



SHORT COMMUNICATION

Confirming the presence of *Clelia equatoriana* Amaral, 1924 (Squamata: Dipsadidae) in Peru

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Abstract.—In 2010, Aguilar et al. (2010) reported *Clelia equatoriana* for northern Peru; however, no voucher specimens or any data proving the record were mentioned. Here we confirm the presence of *C. equatoriana* in Peru based on collected specimens from a recent survey conducted in Piura Department, Peru, and provide novel data from the examination of museum specimens. Our findings extend the known distribution of the species ca. 331 km (straight line distance) SE from previous records in central Ecuador.

Key words. Latitude effect, subcaudals, Tabaconas Namballe, lizard, geographic distribution, range extension

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The neotropical dipsadid snake genus *Clelia* Fitzinger 1826 consists of relatively large snakes (total length > two m in *C. clelia* and *C. plumbea*) that show a striking ontogenetic color change, from orange or red hatchlings to dark gray or black adults (Scott et al. 2006). Currently, the genus contains seven species widely distributed in Central and South America: *C. clelia* distributed from southern Mexico to southwestern Peru; *C. equatoriana* distributed from northern Costa Rica through Panama and Colombia to Amazonian Ecuador; *C. errabunda* in Saint Lucia; *C. hussami* from southern Minas Gerais, Brazil to Uruguay and central Argentina; *C. langeri* in Santa Cruz and Chuquisaca, Bolivia; *C. plumbea* from south of the Amazon river in Brazil to Mato Grosso do Sul and Paraguay, and the Atlantic rainforest of Brazil; and *C. scytalina* from Jalisco and Veracruz in Mexico to Panama, and in South America in Colombia and Ecuador (Zaher 1996; Pizzatto 2005; Cisneros-Heredia et al. 2007; Uetz 2015; Reichle and Embert 2005). These snakes are known by several common names in various countries (e.g., “mussurana” in Brazil, “zopilota” in Costa Rica, “chonta” in

Ecuador, “aguajemachaco” and “machacuai” in Peru, and “cribo” in some Caribbean islands). Representatives of this genus have the particular habit of preying on other snakes, a behavior that has been reported several times before for *C. clelia*, *C. hussami*, and *C. plumbea* (Vitt and Vangilder 1983; Pinto and Lema 2002), and recently in *C. equatoriana* (Rojas-Morales 2012). Consequently, the genus *Clelia* plays an important role in regulation of populations of other snakes, including large venomous snakes of the *Bothrops* and *Crotalus* genera (Campbell and Lamar 2004).

In Peru there are currently two species of *Clelia* formally reported: *C. clelia* and *C. bicolor* (Dixon and Soini 1986; Carrillo and Icochea 1995), but the latter was re-allocated to the genus *Mussurana* by Zaher et al. (2009). More recently, Aguilar et al. (2010) reported *C. equatoriana* for Tabaconas Namballe National Sanctuary (TNNS), a natural protected area located in the north of Cajamarca department, close to the border between Ecuador and Peru. However, no voucher specimen or any additional information proving the record of *C. equato-*

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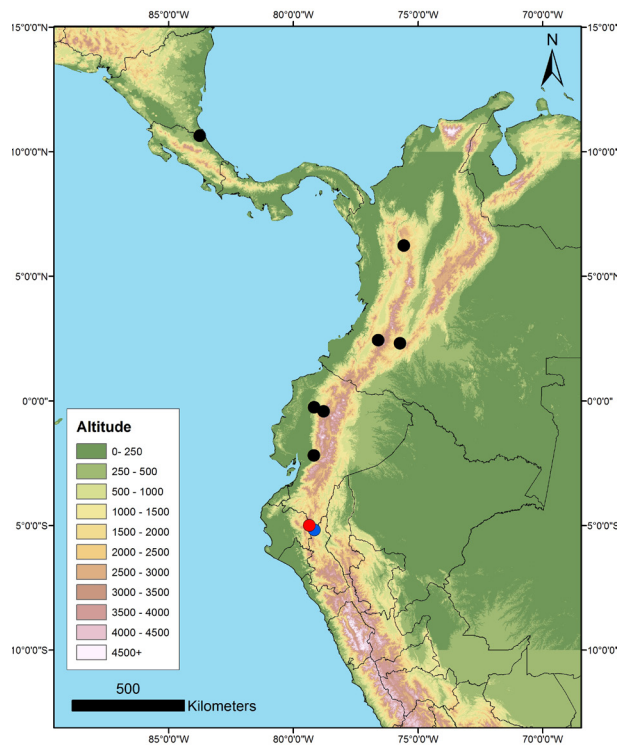


Fig. 1. Map of Isthmian Central America and northwestern South America showing the locality records of *Clelia equatoriana* (circles). Black circles are records by Zaher (1996), red circle is Quebrada Molletón and blue circle is El Sauce.

riana in Peru was provided. In fact, this record was in a small handbook produced by the WWF, which was intended for public awareness, rather than being a formal scientific report. We examined several specimens of the genus *Clelia* in the Herpetology Collection of Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos (MUSM). We found a specimen assigned to *C. equatoriana* (MUSM 24981) collected on a survey made in April 2003. Even though not clearly stated, we suspect that this was the specimen in which the Aguilar et al. (2010) record was based. MUSM 24981 is an adult female from El Sauce Forest (-5.17°S , -79.16°W , 1,500 m), Namballe District, San Ignacio Province, Cajamarca Department, Peru (Fig. 1). A recent survey conducted in the montane forests of Piura Department provided us with two additional specimens, which were deposited in the herpetological collection of Centro de Ornitología y Biodiversidad (CORBIDI), Lima, Peru (CORBIDI 14869 and 14875) (Fig. 2). These specimens were found in August 2014 at Quebrada Molletón (-4.99°S , -79.37°W , 2,222 m), Peña Rica village, in Carmen de la Frontera District, Huancabamba Province, Piura Department, Peru (Fig. 1). Both specimens are juvenile males that were found hiding under a log on the side of a stream in a secondary forest.

All examined specimens agree with the description of *C. equatoriana* by Zaher (1996) in having 17–17–17 dorsal scale rows, as well as the other characters presented in Table 1. However, specimens from Quebrada Molletón show a lower number of subcaudals (60–69)

than the range described for males of *Clelia equatoriana* (75–80 in males) by Zaher (1996). Interestingly, a similar segmental pattern of variation is found in the subcaudals for other Dipsadidae species: *Atractus carrióni* and *A. gigas* (Passos et al. 2010, 2013). Both species have their southernmost records in the same region and similar elevations to the records of *C. equatoriana* reported herein (Piura and Cajamarca departments). In the case of both *Atractus* species, the authors attribute the observed variation to a possible latitude effect in somitogenesis, which leads to the increase of the number of segmental counts in hotter and more humid localities towards the equator. Nevertheless, additional specimens need to be examined to test whether this latitudinal effect holds across different elevational gradients and Dipsadidae genera.

According to Zaher (1996), the southernmost record of *Clelia equatoriana* is in Bucay, Guayas Province, Ecuador. Records from El Sauce Forest and Peña Rica in TNNs extend the known distributional range of *C. equatoriana* by ca. 331 km (straight line distance) SE. These records for Cajamarca and Piura confirm that the distribution of this species can be more austral than previously thought and supports the importance of protected areas such as TNNs in the conservation of this species in Peru.

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Fig. 2. Individuals of *Clelia equatoriana* from Quebrada Molletón, Piura, Peru: CORBIDI 14869 (A) and 14875 (B).

ments on a previous version of this manuscript. We are especially grateful to Nature and Culture International, World Land Trust, and the Gerencia de Recursos Naturales del Gobierno Regional de Piura for funding our field work.

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Table 1. Morphometric characters (in cm) and scale counts of *Clelia equatoriana* specimens (MUSM 24981, CORBIDI 14869, and CORBIDI 14875) compared to mean measurements and scale counts for *C. equatoriana* and *C. clelia* data from Zaher (1996). (*) tail incomplete.

Character	MUSM 24981 (female)	CORBIDI 14869 (male)	CORBIDI 14875 (male)	<i>Clelia equatoriana</i>	<i>Clelia clelia</i>
Total length (cm)	136.5	34.2	49	157.5 max	225 max
Tail length (cm)	21	5.7	10	17.5 max	40 max
Dorsal rows	17-17-17	17-17-17	17-17-17	17-17-17	17-19-17 19-19-17
Ventrals	211	220	204	202–207 (male) 200–217 (female)	201–230 (male) 218–244 (female)
Subcaudals	57*	62	72	75–80 (male) 54–64 (female)	81–98 (male) 70–91 (female)
Loreal presence	present	present	present	present	present
Preoculars	1	1	1	1	1
Postoculars	2	2	2	2	2
temporals	2 + 2/2 + 3	2 + 3	2 + 2	2 + 3	2 + 3 1 + 3 rarely 2 + 2 rarely
Supralabials	7	7	7	7	7
Infralabials	7	7	8	8	8



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Claudia Torres graduated with a biological sciences degree from Universidad Nacional Mayor de San Marcos (UNMSM), Lima Peru, in 2002. She is studying for her Masters in Zoology with specialization in systematics. Currently, she is an associated member at Department of Herpetology at the Natural History Museum San Marcos (MUSM) in Lima, which also investigates the diversity of amphibians and reptiles of southern Peru.



Lourdes Y. Echevarría graduated in biological sciences from Universidad Nacional Agraria La Molina, Lima, Peru, in 2014. As a student, she collaborated constantly in the order and management of the herpetological collections of Centro de Ornitología y Biodiversidad, Lima, developing a great interest in reptiles, especially lizards. For her undergraduate thesis, Lourdes worked on the “Review of the current taxonomic status of *Petracola ventrimaculata* (Cercosaurini: Gymnophthalmidae) using morphological and ecological evidence.” She worked as a researcher of the Museo de Zoología (QCAZ), Pontificia Universidad Católica del Ecuador in Quito during 2015. Lourdes is preparing a monograph on the systematics of the *Petracola ventrimaculata* complex based on the results of her undergraduate thesis, as well as other papers about taxonomy of lizards and snakes.



Pablo J. Venegas graduated in Veterinary Medicine from Universidad Nacional Pedro Ruiz Gallo, Lambayeque, Peru, in 2005. He is currently curator of the Herpetological Collection of Centro de Ornitología y Biodiversidad (CORBIDI). Pablo worked as a researcher of the Museo de Zoología QCAZ, Pontificia Universidad Católica del Ecuador in Quito during 2015. His current research interest is focused on the diversity and conservation of the Neotropical herpetofauna with an emphasis on Peru and Ecuador. He has published more than 40 scientific papers on taxonomy and systematics of Peruvian and Ecuadorian amphibians and reptiles.