

## REVISION OF *ATRACTUS* (SERPENTES: DIPSADIDAE) FROM MIDDLE AND UPPER MAGDALENA DRAINAGE OF COLOMBIA

PAULO PASSOS<sup>1,3,4</sup> AND JOHN D. LYNCH<sup>2</sup>

<sup>1</sup>Universidade Federal do Rio de Janeiro, Departamento de Vertebrados, Museu Nacional, Quinta da Boa Vista, Rio de Janeiro, RJ 20940-040, Brasil

<sup>2</sup>Laboratório de Anfíbios, Instituto de Ciências Naturales, Universidad Nacional de Colombia, Apartado 1495, Bogotá DC, Colombia

**ABSTRACT:** We revised the taxonomic status of *Atractus* species occurring in the eastern slopes of Central Cordillera, Magdalena Valley, and west slopes of Eastern Cordillera of Colombia on the basis of morphological characters (meristics, morphometrics, color patterns, and hemipenes). A lectotype is designated for *Atractus obtusirostris*. Additional specimens of *A. melanogaster* are reported for the first time and a neotype is designated for the species. The status of *A. werneri* is restricted to include only specimens from the western slopes of the Eastern Cordillera. Three new species are described from the eastern slopes of the Central Cordillera. Additionally, we provided a key for species distributed from the eastern Central to the western Eastern Cordilleras of Colombia, and propose a new species group for *Atractus* based on the sharing of exclusive morphological features.

**Key words:** Andean *Atractus*; Central Cordillera; Eastern Cordillera; Geographical variation; Magdalena Valley

**RESUMEN:** Se revisó el status taxonómico de las especies de *Atractus* que ocurren en la vertiente oriental de la Cordillera Central, Valle del Magdalena y vertiente occidental de la Cordillera Oriental de Colombia a través de caracteres morfológicos (merísticos, morfométricos, patrones de color y hemipenes). Un lectotipo es designado para *Atractus obtusirostris*. Especímenes adicionales de *A. melanogaster* son reportados por primera vez y un neotipo es designado para la especie. El status de *A. werneri* es restringido para incluir solamente especímenes de la vertiente occidental de la Cordillera Oriental. Tres nuevas especies son descritas de la vertiente oriental de la Cordillera Central. Adicionalmente, proveemos una clave para las especies distribuidas desde el este de la Cordillera Central hasta oeste de la Cordillera Oriental de Colombia y un nuevo grupo de especies de *Atractus* es propuesto basado en características morfológicas exclusivas compartidas.

**Palabras Clave:** *Atractus* Andinas; Cordillera Central; Cordillera Oriental; Variación geográfica Valle del Magdalena

THE CRYPTOZOIC snake genus *Atractus* Wagler is distributed widely in the Neotropical region, occurring from Panama to Argentina (Giraudo and Scrocchi, 2000; Myers, 2003). *Atractus* is a highly diverse genus hypothesized to be closely related to *Adelphicos* Jan and *Geophis* Wagler (Fernandes, 1995; Savage, 1960) and comprises about 150 available names with about 130 valid species (Passos et al., 2010a,b). Currently, the taxonomic status of several species are unclear, with many taxa remaining misidentified in herpetological collections (Passos and Arredondo, 2009; Passos and Fernandes, 2008; Passos et al., 2005;

2007a,b; 2009a,b,c,d,e; Prudente and Passos, 2008, 2010).

The major problem in *Atractus* alpha taxonomy is that several species are still only known from the type specimens, and geographical, ontogenetic, and sexual variation cannot be assessed for most currently recognized taxa (Passos et al., 2010a,b). *Atractus* taxonomy has been a difficult task also due to a large number of species descriptions added to the fact that a comprehensive revision of the genus is still lacking (Passos et al., 2010a). To date, the most complete contribution to the systematics of the genus is Savage's (1960) seminal work, which focused on the Ecuadorian *Atractus*. Whereas there have been additional taxonomic studies on regional portions of Amazonia (Cunha and Nascimento, 1993; Martins and Oliveira, 1993)

<sup>3</sup> PRESENT ADDRESS: Laboratório de Herpetologia, Instituto Butantan: Av. Vital Brazil 1500, São Paulo, SP 05503-900, Brasil

<sup>4</sup> CORRESPONDENCE: e-mail, attractus@gmail.com

and the Brazilian Atlantic Forest (Passos et al., 2010b) or restricted by certain country limits (Hoogmoed, 1980; Myers, 2003; Roze, 1961), most of the species diversity in the genus has not been evaluated thoroughly (Esqueda and La Marca, 2005; Silva, 2004). Especially within a context of geographic, sexual, and ontogenetic character variation, very common and complex phenomena among species of the genus (Dixon et al., 1976; Passos et al., 2007b; 2009c; 2010a,b; Prudente and Passos, 2008, 2010; Savage, 1960).

Presently, a series of studies are ongoing with respect to fully reviewing *Atractus* diversity, considering taxonomic revisions for the South American biomes (Passos et al., 2009e; Passos et al., 2010b), biogeographic provinces (Passos et al., 2009c), and Andean Cordilleras (Passos et al., 2009b,d), and some areas with relatively high species richness (Passos et al., 2010a). The region currently comprised of the eastern versant of the Central Cordillera, Magdalena Valley, and western versant of the Eastern Cordillera of Colombia (= upper and middle Magdalena drainage) constitutes a trans-Andean province with the occurrence of many putative recognized monophyletic groups of amphibians (Duellman, 1972; Lynch, 1980, 1981) and reptiles (Myers, 1973; Torres-Carvajal, 2007), and its affinity can be explained by the geological uplift of the Andes (Aleman and Ramos, 2000; Gregory-Wodzicky, 2000). Therefore, the aim of this study is to provide a comprehensive review of the *Atractus* species occurring in this region, evaluating the validity of taxa and presenting diagnostic characters and data on intraspecific variation for all recognized species.

#### MATERIALS AND METHODS

We examined *Atractus* specimens in the following collections: Brazil—Instituto Butantan (IBSP), São Paulo, São Paulo. Colombia—Colégio San José (CSJ), Medellín, Antioquia; Colección Zoológica de la Universidad de Tolima (CZUT-R), Ibagué, Tolima; Instituto Alexander Von Humboldt (IAvH), Villa de Leyva, Boyacá; Instituto de Ciencias Naturales (ICN), Universidad Nacional de Colombia, Bogotá DC; Museo La Salle (MLS), Universidad La Salle, Bogotá DC; Museo de

Zoología de la Universidad Javeriana (MUJ), Bogotá DC. Germany—Zoologisches Museum at Universität Hamburg (ZMH-R), Hamburg. Specimens examined are listed in Appendix I. Additional lists of trans-Andean *Atractus* are found in Passos and Arredondo (2009), Passos et al. (2009a,b,c,d,e), and Passos et al. (2010a).

Terminology for *Atractus* cephalic shields follows Savage (1960). The method of counting ventral scales follows Dowling (1951). Nomenclature regarding the loreal condition follows Passos et al. (2007b). Nomenclature for the other measurements and discrete characters follows Passos et al. (2009e). Techniques for hemipenis preparation follow Pesantes (1994). Terminology for hemipenis description follows Dowling and Savage (1960), as augmented by Zaher (1999). Sex was determined by the presence or absence of hemipenes through a ventral incision at the base of the tail. Measurements were taken with an analog caliper to the nearest 0.1 mm under a stereoscope, except for snout-vent length (SVL) and caudal length (CL), which were taken with a flexible ruler to the nearest 1 mm.

#### RESULTS

##### *Atractus apophis* sp. nov. (Figs. 1–2; Table 1)

*Holotype*.—Adult male, ICN 10822, collected on 30 October 1993 by Aurita Bello, Parque Arqueológico San Agustín, municipality of San Agustín (01° 53' N, 76° 16' W, ca. 1640 m), department of Huila, Colombia.

*Diagnosis*.—*Atractus apophis* is distinguished from all congeners by having: (1) 17/17/17 smooth dorsal scale rows; (2) two postoculars; (3) moderate loreal; (4) temporals 1 + 2; (5) seven supralabials, third and fourth contacting orbit; (6) seven infralabials, first three contacting chinshields; (7) five maxillary teeth; (8) four gular scale rows; (9) four prefrontals; (10) 167 ventrals in the single male; (11) 34 subcaudals; (12) black dorsum with small and nearly indistinct beige dots; (13) black venter with disperse creamish white squared blotches; (14) moderate body size, single male 379 mm SVL; (15) moderate tail length in the male (14.2% SVL); (16) hemi-

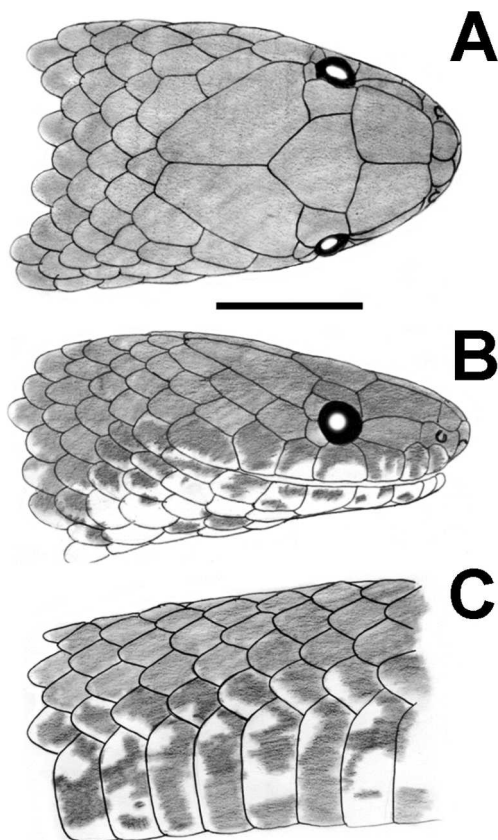


FIG. 1.—Dorsal (A) and lateral (B) views of the head, and lateral view of the body of the holotype of *Atractus apophis* sp. nov. (ICN 10822). Scale = 5 mm.

penis slightly bilobed, semicapitate, and semicalyculate.

*Comparisons.*—Among all congeners, *Atractus apophis* shares only with *A. crassicaudatus* 17 dorsal scale rows, 7 upper and lower labials, 3 infralabials contacting chinshields, generally 4 gular scale rows, black dorsum, black venter with disperse cream flecks, and slightly bilobed, semicapitate, and semicalyculate hemipenis. *Atractus apophis* differs from *A. crassicaudatus* by lacking a cream postorbital stripe, and by having 167 ventrals, 34 subcaudals, 5 maxillary teeth, and hemipenis with lateral projections on distal portion of lobes (vs. well-evident cream postorbital stripe, 139–160 ventrals, 23–30 subcaudals in males, 8–11 maxillary teeth, and hemipenis lacking lateral lobe projections).

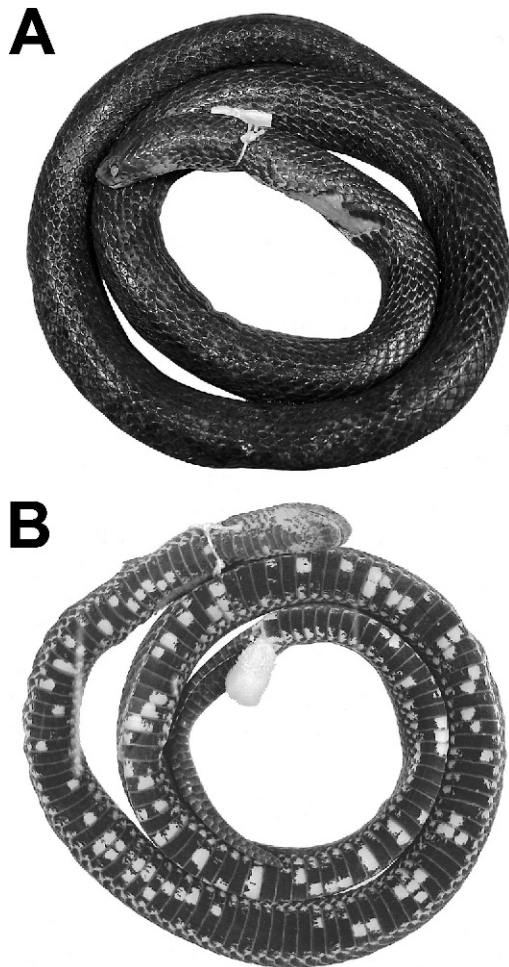


FIG. 2.—Dorsal (A) and ventral (B) views of the holotype of *Atractus apophis* sp. nov. (ICN 10822).

*Description of the holotype.*—Adult male, SVL 379 mm; CL 54 mm (14.2% SVL); midbody diameter 7.8 mm (2.0% SVL); head length 13.1 mm (3.4% SVL); head width 6.6 mm (50% head length); interorbital distance 4.6 mm; rostro-orbital distance 3.4 mm (70% interorbital distance); nasal-orbital distance 2.8 mm; head flattened in lateral view, round in dorsal view; snout slightly acuminate in lateral view, round in dorsal view; cervical constriction indistinct; rostral subtriangular in frontal view, well-visible in dorsal view, 2.2 mm wide, 1.1 mm high; internasal 0.8 mm long, 0.7 mm wide; internasal suture sinistral with respect to

prefrontal suture; prefrontal 2.7 mm long, 2.3 mm wide; supraocular subtrapezoidal, 1.6 mm long, 1.1 mm wide; frontal subtriangular in dorsal view, 3.1 mm long, as wide as long; parietal 4.9 mm long, 2.7 mm wide; nasal divided; nostril located between prenasal and postnasal; prenasal 0.6 mm high, 0.3 mm long; postnasal 0.7 mm high, 0.6 mm long; loreal 2.2 mm long, 0.9 mm high, contacting second and third supralabials; eye diameter 1.6 mm; pupil subelliptical; two postoculars; upper postocular 0.5 mm high, 0.4 mm long; temporals 1 + 2; first temporal 1.8 mm long, 0.8 mm high; upper temporals not fused; seven supralabials, third and fourth contacting orbit; second supralabial higher than first supralabial, and similar in size to third supralabial; sixth supralabial higher and seventh longer than remaining supralabials; symphyisial subtriangular, 1.8 mm wide, 0.6 mm long; seven infralabials, third and fourth contacting chinshields; first pair of infralabials in contact behind symphyisial, preventing symphyisial–chinshield contact; chinshields 3.2 mm long, 1.2 mm wide; four gular scale rows; four preventrals; 167 ventrals; 34 subcaudals; 17/17/17 dorsal scale rows; dorsals without apical pits, supra-anal tubercles, and keels (sensu Gasc and Rodrigues, 1979a,b); nine dorsal scale rows above second subcaudal; caudal spine moderately long, robust, and rhomboid.

*Maxillary arch.*—Arched in dorsal view, with three prediastemal and two postdiastemal teeth; prediastemal teeth poorly spaced, last two teeth moderately spaced, decreasing gradually in size, angular in cross-section, robust at base, narrower at apices; diastema short; postdiastemal tooth slightly shorter than last prediastemal ones, strongly curved posteriorly; lateral process well-developed, lacking posterior projection.

*Color in preservative of the holotype.*—Dorsum and lateral sides of head uniformly black; ventral margins of first six supralabials creamish white; dorsal margins of infralabials creamish white with few black dots ventrally; symphyisial and most of chinshields black; gular region creamish white with disperse black dots; preventrals black with little invasion of creamy pigment; venter black with creamish white lateral–posterior margins, with

small disperse creamish white squares along body; tail uniform black ventrally; dorsal background of body black with distinct small beige dots (one scale width or smaller).

*Hemipenis morphology.*—Hemipenis slightly bilobed, semicapitate, and semicalyculate; capitular crotch well-defined in both sides of organ; capitular crotch located just below bifurcation of sulcus spermaticus; lobes restricted to distal portion of capitulum, little distinct from the base, smaller than remaining capitulum; lobes with lateral depression delimiting lateral projections on distal portion of each lobe; lobes and capitulum covered with small spinulate calyces; spinules gradually replaced by papillae toward apical portion of lobes; calyces arranged on longitudinal series constituting vertical crests poorly defined on the sulcate side, and disposed transversally on the lateral portion of asulcate side of capitulum; capitulum length similar to hemipenial body length and width; sulcus spermaticus divided in the middle of hemipenial body; branches of sulcus spermaticus centrifugally oriented, running to tips of lateral lobe projections; margins of sulcus spermaticus stout, narrow, and bordered by spinules from the bases to the apices of lobes; hemipenial body subcylindrical with moderate scattered hooked spines; large spines located laterally on the hemipenial body; basal naked pocket absent; basal region of the organ with longitudinal plicae and disperse spinules (Fig. 3A).

*Distribution.*—Known only from Parque Arqueológico San Agustín, municipality of San Agustín, on the western versant of Central Cordillera of Colombia. *Atractus apophis* apparently inhabits sub-Andean forest at 1500 m (Fig. 4).

*Etymology.*—The specific epithet “apophis” refers to the Latin name of the snake-like monster Aped or Apófis from Egyptian mythology. This creature, according to old Egypt legend, inhabited the underground of the earth and fought with the God Rá at each night-fall. Aped was always defeated and killed by Rá, but resurrected in the next day for new combat. The word is used here in allusion to the secretive habits of *Atractus apophis*.

*Remarks.*—Despite the fact that *Atractus apophis* is described on the basis of a single

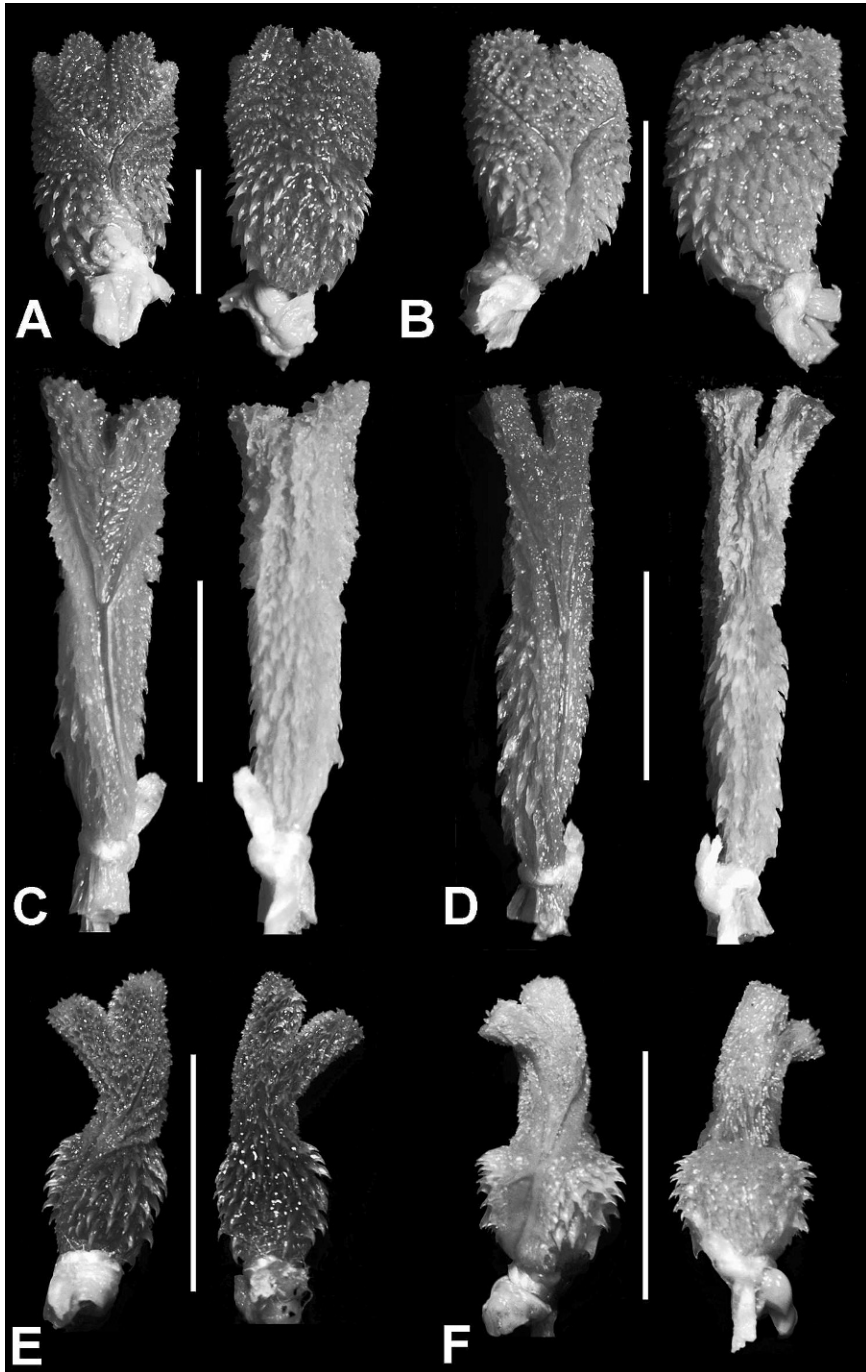


FIG. 3.—Sulcate (left) and asulcate (right) views of the hemipenis of *Atractus apophis* sp. nov. (A), *Atractus chthonius* sp. nov. (B), *Atractus atratus* sp. nov. (C), *Atractus melanogaster* (D), *Atractus obtusirostris* (E), and *Atractus weneri* (F). Scale = 5 mm.

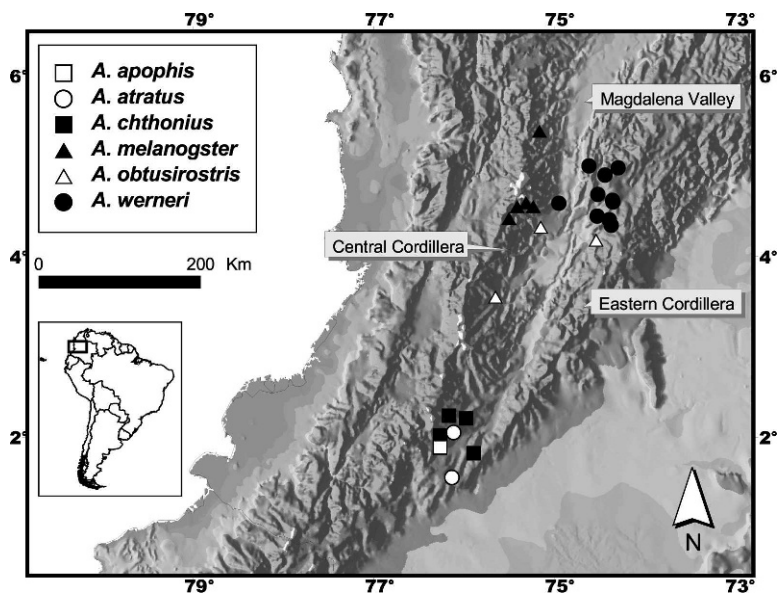


FIG. 4.—Geographical distribution of *Atractus apophis*, *A. atratus*, *A. chthonius*, *A. melanogaster*, *A. obtusirostris*, and *A. werneri*.

specimen, it is easily distinguished (see above) and allopatric with respect to morphologically similar species (*A. crassicaudatus*).

*Atractus atratus* sp. nov.  
(Figs. 5–6; Table 1)

*Holotype*.—Adult female, IAvH 151, from Parque Nacional Natural Cueva de Los Guacharos (ca. 1800 m), municipality of Acevedo, department of Huila, Colombia.

*Paratypes*.—Two specimens, from department of Huila, Colombia. Subadult female

ICN 11512 (FLL 273), collected on 12 October 2004 by F. L. Lopez and M. P. Valencia-Rojas, Corregimiento Morelia (02° 03' N, 76° 07' W, 1710 m), municipality of Salado blanco; subadult male IAvH 131, same data as holotype.

*Diagnosis*.—*Atractus atratus* is distinguished from all congeners by having: (1) 17/17 smooth dorsal scale rows; (2) two postoculars; (3) moderate loreal; (4) temporals 1 + 2; (5) seven or eight supralabials, generally third and fourth contacting orbit; (6) eight infralabials, first four contacting chinshields; (7) seven or eight maxillary teeth; (8) three or four gular scale rows; (9) three or four prefrontals; (10) 150–153 ventrals in females and 140 in the single male; (11) 22–24 subcaudals in females and 29 in the male; (12) dorsum dark brown with transverse cream irregular blotches; (13) venter uniformly brown or dark brown with a few cream flecks; (14) moderate body size, females reaching 502 mm SVL, males 317 mm SVL; (15) moderate tail length in females (10.0–10.8% SVL) and long (15% SVL) in the single male; (16) hemipenis moderately bilobed, semicapitate, semicalyculate.

*Comparisons*.—Among all congeners, *Atractus atratus* shares only with *A. snethla-*

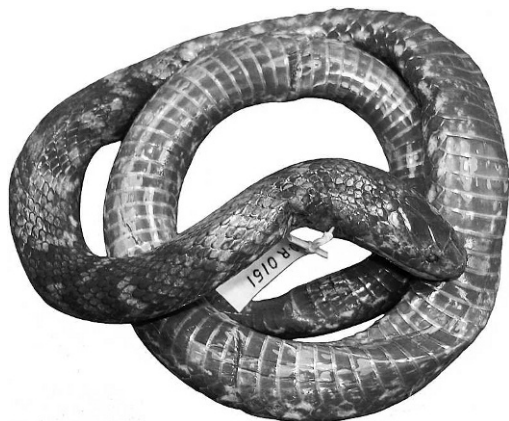


FIG. 5.—General view of the holotype of *Atractus atratus* sp. nov. (IAvH 151).

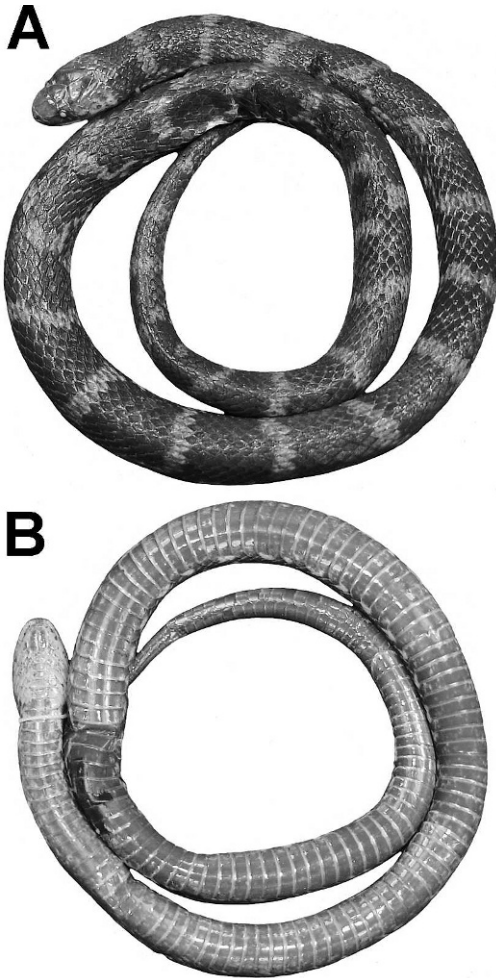


FIG. 6.—Dorsal (A) and ventral (B) views of the paratype of *Atractus atratus* sp. nov. (IAVH 131).

*geae* 17 dorsal scale rows, generally seven supralabials and eight infralabials, first four infralabials contacting chinshields, two postoculars, seven or eight maxillary teeth, dorsal ground color dark brown with light irregular transverse blotches, venter scattered with dark pigmentation, moderately bilobed, semicapitate, and semicalyculate hemipenis. *Atractus atratus* differs from *A. snethlageae* in having the belly entirely or almost entirely dark brown and hemipenis with conspicuous lobular crests on the asulcate side of capitulum (vs. belly cream, generally with small dark brown dots concentrated on the center of ventrals constituting a barely defined stripe, or rarely

with small dots diffused along ventrals, but never covering belly entirely; hemipenis lacking conspicuous lobular crests on the asulcate side of capitulum). With respect to parapatric species (*A. apophis*), *A. atratus* differs by having a moderately bilobed hemipenis, dorsum dark brown with transverse cream irregular blotches, and venter dark brown with few cream flecks (vs. slightly bilobed hemipenis, uniformly black dorsum, and belly mostly black with creamish white squared blotches).

*Description of the holotype*.—Adult female, SVL 502 mm, CL 50 mm (9.7% SVL); midbody diameter 13.0 mm (2.6% SVL); head length 24.7 mm (4.8% SVL); head width 13.5 mm (55% head length); interorbital distance 8.3 mm; rostro-orbital distance 7.1 mm (85% interorbital distance); naso-orbital distance; 5.8 mm; head slightly arched in lateral view, round in dorsal view; snout truncate in lateral view, round in dorsal view; cervical constriction indistinct; rostral subtriangular in frontal view, 4.0 mm wide, 1.9 mm high, poorly visible in dorsal view; internasal 1.6 mm long, as long as wide; internasal suture sinistral with respect to prefrontal suture; prefrontal 5.2 mm long, 4.2 mm wide; supraocular subtrapezoidal, 2.5 mm long, 1.4 mm wide; frontal subtriangular, 5.2 mm long, 5.8 mm wide; parietal 8.9 mm long, 5.3 mm wide; nasal divided; nostril located between prenasal and postnasal; prenasal 1.8 mm high, 0.9 mm long; postnasal 1.8 mm high, 1.1 mm long; loreal 4.6 mm long, 1.6 mm high, contacting second to fourth supralabials; eye diameter 2.2 mm; pupil subelliptical; postoculars of similar height (1.0 mm), upper postocular slightly longer (1.5 mm) than lower; temporals 1 + 2; anterior temporal 3.9 mm long, 2.1 mm high; upper posterior temporal 6.7 mm long, 2.4 mm wide; supralabials eight and seven on right and left sides, respectively; fourth and fifth and third and fourth on right and left sides, respectively, contacting orbit; second supralabial taller than first and third, and slightly shorter than fourth supralabial; sixth or seventh taller and seventh or eighth longer than remaining supralabials; symphyisial subtriangular, 2.8 mm wide, 0.7 mm long; eight infralabials, first four contacting chinshields;

first pair of infralabials in contact behind symphyisial, preventing symphyisial–chinshield contact; chinshields 7.4 mm long, 2.9 mm wide; three gular scales; three preventrals; 150 ventrals; 24 subcaudals; 17/17/17 dorsal scale rows; dorsals without apical pits, supra-anal tubercles, and keels; 10 dorsal scale rows above second subcaudal; caudal spine moderately long, rhomboid, and acuminated.

*Maxillary arch.*—Arched in dorsal view, with five or six prediastemal and two postdiastemal teeth; prediastemal teeth large, moderately spaced, of similar size, curved posteriorly, angular in cross-section, robust at base, narrower at apices; diastema moderately long; postdiastemals considerably smaller than last prediastemal tooth.

*Color in preservative of the holotype.*—Dorsum of head mostly brown, with beige pigmentation covering internasal, loreal, and temporal; supralabials brown with beige spots concentrated on anterior portions of each scale; brown pigmentation reaching ventral part of posterior supralabials; mental region with brown ground color covered by beige irregular dots, concentrated on proximal portion of infralabials and gulars; venter brown, with small and diffuse beige dots concentrated on medial and lateral regions of ventrals; tail brown with diffuse beige dots, concentrated on lateral portion of subcaudals; dorsal ground color brown, with 34 beige transverse blotches (one scale wide); blotches bordered with dark brown pigmentation (1–2 scales wide), contrasting with ground color at posterior region of body; brown interspaces (three scales wide), with beige irregular blotches at paraventral region, occasionally connected to transverse blotches; tail brown with six transverse blotches.

*Juvenile coloration in preservative.*—Dorsum of head predominantly light brown from rostral to prefrontals; background of head brown, with invasion of beige pigmentation at loreal and lateral portion of prefrontals; supralabials brown anteriorly, predominantly beige posterior to fifth scale; temporal region overlapped with beige pigment ventrally; infralabials predominantly creamish white, with diffuse dark brown dots; mental region creamish white, with dark brown blotches concentrated on symphyisial, chinshields, and

preventrals; venter and tail uniformly brown; dorsal ground color of body dark brown, with 30 beige transverse blotches; tail with seven transverse light blotches dorsally.

*Meristic and morphometric variation.*—Male specimen (IAvH 131), SVL 317 mm, CL 49 (15.5% SVL); 143 ventrals; 29 subcaudals; seven supralabials on both sides; four (right side) and three (left side) gular scale rows; four preventrals; seven maxillary teeth on each side. Dorsum with 24 light transverse body and 6 tail blotches. Subadult female (ICN 11512), SVL 296 mm, CL 32 mm (10.8% SVL); 153 ventrals; 22 subcaudals; seven supralabials on both sides; four gular scale rows; seven maxillary teeth on each side.

*Hemipenis morphology.*—Hemipenis moderately bilobed, semicapitate, and semicalyculate; lobes distinct, subcylindrical, with conical apices laterally projected; lobes slightly longer than remaining capitulum; capitular crotch poorly defined on sulcate side and indistinct on sulcate side; capitular crotch located just below sulcus spermaticus bifurcation; lobes and capitulum covered with irregular spinulate calyces; asulcate side of capitulum with conspicuous lobular crests; capitulum with similar length and width of hemipenial body; sulcus spermaticus divided in the middle of hemipenial body; sulcus spermaticus branches centrifugally oriented, running to tips of lobes; margins of sulcus spermaticus stout, narrow, and bordered by spinules from the bases to the apices of lobes; hemipenial body subcylindrical, scattered with moderate hooked spines; large spines located laterally on the hemipenial body; basal naked pocket extended to the middle of hemipenial body; basal region of the organ with longitudinal plicae and disperse spinules (Fig. 3C).

*Distribution.*—From Acevedo to Salado blanco municipalities on the eastern slopes of the Central Cordillera of Colombia. *Atractus atratus* inhabits sub-Andean forests around 1700–2000 m (Fig. 4).

*Etymology.*—The specific epithet “atratus” is derived from Latin adjective ater, meaning something dressed in black. This word is used herein in reference to the uniformly dark coloration of the belly of the new species.

*Remarks.*—Although *Atractus atratus* shows remarkable morphological similarities with the



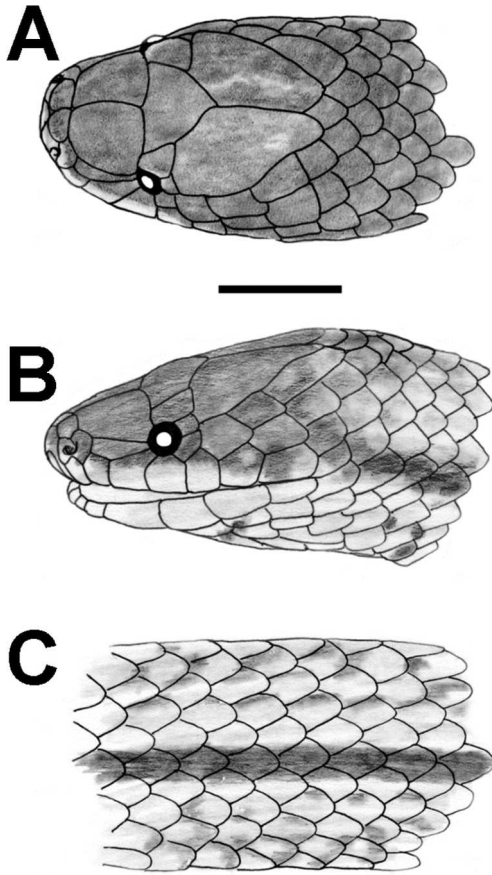


FIG. 7.—Dorsal (A) and lateral (B) views of the head, and dorsal (C) and view of the body of the holotype of *Atractus chthonius* sp. nov. (ICN 5662). Scale = 5 mm.

Amazon species *A. snethlageae*, both taxa are distinguished by general color pattern and hemipenis features (see above). In fact, *A. snethlageae* as currently defined constitutes a species complex that still awaits a proper revision (Passos, 2008). Furthermore, while *A. atratus* appears restricted to Magdalena Valley, *A. snethlageae* is distributed in lowland portions east of the Andes from Ecuador and Peru to eastern region of Brazilian Amazonia (Cunha and Nascimento, 1983; Duellman, 2005; Martins and Oliveira, 1993; Passos, 2008).

*Atractus chthonius* sp. nov.

(Figs. 7–8; Table 1)

*Holotype*.—Adult male, ICN 5662, from Finca Meremburg, Santa Leticia (02° 14' N, 76° 10' W, ca. 2400 m), between municipal-

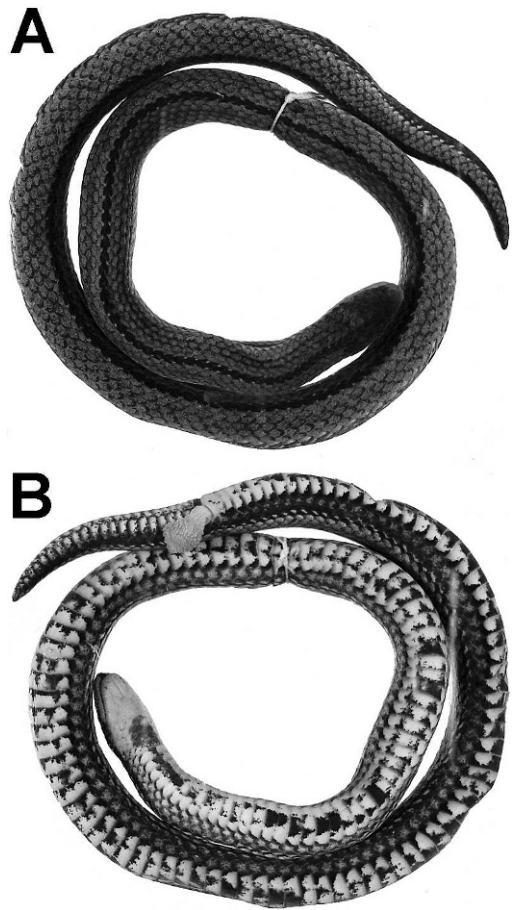


FIG. 8.—Dorsal (A) and ventral (B) views of the holotype of *Atractus chthonius* sp. nov. (ICN 5662).

ities of Popayán in the department of Cauca and La Plata in the department of Huila, Colombia.

*Paratypes*.—Ten specimens, from department of Huila in Colombia: juvenile female ICN 2288 with same data as the holotype; adult males ICN 11515 (FLL 302) and 11516 (FLL 303) collected on 28 November 2004 by F. L. Lopez and M. P. Valencia-Rojas, Finca Riecito (02° 10' N, 75° 57' W, ca. 1970 m), juvenile (CZUTR 171) and adult (CZUTR 173) females and one adult male (CZUTR 172) collected on January 2005 by M. H. Bernal, Vereda Buenos Aires (02° 12' N, 76° 03' W, ca. 2000 m), municipality of La Argentina; adult male IAvH 2062 (GA-H 30) collected on 27 September 1971 by G. Aguirre, Parque Nacional Natural Cueva de

Los Guacharos, municipality of Acevedo; adult female ICN 11517 (FLL 342), collected on 12 October 2004 by F. L. Lopez and M. P. Valencia-Rojas, Cerro Pelado (02° 06' N, 74° 04' W), two subadult females ICN 11513 (FLL 228) and 11514 (FLL 229), collected on October 2004 by F. L. Lopez and M. P. Valencia-Rojas, Vereda El Palamar, Finca Quisayà (ca. 1975 m), Corregimiento Morelia (02° 03' N, 76° 07' W, ca. 1710 m), municipality of Saladoblanco.

*Diagnosis.*—*Atractus chthonius* is distinguished from all congeners by having: (1) 17/17/17 smooth dorsal scale rows; (2) two postoculars; (3) loreal long; (4) temporals 1 + 2; (5) seven supralabials, third and fourth contacting orbit; (6) generally six infralabials, first three contacting chinshields; (7) 9–11 maxillary teeth; (8) four gular scale rows; (9) generally four prefrontals; (10) 137–148 ventrals in females, 138–146 in males; (11) 17–25 subcaudals in females, 20–21 in males; (12) dorsum beige usually with a narrow black vertebral and two dorsolateral cream stripes, first dorsal scale rows brown colored contrasting with remaining dorsal series; (13) venter creamish white, usually with brown blotches forming a central stripe along the body; (14) moderate body size, females reaching 455 mm SVL, males 297 mm SVL; (15) moderate tail length in females (9.0–11.8% SVL) and males (9.2–11.7% SVL); (16) hemipenis slightly bilobed, semicapitate, semicalyculate.

*Comparisons.*—Among all congeners, *Atractus chthonius* shares only with *A. lehmanni* and *A. melanogaster* 17 dorsal scale rows, subcaudals <26 in females and 28 in males, venter with dark pigmentation, and dorsal color pattern with first dorsal scale rows contrasting (lighter or darker) with remaining series. *Atractus chthonius* differs from both by having a slightly bilobed hemipenis with hemipenial body as wide as capitulum (vs. moderately bilobed hemipenis with hemipenial body broader than capitulum). Additionally, *A. chthonius* differs from *A. lehmanni* by having generally six infralabials, first three contacting chinshields, and by lacking a cream occipital band on juveniles and adults (vs. seven infralabials, first four infralabials contacting chinshields, and conspicuous occipital cream band); from *A. melanogaster* by having

seven supralabials, six infralabials, first three infralabials contacting chinshields, 137–148 ventrals in females, 138–146 in males (vs. generally eight supralabials, seven infralabials, first four infralabials contacting chinshields, 156–174 ventrals in females, 155–162 in males). With respect to currently parapatric species (*A. apohis* and *A. atratus*), *A. chthonius* differs from both by having dorsum beige with a narrow black vertebral stripe and first two dorsal scale rows brown contrasting with remaining dorsal rows and venter creamish white generally with brown blotches forming a mid stripe (vs. black dorsum and venter predominantly black with cream squared blotches in *A. apohis*; brown dorsum with cream transverse bands and venter nearly uniform brown to dark brown in *A. atratus*).

*Description of the holotype.*—Adult male, SVL 297 mm; CL 31 mm (10.4% SVL); midbody diameter 8.5 mm (2.9% SVL); head length 12.0 mm (4.0% SVL); head width 6.6 mm (55% head length); interorbital distance 4.5 mm; rostral–orbital distance 3.3 mm (70% interorbital distance); naso–orbital distance 2.6 mm; head flattened in lateral view, round in dorsal view; snout truncate in lateral view, round in dorsal view; cervical constriction barely distinct; rostral subtriangular in frontal view, well-visible in dorsal view, 2.1 mm wide, 1.4 mm high; internasals 1.0 mm long, 0.8 mm wide; internasal suture sinistral with respect to prefrontal suture; prefrontal 2.5 mm long, as wide as long; supraocular subtrapezoidal, 1.5 mm long, 1.1 mm wide; frontal subtriangular, 2.4 mm long, 2.9 mm wide; parietal 4.4 mm long, 3.1 mm wide; nasal divided; nostril restricted to prenasal; prenasal 0.7 mm high, 0.4 mm long; postnasal 0.8 mm high, 0.6 mm long; loreal 2.0 mm long, 0.5 mm high, contacting second and third supralabials; eye diameter 1.4 mm; pupil subelliptical; two postoculars with similar length; upper postocular (0.9 mm high, 0.6 mm long) higher than lower postocular; temporals 1 + 2; anterior temporal 1.4 mm long, 0.9 mm high; upper posterior temporals nonfused; seven supralabials, third and fourth contacting orbit; second supralabial higher than first supralabial and smaller than third supralabial; sixth higher and seventh supralabial longer than remaining

supralabials; symphyisial triangular, 1.6 mm wide, 0.6 mm long; six infralabials, first three contacting chinshield; first pair of infralabials in contact behind symphyisial, preventing symphyisial–chinshields contact; chinshields 3.1 mm long, about three times as long as wide; four gular scale rows; three prefrontals; 146 ventrals; 20 subcaudals on the right and 21 on the left side; 17/17/17 dorsal scale rows; dorsals without apical pits, supra-anal tubercles, and keels; caudal spine moderately long, robust, rhomboid.

*Maxillary arch.*—Arched in dorsal view, with seven or eight prediastemal and two or three postdiastemal teeth; prediastemal teeth large, similar in size, poorly spaced, curved posteriorly, angular in cross-section, robust at base, narrower at apices; diastema short; postdiastemal teeth smaller than last prediastemal tooth; lateral process well-developed, lacking posterior projection.

*Color in preservative of the holotype.*—Dorsum of head reddish brown from rostral to frontal plate; posterior region of frontal brown with small black dots; background of head dark reddish brown to dorsal margin of first six and anterior portion of seventh supralabial; mid-ventral portion of supralabials, posterior region of infralabials, chinshields, and gulars predominantly creamish white; symphyisial and proximal region of first two pairs of infralabial scattered with black dots; venter ground color cream with lateral edges of ventral scales covered by triangular black blotches; irregular triangular blotches connected on median region of belly anteriorly, constituting a medial stripe; dorsal ground color of body beige with a black vertebral line (one scale wide) and first two scale rows brown; paraventral stripes contrasting with remaining dorsal scale rows; ventral margin of third scale row cream, contrasting with first two rows; tail black, with medial portion of each subcaudal cream and first dorsal scale row brown.

*Color pattern variation.*—Dorsum sometimes lacking distinct vertebral stripe; first three scale rows brown on juvenile specimens; rarely first scale row faded on melanic specimens; venter with conspicuous medial stripe covering most of ventral scales, except their lateral margins; venter with cream ground color scattered by few to many dark

brown dots; tail brown pigmented with anterior portion of each subcaudal beige.

*Hemipenis morphology.*—Retracted organ bifurcate and extends to the level of eight subcaudal. Hemipenis slightly bilobed, semicapitate, semicalyculate; lobes poorly distinct, similar in size, clavate, flattened on the apices, with centrolineal orientation; capitular crotch evident on sulcate and well-marked on asulcate side of hemipenis, located just above of sulcus spermaticus bifurcation; lobes and capitulum covered with spinulate calyces disposed on transverse series, forming well-defined flounces on lateral region of the organ; intrasulcar region with irregular calyces; sulcus spermaticus bifurcates on the midregion of hemipenis; sulcus spermaticus branches centrifugally oriented, running to the apices of lobes; margins of sulcus spermaticus stout, moderately expanded, bordered with spinules from the base of the organ to tip of lobes; hemipenial body subcylindrical, with equivalent width of capitular region of organ, covered with moderate hooked spines; basal naked pocket restricted to basal portion of the organ; basal region of hemipenis with longitudinal plicae and disperse spinules (Fig. 3B).

*Meristic and morphometric variation.*—Largest male 297 mm SVL, 31 mm CL; largest female 455 mm SVL, 51 mm CL; tail 9.2–11.7% SVL ( $\bar{X} = 10.8$ ; SD = 1.0;  $n = 5$ ) in males, 9.0–11.8% SVL ( $\bar{X} = 10.4$ ; SD = 1.3;  $n = 4$ ) in females; 138–146 ( $\bar{X} = 142$ ; SD = 3.4;  $n = 5$ ) ventrals in males, 137–148 ( $\bar{X} = 145$ ; SD = 4.1;  $n = 6$ ) in females; 20–22 ( $\bar{X} = 20.8$ ; SD = 1.1;  $n = 5$ ) subcaudals in males, 17–25 ( $\bar{X} = 20$ ; SD = 3.8;  $n = 4$ ) in females; 3 ( $n = 3$  side) or 4 ( $n = 19$  sides) gular scale rows; 3 ( $n = 5$ ), 4 ( $n = 5$ ), or 5 ( $n = 1$ ) prefrontals; 8–11 ( $\bar{X} = 9.5$ ; SD = 1.3;  $n = 12$  sides) dorsal scale rows above second subcaudal; body diameter 3.1–7.3 mm ( $\bar{X} = 5.6$ ; SD = 1.5;  $n = 6$ ); 7 ( $n = 4$  sides), 8 ( $n = 2$ ), 9 ( $n = 2$  sides), or 11 ( $n = 6$  sides) maxillary teeth.

*Distribution.*—Eastern versant of the Cordillera Central, from municipality of Santa Leticia in the department of Cauca to Parque Natural Nacional Cueva de los Guácharos, municipality of Acevedo in the department of Huila, Colombia. *Atractus chthonius* inhabits sub-Andean forest and cloud forest between 1500 m and 2400 m (Fig. 4).

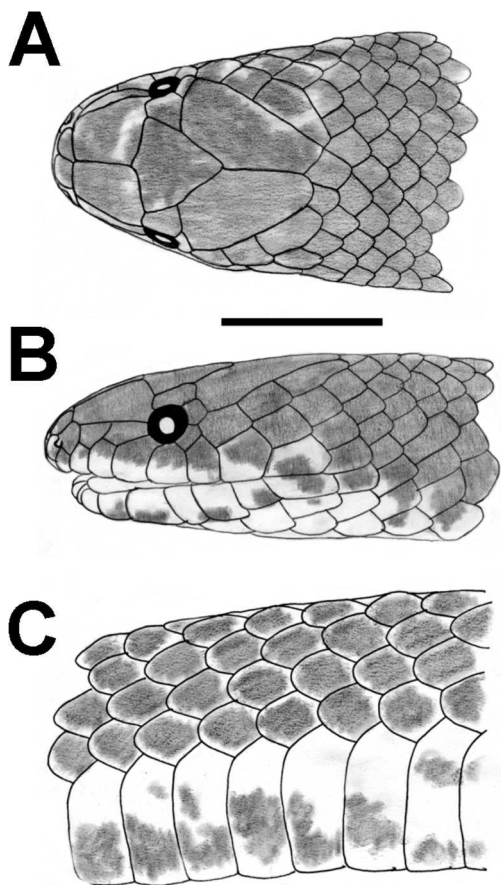


FIG. 9.—Dorsal (A) and lateral (B) views of the head, and lateral (C) view of the body of the neotype of *Atractus melanogaster* (ICN 10030). Scale = 5 mm.

*Etymology*.—The specific epithet “chthonius” is a Latin word derived from the Greek Kthon, meaning something rises on the ground. This name is used herein in reference to the pre-Colombian civilization Tierradentro (= inside of the ground), which originally inhabited the region where *Atractus chthonius* is distributed, and also as reference to the secretive habits of the new species.

*Atractus melanogaster* Werner, 1916

(Figs. 9–12; Table 1)

*Atractus melanogaster* Werner, 1916; Zool. Anz. 47:308.

*Atractus obtusirostris* – Werner, 1916 in part; Amaral, 1931, 1933.

*Holotype*.—Adult female, originally housed at Landesmuseum Brno in Czech Republic,

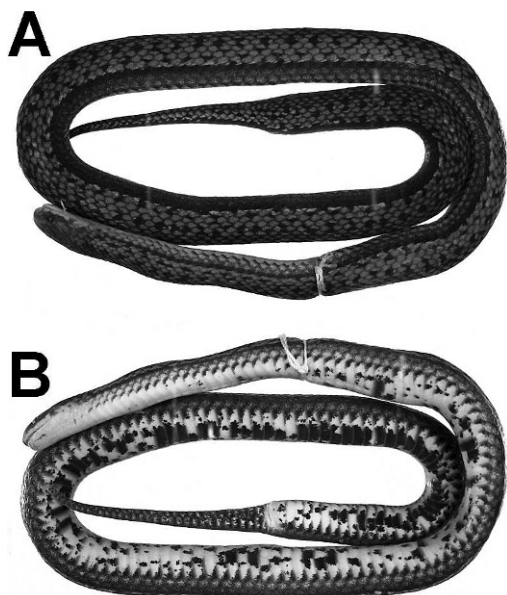


FIG. 10.—Dorsal (A) and ventral (B) views of the neotype of *Atractus melanogaster* (ICN 10030).

from Cañon del Tolima (= Cañon del Río Conbeima, 04° 19' N, 75° 10' W)—according Pérez-Santos and Moreno (1988)—department of Tolima Colombia. The holotype is lost (M. Berec, personal communication), see remarks for justification of neotype designation.

*Neotype*.—Adult male, ICN 10030, collected on 29 May 1981 by J. D. Lynch and V. Rueda, Quebrada Perales (2420 m), Vereda La Palma, 11.4 km west of the municipality of Cajamarca (04° 27' N, 75° 26' W), department of Tolima, Colombia (by current designation).

*Diagnosis*.—*Atractus melanogaster* is distinguished from all congeners by having: (1) 17/17/17 smooth dorsal scale rows; (2) generally two postoculars; (3) loreal long; (4) temporals 1 + 2; (5) generally eight supralabials, fourth and fifth contacting orbit; (6) generally seven infralabials, first four contacting chinshields; (7) 8–11 maxillary teeth; (8) four gular scales; (9) generally four prefrontals; (10) 160–174 ventrals in females, 151–162 in males; (11) 16–18 subcaudals in females, 19–28 in males; (12) dorsum brown, with an irregular vertebral line barely defined, paravertebral dark brown blotches, and first three dorsal scale rows contrasting lighter or

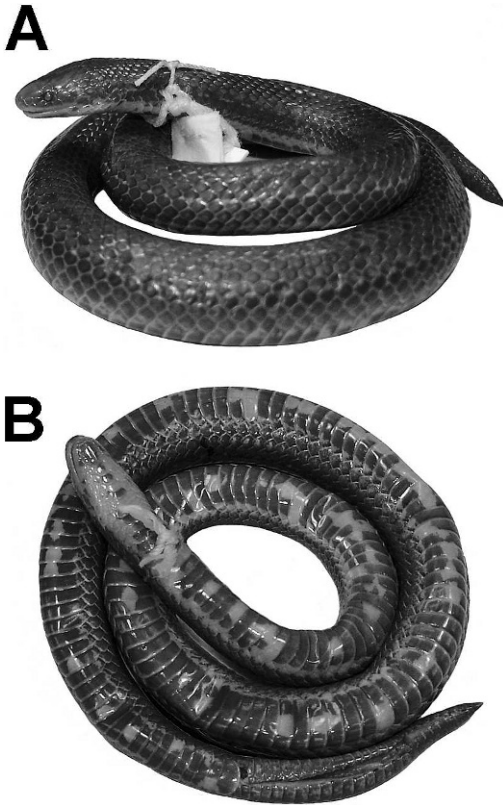


FIG. 11.—Dorsal (A) and ventral (B) views of a juvenile of the *Atractus melanogaster*.

darker) with upper rows; (13) venter predominantly black with cream irregular blotches; (14) moderate body size, females reaching 475 mm SVL, males 336 mm SVL; (15) small tail length in females (7.2–8.5% SVL), small to moderate (8.8–13.2% SVL) in males; (16) hemipenis moderate bilobed, semicapitate, semicalyculate.

*Comparisons*.—Among all congeners, *Atractus melanogaster* shares only with *A. obtusirostris* 17 dorsal scale rows, 8–11 maxillary teeth, dorsal color pattern with barely defined vertebral line, dark brown paravertebral blotches, first two or three dorsal scale rows contrasting with remaining rows, and hemipenial body globular and broader than capitulum. *Atractus melanogaster* differs from *A. obtusirostris* in having generally eight supralabials, first four infralabials contacting chinshields, 16–18 subcaudals in females, 19–28 in males (vs. seven



FIG. 12.—General view in life of *Atractus melanogaster* from department of Tolima, Colombia. Photograph by J. C. Arredondo.

supralabials, first three infralabials contacting chinshields, 28–32 subcaudals in females, 30–38 in males).

*Description of the neotype*.—Adult male, SVL 252 mm, CL 31 mm (12.3% SVL); head length 10.8 mm (4.3% SVL); body diameter 5.8 mm (2.3% SVL); width 5.2 mm (48% head length); head flattened in lateral view, round in dorsal view; snout truncate in lateral view, round in dorsal view; cervical constriction indistinct; rostral subtriangular in frontal view, poorly visible in dorsal view, 1.5 mm wide, 1.0 mm high; internasal 0.7 mm long, 0.8 mm wide; internasal suture sinistral with respect to prefrontal suture; prefrontal 2.2 mm long, 1.9 mm wide; supraocular subtrapezoidal, 1.1 mm long, 0.6 mm wide; frontal subpentagonal, 2.5 mm long, 2.6 mm wide; parietal 4.3 mm long, 2.1 mm wide; nasal divided; nostril located between prenasal and postnasal; prenasal 0.4 mm high, 0.2 mm long; postnasal 0.4 mm high, 0.3 mm long; loreal 1.9 mm long, 0.4 mm high, contacting second, third, and fourth supralabials; eye diameter 1.1 mm; pupil round; two postoculars; upper postocular slightly longer (0.3 mm) and shorter (0.2 mm) than lower postocular; temporals 1 + 2; anterior temporal 1.3 mm long, 0.6 mm high; upper posterior temporals nonfused; eight supralabials, fourth and fifth contacting orbit; second supralabial higher than first and with similar height to third and fourth supralabials; seventh higher and eighth longer than remaining supralabials; symphyisial semicircular, 1.2 mm

wide, 0.4 mm long; seven infralabials, first four contacting chinshields; first pair of infralabials in contact behind symphyseal, preventing symphyseal–chinshield contact; chinshields 3.0 mm long, 0.8 mm wide; four gular scale rows; four preventrals; 158 ventrals; 24 subcaudals; 17/17/17 dorsal scale rows; dorsals without apical pits, supra-anal tubercles, and keels; caudal spine moderately long, conical, robust, acuminate.

*Maxillary arch*.—Slightly arched in dorsal view, with 5–9 prediastemal and two or three postdiastemal teeth; prediastemal teeth large, poorly spaced, of similar size, curved posteriorly, angular in cross-section, robust at base, slightly narrower at apices; postdiastemal teeth half size of the last prediastemal tooth; diastema short; lateral process moderately developed, lacking posterior projection.

*Color in preservative*.—Dorsum of head dark brown or beige, with variegated black blotches; occasionally head with an incomplete cream occipital band covering posterior region of parietals, temporal and occipital scales; background of head dark brown or beige, with variegated black blotches; cream temporal stripe from posterior temporals descending to posterior portion of eighth supralabial; anterior supralabials with beige ground color and dark brown dots concentrated on temporal region (posterior region of seventh and anterior region of eighth supralabial); infralabials, chinshields, gular, and preventral scales predominantly cream, with dark brown dots concentrated on proximal portion of first three pair of infralabials; first 10 ventral scales predominantly creamish white, remaining ventrals with black center and cream lateral portions (about one dorsal scale width); creamish white tail with lateral edges of subcaudals black pigmented; dorsal ground color of body brown or beige with paired black blotches on paravertebral region; black dots (one scale width) occasionally disposed irregularly, producing a reticulate pattern on paravertebral region; occasionally a vertebral conspicuous vertebral line connects paravertebral blotches; first two or three dorsal scale rows contrast with remaining dorsal rows; frequently first two rows lighter (beige or light brown), with dorsal margin or entire third row dark brown; dorsal edge of

third row occasionally constituting a conspicuous dorsolateral stripe; always the dark margin of third row indistinct and dorsum with first three rows lighter; rarely first three rows indistinct from the other dorsal rows and vertebral line connected to expanded lateral blotches.

*Hemipenis morphology*.—Retracted organ bifurcates on 12th and extends to the level of 14th subcaudal. Organ moderately bilobed, semicapitate, semicalyculate; lobes distinct and restricted to distal portion of capitulum; lobes of similar size, clavate, and flattened at apices; lobes with half size of capitulum, barely centrifugally oriented; lobes and capitulum uniformly covered with spinulate calyces; calyces arranged transversally, forming well-defined calyculate flounces; intrasulcar region with a distinct longitudinal crotch in the median portion of capitulum; asulcate side of capitulum with barely defined lobular crests; capitular crotch indistinct on sulcate and well-marked on lateral portion and asulcate side of hemipenis; capitulum located just above sulcus spermaticus bifurcation; capitulum with small retraction on median region of asulcate side of hemipenis and size similar to hemipenial body; sulcus spermaticus bifurcates on midportion of organ; sulcus spermaticus branches centrifugally oriented, running to lobe apices; margins of sulcus spermaticus stout and narrow, bordered by spinules; hemipenial body with subcylindrical shape, slightly broader than capitulum; hemipenial body scattered with moderate hooked spines; basal naked pocket restricted to basal region of hemipenial body; basal region of hemipenis with longitudinal plicae and disperse spinules (Fig. 3D).

*Meristic and morphometric variation*.—Largest male 336 mm SVL, 39 mm CL; largest female 475 mm SVL, 35 mm CL; tail 8.8–13.2% ( $\bar{X} = 11.5$ ; SD = 1.3;  $n = 9$ ) SVL in males, 7.2–8.5% ( $\bar{X} = 7.8$ ; SD = 0.6;  $n = 5$ ) SVL in females; 151–162 ( $\bar{X} = 158.2$ ; SD = 3.7;  $n = 9$ ) ventrals in males, 160–174 ( $\bar{X} = 165.8$ ; SD = 5.2;  $n = 5$ ) in females; 19–28 ( $\bar{X} = 23.8$ ; SD = 2.4;  $n = 9$ ) subcaudals in males, 16–18 ( $\bar{X} = 16.7$ ; SD = 0.7;  $n = 5$ ) in females; 1 ( $n = 1$  side) or 2 ( $n = 17$  sides) postoculars; 7 ( $n = 4$  side) or 8 ( $n = 16$  sides) supralabials; 7 ( $n = 17$  sides) or 8 ( $n = 3$

sides) infralabials; 3 ( $n = 2$  sides) or 4 ( $n = 18$  sides) first infralabials contacting chinshields; 3 ( $n = 1$  side) or 4 ( $n = 17$  sides) gular scale rows; 3 ( $n = 1$ ), 4 ( $n = 10$ ) or 5 ( $n = 2$ ) preventrals; 8–10 ( $\bar{X} = 8.9$ ;  $SD = 0.6$ ;  $n = 26$  sides) dorsal scale rows above second subcaudal; 2.9–7.4 mm ( $\bar{X} = 5$ ;  $SD = 1.3$ ;  $n = 12$ ) body diameter; 8 ( $n = 5$  sides), 9 ( $n = 7$  sides), 10 ( $n = 8$  sides), or 11 ( $n = 6$  sides) maxillary teeth; retracted hemipenis extends from 8th to 14th subcaudal ( $n = 4$ ).

*Distribution.*—On the eastern versant of Central Cordillera of Colombia, from Pensilvania ( $05^{\circ} 23' N$ ,  $75^{\circ} 10' W$ ) in the department of Caldas to Cajamarca ( $04^{\circ} 25' N$ ,  $75^{\circ} 30' W$ ) in the department of Tolima. *Atractus melanogaster* inhabits sub-Andean and Andean forests between 1800 m and 2200 m (Fig. 4).

*Remarks.*—Since the original description, there have been no additional records of *A. melanogaster*. However, Amaral (1931, 1933) misidentified three specimens (institutional abbreviation not given) of *A. melanogaster* as *A. obtusirostris* (P. Passos, personal observation). According to the original description, the holotype of *A. melanogaster* (a female) had 17 dorsal scale rows, 8 supralabials, 7 infralabials, 174 ventrals, 18 subcaudals, irregular dark dorsal blotches alternating on the dorsum, and venter mostly black. Pérez-Santos and Moreno (1988) pointed out that the type locality of *A. melanogaster* (Cañon del Tolima) does not exist, and suggested the possibility it refers to the margins of the Combeima River near Ibagué municipality in the department of Tolima at Colombia. We agree because Ibagué (currently capital department of Tolima) is situated in the lower portion of the eastern versant of Cordillera Central, and was an important trans-Andean cross-country route for the naturalists in the 19th century (J. Lynch, personal observation).

The holotype of *Atractus melanogaster*, originally housed at Landesmuseum Brno in the Czech Republic, is lost (M. Berc, personal communication). The data based on the original description are limited. To complicate matters, we detected two distinct species occurring sympatrically near Ibagué (Toche and Pastales localities). One of them, based on the analysis of syntypes (see below),

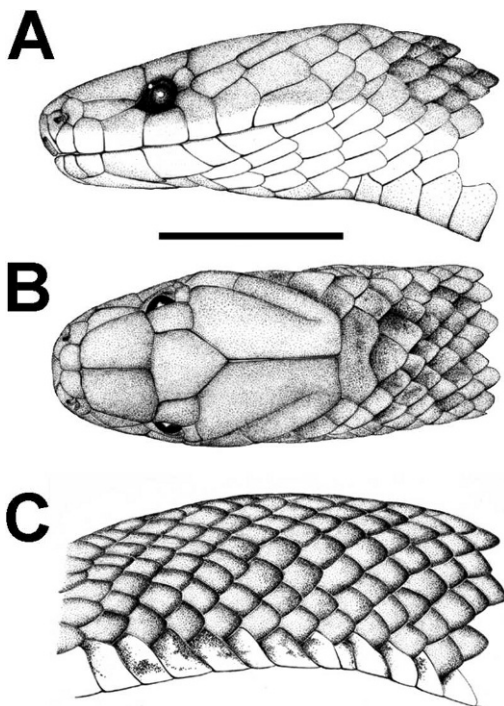


FIG. 13.—Dorsal (A) and lateral (B) views of the head, and lateral (C) view of the body of the lectotype of *Atractus obtusirostris* (ZMH-R 4428). Scale = 5 mm.

represents *A. obtusirostris* and the other matches the original description of *A. melanogaster*. In this sense, following the qualifying conditions of article 75 from ICZN (1999), the neotype designation for *A. melanogaster* is required in order to properly diagnose both species. Finally, because the aforementioned taxa have parapatric distributions (Fig. 4) and little overlap for some meristic features (i.e., number of ventral and infralabial scales), it is possible to consider *Atractus obtusirostris* as a subspecies of *A. melanogaster*. Nevertheless, both taxa actually differ in the number of subcaudals, supralabials, infralabials contacting chinshields, and dorsal and ventral color pattern (see *A. obtusirostris* remarks).

*Atractus obtusirostris* Werner, 1916  
(Figs. 13–14; Table 1)

*Atractus obtusirostris* Werner, 1916; Zool. Anz. 47:308.

*Lectotype.*—Adult male, ZMH 4428 (by current designation), from de Cañon del Tolima (= Combeima River; west Ibagué,

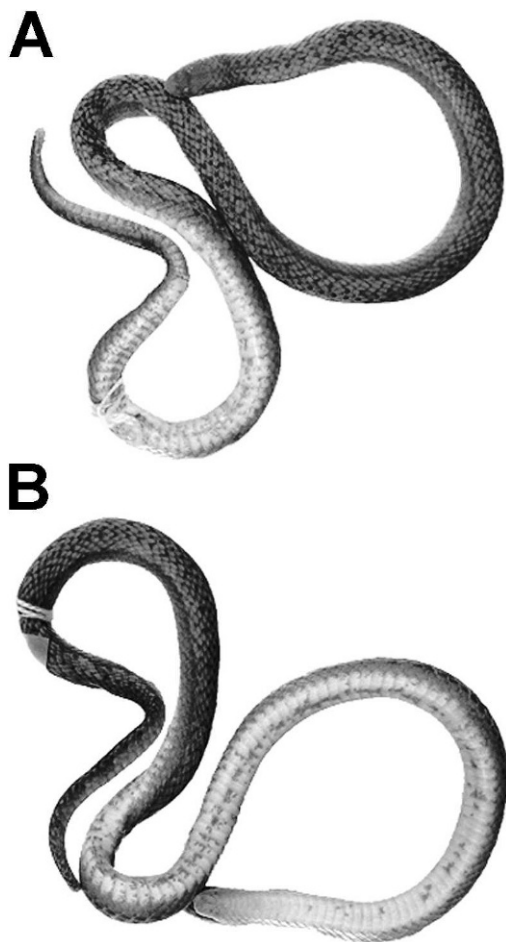


FIG. 14.—Dorsal (A) and ventral (B) views of the paralectotype of *Atractus obtusirostris* (FMNH 22347).

04° 26' N, 75° 14' W, ca. 1100 m), department of Tolima, Colombia (specimen examined).

*Paralectotype*.—Adult male, FMNH 22347, same data as lectotype (specimen photographs examined).

*Diagnosis*.—*Atractus obtusirostris* is distinguished from all congeners by having: (1) 17/17/17 smooth dorsal scale rows; (2) two postoculars; (3) moderate loreal; (4) temporals 1 + 2; (5) seven supralabials, third and fourth contacting orbit; (6) seven infralabials, first three contacting chinshields; (7) 9–11 maxillary teeth; (8) three or four gular scale rows; (9) three or four preventrals; (10) 160–164 ventrals in females, 145–151 in males; (11) 27–32 subcaudals in females, 30–37 in males; (12) dorsal ground color pale brown with

conspicuous vertebral line generally connected to paravertebral blotches and first two scale rows contrasting to remaining series; (13) venter predominantly cream with little invasion of brown pigment between suture of the ventral scales; (14) small to moderate body size, females reaching 376 mm SVL, males 240 mm SVL; (15) moderate tail in females (11.3–13.7% SVL) and long (14.6–18.1% SVL) in males; (16) hemipenis moderately bilobed, semicapitate, semicalyculate.

*Comparisons*.—Among all congeners, *Atractus obtusirostris* shares only with *A. melanogaster* 17 dorsal scale rows, 8–11 maxillary teeth, dorsum with vertebral line, paravertebral blotches, and first two or three scale rows contrasting with remaining series. *Atractus obtusirostris* differs from *A. melanogaster* in having seven supralabials, first three infralabials contacting chinshields, 28–32 subcaudals in females, 30–38 in males (vs. generally eight supralabials, generally first four infralabials contacting chinshields, 16–18 subcaudals in females, 19–28 in males).

*Description of the lectotype*.—Adult male, SVL 215 mm, CL 39 mm (18.1% SVL); body diameter 4.4 mm (2.0% SVL); head length 9.2 mm (4.3% SVL); head width 4.4 mm (48% head length); head slightly arched in lateral view, round in dorsal view; snout truncate in lateral view, round in dorsal view; cervical constriction indistinct; rostral subtriangular in frontal view, 1.5 wide, 0.8 mm high, poorly visible in dorsal view; internasal 0.5 mm long, 0.7 mm wide; internasal suture sinistral with respect to prefrontal suture; prefrontal 2.0 mm long, 1.7 mm wide; supraocular subtrapezoidal, 1.2 mm long, 0.7 mm wide; frontal pentagonal, 2.0 mm long, 2.0 mm wide; parietal 4.0 mm long, 2.5 mm wide; nasal divided; nostril located between prenasal and postnasal; prenasal about two times higher than long; postnasal about as high as long; loreal 1.5 mm long, 0.7 mm high, contacting second and third supralabials; eye diameter 1.2 mm; pupil subelliptical; single postocular on left side and two on right side; postoculars on right side of similar height; upper postocular slightly longer than lower; temporals 1 + 2; anterior temporal twice as long as high; upper posterior temporals nonfused; seven supralabials, third and fourth contacting orbit;



second supralabial taller than first and slightly shorter than third; sixth taller and seventh longer than remaining supralabials; symphy-sial subtriangular, about three times as broad as long; seven infralabials, first three contact-ing chinshields; first pair of infralabials in contact behind symphy-sial, preventing sym-phy-sial–chinshields contact; chinshields about three times as long as wide; four gular scales; four prementals; 145 ventrals; 37/36 subcau-dals; 17/17/17 dorsal scale rows; dorsals without apical pits, supra-anal tubercles, and keels; caudal spine moderately long, conical, slightly acuminate. Maxillary teeth 10 + 1/9 + 1, on the right and left sides, respectively.

*Maxillary arch.*—Arched in dorsal view, with 8 to 10 prediastemal teeth and one or two postdiastemal teeth; prediastemal teeth large, poorly spaced, of similar size, curved posteri-orly, angular in cross-section, robust at base, narrower at apices; diastema short; postdias-temals considerably smaller than last predias-temal tooth; lateral process moderately devel-oped, lacking posterior projection.

*Color in preservative.*—Dorsum of head uniformly brown; background of head brown to midventral portion of supralabials; ventral region of supralabials cream; occasionally brown pigmentation reaches ventral part of posterior supralabials; mental region with cream ground color covered by brown dots, concentrated on first infralabials and region of chinshields; prementals uniformly cream; ven-ter immaculate cream anteriorly and frequent-ly with diffuse brown dots in the posterior third of body; occasionally dots concentrated at median region of belly from midbody to anal plate, forming a tenuous irregular dark line; tail cream with diffuse brown dots, occasionally concentrated above median suture of subcau-dals; dorsal ground color varies from light to dark brown, with a dark brown irregular vertebral line (one scale wide); generally small paravertebral blotches (one scale wide) later-ally connected to vertebral line; occasionally vertebral line fragmented into paravertebral blotches or constituting a barely reticulate pattern; first three dorsal scale rows grayish brown, contrasting with remaining series; frequently a dorsolateral dark brown or black stripe covers the dorsal margin of third scale row, delimiting contrasting region on flanks.

*Hemipenis morphology.*—Retracted organ bifurcates on eighth and extends to ninth subcaudal. Hemipenis moderately bilobed, semicapitate, semicalyculate; lobes of similar size, centrifugally oriented, distinct and re-stricted to distal portion of capitulum, sub-cylindrical with flattened apices; lobes and capitulum uniformly covered with spinulate calyces; capitular crotch indistinct on sulcate and well-marked on lateral region and asul-cate side of hemipenis; capitulum located just above sulcus spermaticus bifurcation; capitu-lum as long as hemipenial body, barely retracted on median region of asulcate side of organ; sulcus spermaticus bifurcates on midportion of organ; sulcus spermaticus branches centrifugally oriented, running to apices of lobes; margins of sulcus spermaticus stout and narrower, bordered with spinules from the base to tip of lobes; hemipenial body globular, broader than capitulum, scattered with moderate hooked spines; basal naked pocket restricted to basal region of hemipenial body; proximal region of organ with longitu-dinal plicae and disperse spinules (Fig. 3E).

*Meristic and morphometric variation.*—Largest male 240 mm SVL, 35 mm CL; largest female 376 mm SVL, 46 mm CL; 3.4–7.0 mm ( $\bar{X}$  = 4.3; SD = 1.1;  $n$  = 11) body diameter; tail 14.6–18.1% ( $\bar{X}$  = 161.4; SD = 1;  $n$  = 3) SVL in males, 11.3–13.7% ( $\bar{X}$  = 12.4; SD = 1.2;  $n$  = 3) SVL in females; 145–151 ( $\bar{X}$  = 147.9; SD = 2.3;  $n$  = 8) ventrals in males, 160–164 ( $\bar{X}$  = 161.7; SD = 2.1;  $n$  = 3) in females; 30–37 ( $\bar{X}$  = 33.7; SD = 2.6;  $n$  = 8) subcaudals in males, 28–32 ( $\bar{X}$  = 30; SD = 2.6;  $n$  = 3) in females; 1 ( $n$  = 1 side) or 2 ( $n$  = 21 sides) postoculars; 2 ( $n$  = 1 side) or 3 ( $n$  = 21 sides) infralabials contacting chinshields; 3 ( $n$  = 11 sides) or 4 ( $n$  = 11 sides) gular scale rows; 2 ( $n$  = 1), 3 ( $n$  = 4), 4 ( $n$  = 5), or 5 ( $n$  = 1) prementals; 8–9 ( $\bar{X}$  = 8.2; SD = 0.3;  $n$  = 22 sides) dorsal scale rows above second subcaudal; 9 ( $n$  = 20 sides), 11 ( $n$  = 1 side), or 12 ( $n$  = 1 side) maxillary teeth; retracted hemipenis extends to the level of eight subcaudal ( $n$  = 1); anal glands of females extends to the level of fourth subcaudal ( $n$  = 1).

*Distribution.*—On the eastern slopes of the Central Cordillera from Toche (04° 32' N, 75° 25' W) to Juntas (03° 33' N, 75° 39' W), and on the western slopes of the Eastern Cordil-lera at Icononzo (04° 11' N, 74° 32' W) in the

department of Tolima, Colombia. *Atractus obtusirostris* inhabits sub-Andean and riparian forests associated with the rivers running from eastern slopes of Cordillera Central between 1200 m and 2200 m (Fig. 4).

*Remarks.*—Werner (1916) described *Atractus melanogaster* and *A. obtusirostris* based on one and three specimens (respectively), both from Cañon del Tolima at Colombia (see *A. melanogaster* remarks for comments on the type locality). Subsequently, Werner (1924) reported seven topotypes of *A. obtusirostris*. Later, Amaral (1931, 1933, 1937) cited four additional specimens of *A. obtusirostris* (institutional abbreviation not given). Nevertheless, the specimens mentioned by Amaral (1931, 1933) refer in fact to *A. melanogaster*, and the other cited by Amaral (1937) to *A. crassicaudatus* (P. Passos, personal observation). The examinations of a syntype of *A. obtusirostris* (ZMH 4428, now lectotype) permitted us to identify 10 additional specimens of the species and their proper diagnosis with respect to *A. melanogaster*. *Atractus melanogaster* and *A. obtusirostris* are morphologically similar parapatric species (see comments on *A. melanogaster*), with their area of sympatry situated in transitional zones between sub-Andean and riparian forests associated with the rivers following from the highlands of the Central Cordillera. Therefore, according to the present patterns of distribution of both species, *A. obtusirostris* is subhygrophilous and also occurs in plant formations at lower elevations of the Central Cordillera and Magdalena Valley, while *A. melanogaster* is restricted to the highlands of the Central Cordillera.

*Atractus weneri* Peracca, 1914  
(Figs. 15–16; Table 1)

*Atractus weneri* Peracca, 1914; Mem. Soc. Neuchâtel ScI. Nat. 5:102.

*Holotype.*—Subadult female, MHNN 03, housed at Muséum d'histoire naturelle de Neuchâtel, from Cafetal Argélia (ca. 1800 m), municipality of Viotá (04° 26' N, 74° 31' W), department of Cundinamarca, Colombia (specimen photographs examined).

*Diagnosis.*—*Atractus weneri* is distinguished from all congeners by having: (1) 17/17/17 smooth dorsal scale rows; (2) two postoculars; (3) loreal long; (4) temporals 1 +

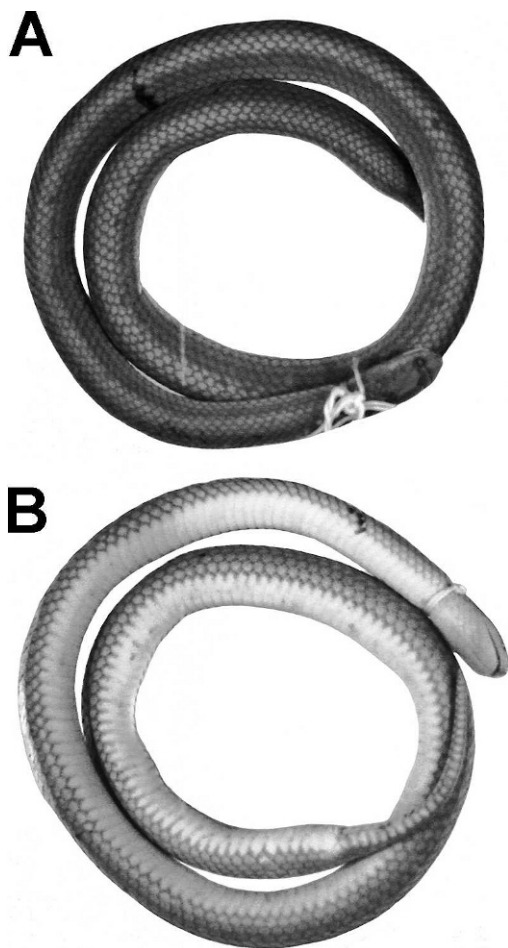


FIG. 15.—Dorsal (A) and ventral (B) views of the *Atractus weneri* (ICN 10696) from San Francisco, department of Cundinamarca, Colombia.

2; (5) generally seven supralabials, third and fourth contacting orbit; (6) generally seven infralabials, first three contacting chinshields; (7) 6–9 maxillary teeth; (8) three or four gular scale rows; (9) three or four preventrals; (10) 158–174 ventrals in females, 148–160 in males; (11) 21–36 subcaudals in females, 27–37 in males; (12) dorsum uniformly brown or having conspicuous vertebral and dorsolateral lines; (13) venter predominantly creamish white, occasionally having diffuse and irregular dark brown blotches; (14) moderate body size, females reaching 346 mm SVL, males 330 mm SVL; (15) small to moderate tail length in females (8.7–15.2% SVL), moderate to long in males (13.2–17.1% SVL); (16)

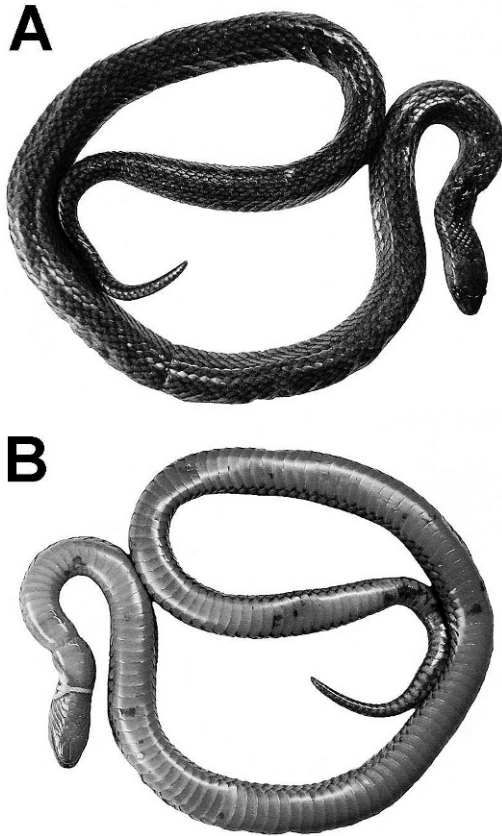


FIG. 16.—Dorsal (A) and ventral (B) views of the *Atractus wernerii* (IAvH 861) from San Francisco, department of Cundinamarca, Colombia.

hemipenis slightly bilobed, semicapitate, and semicalyculate.

*Comparisons.*—Among all congeners, *Atractus wernerii* shares only with *A. melanogaster*, and *A. obtusirostris*: 17 dorsal scale rows; 7–11 maxillary teeth; flanks with coloration contrasting with dorsal ground color; hemipenial body having a globular shape broader than capitulum. *Atractus wernerii* differs from *A. melanogaster* by having 27–37 subcaudals and tail length 13.2–17.1% SVL in males, 21–36 subcaudals and tail length 8.7–15.2% SVL in females, and generally seven supralabials (vs. 19–28 subcaudals and tail 8.8–13.2% SVL in males, 16–18 subcaudals and tail 7.2–8.5% SVL in females, and eight supralabials in *A. melanogaster*); *A. wernerii* differs from *A. obtusirostris* by having

dorsum uniformly brown or with conspicuous vertebral and dorsolateral lines, hemipenis with capitulum longer than hemipenial body (vs. dorsum with irregular vertebral lines, generally fragmented on paravertebral blotches; and hemipenis with capitulum and hemipenial body of similar length).

*Description.*—Head about twice as long as wide, slightly arched in lateral view, round in dorsal view; snout truncate in lateral view, round in dorsal view; canthus rostralis well-defined; cervical constriction slightly distinct; rostral subtriangular in frontal view, wider than high, little visible in dorsal view; internasal longer than wide; internasal suture sinistral with respect to prefrontal suture; prefrontal as long as wide; supraocular subrectangular, about twice as long as wide; frontal subtriangular, wider than long; parietal twice long as wide; nasal divided; nostril restricted to prenasal; prenasal twice as high as long; postnasal as high as long; loreal long, contacting a second and third supralabials; pupil subelliptical; two postoculars; upper postocular higher and longer than lower postocular; temporals 1 + 2; anterior temporal twice as long as high; upper posterior temporals generally nonfused, when fused about three times as long as wide; generally seven supralabials, third and fourth contacting orbit; first two supralabials of similar height, slightly smaller than third supralabial; sixth supralabial higher and seventh longer than remaining supralabials; symphyisial subtriangular, three times as wide as long; generally seven infralabials, first three contacting chinshields; first pair of infralabials in contact behind symphyisial, preventing symphyisial–chinshields contact; chinshields three times longer than wide; three or four gular scale rows; generally three preventrals; 17/17/17 dorsal scale rows; dorsal without apical pits, supra-anal tubercles, and keels; caudal spine short, robust, and rhomboid.

*Maxillary arch.*—Arched in dorsal view, with 5–8 prediastemal and one or two postdiastemal teeth; prediastemal teeth large, poorly spaced, decreasing in size posteriorly, curved, angular in cross-section, robust at base, narrower at apices; diastema short; postdiastemal teeth slightly smaller than last prediastemal tooth; lateral process absent.

*Color in preservative.*—Dorsum of head brown or light brown; occasionally with diffuse dark brown dots above cephalic shields; background of head light brown or brown to level of dorsal margin of supralabials; temporal region occasionally with black blotches concentrated at posterior temporals; supralabials generally uniformly creamish white; mental region generally immaculate creamish white; occasionally symphyseal, first pair of infralabials, and anterior portion of chinshields with dark brown blotches; pre-ventrals uniform creamish white; venter generally uniformly creamish white; belly occasionally scattered uniformly with irregular small dark brown blotches, sometimes concentrated in the center of ventrals; tail generally uniform creamish white, occasionally brown with beige irregular blotches; dorsal ground color of body varies from light brown to brown; dorsum frequently with vertebral (one scale wide) and dorsolateral tiny (one scale or less wide) black lines; dorsolateral lines above dorsal margin of second or ventral edge of third scale rows; dorsolateral lines sometimes fragmented in narrow dark brown blotches arranged longitudinally; blotches or dorsolateral lines rarely contacting vertebral line; paraventral region (below dorsolateral lines) contrasting with remaining dorsum; first two or three scale rows dark brown to grayish brown.

*Hemipenis morphology.*—Hemipenis slightly bilobed, semicapitate, and semicalyculate; lobes distinct and restricted to distal portion of capitulum; lobes of similar size, clavate, flattened at apices; lobes centrifugally oriented, with half size of capitular region; lobes and capitulum uniformly scattered with small spinulate calyces; spinules gradually replaced by papillae toward apices of lobes; capitulum located above sulcus spermaticus bifurcation; capitular crotch poorly distinct on sulcate side, well-defined laterally and on asulcate side of hemipenis; capitulum longer and slender compared to hemipenial body; asulcate side of capitulum with well-developed lobular crests; sulcus spermaticus bifurcates in the basal third of hemipenis; branches of sulcus spermaticus centrifugally oriented, extending to tip of lobes; margins of sulcus spermaticus stout, moderately expanded, bordered by

spinules in proximal and papillae in distal region of lobes; hemipenial body globular, broader than capitulum; hemipenial body scattered with moderate hooked spines; basal naked pocket restricted to basal region of hemipenial body; proximal region of hemipenis with longitudinal plicae and disperse spinules (Fig. 3F).

*Meristic and morphometric variation.*—Largest male 330 mm SVL, 50 mm CL; largest female 346 mm SVL, 30 mm CL; tail 13.2–17.1% ( $\bar{X}$  = 15.3; SD = 1.2;  $n$  = 16) SVL in males, 8.7–15.3% ( $\bar{X}$  = 11.6; SD = 1.7;  $n$  = 28) in females; 148–160 ( $\bar{X}$  = 153.9; SD = 4.2;  $n$  = 16) ventrals in males, 158–174 ( $\bar{X}$  = 165.3; SD = 4;  $n$  = 26) in females; 27–37 ( $\bar{X}$  = 33; SD = 2.4;  $n$  = 16) subcaudals in males, 21–36 ( $\bar{X}$  = 27.3; SD = 3.7;  $n$  = 26) in females; 5 ( $n$  = 1 side), 6 ( $n$  = 5 sides), 7 ( $n$  = 83 sides), or 8 ( $n$  = 1 side) supralabials; 5 ( $n$  = 1 side), 6 ( $n$  = 6 sides), 7 ( $n$  = 81 sides), or 8 ( $n$  = 2 sides) infralabials; 2 ( $n$  = 4 sides), 3 ( $n$  = 83 sides), or 4 ( $n$  = 3 sides) infralabials contacting chinshields; 2 ( $n$  = 1 side), 3 ( $n$  = 42 sides), or 4 ( $n$  = 42 sides) gular scale rows; 1 ( $n$  = 1), 2 ( $n$  = 1), 3 ( $n$  = 11), 4 ( $n$  = 7), or 5 ( $n$  = 27) pre-ventrals; 6–10 ( $\bar{X}$  = 8.2; SD = 0.7;  $n$  = 84 sides) dorsal scale rows above second subcaudal; 2.2–8.6 mm ( $\bar{X}$  = 5; SD = 1.3;  $n$  = 41) body diameter; 6 ( $n$  = 7 sides), 7 ( $n$  = 5 sides), 8 ( $n$  = 10 sides), 9 ( $n$  = 45 sides), or 10 ( $n$  = 5 sides) maxillary teeth; retracted hemipenis bifurcates at seventh to eighth and extends to the level of eighth to ninth subcaudal.

*Distribution.*—Western slopes of Eastern Cordillera of Colombia, from San Francisco (04° 59' N, 74° 18' W) south to Fusagasuga (04° 21' N, 74° 22' W) in the department of Cundinamarca, Colombia. *Atractus werneri* inhabits sub-Andean forest between 1200 m and 1800 m.

*Remarks.*—Peracca (1914) described *Atractus werneri* based on a specimen from the municipality of Viotá on the west slopes of Eastern Cordillera of Colombia. Prado (1940) described *A. colombianus* on the basis of an individual from Chocontá municipality, department of Cundinamarca in the Eastern Cordillera and *A. longimaculatus* based on a specimen from Quindío region in the Central Cordillera. Dunn (1944) corrected the type

locality of *A. longimaculatus* to the municipality of Pacho, located in the Eastern Cordillera of Colombia, and proposed the synonymy of *A. colombianus* and *A. longimaculatus* with *A. werneri*. Dunn (1944) recognized *A. werneri* as a species widely distributed along of the Eastern Cordillera plateau. Later, Peters and Orejas-Miranda (1970) and others (Pérez-Santos and Moreno, 1988; Tipton, 2005) followed the *A. werneri* concept established by Dunn (1944). Based on the examination of photographs and data from the holotype of *A. werneri*, the type series of *A. colombianus* and *A. longimaculatus*, and 500 additional specimens from the Eastern Cordillera, we disagree with Dunn (1944). All qualitative and quantitative analyses (not included in the present study) suggest that *A. longimaculatus* and *A. colombianus* are allied to *A. crassicaudatus*, while *A. werneri* has a more limited distribution than previously understood (Passos, 2008). The taxonomic status of *A. colombianus* and *A. longimaculatus* will be addressed in an additional study focusing on the morphological and molecular variation of *A. crassicaudatus* and, therefore, we temporarily transfer them to the synonymy of the later species.

According to our sample, *Atractus werneri* is restricted to elevations below 2000 m on the west slopes of Eastern Cordillera, occurring sympatrically with *A. crassicaudatus* only at the localities of Fusagasuga, San Antonio del Tequendema, and San Francisco. Although there are superficial similarities in color pattern between both taxa in the above localities (due to enormous chromatic variability of *A. crassicaudatus*), *A. werneri* is easily distinguished from *A. crassicaudatus* by qualitative (hemipenis moderately bilobed with hemipenial body broader than capitulum and basal bifurcation of sulcus spermaticus in *A. werneri* vs. hemipenis slightly bilobed with hemipenial body slender than capitulum and distal bifurcation of sulcus spermaticus in *A. crassicaudatus*) and very distinct mean values of the quantitative characters (27–37 subcaudals in males and 21–36 in females of *A. werneri* vs. 21–33 subcaudals in males and 14–26 in females of *A. crassicaudatus*). Furthermore, this sympatric area represents a transitional zone between the sub-Andean and

Andean forests, representing the extreme eastern (*A. werneri*) and western (*A. crassicaudatus*) distributional limits of both species.

KEY TO SPECIES OF *ATRACTUS* FROM THE MIDDLE AND UPPER MAGDALENA DRAINAGES OF COLOMBIA

1. Dorsum uniform or banded, but never with contrasting coloration (paler or darker) on paraventral region with respect to the other dorsal series ..... 2  
    Dorsum with contrasting coloration on the first dorsal scale rows, generally delimited by thin dorsolateral lines in the top of second or third series (see Figs. 8, 10, and 14) ..... 5
2. Dorsum with transverse alternate bands or blotches contrasting (dark or light) with ground color, more than five maxillary teeth with distinct maxillary diastema ..... 3  
    Dorsum uniform black, five maxillary teeth without maxillary diastema ..... *A. apophis*
3. Less than 40 subcaudals in both sexes ..... 4  
    More than 40 subcaudals in both sexes *A. wagleri*
4. Dorsum with transverse light or black bands without darker border, venter not uniformly black (at least paraventral region creamish white), seven infralabials, first three infralabials contacting chinshields .....  
    ..... *A. crassicaudatus*  
    Dorsum brown with transverse light black bordered blotches, venter uniformly brown, eight infralabials, first four infralabials contacting chinshields ..... *A. atratus*
5. Seven supralabials, first three infralabials contacting chinshields, venter predominantly creamish white, occasionally with a barely defined dark brown stripe on the center ..... 6  
    Eight supralabials, first four infralabials contacting chinshields, venter predominantly brown ..... *A. melanogaster*
6. Ventral scales 137–148 in females and 138–146 in males, subcaudal scales 17–25 in females and 20–21 in males, dorsum with regular vertebral line ..... *A. chthonius*  
    Ventral scales 160–164 in females and 145–151 in males, subcaudals 27–32 in females and 30–37 in males, dorsum with irregular vertebral line frequently fragmented in paravertebral blotches ..... *A. obtusirostris*  
    Number of ventral scales 158–174 in females and 148–160 in males, subcaudal 21–36 in females and 27–37 in males, dorsum with or without regular vertebral line ..... *A. werneri*.

DISCUSSION

Savage (1960) defined three species groups of *Atractus* based on morphological characters

TABLE 1.—Selected diagnostic characters for species of the genus *Atractus* occurring in the middle and upper Magdalena drainage of Colombia. Abbreviations for dorsal color pattern are the following: 1 = uniformly black; 2 = brown with cream bands; 3 = beige with vertebral and dorsolateral stripes; 4 = brown with irregular vertebral line and paravertebral blotches; 5 = brown with conspicuous vertebral line connected to paravertebral blotches; 6 = uniformly brown. Abbreviations for ventral color pattern are the following: 1 = black with disperse squared cream blotches; 2 = almost uniformly brown; 3 = cream usually with conspicuous central stripe; 4 = black with cream irregular blotches; 5 = cream with little invasion of brown pigment between suture of ventral scales; 6 = cream occasionally with disperse brown blotches.

| Species                 | Sex    | Ventrals | Subcaudals | CLSVL <sup>a</sup> | Maximum total length | Modal supralabials | Modal infralabials | Infralabials contacting chinshields | Gular rows | Preventrals | Maxillary teeth | Dorsum | Venter | Hemipenis   |
|-------------------------|--------|----------|------------|--------------------|----------------------|--------------------|--------------------|-------------------------------------|------------|-------------|-----------------|--------|--------|---|
| <i>A. apophis</i>       | Male   | 167      | 34         | 14.2%              | 433 mm               | 7                  | 7                  | 3                                   | 4          | 4           | 5               | 1      | 1      | Slightly bilobed, hemipenial body equivalent to capitulum           |
| <i>A. atratus</i>       | Male   | 143      | 29         | 15.5%              | 366 mm               | 8                  | 8                  | 4                                   | 3-4        | 3-4         | 7-8             | 2      | 2      | Moderately bilobed, hemipenial body equivalent to capitulum         |
|                         | Female | 150-153  | 22-24      | 9.7-10.8%          | 552 mm               |                    |                    |                                     |            |             |                 |        |        |   |
| <i>A. chthonius</i>     | Male   | 138-146  | 20-21      | 9.2-11.7%          | 328 mm               | 7                  | 6                  | 3                                   | 4          | 3-4         | 9-11            | 3      | 3      | Slightly bilobed, hemipenial body equivalent to capitulum           |
|                         | Female | 137-148  | 17-25      | 9.0-11.8%          | 506 mm               |                    |                    |                                     |            |             |                 |        |        |   |
| <i>A. melanogaster</i>  | Male   | 151-162  | 19-28      | 8.8-13.2%          | 375 mm               | 7                  | 8                  | 4                                   | 3-4        | 3-5         | 8-11            | 4      | 4      | Moderately bilobed, hemipenial body slightly broader than capitulum |
|                         | Female | 160-174  | 16-18      | 7.7-8.5%           | 510 mm               |                    |                    |                                     |            |             |                 |        |        |   |
| <i>A. obtusirostris</i> | Male   | 145-151  | 30-37      | 14.6-18.1%         | 275 mm               | 7                  | 7                  | 3                                   | 3-4        | 3-4         | 9-11            | 5      | 5      | Moderately bilobed, hemipenial body broader than capitulum          |
|                         | Female | 160-164  | 27-32      | 11.3-13.7%         | 422 mm               |                    |                    |                                     |            |             |                 |        |        |   |
| <i>A. ueverni</i>       | Male   | 148-160  | 27-37      | 13.2-17.1%         | 380 mm               | 7                  | 7                  | 3                                   | 3-4        | 3-4         | 6-9             | 3, 6   | 6      | Moderately bilobed, hemipenial body broader than capitulum          |
|                         | Female | 158-174  | 21-36      | 8.7-15.2%          | 376 mm               |                    |                    |                                     |            |             |                 |        |        |   |

<sup>a</sup> CL = caudal length; SVL = snout-vent length.

(e.g., pholidosis, hemipenis, and color pattern), but only the *A. elaps* group appears to constitute a natural cluster (Fernandes, 1995; Passos, 2008; Passos et al., 2010b). The other two groups (*A. badius* and *A. trilineatus*) require re-evaluation in the absence of unambiguous diagnostic characters and in the face of so many currently recognized species in the genus (Passos et al., 2010a,b). The species considered in this study, except *A. apophis* and *A. atratus* (see below), fall into a geographically defined *Atractus* assembly, diagnosable from the others by the combination of the following morphological features: 17 dorsal scale rows; 7–11 moderately spaced maxillary teeth; dorsum with regular or irregular vertebral line, sometimes fragmented in paravertebral blotches; flanks with the first two or three scale rows lighter or darker contrasting with remaining dorsal series, limited by slender dorsolateral lines; belly creamish white, poorly to moderately pigmented with brown irregular blotches; hemipenis moderately bilobed, semicapitate, and semicalyculate; hemipenial body globular and broader than capitulum (except in *A. chthonius*). With regard to generic diversity, at least the globular hemipenial body broader than capitulum could be an exclusive feature for this group, and if corroborated in the context of phylogenetic study, can constitute a synapomorphy supporting the assembly of species given below (P. Passos, unpublished data). Because *A. chthonius* shares other possible derived characters (e.g., general color pattern) with species in this group, we speculate its hemipenis condition may be a reversal to a supposed ancestral state (hemipenial body similar in width or more slender than capitulum). Therefore, we tentatively assigned *A. chthonius* to this new species group, for which we name *A. werneri*, together with *A. melanogaster*, *A. obtusirostris*, and *A. werneri*. The distribution of the *A. werneri* species group includes the western slopes of the Central Cordillera, Magdalena Valley, and westernmost portion of the Eastern Cordillera (Passos, 2008). This general pattern of distribution is congruent with other putative monophyletic subgroups of amphibians (Lynch, 1980, 1981) and reptiles (Myers, 1973; Torres-Carvajal, 2007), in which the

high elevations of the Central Cordillera apparently prevent dispersal between both sides of the Cordilleras.

Among all congeners, there are only two other taxa distributed marginally on the western versant of the Eastern Cordillera that are not formally included in the present study (*Atractus crassicaudatus* and *Atractus wagneri*). Because both are morphologically similar to other *Atractus* assemblages and occur only marginally in the study area (Passos, 2008), they are treated in separate studies (e.g., Passos and Arredondo, 2009). On the basis of hemipenial morphology and general color pattern, *A. apophis* and *A. atratus* show more similarities to other species of *Atractus* (Passos, 2008). The first shares a series of morphological characters of external morphology and hemipenis with *A. crassicaudatus* and allied species from the Eastern Cordillera and Sierra Nevada de Santa Marta (Passos et al., 2009c), whereas the second is morphologically similar to the *A. snethlageae* complex (Passos, 2008).

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- Atractus melanogaster* ( $n = 12$ ).—**COLOMBIA**: CALDAS: unknown locality: (MLS 296), *Pensilvania*: (MLS 235, 237); TOLIMA: *Cajamarca*: Vereda La Palma: (ICN 10029–33, 10034 neotype), *Ibague*: Ibanasca: (CZUT-R 117), Pastales: (CZUT-R 10), Toche: (CZUT-R 09).
- Atractus obtusirostris* ( $n = 8$ ).—**COLOMBIA**: TOLIMA: *Ibague*: Pastales: (CZUT-R 12), Toche: (CZUT-R 11), *Icononzo*: (ICN 2722, 6497), *Juntas*: (ICN 5669–71), *Rio Combeima*: (ZMH-R 4428 holotype).
- Atractus werneri* ( $n = 38$ ).—**COLOMBIA**: unknown locality: (MLS 144, 289, 483); CUNDINAMARCA: *El Colégio*: (IAvH 4327), *Fusagasuga*: (ICN 2727, MLS 2329, 2334, 2345–44, 2427, 2514, 2518, 2523, 2563, 2914–16, 2932–34, MUJ 92), *La Mesa*: (MLS 161), *La Vega*: (IAvH 2068), *San Francisco*: (ICN 5738, 10696), *Santandercito*: (IAvH 3014, MLS 1915–16, 2118, 2020), *Sasaima*: (ICN 2612, MLS 236, 238), *Silvania*: (IAvH 145, 823–24, ICN 7268), *Vereda Santa Rita*: (IAvH 17).

## APPENDIX I

## Additional Specimens Examined

*Atractus crassicaudatus* ( $n = 455$ ).—**COLOMBIA**: unknown locality: (IBSP 2443, ICN 8505, 8508–25, 8922–25, MLS 139, 152, 156, 293, 2640, MUJ 92, 355); BOYACA: *Badohondo*: (ICN 10693), *Belen* (ICN 10709), *Chiquinquirá*: (MLS 2577), *Coper*: (MLS 2578–79), *Duitama*: (ICN 10700–07), *Garagoa*: (ICN 10627, MUJ 315–22, 398–99, 509), *Guayatá*: (IAvH 864–65), *Pajarito*: (IAvH 1059, ICN 2608–11, 2831–33), *Pesca*: (IAvH 1880), *Rio Tectino*: (IAvH 799), *Sogomoso*: (MLS 282, 2751–52),