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***Imantodes inornatus* (Boulenger, 1886) (Squamata: Dipsadidae): expansion of known range and first records from the Magdalena River valley, Colombia**

Imantodes inornatus (Boulenger, 1886) (Squamata: Dipsadidae): expansión del rango de la distribución conocida y primeros registros del valle del río Magdalena, Colombia

Román F. Díaz-Ayala, Julián A. Rojas-Morales, Juan C. Zuluaga-Isaza y Viviana A. Ramírez-Castaño

Abstract

The first report of the Speckled Blunt-headed Tree Snake (*Imantodes inornatus*) is presented for the Magdalena River valley, from the departments of Antioquia, Bolívar, Boyacá and Caldas in Colombia. Since these records correspond to the biogeographic Magdalena province, the known range for the species is expanded. In Colombia, this is a trans-Andean species found from the Pacific rainforests of the Chocó region, through the northern portion of the Western and Central Andean ranges, to the middle Magdalena River valley.

Keywords. Biogeographic provinces. Geography. Species distribution. Speckled Blunt-headed Tree Snake.

Resumen

Se registra por primera vez la serpiente de árbol cabeza moteada (*Imantodes inornatus*) en el valle del río Magdalena en los departamentos de Antioquia, Bolívar, Boyacá y Caldas, en Colombia. Estos registros corresponden a la provincia biogeográfica del Magdalena, lo que aumenta el área de distribución conocida. En Colombia, esta especie es un elemento transandino que cruza las selvas tropicales del Pacífico de la región chocoana, a través de la porción septentrional de las cordilleras Occidental y Central hasta el valle medio del río Magdalena.

Palabras clave. Distribución de especies. Geografía. Provincias biogeográficas. Serpiente arborícola de cabeza roma moteada.

Introduction

Accurate information on species distribution and natural history is the basis for biodiversity management and conservation (González-Maya *et al.*, 2014), for it is a key attribute for assessing

the status of threatened species (IUCN, 2012). With over 270 snake species, Colombia is one of the richest countries in snake fauna in the world, surpassed only by Mexico and Brazil (<http://>

www.reptile-database.org, Lynch *et al.*, 2014). However, knowledge about biological aspects such as diversity patterns, distribution, natural history, and conservation status of Colombian snakes is still incipient and poorly represented in scientific literature. Although herpetological collections from the late nineteenth and early twentieth centuries have provided a large collection of snakes from almost all Colombian eco-regions (Lynch *et al.*, 2014), reviews have been made only on a few species (<10 %), generating major challenges in terms of snake conservation (Lynch, 2012, 2015).

The Neotropical Speckled Blunt-headed Tree Snake of the genus *Imantodes* (Linnaeus, 1758), are nocturnal and arboreal species. Eight nominal species of *Imantodes* are currently known. They are widely distributed from Central to South America (Myers, 1982; Torres-Carvajal *et al.*, 2012; Medina-Rangel *et al.*, 2018). These snakes have arboreal habits with morphological features adapted to this microhabitat, including thin bodies and enlarged heads with protuberant eyes, which differs significantly from the neck (Savage, 2002; Torres-Carvajal *et al.*, 2012). There are seven species of *Imantodes* in Colombia, which are: *I. cenchoa* (Linnaeus, 1758); *I. chocoensis* Torres-Carvajal *et al.* 2012; *I. gemmistratus* (Cope, 1861); *I. guane* Missassi & Prudente 2015; *I. inornatus* (Boulenger, 1896); *I. lentiferus* (Cope, 1894); *I. phantasma* Myers 1982 (Medina-Rangel *et al.*, 2018). The genus *Imantodes* is distributed throughout the country, from sea level to 2300 m of elevation, but certain eco-regions are poorly represented with few published data, such as the Orinoco savannas and the Amazonian rainforest (see Rojas-Morales *et al.*, 2014 for *I. cenchoa*), biogeographic provinces of Orinoquia, Guayana and Amazonia (*sensu* Hernandez-Camacho *et al.*, 1992).

Imantodes inornatus differs from its congeners by having yellowish dorsum and small black spots on the head, which often form very narrow crosslines, usually 1 preocular or rarely 2, fewer than 220 ventrals and fewer than 140 subcaudal scales (Myers, 1982; Savage, 2002). This species

ranges from Nicaragua in Central America, to Ecuador in northern South America, being an arboreal dwelling species in lowland wet forests, with some records in pre-montane wet forest (Myers, 1982; Savage, 2002; Köller, 2003). In Colombia, this species is known in the west (Pacific slope) of the Cordillera Occidental between 0-880 m of elevation, Chocó-Magdalena province (*sensu* Hernandez-Camacho *et al.*, 1992), in the departments of Chocó and Valle del Cauca (Sánchez-C. *et al.*, 1995; Castaño-Mora *et al.*, 2004; Castro-Herrera & Vargas-Salinas, 2008; Cardona-Botero *et al.*, 2013; Echavarría-R. *et al.*, 2016).

Based on individuals recently recorded in the field, review of scientific literature and data of herpetological collections, we present the first records of *I. inornatus* in the Magdalena River valley, which corresponds to the trans-Andean valley that separates Eastern and Central ranges (Cordillera Oriental and Cordillera Central) in central Colombia.

Materials and methods

Records of *I. inornatus* were taken from fieldwork completed in 2014, in the area of Miel I hydroelectric project. Also, we reviewed information and specimens from different herpetological collections and museums: AMNH (American Museum of Natural History, New York), MHN-UC (Museo de Historia Natural Universidad de Caldas, Manizales, Caldas), MHUA (Museo de Herpetología Universidad de Antioquia, Medellín, Antioquia), ICN (Instituto de Ciencias Naturales de la Universidad Nacional, Bogotá, Cundinamarca), UIS (Colección de Herpetología Universidad Industrial de Santander, Bucaramanga, Santander), CD (Colección docencia Universidad del Valle, Cali, Valle del Cauca) y COL200CH-M (Colección Científica de Referencia Zoológica de la Universidad Tecnológica del Chocó - Herpetología, Quibdó, Chocó) (Table 1).

Table 1. List of the recorded localities of *Imantodes inornatus* in Colombia, based on literature, fieldwork and museum data. New records in bold. Sources: 1. Castaño-Mora et al. (2004), 2. *Sistema de Información de Biodiversidad* (SIB), 3. American Museum of Natural History (AMNH, New York), 4. *Museo de Herpetología Universidad de Antioquia* (MHUA-R), 5. *Instituto de Ciencias Naturales, Universidad Nacional de Colombia*, Bogotá, Colombia (ICN), 6. *Universidad Industrial de Santander* (UIS-R), 7. *Colección docente*, Universidad del Valle (CD), 8. Echavarría-R. et al. (2016) and 9. Cardona-Botero et al. (2013).

Department	Municipality	Locality	Latitude	Longitude	Elevation (m a.s.l)	Province	Museum voucher	Source
Antioquia	Anorí	Campamento Porce II, Quebrada San Benigno	6°59'6.00"N	75°5'22.92"W	875	Magdalena	MHUA-R 14540	2,4, Review
Antioquia	Guadalupe		6°49'0.59"N	75°14'38.30"W	1840	Magdalena	MHUA-R 14720	2,4, Review
Antioquia	San Carlos	Central Hidroeléctrica San Carlos, Embalse Punchiná	6°11'33.72"N	74°48'10.80"W	866	Magdalena		2, Review
Bolívar	Norosis		8°24'54.36"N	74°13'15.96"W	881	Magdalena	MHUA-R 14873	2,4, Review
Boyacá	Puerto Boyacá	Puerto Romero (Las Quinchas)	5°50'34.81"N	74°19'35.76"W	504	Magdalena	ICN 7919	5, Review
Caldas	Victoria	La Cantera	5°33'36.38"N	74°52'4.41"W	501	Magdalena	MHN-UC-0262	Field work
Caldas	Samaná	La Campiña	5°30'2.20"N	74°54'30.94"W	583	Magdalena		Field work
Caldas	Norcasia	Puente Hierro	5°34'15.90"N	74°52'36.87"W	401	Magdalena		Field work
Chocó	Condoto	Río Condoto	5°7'1.20"N	76°40'54.48"W	99	Chocó-Darién	AMNH_R4492	3
Chocó	Quibdó		5°41'33.71"N	76°40'18.48"W	39	Chocó-Darién	ICN-120	1,5
Chocó	Tadó	Salero	5°21'37.10"N	76°38'45.24"W	98	Chocó-Darién	COLZOOCH-H: 1499	8
Santander	Betulia	Vereda Los Mirabeles	7°3'29.88"N	73°22'45.12"W	290	Magdalena	UIS-R-3273	6, Review
Valle del Cauca	Dagua		3°36'57.96"N	76°51'28.80"W	555	Chocó-Darién	CD-4158	7
Valle del Cauca	Buenaventura	Río Calima, Campamento Cartón de Colombia	3°47'0.24"N	76°52'44.04"W	300	Chocó-Darién	ICN 398	1,5,9

Results and discussion

We obtained nine records of *I. inornatus*: three from the field and six from specimens in herpetological collections (Figure 1, Table 1). Fieldwork specimens: On 12 March 2014 at 19:17 h, an individual of *I. inornatus* (590 mm snout vent length [SVL], 213 mm tail length [TL], Figure 2A) was found moving across a bush of ferns 90 cm height from the ground, at “bosque La Campiña”, Confines village, municipality of Samaná, department of Caldas. A second specimen was observed on 19 July 2014 at 09:03 h, moving in riparian vegetation in “Puente Hierro” vereda La Quiebra, Norcasia municipality, department of Caldas (Figure 2B). A third specimen (632 mm SVL, 231 mm TL, MHN-UC 0262, Figure

2C) was found on 31 October 2014 at 21:47 h in “La Cantera”, El Bosque village, municipality of Victoria, department of Caldas. This individual was observed on the base of a submerged plant in a pond border; it was collected under permit resolution number 164 of 2014, issued by CORPOCALDAS (Autonomous Regional Corporation of Caldas), and it was deposited in the Museo de Historia Natural of the Universidad de Caldas (MHN-UC 0262). This specimen presents 17-17-15 dorsal scales, 196 ventrals, 105 subcaudals, eight supralabials (3-5 contacting the orbit), nine infralabials (1-5 contacting shinshields), one preocular, and one postocular scales.

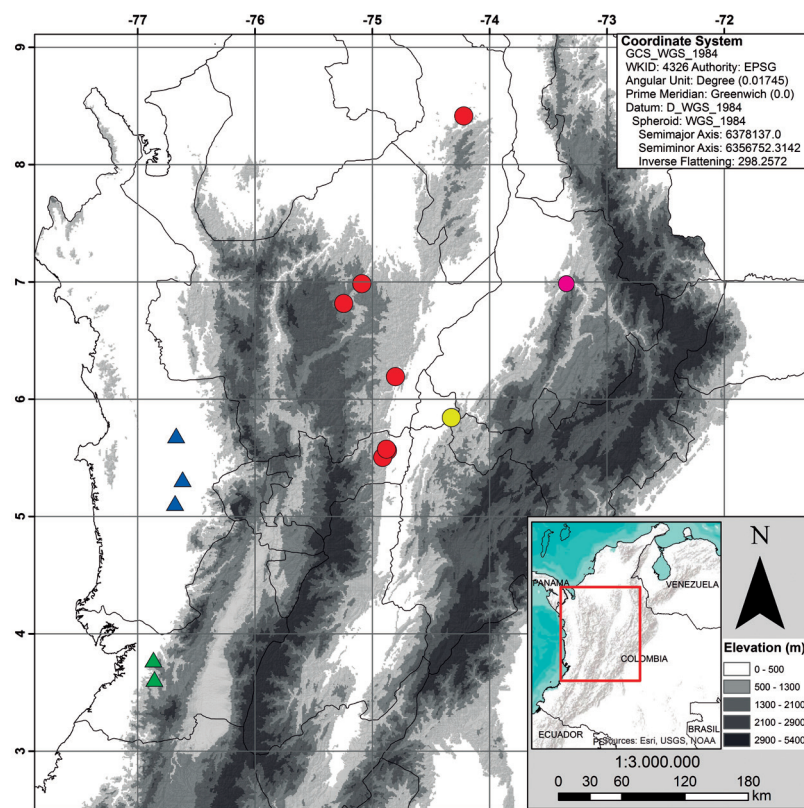


Figure 1. Known distribution of *Imantodes inornatus* in Colombia based on voucher specimens. Triangles depict the previous known records. Dots depict new records. The colors indicate districts into the Chocó-Magdalena biogeographic province *sensu* Hernandez-Camacho *et al* (1992): green triangles (Mikay district), blue triangles (Alto Atrato-San Juan district), red circles (Nechí district), yellow circles (Carare district), and violet circles (Lebrija district).



Figure 2. *Imantodes inornatus* from the middle Magdalena river valley, in the department of Caldas, Colombia. A) Live specimen (590 mm SVL, not collected) from “La Campiña”, Confines village, municipality of Norcasia. B) Live specimen (not collected) from “Puente Hierro”, La Quiebra village, municipality of Norcasia. C) Collected female (632 mm SVL, MHN-UC 0262) from “La Cantera” El Bosque village, municipality Victoria (Caldas, Colombia). Photographs: A) Román F. Díaz, B) Anyinson López, C) Julián Andrés Rojas.

The distribution of *Imantodes inornatus* corresponds to the region known as the *Chocó Biogeográfico* (Biogeographical Chocó) from the Northwest of Honduras, to Colombia and Ecuador in northern South America. Another reptile species of different lineages of Squamata show this distribution pattern (i. e. *Rhinobothryum bovalli* [Serpentes: Dipsadidae], *Diploglossus monotropis* [Sauria: Diploglossidae], *Tantilla reticulata* [Serpentes: Dipsadidae], *Ninia teresitae* [Serpentes: Dipsadidae]) (Savage, 2002; Castaño-Mora *et al.*, 2004; Rojas-Morales, 2012; Díaz-Ayala *et al.*, 2015; Angarita-Sierra & Lynch, 2017). The distribution of *I. inornatus* in the middle Magdalena River valley, particularly in the Nechí, Carare and Lebrija districts (Chocó-Magdalena biogeographic province), supports the known shared distribution of some amphibians and reptiles between the Pacific and middle Magdalena humid forests, as has been discussed by other authors (Hernandez-Camacho *et al.*,

1992; Acosta-Galvis *et al.*, 2006; Angarita-Sierra and Lynch, 2017; Gutiérrez-C. & Arredondo-S., 2007; Rojas-Morales, 2012; Díaz-Ayala *et al.*, 2015).

Accelerated habitat loss and degradation by different activities in the middle Magdalena River valley (i. e. cattle rising, illegal crops, and energy projects), have modified the natural landscape pattern. Monitoring wildlife populations that inhabit these areas, including rarely seen and poorly known species such as snakes, is very important.

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