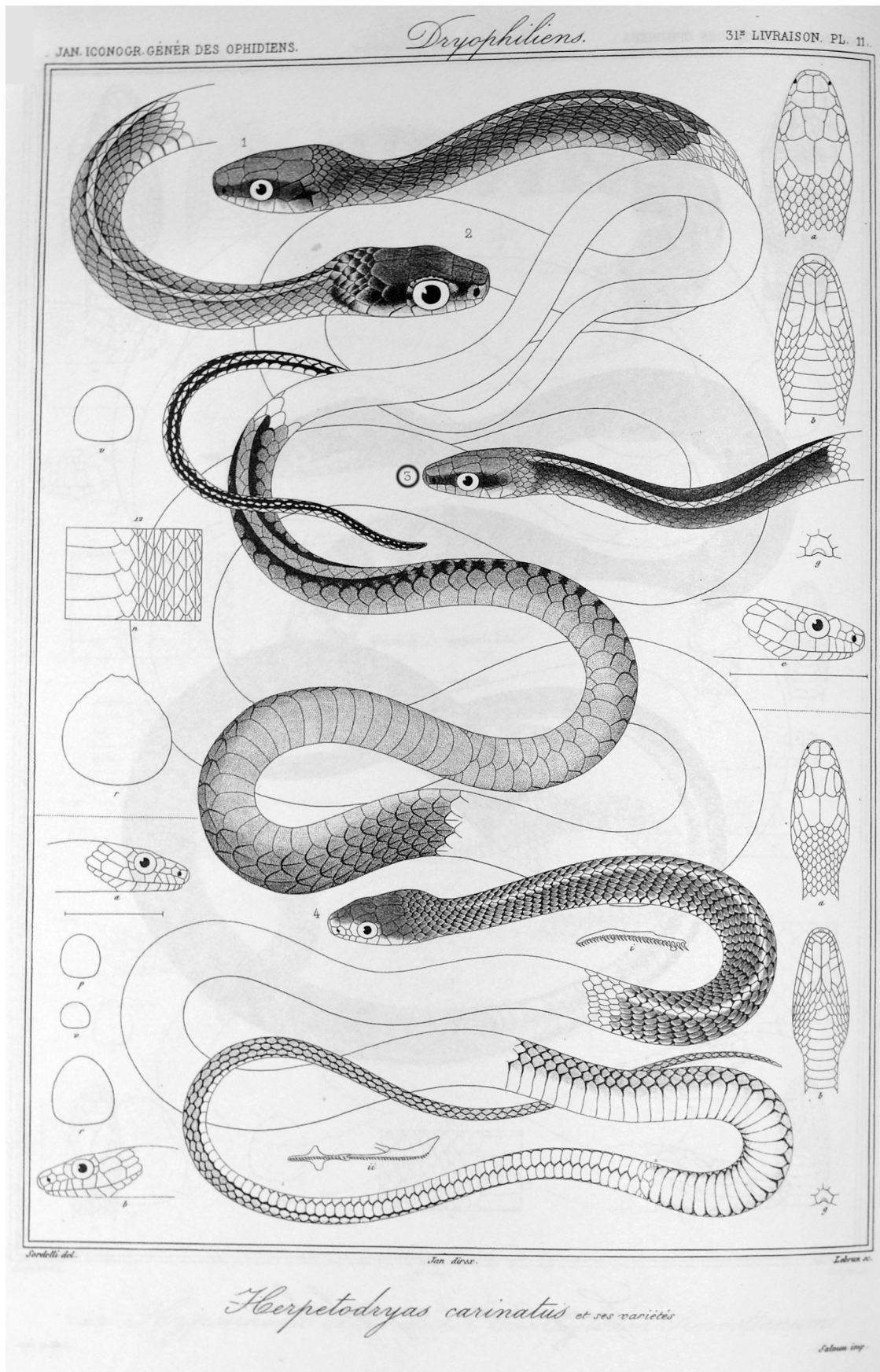


FIGURE 2. Plate 11, edition 31 of the Iconographie published by Jan & Sordelli (1869). Figure number 3 (circle) represents *H. carinatus* var. *flavolineata*. Modified from Jan & Sordelli (1869).

Description of the lectotype of *Herpetodryas carinatus* var. *flavolineata* Jan, 1863

Chironius flavolineatus (Jan, 1863)

Herpetodryas carinatus var. *flavolineata* Jan 1863:80

Herpetodryas flavolineatus Boettger 1885:234

Herpetodryas carinatus var. *flavolineata* Boettger 1898:55

Chironius flavolineatus Bailey 1955:13; Peters & Orejas-Miranda 1970:60; Dixon *et al.* 1993:112.



FIGURE 3. Lectotype of *H. carinatus* var. *flavolineata* (MSNM Re2729). (A) general dorsal view, (B) general ventral view, (C) lateral view of the head (right side), (D) lateral view of the head (left side), (E) dorsal view of the head, (F) detail of the current label of the specimen.

Lectotype: Adult male (MSNM Re2729), Collection of Vertebrates, Museo Civico di Storia Naturale di Milano, Italy. Head and neck partially damaged, tail incomplete, no collecting data. Designated in the present publication.

Type locality: Brazil, no specific locality by original designation (Jan 1863).

Comments: The lack of data regarding the collector and collecting of the lectotype precludes the determination of a more specific type locality.

Description of the lectotype: Snout-vent length (SVL) 560 mm; tail length (TL) 160 mm + n (tail incomplete); head damaged (maxilar broken), distinct from the neck with 22.3 mm long (4% of SVL) and 10.9 mm wide (49% of head length); distance/width rostral-orbital 6.8/0.61 mm; horizontal diameter of eyes left/right 0.45 mm/0.43 mm; one distinct preocular; two postoculars; temporal formula 1+1; eyes and rostral visible in dorsal view; loreal longer than high, contacting postnasal anteriorly, preocular posteriorly, prefrontals dorsally, and second and third supralabials ventrally; two internasals; nine supralabials (left side) (fifth to seventh contacting orbit), 10 supralabials (right side) (fourth to seventh contacting orbit); 9 + n (region damaged) infralabials (left side) (fifth contacting anterior chin shields; fifth and sixth contacting posterior chin shields); 10 infralabials (right side) (fifth contacting anterior chin shields; fifth and sixth contacting posterior chin shields); first pair of infralabials in contact behind the symphysial; frontal longer than wide; dorsal scales in 12-12-8 rows, smooth to the distance of a head length from the occipital region towards the posterior portion of the body; two rows of keeled dorsals in the middle portion of the body; two rows of keeled dorsals in the posterior portion of the body, counted to a distance of a head length anterior to the cloaca; apical pits present in the neck (the conditions of preservation of the specimen precluded the analysis of this character in the other regions of the body); 145 ventral scales; subcaudals divided 48+n/48+n (tail incomplete); cloacal plate divided.

Length and width of the following scales, in both sides of head (left/right): parietals (8.2/3.8 mm)/(7.7/3.9 mm), prenasal (1.9/1.3 mm)/(1.9/1.3 mm), postnasal (2.1/1.8 mm)/(2.1/1.8 mm), prefrontal (3.3/3.4 mm)/(3.1/3.5 mm), frontal (6.7 mm/4.7 mm), supraocular (6.2/2.7 mm)/(6.8/2.3 mm), preocular (1.9/2.9 mm)/(1.8/2.9 mm), upper postocular (0.8/1.9 mm)/(1.1/1.9 mm), lower postocular (1.1/1.9 mm)/(1.1/2.0 mm), loreal (1.8/1.1 mm)/(2.0/1.1 mm), anterior temporal (3.5/2.2 mm)/(3.5/2.5 mm), posterior temporal (4.2/3.4 mm)/(4.3/3.4 mm), eye horizontal diameter (4.8/4.7 mm), eye vertical diameter (3.7/4.1 mm), interparietal suture (5.3 mm), anterior chin shields (5.3/2.4 mm)/(5.7/1.7 mm), posterior chin shields (6.7/1.8 mm)/(7.9/1.4 mm), symphysial (1.3/2.6 mm), rostral scale (1.4/3.1 mm), internasal width (2.8/2.7 mm), internasal length (3.4/2.7 mm), interprefrontal suture (2.2 mm); length of the frontal-supraocular contact (4.8 mm).

Color in preservative (Fig. 3): The color pattern in general is faded; dorsum of the head, occipital region, nasals, loreals, oculars, and temporal scales dark brown; supralabials creamish white, slightly tainted by the invasion of the browned coloration of the sides of the head; infralabials and ventral portion of the head creamish white or yellowish; dorsal ground color changes gradually towards the tail; first third of the body black to dark gray; middle portion of the body dark brown, and last third of the body light brown; paravertebral stripe yellowish, gradually fading towards the posterior portion of the body; paravertebral stripe starting just behind the head and extending to the posterior third of the body; paravertebral stripe width corresponds to the size of a paravertebral scale; lateral edges of paravertebral stripe darker than adjacent scales, generally corresponding to the last keeled dorsal scale row; ventral portion of the body and tail homogeneously creamish white or yellowish.

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References

- Amaral, A. (1927) Da invalidez do nome genérico de ophidios *Erpetodryas* ou *Herpetodryas*. *Revista do Museu Paulista*, 15, 81–82.
- Bailey, J.R. (1955) The snakes of the genus *Chironius* in southeastern South America. *Occasional Papers of the Museum of Zoology, University of Michigan*, 571, 1–21.
- Bernarde, P.S., Albuquerque, S., Barros, T.O. & Turci, L.C.B. (2012) Serpentes do Estado de Rondônia, Brasil. *Biota Neotropica*, 12, 1–29.
<http://dx.doi.org/10.1590/S1676-06032012000300018>
- Bérnils, R.S. & Costa, H.C. (2012) Brazilian reptiles: List of species. Version 2012.1. Sociedade Brasileira de Herpetologia. Available from: <http://www.sbherpetologia.org.br/> (accessed 06 May 2013)
- Boettger, O. (1885) Liste von Reptilien und Batrachien aus Paraguay. *Zeitschrift Natur-Wissenschaft (Halle)*, 58, 213–248.
- Boettger, O. (1898) *Katalog der Reptilien-Sammlung im Museum der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt am Main. II. Teil (Schlangen)*. Gebrüder Knauer, Frankfurt, 160 pp.
- Boie, H. (1826) Notice sur l'Erpétologie de l'île de Java. *Bulletin des Sciences Naturelles et de Géologie*, 9, 233–240.
- Boulenger, G.A. (1894) *Catalogue of the snakes in the British Museum (Natural History)*. Vol. II. Trustees of the British Museum, London, 382 pp.
<http://dx.doi.org/10.5962/bhl.title.54273>
- Dixon, J.R., Wiest, J.A. Jr. & Cei, J.M. (1993) *Revision of the Neotropical Snake Genus Chironius Fitzinger (Serpentes, Colubridae)*. Monografia XIII. Museo Regionale di Scienze Naturali, Torino, 279 pp.
- Dowling, H.G. (1951) A proposed standard system of counting ventrals in snakes. *British Journal of Herpetology*, 1, 97–99.
- Fitzinger, L. (1826) *Neue Classification der Reptilien nach ihren natürlichen Verwandtschaften nebst einer Verwandtschafts-Tafel und einem Verzeichnisse der Reptilien-Sammlung des K. K. zoologischen Museums zu Wien*. J.G. Heubner, Wien, 66 pp.
<http://dx.doi.org/10.5962/bhl.title.4683>
- Hamdan, B. & Lira-da-Silva, R.M. (2012) The snakes of Bahia State, northeastern Brazil: species richness, composition and biogeographical notes. *Salamandra (Frankfurt)*, 48, 31–50.
- ICZN [International Commission on Zoological Nomenclature] (2000) *International Code of Zoological Nomenclature, Fourth Edition*. The International trust for Zoological Nomenclature, London, 126 pp.
- Jan, G. (1863) *Elenco sistematico degli Ofidi Descritti e disegnati per l'Iconografia generale*. Tipografia A. Lombardi, Milano, vii + 143 pp.
- Jan, G. & Sordelli, F. (1869) *Iconographie générale des Ophidiens. Tome Second (livraison 31)*. J. B. Baillière, Paris, 6 plates.
- Kok, P.J.R. (2010) A new species of *Chironius* Fitzinger, 1826 (Squamata: Colubridae) from the Pantepui region, northeastern South America. *Zootaxa*, 2611, 31–44.
- Linnaeus, C. (1758) *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I*. Editio decima, reformata. Laurentii Salvii, Holmiae, 824 pp.
- Peters, J.A. (1964) *Dictionary of Herpetology*. Hafner Publishing Company, New York, vii + 392 pp.
- Peters, J.A. & Orejas-Miranda, B. (1970) Catalogue of the Neotropical Squamata. Part I. Snakes. *Bulletin of the United States National Museum*, 297, 1–347.
<http://dx.doi.org/10.5962/bhl.title.46653>
- Pinto, R.R., Fernandes, R. & Marques, O.A.V. (2008) Morphology and diet of two sympatric colubrid snakes, *Chironius flavolineatus* and *Chironius quadricarinatus* (Serpentes: Colubridae). *Amphibia-Reptilia*, 29, 149–160.
<http://dx.doi.org/10.1163/156853808784125027>
- Ruthven, A.G. (1922) The amphibians and reptiles of the Sierra Nevada de Santa Marta, Colombia. *Miscellaneous Publications, Museum of Zoology, University of Michigan*, 8, 1–69.
- Santana, G.G., Vieira, W.L.S., Pereira-Filho, G.A., Delfim, F.R., Lima, Y.C.C. & Vieira, K.S. (2008) Herpetofauna em um fragmento de Floresta Atlântica no estado da Paraíba, Região Nordeste do Brasil. *Biotemas*, 21,(1), 75–84.
<http://dx.doi.org/10.5007/2175-7925.2008v21n1p75>
- Uetz, P. & Hošek, J. (2013) The Reptile Database. Available from: <http://www.reptile-database.org/> (accessed 13 April 2013)
- Wagler, J.G. (1830) *Natürliches System der Amphibien, mit vorangehender Classification der Säugetiere und Vögel*. J.G. Cotta, München, Stuttgart and Tübingen, vi + 354 pp.

APPENDIX 1. Specimens examined.

Chironius flavolineatus: **BRAZIL, ALAGOAS**: Camaragibe, MNRJ 3981; Matriz de Camaragibe UFPB 4669; Quebrangulo MZUSP 3169; **AMAPÁ**: Ferreira Gomes CHUNB 219; **AMAZONAS**: Humaitá, CHUNB 217, 218, MRNJ 19786; **BAHIA**: Barreiras, MZUFBA 2131, MNRJ 3064, 3065; Cachoeira, MZUFBA 1647; Camaçari, MZUFBA 1199; Candeias, MZUFBA 592; Catú, MZUFBA 610; Cruz das Almas, UEFS 1525; Dias Dávila, UEFS 1469, ZUEC 1759; Itanagra, MZUFBA 401; Salvador, MZUFBA 1668, 1784, 1819, 2278; Santa Rita de Cássia, MZUSP 3602; São Desidério, MZUFBA 2309, ZUEC 7078, 7079; Saubara, UEFS 686; Sem procedência, MZUFBA 2280; Simões Filho, MZUFBA 1603; **CEARÁ**: Barbalha, UFC 2127; Ubajara, MZUSP 10504; **DISTRITO FEDERAL**: Brasília, CHUNB 24908; **GOIÁS**: Alto Paraíso de Goiás, MZMZUFBA BH39; Aporé, CHUNB 48242, 48241; Buritinópolis, MZUSP17770; Formosa, CHUNB 19698; Goiânia, CHUNB 56373; Minaçu, CHUNB 29774, 6669, 29778, 29783, 29777, 29769, 49133, 50423, MZUSP 11097, 11098; Uruaçu MNRJ 7495; **MARANHÃO**: Balsas, CHUNB 52146; Carolina, MZUFBA BH38; **MATO GROSSO**: Acorizal, MZUSP 7307; Araputanga, UFMT 5918; Barra do Tapirapé, MNRJ 588; Barra do Tapirapé, MNRJ 589; Brasnorte, UFMT 8031; Cáceres, UFMT 1529; Chapada dos Guimarães, UFMT 542, 547, CHUNB 55217, MZUSP 5348, 11843, CHUNB 15378, 15380, 15417, 15418; Confresa, MZUSP 3812; Cuiabá, UFMT 8559; Guarantã do Norte, UFMT 5715; Guiratinga, MZUSP 20707; Jauru, UFMT 2817; Jupiá, MZUSP 4425; Nossa Senhora do Livramento, UFMT 1527; Nova Xavantina, CHUNB 63633, MZUSP 3170; Porto Estrela, UFMT 8330; Primavera, UFMT 7608; São José do Rio Claro, MZUSP 11333; Utiriti, MZUSP 4751; Xavantina, MNRJ 6697, 9274, 9276; **MATO GROSSO DO SUL**: Aquidauana, MNRJ 1511, MZUSP 10158; Campo Grande, MZUSP10157; Corumbá, UFMT 1463; Porto, MZUSP 11651; **MINAS GERAIS**: Arinos, MZUSP 3849; Buritizeiro, CHUNB 44474; Conquista, FUNED 392; Indianópolis, PUC-MG 607, FUNED 1695; Jaíba, MZUFV 946; Januária, MZUFV 1090; João Pinheiro, MNRJ 12900, 12901, 14853, 14854, 14855, 14901, 15251, 15252, 15299, 15312, 15355, 15396, 17155, 17156, 17157, 17158, 17159, 17183, 17211, 17251, 17271, 17770, 17771, 17821, 17822, 19985, 19997, 20222; Joaquim Felício, MZUFV 1121; Nova Lima, PUC-MG 1474; Pompeu, PUC-MG 3818; Uberaba, PUC-MG 4141; Uberlândia, PUC-MG 608; UHE Queimado Unai, MNRJ 10929; **NO STATE DATA**: MZUFBA 785, 1261, 1313, 1544; MSNM Re279; **PARÁ**: Cachimbo, CHUNB 12798; Itaituba, MZUSP 3111; Novo Progresso, CHUNB 40091; **PARAÍBA**: Alhandra, UFPB 9374; Cruz do Espírito Santo, MZUSP 20271; Gurinhém, UFPB 4667, MZUSP 9656; João Pessoa, UFPB 4665, UFPB 4666, UFPB 8839; Mamanguape, MZUSP 3171, CHUNB 29018; **PERNAMBUCO**: Recife, MZUSP 8010; Serra Talhada, UFPB 4668, MZUSP 9011; **RIO GRANDE DO NORTE**: Ceará-Mirim, UFRN AAGARDA1894; Macaíba, UFRN AAGARDA 3511; Nísia Floresta, UFRN AAGARDA6236; **SÃO PAULO**: Emas, MZUSP 1894; Igarapava, FUNED 389, 417, 428, 429, 1305, PUC-MG 791, 792, 793; Jales, MZUSP 3987; Pirassununga, MZUSP 3989; Tambaú, CHUNB 24568, 24572; **SERGIPE**: Areia branca, UFS 419, MZUSP 5444; Barra dos Coqueiros, MZUSP 17451; Itabaiana, UFS 2612; Itaporanga da Ajuda, UFS 519; Lagarto, UFC 892; Pirambu, UFS 14, 19; Santo Amaro das Brotas, MZUSP 6991; São Cristovão, UFS 337, 1329, 1330; **TOCANTINS**: Aliança do Tocantins, UFPB 4860, 4861; Dianópolis, CHUNB 33433; Guaraí, MZUSP 12697; Jalapão, CHUNB 24376; Lajeado, MZUSP 14171, 14172; Mateiros, CHUNB 41307; Palmas, CHUNB, 16175, 21959; Peixe, MZUSP 15513, CHUNB 3759, 52634; São Salvador do Tocantins, MZUSP 12125, 17681; **BOLIVIA, SANTA CRUZ**: Andres Ibañez/Barrio Los Olivo, MHNNK201; Ñuflo de Chávez/Perseverancia, MHNNK 405; Chiquitos/Santiago de Chiquitos, MHNNK 2254; Andres Ilbñez/Santa Cruz de la Sierra, MHNNK 5056; **PARAGUAY, AMAMBAY**: PN Cerro Corá, MNHNP 5201.