REVISION OF THE GENUS *ATRACTUS* IN SURINAM, WITH THE RESURRECTION OF TWO SPECIES (COLUBRIDAE, REPTILIA)

NOTES ON THE HERPETOFAUNA OF SURINAM VII

by

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With 17 text-figures, 6 plates and 1 table

ABSTRACT

A re-examination of old specimens of the genus *Atractus*, preserved in the Rijksmuseum van Natuurlijke Historie resulted in the discovery of syntypes of *Brachyorrhos badius* F. Boie, *B. flammigerus* F. Boie, *B. schach* F. Boie and *Rabdosoma torquatus* Duméril, Bibron & Duméril. Lectotypes for all these species are designated. *B. flammigerus* and *B. schach* have been considered synonyms of *Atractus badius* since 1837. This proved to be wrong, they turned out to be valid taxa exhibiting differences in scale counts, body size, hemipenial morphology and colour pattern. Among recently collected material from Surinam the recently described *A. zidoki* Gasc & Rodrigues was discovered and described on the basis of seven specimens. Both *A. latifrons* (Günther) and *A. favae* (Filippi) are reported for the first time from Surinam. Including *A. elaps* (Günther) the total number of species now known from Surinam is eight. Data gathered in Surinam indicate that the existence of many localised forms in *Atractus* is real and that under the name *A. badius* probably several other taxa are hiding. A revision of the entire genus is badly needed.

RESUMEN

En el estudio de ejemplares viejos del género *Atractus*, conservados en el Rijksmuseum van Natuurlijke Historie se descubrieron los sintipos de *Brachyorrhos badius* F. Boie, *B. flammigerus* F. Boie, *B. schach* F. Boie y *Rabdosoma torquatus* Duméril, Bibron & Duméril. Se indican lectotipos para todas esas especies. *B. flammigerus* y *B. schach* han sido considerados como sinónimos de *Atractus badius* desde 1837. Se descubrió que era un error y resultó que esas especies eran taxa valida y que presentan diferencias con respecto al numéro de escamas, al tamaño, a la morfología del hemipenis y al diseño de color. Entre el material recientemente recogido en Surinam se ha tambien descubierto la especie *A. zidoki* Gasc & Rodrigues que se describe a base de siete ejemplares. *A. latifrons* (Günther) y *A. favae* (Filippi) se mencionan por la primera vez de Surinam. Inclusive *A. elaps* (Günther) el numéro total de especies conocidas de Surinam es ocho. Datos obtenidos en Surinam indican que muchas formas localizadas de *Atractus* existen de veras y que bajo el nombre de *A. badius* probablemente se ocultan algunas taxas diferentes. Una revision de todo el género *Atractus* es sumamente necesaria.

INTRODUCTION

Snakes of the genus *Atractus* are notorious for their high degree of endemism, with numerous local taxa known from areas in southern Central

America and northern South America as far south as southern Brazil and Amazonian Bolivia (Peters & Orejas-Miranda, 1970). Especially in and around the Andes many local forms have been recognised, often based only on one or a few specimens showing slight differences from other forms (Savage, 1960). The most recent account of the genus (Peters & Orejas-Miranda, 1970) lists a total of 73 species. One area having a high number of *Atractus* species is the Guiana Shield. Hoogmoed (1979) listed a total of 13 species, 8 of which are considered endemic for this area. Half of the endemic species were described by Roze (1958, 1961) from southern Venezuela.

The first species of *Atractus* were described by F. Boie (1827) who described three species and mentioned the name of a fourth under the generic name *Brachyorrhos*. Two of these names subsequently were synonymised with the specific name *badius*, whereas the nomen nudum *torquatus* was used again by Duméril, Bibron & Duméril (1854) and provided with a valid description. The genus *Atractus* was described by Wagler (1828), based on his *A. trilineatus*, a species restricted to Trinidad and western Guiana. Recent requests concerning the status of several names attributed to this genus prompted me to deal with it apart from the main body of Surinam snakes. When studying the type-material of *Brachyorrhos badius*, *B. schach* and *B. flammigerus* it soon became clear that Boie was right in describing them as different species. Not only do they show clear-cut differences in pattern, but also constant differences in scalation. Moreover, at least at two localities *badius* and *flammigerus* are sympatric. During this study a hitherto undescribed species (only recently described as *A. zidoki*) was found. Thus for Guiana the presence of fairly local forms does seem to be a reality and not just a matter of insufficient knowledge of the species concerned. On the other hand one species was found to have a much wider distribution than formerly assumed.

The genus Atractus in Surinam

Diagnosis. — Small to medium-sized snakes with a small head that passes imperceptibly into the body and a short to long tail. Eye small, with round pupil. Scales mostly smooth, only rarely keeled, apical pits absent in most species, present in one. Scale rows on body without reduction, in 15 or 17 rows. Loreal present in all species, entering the orbit, separating prefrontals and supralabials. Nostril between two scales. Preocular absent except sometimes in *favae*. Temporals 1 + 2. Frontal shorter than parietals. A single pair of chin shields in all but one species (*favae*) separated from the mental.

Anal plate entire, subcaudals divided. Maxillary teeth 4-8, the posterior one or two distinctly smaller. Hemipenis either bilobed or single, differentiated or not.

KEY TO THE SURINAM SPECIES OF ATRACTUS

1. Pair of chin shields not in contact with mental, separated from it by the first pair of infralabials, forming a suture behind the mental, subcaudals less than 50, preocular never present, tail short 2
   Pair of chin shields in contact with mental, first pair of infralabials not forming a suture, subcaudals 57-67, sometimes a small preocular present, tail long . *Atractus favae*
2. Most specimens with one postocular, only exceptionally two postoculars present 3
   All specimens with two postoculars 5
3. Supralabials six, third and fourth entering the orbit, loreal short, pattern of black rings around the body 4
   Supralabials eight, fourth and fifth entering the orbit, loreal elongate, back with small darker spots, arranged in four longitudinal rows, sometimes forming transverse bands, no black rings . . . . . *Atractus torquatus*
4. Scales on body in 15 rows, internasals forming a suture, tail without sharp dorsal ridge . . . . . *Atractus elaps*
   Scales on body in 17 rows, internasals separated, tail with a sharp dorsal ridge . . . . . *Atractus latifrons*
5. Loreal very narrow, elongated; ventrals less than 160; pattern without longitudinal stripes or series of spots 6
   Loreal not elongated; ventrals 173-182; pattern of paravertebral rows of spots and a black stripe along the edges of the ventrals . . . . . *Atractus zidoki*
6. Head wide, blunt; chin shields in contact with four infralabials, subcaudals 19-32, back brown with transverse, black bars or light spots 7
   Head narrow, pointed; chin shields in contact with three (exceptionally four) infralabials, subcaudals 33-50, anterior part of back red with pairs of black bands, the members of each pair separated by narrow white bands, bands not continuous on belly . . . . . *Atractus badius*
7. Upper labials eight, fourth and fifth entering the orbit; infralabials seven or eight, scales on posterior part of back and on tail smooth to strongly keeled, back brown with alternating black-edged light spots . . . . . *Atractus flammigerus*
   Upper labials seven, third and fourth entering the orbit; infralabials eight, all scales on body and tail smooth, back light brown with alternating, rectangular black spots and a black vertebral line . . . . . *Atractus schach*

SPECIES ACCOUNTS

Atractus badius (F. Boie) (pl. 1 fig. b, pl. 2 figs. a, b)

Brachyorrhos badius F. Boie, 1827: 540; Wagler, 1830: 190.

Calamaria badia: Schlegel, 1837: 35 (partly); Savage, 1960: 80 (partly).

Rabdosoma badium var. A: Duméril, Bibron & Duméril, 1854: 99.

Rabdosoma badium: Jan, 1862: 13, pl. VI.

Rabdosoma badium var. *subbicinctum* Jan, 1862: 14; Jan, 1863: 31; Jan & Sordelli, 1865: livr. 10, pl. IV, fig. 3, p. 7; Savage, 1960: 83.

Rhabdosoma badium (partly): Kappler, 1881: 166; Kappler, 1885: 818; Kappler, 1887: 128.

Atractus badius A and B: Boulenger, 1894: 308, 309.

Atractus micheli Mocquard, 1904: 301; Amaral, 1929b: 188; Savage, 1960 :82; Peters & Orejas-Miranda, 1970: 31; Hoogmoed ,1979.

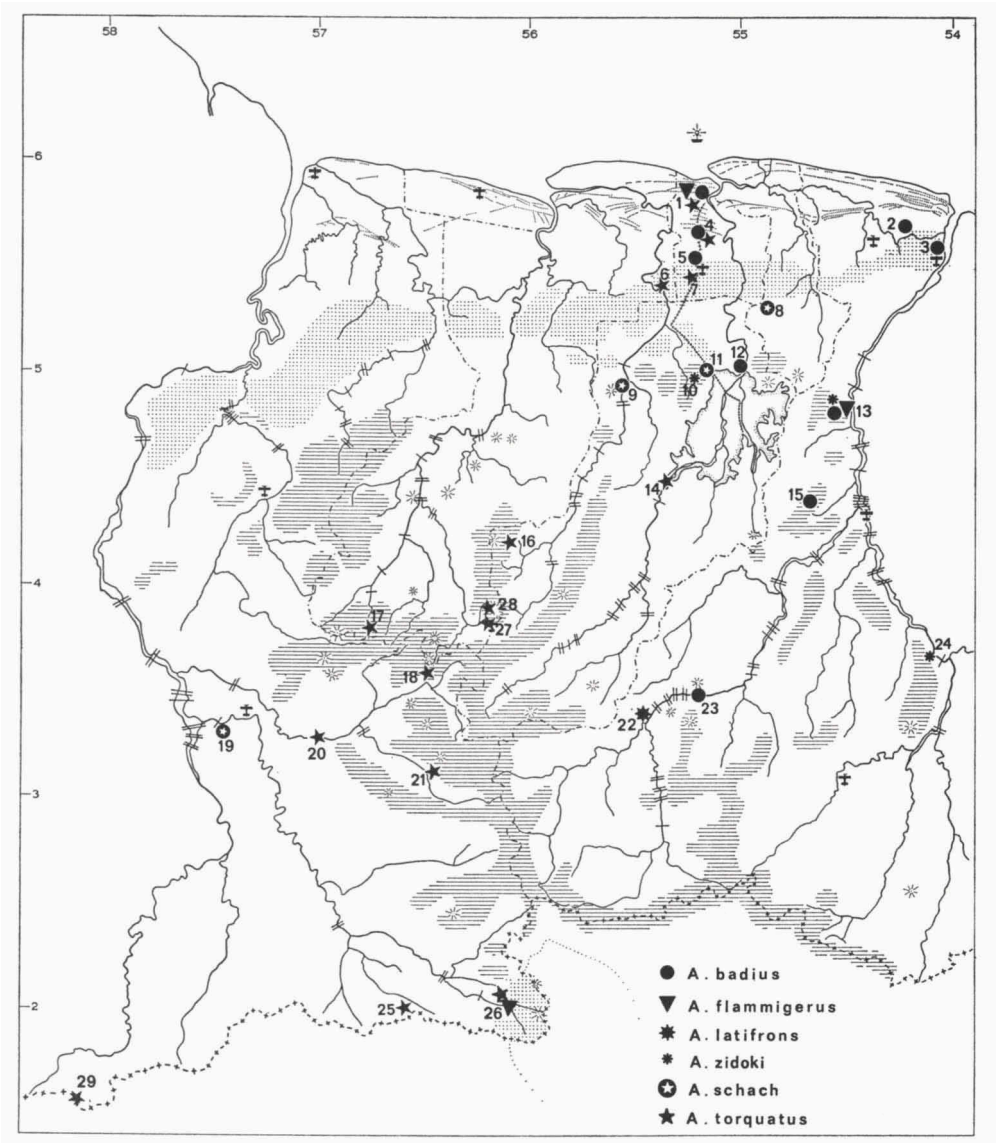

Fig. 1. Recorded distribution in Surinam of *Atractus badius* (F. Boie), *A. flammigerus* (F. Boie), *A. latifrons* (Günther), *A. zidoki* Gasc & Rodrigues, *A. schach* (F. Boie) and *A. torquatus* (Duméril, Bibron & Duméril). 1, Paramaribo + Kwatta; 2, Djai Creek; 3, 6 km N. Albina; 4, road to Zanderij + 10 km N. of Onverwacht; 5, Republiek; 6, Troeli Creek; 7, Zanderij; 8, Encampment 8; 9, Mamadam; 10, Brownsberg; 11, Railway km 121; 12, Afobaka; 13, Nassau Mountains; 14, Pokigron; 15, Lely Mountains; 16, Toekoemoetoe Creek; 17, Linker Coppename River; 18, Wilhelmina Mountains, Camp 3; 19, Encampment Gonini; 20, Lucie River/Vreedzaam Creek; 21, airstrip Kayser Mountains; 22, airstrip Paloemeu; 23, Tapanahoni River, 12-VIII-1904; 24, Benzdorp; 25, New River, 750 feet; 26, airstrip Sipaliwini; 27, NW of airstrip Rudi Kappel (Tafelberg); 28, topplateau of Tafelberg; 29, Boundary Camp.

Atractus badius: Van Lidth de Jeude, 1904: 86; Van Lidth de Jeude, 1914-1917: 60; Werner, 1928: 160 (partly); Amaral, 1929b: 185 (partly); Peters & Orejas-Miranda, 1970: 27 (partly); Hoogmoed, 1979 (partly).
Atractus subbicinctum: Peters & Orejas-Miranda, 1970: 35.

Material. — SURINAM. 1 ♀, 1 ♂, SMNS 170, 626 (178), 1845 (1857), leg. A. Kappler; 1 ♂, ZMA 1507a, leg. Kelb. Distr. Suriname. Paramaribo: 1 ♀, RMNH 13773, February 1888, leg. J. H. Spitzley. Distr. Para. Road to Zanderij: 1 ex., RMNH 18676, 10-VI-1969, leg. H. M. van Meeuwen. Republiek: 1 ♀, RMNH 13772, 17-XII-1950, 1 ♀, RMNH 18677, October 1950, 1 ♀, ZMA 12977, December 1950, all leg. D. C. Geijskes. Distr. Brokopondo. Afobaka: 1 ♀, RMNH 13574, 2-I-1964, leg. P. Leentvaar. Distr. Marowijne. 6 km N. Albina: 1 ♂, RMNH 18678, 16-I-1975, leg. M. S. Hoogmoed. Djai Creek: 1 ♀, RMNH 12860, 6-X-1948, leg. Suriname Expedition 1948-49. Nassau Mountains: 1 ♀, RMNH 12862, 17-III-1949, leg. Suriname Expedition 1948-49. Lely Mountains, 4 km N. Camp V: 2 ♀♀, RMNH 18679-80, 9-V-1975, leg. M. S. Hoogmoed. Tapanahoni River: 1 ♂, RMNH 5689, 12-VIII-1904, leg. G. M. Versteeg.
GUYANE. 2♂♂, 1 ♀, RMNH 120, don. Museum Utrecht (RMNH 120 c is the lectotype of *Brachyorrhos badius* F. Boie, RMNH 120 a, b are paralectotypes).
FRENCH GUIANA. 1 ex., SEPANGUY no number. Cayenne: 1 ♂, RMNH 128, don. Museum Paris, 1835.
BRAZIL. Amapá. Serra do Navio: 1 ex., LACM 44686.

Diagnosis. — A large species of *Atractus*, with pointed head and short tail (14.4-18.3% of total length in males, 12.3-15.4% in females). Maximum snout-vent length in males 316 mm, in females 415 mm; maximum tail length in males 67 mm, in females 71 mm. Seven (or rarely eight) supralabials, third and fourth (rarely fourth and fifth) entering the orbit. Seven infralabials, three (rarely four) in contact with the chin shields. Loreal elongate, 2.5-3.0 times as long as high. Preocular absent, postoculars two. Frontal slightly longer than wide or as long as wide, slightly shorter than its distance to the rostral. Scales smooth, without apical pits, in 17 rows. Ventrals in females 148-160, in males 138-155. Subcaudals in females 33-50, in males 43-47. Maxillary teeth six to seven. Hemipenis undifferentiated. Head black, a light band across the occiput. Back anteriorly with pairs of black bands, posterior part of back and tail darker, sometimes even uniformly black. Belly may be immaculate anteriorly, posteriorly with quadrangular black spots, or with black spots all over, sometimes arranged in one irregular, longitudinal median row. Underside of tail dark with lighter spots.

Colour in life. — Colour notes are available for four specimens recently collected (RMNH 18676, 18678-80). The head is black with a yellow-white band across the occiput. Neck with black collar. Back red with pairs of black bands, separated from each other by a narrow dirty white to yellowish white band. All sets of black-white-black bands slightly wider than the separating red bands. Scales in red bands tipped with black. On posterior part of body black elements increase, sometimes causing that part to appear greyish-black, sometimes the pattern is still visible. Bands not continuous

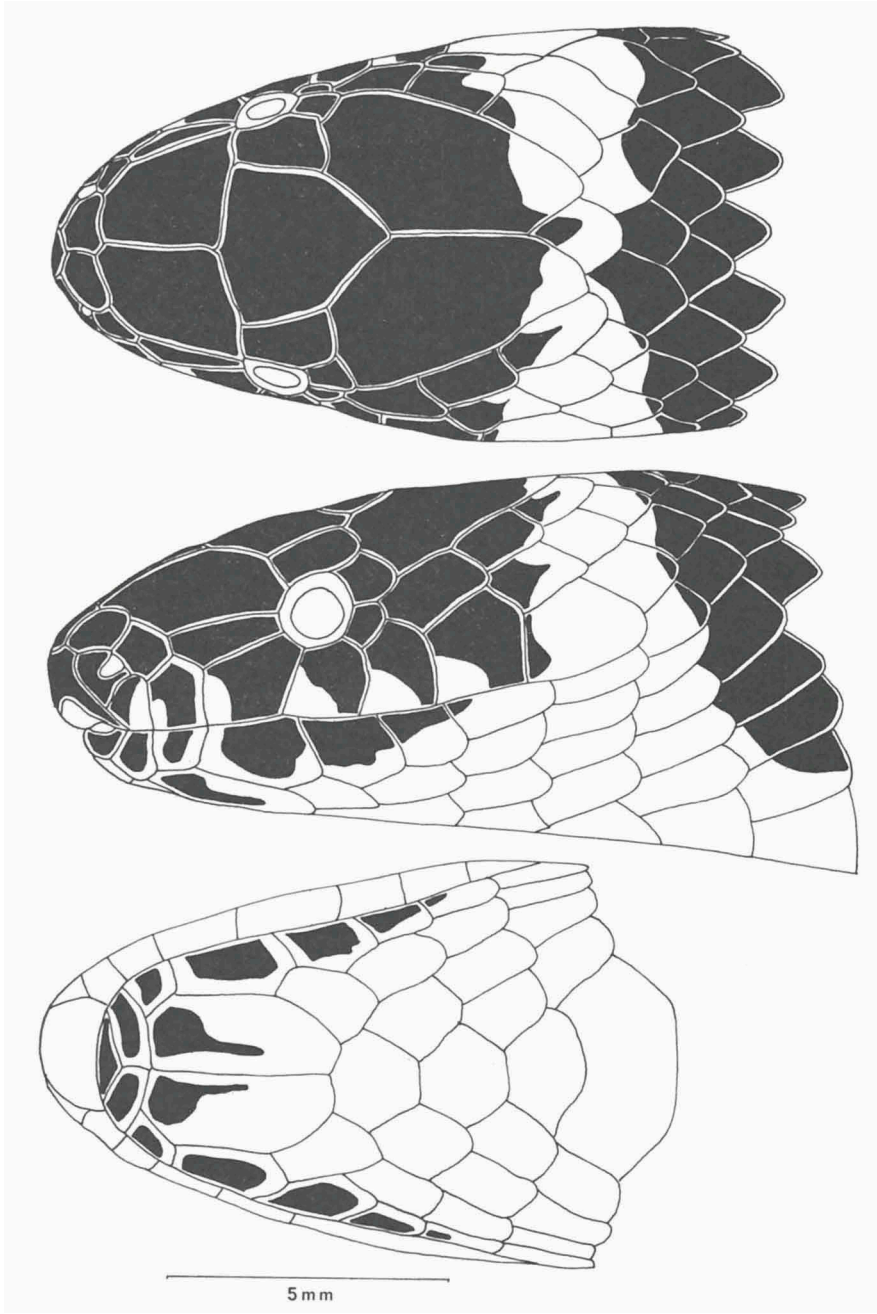

Fig. 2. Dorsal, lateral and ventral views of the head of *Atractus badius* (F. Boie), RMNH 120 c (lectotype).

across belly, reaching the lateral parts of ventrals. Bands of both sides can be in line or are alternating. Upper lip, lower lip and belly yellowish white to dirty white, belly with or without black quadrangular spots, which may be arranged in an irregular median row. Chin pink. Ventral surface of tail dark grey to black with yellowish white spots.

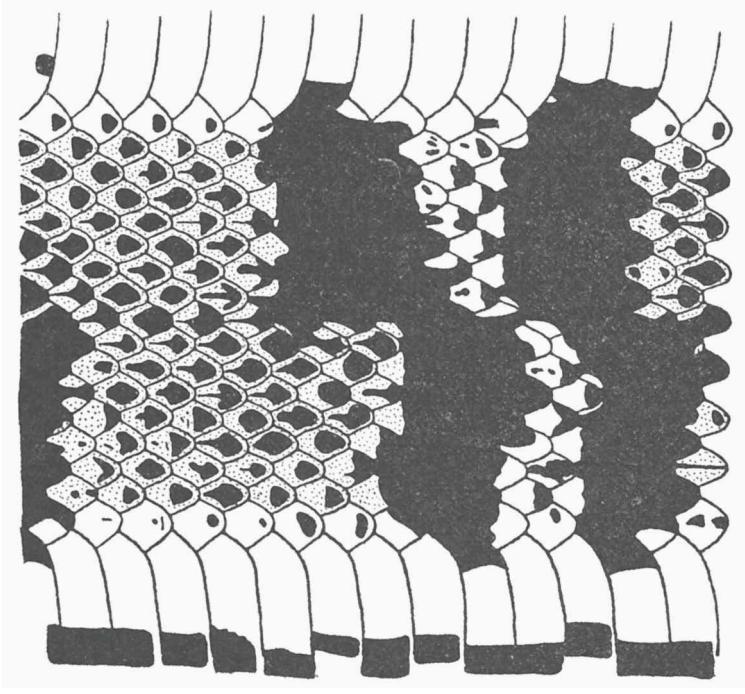

Fig. 3. Pattern on anterior part of body of *Atractus badius* (F. Boie), RMNH 18679 (head is to the left).

Habitat. — Only few specimens are accompanied by data on habitat. All specimens were collected in rain forest. RMNH 18678 was found in a decaying piece of wood on the forest floor, RMNH 18679-80 were found on the ground after a road had been opened through forest by bulldozers. RMNH 18677 was found "in forest near creekbank".

Natural history. — RMNH 12862 had an earthworm in its stomach. RMNH 13574, collected in January contained five, RMNH 18679, collected in May, contained three eggs. A male (RMNH 18678) with a snout-vent length of 190 mm and a tail length of 32 mm already possessed well developed hemipenes.

Range and distribution. — The species has been reported from northern South America east of the Andes and south to northern Argentina. In the

light of the data obtained in Surinam it is very likely that this presumed species does not have such an extensive distribution and that it is composed of several species. To be able to make conclusive statements on this subject a revision of all South American material referred to this species would be necessary. In Surinam it is present throughout the country, from sea level to at least 650 m. At Nassau Mountains it is sympatric with *Atractus flammigerus* and *A. zidoki*, at Paramaribo with *A. flammigerus* and *A. torquatus*.

Remarks. — This species was described in 1827 by F. Boie on the basis of the manuscript of the "Erpétologie de Java" (which never was published) and of notes taken by his brother H. Boie, at that time a member of the Dutch "Natuurkundige Commissie" and formerly curator of the Leiden Museum. I succeeded in finding in our archives the part of the "Erpétologie de Java" dealing with the species of *Brachyorrhos*. The (neatly) handwritten manuscript is on unlined folio paper, the pages are not numbered and both sides of the paper have been used. On the first page the generic description of *Brachyorrhos* starts and it ends on the second page. It reads as follows: "Dentes colubrini, minutissimi, oculiparvi, caput a trunco fusiforme non distinctum, scutis pilei colubrinis, frontalibus anterioribus six ullis, superciliocribus brevibus, mentalium pari unico; cauda brevis, tenuis acuta, caetera ut in Calamaria". On the 27th page of the manuscript is the description of *Brachyorrhos badius*. As there are some slight differences between the description as published by F. Boie and the description in H. Boie's manuscript it seems worthwhile to reproduce the Ms description here:

"*Brach: badius*

brach — scuto orbitali anteriori nullo, loreo elongato, seriebus squamarum trunci 17, supra badius subtus colonique cervicali interrupto vitellinus, fasciis tribus transversis in anteriori dorsi parte fuscis 154+36."

Upon searching our collections I found several old jars labelled *Atractus badius* which could have served for Boie's description of this species. It soon turned out that only RMNH 120 could have contained the material on which Boie based his description of *badius*. Of the five specimens originally in this jar two turned out to belong to *Liophis breviceps* Cope and probably these specimens became associated with the other three somewhere between 1827 and 1837. In this last year Schlegel (1837) gave a short description of *Calamaria badia*, at the same time synonymising *flammigerus, schach* and *torquatus*. From the data on the oldest label of RMNH 120 it is clear that the specimens were together when Schlegel examined them and noted numbers of ventrals on the label. One of the two numbers clearly refers to one of the

Liophis breviceps (RMNH 18667), the other refers to a specimen of *badius* (RMNH 120b). The specimens of *badius* remaining in RMNH 120 respectively have 146, 138 and 153 ventrals, when counting according to the Dowling method. Boie and Schlegel used to count ventrals in a different way, often including one or more gular scales. The number of ventrals of RMNH 120c is close enough to the number of 154 published by F. Boie to justify the selection of RMNH 120c as lectotype of *Brachyorrhos badius* F. Boie. Although the tail of this specimen is damaged and the original number of subcaudals can not be given, I am rather confident that RMNH 120c is one of the syntypes Boie referred to. As happened often in that period the scale counts of several specimens may have been combined to reach the combination 154 + 36. It still is not clear from which specimen the "36" count was taken. RMNH 120c, here selected as lectotype, is a female with a snout-vent length of 302 mm, tail length 36 mm, 153 ventrals, one undivided anal, subcaudals in two rows, 24 pairs left, scales in 17-17-17 rows; seven supralabials, third and fourth entering the orbit; seven infralabials, the three anterior ones in contact with the chin shields; 1 + 2 temporals, two postoculars, no preocular and six maxillary teeth. The colours have faded, but the pattern is still recognisable. The head is dark-brown with a cream band across the occiput, followed by a dark-brown band on the nape; anterior part of body with pairs of dark-brown bands, alternating on the flanks; posterior part of body dark-brown with light transverse bands, pairs of dark-brown bands hardly recognisable. Belly immaculate, creamish; ventral surface of tail light brown. The remaining specimens RMNH 120a and b (both males) become automatically paralectotypes and agree in most characters with the female, differences are in snout-vent length (285, 235 mm), tail length (60, 47 mm), ventrals (146, 138) and subcaudals (44, 40). The pattern of both is more bold, but agrees with that of RMNH 120c, whereas the posterior part of the belly of RMNH 120a shows a median row of dark brown spots.

This also seems to be a convenient opportunity to restrict the type locality. The locality from which the syntypes of *Brachyorrhos badius* came, "Guyane" as is stated in French on the label and in our register, can mean the entire region nowadays indicated with the name Guiana (Hoogmoed, 1979). However, it is most likely that they came from either one of the territories now known as Guyana, Surinam and French Guiana. As most of the Dutch contacts have been with Surinam, as no further data about the provenance of the specimens are known, and as the species is known to occur in Paramaribo, I here restrict the type locality to Paramaribo, Surinam.

There has been much confusion about the status and contents of this taxon. F. Boie (1827) described *Brachyorrhos badius*, *B. schach* and *B. flam-*

migerus on the basis of material in the Leiden Museum. Schlegel (1837), who had access to all of this material, started the confusion by stating "Cette espèce, que l'on vient de nous adresser de Cayenne, a déjà été antérieurement introduite par feu Boie dans son grand ouvrage, où elle figure sous quatre noms divers, savoir: BRACH: BADIUS, TORQUATUS, SCHACH et FLAMMIGERUS. Les individues, qui ont servi de types à ces prétendues espèces, font partie du Musée des Pays-Bas: ils proviennent de plusieurs collections, faites anciennement". By thus synonymising *schach*, and *flammigerus* (*torquatus* being a nomen nudum) with *badius* and also including two specimens of *Liophis breviceps* in his concept of the species, he created a concept of *badius* which was far beyond its real scope. All subsequent authors included *schach* and *flammigerus* in *badius* on Schlegel's authority. This resulted in the recognition of several colour phases, which partly coincide with *schach* and *flammigerus* as described by Boie. Duméril et al. (1854) did not see the type material of *schach* and *flammigerus*, but on Schlegel's authority they included these names in the synonymy of their *Rabdosoma badius*, in which they recognised two colour phases: phase A agrees with *Atractus badius* (F. Boie) as here understood, phase B with *A. flammigerus* (F. Boie) (see below). The next author dealing with this species was Boulenger (1894) who recognised five colour phases, the first two clearly belonging to *Atractus badius* (F. Boie), the fourth one to *A. schach* (F. Boie) and the fifth one to *A. flammigerus* (F. Boie). The third form from Peru could not be allocated with certainty.

The hemipenis, extending to the level of the 10th-13th subcaudal, is bilobed, sometimes very strongly so, the bilobation occurring at the level of the fourth to ninth subcaudal. The sulcus spermaticus bifurcates at the level of the third to sixth subcaudal. The basal part of the hemipenis has longitudinal plicae and a naked basal pocket extending to the level of the second to fourth subcaudal; the central and distal parts are covered with spines, those in the distal part being smaller (cf. Savage, 1960, fig. 4B). This is the undifferentiated type of hemipenis distinguished by Savage (1960). The confusion about the correct status of *A. badius* is convincingly demonstrated by Savage's (1960) statement that one character of the "*Badius* Group" is the possession of a differentiated hemipenis, whereas the species giving its name to the group has an undifferentiated hemipenis. Apparently Savage's idea about *Atractus badius* strongly differs from that presented here on the basis of the original type material.

Dixon & Soini (1977) report this species from Iquitos, but from their data, and after having examined six of their specimens, it is clear that they had a different species before them: the number of subcaudals is too low

and the pattern is very different from that of the type specimens of *badius*. Dixon & Soini (1977) are of the opinion that 50% of their material fits Cope's description of *Rhabdosoma microrhynchum* and consequently suggest that this name (the type specimen of *microrhynchum* unfortunately has got lost) is a synonym of *badius*. I am not completely convinced of this agreement and I am inclined to consider the specimens described by Dixon & Soini (1977) as belonging to an as yet undescribed species.

Although the holotype of *Rabdosoma badium* var. *subbicinctum* Jan could not be examined, the description and the figure published by Jan & Sordelli (1865) are sufficient to decide that this specimen belongs to *Atractus badius* (F. Boie). The same is true for *Atractus micheli* Mocquard; although the holotype was not examined, the description hardly leaves any doubt as to its real nature. The scale counts, its size and the colour pattern all point to it being *Atractus badius* (F. Boie). The only character not in favour of this opinion would be the presence of a small preocular surmounting the loreal. This character would suggest *micheli* to be synonymous with *favae* (Filippi), but all other characters strongly contra-indicate this. As will be evident from the following pages several scale characters of the head, which were thought to be species specific have turned out to show a slight degree of variation, even within specimens. Therefore, I think that the presence of a small preocular in the holotype of *micheli*, hardly poses a problem and that it can be synonymised without reserve with *A. badius* (F. Boie).

Van Lidth de Jeude (1914-17) reported on RMNH 5689 and said that the Surinam name for this snake was Fajasnéki.

Atractus elaps (Günther)

Rhabdosoma elaps Günther, 1858: 241.
Atractus elaps: Dixon et al., 1976: 224; Hoogmoed, 1979.

Material. — SURINAM. 1 ♂, ANSP 3335, Cope collection.

Diagnosis. — A large species of *Atractus* with blunt head and short tail (16% of total length in the single available male). Snout-vent length in one male 474 mm, tail length 89 mm. Six supralabials, third and fourth entering the orbit. Seven infralabials, four in contact with the chin shields. Loreal pentagonal, short, 1.7 times as long as high. One postocular. Frontal wider than long, as long as its distance to the tip of the snout. Scales on body smooth, without apical pits, in 15 rows. Ventrals in the single available male 150. Subcaudals 35. Maxillary teeth eight. Hemipenis bilobed, undifferentiated. Snout and anterior part of head black, with a small creamish spot just behind the nostrils and a creamish transverse band on the back of the head,

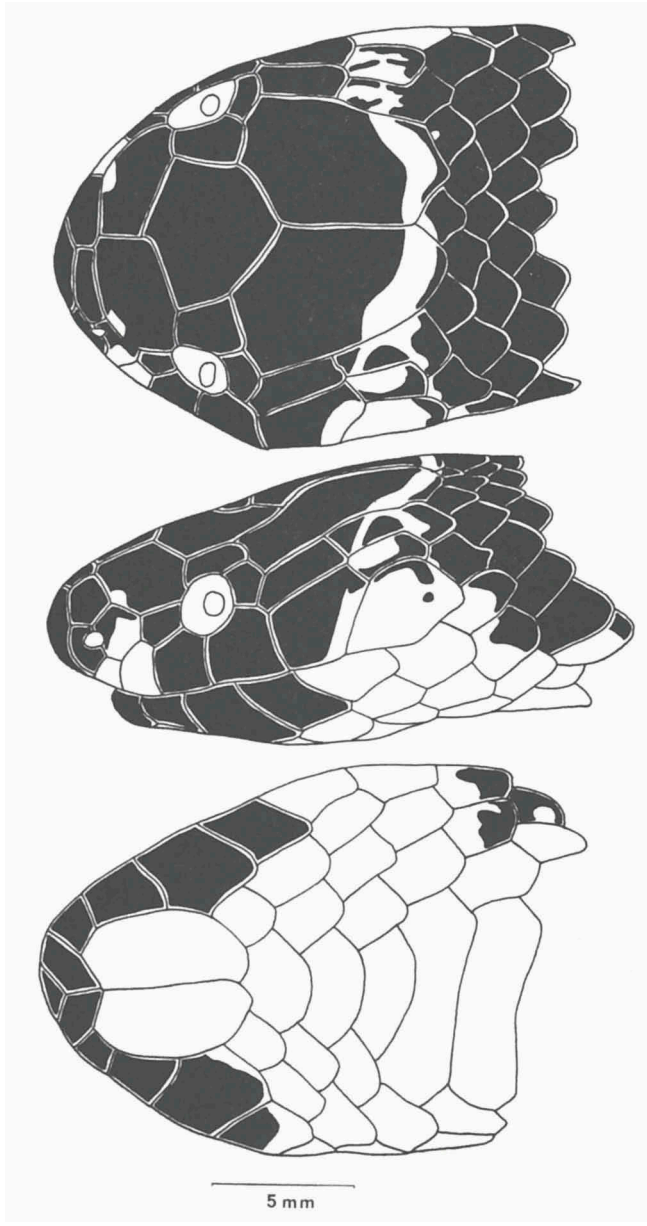

Fig. 4. Dorsal, lateral and ventral views of the head of *Atractus elaps* (Günther), ANSP 3335.

followed by a black band across the neck. Body with 49 wide black and 48 narrow creamish cross-bands. The black bands arranged in pairs, the pairs being separated on the flanks by triangular light areas. Within each black band dorsally and laterally a narrow creamish transverse line (of equal width throughout), extending to the lateral part of the ventrals, rarely continuous, the two parts of each black band being united on the belly. The pattern on the back thus consists of groups of four black bands, the members of each group separated from each other by narrow light bands, the groups separated from each other by wider interspaces, noticeably on the flanks. Belly creamish, with 31 transverse, black bands, which are mostly narrower than the light interspaces. Pattern on tail essentially the same as on body, but less distinct.

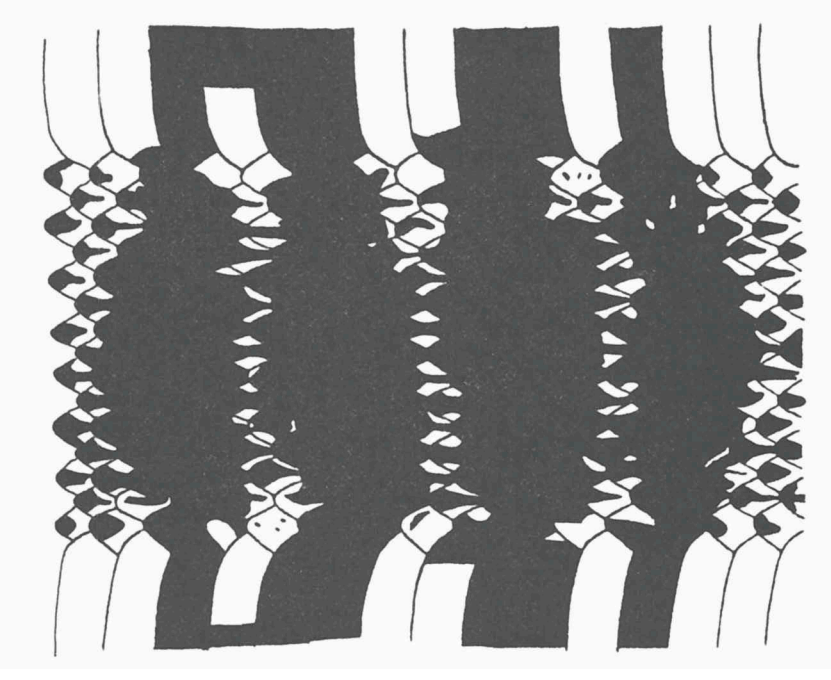

Fig. 5. Pattern on anterior part of body of *Atractus elaps* (Günther), ANSP 3335 (head is to the left).

Colour in life. — No data are available for ANSP 3335, but from the literature it is clear that the species has a pattern of wide black and narrow red and yellow bands (Dixon & Soini, 1977; Savage, 1960). A good coloured illustration is given by Duellman (1978).

Habitat. — For the Surinam specimen no data are available. Dixon & Soini (1977) and Duellman (1978) provide data on this subject which prove

that this is a ground dwelling snake in forested areas, either disturbed or undisturbed, which even enters the water. Most specimens were found in or under objects.

Natural history. — No data available.

Range and distribution. — Until recently only known from "Oriente and interandean highlands of Ecuador, northern Peru, eastern Colombia and Amazonas, Brazil" (Peters & Orejas-Miranda, 1970). Roze (1955 ,1961, 1966) reported this species from south-western Venezuela and Dixon et al. (1976) mentioned its occurrence in Colombia, Ecuador, Peru, Venezuela and Surinam. If the locality of ANSP 3335 is correct, this specimen considerably extends the known range of the species to the east. Considering the fact that *Atractus latifrons* (Günther), another supposedly "upper Amazonian species" of this genus, recently also was found in Surinam, the locality is not so unlikely as Dixon et al. (1976) think. This may be a species with an Amazonian Arc distribution (see also: Hoogmoed, 1979). However, considering the state of the Cope collection, it is not impossible that wrong locality data were entered during the cataloguing of the collection around 1900 (Malnate, in litt.). Nevertheless, I include this species as belonging to the Surinam herpetofauna, because the extent of its established distribution does not make its occurrence in Surinam unlikely.

Remarks. — The hemipenis, extending to the level of the 11th subcaudal, is bilobed, the bilobation occurring at the 10th subcaudal. Sulcus spermaticus bifurcates at the level of the seventh subcaudal. A basal naked pocket extends to the sixth subcaudal, the basal and central area bear large, wide spines, gradually decreasing in size towards the tip of the hemipenis. The arrangement agrees with Savage's (1960) undifferentiated type of hemipenis.

Atractus favae (Filippi)

Calamaria favae Filippi, 1840: 16; Peters & Orejas-Miranda, 1970: 327; Savage, 1960: 32.

Rabdosoma longicaudatum Duméril, Bibron & Duméril, 1854: 106; Jan, 1862: 15; Jan, 1863: 31; Jan & Sordelli, 1865: livr. 11, pl. I, fig. 2, p. 7.

Rabdosoma favae: Jan ,1862: 16; Jan, 1863: 32; Jan & Sordelli, 1865: livr. 11, pl. II, fig. 3, p. 7.

Atractus favae: Boulenger, 1894: 313; Parker, 1935: 523; Hoogmoed, 1979.

Material. — SURINAM. 1 ♀, RMNH 13588, leg. H. F. C. ten Kate.

GUYANA. Demerara near Mackenzie: 1 ♂, BM 1934.11.1.132, 27-VIII-1933, leg. C. S. Carter. Georgetown: 1 ex., AMNH 17678, leg. W. F. H. Rosenberg. Wismar: 1 ex., AMNH 61557, leg. A. S. Pinkus.

"JAVA". 1 ♀, MP 3315 (syntype of *Rabdosoma longicaudatum* Duméril, Bibron & Duméril).

No known locality: 1 ♀, RMNH 121; 1 ♂, RMNH 18681, from the old galleries; 2 ♂♂, BM 63.9.2916, 1963.998.

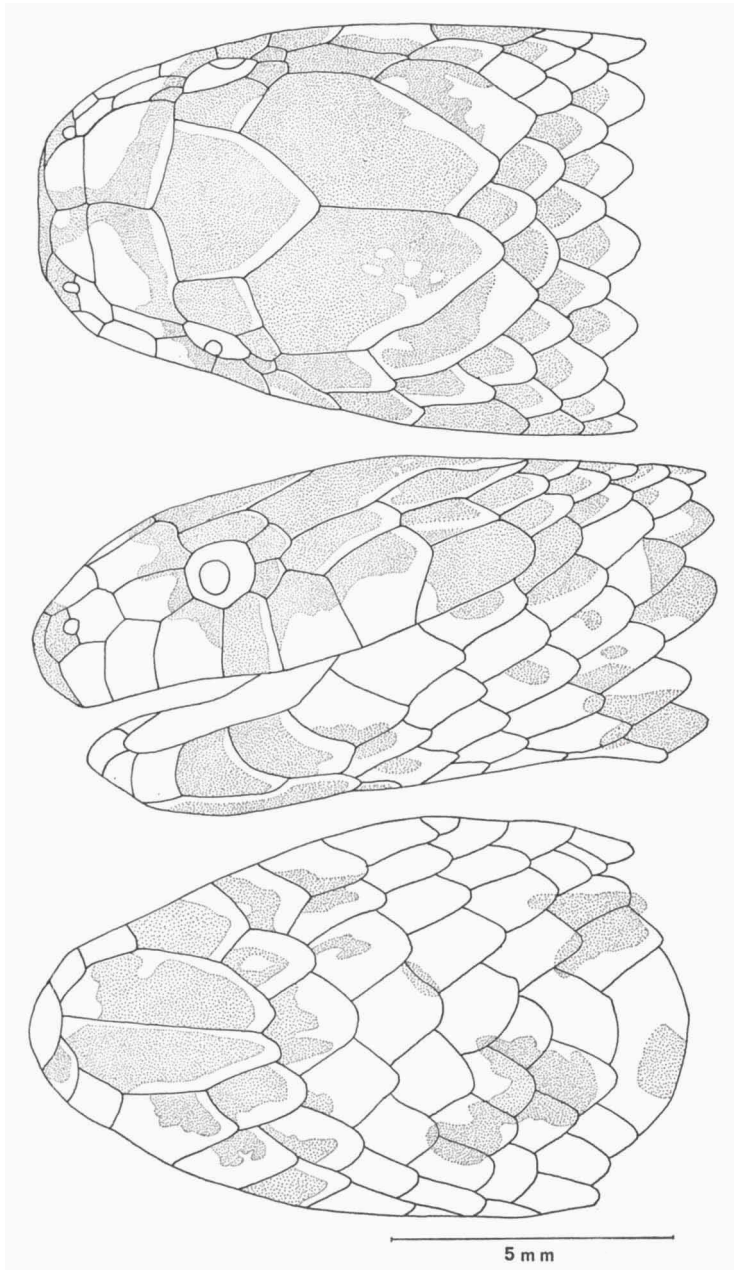

Fig. 6. Dorsal, lateral and ventral views of the head of *Atractus favae* (Filippi), RMNH 13588.

Diagnosis. — A long species of *Atractus*, with blunt head and very long tail (22.0-26.3% of total length in males, 24.6-25.1% in females). Maximum snout-vent length in females 403 mm, in males 336 mm; maximum tail length in females 135 mm, in males 107 mm. Seven supralabials, third and fourth entering the orbit. Seven infralabials, three in contact with the chin shields, which reach the mental. Loreal rectangular, 1.5-1.9 times as long as high, entering the orbit. A small preocular may be present above the loreal, but lacking in most specimens. Postoculars two. Frontal as long as wide, slightly shorter than its distance to the tip of the snout. Scales smooth, without apical pits, in 17 rows. Ventrals in females 177-180, in males 167-174. Subcaudals in females 66, in males 57-67. Maxillary teeth four to eight.

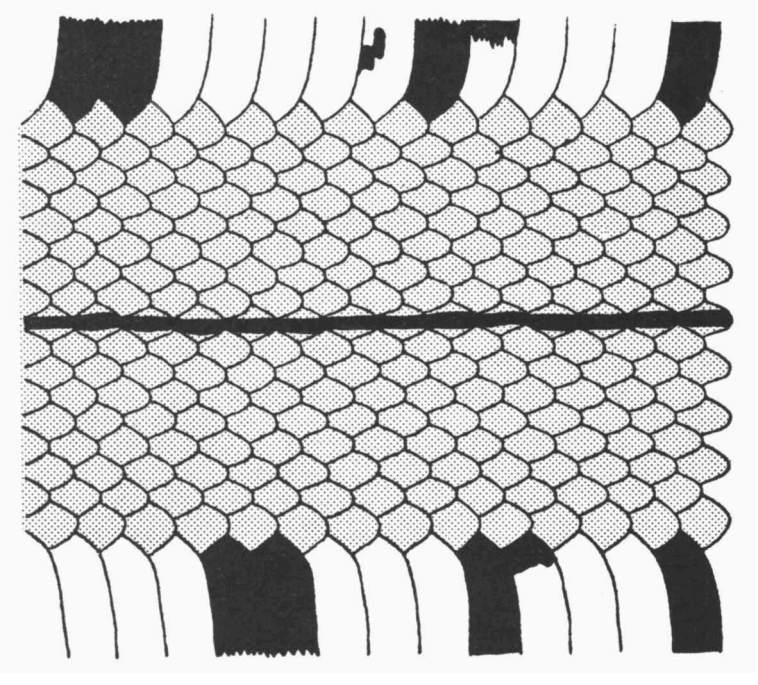

Fig. 7. Pattern on body of *Atractus favae* (Filippi), RMNH 13588 (head is to the left).

Hemipenis undifferentiated. Back brown with an indistinct, dark-brown vertebral stripe. Light spots on snout, extending from anterior supralabials, covering the pre-, the post-, the internasals and the greater part of the prefrontals. Rostral and median suture of internasals and prefrontals dark brown, separating the spots. A light spot on supralabials five and six. Belly and ventral surface of tail creamish with black cross-bars that frequently only extend to the middle and alternate with their counterparts.

Colour in life. — According to Parker (1935) it is "black above and banded black and coral-red beneath with a white spot around the vent".

Habitat. — B.M. 1934.11.1.132 was collected in "forest near Mackenzie".

Natural history. — The smallest male with well developed hemipenis has a snout-vent length of 245 mm and a tail length of 86 mm (BM 1934. 11.1.132).

Range and distribution. — So far the only definite locality known for this species was Mackenzie in Guyana. In the course of this study I obtained three more specimens with more or less exact localities, two in the collections of the AMNH and one in the RMNH collection. Both AMNH specimens are from Guyana, one from Wismar, very close to Mackenzie, the other from Georgetown, further north. The specimen from Surinam originates from the northern part of the country, because H. F. C. ten Kate, who collected it, did not travel south of the line Oreala-Armina Falls. All other known material of this species either has wrong locality data ("Java") or is of unknown origin. Probably this species is endemic to the Guiana Shield, possibly only to a small part of it in northern Surinam and Guyana.

Remarks. — This species long remained an enigma, one of the reasons for this being the fact that its origin was unknown. Boulenger (1894) placed this species in *Atractus*, an action questioned by Amaral (1929a) who was of the opinion that it was most probably different from this genus and was of Indo-malayan origin. The matter of the origin of this species was settled in 1935 when Parker reported on a specimen recently collected in British Guiana (BM 1934.11.1.132). The AMNH Guyanese and the RMNH Surinam specimens substantiate this finding. Parker (1935) commented upon the generic position of *favae* and expressed the opinion that *favae* and *longicaudatum* Duméril, Bibron & Duméril might be different species. This opinion mainly was based on the fact that in one specimen of *longicaudatum* a preocular is missing, whereas in others and in specimens of *favae* a small preocular is present. The Surinam specimen (RMNH 13588) solves this problem, because it shows an intermediate condition: on the left hand side no preocular is present and the prefrontal enters the orbit, on the right hand side a small preocular is present, excluding contact between prefrontal and orbit. Thus, there appears to remain no doubt about *longicaudatum* being identical with *favae*.

Another problem still remains, viz., the matter of generic allocation of this species. I think that there are a few reasons favouring the inclusion of *favae* in a genus different from *Atractus*. To my knowledge no generic name is available for that purpose, so it may prove necessary to establish a new genus. As my acquaintance with the entire genus *Atractus* is only limited

and as I am of the opinion that the proposal of a new genus for *favae* only would be justified in the context of a revisionary study of this group, I do not propose such a genus here. The characters that might indicate generic separation are the long, thick tail and the fact that the chin shields are in contact with the mental, both being unique within the genus *Atractus*.

The hemipenis (RMNH 18681) extends to the level of the ninth subcaudal; it is bilobed, the bilobation occurring at the level of the eighth subcaudal. The sulcus spermaticus bifurcates at the level of the fifth subcaudal. Basal part of the hemipenis with short longitudinal plicae and a naked basal pocket extending to the level of the fourth subcaudal; the central and distal parts are covered with short spines of equal length throughout. This is the undifferentiated type of Savage (1960, cf. fig. 4B).

Atractus flammigerus (F. Boie) (pl. 1 fig. a, pl. 3)

Brachyorrhos flammigerus F. Boie, 1827: 540, Wagler, 1830: 190.
Calamaria badia: Schlegel, 1837: 35 (partly).
Rabdosoma badium var. B: Duméril, Bibron & Duméril, 1854: 100.
Rhabdosoma badium (a, b): Günther, 1858: 11.
Atractus badius var. E: Boulenger, 1894: 309.
Atractus badius: Amaral, 1929b: 185 (partly); Peters & Orejas-Miranda, 1970: 27 (partly); Hoogmoed, 1979 (partly).
Atractus major: Reed & Borowsky, 1970: 161.
Atractus sp. B. Dixon & Soini, 1977: 37.

Material. — SURINAM. Distr. Suriname. Paramaribo: 1 ♂, RMNH 13573, 5-II-1962, leg. P. H. van Doesburg. Distr. Nickerie. Sipaliwini: 1 ♀, YPM R. 5912, 7-XII-1961. leg. R. Freund. Distr. Marowijne. Nassau Mountains: 1 ♀, RMNH 13571, km 3.7, 1-III-1949, 1 ♂, RMNH 13572, km 6, 7-III-1949, both leg. Suriname Expedition 1948-49.
GUYANE. 1 ♀, 1 ♂, RMNH 118, from Cabinet Brugmans (respectively lecto- and paralectotype of *Brachyorrhos flammigerus* F. Boie).
PERU. Distr. Loreto, Paraiso: 1 ♂, TCWC 42107.

Diagnosis. — A large species of *Atractus*, with blunt head and very short tail (8-10% of total length in females, 12-13% in males). Maximum snout-vent length in females 333 mm, in males 328 mm; maximum tail length in females 32 mm, in males 50 mm. Eight supralabials, fourth and fifth entering the orbit (exceptionally 7(3.4)). Seven or eight infralabials, four in contact with the chin shields. Loreal elongate, 2.2-3.0 times as long as high. Postoculars two. Frontal wider than long to longer than wide, as long as the prefrontals or as long as its distance to the rostral. Most scales on body smooth, without apical pits, in adults scales on posterior part of body, just anterior of vent, and on dorsal surface of tail keeled, very strongly so in adult males, forming longitudinal ridges. Ventrals in females 145-150, in males 138-149. Subcaudals in females 19-24, in males 26-31. Maxillary

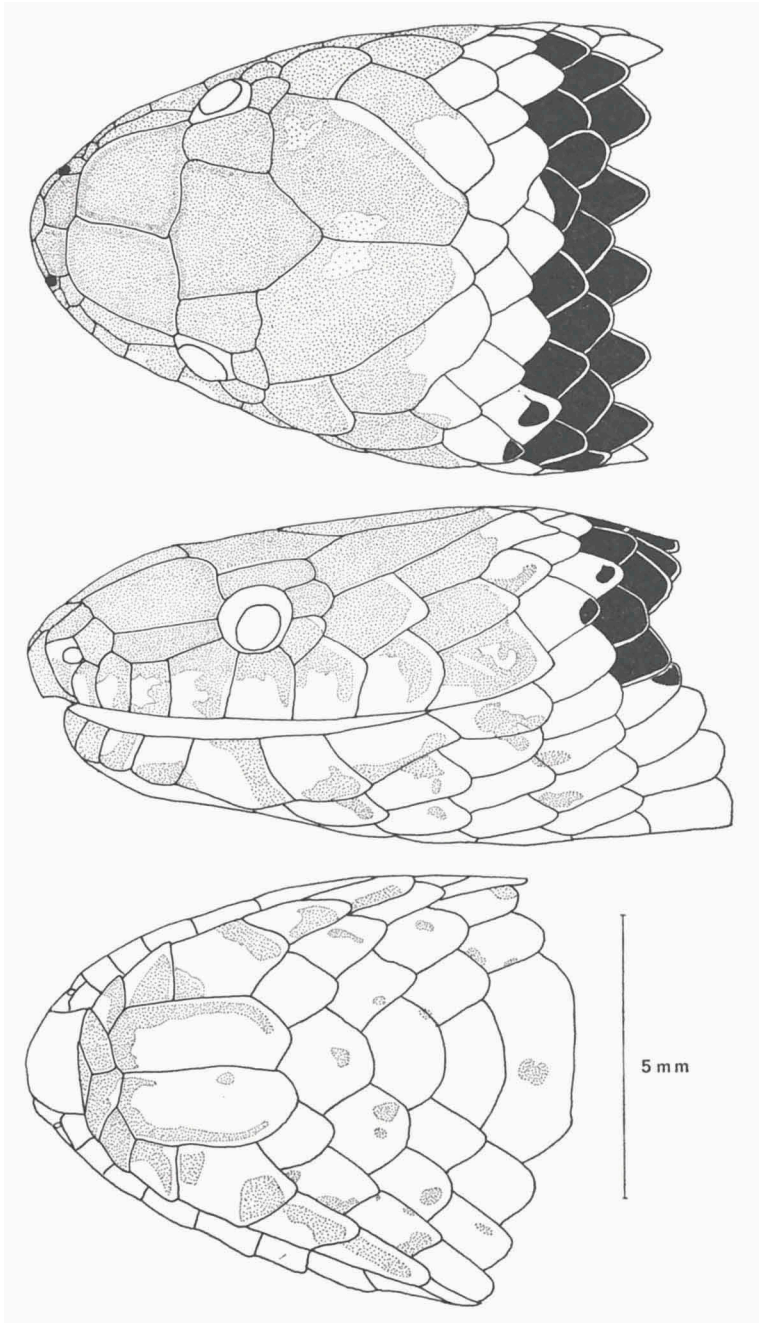

Fig. 8. Dorsal, lateral and ventral views of the head of *Atractus flammigerus* (F. Boie), RMNH 13572.

teeth seven or eight. Hemipenis bilobed, differentiated. Head brown, a wide, yellowish band across the occiput, followed by a black one. Back brown with black-margined light-brown to creamish spots, sometimes forming transverse bands, mostly forming rectangular or triangular spots on the flanks, alternating with those of the opposite flank. This pattern continues on the tail. Lower part of supralabials creamish, lower parts of infralabials and antero-lateral part of chin shields with black spots. Belly with rectangular brown or black spots, forming two more or less distinct longitudinal rows, rarely immaculate. Ventral surface of tail brown or grey, with or without light spots.

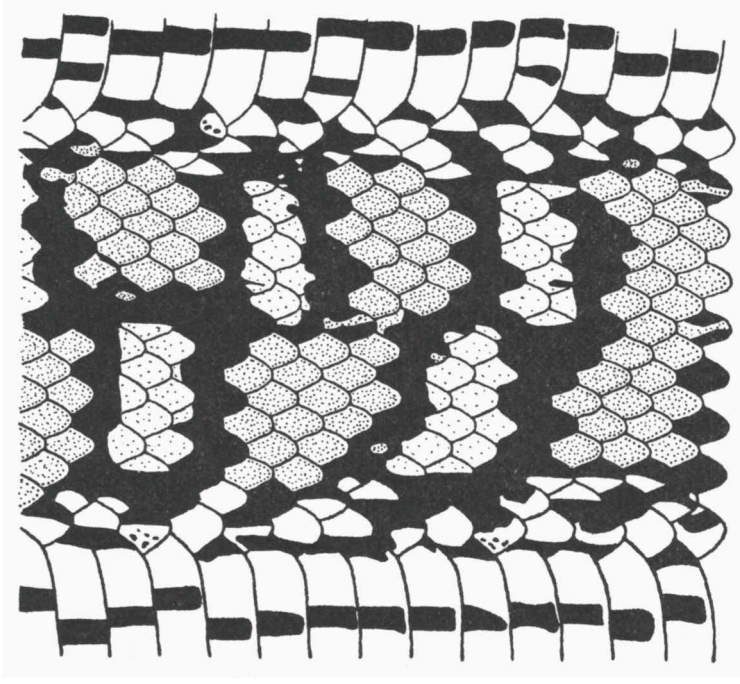

Fig. 9. Pattern on body of *Atractus flammigerus* (F. Boie), RMNH 13573 (head is to the left).

Colour in life. — No field data are available on this subject. In the files of the Rijksmuseum van Natuurlijke Historie I found a map with coloured plates of reptiles and amphibians, apparently destined to be used for the "Erpétologie de Java". The map was marked "Reptiles. 1 Volume. 10me Livraison". Apart from the plates there is a list titled "Designation des Planches pour le Graveur". From this list it is evident that originally there

were 57 plates, several of which now are missing. Plate 23, to which Schlegel (1837) refers, fortunately is still present and fig.2 shows "*Brachyorrhos flammigerus*", which is here reproduced on plate 1 fig. a. It was painted by P. van Oort, one of the artists of the Natuurkundige Commissie, probably after a relatively fresh specimen which was dark brown above with black-edged yellow spots. The specimen completely agrees with RMNH 118a, which is here selected as lectotype.

Habitat. — Only few data are available: RMNH 13573 was collected under a flower-pot in the Botanical Garden, YPM R.5912 in "jungle", RMNH 13571 and 13572 were collected in rain forest. Apparently this species occurs in forest, both primary and secondary.

Natural history. — No data on this subject are available.

Range and distribution. — Until now only known from Surinam, from the Iquitos region ("*Atractus* sp. B." of Dixon & Soini, 1977) and from Pará, Brazil (Günther, 1858; Boulenger, 1894: "var. E."). In Surinam it occurs from sea level to an altitude of at least 500 m. At Sipaliwini and in Paramaribo it is sympatric with *Atractus torquatus*, in Paramaribo and at Nassau Mountains it is sympatric with *A. badius*. At Nassau Mountains also *A. zidoki* is present alongside *A. badius* and *A. flammigerus*.

Remarks. — The hemipenis, extending to the level of the ninth to tenth subcaudal, is bilobed, the bilobation occurring at the level of the seventh to ninth subcaudal. The sulcus spermaticus bifurcates at the level of the fifth to sixth subcaudal. At its base there are longitudinal plicae, a basal naked pocket extending to the level of the third to sixth subcaudal, the central area is covered with spines, the distal region with scalloped calyces (Savage, 1960, fig. 4A), an arrangement that according to Savage would be typical for species of the "*Badius* Group" that have a differentiated hemipenis.

This species was described by F. Boie (1827) apparently on the basis of two specimens, the ventral and subcaudal counts of which were given as 151-55 + 21-26. RMNH 118 is provided with an old label on which the name *Calamaria badia* var. and the counts 145-26 and 151 + 21 appear. The two specimens in the jar, a female and a male, respectively have 150 and 143 ventrals and 19 and 26 subcaudals. These data (obtained according to the Dowling method) are close to the data on the label and to those published by F. Boie who apparently based himself not on the specimens but completely on the unpublished manuscript of the "Erpétologie de Java" by his brother H. Boie. In this manuscript the same counts as published by F. Boie are found, apparently H. Boie made a mistake in transcribing the data from the label into the manuscript. As there are some rather important differences between the description published by F. Boie and the

description in the manuscript, the last one is here reproduced because it gives a much better understanding of the species concerned:

"*Brach*: *flammigerus*

Brach. — scuto orbitali anteriori nullo, loreo elongato, gularibus 3, seriebus squamarum trunci 17, supra fuscus fasciis transversis sinuatis ferrugineis flammeus, subtus ferrugineus fusco nebulosus 151-155 + 21-26".

As has been pointed out above, a coloured figure of the female (RMNH 118a) was discovered together with the manuscript. As the specimens in RMNH 118 unmistakably are the syntypes of *Brachyorrhos flammigerus* F. Boie, I here select the female RMNH 118a as the lectotype of this species and the male RMNH 118b as the paralectotype. RMNH 118a has a snout-vent length of 313 mm, a tail length of 27 mm, 150 ventrals, one undivided anal, subcaudals in 19 pairs, scales in 17-17-17 rows; the specimen is aberrant in possessing only seven supralabials of which the third and fourth enter the orbit; eight infralabials, the anterior four in contact with the chin shields; 1 + 2 temporals, two postoculars, no preocular and seven maxillary teeth. The pattern is still well preserved (pl. 1). The paralectotype RMNH 118b has a snout-vent length of 275 mm, tail length 36 mm, 143 ventrals, subcaudals in 26 pairs, eight supralabials of which the fourth and fifth enter the orbit.

It seems useful to restrict the type locality now. Like the syntypes of *Brachyorrhos badius*, the syntypes of *B. flammigerus* according to the (French) data on the label and in the register, also came from "Guyane". For the same reasons as mentioned under *Atractus badius*, I here restrict the type locality of *B. flammigerus* to Paramaribo, Surinam.

F. Boie (1827) was right in describing this species as distinct from *badius* and *schach*, while Schlegel (1837) erred in synonymising *flammigerus* and *schach* with *badius*, as has been pointed out above. On the basis of recently collected material and the Boie syntypes it turned out to be easy to recognise this species on the basis of scale characters, hemipenis structure and colour pattern.

Reed & Borowsky (1970) reported YPM R.5912 as *Atractus major*. I checked this specimen and it agrees completely with the syntypes and other recent specimens of *A. flammigerus*.

Atractus latifrons (Günther) (pl. 2 figs. c, d)

Geophis latifrons Günther, 1868: 415; Savage, 1960: 81.
Atractus latifrons: Hoogmoed, 1979.

Material. — SURINAM. Distr. Marowijne, Paloemeu: 1 ♂, USNM 159055, August 1964, leg. T. H. Lewis.

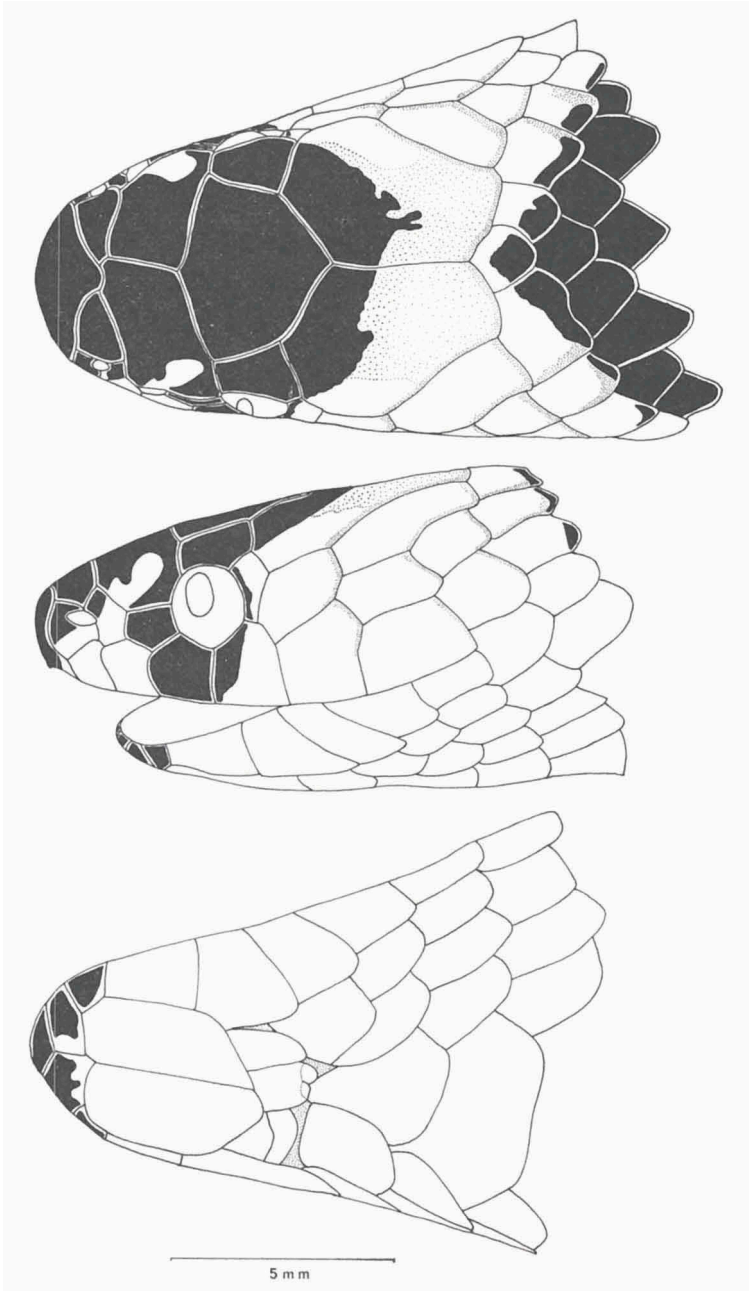

Fig. 10. Dorsal, lateral and ventral views of the head of *Atractus latifrons* (Günther), USNM 159055.

Diagnosis. — A large species of *Atractus*, with rather pointed head and short tail (16% of total length in the single available male). Snout-vent length in one male 341 mm, tail length 65 mm. Tail triangular in cross-section, with sharp dorsal ridge. Six supralabials, third and fourth entering the orbit.

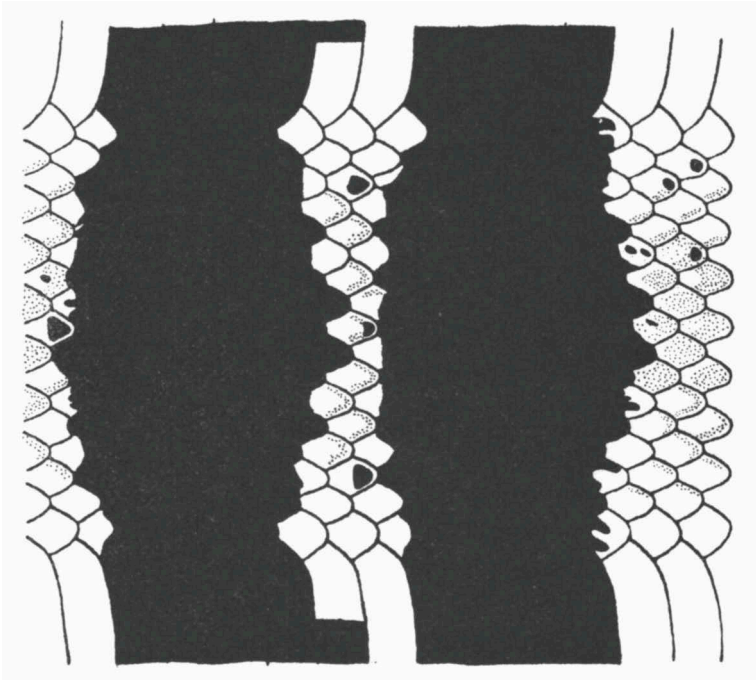

Fig. 11. Pattern on anterior part of body of *Atractus latifrons* (Günther), USNM 159055 (head is to the left).

Seven or six infralabials, four in contact with the chin shields. Loreal pentagonal, short, 1.3 times as long as high. One postocular. Frontal wider than long, as long as its distance to the tip of the snout. Internasals triangular, separated by the rostral. Nostril in a deep groove. Scales on body smooth, without apical pits, in 17 rows. Ventrals 146, subcaudals 36. Maxillary teeth five. Hemipenis bilobed, undifferentiated. Head black with a vertical light bar in front of the eye and a light transverse bar on the posterior part of the parietals. Body with 21 black rings, tail with five and a black tip. Last black ring on body ending on anal. Black rings in anterior part of body narrower than in posterior part, rings wider dorsally than ventrally. Light brown bands across back narrower than black rings, creamish cross-bands on belly of equal width or narrower than black rings.

Colour in life. — No data are available for USNM 159055, but from the literature it is clear that the groundcolour of the back is either red or yellow (Boulenger, 1894; Dixon & Soini, 1977).

Habitat. — For the Surinam specimen no data are available, except that the Paloemeu area is covered with rainforest in which Indians have constructed a number of agricultural plots (slash and burn, shifting grounds) near the airstrip. Dixon & Soini (1977) report this species from recently cleared fields and orchards, and from a small clearing along a river bank.

Natural history. — No data available.

Range and distribution. — Until recently only known from "Western Brazil; eastern Peru; eastern Colombia" (Peters & Orejas-Miranda, 1970). This specimen considerably extends the known range to the east. Apparently this is another species with the "Amazonian Arc" distribution (Hoogmoed, 1979).

Remarks. — The hemipenis, extending to the level of the tenth subcaudal, is bilobed, the bilobation occurring at the ninth subcaudal. Sulcus spermaticus bifurcating at the fifth subcaudal. A basal naked pocket extending to the level of the third subcaudal. The entire organ covered with spines, gradually decreasing in size towards the tip of the hemipenis. This arrangement is typical of Savage's (1960) undifferentiated type of hemipenis.

Atractus zidoki Gasc & Rodrigues (pl. 4-5) [1])

Atractus sp. A. Hoogmoed, 1979 (as presented in 1977).
Atractus zidoki Gasc & Rodrigues, 1979: 548.

Material. — SURINAM. Distr. Brokopondo. Brownsberg: 1 ♂, RMNH 18684, 5-XII-1971, 1 ♂, RMNH 18685, 10-II-1972, both leg. G. F. Mees; 1 ♂, MCZ 146943, May 1975, leg. R. E. Mittermeier; 1 ♀, AMNH 108792, 16-II-1972, leg. C. W. Myers & J. Daly. Distr. Marowijne. Nassau Mountains: 1 ♂, RMNH 13781, 8-III-1949, leg. Suriname Expedition 1948-49. Benzdorp: 1 ♂, RMNH 13782, leg. A. M. H. Hermans. FRENCH GUIANA. 1 ♂, SEPANGUY no number.

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[1]) The manuscript of this article was presented for publication on February 8, 1979. The species here discussed originally was described as new, but after receipt of Bull. Mus. natn. Hist. nat. Paris, 4e ser., 1, 1979, section A, no. 2, published on June 30, 1979 and received in the RMNH on September 25, 1979, in which an article by Gasc & Rodrigues (1979: 547-557), describing this same species as *Atractus zidoki*, appeared, the manuscript (in its first printing stage) was retrieved from the printer and changes were made accordingly. Unfortunately no radical changes could be made, so in the text no reference to the paper by Gasc & Rodrigues (1979) is made, except under range and distribution. It suffices to say that we all independently came to the same conclusions and observed the same characters, unique within the genus *Atractus*. It is regrettable that lack of communication caused this duplication of efforts, where cooperation would have lead to a much more complete picture of the snake under consideration.

Diagnosis. — A small species of *Atractus*, not exceeding a total length of 280 mm in the series here reported. Tail 13-15% of total length. Head rather pointed. Seven (exceptionally eight) supralabials, third and fourth (and, exceptionally, fifth) entering the orbit. Seven infralabials, three in contact with the chin shields. Loreal pentagonal, short, 0.6-1.6 times as long as high. Postoculars two. Frontal as long as wide or longer than wide, slightly longer than its distance to the rostral or equal to its distance to the tip of the snout. Scales smooth, with two apical pits, scales on flanks in front of anus with blunt keels. Ventrals 173-182, subcaudals 39-44. Maxillary teeth four or five. Hemipenis undifferentiated, not bilobed. Head brown with light temporal spots and a dark brown collar. Back light brown with longitudinal series of paravertebral spots. A white stripe on the lower row of dorsal scales, a brown stripe on the edge of the ventrals. Belly immaculate, sometimes a brown median stripe on ventral surface of tail.

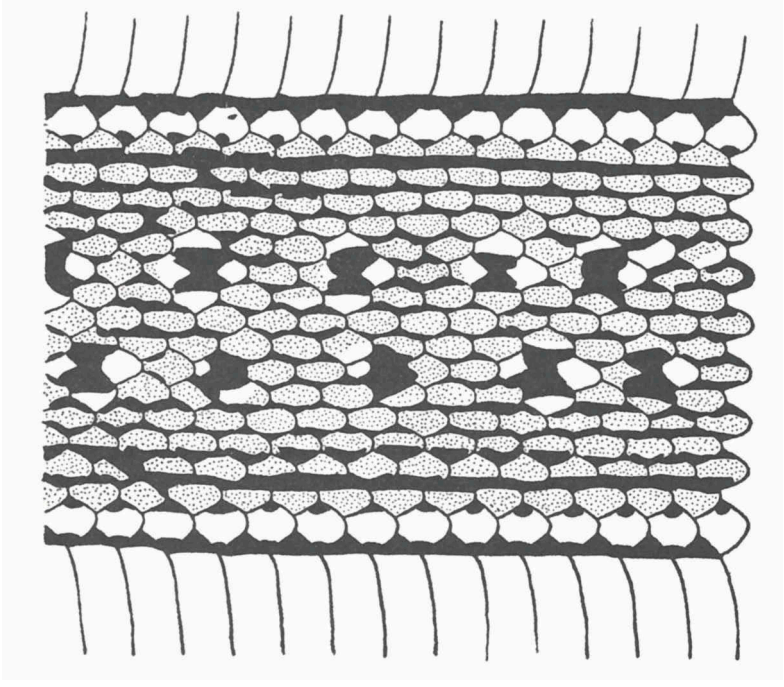

Fig. 12. Pattern on body of *Atractus zidoki* Gasc & Rodrigues, RMNH 18684 (head is to the left).

Description. — Rostral wider than deep, well visible from above. Nostril in the suture between pre- and postnasal. Loreal pentagonal, short, 0.6-1.6 times as long as deep. No preocular. Two postoculars, the upper one largest.

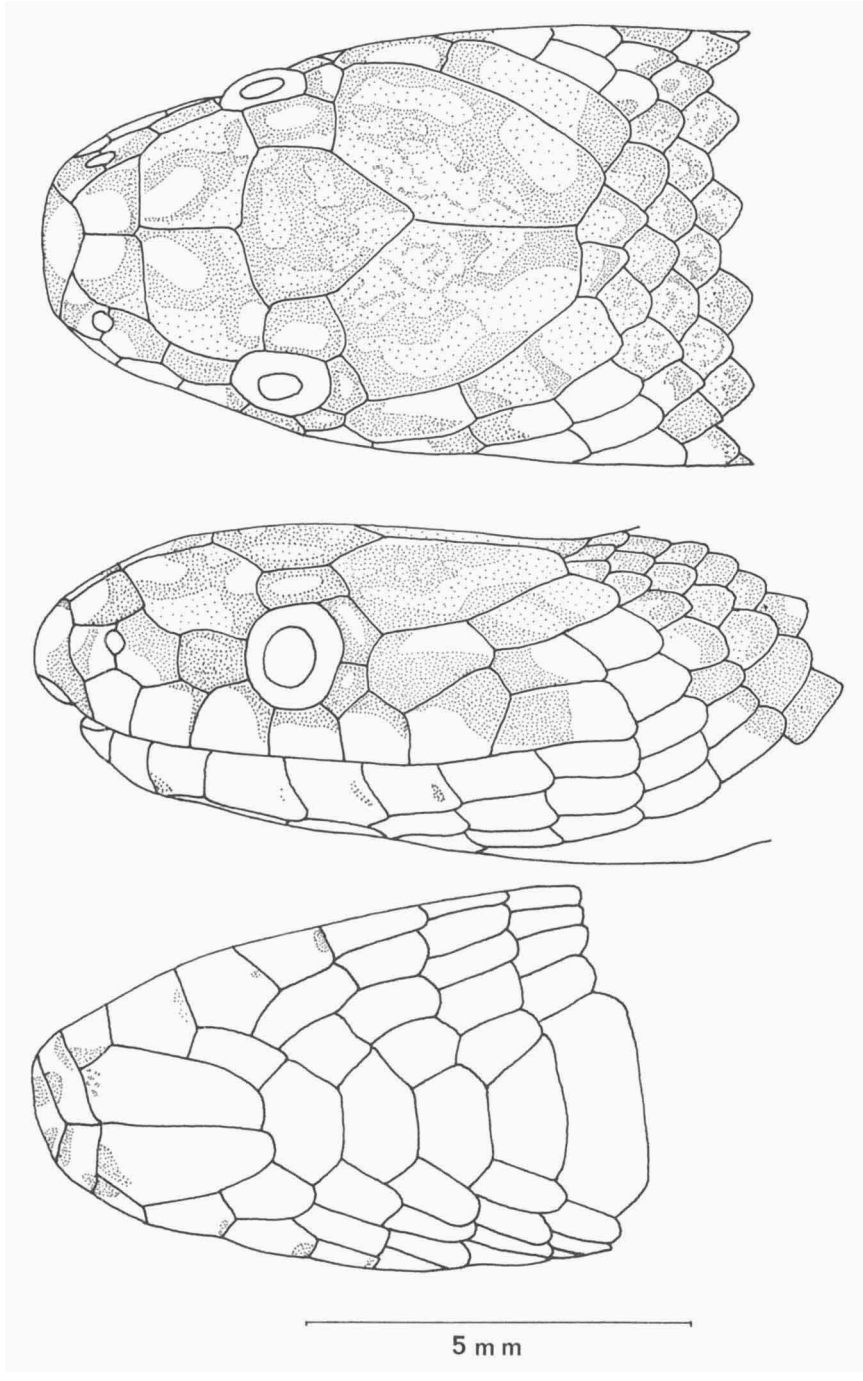

Fig. 13. Dorsal, lateral and ventral views of the head of *Atractus zidoki* Gasc & Rodrigues, RMNH 18684.

Temporals 1 + 2. Parietal bordered by either three or two temporal scales, when two the posterior one very long. Frontal hexagonal or pentagonal, mostly as long as wide (in MCZ 146943 longer than wide), slightly longer than its distance to the rostral (in MCZ 146943 as long as its distance to the tip of the snout), shorter than the parietals. Internasals small, pentagonal, as wide as long or wider than long, forming a median suture which is 1/2-2/3 as long as suture between the prefrontals. Prefrontals much larger than internasals, polygonal, as long as wide or slightly longer, entering the orbit. Seven supralabials, third and fourth entering the orbit, sixth and seventh larger than preceding five. RMNH 18684 has eight supralabials (third, fourth and fifth entering the orbit) on its right side. Seven infralabials, the anterior four in contact with the single pair of chin shields; first pair of infralabials forming a suture, thus separating mental and chin shields. Four gulars between chin shields and first ventral. Dorsal scales in 17-17-17 rows; smooth, except the lower three or four rows in the preanal region which bear short, blunt keels (very distinct in RMNH 13782), all scales with two apical pits (pl. 5). Ventrals 173-182, anal entire, subcaudals in 39-44 pairs. Maxillary teeth four or five.

Snout round; head small, rather pointed, passing imperceptibly into the body. Snout-vent length 174-238 mm, tail length 28-42 mm, tail length 13-15% of total length. Body cylindrical, tail short, conical.

Hemipenis (inverted organ) single, subcylindrical, extending to the level of the 11th-13th subcaudal. Sulcus spermaticus at the lateral surface, bifurcating at the level of the ninth subcaudal in RMNH 18684 (right organ). A very short smooth basal area, followed by a central area with large spines (to seventh subcaudal) and a distal area with shorter spines. Spines in central area arranged in longitudinal rows, spines well visible. In distal area spines more or less hidden between scalloped longitudinal plicae, which in the everted organ may give rise to an area with calyces mixed with spines. On the medial side, opposite the sulcus spermaticus, a fold that is distinctly wider than the other longitudinal folds.

Colour in life. — The ventral parts of RMNH 18684 were described as being bright red in life; AMNH 108792 as having a bright orange-red belly, the lighter stripe on the lower row of dorsals on the tail also being orange, that on the remaining part of the body yellowish or whitish.

Habitat. — All specimens were collected in rain forest. MCZ 146943 was crossing a road, but it is not known whether that was at day or at night. No other data are available.

Natural history. — Like all other members of this genus *A. zidoki* probably is subterraneous. AMNH 108792, a pregnant female, was regurgitated in

three pieces by a giant frog, *Leptodactylus pentadactylus* (L.), collected on February 16, 1972. This would mean that the eggs are deposited during the short dry season. The fact that the snake was eaten by this nocturnal frog indicates that it is active at night.

Range and distribution. — So far known from three localities in eastern and central Surinam, with elevations between 150 and 500 m, and from one locality (Trois Sauts) in southeastern French Guiana (Gasc & Rodrigues, 1979).

Remarks. — The present species differs from its congeners by its undivided hemipenis (bilobed in the other species, cf. Savage, 1960) and by the presence of apical pits. Another notable character are the bluntly keeled lateral scales just anterior of the anus, but this could be a character restricted to males and possibly also subject to seasonal variation. A similar situation is found in *Atractus flammigerus*, where both males and females may have keeled scales in the posterior part of the body and on the tail. Despite the differences mentioned above I have retained this species in the genus *Atractus* because in most scale characters and in its dimensions it agrees with this genus. The characters in which it differs have proved to be variable in other genera as well and a revision of the entire genus *Atractus* might result in finding more species with undivided hemipenis and apical pits.

Atractus schach (F. Boie) (pl. 1 fig. d, pl. 4 figs. c, d)

Brachyorrhos schach F. Boie, 1827: 540.
Brachyorrhos Schach: Wagler, 1830: 190.
Calamaria badia: Schlegel, 1837: 35 (partly).
Rabdosoma badium: Duméril, Bibron & Duméril, 1854: 95 (partly).
Rabdosoma badium (partly): Günther, 1858: 11; Kappler, 1881: 166; Kappler, 1885: 818; Kappler, 1887: 128.
Atractus badius var. D: Boulenger, 1894: 309.
Atractus badius: Hoogmoed, 1979 (partly).

Material. — SURINAM. 1 ex., SMNS 6259 (604), leg. A. Kappler. Distr. Nickerie. Encampment Gonini: 1 ♀, RMNH 18686, June 1968, leg. H. J. Kotzebue. Distr. Brokopondo. Mamadam: 1 ♂, RMNH 18687, March 1975, leg. v. d. Schee. Railway km 121: 1 ♂, RMNH 12863, May 1949, leg. C. Bleys. Distr. Commewijne. Encampment 8: 1 ♂, DGR 9, 10-III-1970, leg. D. G. Reeder.

GUYANE. 2 ♂ ♂, RMNH 119, from "Ancien Cabinet" (RMNH 119a is the lectotype of *Brachyorrhos schach* F. Boie, RMNH 119b is the paralectotype).

Diagnosis. — A small species of *Atractus*, with rather blunt head and very short tail (10% of total length in one female, 10-14% in males). Maximum snout-vent length in males 192 mm, same length in one female 115 mm; maximum tail length in males 24 mm, same length in one female 13 mm.

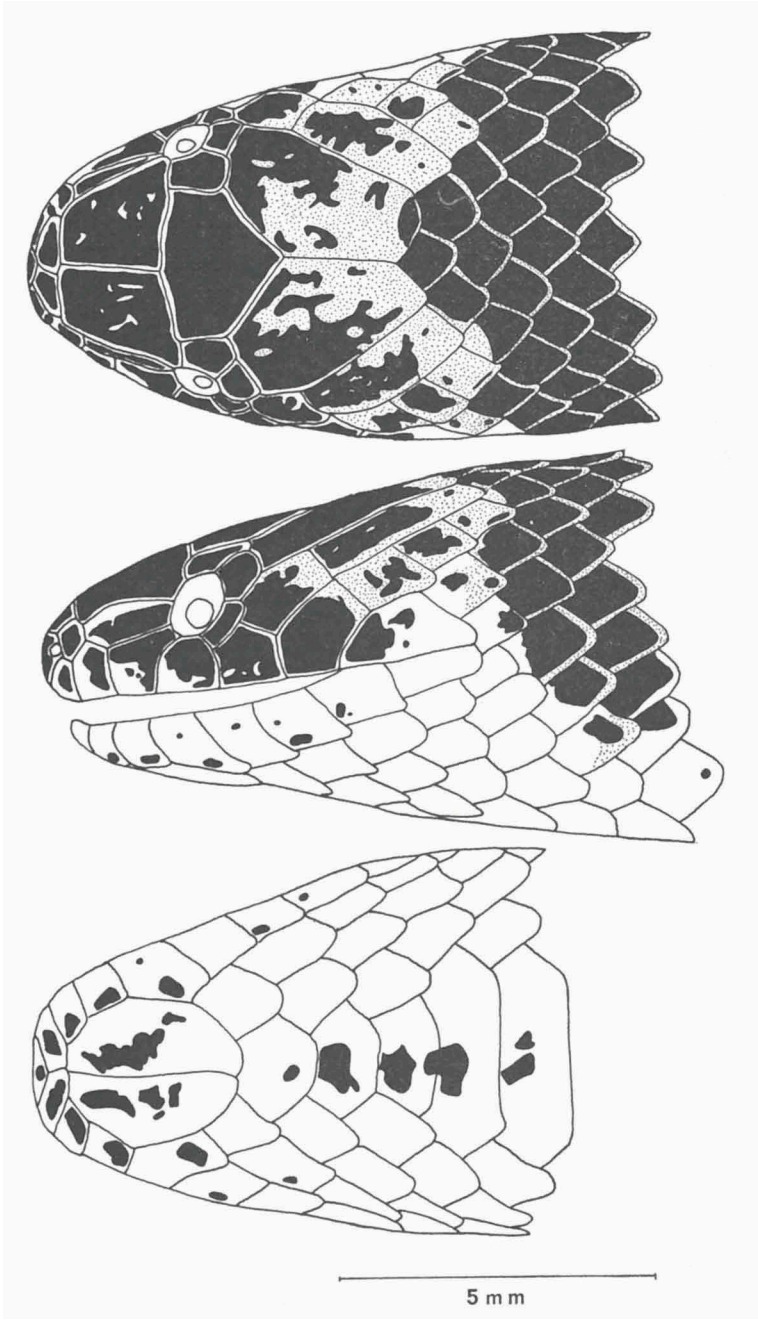

Fig. 14. Dorsal, lateral and ventral views of the head of *Atractus schach* (F. Boie), RMNH 18687.

Seven supralabials, third and fourth entering the orbit. Eight (exceptionally nine) infralabials, the anterior four (exceptionally five) in contact with the chin shields. Loreal elongate, 2.3-2.8 times as long as high. Postoculars two. Frontal wider than long, as long as, or slightly longer than, the prefrontals. Scales on body smooth, without apical pits, in 17 rows. Ventrals in one female 150, in males 145-151. Subcaudals in one female 19, in males 25-32.

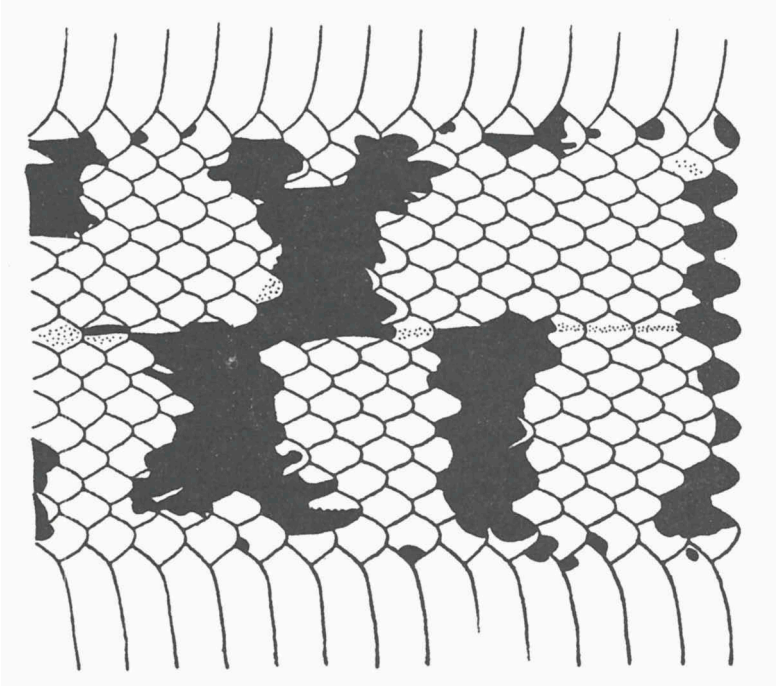

Fig. 15. Pattern on anterior part of body of *Atractus schach* (F. Boie), RMNH 18687 (head is to the left).

Maxillary teeth six or seven. Hemipenis bilobed, differentiated. Snout and anterior part of head black, a light brown, transverse band on the back of the head, followed by a black band on the neck. Body light brown with rectangular black blotches, those of both flanks either alternating or confluent. A vague but distinct black vertebral line. Blotches on flanks often bifurcating near the ventrals. Belly immaculate or with a single row of brown or black spots down the middle, posteriorly accompanied by other brown or black spots. Underside of tail either completely grey or heavily mottled with brown.

Colour in life. — Of RMNH 18687 several colour slides of the living animal (MSH 1975-XIII-31, 32, 36; 1975-XIV-1, 2, 3, 4) are available.

The back is orange brown with black blotches. The belly is white with a median row of black spots, underside of tail grey.

Habitat. — All specimens were collected in rainforest. RMNH 12863 was found in a prospection pit; DGR 9 was found during daytime, in leaf-litter in dry tropical forest. These data confirm that this species is a semi-fossorial species, as all other members of the genus on which habitat data are available.

Natural history. — No data available.

Range and distribution. — So far only known from four localities in western and central Surinam, with elevations between 20 and 150 m and from Manaos, Brazil (Boulenger, 1894). All Surinam localities are south of the coastal savanna belt.

Remarks. — The hemipenis, extending to the level of the 8th-14th subcaudal, is bilobed, the bilobation occurring at the level of the 6th-12th subcaudal. Sulcus spermaticus bifurcating at the level of the fifth to eighth subcaudal. A naked basal pocket extending to the third or fourth subcaudal, proximal part with longitudinal plicae, central part with long spines, distal part with deep calyces with spinulate ridges. This arrangement puts this species in Savage's (1960) "*Badius* Group" with a differentiated hemipenis.

F. Boie (1827) described this species on the basis of an unknown number of specimens of which no ventral or subcaudal count was recorded, only the number of scale rows on the back was given as 16. The only specimens agreeing with the description by Boie are RMNH 119. The jar containing these specimens still has attached an old label on which is written: "Calamaria badia, Brachyorrhos Schach Boie, 148 + 25 0, . . 08 + 0.022, 147 + 26". The specimens are from the old collection ("Ancien Cabinet"), present at the foundation of the Rijksmuseum van Natuurlijke Historie in 1820. Apparently these are the specimens that Schlegel (1837) put in the synonymy of his *Calamaria badia*. The two specimens in RMNH 119 thus are syntypes of *Brachyorrhos schach* F. Boie. The largest specimen (RMNH 119a) is selected as the lectotype, the smaller one thereby becoming a paralectotype (RMNH 119b). The measurements and counts of these specimens (both males) are respectively: snout-vent length 192 and 183 mm, tail length 24 and 21 mm, ventrals 145 and 151, subcaudals for both 25, anal undivided, scales in 17-17-17 rows; seven supralabials of which the third and fourth enter the orbit; eight infralabials, the anterior four in contact with the chin shields; 1 + 2 temporals, two postoculars, no preocular and six maxillary teeth. The pattern in RMNH 119a is well preserved, showing dark brown spots on a light brown background, with the vertebral stripe still evident. RMNH 119b is much more bleached and shows brown spots on a creamish

to white background, without trace of a vertebral stripe. Again the original description of H. Boie was found in the unpublished manuscript of the "Erpétologie de Java" and again some minor differences with the published description were noticed. It seems useful to repeat the Ms description here:

"Brach schach

Brach — scuto orbitali anteriori nullo, loreo elongato, seriebus squamarum trunci 16, supra e cinereo et fusco pallidus, linea dorsi media nigra maculis fuscis subquadratis huic contiguis, aliisque laterum minoribus tessellatus, subtus e ferrugineo albidus scutis abdominalibus posterioribus, subcaudalibusque nebulosus".

Strange enough this description does not contain any scale counts, which is an exception in the manuscript.

Again, as in *Brachyorrhos badius* and *B. flammigerus*, the syntypes come from "Guyane". For the reasons mentioned under *Atractus badius*, I here restrict the type locality to Mamadam, Saramacca River, distr. Brokopondo, Surinam.

Schlegel (1837) synonymised *Brachyorrhos schach* F. Boie with his *Calamaria badia* and in this action was followed by Duméril et al. (1854), who still list *B. schach* as a synonym. Günther (1858) apparently also followed Schlegel, but he was the last one to incorporate the name *B. schach* in his synonymy. Since Günther (1858) the name *B. schach* virtually disappeared and was not mentioned by Boulenger (1894), Amaral (1929b), Savage (1960) and Peters & Orejas-Miranda (1970). As has been said already above, Schlegel's action was wrong and *schach* represents a perfectly good taxon which differs from *badius* in the structure of the hemipenis, in scale counts, shape of the head, colour pattern and size. From *flammigerus*, the other species synonymised with *badius* by Schlegel, it differs in scale counts, in colour pattern and in size.

Atractus torquatus (Duméril, Bibron & Duméril) (pl. 1 fig. c, pl. 6)

Brachyorrhos torquatus (nomen nudum) F. Boie, 1827: 540; Wagler, 1830: 190.
Calamaria badia (partly): Schlegel, 1837: 35.
Rabdosoma torquatum Duméril, Bibron & Duméril, 1854: 101.
Rabdosoma varium Jan, 1862: 18; Jan, 1863: 32; Jan & Sordelli, 1865: livr. 11, pl. III, fig. 3, p. 7.
Rhabdosoma varium: Kappler, 1881: 166; Kappler, 1885: 818; Kappler, 1887: 128; Savage, 1960: 83.
Atractus torquatus: Boulenger, 1894: 309; Werner, 1928: 160; Amaral, 1929b: 189; Peters & Orejas-Miranda, 1970: 35; Hoogmoed, 1979.
Rhabdosoma torquatum: Savage, 1960: 83.
Atractus sp. A. Dixon & Soini, 1977: 37.

Material. — Unknown locality: 5 ex., RMNH 117, from Cabinet Hendriks (paralectotypes of *Rabdosoma torquatum* D., B. & D.).

SURINAM. 1 ♀, 1 ♂, RMNH 114-5, leg. H. H. Dieperink (lectotype and paralectotype of *R. torquatum* D., B. & D.); 1 ♀, ANSP 3332, leg. Hering; 1 ex., SMNS 625 (179), 1857, leg. A. Kappler. Distr. Suriname. Kwatta: 1 juv., RMNH 13575, 30-VI-1959, leg. E. van Brussel. Distr. Nickerie. Wilhelmina Mountains, Camp 3: 1 ♂, RMNH 13576, August 1963, leg. H. P. Pijpers. Airstrip Kayser Mountains: 1 ♀, RMNH 13577, 29-VIII-1963, leg. S. Ligorie; 1 juv., FMNH 129000, 1-II-1961, leg. H. A. Beatty. Lucie River, camp at mouth Vreedzaam Creek: 1 ♀, RMNH 18688, 14-II-1975, leg. M. S. Hoogmoed. Sipaliwini: 1 ♀, RMNH 18689, 5 km NW. airstrip, 9-II-1970, 1 ♂, RMNH 18690, 6 km NW. airstrip, 12-II-1970, both leg. M. S. Hoogmoed & J. J. P. Paats. New River, 750 feet: 1 ♀, 2 ♂♂, BM 1939.1.1.92-94, leg. C. A. Hudson. Boundary Camp: 1 ex., FMNH 309633, 19/IX-19/X-1938, leg. E. R. Blake. Distr. Saramacca. Linker Coppename River: 1 ♂, ZMA 13224, 15-V-1967, leg. H. Nijssen. Troeli Creek: 1 ♂, RMNH 18692, 1968, leg. H. A. M. de Kruijf. Distr. Brokopondo. Pokigron: 1 ♂, ZMA 13205, 23-III-1967, leg. H. Nijssen. Toekoemoetoe Creek, between Camp 15½ and 18: 1 ♀, ZMA 15214, 6-II-1922, leg. G. Stahel. Airstrip Rudi Kappel (Tafelberg): 1 ex., MSH fieldno. 1979-2484, 6.5 km NNW., 9-VI-1979, leg. M. S. Hoogmoed & W. N. Polder, 1 juv., MSH field no. 1979-2762, 6.5 km NNW., 11-VII-1979, leg. M. S. Hoogmoed, 1 ♀, MSH field no. 1979-2578, 16 km NW., 22-VI-1979, leg. M. S. Hoogmoed. Topplateau Tafelberg: 1 ♀, MSH field no. 1979-2713, third camp, 6-VII-1979, leg. M. S. Hoogmoed & W. N. Polder. Distr. Para. Zanderij: 1 juv., RMNH 18694, May, 1975, leg. A. Abuys. 10 km N. Onverwacht: 1 ♀, RMNH 18693, 13-I-1970, leg. M. S. Hoogmoed & J. J. P. Paats.

GUYANA. Demerara Falls: 1 ♀, 1 ♂, BM 72.10.16.72-73, leg. Cutter.

PERU. Distr. Loreto. Mishana: 1 ♀, TCWC 41411.

Diagnosis. — A large species of *Atractus*, with pointed head and short tail (14.1-16.9% of total length in males, 11.9-13.4% in females). Maximum snout-vent length in males 463 mm, in females 527 mm; maximum tail length in males 94 mm, in females 77 mm. Eight supralabials, fourth and fifth entering the orbit. Eight (exceptionally seven) infralabials, the anterior four (exceptionally three) in contact with the chin shields. Loreal elongate, 2-2.5 times as long as high. Postocular one. Frontal longer than wide, from as long as its distance to the rostral to longer than its distance to the tip of the snout. Scales on body smooth, without apical pits, in 17 rows. Ventrals in males 144-160, in females 151-172. Subcaudals in males 38-47, in females 36-42. Maxillary teeth seven to nine. Hemipenis bilobed, undifferentiated. Head and back light to reddish brown; a black collar on the neck some distance behind the head, distinct in most, indistinct in a few specimens. A series of dark brown to black spots on each side of the vertebral area, which may melt together to form transverse bands. On the flanks another row of dark brown to black spots. Lower part of the supralabials creamish. Belly cream-coloured with black spots, forming two rows; sometimes nearly uniform. Underside of tail with two rows of dark brown to black spots. Chin grey, extending posteriorly into two grey lines along the lower part of the infralabials.

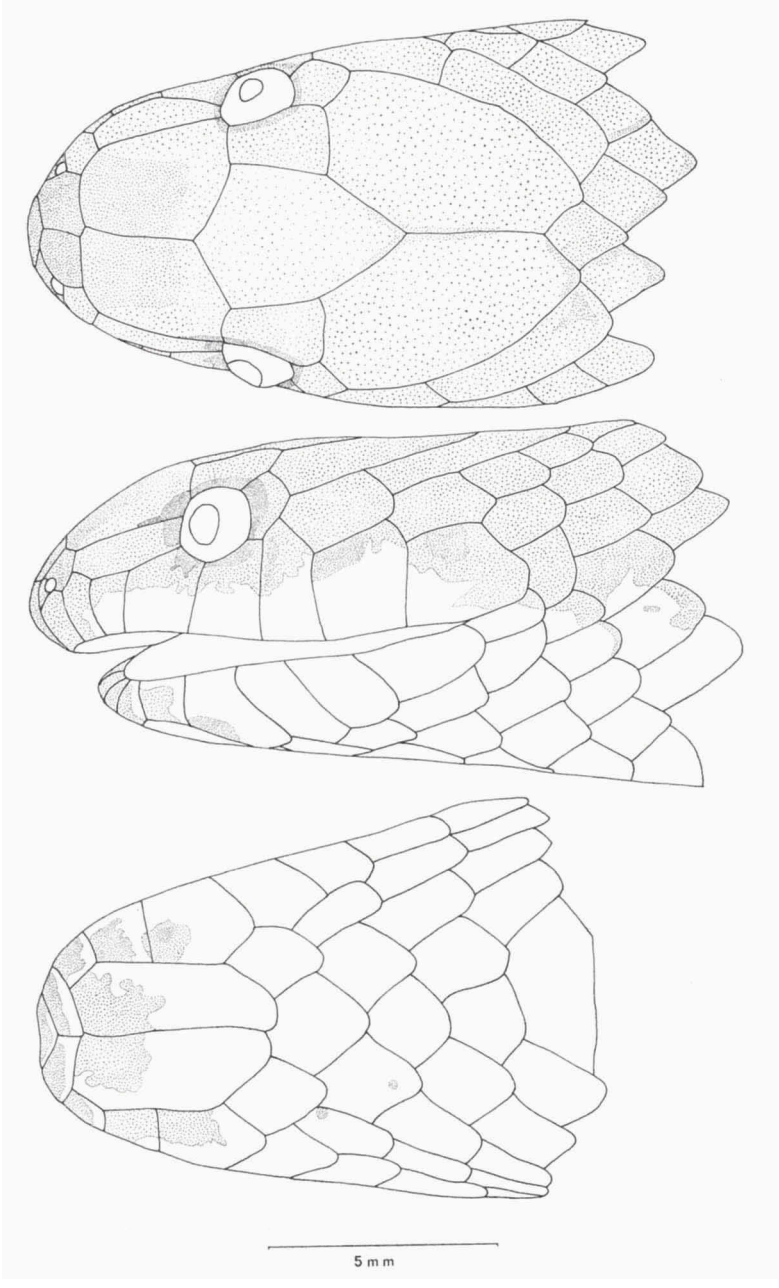

Fig. 16. Dorsal, lateral and ventral views of the head of *Atractus torquatus* (Duméril, Bibron & Duméril), RMNH 114 (lectotype).

Colour in life. — Upper parts iridescent dark greyish brown to reddish brown. Ventral parts creamish to yellow with brown spots. Underside of tail orange. Iris chestnut brown.

Habitat. — Most specimens accompanied by data on this subject come from rain forest areas. Of only a few specimens more detailed data are available. ZMA 15214 was found "on sand in creek" and consequently was supposed to be a "watersnake". RMNH 18689 was found inside a rotten log on the forest floor, RMNH 18688 was crawling at night over the ground in a camp on a river bank. My own observations indicate that this is a subterraneous (burrowing) snake that may leave its cover at night. During a recent field-trip to the Tafelberg in Central Surinam, four specimens of this species were collected. One (MSH field no. 1979-2484) was found at night at the edge of a large pond in rain forest, half of its body submerged in the water, the other half on the bank. The other specimens (MSH field no. 1979-2578, 2713, 2762) were all found in daytime, when tearing apart standing, decayed stumps of trees. The animals were all about 1 m above the ground. The stumps in which the snakes were found also contained numerous large annelids, which probably form the basic diet for this snake. The forest in which these three specimens were found can be described as rain forest (MSH 1979-2578), savanna forest along creek (MSH 1979-2713) and high dakama forest in creek valley (MSH 1979-2762). Most specimens accompanied by data were collected on the banks of rivers or creeks, but this may be an artefact, caused by the fact that most transportation in the interior of Surinam takes place along rivers. However, three of the specimens collected during the recent field-trip were closely associated with water, so this species may indeed prefer the vicinity of water.

RMNH 18690 was regurgitated by another snake, *Erythrolamprus aesculapii* (L.) (RMNH 18691), which was collected in a dry creek bed in rain forest.

Range and distribution. — Occurring throughout Surinam, north of the coastal savanna belt, in forested areas within this belt and south of it. Also known from Guyana, French Guiana, Peru ("*Atractus* sp. A." of Dixon & Soini, 1977) and Bolivia. Peters & Orejas-Miranda (1970) give its distribution as: "Amazonian Colombia and Bolivia; Amazonas, Brazil". Probably this species is distributed throughout the Guianas and the Amazon basin. In Surinam it occurs from sea level to at least 600 m.

Remarks. — The hemipenis, extending to the level of the 8th-12th subcaudal, is bilobed, the bilobation occurring at the sixth to ninth subcaudal. Sulcus spermaticus bifurcating at the fourth to sixth subcaudal. A naked basal pocket extending to the third or fourth subcaudal. Proximal part of

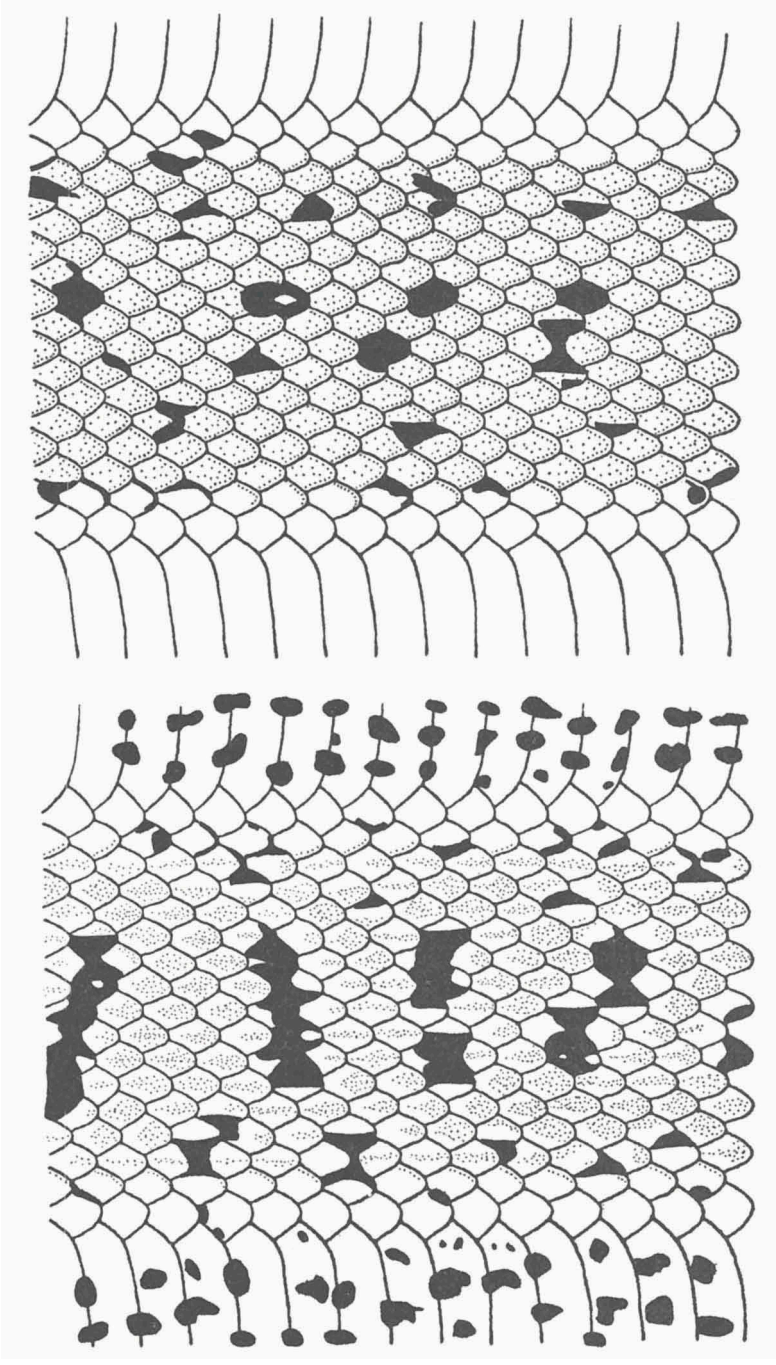

Fig. 17. Pattern on body of two specimens of *Atractus torquatus* (Duméril, Bibron & Duméril). Upper figure: RMNH 13576, lower figure: RMNH 18690.

hemipenis with longitudinal plicae, central part with long spines, distal part with distinctly smaller spines. This arrangement puts this species in Savage's (1960) groups with undifferentiated hemipenis.

The first to use the name *torquatus* was F. Boie (1827), who only listed it as a species of the genus *Brachyorrhos*, but did not provide a description of it. Thus, it is a nomen nudum. It remains unclear why no description was provided, since in the unpublished manuscript of H. Boie's "Erpétologie de Java" a full description of this species was available, following that of *badius* and preceding those of *flammigerus* and *schach*, all of which apparently were used by F. Boie in preparing his 1827 article. As this description is important for the selection of a lectotype it is reproduced here:

"*Brach*: *torquatus*

brach. scuto orbitali anteriori nullo, loreo elongato, seriebus squamarum trunci 17; supra e ferrugineo rufus, subtus flavescens, fascia cerviciis transversa serie duplia maculorum dorsi, laterumque punctis nigris 152 + 43".

Schlegel (1837), apparently basing himself on the material studied by H. Boie, put *torquatus* in the synonymy of his *Calamaria badia*, together with *flammigerus* and *schach*. Duméril et al. (1854) disagreed with Schlegel and considered this species distinct from *badius*. They described it as *Rabdosoma torquatum* and in doing so based themselves on one specimen from Bolivia and on seven from Surinam, the last ones sent to them on loan by Schlegel and Temminck of the Leyden museum. In our collections there are seven specimens which were present in our museum during the time when Duméril et al. were writing their book. Apparently they all were sent on loan to Paris. Two of these specimens (RMNH 114 and 115) were collected in Surinam by H. H. Dieperink, who sent natural history specimens to the RMNH between 1824 and 1836. It is not known when these specimens arrived in our museum, but probably they arrived before H. Boie departed to the Dutch East Indies in 1825. The other five specimens (RMNH 117) originate from a "Cabinet Hendriks" and are of unknown provenance. Neither is known at what date these specimens arrived in the RMNH. Engel (1938) does not mention Hendriks in his list of Dutch zoological cabinets and menageries. Schlegel's (1837) remark that all individuals, that served as types of *badius, torquatus, schach* and *flammigerus*, as proposed by H. Boie in his unpublished "Erpétologie de Java", came from several old collections, makes it likely that the specimens from the Hendriks Cabinet were at least part of the series Boie had before him when making the description of *Brachyorrhos torquatum*. Specimen RMNH 117d has 151 ventrals and 42 pairs of subcaudals, closely agreeing with the counts given by H. Boie. It is

also possible to arrive at those counts by combining the data of RMNH 114 and 115, the first one having 148 + 41, the second 151 + 38. However, it is no longer possible to deduct what actually happened here.

Anyway, it seems to be beyond doubt that the seven specimens in RMNH 114, 115 and 117 formed part of the series Duméril et al. (1854) consulted when they described *Rabdosoma torquatum*, and consequently are syntypes of that species. Apparently RMNH 115 is the specimen to which Duméril et al. (1854) refer in their text as being the largest of the series and belonging to the Leiden museum. Its length is given as 594 mm, but when adding the data for head, body and tail, it only attains 584 mm. I actually measured 475 mm for the snout-vent length and 71 mm for the tail length, making up a total length of 546 mm. I think the difference in length measured is permissible considering the fact that the specimen is contorted. Jan & Sordelli (1865) depicted a specimen from Surinam from the Leiden museum as *Rabdosoma varium*. The picture agrees with RMNH 114 in the arrangement of the scales in the gular region and in its pattern. The number of subcaudals in the drawing (37) does not agree with that of RMNH 114, but more with that of RMNH 115. As RMNH 115 does not have the distinctive gular scale arrangement and moreover is badly bleached, I am of the opinion that the single fact of the disagreement in subcaudal scale count is not very important (due to artistic liberty?) and that indeed RMNH 114 was depicted. Therefore, I designate this specimen (RMNH 114) as lectotype of *Rabdosoma torquatum* Duméril, Bibron and Duméril. It is a male with a snout-vent length of 354 mm, a tail length of 65 mm, 148 ventrals, one undivided anal, 41 pairs of subcaudals; eight supralabials, fourth and fifth entering the orbit; eight infralabials, the four anterior ones in contact with the chin shields, 1 + 2 temporals, one postocular, no preocular and eight maxillary teeth. RMNH 115 and the five specimens in RMNH 117 thereby become paralectotypes. The specimen in the Paris Museum collected by d'Orbigny in "les environs de Santa-Cruz, de la Sierra dans la Bolivia" is another paralectotype. Although several authors (Savage, 1960; Peters & Orejas-Miranda, 1970) cited the locality Santa-Cruz de la Sierra, Departamento de Santa-Cruz, Bolivia as terra typica of this species, this does not constitute a valid lectotype designation, and the procedure followed here is legitimate.

The type locality ("terra typica") given by previous authors (Savage, 1960; Peters & Orejas-Miranda, 1970) becomes invalid because of the selection of a lectotype of *Rabdosoma torquatum* from Surinam. It is most likely that the lectotype was either from Paramaribo or from the nearby coastal area, places where Dieperink, who sent the specimen, is known to have collected. From the same area recent specimens are known. Therefore, I here restrict the type locality of *R. torquatum* to Paramaribo, Surinam.

TABLE I

Morphometric data for Surinam species of *Atractus*

Atractus		ratio tail/total length	ventrals	subcaudals	longitudinal scale rows	supralabials	infralabials	postoculars	maxillary teeth
badius	♀	12.3 - 15.4 %	148 - 160	33 - 50	17 - 17 - 17	7(3.4)[8(4.5)]	7(3)	2	6
	♂	14.4 - 18.3 %	138 - 155	43 - 47	17 - 17 - 17	7(3.4)	7(3)[7(4)]	2	6 - 7
elaps	♂	16 %	150	35	15 - 15 - 15	6(3.4)	7(4)	1	8
favae	♀	24.6 - 25.1 %	177 - 180	66	17 - 17 - 17	7(3.4)	7(3)	2	4 - 5
	♂	22.0 - 26.3 %	167 - 174	57 - 67	17 - 17 - 17	7(3.4)	7(3)	2	5 - 8
flammigerus	♀	8 - 10 %	145 - 150	19 - 24	17 - 17 - 17	8(4.5)	7(4) - 8(4)	2	7 - 8
	♂	12 - 13 %	138 - 149	26 - 31	17 - 17 - 17	8(4.5)	7(4) - 8(4)	2	7
latifrons	♂	16 %	146	36	17 - 17 - 17	6(3.4)	6(4) - 7(4)	1	5
riddoki	♂	13 - 15 %	173 - 182	39 - 44	17 - 17 - 17	7(3.4)	7(3)	2	4 - 5
schach	♀	10 %	150	19	17 - 17 - 17	7(3.4)	8(4)	2	---
	♂	10 - 14 %	145 - 151	25 - 32	17 - 17 - 17	7(3.4)	8(4)	2	6 - 7
torquatus	♀	11.9 - 13.4 %	151 - 172	36 - 42	17 - 17 - 17	8(4.5)	8(4)	1	7 - 8
	♂	14.1 - 16.9 %	148 - 160	38 - 47	17 - 17 - 17	8(4.5)	8(4)	1 - 2	7 - 8

Data between square brackets indicate that these are found only exceptionally.

Atractus cf **univittatus** (Jan)

Rabdosoma univittatum Jan, 1862: 15.

Material. — SURINAM. 1 ♀, ANSP 3334, leg. Hering.

Remarks. — This specimen of *Atractus* was catalogued in ANSP as *A. crassicaudatus* (Duméril, Bibron & Duméril), from Surinam, belonging to the Hering collection. However, as Dr. E. V. Malnate (in litt.) pointed out to me, these data could very well be wrong. Examination of the specimen, which is in a very poor state, missing the maxillaries and being very bleached, showed that it certainly does not belong to *A. crassicaudatus*. In spite of the faded condition of the specimen, part of its pattern is still distinguishable and it is clear that a vertebral stripe is present. Considering this pattern and the lepidosis characters (ventrals 158, subcaudals in 31 pairs, postoculars two, supralabials 7 (3,4) and 8 (4,5), infralabials 7 (3) I came to the tentative conclusion that ANSP 3334 can be identified as *A.* cf. *univittatus* (Jan). The specimen agrees very well with the picture in Jan & Sordelli (1865: livr. 10. pl. II, fig. 2). I have to refrain from a more definite identification because of the poor condition of the specimen. When the identification is correct, it concerns a species hitherto only recorded from the coastal range in Venezuela which makes its occurrence in Surinam seem highly unlikely. Considering what is known about the zoogeographical relationships of the coastal range, the species at the most could be expected to occur eastward to the Paria Peninsula, but its endemicity in the area most likely is real, as has been

proven for many other organisms. Also, as far as is known, both father and son Hering (Holthuis, 1959) only collected material in Surinam and did not acquire specimens from elsewhere. We therefore may conclude that the locality and collector are almost certainly wrong and that the specimen does not belong to the Surinam herpetofauna. It has been treated as such and is not included in the key.

Discussion

On the basis of material in the possession of the RMNH since its foundation or since the early days thereafter, it was possible to clarify the status of several old names (*badius, schach, flammigerus*) in the genus *Atractus* that since long had been considered synonyms of the supposedly widespread species *Atractus badius*. The names concerned were synonymised on external characters only and one of the main reasons probably was that a certain amount of variation in scalation of the head tended to obscure the boundaries between the species. This view was further supported by the variation in colour pattern. However, when scale characters and colour pattern are studied in combination, it soon becomes evident that we are dealing with three separate taxa, that can easily be separated, even on the basis of external characters only. The distinctness of the taxa is confirmed when the hemipenis is regarded. Within the three taxa two types of hemipenis occur:

1. *Atractus badius* has an undifferentiated hemipenis, covered with spines over its entire length, the only differentiation being that the spines on the distal, bilobed part are shorter than those on the central part.

2. *A. flammigerus* and *A. schach* both have a differentiated hemipenis, in which the central part is covered with long spines, the distal, bilobed part is calyculate with scalloped or spinulate ridges.

The job of defining the three taxa was considerably lightened by the availability of fresh material from Surinam, which provided a better basis for the understanding of variability within the three species and also provided data about colour patterns in life.

Both *A. favae* and *A. zidoki* pose problems as to the delimitation of the genus. *A. favae* is aberrant in having a relatively long (22-26%), thick tail. *A. zidoki* has two apical pits per scale and an undivided hemipenis. Another character which was considered to be of general occurrence within the genus are smooth scales. However, both in *A. zidoki* and in *A. flammigerus* keeled scales occur. In *A. zidoki* the female paratype (Museum nationale d'histoire naturelle, Paris 1977-1602) shows very feebly developed keels in the precloacal region, of six males studied by me five possess three or four rows of bluntly keeled scales on the flanks just in front of the anus. This could be

of importance during mating. In *A. flammigerus*, all scales on the posterior part of the body and on the tail may be keeled, independent of sex. Thus, apparently in a number of species at least part of the scales is not smooth but keeled, and this may be sexually linked. Some of these characters or a combination of them could be a reason to remove such species from the genus *Atractus* and, as they do not fit any other generic diagnosis, erect new genera for them. As most of these characters are known to vary within other genera and, as a revision of the genus *Atractus* has not yet been attempted, it is preferred, for the time being, to enlarge the generic diagnosis of *Atractus* in such a manner that the species showing the characters discussed above may be included. Thus, *Atractus* has smooth or (rarely and only in the posterior part of the body) keeled scales, with or without apical pits; tail short to long (maximum 26% of total length); hemipenis either bilobed or single.

The discovery of *Atractus latifrons* in a locality several thousands of kilometers to the east of the recorded area of distribution, seems rather surprising, not because of the gap existing, but mainly because most species of this genus only have a relatively restricted distribution. The pattern of distribution, with specimens known from the eastern base of the Andes and upper Amazonia and from the Guianas, is known to occur in several other species (Duellman, 1978; Hoogmoed, 1979). This pattern is a mere reflection of our scanty knowledge of the distribution of the organisms involved and in most cases proved to be indicative of an Amazonian Arc distribution (Hoogmoed, 1979) or even of an Amazonian distribution. However, the fact that *A. latifrons* thus far is only known from two widely separated areas, is not so surprising, because snakes of the genus *Atractus* are burrowing and, due to this evasive way of life, are underrepresented in museum collections. Further herpetological research in central and lower Amazonia probably will present us with snakes of this species from intermediate areas.

On the other hand, *Atractus badius*, up till now considered a widespread species, occurring in "northern South America east of the Andes and south to northern Argentina" (Peters & Orejas-Miranda, 1970), turned out to be a composite of several valid taxa which were duly restored to their proper taxonomic level. Moreover, both from recent literature (Dixon & Soini, 1977) and from own research it emerged that specimens from north-eastern Peru, considered to be *A. badius*, are specifically distinct from that species. A comparable situation occurred recently in *A. elaps*, which turned out to consist of two species (Dixon, Thomas & Greene, 1976).

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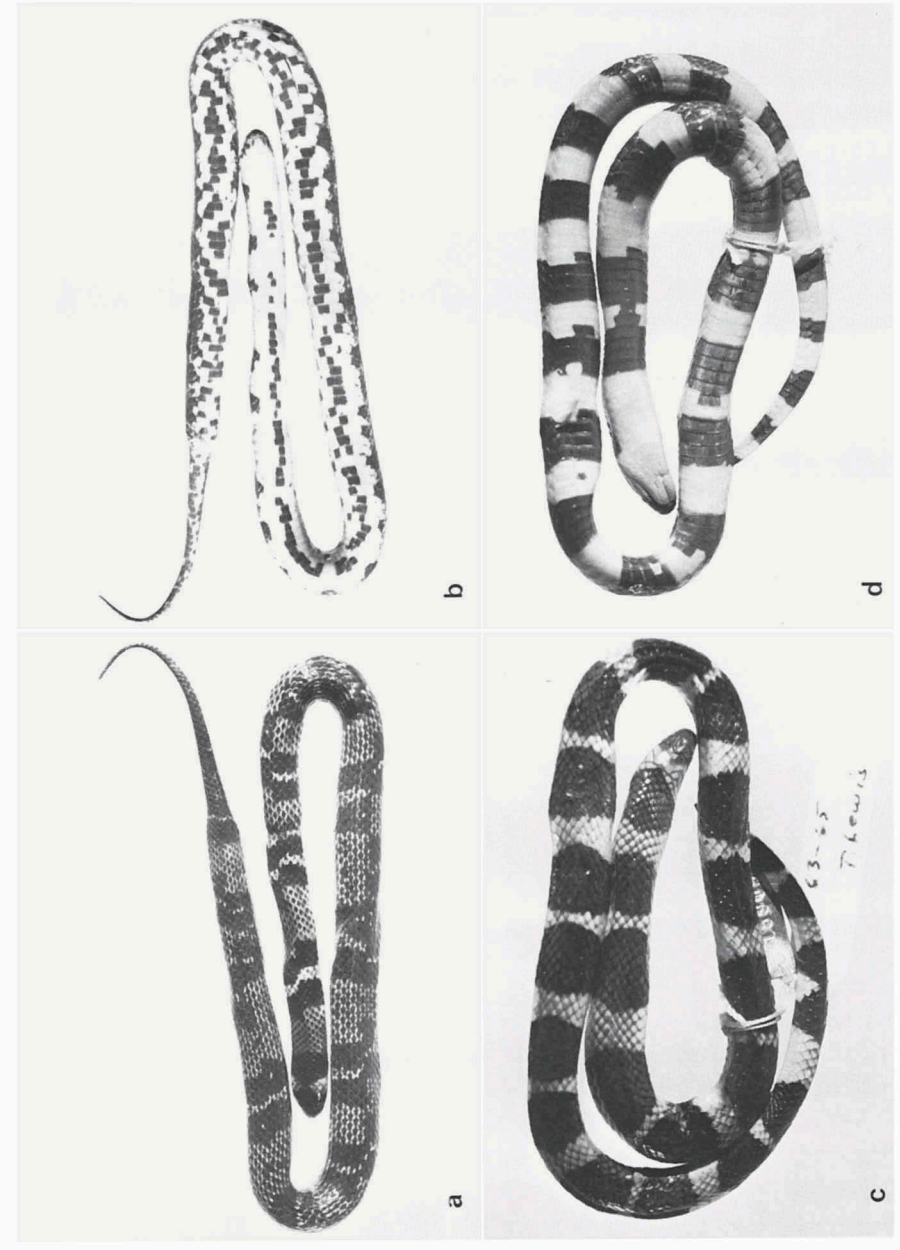
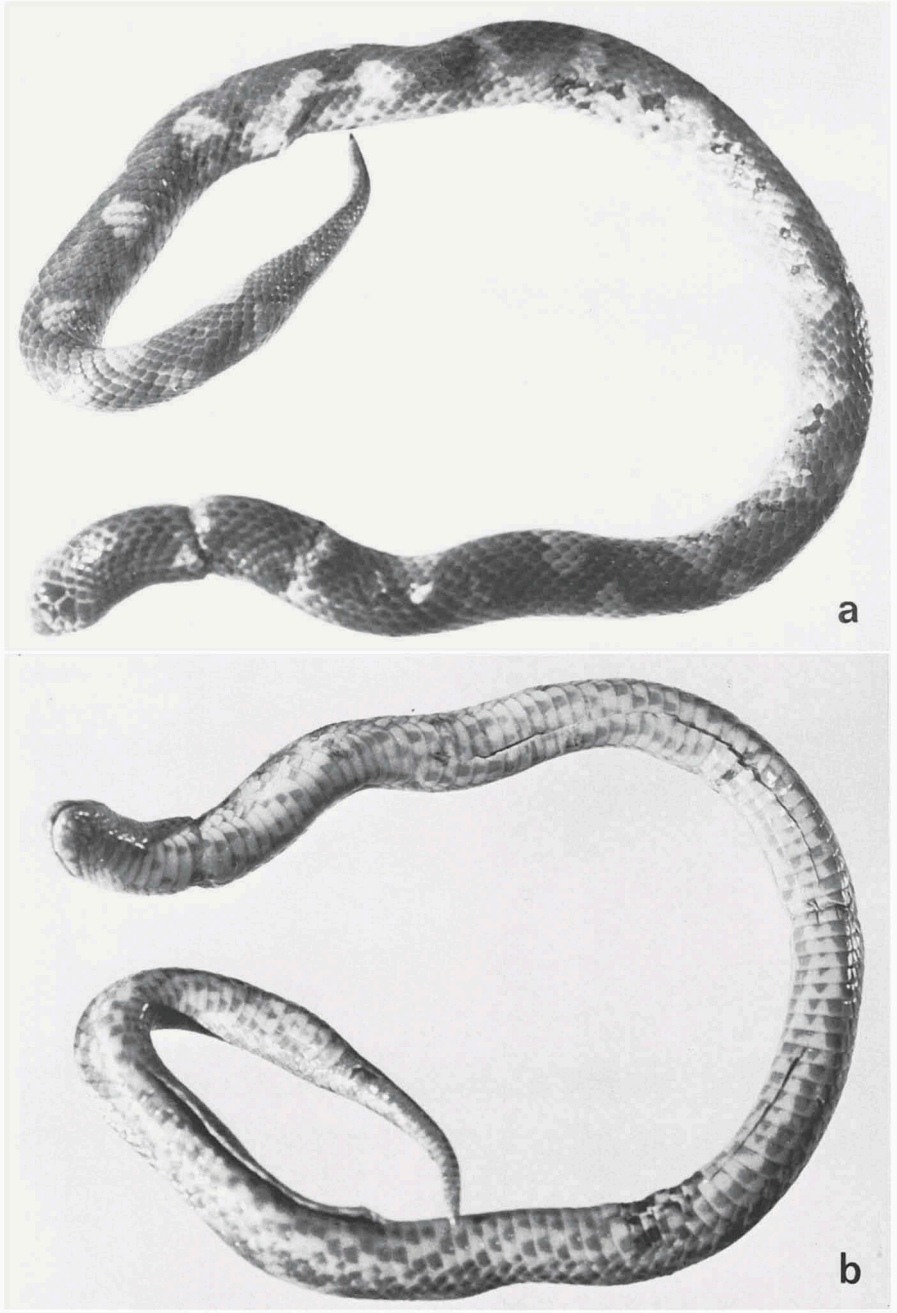
Fig. a. Drawing of lectotype (RMNH 118a) of *Atractus flammigerus* (F. Boie), reproduced from an unpublished plate (Reptiles. 1 Volume. 10me Livraison, pl. 23 fig. 2) meant to be published in the "Erpétologie de Java" by H. Boie. Del. P. van Oort. Fig. b. Young male of *A. badius* (F. Boie), RMNH 18678. Fig. c. *Atractus torquatus* (Duméril, Bibron & Duméril), RMNH 13576. Fig. d. Freshly killed specimen of *A. schach* (F. Boie), RMNH 18687. (Figs. b and d after slides by the author, fig. c after a slide by Mr. H. P. Pijpers).

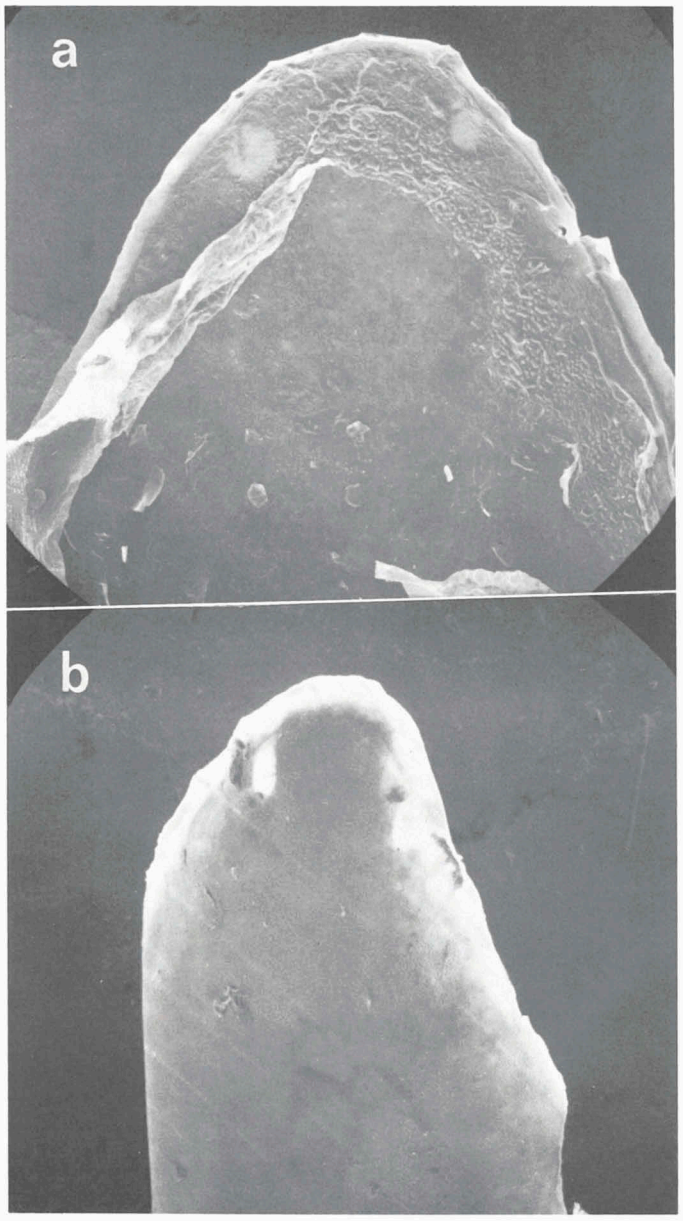


Figs. a, b. *Atractus badius* (F. Boie), ♀ RMNH 18679, total length 415 + 71 mm. a, dorsal view; b, ventral view. Figs. c, d. *Atractus latifrons* (Günther), ♂ USNM 159055, total length 341 + 65 mm. c, dorsal view; d, ventral view.

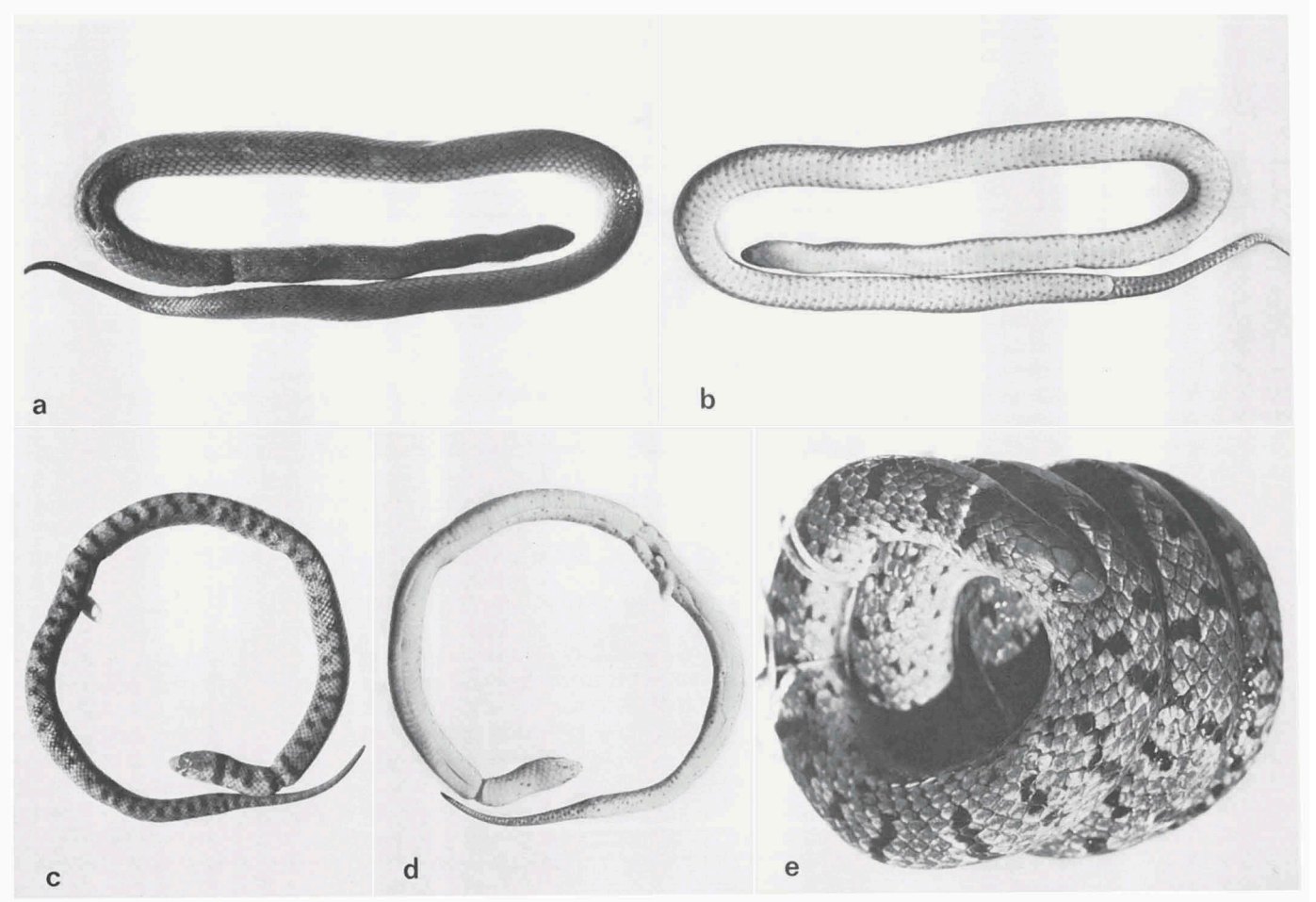


Atractus flammigerus (F. Boie), ♀ RMNH 13571, total length 333 + 32 mm. a. Dorsal view; b. Ventral view.

Figs. a, b. *Atractus zidoki* Gasc & Rodrigues, ♂ RMNH 18685, total length 174 + 28 mm. a, dorsal view; b, ventral view. Figs. c, d. *Atractus schach* (F. Boie), ♂ RMNH 18687, total length 181 + 24 mm. c, dorsal view; d, ventral view.



Actractus zidoki Gasc & Rodrigues, ♂ RMNH 13781. a, ventral surface of dorsal scale from posterior part of body, note the two apical pits, visible as round light areas near the tip; b, dorsal surface of dorsal scale from posterior part of body, note the apical pits, of which the left one is very distinct. Both photographs were made by the author with the Jeol JSM-25 Scanning Electron Microscope. The white bar in the lower left corner represents 0.1 mm.



Atractus torquatus (Duméril, Bibron & Duméril). a, dorsal view of ♀ RMNH 18688, total length 527 + 77 mm; b, ventral view of same specimen as in a; c, dorsal view of juvenile RMNH 13575, total length 172 + 27 mm; d, ventral view of same specimen as in c; e, oblique dorsal view of ♂ RMNH 13576, total length 463 + 94 mm.