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New records of *Diploglossus monotropis* (Kuhl, 1820) (Squamata: Anguidae) from Urabá and Magdalena River valley, Colombia, with an updated geographic distribution map

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Abstract: Based on recent records, published data, and review of specimens deposited in scientific collections, we present an updated map of the geographic distribution of *Diploglossus monotropis* in Colombia. Our data show that this species has a wide geographical distribution, including the Pacific versant of the Cordillera Occidental, the inter-Andean valley of the Magdalena River, and the Caribbean lowlands of northern Colombia.

Key words: distribution, *Diploglossus monotropis*, Colombia, biogeographic provinces, microhabitats, range extension

The skink-like lizards of the genus *Diploglossus* Wiegmann, 1834 (known as galliwasps) comprise 17 species inhabiting Central (including the Greater and Lesser Antilles) and South America (Uetz and Hošek 2015). These lizards are characterized by having elongate bodies and small but well-developed limbs, large head shields, and small uniform cycloid body scales (Savage 2002; Vitt and Caldwell 2014). Two *Diploglossus* species occur in Colombia: the Dotted Galliwasp, *D. millepunctatus* O'Shaughnessy, 1874, an endemic species restricted to the Malpelo island in the Pacific Ocean, and the Kuhl´s Galliwasp, *D. monotropis* (Kuhl, 1820) (Dunn 1944; Castaño-Mora et al. 2004).

Diploglossus monotropis is a moderate to large-sized secretive diurnal lizard distributed from Nicaragua to Colombia and Ecuador (Dunn 1944; Myers 1973; Ríos et al. 2011; Savage 2002). It may be identified by sheathed claws; a frontonasal and paired prefrontals; nasal in contact with rostral; large nostril in extreme posterior part of nasal; positioning of postnasal scales somewhat variable, usually two postnasals, or one postnasal and a small posterior supranasal (= upper postnasal); striated dorsal and lateral scales with a distinct median keel. It is brilliantly colored in life, with a bold dorsal pattern of alternating broad, black-edged dark bands and narrow light interspaces, orange to bright red venter and flanks, and orange iris. Juveniles and females are vividly banded as well, but the venter is yellow in small specimens and gradually turns orange in adult females (Myers 1973; Savage 2002; Figure 1).

In Colombia, published records (Dunn 1944; Medem 1968; Ayala 1986; Renjifo et al. 2003; Castaño-Mora et al. 2004; Garcia-Rentería et al. 2006; Carvajal-Cogollo et al. 2007; Ríos et al. 2011; Cardona-Botero et al. 2013) show that *D. monotropis* is distributed throughout the following biogeographic provinces (*sensu* Morrone 2014): Chocó-Darién (most records), Western Ecuador (southwestern Pacific lowlands), Guajira (northern Caribbean region, Figure 2), Cauca (Western Colombia, Ecuador and northern Peru) and Magdalena (Río Magdalena valley) (Figure 3; Table 1). Throughout its range, this species occurs at elevations below 1,000 m (Figure 3).

Herein, we update the geographic distribution of *Diploglossus monotropis* in Colombia, adding new locality records of this species, based both on specimens deposited in scientific collections and recent observations. Among the recent records, we include the easternmost record in Colombia. In addition, we correct a record attributed to *D. monotropis*, which actually corresponds to a different

Figure 1. *Diploglossus monotropis*. A. Juvenile (SVL = 132.6 mm; MHUA-R 12662) from Tulenapa, Carepa (Antioquia, Colombia); B. Adult male (SVL = 155 mm; not collected) from Vereda la Campiña, Samaná (Caldas, Colombia). Photos: A. Freddy A. Grisales; B. Román Felipe Díaz-Ayala.

Figure 2. Dorsal view of *Diploglossus monotropis* (MLS-sau 472) from Ciénaga, Magdalena, Colombia.

taxon. The museum acronyms of the reviewed Colombian natural history collections are as follows: CZUT (Colección Zoológica Universidad del Tolima, Ibague, Tolima); ICN (Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Cundinamarca); IAvH (Instituto Alexander von Humboldt, Villa de Leyva, Boyacá); MHN-UCa (Museo de Historia Natural Universidad de Caldas, Manizales, Caldas); MHUA (Museo de Herpetología Universidad de Antioquia, Medellín, Antioquia); MLS (Museo de La Salle, Universidad de la Salle, Bogotá, Cundinamarca); and UIS (Colección de Herpetología Universidad Industrial de Santander, Bucaramanga, Santander).

The new records comprise five old unpublished museum records and four recent records from 2013–2014. Five records are from the Pacific versant of Cordillera Occidental (Chocó-Darién province *sensu* Morrone 2014) and the other four records are from the Río Magdalena valley (Magdalena province *sensu* Morrone 2014). Species identification was based on the diagnosis described above.

The four recent records are as follows (Figure 3; Table 1): on 19 February 2013, a juvenile male (132.6 mm SVL, MHUA-R 12662; Figure 1A) from Carepa, Antioquia (07.7779° N, 076.6706° W; ca. 30 m) was found in leaf litter in disturbed forest. On 25 April 2013, a juvenile female (133.7 mm SVL, MHN-UCa 0230) from Norcasia, Caldas (05.6644° N, 074.7802° W; 180 m), was found active at 22:07 hours on the ground in leaf litter, and approximately 30 cm from a small stream. On 29 April and 6 May 2014 respectively, a male (198 mm SVL, UIS-R-2716) and a female (UIS-R-2717), were collected in Betulia, Santander (07.0580° N, 073.3904° W; 444 m); the male was active among rocks in an abandoned cacao plantation, and the female was active on the ground in leaf litter, near a dry creek. These specimens represent the easternmost records in Colombia, ca. 188 km northeast of the nearest known record of this species in Muzo, Boyacá (Medem 1968; Ayala 1986; Table 1). On 22–23 June 2014 in Samaná, Caldas (05.4990° N, 074.9079° W; 510 m), one adult male (155 mm SVL; Fig. 1B) and two juveniles (63.6 mm and 95 mm SVL [MHN-UCa 246]) were observed. These individuals were found active at night (between 19:00 and 21:00 hours) on the ground in leaf litter, 150–180 cm from a small stream. The specimens MHUA-R 12662 and MHN-UCa 0230 were examined during a revision of museum specimens in the herpetological collections of the MHUA and the

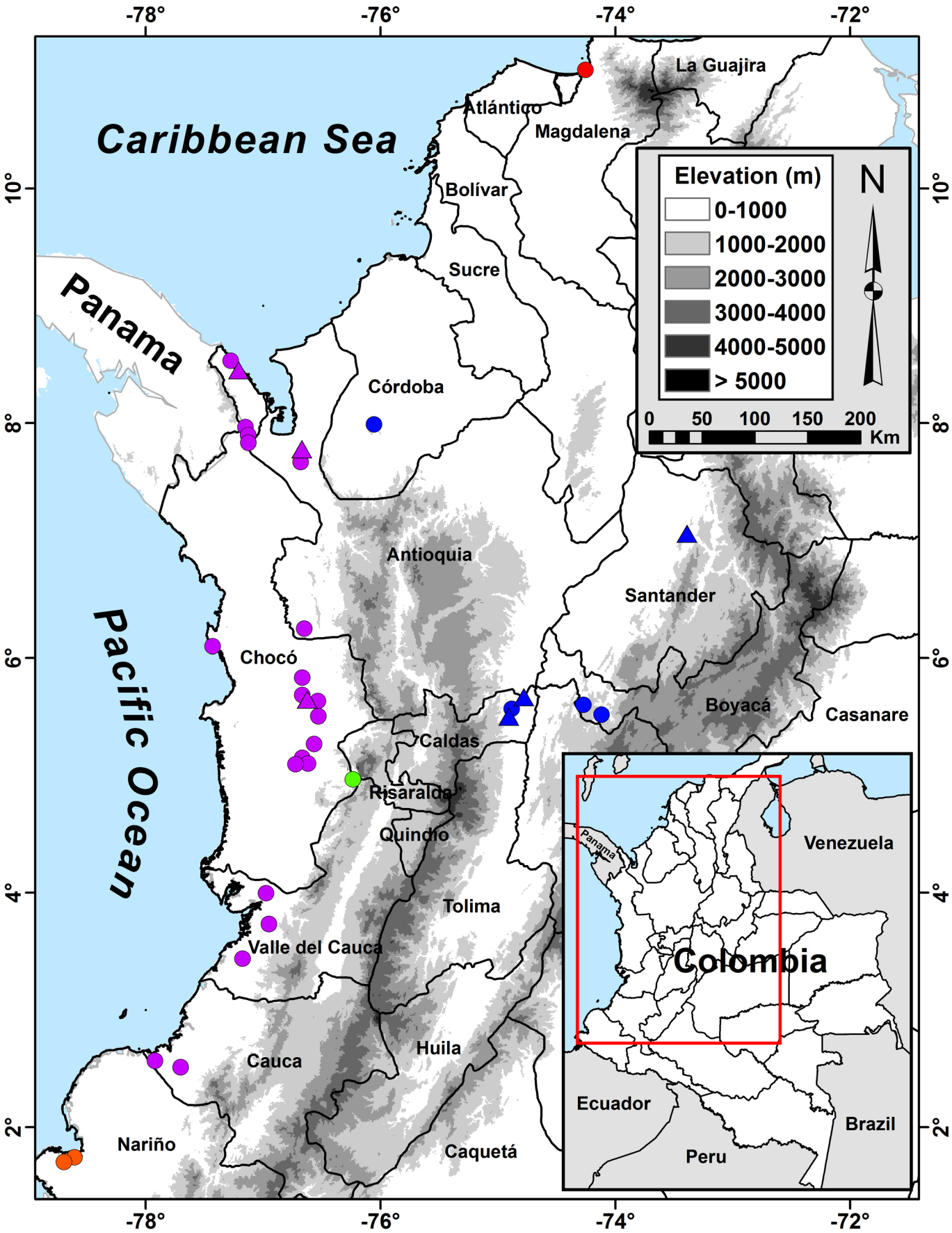

Figure 3. Current distribution of *Diploglossus monotropis* in Colombia, showing previously known (circles) and new (triangles) records. The color marks indicate the biogeographic provinces *sensu* Morrone (2014): blue (Magdalena), green (Cauca), orange (Western Ecuador), red (Guajira), and violet (Chocó-Darién).

Table 1. List of the recorded localities, sorted by department, of *Diploglossus monotropis* in Colombia, based on literature and museum data. In bold unpublished museum records and new observations ("This work"). Source: 1. Ayala (1986); 2. Carvajal-Cogollo et al. (2007); 3. Castaño-Mora et al. (2004); 4. Garcia-Rentería et al. (2006); 5. HerpNet2; 6. Medem (1968); 7. Rengifo et al. (2003); 8. Ríos et al. (2011); 9. UMMZ. Names of provinces *sensu* Morrone (2014).

Department	Municipality	Locality	Latitude	Longitude	Province	Museum voucher	Source
Antioquia	**Carepa**	**Tulenapa**	**7.7779**	**-76.6706**	**Chocó-Darién**	**MHUA-R 12662**	**This work**
Antioquia	Chigorodó	Near Turbo	7.67	-76.68	Chocó-Darién	USNM 153969	1, 5[a]
Antioquia	Vigía del Fuerte	Rio Arquía, Belén	6.25	-76.65	Chocó-Darién	LACM	5[a]
Antioquia					?	FMNH 78136-37	5[a]
Boyacá	Quípama	Inspección de Policía de Humbo	5.6005	-74.2714	Magdalena	MLS-sau 469, 471	1*
Boyacá	Muzo		5.5167	-74.1167	Magdalena	MLS-sau, 468, 470	1*, 6*
Caldas	**Norcasia**	**Vereda La Quiebra de Roque**	**5.6644**	**-74.7802**	**Magdalena**	**MHN-UCa 0230**	**This work**
Caldas	Norcasia	Embalse La Miel I	5.5667	-74.8830	Magdalena	MHUA-R 10279, 10322	This work
Caldas	**Samaná**	**Vereda La Campiña**	**5.4990**	**-74.9079**	**Magdalena**	**MHN-UCa 246**	**This work**
Cauca	Guapi	Camino al acueducto entre Chansará y Cantadelicia	2.567222	-77.920278	Chocó-Darién	ICN 4340-4341	1, 3
Cauca	Guapi	Sangaral	2.5127	-77.7026	Chocó-Darién		8
Cauca					?	AMNH 107820, 1009666	1, 5[a]
Chocó	Acandí	Sasardí	8.5333	-77.2763	Chocó-Darién	MHUA-R 10635	This work
Chocó	**Acandí**	**Vereda La Playona**	**8.449965**	**-77.208331**	**Chocó-Darién**	**IAvH 3521**	**This work**
Chocó	Riosucio	Alto El Limón	7.96667	-77.1500	Chocó-Darién	IAvH 1946	1*
Chocó	Riosucio	Vereda Tilupo	7.89842	-77.1261	Chocó-Darién	IAvH 1544, 1546	1*
Chocó	Riosucio	Vereda Sautatá	7.83349	-77.1260	Chocó-Darién	IAvH 1547	1*
Chocó	Bahía Solano	El Valle	6.10	-77.4300	Chocó-Darién	USNM 151507	1, 5[a]
Chocó	Quibdó		5.833	-76.667	Chocó-Darién	MLS-sau 949-950	This work
Chocó	Quibdó	Pacurita	5.683333	-76.666667	Chocó-Darién		4
Chocó	**Quibdó**	**Cuenca hidrográfica del Río Cabí, corregimiento Pacurita-corregimiento San José de Purré**	**5.64389**	**-76.6242**	**Chocó-Darién**	**IAvH 5041**	**This work**
Chocó	Quibdó	Corregimiento de San José de Purré	5.63333	-76.5333	Chocó-Darién		4
Chocó	Lloró	Granja Universidad Tecnológica del Chocó	5.503056	-76.53	Chocó-Darién		3, 7
Chocó	Tadó	Angostura	5.2673	-76.5650	Chocó-Darién		8
Chocó	Istmina	Quebrada Cubis	5.1500	-76.6666	Chocó-Darién	ICN 2256-2257	1, 3
Chocó	Condoto	Rio Condoto, Peña Lisa	5.10000	-76.61667	Chocó-Darién	ICN 1316	1, 3
Chocó	Istmina	Bocas del Río Condoto, Alto Río San Juan, corregimiento Andagoya	5.0945	-76.7228	Chocó-Darién	ICN 1317-1318, MCZ 29682	1, 3, 5[a],6
Chocó	San José del Palmar	Vereda Torito	4.9640	-76.2341	Cauca	ICN 7185	1, 3
Chocó		Rio San Juan			Chocó-Darién	USNM 73302	5[a]
Chocó					?	ANSP 25565, UMMZ 48410, 121064-65	1, 5[a], 9[b]
Córdoba	Tierralta	Cerro Murrucucú (Parque Nacional Natural Paramillo)	7.9895	-76.05575	Magdalena		2
Magdalena	Ciénaga		11.0106	-74.2547	Guajira	MLS-sau 472	1*
Nariño	Tumaco	Rio Rosario	1.745	-78.6072	Western Ecuador		6
Nariño	Tumaco	Estero San Antonio, Flor de las Brisas, Robles	1.70417	-78.6953	Western Ecuador	UVC 7719, 7822	1, 3
Nariño					?	FMNH 165180	1, 5[a]
Santander	**Betulia**	**Hacienda Mirabel, vereda Sogamoso**	**7.057995**	**-73.390400**	**Magdalena**	**UIS-R-2716, 2717**	**This work**
Valle del Cauca	Buenaventura	Estación Forestal Bajo Calima	3.996111	-76.974	Chocó-Darién		1, 3
Valle del Cauca	Buenaventura	Zabaletas	3.7333	-76.9500	Chocó-Darién		1, 3
Valle del Cauca	Buenaventura	Río Cajambre	3.4383	-77.1744	Chocó-Darién		1, 3
Valle del Cauca					?	FMNH 165179	1, 5[a]

Data obtained on 2 June 2014 from records held in natural history collections (acronyms follow Sabaj Pérez [2014]) and accessed through the following specimen searching portals:

* Museum records already published, but also reviewed by us.
[a] HerpNET2 (http://www.herpnet2.org): Academy of Natural Sciences (ANSP, Drexel University, Philadelphia); American Museum of Natural History (AMNH; New York); Field Museum of Natural History (FMNH, Chicago); Natural History Museum of Los Angeles County (LACM, Los Angeles); Museum of Comparative Zoology (MCZ, Harvard University, Cambridge); Smithsonian National Museum of Natural History (USNM, Washington, D.C.).
[b] University of Michigan Museum of Zoology (UMMZ, Ann Harbor; http://quod.lib.umich.edu/cgi/i/image/image-idx?c=amph3ic).

MHN-UCa. The specimens MHN-UCa 246 and UIS-R-2716-17 were collected under research permits issued by Corporación Autónoma Regional de Caldas (Resolution 164/2014) and Corporación Autónoma Regional de Santander (resolution 375/2009), respectively.

Llano-Mejía et al. (2011), following the work of Reinoso et al. (2009), included *D. monotropis* (based on the specimen CZUT-A 00051) in the list of reptiles of the Department of Tolima. However, this specimen is actually an unidentified species of *Leposoma* (family Gymnophthalmidae). Furthermore, that specimen was collected in a locality above 1,660 m (Quebrada Laureles, vereda Laureles, Ibague municipality), which is outside the known elevational range of *D. monotropis*.

These data indicate that *D. monotropis* has a wide distribution in Colombia. The occurrence of this species in the five biogeographic provinces could also support the biogeographic similarity between provinces, as has been discussed by other authors based on shared vertebrate faunas (e.g., Müller 1973; Hernández-Camacho 1992; Acosta-Galvis et al. 2006; Gutiérrez-C. and Arredondo-S. 2007; Moreno-Arias et al. 2008; Rojas-Morales 2012), particularly between the provinces of Cauca, Chocó-Darien, Magdalena and Western Ecuador (all considered as within the Pacific province, *sensu* Cabrera and Willink 1973).

Finally, the occurrence of this species and others such as *Hyalinobatrachium fleischmanni* (Boettger, 1893) and *Typhlonectes natans* (Fischer, 1880), both in the northernmost region of Guajira province and the northwestern region of Magdalena province (Acosta-Galvis 2012; Tapley and Acosta-Galvis 2010), suggest the possible presence of the species in the distributional gap between these two regions; future sampling is required to determine this.

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