



A large (approximately 75cm TL) male coralsnake, *Micrurus dumerilii* (*transandinus*) found in the Cémaco District of the Emberá-Wounaan *Comarca* (Chocó indigenous community) at Unión Chocó, on the Río Tuira, Province of Darién, Panama (8.0778°N, 77.5583°W). This specimen formed the basis for the initial record of *Micrurus dumerilii* in Panama (Campbell and Lamar, 2004). 📷 © William W. Lamar



## Dumeril's Coralsnake (*Micrurus dumerilii* Jan, 1858) in Panama

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**ABSTRACT:** The coralsnake *Micrurus dumerilii* has been reported for Panama on the basis of two specimens, and suggested on the basis of another. We confirm the identity of two of these specimens, reallocate another to *M. nigrocinctus* and correct its locality, and report a new specimen of *M. dumerilii* from central Panama that represents a significant range extension. We also discuss the habitat, and details of color, pattern, and scutellation for *M. dumerilii* in Panama.

**Key Words:** Darién, geographic distribution, *Micrurus nigrocinctus*, *Micrurus alleni*, Parque Nacional Chagres

**RESUMEN:** La serpiente coral *Micrurus dumerilii* ha sido reportada para Panamá a base de dos especímenes y sugerido a base de otro. Confirmamos la identidad de dos de los dichos ejemplares, mientras re-identificamos uno como *M. nigrocinctus* y corregimos sus datos de localidad, y reportamos un espécimen nuevo de *M. dumerilii* procedente de Panamá central que representa una extensión de distribución significativa. También ofrecemos datos sobre el hábitat, detalles de color, patrón y escamación para *M. dumerilii* en Panamá.

**Palabras Claves:** Darién, distribución geográfica, *Micrurus nigrocinctus*, *Micrurus alleni*, Parque Nacional Chagres

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## INTRODUCTION

Over 150 species of snakes have been reported from the Republic of Panama (Jaramillo et al., 2010). Some of these are known from as few as one specimen (or part of a specimen), and many species remain understudied, especially at the terminus of their geographic ranges. In particular, this situation occurs east of the Panama Canal in the newly delineated province of Panamá (Ray and Ruback, 2015) and in the province of Darién, where forests are relatively intact but logistical access to sites remains difficult.

Political borders are irrelevant to mobile species as long as suitable habitat is available on each side. The region along the Panama–Colombia border is one of the most undisturbed and unexplored regions of the New World, because of logistical and human safety reasons. Species such as *Bothrops punctatus*, *Micrurus dumerilii*, and *Trachyboa boulengeri* are known to reach their northern distributional limits in the Darién region of Panama (Wallach et al., 2014).

The distribution of *M. dumerilii* in Panama, however, presents an interesting situation. Campbell and Lamar (2004: 166) first reported this species from Panama by stating the following: “A specimen (Pl. 90) is available from near the Panama-Colombia border, and several specimens (e.g., UTA R-16871) have been found in southeastern Panama. The specimen identified as *M. alleni* from El Real de Santa María, Darién, Panama (Savage and Vial, 1974) is almost certainly referable to *M. dumerilii*.” Subsequently, Jaramillo et al. (2010), Wallach et al. (2014), and Johnson et al. (2015) have listed the presence of *M. dumerilii* in the country, whereas Köhler, (2008) did not include the occurrence of this species in Central America and Ray and Knight (2013) and Uetz and Hošek (2015) suggested that the species might be found in southeastern Panama.

Herein we examine certain color pattern and scalation data for specimens from Panama assigned to *M. dumerilii*, and provide a photo voucher that represents a sizeable range extension for this species in the country.

## MATERIALS AND METHODS

### Study Species

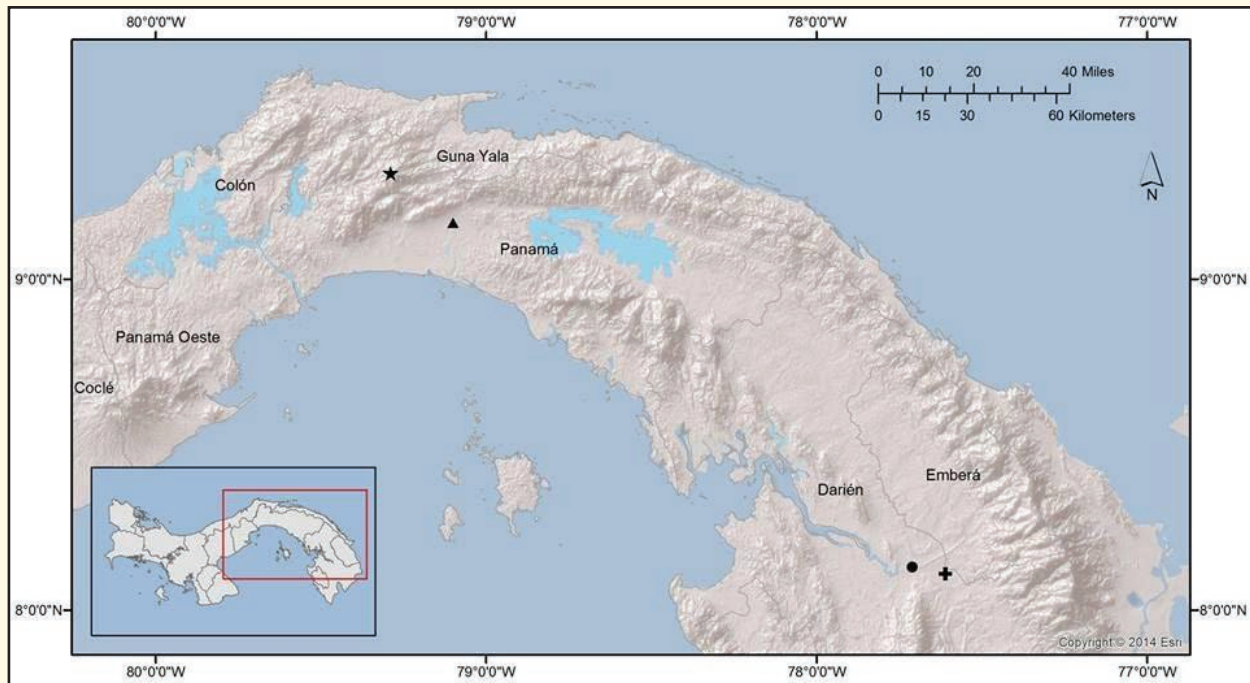
*Micrurus dumerilii* is a medium-sized coralsnake (average total length [TL] 50–70 cm; maximum TL 94.8 cm) that on the Atlantic versant occurs in northwestern Venezuela and northern, eastern, and central Colombia, and on the Pacific versant from southeastern Panama to northern Ecuador (Campbell and Lamar, 2004). This species occurs mostly at low elevations (0–600 m) in Lowland Wet/Moist Forest, although in Colombia it has been reported up to 2,133 m in elevation (Campbell and Lamar, 2004; Jaramillo et al., 2010). *Micrurus dumerilii* is distinguished from other coralsnakes by the presence of short yellow rings that border black rings; red rings are longer than the other rings, and contain black flecks on each scale; yellow coloration on the head also helps distinguish *M. dumerilii* from other Panamanian or northern South American species (Roze, 1999; Campbell and Lamar, 2004; Ray and Knight, 2013). The IUCN Red List has yet to assess the conservation status of *M. dumerilii* ([www.iucnredlist.org](http://www.iucnredlist.org); accessed 31 July 2015), but using the Environmental Vulnerability Score (EVS) to assess the conservation status of herpetofaunal species in Central America, Johnson et al. (2015) assigned this species a score of 16, which is in the High Vulnerability category (14 to 20).

### Study Site

Parque Nacional Chagres is a protected area within the Sistema Nacional de Áreas Protegidas (SINAP), managed by the Panamanian government. The park is 129,000 ha in size, and consists primarily of Tropical Rainforest. Rivers that run through the area help maintain the operations of the Panama Canal and provide water for the cities of Panamá and Colón (Elizondo Lara et al., 2015).

### Specimen Evaluation and Documentation

We used the museum abbreviations provided by Sabaj Pérez (2014), and constructed the map (Fig. 1) using ArcMap 10.1 (ESRI, 2012). Through the use of photographs and personal communication with various people (see Acknowledgments), we evaluated museum specimens from Panama classified or suspected as being *M. dumerilii* to confirm their identification, using current taxonomic standards.



**Fig. 1.** Map indicating the known distribution of *Micrurus dumerilii* in Panama. The star denotes individual (photo vouchers UTADC 8523, 8526) found in Parque Nacional Chagres, province of Panamá. The triangle denotes a specimen of *Micrurus nigrocinctus* (UTA R-16871) found in Chepo, which previously was assigned to *M. dumerilii*. The circle denotes El Real de Santa María, district of Pinogana, province of Darién, where USNM 140673 was found, and the plus sign denotes W. Lamar's specimen found at Unión Chocó, Río Tuira, province of Darién, both now identified as *M. dumerilii*.

## RESULTS

On 6 April 2015 at 1100 h, AP and KC observed an individual of *Micrurus dumerilii* at Parque Nacional Chagres, located in the far eastern portion of the province of Panamá (9.3199N, 79.2889W; elev. 810 m; Fig. 1). The snake was found in leaf litter on a wide (4 m) ridgeline trail that serves as the boundary for the park. The surrounding habitat was moist primary forest with a canopy ca. 25 m in height. The ambient temperature was ca. 22°C and the relative humidity was ca. 90%. Mist was present in the morning, and it rained the preceding night. The individual was not captured or measured, but its total length (TL) was estimated as 60 cm. The snake was moving slowly along the leaf litter and showed no sign of defensive behavior.

JMR identified the snake by using photographs (UTADC 8523, 8526; Fig. 2) and the information provided by AP and KC. The small eye and blunt nose confirmed the snake to be in the genus *Micrurus*, and the species was identified by the presence of black rings surrounded by short yellow rings and long red rings with black tips on each scale. The coloration of the head was black with yellow along the sides and labials. The tail was not photographed, but AP and KC both noted a bi-colored pattern on the live snake. Based on these photographs, Eric Smith (pers. comm.) confirmed the identification of the snake.

## Other Specimens

Campbell and Lamar (2004) illustrated a specimen (UTA R-16871; Plates 91, 92) labeled as *M. dumerilii* from "Approximately 10 km north of Chepo on the Pan American Highway, Darién, Panama." We confirmed, however, that the original collection data was in error and the locality lies within the province of Panamá (M. Harvey, pers. comm. [the collector]). Although in 2004 the identification of UTA R-16871 fell within characters assigned to *M. dumerilii*, our current (and much expanded) knowledge of variation in coral snakes indicates that the identification of UTA R-16871 confidently can be allocated to *M. nigrocinctus* (E. Smith, pers. comm.).



**Fig. 2.** An individual of *Micrurus dumerilii* found in Parque Nacional Chagres, province of Panamá. The snake measured ca. 60 cm TL. A = anterior portion of the snake, and B = a view of the dorsal pattern. © Aaron Prairie

The locality for one specimen (ANSP HPR 6856) in VertNet ([www.vertnet.org](http://www.vertnet.org)) is listed as either Panama or Colombia. Over a century ago Edward D. Cope placed this specimen in the ANSP collection, but its exact provenance is uncertain. The specimen shows a triad color pattern and its identification as *M. dumerilii* is correct. We mention it here for the sake of completeness, but find the specimen irrelevant for the purposes of this paper.

Campbell and Lamar (2004) strongly suggested that specimen USNM 140673, collected at El Real de Santa María, Darién, Panama and classified as *M. alleni* by Savage and Vial (1974), actually represents a specimen of *M. dumerilii*. Steve Gotte at the USNM kindly provided the following measurements and scale counts for the specimen: snout–vent length (SVL) = 204 mm; TL = 237 mm, with what appears to be a mostly healed yolk scar; ventrals = 203; and subcaudals = 53. Eric Smith evaluated the photographs provided by the USNM (Fig. 3), and in comparing taxa that have appeared as subspecies in the literature noted the following:

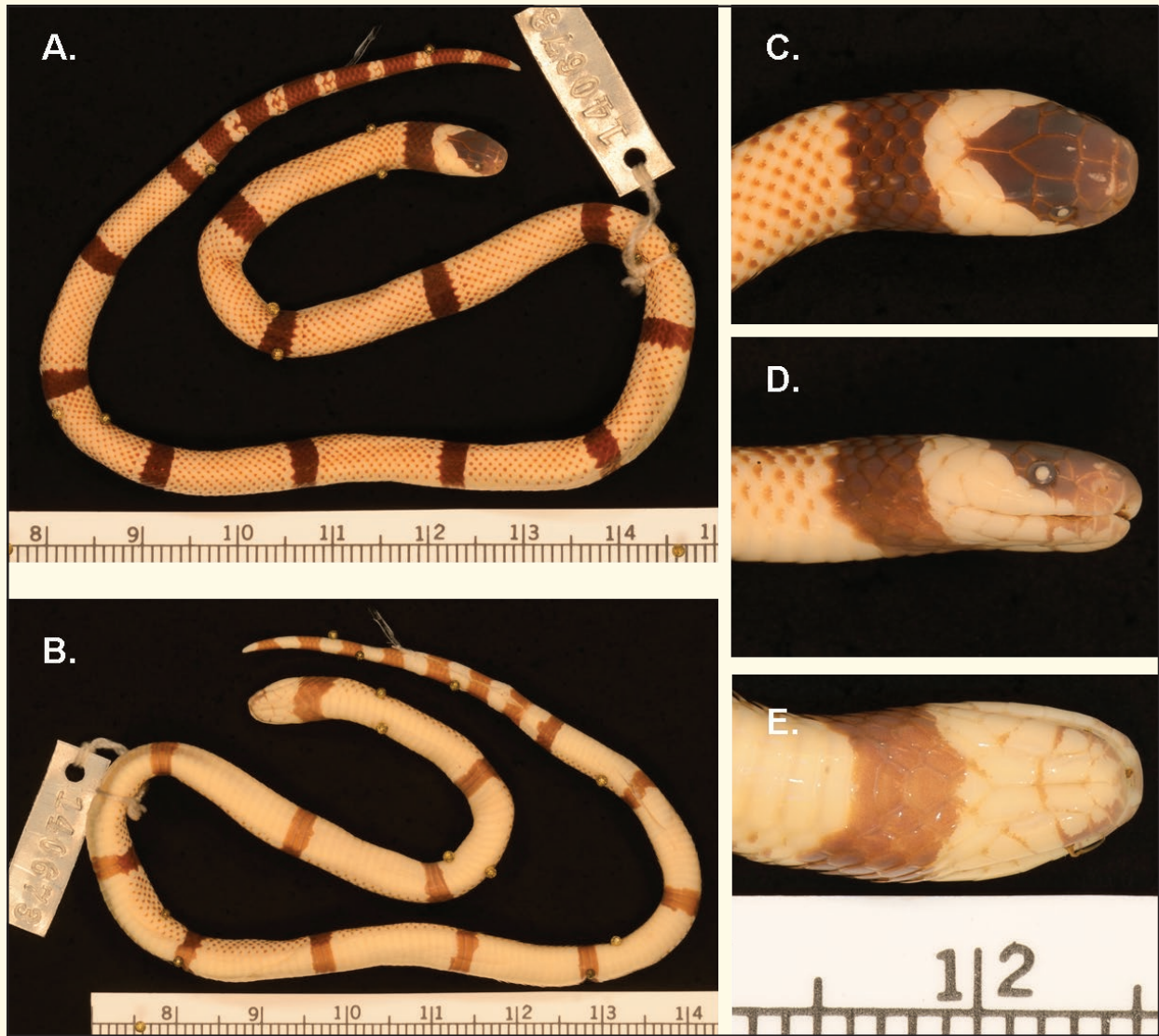
“The specimen is a male *M. dumerilii transandinus* and not a [*M.*] *alleni*, [*M.*] *nigrocinctus* or [*M.*] *clarki*:

1. I count 200 ventrals (not 209, like Savage and Vial [1974] mention in the[ir] publication), this is out of the range for male [*M.*] *alleni* and within that of male [*M.*] *dumerilii transandinus*.
2. The number of dorsal bands [rings] is also out of the range for male [*M.*] *alleni*, but within that of [*M.*] *dumerilii transandinus*.
3. The subcaudals are out of the range for male [*M.*] *nigrocinctus nigrocinctus*, and also the nuchal band [ring] extension.
4. The cap extending to the parietals at the midline is typical of [*M.*] *dumerilii transandinus*.
5. The black and maybe also red color on the light interspaces of the tail is also typical of [*M.*] *dumerilii transandinus*.

[*M.*] *clarki* is the original Smithsonian ID, but the ventrals do not match for a male and color is off.”

Based on the above information, the assumption made by Campbell and Lamar (2004) as to the identification of this specimen is correct. The photo voucher of *M. dumerilii* we report here from Parque Nacional Chagres represents a straight-line distance of 218.6 km NW of the El Real de Santa María locality.

A second specimen measuring 75 cm TL that was collected at Unión Chocó, Río Tuira, province of Darién, Panama (ca. 11.3 km from the location of the previous specimen; ca. 8.1042N, 77.6063W) by W. Lamar also has been identified morphologically as *M. dumerilii* (W. Lamar, pers. comm.; Plate 92 in Campbell and Lamar, 2004). The photo voucher we report here from Parque Nacional Chagres was found 228.3 km straight-line distance NW of the aforementioned locality.



**Fig. 3.** Coralsnake specimen USNM 140673, now identified as *Micrurus dumerilii*, which measured 237 mm TL. A = dorsal view; B = ventral view; C = dorsal view of the head; D = lateral view of the head; and E = ventral view of the head. The scale in E is not consistent with that in C and D.

## DISCUSSION

The information we present here corroborates the occurrence of *Micrurus dumerilii* in Panama, as indicated by Campbell and Lamar (2004). It also provides additional information on this species, and suggests that *M. dumerilii* likely will be found in suitable habitat throughout the eastern portion of the province of Panamá and the province of Darién. Because the locality where our individual was observed is adjacent to the province of Colón and the Comarca of Guna Yala, *M. dumerilii* likely occurs within the same habitat in these political units.

For nearly five years in the early 1990s, a survey was conducted on the herpetofauna of Parque Nacional Chagres and the surrounding areas (Ibáñez et al., 1995). These authors reported 71 species of reptiles (37 snakes), including two coralsnakes (*M. multifasciatus* and *M. stewarti*). Ray and Knight (2013) later documented the occurrence of *M. nigrocinctus* in the same general area. Despite the relatively comprehensive survey conducted by

Ibáñez et al. (1995), many species in this region of Panama remain known from only one or a few specimens (e.g., *Atractus imperfectus* and *A. depressiocellus* [Myers, 2003], *Coniophanes joanae* [Myers, 1969], and *Geophis bellus* [Myers, 2003]). The fact that *M. dumerilii* had not been reported this far west, despite the occurrence of suitable habitat throughout the province of Darién and the eastern portion of the province of Panamá suggests that much still remains to be learned about this interesting area.

Surveys on the composition of flora and fauna conducted in protected and unprotected areas are essential for the conservation of species. Documentation of the presence of species and the collection of data on population sizes are critical to the development of management plans.

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**Aaron Prairie** is a general biologist who focuses on insect ecology and tropical soil ecosystems. After acquiring a BS in Biology and BS in Chemistry from the University of New Mexico, he became the Biology Director for the Kalu Yala internship company in the province of Panamá, Panama. With this company, he is working to create a sustainable community and continue to build the ecological knowledge base of the Tres Brazos valley.



**Kathryn Chandler** is a marine biologist who specializes in water chemistry and its effects on an entire ecosystem. She just acquired her BS in Aquatic Environmental Science from Florida State University, with minors in Biology and Chemistry, and plans on obtaining a position as a marine educator for National Harbor Marine Institute. During her undergraduate studies, she participated in an internship with Kalu Yala Internship Company, where she worked under Aaron Prairie building the ecological knowledge base of the Tres Brazos valley.



**Patty Ruback** is a full-time mom and part-time GIS conservation specialist. She has collaborated on a number of research projects, and most recently has focused her attention on Panamanian snakes with La Mica Biological Research Station in Coclé Province. To date, she has co-authored six peer-reviewed scientific publications, in addition to the 2013 book, *The Venomous Snakes and their Mimics of Panama and Costa Rica*. Aside from her work on maps, she recently founded a grassroots organization in her community to help connect people with good local and sustainable food. Patty continues to travel extensively, as she educates her young daughter about conservation and social issues.



**Julie Ray** is a herpetologist who focuses on snake ecology. Her Master's thesis, from Northern Illinois University, focused on the diet and microevolutionary changes in color pattern of the Lake Erie Watersnake, and her Ph.D. dissertation, from Old Dominion University, was on the ecology of a Neotropical snake community in central Panama, with an emphasis on snailsucker snakes. Julie is the founder and director of La MICA Biological Station in the province of Coclé, Panama, and holds a Research Associate position at Towson University in Maryland and an adjunct faculty position at Missouri State University. Over 30 of her papers and notes on the Panamanian herpetofauna have been published, and she also has co-authored the bilingual book *The Venomous Snakes and their Mimics of Panama and Costa Rica* and currently is writing another bilingual book, *A Field Guide to the Snakes of Panama*. She also is a full-time mother, and a member of the Social Media Team and a Country Representative for Panama for the journal *Mesoamerican Herpetology*.