

# On the status of *Apostolepis freitasi* (Serpentes, Elapomorphinae) by examination of new specimens

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## Abstract

*Apostolepis freitasi* Lema, 2004 was described only with the holotype, a young and discolored specimen from Bahia (Brazil). New specimens were found which data cleared better the status of the species, indicating a differentiate population of *Apostolepis cearensis* Gomes, 1915, restrict to southeastern Bahia State, Brazil, in the morpho climatic domain Caatinga influenced by littoral climate.

**Key words:** local morph, *Apostolepis cearensis*, Caatinga, southeastern Bahia, Brazil.

## Introduction

Lema (2004a, p. 4) described *Apostolepis freitasi* with a single specimen, being young and discolored, but yet visible. Ferrarezzi et al. (2005, p. 219) synonymized it with *Apostolepis cearensis* Gomes 1915, alleging to be only a variation, but they did not indicated where are published that variation. Lema and Renner (2005, p. 138) analyzed the variation of *A. cearensis*, but they did not find a phenotype similar to *A. freitasi*. Now, the discovery of new specimens similar to *A. freitasi* allows to reevaluate the status of this species, confirming Ferrarezzi et al. (2005). In this paper, the new specimens are described and compared with *A. cearensis*.

## Material and methods

Acronyms for collections: CIAVE,

Centro de Investigações de Animais Venenosos, Universidade Estadual de Feira de Santana, Feira de Santana, Bahia; MCP, Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS; MNRJ, Museu Nacional, Universidade Federal do Rio de Janeiro, RJ.

Measurements and counts according Lema (2004a), but using a cord fixed with pins, because they are broken and poorly preserved specimens.

## Specimens

Brazil: Bahia: Alagoinhas (CIAVE 85506); Departamento Central: Tanque do Aragão (MNRJ 6525, holotype of *A. freitasi*); Feira de Santana (MCP 14782, MCP 14784, MCP 14785, CIAVE 65949) (Figure 1).

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## Results

### Differences observed in a early study:

*A. freitasi* has (a) smaller projection of snout, instead evident projection in *A. cearensis*; (b) black cervical collar semi lunar, instead trapezoid, with a vertebral extension; (c) lower side of head light, instead blackish in *A. cearensis*; (d) lower side of the black blotch tail almost immaculate, instead entirely black in *A. cearensis*, usually without white spot on the tip.

### Data of the specimens

a) Morphology — Head high, with little projecting snout; not much wider than neck at the level of parietal plates; more rounded in young specimens, and more elongate in young; orbit diameter almost equal, with distance from it to oral margin; snout round, with anterior edge angled, rounded in young, little projecting beyond the jaws; nostril in anterior border of nasal plate; anterior margin of jaws wide, almost right; trunk elongated; tail relatively long, subcylindric, with terminal plate short and conic, little or not compressed.

b) Measurements (Table 1) — The largest specimen (male), has a total length of 475 mm; the smallest, a male, is 181 mm long; the ratio of tail length by total length ( $R_1$ ) is 0.054 for males ( $n = 2$ ), and 0.074 for females ( $n = 4$ ); subcaudal/ventral ratio is ( $R_3$ ) 0.148 for males ( $n = 1$ ), and 0.105 for females ( $n = 3$ ); two specimens can not to be counted; eye diameter equal to distance to oral border, with little variation, being a relatively large eye.

c) Pholidosis — Rostral broader than high; with portion visible from above more than one half of its distance to suture between prefrontals; prefrontal large, as long as wide; contacting second supralabial; the later small, longer than wide, and trapeze-like; frontal wide, hexagonal; anterior angle smaller than the posterior; parietal long and narrow; narrower in the

young; nasal triangle-like; preocular smaller than postocular, about one half; postocular curled around the orbit; supralabials 6, second and third entering orbit, Posterior temporal present, small and similar to sixth supralabial; absent in CIAVE 85506; occipital high and narrow; mental concave, almost contacting anterior chin shields; anterior chin-shields long and parallel, rectangle like, larger than posterior; infralabials 7, first to fourth contacting anterior chin-shields; lateral gulars in 6-7 rows, which meet at the midline, 5/5 or 3/3+3; ventral scales 216-246, males 216 ( $n = 1$ ), females 240-246 ( $x = 243.3$ ,  $n = 3$ ); subcaudal scales paired, 29-32 in males ( $x = 30.5$ ,  $n = 2$ ) and 25-27 in females ( $x = 26$ ,  $n = 4$ ).

d) Coloration — Pileus uniformly black covering supraoculars and frontal, extending by sides, except the snout; an oblique black band crossing the eye, preoculars, nasal, and all supralabials (except the 4<sup>th</sup>); snout, anterior frontal, rostral, nasals, prefrontals, and anterior first labial, pinkish; nostril is black and rounded; light supralabial blotch is small and high, varying from oval, triangular to rectangle, in the same specimen;

running along the posterior half of third supralabial to the upper anterior margin of the fifth; black nuchal collar narrow (one vertebral scale long), usually complete, touching gular region where is nearly indistinct; and with dentate margin; gular region light, with few blotches, pale at midline; mental region light, with few anterior black dots, mainly in median line; infralabials usually darkish at inner margins; white nuchal collar about 4-6 dorsal scales long by vertebral line, crossing the gular region (black nuchal ring); some specimens have a pair of black blotches on the fourth infralabials, as a continuation of the black ocular stripe; only one specimen has the lower side of head darkish; black cervical collar short, dentate, 3-4 vertebral scales long, and covering the third row of dorsal scales, anterior margin in “V”, with median projection by vertebral line on the white nuchal collar; the posterior margin is similar, with also a median short projection by vertebral line; the margins, anterior and posterior, are dentate, which short slender projections, as vestiges of a striped pattern; there are black spots at vertebral line after the

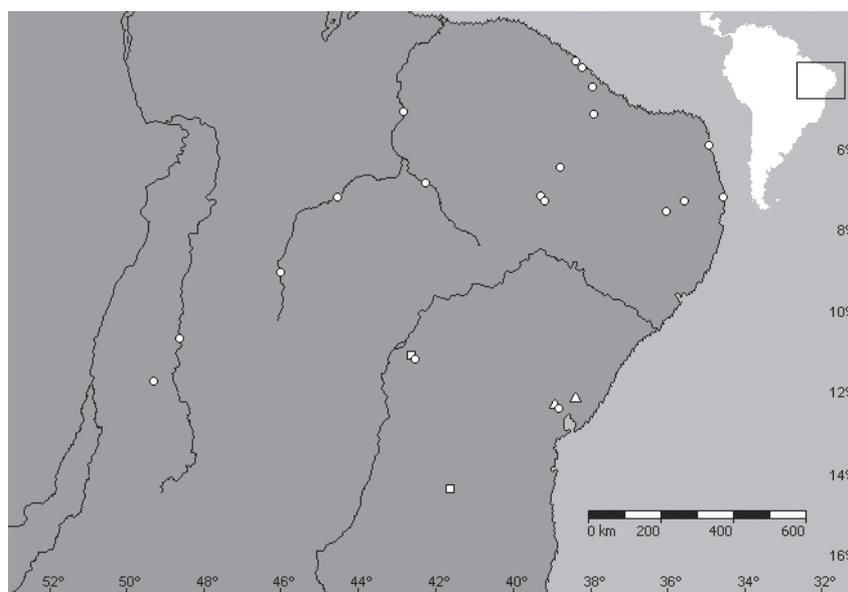


Figure 1. Distribution of *Apostolepis freitasi* (triangles), *Apostolepis cearensis* (circles), and *Apostolepis sp.* (squares), showing the localities where they were found (E. M. Lucchesi del.).

**Table 1.** Morphometric and meristic data of *Apostolepis freitasi* specimens. Abbreviations: AME, anterior chin shields; DEO, distance from eye to oral border; FRO, frontal; HEL, head length; PAR, parietal; PFR, prefrontal length x width; RO, rostral; SC, subcaudal scales; SOC, supraocular; TAL, tail length; TOL, total length; TRL, trunk length; VE, ventral scales. R1, ratio between TAL/TOL. R2, ratio between HEL/TOL. Measurements in mm.

| Characters                | 14782      | 14784   | 14785   | 65949      | 85506      |
|---------------------------|------------|---------|---------|------------|------------|
| Age                       | Young      | Adult   | Adult   | Young      | Young      |
| Sex                       | ♀          | ♀       | ♂       | ♀          | ♀          |
| HEL                       | 7.0        | —       | —       | 7.2        | 7.0        |
| TRL                       | 185.0      | —       | —       | 200.0      | 195.0      |
| TAL                       | 15.0       | 40.0    | 40.0    | 16.0       | 14.0       |
| TOL                       | 207.0      | 453.0   | 475.0   | 223.2      | 216.0      |
| R1                        | 0.072      | 0.088   | 0.084   | 0.072      | 0.065      |
| R2                        | 0.034      | —       | —       | 0.032      | 0.032      |
| Head width (largest)      | 3.3        | —       | —       | 3.6        | 3.2        |
| Head width (smallest)     | 1.8        | —       | —       | 1.8        | 1.4        |
| Head height major         | 2.2        | —       | —       | 2.7        | 2.4        |
| Head width (smallest)     | 1.0        | —       | —       | 0.8        | 1.0        |
| Snout length              | 1.9        | —       | —       | 2.3        | 2.0        |
| Eye diameter              | 0.4        | —       | —       | 0.6        | 0.6        |
| Dist. eye-oral border     | 0.6        | —       | —       | 0.8        | 0.6        |
| Neck: height x width      | 2.4 x 3.2  | —       | —       | 3.0x3.2    | 2.4x3.0    |
| Trunk width (middle)      | 2.4        | 7.2     | 6.3     | 4.0        | 3.3        |
| Tail width: basis-middle  | 1.3 - 1.3  | — 4.9   | 4.6-4.5 | 0.4-1.0    | 2.1-1.9    |
| RO: portion visible above | 0.5        | —       | —       | 0.5        | 0.5        |
| PFR: length x width       | 1.3x1.3    | —       | —       | 1.4x1.4    | 1.4x1.4    |
| FRO: length x width       | 2.0x1.2    | —       | —       | 2.0x1.2    | 2.0x1.0    |
| PAR: length x width       | 3.2x1.5    | —       | —       | 3.1x1.6    | 3.3x1.5    |
| Suture between PFR        | 1.1        | —       | —       | 1.0        | 0.9        |
| Suture between PAR        | 2.0        | —       | —       | 2.2        | 2.0        |
| Last SC and terminal      | 0.25-1.0   | 0.6-1.5 | 0.8-1.5 | 0.4-1.0    | 0.4-0.9    |
| Supralabials (Eye) number | 6 (ii-iii) | —       | —       | 6 (ii-iii) | 6 (ii-iii) |
| Infralabials (AME) number | 7 (I-iv)   | —       | —       | 7 (i-iv)   | 7 (I-iv)   |
| Lateral gulars number     | 6          | —       | —       | 6          | 6          |
| Median gulars number      | 5/5        | —       | —       | 5/5        | 5/5        |
| Preventrals number        | 1          | —       | —       | 1          | 1          |
| VE number                 | 240        | —       | —       | 244        | 246        |
| Cloacal                   | 1/1        | 1/1     | 1/1     | 1/1        | 1/1        |
| SC number                 | 25         | 27      | 29      | 26         | 26         |
| R3 = SC/VE                | 0.104      | —       | —       | 0.107      | 0.106      |
| Supracaudal rows          | 4          | 4       | 4       | 4          | 4          |

**Table 2.** Comparison of the number of ventral and subcaudal scales in *Apostolepis freitasi* and *Apostolepis cearensis* being R, the ratio between subcaudal and ventral scale number. The data of *A. cearensis* are from Lema and Renner (2005).

|               | <i>Apostolepis freitasi</i> |             |             | <i>Apostolepis cearensis</i> |             |             |
|---------------|-----------------------------|-------------|-------------|------------------------------|-------------|-------------|
|               | ♂                           | ♀           | Σ           | ♂                            | ♀           | Σ           |
| VE: variation | 216                         | 240-246     | 216-246     | 218-244                      | 218-246     | 218-246     |
| VE: average   | 216.0                       | 243.3       | 236.5       | 228.1                        | 235.4       | 232.0       |
| SC: variation | 29-32                       | 25-27       | 25-32       | 27-34                        | 24-32       | 24-34       |
| SC: average   | 30.5                        | 26.0        | 27.5        | 30.6                         | 27.3        | 28.8        |
| R: variation  | 0.148                       | 0.104-0.107 | 0.104-0.148 | 0.111-0.152                  | 0.102-0.142 | 0.102-0.152 |
| R: average    | 0.148                       | 0.106       | 0.116       | 0.125                        | 0.116       | 0.125       |

black collar; back ground color immaculate red, attaining the third row of dorsal scales; the fourth row is pinkish; paraventral zone cream in 2-3 dorsal scale rows; venter cream; black tail blotch covering 7-10 supracaudal scales, and 3-6 pairs of subcaudal scales, with irregular blotches along sides or margins of subcaudal scales, though two or three pairs may be completely black; terminal dark, white ventrally, with black tip.

## Discussion and Conclusion

*A. cearensis* occurs in all Caatinga, in both sides of the São Francisco river, but it is very rare at southeastern part, where we found the specimens of *A. freitasi*. In the same area were found few specimens of *A. cearensis* with normal taxa of melanin (Figure 5 [Não há figura 5]). In Zamprogno *et al.* (1998) and Lema and Renner (2005), the presence of this phenotype poor in melanin, were omitted or announced as new species. The major differences between the two species were noted as the head and snout shapes: snout rounded in *A. freitasi*, and projecting (acute) in *A. cearensis*, but this varies during development, and also by sex; the head wider than *A. cearensis*, is only a variation. *A. cearensis* has the snout similar to some small species from southwestern Brazil and Bolivia (e.g. *A. vittata* (Cope, 1887)), but the projection of snout also varies, at least, in this restrict population.

The state of Bahia is very rich in biodiversity, in contrast that whose fauna is still poor known (Argolo, 1992). The presence of the phenotype *freitasi* in a restrict area can be due a particular environment resulting of ocean versus Caatinga climates, in a sandy littoral plain; and the probable presence of another species in the same area (Lema and Renner, 2005), will be examined after to get a good sample.

Table 2 presents parameters of the ventral and subcaudal scales in the two

species showing similarities between the two species, with insignificant differences, as that the trunk length in males of *A. freitasi* to be smaller than females, instead in *A. cearensis* the male trunk is little smaller than female; and the tail of males of *A. freitasi* is longer than females, and in *A. cearensis*, is little longer than females.

The population of *A. cearensis* called *freitasi*, is characterized by the low tax of melanin as the lower side of the head, with or without black blotch or blotches, or only shadowed; the light labial blotch very large; the cervical black blotch only dorsal usually semilunar shape (Turkish moon), and the black blotch of tail usually immaculate at subcaudals.

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