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Rediscovery of the Ecuadorian snake *Atractus dunni* Savage, 1955 (Serpentes: Colubridae)

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Abstract: ***Atractus dunni*** **Savage was known only from the type specimen collected in the 19th century from the type locality "Ecuador", and additional specimens had not been reported. Herein I provide a redescription of the holotype of *Atractus dunni*, and report new data on its lepidosis, dentition, and coloration variation, based on additional specimens. The species is endemic to Ecuador, currently known from a few localities in low montane evergreen and montane cloud forests, at altitudes between 1530 to 1900 m, on the western versant of the Andes of Ecuador.**

■ **Reptilia, Serpentes, Colubridae, *Atractus dunni*, redescription, natural history, distribution, Ecuador**

INTRODUCTION

The greatest constraint in conservation planning for either individual species or entire snake assemblages is the fundamental lack of basic biological information on most species (Dodd 1993). Unfortunately for some groups, we are deficient at the most basic levels: taxonomy, distribution, natural history. Several clades are not well studied, and faulty taxonomy masquerades new species or synonymies; several species are undiscovered or undescribed, and the existence of sibling species and intraspecific variation is poorly understood (Lovich & Gibbons 1997).

A good example for all these issues is the genus *Atractus* Wagler, 1828, probably one of the least-known member of the neotropical herpetofauna. Almost 100 species of snakes have been assigned to the genus until 2005; however, most were described on the basis of a single or a few specimens, from single localities (e.g. *Atractus depressiocellus* Myers, 2003 known only from Cerro Azul [Cerro Jefe] region, Panama) or too general areas (e.g. type locality of *Atractus dunni* Savage, 1955 is "Ecuador"). Furthermore, snakes of the genus *Atractus* are rarely registered during routine field research because of their fossorial and semifossorial habits; therefore they are poorly represented in scientific collections and publications, and even the few specimens in collections are usually not classified or erroneously named, hiding data on known and undescribed species.

Bocourt (1883) described the species *Rhabdosoma maculatum* on the basis of two specimens from "Equateur", one of them was a female PM 5986 (now MNHN 5986). Boulenger (1894) transferred *R. maculatum* in the genus *Atractus*, placing the female type specimen in the synonymy of *Atractus badius* (Boie, 1827) and the male type specimen in his new species *A bocourti*. Sixty-one years later, Savage (1955) recognized that the female specimen of *R. maculatum* represents a valid species different from *A. badius*,

and proposed *Atractus dunni* as a new replacement name for *Rhabdosoma maculatum* Bocourt, 1883, which was a secondary homonym of *Isocelis maculata* Gunther, 1858 (= *Atractus maculata*). He based his description "on the Bocourt's original account and plate and information kindly provided by M. Jean Guibe of the Paris Museum" (Savage 1955, 1960). Because the type locality of *A. dunni* was so general (Equateur = Ecuador), Savage (1960) hypothesized that this species was a snake from the eastern slopes of the Andes. Since Savage's (1960) revision of the Ecuadorian *Atractus*, no additional specimens of *A. dunni* have been reported until now, and the species remained unknown from any specific locality.

In 1999, while studying specimens of *Atractus* from western Ecuador deposited in Ecuadorian collections, it became clear that some were related to *Atractus dunni*, but there were discrepancies with the description of Savage (1955, 1960). A revision in 2002 of the holotype of *Atractus dunni* deposited in Paris and additional material in USA collections clarified the identity of *Atractus dunni* and elucidated new information on the taxon known since 1883 from only a single specimen.

The aim of this paper is to provide a redescription of the holotype of *Atractus dunni*, to report new data based on new material, including lepidosis, dentition and coloration, and to clarify the distribution of this species.

MATERIAL AND METHODS

The following specimens of *Atractus dunni* were examined: ECUADOR: MNHN 5986 (holotype): without specific locality except "Equateur" (= Ecuador). Province of Imbabura: FHGO 513: Km 8 Apuela – Cotacachi road, near Intag (ca. 00°21'N, 78°35'W, c. 1980 m); FHGO 461: Hacienda La Florida, near Intag (ca. 00°19'N, 78°34'W, c. 1980 m). Province of Pichincha: DFCH-USFQ G513: Río Guajalito Protection Forest (ca. 00°13'S, 78°49'W, c. 1980 m); FHGO 91, 375-6, 379: Estación La Favorita, near Palmeras (=Río Guajalito Protection Forest) (ca. 00°16'S, 78°46'W, c. 1680 m); USNM 232525: Llambo, camino de Gualea. MCZ-R 175075-78: Las Pampas.

Measurements are based on specimens fixed in formalin and preserved in 75 % ethanol. Abbreviations used in the text are SVL (snout-vent length), TL (total length), TaL (tail length), HW (head width), HL (head length), ED (eye diameter), WM (width at midbody). Total length and tail length measurements were made to the nearest 1.0 mm with a metal straight ruler. Other body measurements were made to the nearest 0.05 mm with a caliper under a dissecting microscope. Color descriptions are based on slides of FHGO 513 and the examination of preserved specimens. Drawings were produced with the aid of a dissecting microscope or based on digital photographs. Ventral plates were counted by the method of Dowling (1951). Maxillary teeth were counted *in situ* (Myers 1974). The depositories of the quoted material listed in Appendix 1 are abbreviated in the text as follows: DFCH-USFQ = D.F. Cisneros-Heredia's collection housed at Universidad San Francisco de Quito, Quito, Ecuador; FHGO = Fund. Herpetológica G. Orcés' collection, Quito, Ecuador; MNHN = Museum National d'Histoire Naturelle, Paris, France; MCZ = Department of Herpetology, Museum of Comparative Zoology at Harvard University, USA; USNM = National Museum of Natural History, Smithsonian Institution, Washington, DC, USA. Localities and their geographic coordinates and elevations were determined from researcher's field notes and museum records and revised according to the 2000 physical map of the Republic of Ecuador published by the Instituto Geográfico Militar and NIMA (2003). Nine diagnostic features are used in order to facilitate the com-

parison with other species; these numbered characters for the diagnosis follow Savage (1960) with modifications by Schargel & García-Pérez (2002).

RESULTS

Atractus dunni Savage, 1955

Rhabdosoma maculatum Bocourt, 1883: 539, pl. 34. Type locality = "Equateur".
Atractus badius (in part) Boulenger 1894: 308 (Reference to Bocourt's female).
Atractus dunni Savage, 1955: 14. Type locality = Ecuador; Bocourt's female (PM 5986, now MNHN 5986) was designated as a lectotype of *Rhabdosoma maculatum* Bocourt, 1883, a secondary homonym of *Isocelis maculata* Günther, 1858; same specimen is the holotype of *A. dunni*.

Redescription of the holotype. The holotype (MNHN 5986) of *Rhabdosoma maculatum* Bocourt, 1883 and *Atractus dunni* Savage, 1955 is rather well preserved, although a little soft in the posterior half. According to the MNHN catalogue, it was collected by "Deyrolle" in "Equateur" [= Ecuador]. The specimen is a female of 320 mm in SVL and 33 mm in TaL. The SVL measurement differs considerably from data provided by Savage (1955), and probably it is due to J. Savage getting data from secondary sources, as he never actually saw this type specimen. Head barely distinct from neck. Dorsal scales smooth in 17-17-17 rows, no apical pits. 142 ventrals, an undivided anal plate, 20 subcaudals, all paired. Tail complete, ending in a sharp-tipped terminal scale. Ventral count cited by Bocourt (1883) and Savage (1955) was 144, difference is due to different count methods.

Head longer than wide. Rostral smaller than a prefrontal, barely visible from above and below. Paired small and quadrangular internasals, smaller than prefrontals. Paired big and rectangular prefrontals longer than broad. Each prefrontal in contact with its mate and with frontral, supraocular, loreal, nasal, and internasal. Frontal pentagonal, broader than long, four times bigger than the supraoculars. Parietals almost 2.5 time longer than frontal, but almost as wide as frontal.

One supraocular on each side, pentagonal and long (twice longer than wide), in touch with prefrontal, frontal, parietal, and postocular and barely with loreal (Perez-Santos & Moreno 1991 erroneously cited two supraoculars). No preocular. Nostril between two nasals. One elongated loreal in touch with eye, almost four times longer than wide. Two postoculars on each side, the upper one is cuadrangular and slightly smaller than the lower which is rectangular. One anterior plus two posterior temporals, the posterior upper temporal on each side very long, twice longer than wide, 1.75 as long as the parietals; anterior temporal touching both postocular, fifth and fourth supralabials and parietal. Supralabials seven, with third and fourth bordering the orbit, the second and third touching loreal. Infralabials seven (erroneously reported as five by Savage 1955); first pair in broad contact between mental and genials; three infralabials touching the genial on each side. One pair of genials.

Subcircular pupila, six maxillary teeth on the left side, right side broken. Seven mandibular teeth, although probably more as the mandible is damage. No diastema.

In preservative, head uniform brown from the tip of the snout to the posterior edges of the parietals, proximal half of posterior temporals and upper half of supraoculars; followed by an incomplete light cream nuchal collar of 1–2 dorsal scales width interrupted mid-dorsally by a dark mid-dorsal line. Behind the light collar, a dark shadow suggesting a dark

incomplete collar of 1–2 dorsal scales. Dark post ocular stripe. Lower half of supralabials and distal half of posterior temporals light cream. Light nuchal collar continues into the light cream throat and infralabials. The following description of dorsal and ventral body coloration is at mid-body: Dorsal ground color brown, with a dark vertebral shadow, suggesting a mid-dorsal / vertebral stripe. On the forth and fifth dorsal rows a series of dark spots, usually of one scale wide, occupy the upper border of the forth row and lower border of the fifth row. On the sixth and seventh dorsal rows, a second series of dark spots again appears, usually of one scale wide, occupying the upper border of the sixth row and lower border of the seventh row. In the space between these two series of spots (on row 5 and 6), there is a light cream spot. Sometimes the upper and lower spots get fused and the light cream spot emerge behind. These two series of spots are distributed fairly uniform along the entire body, separated from each other by c. 2–3 dorsal rows. On the second and third dorsal rows a third series of spots occurs, less conspicuous than previous ones, these spots usually occupy one and a half scale wide, mainly on the second row and on the edges of the surrounding scales. None series of spots get fused forming a stripe, and there are no lateral dark stripes in the body of the holotype. Ventral ground color light cream, with distinct dark marks on the lateral sides of the ventrals, continuous with one another, forming a pair of irregular ventral stripes, separated from the first row of dorsals by the light cream margins of the ventrals, which suggesting paired light stripes (Fig. 1).

Variation. Twelve additional specimens assignable to *Atractus dunni* were examined; six adult males, five adult females and one juvenile female. The following data include the holotype in the analysis. Male SVL range was 275–302 mm (n = 2), female SVL range 205–324 mm (n = 4) and the juvenile female SVL was 119. Tail was 18 % of SVL in one male and 10–13 % of SVL in five females. Mean number of ventrals in males was 130.7 ± 5.0 (range = 125–136, n = 6), mean number of ventral in females was 143.4 ± 3.8 (range = 138–150, n = 7). Mean number of subcaudals in males was 33.2 ± 4.3 (range = 26–37, n = 6), mean number of subcaudals in females was 20.9 ± 1.2 (range = 19–23, n = 7). Total number of scales (ventrals plus subcaudals, males and females combined) was 164.1 ± 2.3 (range 160–173, n = 13). Dorsal scales do not show reduction in most specimens, with 17 scales along the body; however, two specimens have reduced counts on the neck with 16 scales (MCZ R-175075, 175077). Rostral is usually barely visible from above and below, but sometimes it is not visible from below (DFCH-USFQ G513) or it is a little protruding (USNM 232525). Supraoculars are sometimes not in contact with loreal (USNM 232525, MCZ R-175077). Prefrontals are in most specimens longer than broad, but sometimes a little bit broader than long (DFCH-USFQ G513) or as long as broad (FHGO 461). The relative size of the postoculars is variable, as the upper one can be greater, equal or smaller than the lower one. Most specimens examined have the posterior upper temporal on each side very long, even as long as the parietals; but two specimens (FHGO 375, MCZ R-175077) have the posterior upper temporal normal in size, and the scale behind longer. Supralabials can vary from six to seven, with two specimens (DFCH-USFQ G513, MCZ R-175075) showing seven on the right side and six on the left side, because of fusion between the second and third supralabials. Infralabials can vary from six to eight, with one specimen (FHGO 379) having seven infralabials on the right side and six on the left. Usually three infralabials are in touch with each genial, but in some specimens four infralabials contact the genial either in both sides or on one side (FHGO 091, 376). Maxillary teeth vary from 6 to 7 (the last one very small and almost indistinguishable without a close search); and mandibular teeth vary from 7 to 8 (in both series of teeth, some specimens with less teeth had broken teeth or damaged / incomplete

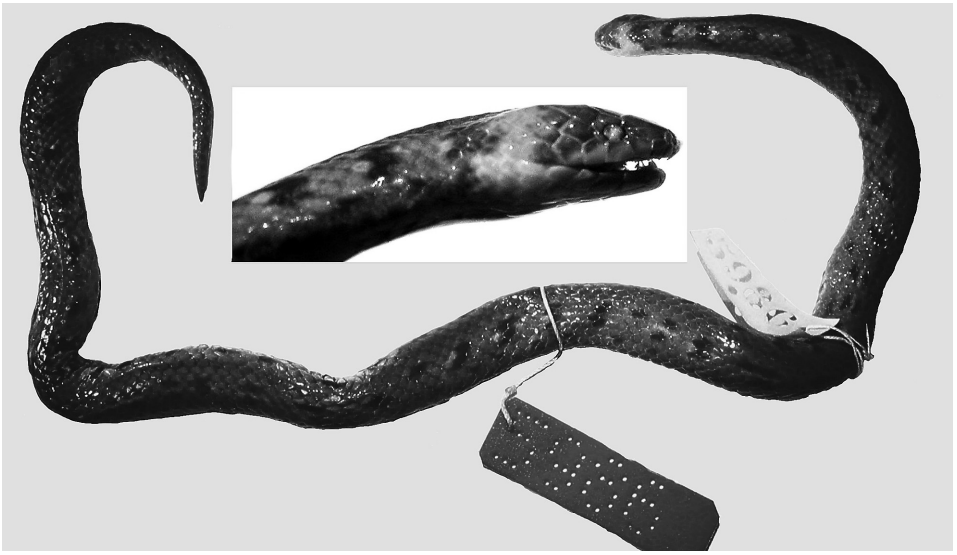

Figure 1. Holotype of *Atractus dunni* Savage MNHN 5986.

bones). Some males have small, sometimes inconspicuous cloacal tubercles at the base of the first subcaudals, its presence probably depends on the reproductive season.

Coloration varies ontogenically and intraspecifically. Dorsal ground color in juveniles is usually much paler than adults, therefore the dorsal pattern of spots series described for the holotype is very conspicuous in juveniles, and the nuchal collar is very prominent and defined. Ventral ground color in juveniles is also paler, almost white; less patterned because the marks are light brown. Adults are always darker; the dorsal ground color among adults can varies from light brown to very dark brown. Some individuals show a mid-dorsal line, especially towards the anterior part of the body; other specimens show just a vertebral dark shadow or no vertebral mark at all. When the dorsal ground color is dark brown, the dorsal series of spots are inconspicuous, although sometimes visible under correct light conditions. The dorsal series of spots can get fused, mainly in the anterior half of the body or near the tail. Ventral ground color varies from light cream to dark brown or almost black. Anal plate can be either light or dark brown. Underside of the tail is always dark, between brown and black. The nuchal collar can be either conspicuous and defined or barely suggested by a pale shadow.

Color in life. The following description of the coloration in life of *Atractus dunni* is based on photographs of specimen FHGO 513, and a specimen observed but not collected at the Bellavista Lodge, northwestern Pichincha: The head is dark brown with a yellow nuchal collar. Rostral, nasal, and supralabials yellow with the upper borders dark brown, other head areas brown, with a dark postocular mark. Dorsum brown with dark marks in the same pattern described for the holotype (Fig 2).

Diagnosis. Based on the characters discussed below, *Atractus dunni* differs from other species of the genus by the following characters: (1) 17-17-17 dorsal scale rows, reductions of one scale in some specimens at the neck; (2) one elongate loreal, three to four times as long as high; (3) 6 to 7 maxillary teeth, and 7 to 8 mandibular teeth; (4) ventral scales 138 to 150 in females, 125 to 136 in males; subcaudal scales 19 to 23 in females,

Figure 2. A living specimen (not collected) of *Atractus dunni* Savage from Bellavista (Pichincha, Ecuador). Photo by Jesse Delia.

26 to 37 in males; (5) ventrals plus caudals 160 to 173; (6) Dorsal pattern variable, from clear brown with a pattern composed of three series of spots to a nearly uniform dark brown with diffused shadows suggesting the series of spots. Sometimes there is a dark shadow suggesting a vertebral stripe; in some individuals there is a true vertebral stripe, but usually it is present just on the anterior part of the body, getting divided into dots or disappears at the middles and end of the body; (7) ventral pattern with light cream / brown ground with a pair of irregular dark ventral stripes separated from the first dorsals by a paired light stripes. The dark stripes get expanded in some specimen covering almost the entire ventral plates and suggesting a dark venter with clear botches; (8) an incomplete light nuchal collar, in some specimens weakly defined; (9) six to seven supralabials and five to seven infralabials; and (10) adults reaching maximum 357 mm TL in males and 353 mm TL in females.

Distribution and natural history. New material (see Material and methods) reported herein indicates that *Atractus dunni* is a species distributed on the western versant of the Andes of Ecuador, not supporting Savage's (1955) hypothesis on its Atlantic versant provenance. *Atractus dunni* is endemic to Ecuador, being currently known from a few localities at altitudes between 1530 to 1900 m in the provinces of Imbabura (surroundings of Intag), Pichincha (Río Guajalito Protection Forest, La Favorita Reserve, and Bellavista Lodge near Tandayapa), and Cotopaxi (Las Pampas). A photograph of an individual observed at the Bellavista Lodge, near Tandayapa, confirms the presence of the species there. All specimens with field data were collected in semifossorial situations, especially under decay logs or rocks in low montane evergreen forest and montane cloud forest.

Peters & Orejas-Miranda (1970) included Peru in the range of the species without additional comments; an action followed by Perez-Santos & Moreno (1991) who did not mention or indicate that they examined additional material. In all other references, *A. dunni* has been cited as known only from the type locality "Ecuador" (Almendáriz 1991, Coloma et al. 2000–2004, Peters 1960, Savage 1955, 1960). Carrillo de Espinoza (1989) did not include *A. dunni* in the herpetofauna of the country, but Carrillo de Espinosa & Icochea (1995) and CONAM (1999) cited *A. dunni* but mention that its distribution in Peru is unknown. The collection of the Museo de Historia Natural, Universidad Nacional Mayor de

San Marcos (Peru) does not hold any specimen of *A. dunni* (pers. obs. 2003) and there are no detailed published reports regarding the presence of *A. dunni* in Peru. The reasons of Peters & Orejas-Miranda (1970) for including Peru in the range of *A. dunni* are unknown. I considered the inclusion of Peru in the range of the species erroneous and there are small chances that the species could cross the Huancabamba depression and to reach western Peru. The species could occur further north in Colombia.

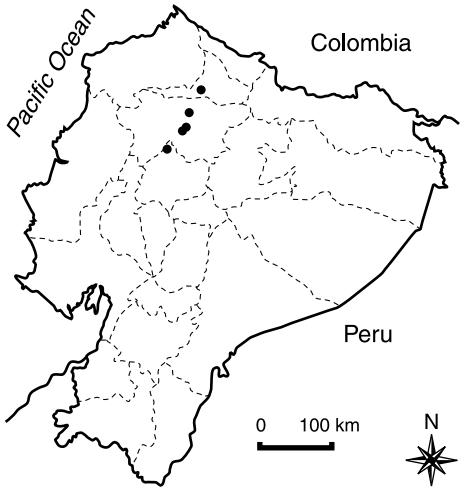

Figure 3. Known distribution of *Atractus dunni* Savage.

Three specimens (MCZ R-36990-2) – part of a collection from the "Pastaza River, Canelos to Marañon, Ecuador" (eastern versant of the Andes of Ecuador) – closely resemble *A. dunni*. These specimens were kindly revised by Dr. Jose Rosado at my request, and showed no differences on most lepidosis characters, except that they had five to six supralabials, and that two of them had 15 dorsal rows at neck. The coloration is apparently within the range of variation observed in *A. dunni*. These specimens would represent first records east of the Andes; however, another species from the western versant of the Andes of Ecuador is also present at the same collection, *Saphenophis bourcieri* (Jan, 1867). Therefore, either both species, *A. dunni* and *S. bourcieri* are distributed on both sides of the Andes but recent collections have failed to locate them in eastern Ecuador; or those specimens were collected in western Ecuador and get confused in this collection; or the *Atractus* specimens represent a different species similar to *A. dunni*. Until this material is more thoroughly revised, I suggest keeping this eastern locality in question.

DISCUSSION

Atractus dunni is a highly variable species in terms of its coloration, having ontogenic and intraspecific variation. However, most individual show a pattern clearly discernible from other *Atractus* of the region, and the future identification of the species should be fairly easy. The species is currently assigned to the *trilineatus* group, as defined by Savage (1955). Information on new material presented herein confirms *A. dunni* as a valid species different from most other species of the *trilineatus* group recognized by Savage (1955) as present in Ecuador: *A. ecuadorensis* Savage, 1955*, A. collaris* Peracca, 1897*, A. gaigae* Savage, 1955, and *A. resplendens* Werner, 1901. However, the differences between *A. lehmanni* Boettger, 1898 and *A. dunni* are still subtle. The color pattern showed by some specimens assigned to *A. dunni* in this paper is very dark and almost unpatterned, resembling the color pattern described for *A. lehmanni*. Other characters are also very similar. However, ventral counts of females and males do not overlap between both species, but the sample size in each case is small, as the only specimens of *A. lehmanni* are the topotypes. Also, the type locality of *A. lehmanni* is "Hoya de Cuenca", an interandean valley in southern Ecuador, quite distant from the currently known distribution of *A. dunni*. As I did not check the types of *lehmanni* and until more material is available, I keep both species separated, however as Savage

(1955) pointed out, they can be conspecific, the variation of ventral count could represent clinal variation, and the differences in color a condition similar to *A. occipitoalbus* (Jan, 1862), where there are different color phases in a single population.

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