

A new species of *Atractus* (Reptilia: Ophidia: Colubridae: Dipsadinae) from the Amazon forest region in Brazil

M.S. Hoogmoed & A.L.C. Prudente

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Marinus S. Hoogmoed, Nationaal Natuurhistorisch Museum, Postbus 9517, 2300 RA Leiden, The Netherlands. Present address: Museu Paraense Emílio Goeldi/CZO/Herpetologia, Caixa Postal 399, 66017-970 Belem, PA, Brasil (e-mail: avilapires@museu-goeldi.br).

Ana Lúcia C. Prudente, Museu Paraense Emílio Goeldi, Caixa Postal 399, Belém, Pará, CEP 66017-970, Brazil (e-mail: prudente@museu-goeldi.br).

Key words: Reptilia; Colubridae; *Atractus*; spec. nov.; Brazil; Amazonia; Mamirauá; Caxiuanã; habitat; várzea.

Three specimens of *Atractus natans* were found during fieldwork in the “Reserva Mamirauá”, Amazonas and a fourth one in the “Estação Científica Ferreira Penna”, Floresta de Caxiuanã, Pará, Brazil. The specimens from Mamirauá were all collected in floating logs in várzea forest during the period of flooding. The new species is small (maximum total length 308 mm) with a coniform head, has 17-17-17 smooth dorsals, without apical pits, male lacking pre-anal keels, ventrals 136-162, caudals 19-25, anal undivided. One or two postoculars, loreal 1.6–2.8 times as long as high, frontal triangular, wider than long. Maxillary teeth 5-6. The hemipenis is bilobed, with bifurcated sulcus spermaticus, capitulum with calyces covered by very small spines, body covered by spines of different size. The back is (dark) brown without a distinct pattern, although on the flanks small darker spots more or less in longitudinal rows are present, a light collar on the posterior part of the head, (indications of) a light area on the snout, throat with black spots sometimes arranged in oblique lines, a wide median black band on the white (in life partly brick red) belly, and underside of tail dark with light spots (brick red in life) at the posterior end of the scales.

Palavras-chave: Reptilia; Colubridae; *Atractus* spec. nov.; Brasil; Amazônia; Mamirauá; Caxiuanã; habitat; várzea.

Três espécimes de *Atractus natans* foram coletados durante os trabalhos de campo realizados na Reserva de Mamirauá, Amazonas e um exemplar procede da Estação Científica Ferreira Penna, Floresta Nacional de Caxiuanã, Pará, Brasil. Os três espécimes de Mamirauá foram coletados em troncos flutuantes em floresta de várzea, durante o período de cheia. *Atractus natans* é uma espécie pequena (comprimento total máximo de 308 mm), com 17-17-17 escamas dorsais lisas, sem fossetas apicais, quilhas pré-anais ausente nos machos, ventrais 136-162, subcaudais 19-25 e anal inteira. Uma ou duas pós-oculares, loreal 1.6-2.8 vezes mais longa que alta e frontal triangular, mais larga que longa. Dentes maxilares 5-6. Hemipênis bilobado, com sulco espermático bifurcado, capítulo com cálices ornamentados por diminutos espinhos e corpo recoberto com espinhos de diferentes tamanhos. A espécie apresenta corpo marrom escuro sem um padrão distinto, embora estejam presentes pequenos pontos escuros ao longo dos flancos. Colar claro na região dorsal posterior da cabeça, com indicação de área clara no focinho. Região gular com pontos negros dispostos em linhas oblíquas. Ventre claro, com uma larga faixa escura (*in vivo* vermelho tijolo) e região ventral da cauda escura, com pequenos pontos claros (*in vivo* vermelho tijolo).

Introduction

Fossorial snakes of the genus *Atractus* Wagler, 1828, are notorious for the difficulties they present to identify them. The genus has a confused history, with taxa being relegated to the synonymy of others on the basis of superficial similarity and sometimes

despite quite distinct differences, and with new species still regularly described (Savage, 1960; Hoogmoed, 1980, 1982; Gasc & Rodrigues, 1979, 1980a; Fernandes, 1995; Schargel & García-Pérez, 2002; Myers, 2003). Relationships within the genus are still obscure and many species are only known from small areas or from type specimens only. The genus occurs from eastern Panama through northern South America south to Amazonian Bolivia and southern Brazil (Peters & Orejas-Miranda, 1970; Myers, 2003).

Our knowledge of the species of the genus *Atractus* in the eastern part of the Amazon area, including the Guiana's, has been growing slowly over the past 25 years, but apparently is still far from complete, with new species turning up regularly. Cunha & Nascimento (1978) mentioned only *Atractus badius* from eastern Para, but the picture they published clearly shows *A. flammigerus* (F. Boie, 1827), and in 1983 they indicated that the material they reported upon in 1978 indeed contained two species (*A. flammigerus* and *A. schach* (F. Boie, 1827)). Gasc & Rodrigues (1979, 1980a) described two new species, one as *Atractus zidoki* and a second one as *Geophis alasukai* (= *Atractus flammigerus* Boie, 1827, cf. Hoogmoed, 1983) from French Guiana. Hoogmoed (1980) described and commented upon eight species of *Atractus* present in Suriname (*A. badius* (F. Boie, 1827), *A. elaps* (Günther, 1858), *A. favae* (Filippi, 1840), *A. flammigerus*, *A. latifrons* (Günther, 1868), *A. schach*, *A. torquatus* (Duméril, Bibron & Duméril, 1854), and *A. zidoki* Gasc & Rodrigues, 1979). The author (Hoogmoed, 1980) also excluded *A. cf. univittatus* (Jan, 1862) from the fauna of Suriname and provided a key for the identification of the Suriname species. Gasc & Rodrigues (1980b) provided a list of the snakes of French Guiana in which they mention three species of *Atractus* and one of *Geophis*: *A. latifrons*, *A. subbicinctus* (= *A. badius*), *A. zidoki*, and *Geophis alasukai* (= *A. flammigerus*). Cunha & Nascimento (1983) described three new taxa from Brazilian Amazonia: *Atractus albuquerquei*, *A. alphonsehogei* and *A. flammigerus snethlageae*, later considered a full species by several authors (Vanzolini, 1986; Martins & Oliveira, 1993), and further mentioned *A. badius*, *A. elaps*, *A. insipidus* Roze, 1961, *A. latifrons*, *A. major* Boulenger, 1893, *A. schach*, and *A. zidoki* from Amazonian Brazil (we here do not refer to "Amazonia legal" as understood in Brazil, but to the Amazonian forest area in Brazil), and *A. trilineatus* from savanna in Roraima. Abuys (1983), in a popular article in Dutch, copied Hoogmoed's (1980) data and drawings, adding some data on the natural history of some of the species. Cunha & Nascimento (1984) confirmed the occurrence of *A. zidoki* in eastern Para. Chippeaux (1986), in an extended list of the snakes of French Guiana, mentioned five species (*A. badius*, *A. flammigerus*, *A. latifrons*, *A. schach*, *A. zidoki*) for that country and provided a key for these and five more species (*A. elaps*, *A. favae*, *A. insipidus*, *A. torquatus*, *A. trilineatus*) that, according to him, might occur in French Guiana. Hoogmoed & Ávila-Pires (1991), reporting on a collection they made in French Guiana, mentioned three species of *Atractus* from Petit Saut on the Sinnamary river: *A. badius*, *A. schach* and *A. torquatus* (first record for French Guiana with detailed locality). Martins & Oliveira (1993) provided an overview of the species of *Atractus* in the wider environs of Manaus, Amazonas State in Central Brazilian Amazonia. They described eight species (*A. alphonsehogei*, *A. latifrons*, *A. major*, *A. poeppigi* (Jan, 1862), *A. schach*, *A. snethlageae*, *A. torquatus*, *A. trilineatus*) from the area and provided a key to identify them. Cunha & Nascimento (1994), in the second edition of their book on the snakes of eastern Pará, mentioned four taxa of *Atractus* for that region (*A. alphonsehogei*, *A. flammigerus snethlageae*, *A. schach*, *A. zidoki*). Starace (1998), in his book on the snakes

and amphisbaenians of French Guiana, mentions the same five species as Chippaux (1986) and copies the key provided by Chippaux (1986), including the same five additional possible species for French Guiana. It should be noted here that both Chippaux (1986) and Starace (1998) erroneously call the elongate scale between nasal and eye (the loreal of most authors) the preocular. In fact the preocular in *Atractus* generally is lacking (Savage, 1960; Hoogmoed, 1980; Myers, 2003) and is one of several characters that easily serve to identify members of this genus. Starace (1998) still considers *A. torquatus* not indigenous to French Guiana, failing to take into account recent publications that report the species from that country based on collected material (Hoogmoed, 1980; Hoogmoed & Ávila-Pires, 1991).

Claessen (2001: 223), intending to provide an overview of the snakes of the Guianas mainly based on Abuys (1983), mentions 11 species of *Atractus*, but erroneously considers *A. subbicinctum*, *A. micheli* (both synonyms of *A. badius*), and *Geophis alasukai* (synonym of *A. flammigerus*) as separate species, although in literature it has already been made clear that these are just synonyms of other species (Hoogmoed, 1980; Chippaux, 1986). Claessen (2001: 229), repeated by Claessen (2003a: 22), provides more mistakes in a table where *A. trilineatus* is stated as occurring in all Guiana's and the state of Amazonas in Brazil. In reality, *A. trilineatus* is only known from eastern Venezuela, Trinidad, Tobago, one locality in the Brazilian state of Amazonas (Martins & Oliveira, 1993) and western Guyana and no specimens are known from Suriname and French Guiana (Hoogmoed, 1979, 1982). In Brazil *A. trilineatus* is only known from the state of Roraima (Cunha & Nascimento, 1980, 1983), and only recently was reported from one locality in the state of Amazonas (Martins & Oliveira, 1993). *A. trilineatus* does not occur in "eastern Amazonas in Brazil" as erroneously stated by Martins & Oliveira (1993). Claessen (2003a: 21) still lists *A. mitcheli* separately, but says that Hoogmoed (1980) considers this as a synonym of *A. badius*. Claessen (2003a: 22) mentions "*Atractus subbicinctum* Savage, 1960" as occurring in Suriname and French Guiana. Apparently *A. subbicinctum* (Jan, 1862) is meant, which generally is considered a synonym of *A. badius* (F. Boie, 1827) (Hoogmoed, 1980; Chippaux, 1986; Starace, 1998) but which Claessen now mentions in a wrong combination of specific name and author. Claessen (2003b) mentions *Geophis alasukai* from French Guiana and, curiously, says that *Atractus flammigerus* is a (junior) synonym of the latter.

At the moment the following 16 species of *Atractus* are known from several parts of Brazilian Amazonia and/or the Guianas: *A. albuquerquei*, *A. alphonsehoegi*, *A. badius*, *A. elaps*, *A. favae*, *A. flammigerus*, *A. insipidus*, *A. latifrons*, *A. major*, *A. poeppigi*, *A. schach*, *A. snethlagae*, *A. torquatus*, *A. trilineatus*, and *A. zidoki*. We here add one new, small species to this list. We know of a second species from Amazonian Brazil that is being described (Santos-Costa & Prudente, 2003; Prudente & Santos-Costa, in prep.).

Descriptive part

Three specimens of *Atractus* were collected in Mamirauá, Amazonas in floating rotten logs during the period of high waters ("cheia") when the entire area was under about 12 m of water (Ayres, 1993; Bannerman, 2001). These fossorial snakes were not really expected to occur in that flooded area, but apparently they found a solution to the problem of seasonal long term flooding, like several other species in the area did

(Hoogmoed & Ávila-Pires, in prep.). In the collection of the MPEG a fourth specimen of this species was found that was collected in the Biological Station Ferreira Penna of the Museu Paraense Emílio Goeldi, Floresta de Caxiuaña, Pará. Unfortunately, this specimen has no associated data on habitat. This specimen was not mentioned by Ávila-Pires & Hoogmoed (1997), and neither by Bernardi et al. (2002), so we may assume it was collected (or only reached the museum) after 2002. We use these specimens to describe the following new species.

Atractus natans spec. nov.
(figs 1-6)

Atractus sp. [Hoogmoed & Ávila-Pires in] Bannerman, 2001: 163.

Material.— Holotype, ♀, MPEG 18836, near flutuante at confluence of Paraná Apra and Rio Mamirauá, Estação Ecológica de Mamirauá, Município de Uarini, Amazonas, Brazil, 3°02'57.2"S 64°50'59.7"W, 1.viii.1994, 09.18 h, 50 m, leg. M.S. Hoogmoed & T.C.S. Ávila-Pires. Paratypes: 1 juv. ♀, MPEG 18838, Cano de Rato, flutuante at confluence of Paraná Apra and Rio Mamirauá, Estação Ecológica de Mamirauá, Município de Uarini, Amazonas, Brazil, 3°02'47.4"S 64°51'17.5"W, 1.viii.1994, 15.30 h, 50 m, leg. M.S. Hoogmoed & T.C.S. Ávila-Pires; 1 ♀, RMNH 35530, Cano Sapucaia, side creek on left bank of Rio Mamirauá, Estação Ecológica de Mamirauá, Município de Uarini, Amazonas, Brazil, 3°04'02.1"S 64°48'24.5", 5.viii.1994, 14.45 h, 50 m, leg. M.S. Hoogmoed & T.C.S. Ávila-Pires; 1 ♂, MPEG 20213, Estação Científica Ferreira Penna, Floresta Nacional de Caxiuanã, Rio Curuá, Município de Melgaço, Pará, Brazil, 1°42'33"S 51°31'45"W (Bernardi et al., 1999, 0 m, date and collector unknown).

Etymology.— The specific name *natans* (= floating in Latin) is used in loose reference to the fact that all specimens collected in Mamirauá (the majority of the type series) were found in floating rotten logs in flooded forest (igapó = restinga baixo).

Diagnosis.— A small species of *Atractus* (maximum svl 283 mm in females, 221 mm in the male, tail length 25 mm in females, 32 mm in the male) with a narrow, distinctly coniform head, with 17-17-17 smooth dorsal scales without pits, 153-162 ventrals in females, 136 in the single male, 19-21 pairs of subcaudals in females, 25 in the single male, a frontal that is wider than long to as wide as long, loreal 1.6-2.8 times as long as high, no preocular, one (rarely) or two (mostly) postoculars, a small anterior and a long upper posterior temporal scale which is bordered ventrally by three lower posterior temporals. A wide and very narrow, small mental. Snout light, more so in the juvenile than in adults. A light collar on the back of the head and a wide black median ventral band of varying width on a white (or orange in life) background, underside of tail black, but with light edges or white (orange in life) spots on the scales.

The new species can be distinguished from other species of *Atractus* in the region by the following combination of characters: its colour pattern, frontal as wide as long or wider, 136 (male) or 153-162 (females) ventrals, low number of subcaudals (females: 19-21, male: 25), no apical pits and very short tail (8.1-8.5% of total length in females, 12.6% in the male). *A. albuquerquei*, *A. elaps*, *A. insipidus*, *A. poeppigi* and *A. trilineatus* can be distinguished from *A. natans* by only having 15 dorsal scale rows. *A. favae* is easily distinguished from all other *Atractus* in the region (or any other *Atractus* for that matter), including *A. natans*, by having the mental in contact with the single pair of chin shields, by having a tail that is about 25% of the total length and having a very high number of subcaudal scales (57-67). Adult *A. natans* are much smaller than *A.*

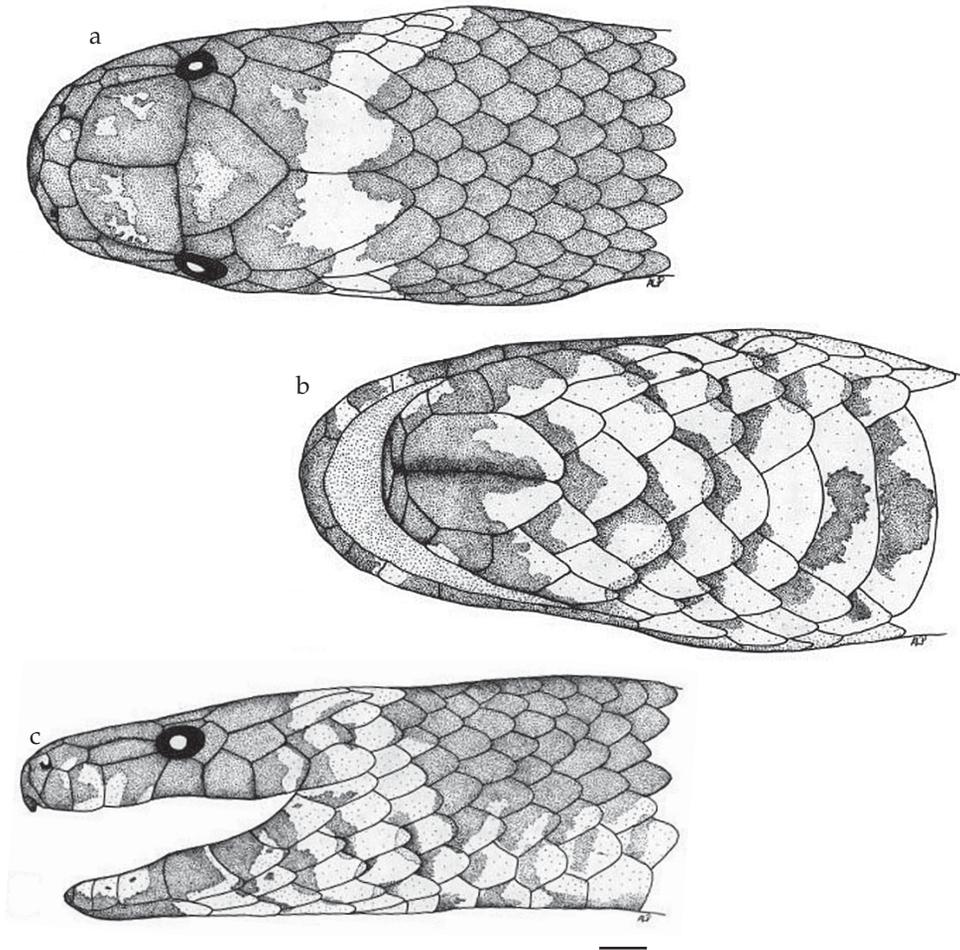


Fig. 1. *Atractus natans* spec. nov. a, dorsal view of head; b, ventral view of head; c, lateral view of head of ♀, holotype MPEG 18836 (del. A.L.C. Prudente). The bar represents 1 mm.

badius, *A. flammigerus*, *A. latifrons*, *A. major*, *A. snethlagae* and *A. torquatus*, who also have 17 dorsals. From *A. alphonsehoegi*, *A. schach* and *A. zidoki* it can be distinguished on the basis of dorsal and ventral patterns, the lighter snout and wide light band on the back of the head, and from *A. alphonsehoegi* and *A. zidoki* also by lacking apical pits and (in males) lacking keels on the scales of the flanks in the anal region.

Description of the holotype (female, MPEG 18836).— Proportions and scutellation (fig. 1 a, b, c): total length 308, SVL 283 mm (in life 290 mm), tail length 25 mm (in life 26 mm) (8.1% of total length). The weight was 5.8 grams. Head slightly wider than neck, narrower than diameter of midbody, coniform. Body cylindrical with the belly flattened, but ventrolateral area rounded. Greatest headwidth 57% of the distance between tip of snout and end of parietals, 45% of the head length measured to the end of the mandibular (= skull length), 1.6% of SVL; length of skull 3.8% of SVL; greatest body

width 2.3% of SVL. Tail conical, with a sharp tip. Dorsal scales smooth, lacking apical pits, in 17-17-17 rows. Ventrals 158, anal plate undivided, subcaudals in 19 pairs.

Head narrow, coniform, about twice as long as wide, tip of snout rounded both in dorsal and lateral view. Rostral wider than high, visible from above. Internasals small, pentagonal, their median suture about 1/3 the length of the prefrontal suture. Prefrontals large, much larger than the internasals, irregularly hexagonal, in broad contact with the eye, their median suture slightly shorter than the length of the frontal, prefrontal suture dextral to the internasal suture (cf. Myers, 2003: 9, footnote 7). Frontal large, wider than long, roughly triangular with tip posteriorly, about as long as the prefrontal suture, and thus shorter than its distance to the rostral, its width 80% of the interorbital distance, its anterior border nearly straight and between the centre of the eyes. Supraocular small, irregularly pentagonal, placed above the posterior part of the eye. Parietals large, as long as prefrontals and frontal together.

Nostril between a small anterior and a larger posterior nasal. Loreal 2.8 times as long as high, in broad contact with the eye. Eyes small, pupil round. Interorbital distance 72% of head width. Diameter eye about half the length of the loreal, larger than its distance to the mouth. No preocular. One large, vertically elongate postocular. A single anterior upper temporal, in contact with the parietal, postocular and supralabials, followed by a large upper posterior temporal that reaches the end of the parietals (left), or a large and a smaller one till the end of the parietal (right). On its lower side this posterior temporal is bordered by three (left) or two (right) scales. Seven upper labials, 3 and 4 in contact with the eye.

Seven lower labials. First pair in contact in the median, separating the small, wide and short (= transversely narrow) mental and the only pair of roughly oval (much longer than wide) chin shields. First four pairs of lower labials in contact with the chinshields.

Colour pattern in preservative: body brown with on each flank two indistinct and irregular rows of darker spots, each spot occupying one or two scales. Scales on anterior part of head (internasals, prefrontals, frontal) with lighter areas in their centre, apparently as a reminder of the juvenile pattern (see below). Posterior part of head with a light band, covering the posterior part of the parietals, the anterior part of the upper posterior temporal, the first two lower posterior temporals, the posterior part of the 7th upper labial and 2 scales bordering the 7th supralabial posteriorly. There is also a light spot on the posterior part of the 6th upper labial. Mental, lower labials and anterior part of the chinshields black. Scales on the throat white with a black spot on the anterior tip. The spots on the gulars form four continuous, oblique (directed from anteriorly to posteriorly) lines with the dark edges of scales on the posterior part of the head behind the eye, between the 4th lower labial and the beginning of the dark colouring of the body.

Belly with a wide central black band of irregular width. Sides of ventrals white, rest black (mostly covering more than half the width of a ventral). Size of black area of ventrals differs from ventral to ventral and the position of the black part may be different as well (positioned medially, or displaced either to the right or to the left), thus there is no clear cut black central band bordered by two white lines, but the border between black and white is like an irregular zigzag. Anal mostly black, with a posterior white edge and a white spot connected to it. Postanal white area on base of tail,

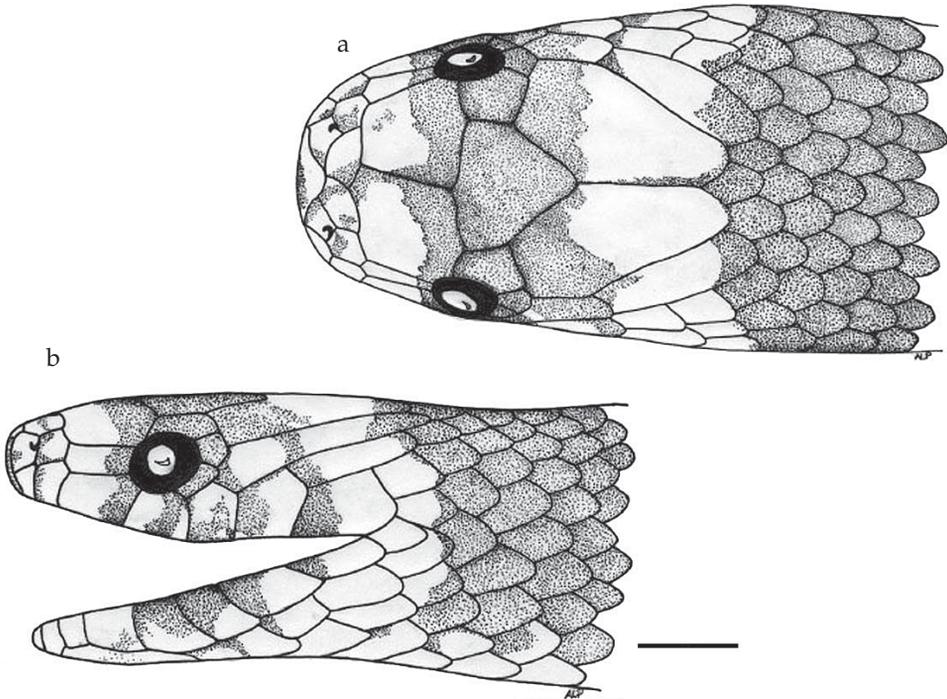


Fig. 2. *Atractus natans* spec. nov. a, lateral view of head; b, dorsal view of head of juvenile ♀, paratype MPEG 18838 (del. A.L.C. Prudente). The bar represents 1 mm.

including the first pair of subcaudals. Underside of tail black with white spots on many (not all) subcaudals.

Colour in life (based on field notes and slides made by Teresa C.S. Avila-Pires; figs 3, 4): Posterior part of head with a cream transverse collar. Back iridescent blackish Neutral grey (82) with tiny orangish (Flesh ochre) (132D) spots towards the sides. Throat white with black spots and four oblique lines on each side. Ventrally Flesh ochre (132D) to Orange rufous (132C) and white at the sides, with a wide black band down the middle. Ventrals on anterior part of belly adjacent to the black spot white. Starting from the ninth ventral the area adjacent to the black spot is brick red, a small area in the beginning, but getting larger posteriorly and soon covering most of the light area of the ventral, laterally bordered by white. Posterior edge of anal and connected spot also brick red. The post-cloacal spot on the base of the tail Orange rufous (132C). Tail mostly black, with a few, small Flesh ochre (132D) spots ventrally (colour codes according to Smithe, 1974).

Dentition: six maxillary teeth on the left, five on the right. Teeth strongly curved backwards,

Variation.— The three paratypes in general agree with the holotype, but show differences in size and in some scale counts as follows: MPEG 18838 has a SVL of 150 mm (157 mm in life), a tail length of 14 mm (same in life), the weight was 2.35 grams, it has 162 ventrals and 21 pairs of subcaudals; RMNH 35530 has a SVL of 276



Fig. 3. *Atractus natans* spec. nov. Dorsal view of alive ♀ holotype (MPEG 18836) (photo T.C.S. Ávila-Pires).

mm (according to the field book 382 mm in life, but this certainly must be in error and probably was 282 mm), a tail length of 25 mm (24 mm in life), the weight was 6.4 grams, it has 153 ventrals and 19 pairs of subcaudals; MPEG 20213 (male) has a SVL of 221 mm and a tail length of 32 mm, it has 136 ventrals and 25 pairs of subcaudals. The relatively large difference between the numbers of ventral scales of the male and the females falls well within the sexual variation for this character in *Atractus* (Hoogmoed, 1980). All paratypes have two quadrangular postoculars (the lower one slightly smaller than the upper one) (fig. 2a) and 1+ 1/1+1+1 temporals. The loreal is 2.4 times as long as high in the male (MPEG 20213), 2.7 times in RMNH 35530 and only 1.65 times in the juvenile female (MPEG 18838). The frontal is wider than long, and its anterior margin is between the centre of the eyes. The anterior margin forms a very open and shallow V, with the tip pointing forward. In the male (MPEG 20213) and in RMNH 35530 the frontal length equals that of the prefrontal suture, in the juvenile its length equals the distance to the rostral (= length prefrontals + internasal) and in both cases thus is shorter than its distance to the tip of the snout. Prefrontal suture in all specimens dextral to the internasal suture. The male does not show keeled or tubercular dorsal scales on the flanks in the anal region. The tail of the male is 12.6% of its total length, that of the juvenile female (MPEG 18838) 8.5% and that of RMNH 35530 8.2%. MPEG 18838 and RMNH 35530 have 5 maxillary teeth, MPEG 20213 six.

The male MPEG 20213 has a damaged head: its lower jaw seems to be shorter than the skull and on the right hand side it shows a cut that has damaged the skin in that



Fig. 4. *Atractus natans* spec. nov. Ventral view of ♀ holotype (MPEG 18836) just after euthanasia (photo T.C.S. Ávila-Pires).

region. On the left hand side no external damage is visible, but the jaw there also is shorter than the skull.

The largest variation occurs in pattern. Based on the material available there seems to be a juvenile head pattern that disappears to varying degrees in adults, more so in females than in the male. The only specimen from Caxiuana shows differences in the ventral pattern as compared to the Mamirauá specimens, but well within normal variation. We therefore think it better to provide a description of the pattern of each specimen.

MPEG 18838, a juvenile female from Mamirauá (fig. 2 a, b): Snout (till just anterior of the frontal) cream with brown spots on the rostral and along the sutures of the other scales involved in the light area. A wide, dark ocular band from just before the eyes to the anterior part of the parietals. Cream collar on posterior part of head (thus, this is not a nuchal collar), covering the posterior part of the parietals, posterior upper temporal, the posterior part of the first lower posterior temporal, the anterior part of the second lower posterior temporal, the posterior part of the last upper labial on each side and one scale behind it. Posterior part of anterior temporal and last upper labial with large white spots, which are separated from the light collar by a dark brown line from parietal to mouth, formed by dark brown areas on the anterior part of the upper posterior temporal, the first lower posterior temporal and the 7th upper labial. Neck the same colour as the rest of the body. Body brown, with on each side two irregular and indistinct rows of dark brown spots covering one or two adjacent dorsals. Only a few gulars with dark brown spots. Belly with a central dark band, the width of which

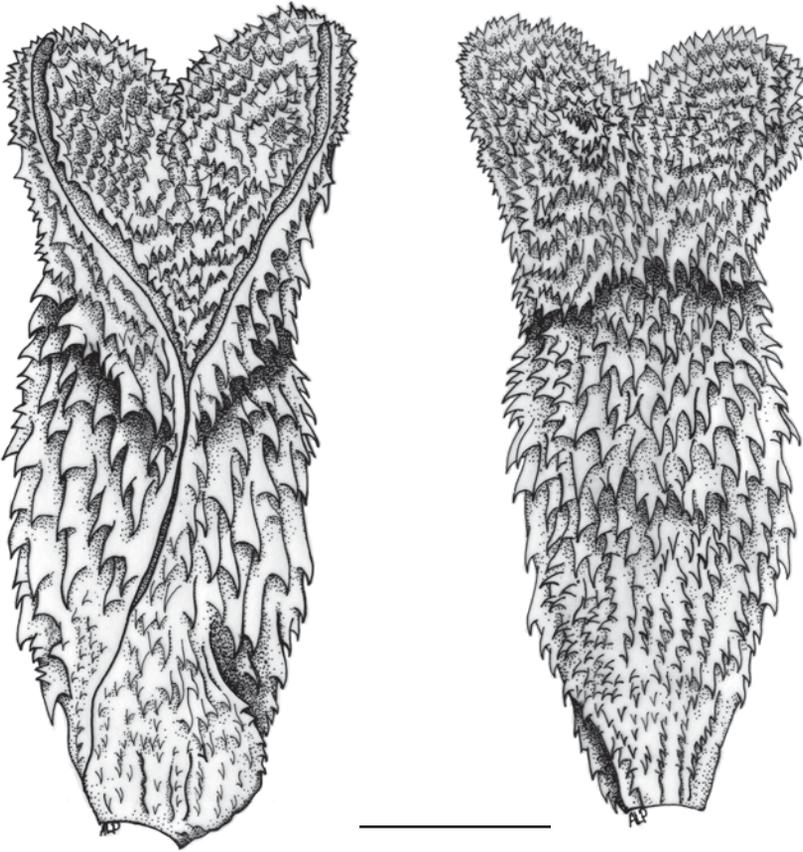


Fig. 5. *Atractus natans* spec. nov. Sulcate (a) and asulcate (b) view of the hemipenis of ♂ paratype MPEG 20213 (del. A.L.C. Prudente). The bar represents 1 mm.

generally is more than half the width of a ventral, but the width of the black spots on each ventral is different and sometimes distinctly less than half the width of a ventral. Anal mostly dark brown, with a white posterior edge. A white post-cloacal spot on the base of the tail, including the first pair of subcaudals. Underside of tail dark brown, with light edges to the scales. The field notes simply read: "ventral surface medially black, at the sides white".

RMNH 35530 (female from Mamirauá). A light area on the tip of the snout, involving the rostral, nasals, internasals, anterior part of prefrontals and loreal, upper labials 1 and 2, and the anterior part of upper labial 3, with dark spots near the sutures. Frontal with a dark anterior band and a dark central spot, remainder lighter, but darker than the spot on the snout or the light posterior head band. A wide dark ocular band reaching from the prefrontals to the anterior part of the parietals. Cream collar on the posterior part of the head, covering most of the parietals (only anterior and posterior tips are dark brown), posterior part of the anterior upper temporal, middle part of the posterior upper temporal, the first two posterior lower temporals,

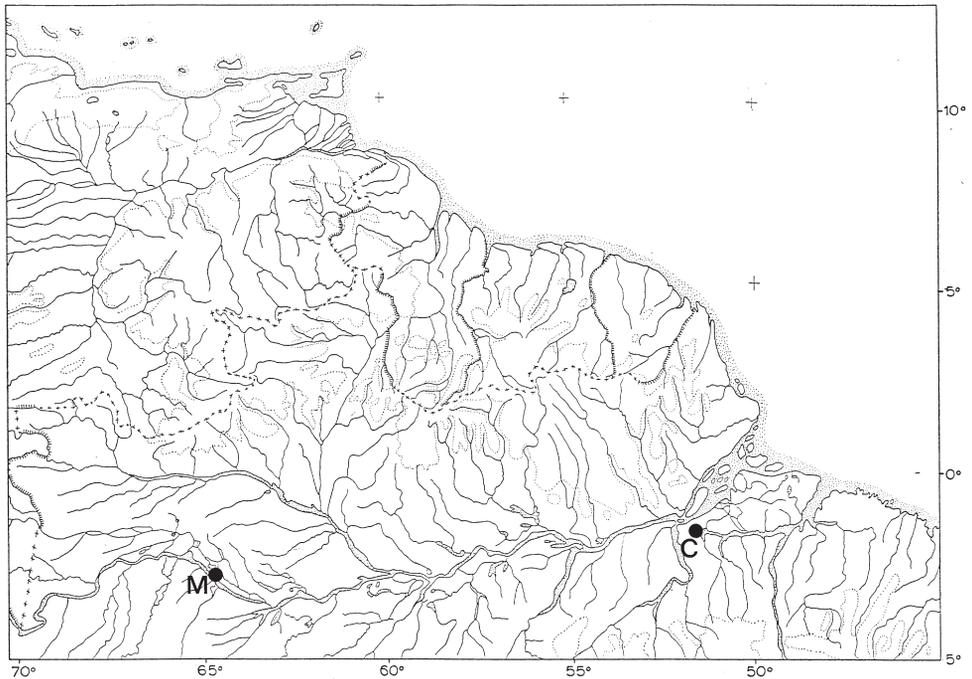


Fig. 6. Map of northeastern South America with the northern part of the Amazon basin in Brazil, showing the localities where *Atractus natans* spec. nov. was found along the Amazon. M = Mamirauá, C = Caxiuana. Borders between countries have been indicated by lines of crosses or hatching along rivers. The stippled line is the contourline of 200 m.

the posterior part of the seventh upper labial and 2 scales posterior of it. This collar is continued on the throat. Body and neck brown with a longitudinal row of dark brown spots on each flank. The dark brown spots covering (parts of) one to five scales. The dorsal scale row bordering the ventrals is white. Two or three rows bordering this white row with distinctly lighter central area. Other scales on the back also with a smaller lighter central area. No distinct lines being formed though. All gulars white with a black spot on their anterior tip, the spots forming four oblique rows. Ventrals white with irregular, transverse spots in the midline. Spots of irregular width, anteriorly not quite covering the length of the ventral, posteriorly more extensive. Anal white with irregular black spotting. Subcaudals black with white edges. The field notes on colour in life read as follows: "Dorsal surface predominantly Raw umber (223). Head with rostral region and transverse posterior band Marsh brown (223A) (paler on rostral). Chrome orange (16) spots on body, especially towards the sides. Ventral surface black medially, Chrome orange (16) ventrolaterally. The Chrome orange (16) area becomes paler on anterior part of body and almost white under head. Under tail scales black anteriorly, pale Chrome orange (16) posteriorly" (colour codes according to Smithe, 1974).

MPEG 20213 (adult male from Caxiuana): a light band on the snout covers the nasals, the internasals, most of the prefrontals and the anterior three upper labials

(continued on the anterior three lower labials, see below). Light band on posterior part of head covers the upper temporals, a narrow area on the posterior part of the parietals, the first two lower posterior temporals, the last upper labial and two scales that border the last upper labial posteriorly. Body brown without distinct pattern. Both light bands on the head separated by a brown band. Dorsal rows bordering the ventrals mainly white, with a dark anterior and upper rim. Scales in the row above them (and to a lesser extent in two more adjacent rows) with lighter central area. No distinct lines being formed though. First three lower labials with black area at median part, white elsewhere, forming the continuation of the light area on the tip of the snout. Posterior four lower labials with a black area in the upper anterior corner, rest white. Chin shields anteriorly black, posteriorly white. All gulars with an anterior black spot. Belly white with irregular black spots in the midline, which become wider and more numerous posteriorly, but still of varying width and not forming a massive black band. The general impression is a white belly with black spots arranged in the midventral zone, with a preponderance of white. Anal black. A white post-cloacal spot on the base of the tail (up till the first pair of subcaudals). Subcaudals anteriorly black, posterior part white.

Hemipenis (MPEG 20213) (fig. 5): fully everted right hemipenis about 8.6 mm long, reaching to subcaudal 6-7. Moderately bifurcate, with lobes comprising about one-third of total length. Sulcus spermaticus divides above midpoint of hemipenis (about at subcaudal 5), branches diverge and end at the top of lobes. Distinctly capitate on the sulcate side. Capitulum calyculate, comprising about one-third of the organ. Capitulum with calyces of different sizes. Calyces with small spines. Proximal part of hemipenis with several longitudinal plicae, surmounted by several spinules and spines of different sizes, on both sides. Midsection, in lateral view, with hooked spines slightly aligned in five or six oblique rows. A small lateral naked area on the base of organ. On the sulcate side a nude pocket is present on the right-hand side of the left organ and on the left-hand side of the right organ.

Natural history.— All specimens collected in Mamirauá were found in rotten logs of which a large part of the volume consisted of very loose material (humus), in which the snakes were found and where they had a fossorial existence. The logs were floating in August in flooded forest (igapó = restinga baixa) in about 12 m of water, as a result of the yearly flooding (“cheia”) of the forest in which they were found (Ayres, 1993). One of the logs encountered (on August 3, 1994) was a real miniature Noah’s ark, and apart from containing in its interior *Atractus natans* spec. nov. (MPEG 18838) there was a specimen each of *Bufo marinus* Linnaeus, 1758, and *Anolis fuscoauratus* Duméril & Bibron, 1837, and a small (lizard?) egg (unidentified) on top of the log. After the first specimen of *A. natans* was found in a floating log, we paid special attention to floating logs, and found two more *A. natans* in the same habitat, each in a different log. Unfortunately, it was not noted how many logs were opened in total, but the amount certainly surpasses ten, and not all logs showed the rotten, loose interior. In short, only part of the logs investigated yielded snakes and each snake was by itself in one log, which were all of the same consistency. During a second field period in Mamirauá, at the period of low water, when the forest was no longer inundated (December 1994), rotten logs on the forest floor were examined again, but this time no further *Atractus* were found. No data on the habitat of the specimen from Caxiuanã are available, not even the date.

The floating logs could potentially form a means of long distance dispersal for this species, but the logs we encountered were all floating in quiet stretches of the várzea forest and more or less captured between standing vegetation. However, when they would reach open water, and the stream channel of creeks, paranás or rivers, these floating logs and the animals in (and on) them could theoretically be transported over large distances.

For general data on the climate and physiography of Mamirauá, see Ayres (1993) and Bannerman (2001), for similar data on Caxiuanã, see Bernardi et al. (1999).

Distribution (fig. 6).— At the moment only known from two localities in the Brazilian states of Amazonas (Mamirauá, from several localities close together) with an altitude of about 50 m above sea level, and Pará (Caxiuanã) at about sea level, which are respectively located in the western part of Brazilian Amazonia and in its eastern part. The localities are about 1500 km apart, at about the same latitude and both in the valley of the Amazon. This might indicate that this is a várzea species, with a longitudinal distribution along rivers (cf. the distribution of the lizards *Mabuya bistriata* (Spix, 1825) and *Kentropyx altamazonica* Cope, 1876 (Avila-Pires, 1995)). But taking into account the low number of localities for this new species, this is a long shot.

Remarks.— Myers (2003) in footnote 7 on page 9 made a remark about the fact that the asymmetrical prefrontal suture (a peculiar character in Colubridae) was present in “four of the five Panamanian specimens [of *Atractus*], and some others” he had seen was dextral to the internasal suture, and that he had noted the same in the drawings of most of the species dealt with by Hoogmoed (1980). We may add that this is also the case in the drawings in Cunha & Nascimento (1983), Martins & Oliveira (1993), Fernandes (1995) and in Schargel & García-Pérez (2002). We checked our material specifically and all specimens dealt with here do have this character: prefrontal suture dextral to the internasal suture. Not much attention has been paid to this character until Myers (2003) pointed it out, but it might be very useful in further studies to understand the relationships within *Atractus*, as e.g. in the rather aberrant *A. favae*, the prefrontal and internasal sutures are continuous as in other Colubrids.

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