

The identity of *Apostolepis pyimi* and placement of *A. quinquelineata* in the synonymy of *A. nigrolineata* (Serpentes, Xenodontinae)

Thales de Lema^{1,3} & Nelson Rufino de Albuquerque²

¹Av. Luiz Manoel Gonzaga, 100/1001, Petrópolis, CEP 90470-280, Porto Alegre, RS, Brazil

²Universidade Federal de Mato Grosso do Sul – UFMS,

Campus do Pantanal, Departamento de Ciências do Ambiente,

Av. Rio Branco 1270, Universitário, CEP 79304-020, Corumbá, MS, Brazil

³Corresponding author: Thales de Lema, e-mail: thalesdelema@terra.com.br

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Abstract: The correct application of the names *Apostolepis nigrolineata*, *A. quinquelineata*, and *A. pyimi* has been subject of considerable controversy. Based upon review of the literature and the characteristics used to distinguish these species from each other, we conclude that *A. pyimi* is a valid species and that *A. quinquelineata* is a junior synonym of *A. nigrolineata*. They differ from each other in hemipenial morphology and coloration. The background color of *A. nigrolineata* is reddish brown (vs. brown in *A. pyimi*). In addition, only the dorsal region of end of tail is covered by a black band in *A. nigrolineata* (vs. end of tail completely surrounded by a black band in *A. pyimi*). Both species are sympatrically distributed along the lowlands of Amazonia but *A. nigrolineata* occurs in both western and eastern regions whereas *A. pyimi* is restricted to eastern regions with additional records from the States of Amazonas, Rondônia, Mato Grosso and an endemic population in the state of Ceará, northeastern Brazil.

Keywords: *Dipsadidae*, *Apostolepis*, taxonomy, synonymization, amazon region.

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Resumo: A correta aplicação dos nomes *Apostolepis nigrolineata*, *A. quinquelineata*, e *A. pyimi* tem sido assunto de considerável controvérsia. Baseado em uma revisão da literatura e das características usadas para distinguir essas espécies umas das outras, nós concluímos que *A. pyimi* é uma espécie válida e que *A. quinquelineata* é um sinônimo júnior de *Apostolepis nigrolineata*. Elas diferem uma da outra na morfologia hemipeniana e coloração. A coloração dorsal de *A. nigrolineata* é marrom avermelhada (vs. marrom em *A. pyimi*). Em adição, apenas a região dorsal do final da cauda de *A. nigrolineata* é coberta por uma banda preta (vs. o final da cauda é completamente envolto por uma banda preta em *A. pyimi*). Ambas as espécies ocorrem dentro da Amazônia, mas *A. nigrolineata* ocorre nas regiões oeste e leste enquanto *A. pyimi* é restrita para regiões do leste com registros adicionais para os estados do Amazonas, Mato Grosso, Rondônia e mais uma população endêmica no estado do Ceará, nordeste do Brasil.

Palavras-chave: *Dipsadidae*, *Apostolepis*, taxonomia, sinonimização, região amazônica.

Introduction

The snake genus *Apostolepis* Cope, 1862 is a diverse new world group of fossorial snakes distributed throughout South America, occurring from Guyana to northern Argentina, and from northeastern to southeastern Brazil (Lema & Renner 1998, Lema 2001). These snakes have had a long and confusing taxonomic history (e.g. Amaral 1930a, b, Hoge 1959, Cunha & Nascimento 1978), in part due to their coloration and morphological similarity (see Harvey 1999, Lema 2001), which resulted in numerous misidentifications and synonymies within this genus. This has been particularly true with the recently revalidated *A. nigrolineata* (Peters, 1869) and one of its synonymies, *A. pymi* Boulenger 1903. The nomenclatural history of these two species is summarized herein:

Peters (1869) described *Elapomorphus nigrolineatus* based on one specimen from Guyana (Lema 2001). Strauch (1885), who made the first revision of the Elapomorphinae snakes, redescribed the holotype of *E. nigrolineatus*. Boulenger (1896) described *Apostolepis quinquelineata* based on one specimen from Demerara, Guyana. Subsequently, Boulenger (1903) described *Apostolepis pymi* based on one specimen from "Brazil", later restricted to Pará State by Lema (1997).

Amaral (1930a, b) considered *Apostolepis pymi* and *A. quinquelineata* to be synonymous with *A. coronata*, described by Sauvage (1877) as *Elapomorphus coronatus*, based on one specimen from "Amérique du Sud" (Rio de Janeiro) (Lema & Hofstadler-Deiques 1995). Amaral (1930a) noted that the five black stripes are reduced and disappear in adult specimens of *Apostolepis pymi*; he also considered the holotype of *A. pymi* as a juvenile specimen. Subsequently, Amaral (1930b) considered *A. nigrolineata* to be synonymous with *A. flavotorquata* (Duméril et al. 1854), the latter described based on one specimen from "l'intérieur de l'Amérique méridionale" (Goiás State) (according to Strauch 1885).

Apostolepis pymi and *A. quinquelineata* were considered to be synonymous by Cunha & Nascimento (1978, 1993), who redescribed *A. quinquelineata* based on the examination of several specimens from eastern Pará.

Apostolepis nigrolineata was recently revalidated by Lema (1997) to accommodate specimens previously listed as *A. pymi*. Lema (1997) re-examined the holotype of *A. nigrolineata* and considered *A. pymi* as a junior synonym of *Apostolepis nigrolineata*. Finally, Lema (2001) kept *A. pymi* in the synonymy of *A. nigrolineata*.

Based upon review of the literature, we discussed the taxonomic status of *A. nigrolineata* and *A. pymi*. Both species have long been misidentified in the literature and the distinctness between them is given.

Material and Methods

We reviewed all articles that dealt with the names *A. nigrolineata*, *A. quinquelineata*, and *A. pymi* (see species accounts in Appendix 1). Subsequently, we focused our review only in those articles that dealt specifically with nomenclatural changes (e.g. Amaral 1930a, b, Lema 1997, Lema & Renner 1998) and the characteristics used by various authors to distinguish species from each other. *Apostolepis rondoni* Amaral, 1925, known only from the holotype, was considered to be a junior synonym of *A. quinquelineata* by Lema & Renner (1998) and is therefore not included in our review (see also Cunha & Nascimento 1978, Silva Jr. 1993). The specimen depicted in Figures 1 and 2 is deposited in the Coleção de Anfíbios e Répteis do Museu de Ciências e Tecnologia da PUCRS (MCP) as MCP 10718.

Results and Discussion

Except for its original description (Boulenger, 1903) the species *Apostolepis pymi* has been consistently misidentified



Figure 1. Dorsal view of *Apostolepis nigrolineata* (MCP 10718, an adult male) from ilha de Outeiro, vicinity of Belém, Pará, Brazil (Photo credit: Marcos Di-Bernardo). Note three distinct dorsal stripes.



Figure 2. Ventral view of *Apostolepis nigrolineata* (MCP 10718, an adult male) from ilha de Outeiro, vicinity of Belém, Pará, Brazil (Photo credit: Marcos Di-Bernardo). Note the ventral region of the tail is almost entirely immaculate. A small black spot can be observed on the 30th pair of subcaudal scales.

throughout the literature (e.g. Amaral 1930a, b, Hoge 1959, Cunha & Nascimento 1978, Nascimento & Lima-Verde 1989, Lema 1978). Similarly, *A. nigrolineata* has received several different names such as *Elapomorphus (Apostolepis) nigrolineatus* Strauch, 1885, *A. nigrolineata*, *A. quinquelineata* Boulenger, 1896, and *A. rondoni*.

While reviewing the status of *A. nigrolineata*, Lema (1997) re-examined three specimens of *A. nigrolineata*, including its holotype, and recognized this species as a synonym of *A. pymi*. The number of dorsal stripes in both species is five, although it reduces to three in adults. Adults of both species retain evidence of paravertebral stripes; however, these are almost indiscernible (Lema & Renner 1998). This similarity (i.e. five stripes in young specimens) led Lema (1997) to recognize the holotype of *A. nigrolineata* as a juvenile of *A. pymi*. It should be emphasized that most specimens of *A. nigrolineata* examined by Lema & Renner (1998) (identified as *A. quinquelineata* in their paper) are juveniles. We reidentified the specimen identified as *A. nigrolineata* for Guaporé river, Mato Grosso by Lema (1997: 197) as *A. pymi*. Actually, this specimen (UFMT 2500) was collected in a patch of seasonal semideciduous forest located in Vale de São Domingos, Mato Grosso.

Apostolepis nigrolineata can be easily distinguished from *Apostolepis pyimi* by the following combination of characters: dorsum reddish brown (Figure 1) (vs. dorsum brown); a blackish brown head (vs. a dark brown head) lacking a pair of cream blotches on preocular scales (vs. a pair of cream blotches occupying almost whole of prefrontal scales); a pair of cream blotches on neck covering the 3rd and 4th dorsal scales on 5th scale row on each side (see Figure 1 in Lema & Renner 1998) (vs. blotches absent). The caudal band is dark brown in *A. nigrolineata* and covers only the dorsal surface of the end of the tail (caudal band covers ventral and dorsal surfaces in *A. pyimi*). Further, the tip of the tail is conical (pointed) in *A. nigrolineata* (vs. rounded in *A. pyimi*).

According to Lema & Renner (1998), *A. nigrolineata* (identified as *A. quinquelineata*) and *A. pyimi* occur sympatrically from the eastern region of Amazonas to western Pará. The specimen collected in the ilha de Outeiro, Pará State (Figure 1) extends eastward to the previously known zone of sympatry. Data from external morphology and hemipenial morphology can be found in Lema & Renner (1998).

In summary, Lema (1997) erroneously considered *A. pyimi* as a synonym of *A. nigrolineata*. Instead, *A. pyimi* is the correct name for the species of this complex occurring mainly in eastern Amazonia (Lema & Renner 1998). *Apostolepis nigrolineata* is a senior synonym of both *A. quinquelineata* and *A. rondoni* and is the species occurring in western Amazonia. Both species were described and reviewed by Lema (1997) and Lema & Renner (1998) who used the name *A. quinquelineata* instead of *A. nigrolineata*.

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Appendix 1

Appendix 1. Species Accounts.

Apostolepis nigrolineata (Peters 1869)

Elapomorphus nigrolineatus Peters (1869), type-locality: given as “Guinea”, but assumed by Lema (2001) to be Guyana.

Elapomorphus (Apostolepis) nigrolineatus; Strauch, 1885

Apostolepis nigrolineata; Boulenger, 1896; Lema, 2001

Apostolepis quinquelineata Boulenger (1896), type-locality Demerara, Guyana. Hoge, 1958; Peters and Orejas-Miranda, 1970; Cunha and Nascimento, 1978; Cunha and Nascimento (1993); Lema, 1978; Lema and Renner, 1998

Apostolepis rondoni Amaral (1925), type-locality Rondon, Rondônia, Brazil. Amaral, 1977; Silva, 1993

Apostolepis coronata; Amaral (1930a, b, 1936, 1944).

Distribution. *Apostolepis nigrolineata* occurs within the Amazon basin, from Guyana to western Amazonas, Rondônia and Pará States (Lema & Renner 1998, identified as *Apostolepis quinquelineata*).

Apostolepis pyimi Boulenger (1903)

Apostolepis pyimi Boulenger (1903), type-locality: “Brazil”; restricted by Lema (1997) to Pará State

Apostolepis quinquelineata; Amaral, 1930a; Hoge, 1958; Cunha and Nascimento (1978, 1993); Nascimento and Lima-Verde, 1989.

Apostolepis coronata; Amaral (1930a, b, 1936); Peters and Orejas-Miranda, 1970.

Apostolepis flavotorquata; Amaral, 1930a; Lema, 1978.

Apostolepis nigrolineata; Lema, 2001.

Distribution. *Apostolepis pyimi* is known from eastern Pará to western Maranhão, with additional records from the states of Amazonas, Mato Grosso, Rondônia and Ceará (Lema & Renner 1998).