

# Other Contributions

## NATURE NOTES

### Amphibia: Anura

***Incilius occidentalis* (Camerano, 1870). Maximum elevation.** The Pine Toad, *Incilius occidentalis* (Bufonidae), is endemic to Mexico and is known from numerous localities in the states of Aguascalientes, Colima, Durango, Estado de México, Guanajuato, Guerrero, Hidalgo, Jalisco, Michoacán, Morelos, Nayarit, Oaxaca, Puebla, Querétaro, San Luis Potosí, Sinaloa, Tlaxcala, Veracruz, and Zacatecas, and occurs in a wide variety of habitats, including oak and pine-oak forests, scrublands, arid and semi-arid areas, and cloud forest, at elevations from 150 to 2,670 m (Vázquez-Díaz and Quintero-Díaz, 1997; 2005; Lemos-Espinal and Dixon, 2013, 2016; Ramírez-Bautista et al., 2014; Santos-Barrera, 2014). In the state of Aguascalientes, specimens have been reported at elevations from 1,560 m to 2,370 m (McCranie and Wilson, 2001).

On 14 July 2017 at 1602 h, during a rainy day, two of us (GEQD, CCF) found a female *I. occidentalis* (total length = 74 mm; body mass = 121.5 g) under a rock in oak-pine forest at an elevation of 2,770 m in the Sierra Fría, Municipio de San José de Gracia, Aguascalientes (22.229874°N, -102.634953°W; WGS 84; Fig. 1). The toad was collected and photographed, and then released. A photo voucher of this individual is deposited in the University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8934). This voucher represents the highest known elevation for this species in the state of Aguascalientes, as well as for its entire range. Our record increases the known elevation of *I. occidentalis* by 100 m (Lemos-Espinal and Dixon, 2013; 2016), and confirms the presence of this species in pine-oak forest in the state of Aguascalientes.



**Fig. 1** An *Incilius occidentalis* (UTADC-8934) from the Sierra Fría, Aguascalientes, found at an elevation 2,770 m, which represents the maximum known elevation for this widespread species.  © Carolina Chávez-Floriano

**Acknowledgments.**—We thank the personnel involved with the project *The Herpetofauna of Aguascalientes, México*, and also are indebted to Roberto Roque-Lozano and César Omar-Trujillo for field assistance, and Carl J. Franklin for providing the photo voucher number. The specimen was handled under scientific permit number SGPA/DGVS/030709/16, issued by the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

## LITERATURE CITED

- LEMONS-ESPINAL, J. A. AND J. R. DIXON. 2013. Amphibians and Reptiles of San Luis Potosí. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.
- LEMONS-ESPINAL, J. A. AND J. R. DIXON. 2016. Anfíbios y Reptiles de Hidalgo, México / Amphibians and Reptiles of Hidalgo, Mexico. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., Mexico.
- MCCRANIE, J. R., AND L. D. WILSON. 2001. The herpetofauna of the Mexican state of Aguascalientes. Courier Forschungsinstitut Senckenberg 230: 1–57.
- QUINTERO-DÍAZ, G. E., J. VÁZQUEZ-DÍAZ, AND J. J. SIGALA R. 2008. Anfíbios. Pp. 135–139 *In* La Biodiversidad en Aguascalientes: Estudio de Estado. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Mexico, D.F., Instituto del Medio Ambiente del Estado de Aguascalientes, Aguascalientes, and Universidad Autónoma de Aguascalientes, Aguascalientes, Mexico.
- RAMÍREZ-BAUTISTA, A., U. HERNÁNDEZ-SALINAS, R. CRUZ-ELIZALDE, C. BERRIOZABAL-ISLAS, I. GOYENECHEA M., AND J. M. CASTILLO-CERÓN. 2014. Los Anfíbios y Reptiles de Hidalgo, México: Diversidad, Biogeografía y Conservación. Sociedad Herpetológica Mexicana, A.C., Mexico.
- SANTOS-BARRERA, G. 2014. Geographic variation in *Incilius occidentalis* (Anura: Bufonidae), an endemic toad from Mexico, with a redescription of the species and delimitation of the type locality. *Revista Mexicana de Biodiversidad*, 85: 414–428.
- VÁZQUEZ-DÍAZ, J., AND G. E. QUINTERO-DÍAZ. 1997. Anfíbios y Reptiles de Aguascalientes. Centro de Investigaciones y Estudios Multidisciplinarios de Aguascalientes, and Gobierno del Estado de Aguascalientes, Aguascalientes, Mexico.
- VÁZQUEZ-DÍAZ, J., AND G. E. QUINTERO-DÍAZ. 2005. Anfíbios y Reptiles de Aguascalientes. 2<sup>nd</sup> ed. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., and Centro de Investigaciones y Estudios Multidisciplinarios de Aguascalientes, Aguascalientes, Mexico.

GUSTAVO ERNESTO QUINTERO-DÍAZ<sup>1,2</sup>, RUBÉN ALONSO CARBAJAL-MÁRQUEZ<sup>2,3</sup>, AND CAROLINA CHÁVEZ-FLORIANO<sup>2</sup>

<sup>1</sup>Universidad Autónoma de Aguascalientes, Centro de Ciencias Básicas, Departamento de Biología. C.P. 20131, Aguascalientes, Aguascalientes, Mexico. E-mail: gequintmxags@hotmail.com (Corresponding author)

<sup>2</sup>Conservación de la Biodiversidad del Centro de México, A.C., Andador Torre de Marfil No. 100, C.P. 20229, Aguascalientes, Aguascalientes, Mexico.

<sup>3</sup>El Colegio de la Frontera Sur. Departamento de Conservación de la Biodiversidad. Unidad Chetumal, Av. Centenario Km 5.5, 77014, Chetumal, Quintana Roo, Mexico.

***Lithobates forreri* (Boulenger, 1883). Diet.** Forrer's Leopard Frog, *Lithobates forreri*, is a large ranid (females to 110 mm) with a distribution restricted to major rivers and swampy areas along the Pacific versant of Mexico from central Sonora and southwestern Chihuahua southward to west-central Costa Rica, at elevations from sea level to 1,300m (Frost and Bagnara, 1976; Savage, 2002; Frost, 2017). Although this common species is rather widely distributed, little information is available on its diet. Lemos-Espinal et al. (2007) suggested that it probably feeds on small invertebrates. Fishing spiders of the genus *Dolomedes* (family Pisauridae) are large and somewhat robust, and usually are encountered near permanent bodies of water where they forage along the surface aided by the hairs on the ventral surface of their body, which are coated with hydrophobic substances; at least three species (*D. holti*, *D. triton*, and *D. vittatus*) are found in Mexico (Carico, 1973; CONABIO, 2008).

On 11 May 2017 at 2042 h, at Rancho Ecoaldea, Ojo de Cielo, San Blas, Nayarit, Mexico (21.577007°N, -105.060498°W; WGS 84; elev. 482 m), one of us (JALB) found a young *L. forreri* foraging along the edge of a pool of water within in a dry stream in tropical deciduous forest. The frog detected the moving spider, which also appeared to be foraging along the rocks surrounding the puddle, and proceeded to prey on the spider. Soon after we captured the frog it regurgitated its prey, which we identified as a *Dolomedes* sp. (Fig. 1); we released the frog after taking the photograph. We observed several other spiders of what appeared to be the same species in the immediate area.



**Fig. 1.** A *Lithobates forreri* with the legs of its prey protruding from its mouth (left), and the regurgitated fishing spider, *Dolomedes* sp. (right).  © Jesús A. Loc-Barragán

**Acknowledgments.**—We thank Jorge L. Escamilla-Dimas for field assistance.

#### LITERATURE CITED

- CARICO, J. E. 1973. The Nearctic species of the genus *Dolomedes* (Araneae: Pisauridae). *Bulletin of the Museum of Comparative Zoology at Harvard College* 144: 435–488.
- CONABIO (COMP.) 2008. Catálogo de autoridades taxonómicas de los arácnidos (Arachnida: Arthropoda) de México. Base de datos SNIB-CONABIO. México. Incluye información del proyecto BK006. ([www.biodiversidad.gob.mx/especies/gran\\_familia/animales/aracnidos/doc/Aracnidos.pdf](http://www.biodiversidad.gob.mx/especies/gran_familia/animales/aracnidos/doc/Aracnidos.pdf)).
- FROST, D. R. 2017. *Amphibian Species of the World: An Online Reference*. Version 6.0. American Museum of Natural History, New York, New York, United States. ([www.research.amnh.org/herpetology/amphibia/index.html](http://www.research.amnh.org/herpetology/amphibia/index.html); accessed 22 June 2017).
- FROST, D. R., AND J. T. BAGNARA. 1976. A new species of leopard frog (*Rana pipiens* complex) from northwestern Mexico. *Copeia*, 1976: 332–338.
- LEMONS-ESPINAL, J. A. AND H. SMITH. 2007. *Anfibios y Reptiles del Estado de Chihuahua, México / Amphibians and Reptiles of the State of Chihuahua, Mexico*. Universidad Nacional Autónoma de México, Tlalnepantla, Estado de México, and Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., Mexico.
- SAVAGE, J. M. 2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas*. The University of Chicago Press, Chicago, Illinois, United States.

**JESÚS A. LOC-BARRAGÁN<sup>1</sup>, RUBÉN ALONSO CARBAJAL-MÁRQUEZ<sup>2,3</sup>, AND MARCO A. DOMÍNGUEZ-DE LA RIVA<sup>4</sup>**

<sup>1</sup>*Coordinación de monitoreo de fauna silvestre. Forestales A.C. Calle Valparaiso No. 100, C.P. 63157, Cd. Del Valle, Tepic, Nayarit, Mexico. E-mail: biolocbarragán@gmail.com (JALB, Corresponding author)*

<sup>2</sup>*El Colegio de la Frontera Sur. Departamento de Conservación de la Biodiversidad. Unidad Chetumal, Av. Centenario Km 5.5, 77014, Chetumal, Quintana Roo, Mexico.*

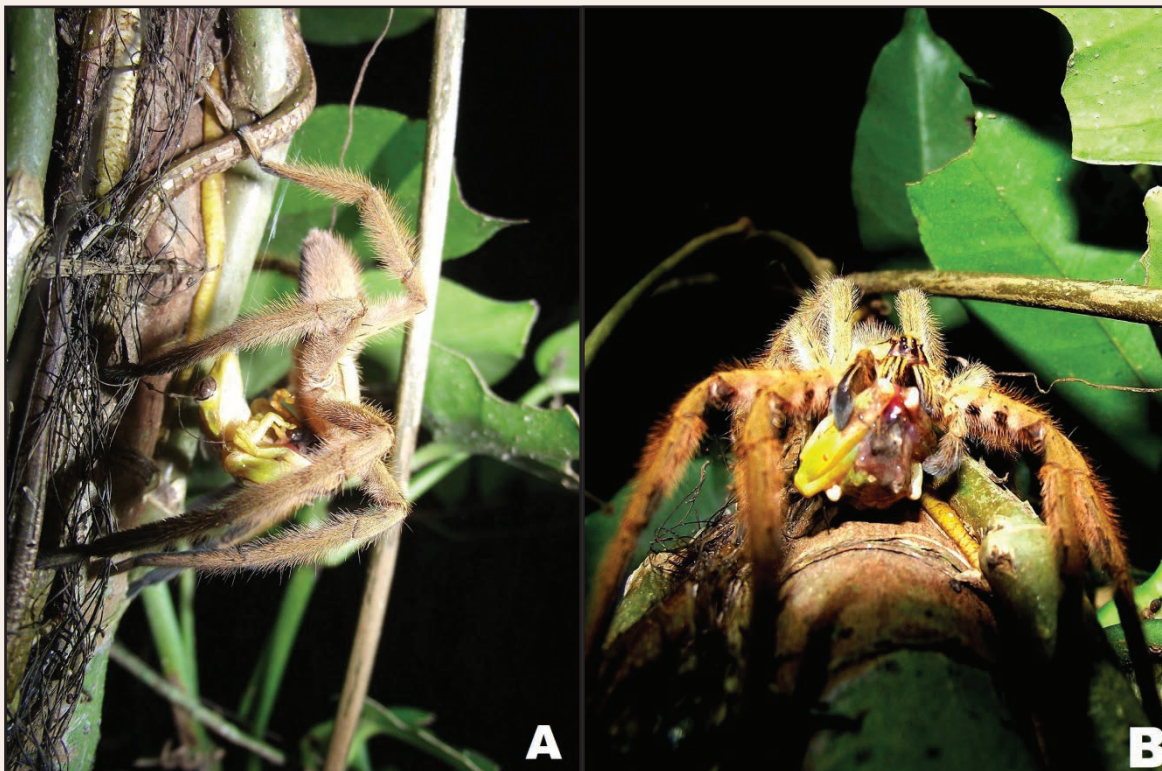
<sup>3</sup>*Conservación de la Biodiversidad del Centro de México, A.C., Andador Torre de Marfil No. 100, C.P. 20229, Aguascalientes, Aguascalientes, Mexico.*

<sup>4</sup>*Universidad Autónoma de Aguascalientes, Centro de Ciencias Básicas, Departamento de Biología, C.P. 20131, Aguascalientes, Aguascalientes, Mexico.*

***Rheohyla miotympanum* Cope, 1863. Predation.** Spiders are important predators of anuran amphibians. Almost 48% of the reports of invertebrates preying on amphibians pertain to spiders (Toledo, 2005), and thus arachnids not only are prey but also competitors for some anurans (Wells, 2007). In the Neotropics, some of the principal families of spiders that prey on anurans are the Pisauridae, Lycosidae, and Ctenidae (Toledo, 2005), and their reported prey mostly are frogs of the families Leptodactylidae (Barbo, et al., 2009), Craugastoridae (Zumbado et al., 2009; Aguilar-López et al., 2014; Jablonski, 2015), and Hylidae (Brasileiro and Oyamacuchi, 2006; Ugarte and Briggs, 2007; Jansen and Schulze, 2008; Maffei et al., 2014), which are some of the most diverse families in the Americas.

The Small-eared Treefrog (*Rheohyla miotympanum*) is a hylid frog endemic to Mexico, with a wide distribution on the Atlantic slope ranging from the highlands of Nuevo León and Coahuila to Guanajuato, Hidalgo, Veracruz, Oaxaca, and central Chiapas, at elevations from 100 to 2,280 m (Duellman, 2001). This species often is abundant in modified habitats, including shaded coffee plantations and cattle pastures (Pineda and Halfpeter, 2004). Two records of invertebrates preying on *R. miotympanum* are available, and both report water bugs (Belostomatidae) as the predators (Pineda, 2003; Hernández et al., 2012).

On 19 August 2014 at 2330 h, during fieldwork at Zona de Protección de Flora y Fauna Santa Gertrudis (19.84306°N, 96.57306°W; WSG 84; elev. 470 m), Municipio de Vega de Alatorre, Veracruz, Mexico, in a patch of secondary vegetation within tropical rainforest, we observed an adult male *R. miotympanum*, 23 mm in snout–vent length (SVL), which had been captured by a young Tiger Wandering Spider, *Cupiennius salei* (Araneae: Ctenidae). The spider was perched on a climbing plant about 50 cm above the ground and was holding the frog with its chelicerae, which had pierced the ventral portion of the pelvic region of the frog (Fig. 1). This observation represents the first report of a spider preying upon *R. miotympanum*. In the study area *R. miotympanum* is an abundant species in secondary vegetation, as we recorded about 60 individuals during 3 person-hours of sampling effort. *Rheohyla miotympanum* likely is an important component of the food web in this area, and *C. salei* appears to participate in regulating the population of this hylid.



**Fig. 1.** Lateral (A) and frontal (B) views of a *Cupiennius salei* feeding on a *Rheohyla miotympanum* at Zona de Protección de Flora y Fauna Santa Gertrudis, Municipio de Vega de Alatorre, Veracruz, Mexico. © Arístides García-Vinalay

**Acknowledgments.**—We thank Raziel Lucio for identifying the spider, Ricardo Luría-Manzano, José Luis Aguilar-López, and Louis W. Porras for providing helpful comments on this note, the Hernandez-Ochoa foundation for their kindness during our fieldwork in the reserve. Our fieldwork was supported with funds from the strategic project “Refaunación de Áreas Naturales Protegidas en el Estado de Veracruz” No. 2003530908. Permits for this study were issued by the Dirección General de Vida Silvestre of the Secretaría de Medio Ambiente y Recursos Naturales (collecting permit numbers: SGPA/DGVS/034444/15).

#### LITERATURE CITED

- AGUILAR-LÓPEZ, J. L., E. PINEDA, AND R. LURIA-MANZANO. 2014. Depredación de tres especies de herpetozoos por arañas en la región tropical de Veracruz, México. *Revista Mexicana de Biodiversidad* 86: 965–968.
- BARBO, F. E., M. G. RODRIGUES, F. M. COUTO, AND R. J. SAWAYA. 2009. Predation on *Leptodactylus marmoratus* by the spider *Cteneus medius* (Araneae: Ctenidae) in the Atlantic forest, southeast Brazil. *Herpetology Notes* 2: 99–100.
- BRASILEIRO, C., AND H. OYAMACUCHI. 2006. Natural History Notes. *Scinax alcatraz* (Alcatraz Snouted Treefrog). Predation. *Herpetological Review* 37: 451.
- DUELLMAN, W. E. 2001. The Hylid Frogs of Middle America. 2<sup>nd</sup> ed. Contributions to Herpetology, Volume 18, Society for the Study of Amphibians and Reptiles. Ithaca, New York, United States.
- HERNÁNDEZ, S. U., A. RAMÍREZ-BAUTISTA, L. M. BADILLO-SALDAÑA, AND D. LARA-TUFIÑO. 2012. Natural History Notes. *Ecnomiohyla miotympanum* (Small Eared Treefrog). Predation. *Herpetological Review* 43: 462.
- JABLOSKI, D. 2015. Predation on *Pristimantis ridens* (Cope, 1866) by a wandering spider (Ctenidae Keyserling, 1877) in mountain cloud forest of Costa Rica. *Herpetology Notes* 8: 1–3.
- JANSEN, M., AND A. SCHULZE. 2008. Natural History Notes. *Dendropsophus leucophyllatus* (Bereis’ Tree Frog). Predation. *Herpetological Review* 39: 459.
- MAFFEI, F., M. BOLFARINI, AND F. K. UBAID. 2014. Predation of *Scinax fuscovarius* (Anura: Hylidae) by two invertebrates in southeastern Brazil. *Herpetology Notes* 7: 371–374.
- PINEDA, E. 2003. Natural History Notes. *Ecnomiohyla miotympanum* (Small-eared Treefrog). Predation. *Herpetological Review* 34:136–137.
- PINEDA, E., AND HALFFTER, G. 2004. Species diversity fragmentation: frogs in a tropical landscape in México. *Biological Conservation* 117: 499–508.
- TOLEDO, S. 2005. Predation of juvenile and adult anurans by invertebrates: current knowledge and perspectives. *Herpetological Review* 36: 395–400.
- UGARTE, C., AND V. BRIGGS. 2007. Natural History Notes. *Hyla loquax* (Swamp Tree Frog). Predation. *Herpetological Review* 38: 186.
- WELLS, K. D. 2007. The Ecology and Behavior of Amphibians. The University of Chicago Press, Chicago, Illinois, United States.
- ZUMBADO, U. H., G. F. SOLEY, AND F. BOLAÑOS. 2009. Natural History Notes. *Craugastor ranoides* (NCN). Predation. *Herpetological Review* 40: 201.

#### ARÍSTIDES GARCÍA-VINALAY<sup>1</sup> AND EDUARDO PINEDA<sup>2</sup>

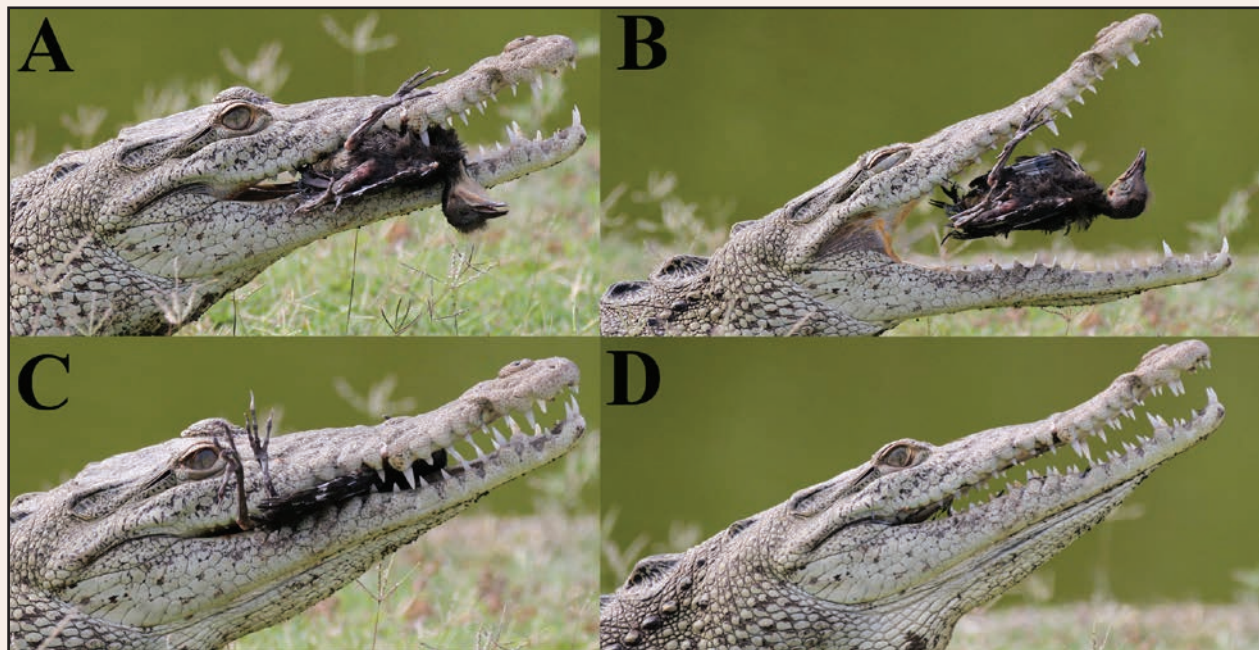
<sup>1</sup>Universidad Veracruzana, Facultad de Ciencias Biológicas y Agropecuarias, Camino Peñuela-Amatlán de los Reyes S/N, Veracruz, Mexico. E-mail: aris\_ham@hotmail.com (Corresponding author)


<sup>2</sup>Red de Biología y Conservación de Vertebrados, Instituto de Ecología, A.C., Carretera antigua a Coatepec Km. 2.5, Congregación El Haya, Xalapa Veracruz, Mexico.

## Reptilia: Crocodylia

***Crocodylus acutus* (Cuvier, 1807). Diet.** The American Crocodile, *Crocodylus acutus*, is widely distributed in coastal and lowland wetlands in the northern Neotropics (Thorbjarnarson et al., 2006). This species feeds on a broad array of food items, including fruits, arthropods, crustaceans, fishes, amphibians, reptiles, birds, and both terrestrial and marine mammals (Casas-Andreu and Barrios-Quiroz, 2003; Nabhan, 2003; Villegas and Schmitter-Soto, 2008; Platt et al., 2013a, b, 2014; Beltrán-López, 2015; Cupul-Magaña et al., 2015, 2016; Acosta-Chaves et al., 2016). To our knowledge, the following 13 species of birds (classified in seven Orders) have been reported in the diet of *C. acutus*: Anseriformes: *Anas discors*; Charadriiformes: *Jacana spinosa*; Columbiformes: *Zenaida macroura*; Gruiformes: *Rallus longirostris*; Pelecaniformes: *Bubulcus ibis*, *Butorides virescens*, *Eudocimus albus*, *Nyctanassa violacea*, and *Pelecanus occidentalis*; Phoenicopteriformes: *Phoenicopterus ruber*; and Suliformes: *Anhinga anhinga*, *Phalacrocorax auritus*, and *P. brasilianus* (Cupul-Magaña et al., 2015). In this note, we present photographic evidence of a *C. acutus* preying on a young Great-tailed Grackle, *Quiscalus mexicanus* (Gmelin, 1788), a social bird (Order Passeriformes) with a distribution extending from southern Canada to northern South America (Johnson and Peer, 2001).

On 16 May 2017, at the Marina Vallarta Club de Golf, Puerto Vallarta, Jalisco, Mexico (20°40'00"N, 105°15'50"W; datum WGS 84; elev. < 4 m), one of us (FMC) observed and photographed an adult *C. acutus* (total length  $\leq$  1.8 m; individual not captured or sexed) eating a young *Q. mexicanus* (Fig. 1) that presumably had fallen from its nest and died. The bird likely was consumed by the *C. acutus* shortly thereafter, because the bird showed no signs of decomposition. This observation is another example of opportunist feeding behavior in wild *C. acutus*.



**Fig. 1.** Predation of a young *Quiscalus mexicanus* by *Crocodylus acutus* in Puerto Vallarta, Jalisco, Mexico. Sequence of events: (A) the corpse is collected; (B, C) the bird is thrown into the air and placed in position for swallowing; and (D) the bird is swallowed.  © Frank Mc Cann

## LITERATURE CITED

- ACOSTA-CHAVES, V. J., K. R. RUSSELL, AND C. SARTINI. 2016. Nature Notes. *Crocodylus acutus* (Cuvier, 1807). Predation on a Brown Pelican (*Pelecanus occidentalis*) in the ocean. *Mesoamerican Herpetology* 3: 140–142.
- BELTRÁN-LÓPEZ, V. 2015. Componentes en la Dieta de *Crocodylus acutus* (Reptilia: Crocodylidae) en el Suroriente del Parque Nacional Coiba, Veraguas-Panamá. Unpublished Licenciatura thesis, Universidad del Quindío, Armenia-Quindío, Colombia.
- CASAS-ANDREU, G., AND G. BARRIOS-QUIROZ. 2003. Hábitos alimenticios de *Crocodylus acutus* (Reptilia: Crocodylidae) determinados por el análisis de sus excretas en la costa de Jalisco, México. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México, Serie Zoología* 74: 35–42.
- CUPUL-MAGAÑA, F. G., F. MC CANN, AND A. H. ESCOBEDO-GALVÁN. 2015. Observación del consumo de presas en el Cocodrilo Americano (*Crocodylus acutus* Cuvier, 1807): registro fotográfico. *Quehacer Científico en Chiapas* 10(2): 11–15.
- CUPUL-MAGAÑA, F. G., F. MC CANN, AND A. H. ESCOBEDO-GALVÁN. 2016. Nature Notes. *Crocodylus acutus* (Cuvier, 1807). Diet. *Mesoamerican Herpetology* 3: 1,004–1,005.
- JOHNSON, K., AND B. D. PEER. 2001. Great-tailed Grackle (*Quiscalus mexicanus*). Pp. 1–28 *In* A. Poole and F. Gill (Eds.), *The Birds of North America* 576. The Birds of North America, Inc., Philadelphia, Pennsylvania, United States.
- NABHAN, G. P. 2003. *Singing the Turtles to Sea: The Comcaac (Seri) Art and Science of Reptiles*. University of California Press, Berkeley, California, United States.
- PLATT, S. G., C. CHENOT-ROSE, V. ROSE, AND T. R. RAINWATER. 2014. Natural History Notes. *Crocodylus acutus* (American Crocodile). Frugivory. *Herpetological Review* 45: 120–121.
- PLATT, S. G., R. M. ELSEY, H. LIU, T. R. RAINWATER, J. C. NIFONG, A. E. ROSENBLATT, M. R. HEITHAUS, AND F. J. MAZZOTTI. 2013a. Frugivory and seed dispersal by crocodylians: an overlooked form of saurochory? *Journal of Zoology* 291: 87–99.
- PLATT, S. G., J. B. THORBJARNARSON, T. R. RAINWATER, AND D. R. MARTIN. 2013b. Diet of the American Crocodile (*Crocodylus acutus*) in marine environments of coastal Belize. *Journal of Herpetology* 47: 1–10.
- THORBJARNARSON, J., F. MAZZOTTI, E. SANDERSON, F. BUITRAGO, M. LAZCANO, K. MINKOWSKI, M. MUÑIZ, P. PONCE, L. SIGLER, R. SOBERON, AND A. M. TRELANCIA. 2006. Regional habitat conservation priorities for the American Crocodile. *Biological Conservation* 128: 25–36.
- VILLEGAS, A., AND J. J. SCHMITTER-SOTO. 2008. Feeding habits of the American Crocodile, *Crocodylus acutus* (Cuvier, 1807) (Reptilia: Crocodylidae) in the southern coast of Quintana Roo, Mexico. *Acta Zoológica Mexicana (n.s.)* 24: 117–124.

FABIO GERMÁN CUPUL-MAGAÑA<sup>1</sup>, FRANK MC CANN<sup>2</sup>, AND ARMANDO H. ESCOBEDO-GALVÁN<sup>1</sup>

<sup>1</sup>Centro Universitario de la Costa, Universidad de Guadalajara, Av. Universidad 203, Delegación Ixtapa, C.P. 48280, Puerto Vallarta, Jalisco, Mexico. E-mail: fabiocupul@gmail.com

<sup>2</sup>Condominio Girasol departamento 12, carretera a Mismaloya Km 8.5, C.P. 48390, Puerto Vallarta, Jalisco, Mexico.

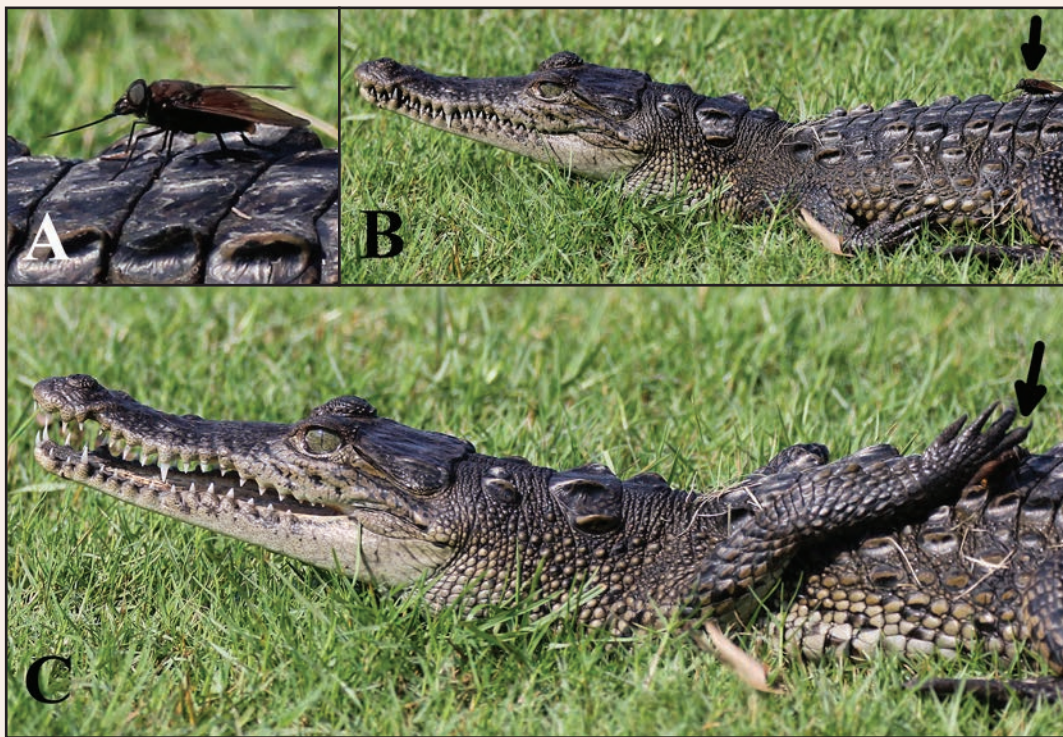
***Crocodylus acutus* (Cuvier, 1807). Ectoparasitism.** Ectoparasites recorded in crocodylians include ticks, leeches (Montague, 1984; Rainwater et al., 2001; Huchzermeyer, 2003; Padilla-Paz, 2008; García-Grajales and Buenrostro-Silva, 2011; Charruau et al., 2017a; Tellez et al., 2017), barnacles (Monroe and Garrett, 1979; Cupul-Magaña et al., 2011; Nifong and Frick, 2011; Escobedo-Galván et al., 2012; Elsey et al., 2014), and sea anemones (Charruau and González-Muñoz, 2016). The available information on interactions between crocodylians and insects (as ectoparasites), however, remains limited.


The crocodylian skin is an important part of the body's defense mechanism (Elkan and Cooper, 1980; Alderton, 1998), but small animals sometimes can remain and/or successfully penetrate this protective cellular barrier. Such is the case with capillarid worms (Charruau et al., 2017b), as well as dipteran species of the family Tabanidae, where female flies generally are large-bodied blood feeders that can attack many vertebrates, including crocodylians, by using their proboscis to pierce the skin (Tellez, 2013; Karolyi et al., 2014).

Some species of tabanids has been linked to the mechanical transmission of parasites in crocodiles and caimans (Hoare, 1929; Barros, 1996; Ferreira et al., 2002; Onmaz et al., 2013). Fairchild (1986) summarized some data of tabanid hosts preferences in Panama, and indicated dead caimans as hosts of *Fidena flavipennis*. Additionally, Tellez (2013) listed some species of the genera *Catachlorops*, *Diachlorus*, *Lepiselaga*, *Phaeotabanus*, *Stenotabanus*, and *Tabanus* parasitizing caimans. Nevertheless, we are not aware of any records of species of *Esenbeckia* feeding on crocodiles, or records of any tabanids feeding on crocodiles in Mexico.

Herein we present the first report of tabanid fly (or horsefly) *Esenbeckia* sp., a diverse genus of the subfamily Pangoniinae in Mexico (Ibáñez-Bernal and Coscarón, 2000), biting an American Crocodile (*Crocodylus acutus*), a widely distributed species in coastal regions of the northern Neotropics (Thorbjarnarson, 1989).

On 1 August 2016, at the Marina Vallarta Club de Golf, Puerto Vallarta, Jalisco, Mexico (20°39'58"N, 105°15'50"W; datum: WGS 84; elev. < 3 m), one of us (FMC) observed and photographed a juvenile *C. acutus* (total length  $\leq 1$  m; individual not captured or sexed) as it was being bitten by a tabanid fly, *Esenbeckia* sp. (Fig. 1A). The horsefly landed on the upper portion of the crocodile's back and bit between the scales (Fig. 1B). We presume this to be a blood feeding behavior used by the tabanid fly on *C. acutus*; the bite perhaps is painful or extremely unpleasant for the crocodile, because the *C. acutus* spread its front limbs and directed them toward its back in an effort swat the horsefly (Fig. 1C). Future research on the interactions between tabanids and crocodiles is necessary to determine the frequency in which the crocodiles are parasitized by biting dipterans, and whether these bites can affect the health of the crocodiles.



**Fig. 1.** Sequence of events: (A) Close-up of Tabanid fly *Esenbeckia* sp.; (B) the fly after landing on the upper portion of the back of a *Crocodylus acutus* (see black arrow); and (C) the crocodile reacts by using its front limbs in an attempt to swat the horsefly (see black arrow).  © Frank Mc Cann

#### LITERATURE CITED

- ALDERTON, D. 1998. Crocodiles & Alligators of the World. Blandford, London, United Kingdom.
- BARROS, A. T. M. 1996. Seasonality of *Phaeotabanus fervens* (Diptera: Tabanidae) in the Pantanal Region, Brazil. *Memórias do Instituto Oswaldo Cruz* 91: 159.



- CHARRUAU, P., AND R. GONZÁLEZ-MUÑOZ. 2016. Epibiont sea anemones inhabiting the American Crocodile *Crocodylus acutus*. *Marine Biodiversity* 46: 11–12.
- CHARRUAU, P., J. PÉREZ-FLORES, J. R. CEDEÑO-VÁZQUEZ, D. GONZÁLEZ-SOLÍS, G. A. GONZÁLEZ-DESALES, O. MONROY-VILCHIS, AND M. A. DESALES-LARA. 2017a. Occurrence of *Amblyomma dissimile* on wild crocodylians in southern Mexico. *Diseases of Aquatic Organisms* 121: 167–171.
- CHARRUAU, P., J. PÉREZ-FLORES, AND D. LABARRE. 2017b. Skin parasitism by *Paratrichosoma recurvum* in wild American Crocodiles and its relation to environmental and biological factors. *Diseases of Aquatic Organisms* 122: 205–211.
- CUPUL-MAGAÑA, F. G., A. RUBIO-DELGADO, A. H. ESCOBEDO-GALVÁN, AND C. REYES-NÚÑEZ. 2011. First report of the marine barnacles *Lepas anatifera* and *Chelonibia testudinaria* as epibionts on American Crocodile (*Crocodylus acutus*). *Herpetology Notes* 4: 213–214.
- ELKAN, E., AND J. E. COOPER. 1980. Skin biology of reptiles and amphibians. *Proceedings of the Royal Society of Edinburgh* 79B: 115–125.
- ELSEY, R. M., R. KING, J. C. NIFONG, AND M. G. FRICK. 2014. Natural History Notes. *Alligator mississippiensis* (America Alligator). Epibiosis. *Herpetological Review* 45: 118–119.
- ESCOBEDO-GALVÁN, A. H., J. H. GAVIÑO-RODRÍGUEZ, E. A. REYES-HERRERA, S. I. QUIJANO-SHEGGIA, AND M. GARCÍA-GARCÍA. 2012. Occurrence of *Amphibalanus amphitrite* (Darwin, 1854) (Cirripedia, Balanidae) on *Crocodylus acutus* (Reptilia, Crocodylia) in Colima, Mexico. *Crustaceana* 85: 1,145–1,148.
- FAIRCHILD, G. B. 1986. The Tabanidae of Panama. *Contributions of the American Entomological Institute* 22(3): 11–39.
- Ferreira, R. L. M., A. L. HENRIQUES, AND J. A. RAFAEL. 2002. Activity of tabanids (Insecta: Diptera: Tabanidae) attacking the reptiles *Caiman crocodilus* (Linn.) (Alligatoridae) and *Eunectes murinus* (Linn.) (Boidae), in the Central Amazon, Brazil. *Memórias do Instituto Oswaldo Cruz* 97: 133–136.
- GARCÍA-GRAJALES, AND A. BUENROSTRO-SILVA. 2011. Infestación y distribución corporal de sanguijuelas en el Cocodrilo Americano (*Crocodylus acutus* Cuvier 1807) (Reptilia: Crocodylidae) del estero La Ventanilla, Oaxaca, México. *Acta Zoológica Mexicana*, (n.s.) 27: 565–575.
- HOARE, C. A. 1929. Studies on *Trypanosoma grayi*. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 23: 39–56.
- HUCHZERMAYER, F. W. 2003. *Crocodiles: Biology, Husbandry and Diseases*. CABI Publishing, Wallingford, United Kingdom.
- IBÁÑEZ-BERNAL, S., AND S. COSCARÓN. 2000. Tabanidae (Diptera). Pp. 593–606 *In* J. Llorente-Bousquets, E. González-Soriano, and N. Papavero (Eds.), *Biodiversidad, Taxonomía y Biogeografía de Artrópodos de México: Hacia una Síntesis de su Conocimiento*. Volume III. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., and Universidad Nacional Autónoma de México, Tlalnepantla, Estado de México, Mexico.
- KAROLYI, F., J. F. COLVILLE, S. HANDSCHUH, B. D. METSCHER, AND H. W. KRENN. 2014. One proboscis, two tasks: adaptations to blood-feeding and nectar-extracting in long-proboscid horse flies (Tabanidae, Philoliche). *Arthropod Structure & Development* 43: 403–413.
- MONROE, R., AND R. GARRETT. 1979. *Chelonibia testudinaria* (L.) (Cirripedia, Coronulidae) on *Crocodylus porosus* Schneider, a new host record. *Crustaceana* 36: 108.
- MONTAGUE, J. J. 1984. Abnormalities and injuries in New Guinea Freshwater Crocodiles (*Crocodylus novaeguineae*). *Journal of Herpetology* 18: 201–204.
- NIFONG, J. C., AND G. FRICK. 2011. First record of the American Alligator (*Alligator mississippiensis*) as a host to the sea turtle barnacle (*Chelonibia testudinaria*). *Southeastern Naturalist* 10: 557–560.
- PADILLA-PAZ, S. E. 2008. Hematología, Índice Corporal y Lesiones Externas del Cocodrilo de Pantano *Crocodylus moreletii* en los Humedales del Norte del Estado de Campeche, México. Unpublished M.Sc. thesis, El Colegio de La Frontera Sur, Campeche, Mexico.
- ONMAZ, A. C., R. G. BEUTEL, K. SCHNEEBERG, A. N. PAVALIOU, A. KOMAREK, AND R. VAN DEN HOVEN. 2013. Vectors and vector-borne diseases of horses. *Veterinary Research Communications* 37: 65–81.
- RAINWATER, T. R., S. G. PLATT, R. G. ROBBINS, AND S. T. McMURRY. 2001. Ticks from a Morelet's Crocodile in Belize. *Journal of Wildlife Diseases* 37: 836–839.
- TELLEZ, M. 2013. A checklist of host-parasite interaction of the order Crocodylia. University of California Press, Berkeley, United States.
- TELLEZ, M., S. MATOLA, AND D. BRIANNE. 2017. Nature Notes. *Crocodylus acutus* (Cuvier, 1807). Ectoparasitism. *Mesoamerican Herpetology* 4: 415–417.
- THORBJARNARSON, J. B. 1989. Ecology of the American Crocodile, *Crocodylus acutus*. Pp. 228–259 *In* *Crocodiles: Their Ecology, Management, and Conservation*. A Special Publication of the IUCN/SSC Crocodile Specialist Group, Gland, Switzerland.

**FABIO GERMÁN CUPUL-MAGAÑA<sup>1</sup>, FRANK MC CANN<sup>2</sup>, SERGIO IBÁÑEZ-BERNAL<sup>3</sup>, AND ARMANDO H. ESCOBEDO-GALVÁN<sup>1</sup>**

<sup>1</sup>Centro Universitario de la Costa, Universidad de Guadalajara, Av. Universidad 203, Delegación Ixtapa, C.P. 48280, Puerto Vallarta, Jalisco, Mexico. E-mail: fabiocupul@gmail.com

<sup>2</sup>Condominio Girasol departamento 12, carretera a Mismaloya km 8.5, C.P. 48390, Puerto Vallarta, Jalisco, Mexico.

<sup>3</sup>Instituto de Ecología A.C., Red Ambiente y Sustentabilidad, Km 2.5 carretera antigua a Coatepec No. 351, El Haya, Xalapa, 91070, Veracruz, Mexico.

## Reptilia: Squamata (lizards)

***Ctenosaura similis* (Gray, 1830). Predation.** The Black Spiny-tailed Iguana, *Ctenosaura similis*, is a large lizard (maximum snout–vent length = 489 mm) that occurs from the Isthmus of Tehuantepec (central Tabasco on the Atlantic versant and central Oaxaca on the Pacific versant), Mexico, southward across Central America (except highland areas and very humid regions), including some offshore islands, to central Panama, at elevations from sea level to 1,320 m elevation (Savage, 2002; Köhler, 2008); it also has been introduced in the islands of San Andrés and Providencia, Colombia, and in Florida, United States (Dunn and Saxe, 1950; Meshaka et al., 2004). Although this species is found in various types of habitats, on the Pacific versant of Mesoamerica it occurs primarily in wooded or semi-forested habitats in xeric environments (Mora, 2010). Known predators of *C. similis* include the snakes *Agkistrodon howardgloydi* (Solórzano et al., 1999), *Boa imperator* (Bakkegard and Timm, 2001), *Conopsis lineatus* (Hernández-Gallegos et al., 2008), *Crotalus tzabcan* (Heimes, 2016); *Leptodeira frenata* (Barbour and Cole, 1906); *Leptophis mexicanus* (Platt et al., 2016), *Loxocemus bicolor* (Mora, 1987), *Oxybelis fulgidus* (Henderson, 1982; Henderson and Binder, 1980); *Trimorphodon biscutatus* (Savage, 2002); and the mammals *Dasyopus novemcinctus* (Mora, 2010) and *Felis rufus* (Engeman et al., 2007). Additionally, this species has been reported to engage in cannibalism (Fitch and Henderson, 1978; Mora, 1991; Mora et al., 2015). Savage (2002: 436) noted that individuals of *C. similis* are “heavily preyed upon by hawks, jays, basilisks, and probably small carnivorous mammals,” but did not provide additional information. Herein, we report a new avian predator on *C. similis* in southeastern Mexico.

On 23 July 2017 at 1037 h, two of us (FOL and SML) observed a Turquoise-browed Motmot (*Eumomota superciliosa*) preying on a hatchling *C. similis* (Fig. 1) at Cuadrángulo de las Monjas, Municipio de Uxmal, Yucatán, Mexico (20.361600°N, -89.7707°W), elev. 59 m. The event took place along the edge of a rock wall, in what used to be the basement of an old historic building. At the time of the observation, the bird was holding and forcefully striking the lizard against the wall, and then flew away with its prey. To the best of our knowledge, this is the first published report of *E. superciliosa* preying upon *C. similis*.



**Fig. 1.** A Turquoise-browed Motmot (*Eumomota superciliosa*) preying on a hatchling Black Spiny-tailed Iguana (*Ctenosaura similis*) in Cuadrángulo de las Monjas, Municipio de Uxmal, Yucatán, Mexico. © Fernando Ortiz-Lachica

## LITERATURE CITED

- BAKKEGARD, K. A., AND R. M. TIMM. 2001. Natural History Notes. *Boa constrictor* (Boa Constrictor). Diet. Herpetological Review 32: 261–262.
- BARBOUR, T., AND L. J. COLE. 1906. Vertebrata from Yucatan. Reptilia, and Amphibia, Pisces. Bulletin of the Museum of Comparative Zoology, Harvard 50: 146–159.
- DUNN, E. R., AND L. H. SAXE, JR. 1950. Results of the Catherwood-Chaplin West Indies expedition, 1948. Part V. Amphibians and Reptiles of San Andrés and Providencia. Proceedings of The Academy of Natural Sciences of Philadelphia. Volume CII: 141–165.
- ENGEMAN, R. M., M. L. CHRISTIE, B. CONSTANTIN, AND R. CHRISTIE. 2007. Natural History Notes. *Ctenosaura similis* (Black Spiny-tailed Iguana). Predation. Herpetological Review 38: 454.
- FITCH, H. S., AND R. W. HENDERSON. 1978. Ecology and exploitation of *Ctenosaura similis*. The University of Kansas Science Bulletin 51: 483–500.
- HEIMES, P. 2016. Herpetofauna Mexicana Vol. 1. Snakes of Mexico. Edition Chimaira, Frankfurt am Main, Germany.
- HENDERSON, R. W. 1982. Trophic relationships and foraging strategies of some New World tree snakes (*Leptophis*, *Oxybelis*, *Uromacer*). Amphibia-Reptilia 3: 71–80.
- HENDERSON, R. W., AND M. H. BINDER. 1980. The ecology and behavior of vine snakes (*Ahaetulla*, *Oxybelis*, *Thelotornis*, *Uromacer*): a review. Milwaukee Public Museum, Contribution to Biology and Geology 37: 1–38.
- HERNÁNDEZ-GALLEGOS, O., F. RODRÍGUEZ-ROMERO, G. GRANADOS-GONZÁLEZ, AND F. R. MÉNDEZ. 2008. Natural History Notes. *Conophis lineatus* (Road Guarder). Diet. Herpetological Review 39: 467.
- KÖHLER, G. 2008. Reptiles of Central America. Herpeton, Offenbach, Germany.
- MESHAKA, W. E., JR., B. P. BUTTERFIELD, AND J. B. HAUGE. 2004. The Exotic Amphibians and Reptiles of Florida. Krieger Publishing Company, Malabar, Florida, United States.
- MORA, J. M. 1987. Predation by *Loxocemus bicolor* on the eggs of *Ctenosaura similis* and *Iguana iguana*. Journal of Herpetology 21: 334–335.
- MORA, J. M. 1991. Cannibalism in the ctenosaur lizard, *Ctenosaura similis*, in Costa Rica. Bulletin of the Chicago Herpetological Society 26: 197–198.
- MORA, J. M. 2010. Natural history of the Black Spiny-tailed Iguana (*Ctenosaura similis*) at Parque Nacional Palo Verde, Costa Rica, with comments on the conservation of the genus *Ctenosaura*. Pp. 716–733 In L. D. Wilson, J. H. Townsend, and J. D. Johnson. (Eds.), Conservation of Mesoamerican Amphibians and Reptiles. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.
- MORA, J. M., F. H. G. RODRIGUES, L. I. LÓPEZ, AND L. D. ALFARO. 2015. Nature Notes. *Ctenosaura similis*. Cannibalism. Mesoamerican Herpetology 2: 107–109.
- PLATT, S. G., T. R. RAINWATER, J. C. MEERMAN, AND S. M. MILLER. 2016. Nature Notes. Notes on the diet, foraging behavior, and venom of some snakes in Belize. Mesoamerican Herpetology 3: 162–170.
- SAVAGE, J. M. 2002. The Amphibians and Reptiles of Costa Rica. A Herpetofauna between Two Continents, between Two Seas. The University of Chicago Press, Chicago, Illinois, United States.
- SOLÓRZANO, A., M. ROMERO, J. M. GUTIÉRREZ, AND M. SASA. 1999. Venom composition and diet of the cantil, *Agkistrodon bilineatus howardgloydi* (Serpentes: Viperidae). Southwestern Naturalist 44: 478–483.

**FERNANDO ORTIZ-LACHICA<sup>1</sup>, SALVADOR MORENO-LÓPEZ<sup>2</sup>, ELÍ GARCÍA-PADILLA<sup>3</sup>, VICENTE MATA-SILVA<sup>4</sup>, AND LARRY DAVID WILSON<sup>5</sup>**

<sup>1</sup>Universidad Autónoma Metropolitana Iztapalapa, Ciudad de México, Mexico. E-mail: fernandoortizl@yahoo.com.mx

<sup>2</sup>Paseo de los Volcanes 1617. Res. Moctezuma Pte. 45053 Zapopan, Jalisco, Mexico. E-mail: smorenol@iteso.mx

<sup>3</sup>Oaxaca de Juárez, C.P. 04700, Oaxaca, Mexico. E-mail: quetzalcoatl86@gmail.com

<sup>4</sup>Department of Biological Sciences, The University of Texas at El Paso, El Paso, Texas 79968-0500, United States. E-mail: vmata@utep.edu

<sup>5</sup>Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, Honduras; 16010 SW 207<sup>th</sup> Avenue, Miami, Florida 33187-1056, United States. E-mail: bufodoc@aol.com

***Gerrhonotus parvus* Knight and Scudday, 1985. Malformation.** The Pigmy Alligator Lizard, *Gerrhonotus parvus*, is a relatively small anguid in which the holotype, an adult female, measured 152 mm in total length (TL): the snout–vent length (SVL) = 55 mm + the tail length ( $T_aL$ ) = 97 mm (Knight and Scudday, 1985). This species can be differentiated from its congeners by a combination of the following characters: small adult size; smooth dorsal scales; nasals in contact with rostral, second primary temporal in contact with fifth medial supraocular; suboculars separated from lower primary temporal by an upper labial; and wide pale crossbands on the tail (Knight and Scudday, 1985). The scalation characters of the specimens we collected (see below) are consistent with those reported for this species.

*Gerrhonotus parvus* is known to occur in the Sierra Madre Oriental in the state of Nuevo León, Mexico, and originally was reported from the municipality of Galeana in a transition zone between pine forest (*Pinus arizonica*) and open gypsophyllous scrub at an elevation of 1,650 m (Knight and Scudday, 1985). Subsequently, Banda-Leal et al. (2002) reported a specimen from Cañon de San Isidro in the municipality of Santiago, which is located northwest of the type locality. This canyon lies at an elevation of ca. 1,600 m, and runs east to west; the canyon is characterized by steep limestone walls covered with agaves (*Agave lecheguilla*, *A. bracteosa*), sotol (*Dasyilirion* sp.), and scrub oak (*Quercus* sp.) and contains intermittent pools of water. The floor of the canyon contains piles of leaf litter and scattered large rocks (Banda-Leal et al., 2002; Bryson and Lazcano, 2005). Conroy et al. (2005) reported another specimen of *G. parvus* from between the two areas indicated above, from Cañon de Mireles in the municipality of Los Rayones; the habitat in this area is similar to that of Cañon de San Isidro but the specimen was found at an elevation of 900 m, the lowest recorded for this species. Banda-Leal et al. (2014) later reported another specimen, from Cañon de Reflexiones in the municipality of Santa Catarina, which lies northwest of Cañon de San Isidro, and again in a similar habitat. *Gerrhonotus parvus* currently is protected by national and international laws. In Mexico, this species has been afforded a special protection status by SEMARNAT (2010), and at the international level IUCN has placed this species in the Endangered category (Canseco-Márquez and Mendoza-Quijano, 2007). Additionally, Johnson et al. (*This Issue*) determined an Environmental Vulnerability score of 17 for *G. parvus*, which placed it in “priority level one” (the highest of 19 levels) for determining the degree of attention endemic herpetofaunal species in Mexico should be afforded for future conservation planning.

From 2012 to 2015, we conducted intensive surveys during which we collected specimens and gathered data on *G. parvus* in the four above-mentioned localities. During our surveys we collected and obtained general morphological and ambient data on *G. parvus* at the following localities: Galeana (6 individuals), Cañon de San Isidro, Santiago (46), Cañon de Mireles, Los Rayones (1), and Cañon de Reflexiones in Santa Catarina (1).

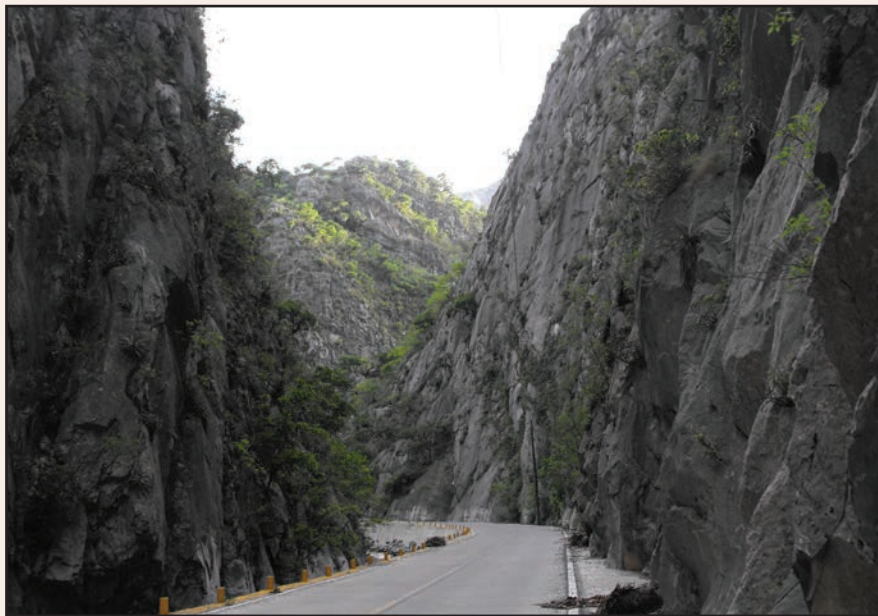
On 16 June 2014 at 1230 h, we collected a juvenile female *G. parvus* in Cañon de San Isidro, Santiago, Nuevo León (25.380878°N, -100.309179°W; WGS 84; elev. 1,720 m; Figs. 1, 2), as it was moving in leaf litter along a ridge in the canyon. The morphological characteristics of the individual at the time of collection were as follows: SVL = 53.32 mm;  $T_aL$  = 48.69 mm; TL = 102.01 mm; and body mass = 2.04 g. We also recorded the following temperature and humidity data: body temperature (BT) = 26.5°C; microhabitat temperature (MT) = 22.3°C; and ambient humidity (AH) = 71%. The individual has been maintained in captivity for 3 years as part of our live collection, and presently its morphological characteristics are as follows: SVL = 64.03 mm;  $T_aL$  = 68.63 mm; TL = 132.66 mm; and body mass = 5.03 g. After having collected or observed 54 individuals of *G. parvus*, herein we document the first malformation we have observed in this species.

When the juvenile female *G. parvus* was collected, it was missing a hind limb. In order to determine if this was a congenital deformity or if the limb was lost as a result of a predatory event, we took a radiograph (X-Ray Machine Model DM-100P Heyday) and closely examined the area with the missing limb. The results show a low radiopacity zone in the right coxofemoral articulation, which indicates no evidence of bone formation for this limb, and thus we diagnosed this as a congenital defect (i.e., the individual was born without the limb; Fig. 3).

Abnormalities or malformation in reptiles have been reported in several species.



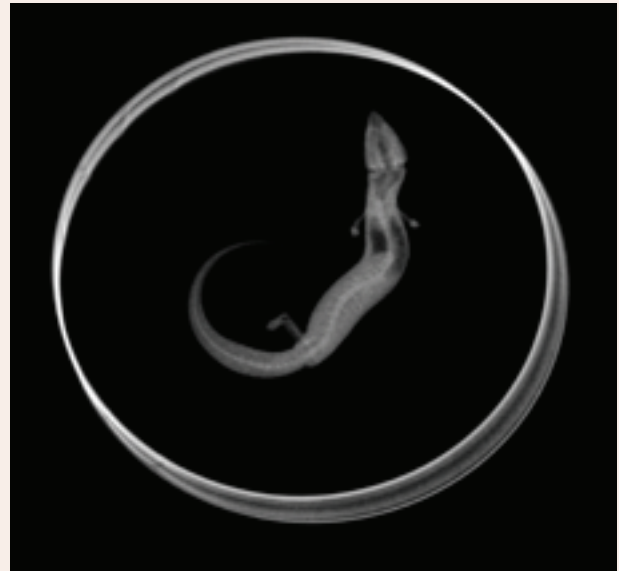
**Fig. 1.** An adult female *Gerrhonotus parvus* found with a missing hindlimb at Cañon de San Isidro, Santiago, Nuevo León.  © Daryne Berenice Esquivel-Arévalo



**Fig. 2.** A road cutting through the habitat where the individual of *Gerrhonotus parvus* was found.  © Javier Banda-Leal

Caldwell and Hong (2012) reported on a *Gekko japonicus* with multiple morphological abnormalities in the left side of its body, where the left forelimb appeared to be hypoplastic and reduced in size, with the hand containing only two digits and a partial third, and Carbajal-Márquez and González-Saucedo (2012) documented finding an adult *Gerrhonotus liocephalus* with six digits on each of its rear limbs. In reptiles, an overall reduction in the proportions of limbs has been observed when incubating eggs are exposed to extreme ranges in temperature, which affects the developing embryos and can result in various types of deformities, including a malformation of the eyes and limb anomalies (Deeming and Ferguson, 1991; Mader, 1996). Environmental contamination also might be linked to deformities in reptiles (Khan and Law, 2005), including a malformation of the eyes and limbs (Bell et al., 2006). Genetic factors are also known to be responsible for anomalies seen in reptiles (Olson et al., 1996; Velo-Anton et al., 2011). Other abnormalities, known as kyphosis and scoliosis, and malformations of the vertebral column, have been

reported in the following lizards: *Sceloporus undulatus* (Mitchel and Georgel, 2005); *Liolaemus petrophilus* (Frutos et al., 2006); *Cyclura cychlura* (Owens and Knapp, 2007), *Japalura swinhonis* (Norval et al., 2010); *Sceloporus marmoratus* (Chavez-Cisneros et al., 2012); *Liolaemus koslowskyi* (Avila et al., 2013); and *Sceloporus vandenburgianus* (Valdez-Villavicencio et al., 2016). All of these animals were adults that reached adulthood with these birth defects. Other types of malformations of the body also have been documented. Ljustina and Stroud (2016), reported on an individual of *Anolis* (= *Ctenotus*) *crisatellus* in which the external tympanum was absent on one side of the head, and skin had covered the ear opening. Campos-Gomides et al. (2014), reported finding a *Plica plica* with a filiform appendix in gular region, a *P. umbra* with reduced or nearly absent ear openings, and another *P. umbra* with a symmetrical cavity on each of the first infralabial scales. In this note we provide the first report of a congenital abnormality in *G. parvus*.



**Fig. 3.** An adult female *Gerrhonotus parvus* found with a missing hindlimb, showing a low radiopacity zone in the right coxofemoral articulation. Radiograph courtesy of Manuel Omar Serna.

**Acknowledgments.**—We thank the following institutions for financial support to conduct the field and laboratory work: Universidad Autónoma de Nuevo León (PAICYT CN315-15), Instituto Bioclon S.A. y C.V., and San Antonio Zoological Gardens and Aquarium. We also are grateful to SEMARNAT for issuing the previous (Oficio Num.SGPA/ DGVS/0511/12; 01589/13; 01867/14; 05581/15) and recent collecting permits.

#### LITERATURE CITED

- AVILA, J. L., C. D. MEDINA, AND M. MORANDO. 2013. *Liolaemus koslowskyi*. Scoliosis and Kyphosis. *Herpetological Review* 44: 144–145.
- BANDA-LEAL, J., W. ROBERT, JR., AND D. LAZCANO. 2002. New Record of *Elgaria parva* (Lacertilia: Anguidae) from Nuevo León, México. *The Southwestern Naturalist* 47: 614–615.
- BRYSON, R. W., AND D. LAZCANO. 2005. The Pygmy Alligator Lizard of Nuevo León, México. *Reptilia* 39: 69–72.
- BANDA-LEAL, J., D. LAZCANO, M. NEVÁREZ-DE LOS REYES, AND C. BARRIGA-VALLEJO. 2014. Noteworthy records of *Gerrhonotus parvus* in Nuevo Leon, Mexico *Gerrhonotus parvus* Knight and Scudday, 1985 (Squamata: Anguidae): New range extension and clutch size in the state of Nuevo León, Mexico. *Check List* 10: 950–953.
- BELL, B., J. R. SPOTILA, AND J. CONGDON. 2006. High incidence of deformity in aquatic turtles in the John Heinz National Wildlife Refuge. *Environmental Pollution* 142: 457–465.
- CANSECO-MARQUEZ, L., AND F. MENDOZA-QUIJANO. 2007. *Gerrhonotus parvus*. The IUCN Red List of Threatened Species 2007: e.T63711A12708470. ([www.doi.org/10.2305/IUCN.UK-2007.RLTS.T63711A12708470.en](http://www.doi.org/10.2305/IUCN.UK-2007.RLTS.T63711A12708470.en); accessed 4 September 2017).
- CARBAJAL-MÁRQUEZ, R. A., AND Z. Y. GONZÁLEZ-SAUCEDO. 2012. *Gerrhonotus liocephalus* (Weigman's Alligator Lizard). Deformity. *Herpetological Review* 43: 485.
- CALDWELL, K.R., AND X. HONG. 2012. Natural History Notes. *Gekko japonicus* (Japanese Gekko). Deformity. *Herpetological Review* 43: 485.
- CAMPOS-GOMIDES, S., P. DE ANCHIETTA-GARCÍA, AND M. TREFAUT-RODRIGUES. 2014. Natural History Notes. *Plica plica* (Tree Runner) and *Plica umbra* (Blue-lipped Tree Runner). Morphological anomalies. *Herpetological Review*. 45: 331.
- CHÁVEZ-CISNEROS, J., AND D. LAZCANO. 2012. *Sceloporus marmoratus* (Northern Rose-bellied Lizard). Kyphosis and scoliosis. *Herpetological Review* 42: 610.
- CONROY, C. J., R. W. BRYSON, D. LAZCANO, AND A. KNIGHT. 2005. Phylogenetic placement of the Pygmy Alligator Lizard based on mitochondrial DNA. *Journal of Herpetology* 39: 142–147.
- DEEMING, D. C., AND M. W. J. FERGUSON, 1991. *Egg Incubation: Its Effects on Embryonic Development in Birds and Reptiles*. Cambridge University Press, Cambridge, Massachusetts, United States.
- FRUTOS, N., M. KOZKYARISKI, AND L. J. AVILA. 2006. *Liolaemus petrophilus* (Stone-loving Lizard). Scoliosis. *Herpetological Review* 37: 468–469.
- JOHNSON, J. D., L. D. WILSON, V. MATA-SILVA, E. GARCÍA-PADILLA, AND D. L. DESANTIS. 2017. The endemic herpetofauna of Mexico: organisms of global significance in severe peril. *Mesoamerican Herpetology* 4: 544–620.

- KNIGHT, R. A., AND J. F. SCUDDAY. 1985. A new *Gerrhonotus* (Lacertilia: Anguidae) from the Sierra Madre Occidental, Nuevo León, México. *The Southwestern Naturalist* 30: 89–94.
- KHAN, M. Z., AND F. C. P. LAW. 2005. Adverse effects of pesticides and related chemicals on enzyme and hormone systems of fish, amphibians and reptiles. *Proceedings of the Pakistan Academy of Sciences* 42: 315–323.
- LJUSTINA, O., AND J. T. STROUD. 2016. Natural History Notes. *Anolis cristatellus* (Puerto Rican Crested Anole). Absent tympanum. *Herpetological Review* 47: 459.
- MITCHEL, J. C., AND C. T. GEORGE. 2005. *Sceloporus undulatus undulatus* (Eastern Fence Lizard). Scoliosis. *Herpetological Review* 36: 183–184.
- MADER, D. R. 1996. *Reptile Medicine and Surgery*. W. B. Saunders Co., Philadelphia, Pennsylvania, United States.
- NORVAL, G., M. JEAN-JAY, AND W. JIN-HSIANG. 2010. *Japalura swinhonis* (Swinehoe's Tree Lizard). Spinal Deformity. *Herpetological Review* 41: 224–225.
- OLSON, M., A. GULLBERG, AND H. TEGELSTRÖM. 1996. Malformed offspring, sibling matings, and selection against inbreeding in the sand lizard (*Lacerta agilis*). *Journal of Evolutionary Biology* 9: 229–242.
- OWENS, A. K., AND C. R. KNAPP. 2007. Natural History Notes. *Cyclura cychlura cychlura* (Andros Iguana). Scoliosis; kyphosis. *Herpetological Review* 38: 454–455
- SEMARNAT (SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES). 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental Especies nativas de México de flora y fauna silvestres-Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio. Lista de especies en riesgo. Diario Oficial de la Federación. Jueves 30 de diciembre de 2010, Ciudad de México, Mexico.
- VALDEZ-VILLAVICENCIO, J., H. HOLLINGSWORTH, D. BRADFORD, AND P. GALINA-TESSARO. 2016. Nature Notes. *Sceloporus vandenburgianus* Kyphosis and scoliosis. *Mesoamerican Herpetology* 3: 488–490.
- VELO-ANTÓN, G., C. G. BECKER, AND A. CORDERO-RIVERA. 2011. Turtle Carapace Anomalies: The Roles of Genetic Diversity and Environment. *PLoS ONE* 6(4): e18714. <https://doi.org/10.1371/journal.pone.0018714>

**DAVID LAZCANO<sup>1</sup>, JAVIER BANDA-LEAL<sup>2</sup>, AND NADIA ALVARADO-MORENO<sup>3</sup>**

<sup>1</sup>Laboratorio de Herpetología, Facultad de Ciencias Biológicas, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Apartado Postal 513, C.P. 66450 Nuevo León, Mexico. E-mail: imantodes52@hotmail.com

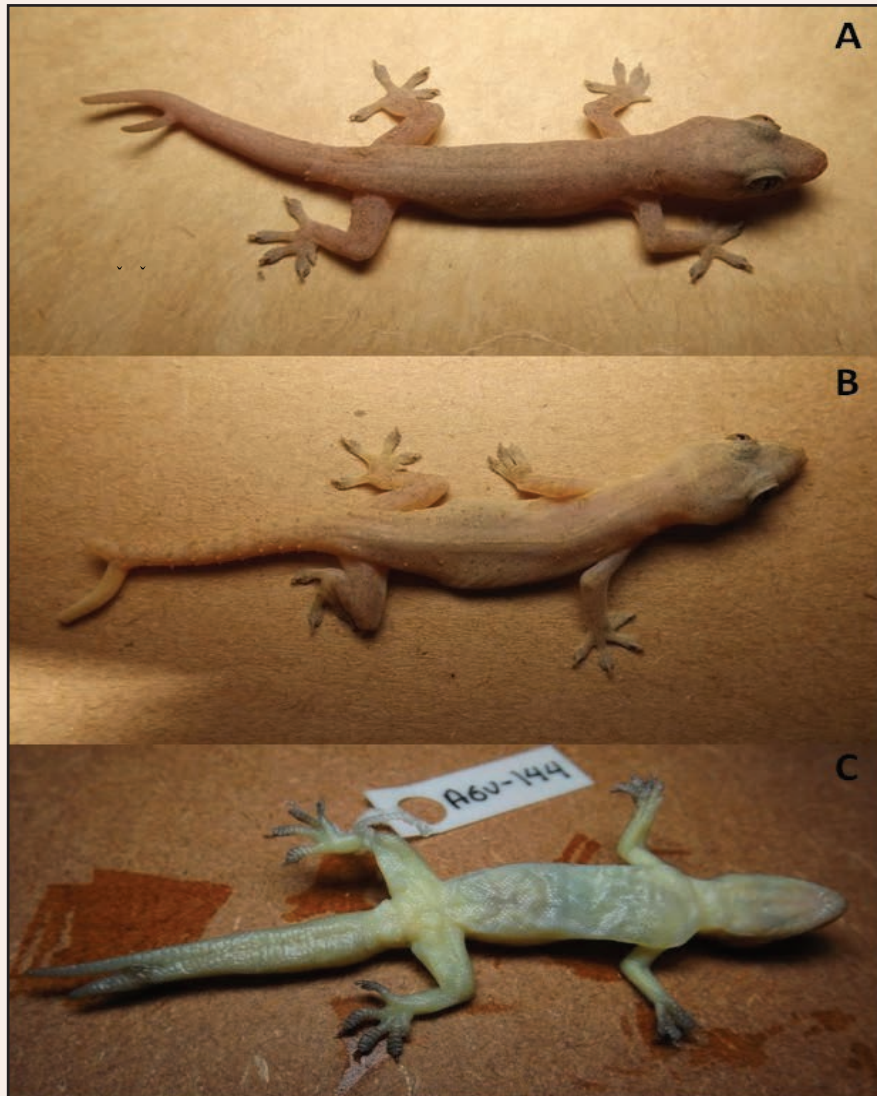
<sup>2</sup>Pornatura Noreste, Loma Grande 2623, Loma Larga, Monterrey, Nuevo León, C.P. 64710, Mexico. E-mail: javierbandaleal@gmail.com

<sup>3</sup>Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma de Nuevo León, Campus de Ciencias Agropecuarias, Francisco Villa s/n Col. ExHacienda el Canadá, General Escobedo, C.P. 66050, Nuevo León. Mexico. E-mail: jikol\_57@hotmail.com

***Hemidactylus frenatus* Duméril & Bibron, 1836. Tail bifurcation.** Caudal autotomy is a defensive mechanism mainly used by salamanders and lizards, and occurs by the contraction of the tail muscles and the detachment part of the tail in response to a predatory attempt (Bateman and Fleming, 2009; Vitt and Caldwell, 2009). In lizards, this mechanism has been documented in 13 families, but it can be absent in certain species (Bateman and Fleming, 2009). Most reports on tail malformations are in lizards capable of autotomy and usually are associated with regeneration failures of the extremity, as opposed to congenital malformations (Conzندی et al., 2013). The presence of two or even three tails generally occurs when the tail is damaged and thus cannot be completely autotomized, and at this point an additional tail (or tails) begins to develop (Ananjeva and Danov, 1991).

The Common House Gecko, *Hemidactylus frenatus*, is an exotic species capable of using this defensive mechanism. Historically, the introduction of *H. frenatus* to areas outside of its natural range occurred so early and extensively that the exact natural distribution of this species is unclear, but its natural range presumably included an area extending from Bangladesh to the Philippines (Farr, 2011). In Mexico, this species has been recorded in 21 of the 31 states in the country, primarily along the coastal regions but also in the interior (Schmidt-Ballardo et al., 1996; Casas-Andreu et al., 1998; Farr, 2011; Bañuelos-Alamillo et al., 2016). Although *H. frenatus* has a broad distribution, relatively little information is available on its ecology, and specifically on tail malformations. Although bifurcated tails have been reported in *H. frenatus* (Chan et al., 1984; Heyborne and Mehan, 2017), herein I report the first instance of this condition in individuals from Mexico, and also present photographs of different types of tail bifurcations in this species.

In August of 2016 from ca. 2000 to 2300 h, in Municipio de Minatitlán, southeastern Veracruz, Mexico (17°59'54" N, 94°33'89" W; WGS 84; elev. 16 m), I collected 74 individuals of *H. frenatus* in a small portion (0.07 km<sup>2</sup>) of this urban area. The tail of four of these individuals was bifurcated, but I only photographed three of the geckos (Fig. 1). Each of the individuals showed a different type of bifurcation: in the first the tail was fully regenerated, with the bifurcation present near the tip (Fig. 1A); in the second a malformation was present at the point of bifurcation (Fig. 1B); and in the third two fully regenerated tails were present, which were fused along most of the length of the tail but separated near the tip (Fig. 1C). The presence of multiple tails in an individual could affect its fitness in negative ways, because the tail plays an important role in locomotion and can affect such activities as foraging, mating, and the ability to escape from predators (Passos et al., 2014).



**Fig. 1.** Three individuals of *Hemidactylus frenatus* in this report show different types of tail bifurcations.

📷 © Arístides García-Vinalay

**Acknowledgments.**—I thank José Luis Aguilar-López, Patricia Hernández-López, and Louis W. Porras for their helpful comments on this note.



## LITERATURE CITED

- ANANJEVA, N. B., AND R. A. DANOV, R. A. 1991. A rare case of bifurcated caudal regeneration in the Caucasian Agama, *Stellio caucasis*. *Amphibia-Reptilia* 12: 343–346.
- BAÑUELOS-ALAMILLO, J. A., R. A. CARBAJAL-MÁRQUEZ, AND I. Y. TRUJILLO DE LA TORRE. 2016. Distribution Notes. *Hemidactylus frenatus* Duméril & Bibron 1836. *Mesoamerican Herpetology* 3: 180–181.
- BATEMAN, P. W., AND P. A. FLEMING. 2009. To cut a long tail short: a review of lizard caudal autotomy studies carried out over the last 20 years. *Journal of Zoology* 277: 1–14.
- CASAS-ANDREU, G., G. BARRIOS-QUIROZ, AND R. CRUZ-AVINA, R. 1998. Geographic Distribution. *Hemidactylus frenatus* (House Gecko). *Herpetological Review* 29: 51.
- CHAN, J. G., L. L. YOUNG, P. R. K. CHANG, C. M. SHERO, AND C. WATTS. 1984. Morphological anomalies of two geckos, *Hemidactylus frenatus* and *Lepidodactylus lugubris*, and the toad, *Bufo marinus*, on the Island of Hawaii, Pp. 41–50. In C. W. Smith (Ed.), *Proceedings of the Fifth Conference in Natural Sciences in Hawaii, Hawaii Volcanoes National Park, June 5–7 1984*, University of Hawaii, Honolulu Hawaii, United States.
- CONZENDY, P., S. P. SILVA-CAMPOS, F. MOL-LANNA, J. D. CYSNEIROS-GOMES DE AMORIM, AND B. MARIA DE SOUSA. 2013. Natural History Notes. *Ophiodes Striatus* (Striped Worm Lizard). Bifurcated Tail. *Herpetological Review* 44: 145–146.
- FARR, W. L. 2011. Distribution of *Hemidactylus frenatus* in Mexico. *The Southwestern Naturalist* 56: 265–273.
- HEYBORNE, W. H., AND A. MAHAN. 2017. Natural History Notes. *Hemidactylus frenatus* (Common House Gecko). Tail bifurcation. *Herpetological Review* 48: 437–438.
- PASSOS, D. C., L. T. PINHEIRO, C. A. BARBOSA-GALDINO, AND C. F. DUARTE-ROCHA. 2014. Natural History Notes. *Tropidurus semitaeniatus* (Calango de Lagedo). Tail bifurcation. *Herpetological Review* 45: 138.
- SCHMIDT-BALLARDO, W., F. MENDOZA-QUIJANO, AND M. E. MARTÍNEZ-SOLÍS. 1996. Geographic distribution. Range extensions for *Hemidactylus frenatus* in México. *Herpetological Review* 27: 40.
- VITT, L. J. AND J. P. CALDWELL. 2009. *Herpetology: An Introductory Biology of Amphibians and Reptiles*, 3<sup>rd</sup> ed. Academic Press, Burlington, Massachusetts, United States.

## ARÍSTIDES GARCÍA-VINALAY

*Universidad Veracruzana, Facultad de Ciencias Biológicas y Agropecuarias, Camino Peñuela-Amatlán de los Reyes S/N, Veracruz, Mexico. E-mail: aris\_ham@hotmail.com*

## Nocturnal activity facilitated by artificial lighting in the diurnal *Norops sagrei* (Squamata: Dactyloidae) on Isla de Flores, Guatemala

The Brown Anole, *Norops sagrei* (Duméril & Bibron, 1837), is native to Cuba, the Bahamas, and some adjacent islands in the Caribbean (Schwartz and Thomas, 1975; Losos, 2009). This species is well known as a successful invader (Wilson and Porras, 1983; Kolbe et al., 2004; Kraus, 2009; Tan and Lim, 2012; GISD, 2017), and its distribution worldwide continues to increase. Its occurrence in Mexico and parts of Central America is well documented, and in Guatemala this species has been reported to inhabit the northern lowlands in the department of Petén (Stuart, 1955).

The origin and relationships of *N. sagrei* throughout its range are a topic of great interest and controversy, with the commonly referred to “*N. (or Anolis) sagrei*” potentially forming a species complex. Numerous publications have addressed or at least discussed the variation and distinctness of *N. sagrei* populations (Lee, 1992; Lee, 1996; Nicholson et al. 2012; McCranie and Kohler, 2015; González-Sánchez et al., 2017), yet the origin and validity of populations in Guatemala remains uncertain. Like many, we hesitate to accept the separation of the entire Central American population as *Norops (Anolis) s. mayensis* (Smith and Burger, 1949), before a thorough molecular analysis of the populations in this region is conducted. Stuart (1955: 22) noted that the specimens he examined from British Honduras (Belize) fell “in line with typical material rather than with “*mayensis*,” and postulated that the

observed variation within the populations along the Caribbean coast of Central America likely is dependent upon the source and nature of the parent population from which they stemmed. Like González-Sánchez (2017) decided in a study on the herpetofauna of the Yucatan Peninsula, for the purposes of this note we also consider *N. sagrei* at this locality to be an introduced species.

We made the following observations on Isla de Flores, a small island located in Lago Petén Itzá in the department of Petén. Although the surrounding mainland contains some forested areas, Isla de Flores has undergone extensive urbanization and the natural vegetation no longer is present. *Norops sagrei* is opportunistic and largely insectivorous in its feeding habits, and its diet consists of small arthropods such as flies, crickets, grasshoppers, caterpillars, moths, annelids, and mollusks (Tan and Lim, 2012; Campbell, 2002). This species also has been reported to consume smaller lizards, including its own species, and sympatric anole competitors (Losos et al., 1993; Campbell, 2000; Gerber and Echternacht, 2000; Nicholson et al., 2000), and its diverse diet likely contributes to its ability to thrive and exploit disturbed environments, and thus consideration as a “habitat generalist” (Campbell, 2002).

Herein, we document nocturnal activity and utilization of an artificial light source by *N. sagrei* on Isla de Flores, Departamento de Petén, Guatemala (16°55'46"N, 89°53'29"W; elev. 127 m). On 22 May 2017 from 1930 to 2340 h, we observed five individuals of *N. sagrei* foraging amongst planted decorative vegetation surrounding three artificial lights at the San Telmo Hotel (Fig. 1). The site of these observations was highly disturbed and urbanized, with plenty of anthropogenic disruption due to human traffic. At ca. 2000 h, we observed males and females of *N. sagrei* competing for position around the artificial light source. At 2042 h, we observed a male catching and consuming a moth (Lepidoptera) that had been attracted by the artificial light source. Apparently, artificial lights can facilitate nocturnal activity in *N. sagrei*, and even aid in procuring food for this diurnal species. Additionally, on 27 May 2017, we observed a large population of *N. sagrei* active throughout the day (ca. 0600–1700 h) and late at night (ca. 2100–2300 h) at Los Amigos Hostel. Nocturnal behavior by *N. sagrei* at these sites was common, and the many artificial lights located in the planted outdoor premises allowed for an extended period of activity and the opportunity for these lizards to feed on insects attracted to the light sources (Perry et al., 2008). Notably, we did not observe the presence of *Hemidactylus frenatus* (Asian House Gecko) at either of these localities; it is a common and invasive species often associated with the use of artificial lights in the region.

Anoles are almost exclusively diurnal and exceedingly visually oriented (Fleishman, 1992), so documentation of nocturnal activity and the use of a “night-light niche” (Garber, 1978) within this group is considered rare. Previously, such behavior has been reported in anoles (Wilson and Porras, 1983; Schwartz and Henderson, 1991; Meshaka et al., 2004; Perry et al., 2008; Powell, 2015), and specifically for *N. sagrei* in Mexico (Badillo-Saldaña et al., 2016), but to the best of our knowledge it has not been reported in Guatemala. The occurrence of such nocturnal activity is unusual and remains poorly documented. Thus, we hope this short note provides further confirmation and recognition of this urban behavior in *N. sagrei*, while highlighting the adaptive potential of this species to exploit new resources and available niches.

**Acknowledgments.**—We thank the San Telmo Hotel and Los Amigos Hostel for providing the accommodations, as well as the local community of Isla de Flores for being so welcoming and friendly during our stay.

#### LITERATURE CITED

- BADILLO-SALDAÑA, L. M., C. BETETA-HERNÁNDEZ, A. RAMÉREZ-BAUTISTA, J. D. LARA-TUFIÑO, AND R. PINEDA-LÓPEZ. 2016. Nature Notes. First records of nocturnal activity in two diurnal anole species (Squamata: Dactyloidae) from Mexico. *Mesoamerican Herpetology* 3: 715–717.
- CAMPBELL, T. S. 2000. Analysis of the effects of an exotic lizard (*Anolis sagrei*) on a native lizard (*Anolis carolinensis*) in Florida, using islands as experimental units. Unpublished Ph.D. dissertation, University of Tennessee, Knoxville, Tennessee.
- CAMPBELL, T. S. 2002. The Brown Anole (*Anolis sagrei* Dumeril and Bibron 1837). The Institute for Biological Invasions: The Invader of the Month, February 2001. (<http://invasions.bio.utk.edu/invaders/sagrei.html>; page currently unavailable).
- FLEISHMAN, L. J. 1992. The influence of the sensory system and the environment on motion patterns in the visual displays of anoline lizards and other vertebrates. *The American Naturalist* 139: S36–S61.
- GARBER, S. D. 1978. Opportunistic feeding behavior of *Anolis cristatellus* (Iguanidae: Reptilia) in Puerto Rico. *Transactions of the Kansas Academy of Science* 81: 79–80.

- GERBER, G. P., AND A. C. ECHTERNACHT. 2000. Evidence for asymmetrical intraguild predation between native and introduced *Anolis* lizards. *Oecologia*. 124: 599–607.
- GISD (GLOBAL INVASIVE SPECIES DATABASE). 2017. Species profile: *Norops sagrei*. ([www.iucngisd.org/gisd/species.php?sc=603](http://www.iucngisd.org/gisd/species.php?sc=603); accessed 19 July 2017).
- GONZÁLEZ-SÁNCHEZ, V. H., J. D. JOHNSON, E. GARCÍA-PADILLA, V. MATA-SILVA, D. L. DESANTIS, AND L. D. WILSON. 2017. The Herpetofauna of the Mexican Yucatan Peninsula: composition, distribution, and conservation status. *Mesoamerican Herpetology* 4: 264–380.
- KOLBE, J. J., R. E. GLOR, L. R. SCETTINO, A. C. LARA, A. LARSON, AND J. B. LOSOS. 2004. Genetic variation increases during biological invasion by a Cuban lizard. *Nature*. 431: 177–181.
- KRAUS, F., 2009. Alien Reptiles and Amphibians: A Scientific Compendium and Analysis. Springer Science and Business Media B.V., New York, United States.
- LEE, J. C. 1992. *Anolis sagrei* in Florida: phenetics of a colonizing species III. West Indian and Middle American comparisons. *Copeia* 1992: 942–954.
- LEE, J. C. 1996. The Amphibians and Reptiles of the Yucatán Peninsula. Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.
- LOSOS, J. B., 2009. Lizards in an Evolutionary Tree: Ecology and Adaptive Radiation of Anoles. University of California Press, Berkeley, California, United States.
- LOSOS, J. B., J. C. MARKS, AND T. W. SCHOENER. 1993. Habitat use and ecological interactions of an introduced and a native species of *Anolis* lizard on Grand Cayman, with a review of the outcomes of anole introductions. *Oecologia*. 95: 525–532.
- MCCRANIE, J. R., AND G. KÖHLER. 2015. The Anoles: (Reptilia: Squamata: Dactyloidae: *Anolis*: *Norops*) of Honduras: Systematics, Distribution, and Conservation. Bulletin of the Museum of Comparative Zoology, Special Publication Series, No. 1, Cambridge, Massachusetts, United States.
- MESHAKA, W. E., JR., B. P. BUTTERFIELD, AND J. B. HAUGE. 2004. Exotic Amphibians and Reptiles of Florida. Krieger Publishing Company, Malabar, Florida, United States.
- NICHOLSON, K. E., B. I. CROTHER, C. GUYER, AND J. M. SAVAGE. 2012. It's time for a new classification of anoles (Squamata: Dactyloidae). *Zootaxa* 3,477: 1–108.
- NICHOLSON, K. E., A. V. PATERSON, AND P. M. RICHARDS., 2000. Natural History Notes. *Anolis sagrei* (Brown Anole). *Cannibalism. Herpetological Review* 31: 173–174.
- PERRY, G., B. W. BUCHANAN, R. N. FISHER, M. SALMON, AND S. E. WISE. 2008. Effects of artificial night lighting on amphibians and reptiles in urban environments. Pp. 239–256 In J. C. Mitchell, R. E. Brown, and B. Bartholomew (Eds.), *Urban Herpetology. Herpetological Conservation, Number 3*, Society for the Study of Amphibians and Reptiles, Salt Lake City, Utah, United States.
- POWELL, R. 2015. Exploiting the night-light niche: a West Indian experience in Hawaii. *IRFC Reptiles and Amphibians* 22: 36–38.
- SCHWARTZ, A. AND R. THOMAS. 1975. A Check-list of West Indian Amphibians and Reptiles. Carnegie Museum of Natural History Special Publication No. 1, Pittsburg, Pennsylvania, United States.
- SCHWARTZ, A., AND R. W. HENDERSON. 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. University of Florida Press, Gainesville, Florida, United States.
- SMITH, H. M., AND W. L. BURGER. 1949. A new subspecies of *Anolis sagrei* from the Atlantic coast of Tropical America. *Anales del Instituto de Biología de la Universidad de México* 20: 407–410.
- STUART, L.C. 1955. A brief review of the Guatemalan lizards of the genus *Anolis*. *Miscellaneous Publications of the Museum of Zoology, University of Michigan* 91: 1–31.
- TAN, H. H. AND K. K. P. LIM. 2012. Recent introduction of the Brown Anole *Norops sagrei* (Reptilia: Squamata: Dactyloidae) to Singapore. *Nature in Singapore* 5: 359–362.
- WILSON, L. D., AND L. W. PORRAS. 1983. The Ecological Impact of Man on the South Florida Herpetofauna. University of Kansas Museum of Natural History, Special Publication No. 9, Lawrence, Kansas, United States.

**TOM W. BROWN<sup>1</sup> AND CRISTINA ARRIVILLAGA<sup>1,2</sup>**

<sup>1</sup>*Kanahau Utila Research and Conservation Facility, Isla de Utila, Honduras. Email: browntb@outlook.com (TWB, Corresponding author)*

<sup>2</sup>*Universidad del Valle de Guatemala (UVG), Ciudad de Guatemala, Guatemala.*

***Sceloporus mucronatus* Cope, 1885. Endoparasites.** *Sceloporus mucronatus*, a Mexican endemic, is found in primary and secondary open montane oak woodland, pine-oak forest, and pine forest, as well as in agricultural areas with rock crevices, in the states of Hidalgo, Mexico, Puebla, Tlaxcala, Veracruz, Guerrero, and Oaxaca, at elevations from 1,750 to 3,700 m (Canseco-Márquez et al., 2007; Lemos-Espinal and Dixon, 2016; Ramírez-Bautista et al., 2014). To date, seven records of endoparasites in *S. mucronatus* have been reported—of cestodes (*Oochoristica scelopori*) and six of nematodes (*Ascarops* sp., *Pharyngodon* sp., *Physaloptera retusa*, *Spauligodon giganticus*, *S. oxcutzcabiensis* and *S. similis*)—from individuals collected in Mexico City, Puebla, and unidentified locations (Paredes-León et al., 2008). Herein we report new records for two species of nematodes in this species.

We examined four specimens of *S. mucronatus* collected in March of 2016, two from Cerro las Navajas, Municipio de Singuilucan (20.093978°N; -98.557812°W; elev. 3,069 m; CIB-CH 5108–5109) and two from El Gavillero, Municipio de Huichapan (20.365238°N; -99.555199°W; elev. 2,540 m; CIB-CH 5110–5111). Using standard laboratory techniques, we searched for helminths using a dissecting microscope. We cleared the nematodes in lactophenol, and placed them on a coverslipped microscope slide. We found two species of Nematoda, *Strongyluris similis* and *Spauligodon giganticus*, and deposited the voucher helminths in the Colección Nacional de Helmintos (CNHE), Universidad Nacional Autónoma de México as *S. similis* (CNHE 10454), and *Sp. giganticus* (CNHE 10453, Huichapan; CNHE 10452, Singuilucan).

The *Strongyluris similis* collected in the municipality of Singuilucan is a parasite heteroxeny of different species of Mexican lizards of the genera *Petrosaurus*, *Sceloporus*, and *Urosaurus* (Paredes-León et al., 2008). In Hidalgo, it was reported in *S. jarrovi* and *S. mucronatus* from unknown localities (Goldberg et al., 1996; 2003). This species of nematode is common in the rectum of lizards. Its transmission reveals unusual adaptations for different environments, as it uses cockroaches (including *Blattella germanica*) and larval *Culex* sp. as intermediate hosts (Anderson, 2000). We identified three males of *S. similis* that show a pair of different-sized spicules (right spicule 0.79–0.81 mm long, left spicule 0.75–0.78 mm long), and the caudal extremity shows a caudal ala and a spike. Moreover, it presents seven pairs of lateral pedunculated papillae, three small ventral ones and a sucker in the middle part of the caudal extremity. *Sp. giganticus* is an intestinal parasite reported in *Lepidophyma*, *Petrosaurus*, and *Sceloporus* in Mexico (Paredes-León et al., 2008). In Hidalgo, this parasite was reported in *Lepidophyma gaigeae*, in the municipality of Zimapán, and in *S. jarrovi* from an unknown locality (Goldberg et al., 1996; 2002). Herein we report nematodes collected in two municipalities in Hidalgo, Huichapan and Singuilucan. *Sp. giganticus* has a monoxeny cycle; the infection of this nematode occurs by ingestion of its eggs, and the infection might occur in lizards fewer than two weeks of age (Goldberg and Bursey, 1992). We identified 11 males and 14 gravid females of *Sp. giganticus*. Lateral alae are present and a spicule is absent in males, and in females the alae are absent; gravid females are characterized by a total length of 4.1–6.9 mm and a maximum width of 0.50–0.86 mm, with the vulva situated 0.57–0.66 mm from the cephalic end. The thread-like part of the tail contains 10 small spines; the eggs are oblong and slightly flattened on one side, 0.11–0.12 mm long × 0.03–0.04 mm wide, with a knob on one end. This species had been collected parasitizing *S. minor* in the municipality of Zimapán, Hidalgo (Falcón-Ordaz and Goyenechea, 2016), and also has been found parasitizing *S. mucronatus* in Puebla (Goldberg et al., 2003). For both nematodes, new localities from the states of Hidalgo and Mexico are reported, with *S. mucronatus* reported for the first time in the municipality of Singuilucan, Hidalgo.

**Acknowledgments.**—Jorge Falcón-Ordaz thanks PRODEP-SEP for the program “Apoyo a la Incorporación de Nuevos PTC” at UAEH. Irene Goyenechea thanks project “Diversidad Biológica del Estado de Hidalgo (tercera etapa) Fomix-Conacyt-HGO-2012-191908.” The two specimens of *Sceloporus mucronatus* were collected under SEMARNAT permit FAUT-0052 (valid to 2017) issued to Irene Goyenechea.

#### LITERATURE CITED

- ANDERSON, R. C. 2000. Nematode Parasites of Vertebrates: Their Development and Transmission. 2<sup>nd</sup> ed. CAB International, Wallingford, Oxon, United Kingdom.
- CANSECO-MÁRQUEZ, L. F. MENDOZA-QUIJANO, AND P. PONCE-CAMPOS. 2007. *Sceloporus mucronatus*. The IUCN Red List of Threatened Species 2007: e.T64128A12747549. (www.dx.doi.org/10.2305/UUCN.UK.2007.RLTS.T64128A12747549.en; accessed 10 July 2017).
- LEMONS-ESPINAL, J. A. AND J. R. DIXON. 2016. Anfíbios y Reptiles de Hidalgo. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, Ciudad de México, Mexico.

- FALCÓN-ORDAZ J AND I. GOYENECHEA. 2016. Nature Notes. *Sceloporus minor*. Endoparasites. Mesoamerican Herpetology 3: 729–730.
- GOLDBERG, S. R., AND C. R. BURSEY. 1992. Prevalence of the nematode *Spauligodon giganticus* (Oxyurida: Pharyngodonidae) in neonatal Yarrow's Spiny Lizards, *Sceloporus jarrovi* (Sauria: Iguanidae). Journal of Parasitology 78: 539–541.
- GOLDBERG, S. R., C. R. BURSEY, AND R. L. BEZY. 1996. Gastrointestinal helminths of Yarrow's Spiny Lizard, *Sceloporus jarrovi* (Phrynosomatidae) in Mexico. The American Midland Naturalist. 135: 299–309.
- GOLDBERG, S. R., C. R. BURSEY, AND J. L. CAMARILLO-RANGEL. 2002. Gastrointestinal helminths of Gaige's Tropical Night Lizard, *Lepidophyma gaigeae* (Sauria: Xantusiidae) from Hidalgo, Mexico. Texas Journal of Science. 54: 282–285.
- GOLDBERG, S. R., C. R. BURSEY, AND J. L. CAMARILLO-RANGEL. 2003. Gastrointestinal helminths of seven species of sceloporine lizards from Mexico. The Southwestern Naturalist. 48: 208–217.
- PARÉDES-LEÓN R., L. GARCÍA-PRÍETO, C. GUZMÁN-CORNEJO, V. LEÓN RÉGAGNON, AND T. M. PÉREZ. 2008. Metazoan parasites of Mexican amphibians and reptiles. Zootaxa. 1,904: 1–66.
- RAMÍREZ-BAUTISTA A., U. HERNÁNDEZ-SALINAS, R. CRUZ-ÉLIZALDE, C. BERRIOZABAL-ISLAS, D. LARA-TUFIÑO, I. GOYENECHEA MAYER-GOYENECHEA, AND J. M. CASTILLO-CERÓN. 2014. Los Anfíbios y Reptiles de Hidalgo, México: Diversidad, Biogeografía y Conservación. Sociedad Herpetológica Mexicana, A.C., Mexico.

CRISTIAN RAÚL OLVERA-OLVERA<sup>1</sup>, SAUDY CONSEPCIÓN FLORES-AGUILAR<sup>1</sup>, IRENE GOYENECHEA<sup>2</sup>, AND JORGE FALCÓN-ORDAZ<sup>1</sup>

<sup>1</sup>Laboratorio de Morfología Animal, Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo, Ciudad del Conocimiento, Km 4.5 carretera Pachuca-Tulancingo, Col. Carboneras, 42181 Mineral de la Reforma, Hidalgo, Mexico. E-mails: centruroides\_limpidus\_tecomanus@hotmail.com, arika-586@live.com.mx, and jfalcon.ordaz@gmail.com (JFO, Corresponding author)

<sup>2</sup>Laboratorio de Sistemática Molecular, Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo, Ciudad del Conocimiento, Km 4.5 carretera Pachuca-Tulancingo, Col. Carboneras, 42181 Mineral de la Reforma, Hidalgo, Mexico. E-mail: ireneg28@gmail.com

## Reptilia: Squamata (snakes)

***Clelia clelia* (Daudin, 1803). Predation on larger prey.** The Common Mussurana, *Clelia clelia*, is a well-known ophiophagous species that uses a combination of envenomation and constriction to subdue its prey (Savage, 2002). Its ability to forage, follow, find by smell, attack, bite, constrict, and swallow its prey has been reported by various authors (e.g., Scott, 1983; Savage, 2002; Solórzano, 2004; Chavarria and Barrio-Amorós, 2014; Timofeevski et al., 2017). What has been not described, however, is how an individual of *C. clelia* can swallow a prey item larger than itself, and herein we report such an event.

On 31 May 2017, after returning from a rainforest walk at Finca Ecoturística La Tarde, near La Palma, Cantón de Osa, Provincia de Puntarenas, Costa Rica (8°34'39.07"N, 83°29'9.66"W; datum WGS 84; elev. 196 m), we observed a red snake in a grassy field saturated with puddles from recent rains. As we approached the snake, we realized that it was a juvenile *C. clelia* in the process of subduing a Spotted Cat-eyed Snake, *Leptodeira polysticta* (Fig. 1). As we came closer, we noticed that the *Clelia* was coiled around the *Leptodeira* but no longer was constricting it, and was searching for the head to start the ingestion process. The *Clelia* apparently was having trouble closing the open mouth of the *Leptodeira*, so after a few minutes it released the head and again constricted the body of its prey, this time managing to insert the entire head of the *Leptodeira* in its mouth (Fig. 2). The *Leptodeira* recently had consumed a prey item (probably a frog), which was moving inside of its body and the snake appeared to be convulsing. After ca. 15 min, during which time the *Clelia* was attempting to properly position the body of the *Leptodeira*, the *Clelia* swallowed the anterior half of its prey rather fast. At that point we realized that the prey was longer and of a similar circumference as that of the predator, and we began wondering how the *Clelia* would be able to ingest such a large prey item? Soon after, however, we began to notice undulating movements along the neck of the *Clelia*,

which continued posteriorly to about midbody, and then the *Clelia* remained motionless for about 10 min (Fig. 3). Subsequently, the *Clelia* began to rotate its body in a circular motion, reminiscent of feeding behavior often seen in crocodiles. Presumably, such behavior assists the predator in the final stages of subduing its prey. Although we didn't have a tape measure to be more accurate, we estimated the total length of the *Clelia* at ca. 50 cm and that of the *Leptodeira* at ca. 65 cm. After a few minutes of observing the rotating movements, along with further ingestion of the prey item, the *Clelia* stopped to rest for ca. 5 min. We then left the scene, but returned 10 min later to find the *Leptodeira* almost totally ingested, with only its tail sticking out of the mouth of the *Clelia*; because the *Leptodeira* was about 30% longer than the *Clelia*, its body became positioned in an “accordion-like” fashion within the *Clelia* (Fig. 4). This “folding” of the prey item was noticeable, especially along the throat region of the *Clelia*. At that point the *Clelia* began showing signs of activity, and while ignoring our presence moved away without much difficulty (Fig. 5). Interestingly, the *Leptodeira* was alive during most of the ingestion process, as we observed it barely moving inside the predator. The entire event (from the point in which we began to observe it) lasted ca. 1 h. A video of most of the process can be seen at: <https://www.youtube.com/watch?v=D299p3GjgAw>.

We were unable to make further observations or to provide an X-ray to determine exactly how the prey item was accommodated inside the body of the predator. Previously, however, X-rays of two species of *Lampropeltis* have shown a larger prey item (snake) within the body cavity, where the prey was positioned in an undulating fashion and the tail was bent in the shape of a “U” in the area of the throat (Ditmars, 1931; Jackson et al., 2004).



**Fig 1.** A juvenile *Clelia clelia* subdues a larger individual of *Leptodeira polysticta*. After constricting the body and biting it (and presumably injecting its venom), the *Clelia* searches for the head of its prey. © Rémon ter Harmsel



**Fig 2.** Soon after, the *Clelia* begins to swallow the *Leptodeira*, starting with the head. © Rémon ter Harmsel



**Fig 3.** At this point the *Clelia* has swallowed more than one-half of its prey, and stops to rest.

📷 © Rémon ter Harmsel



**Fig. 4.** After resuming the ingestion process, the *Clelia* undergoes a series of circular rotating movements, perhaps to make sure the *Leptodeira* had died before continuing to ingest the snake. Note the undulating position of the *Leptodeira* within the predator.

📷 © Rémon ter Harmsel



**Fig 5.** After swallowing a prey item larger than itself, the *Clelia* remained motionless for a few seconds and then retreated into the forest.

📷 © Cesar Barrio-Amorós

## LITERATURE CITED

- CHAVARRÍA, M. AND C. BARRIO-AMORÓS. 2014. Nature Notes. *Clelia clelia*. Predation. Mesoamerican Herpetology 1: 286.
- DITMARS, R. L. 1931. Snakes of the World. The Macmillan Company, New York, United States.
- SCOTT, N. J. 1983. *Clelia clelia* (Zopilota, Musarana). P. 392 In D. H. Janzen (Ed.), Costa Rican Natural History. The University of Chicago Press, Chicago, Illinois, United States.
- JACKSON, K., N. J. KLEY, AND E. L. BRAINERD. 2004. How snakes eat snakes: the biomechanical challenges of ophiophagy for the California Kingsnake, *Lampropeltis getula californiae* (Serpentes, Colubridae). Zoology 107: 191–200.
- SAVAGE, J. M. 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas. The University of Chicago Press, Chicago, Illinois, United States.
- SOLÓRZANO, A. 2004. Serpientes de Costa Rica: Distribución, Taxonomía e Historia Natural / Snakes of Costa Rica: Distribution, Taxonomy, and Natural History. Instituto Nacional de Bioversidad (INBio), Santo Domingo de Heredia, Costa Rica.
- TIMOFEEVSKI, S., D. PANIAGUA, N. TIMOFEEVSKI, AND C. L. BARRIO-AMORÓS. 2017. Nature Notes. *Clelia clelia*. Predation on *Basiliscus basiliscus*. Mesoamerican Herpetology 4: 179–180.

CÉSAR BARRIO-AMORÓS<sup>1</sup> AND RÉMON TER HARMSSEL<sup>2</sup>

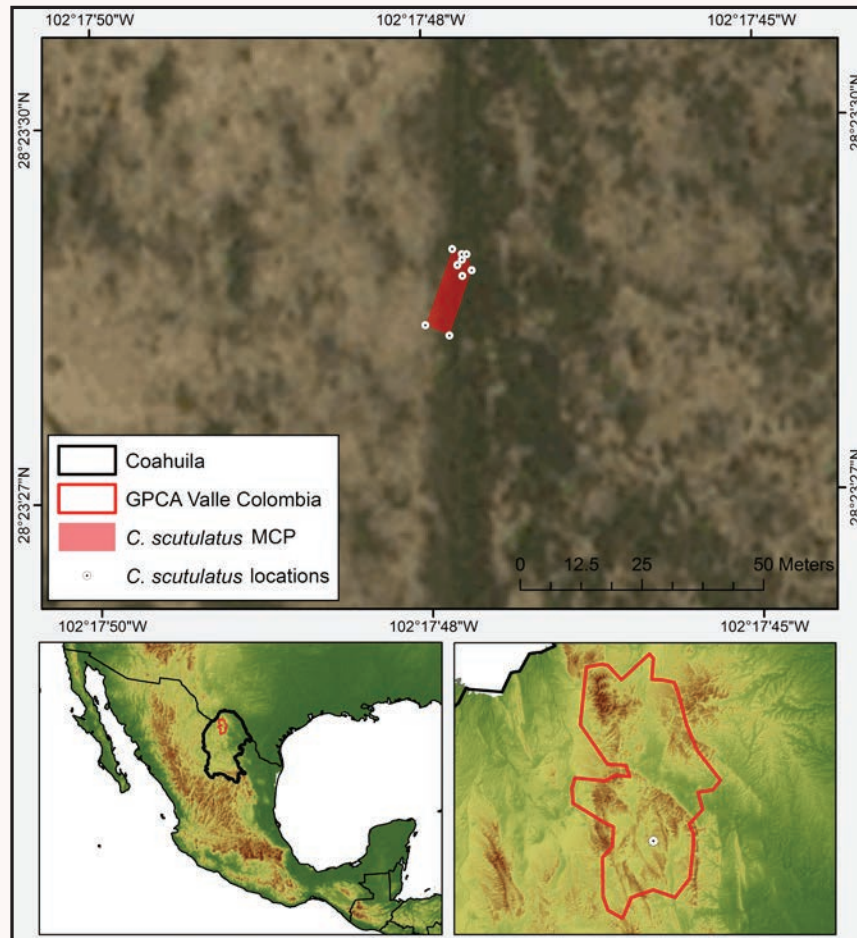
<sup>1</sup>Doc Frog Expeditions, Uvita, Puntarenas, Costa Rica. E-mail: cesarba@yahoo.com

<sup>2</sup>RAVON Foundation (Reptile, Amphibian and Fish Conservation Netherlands), Natuurplaza, Toernooiveld 1, 6525 ED, Nijmegen, the Netherlands.

***Crotalus scutulatus* (Kennicott, 1861). Diet.** The Mojave Rattlesnake, *Crotalus scutulatus*, is widely distributed in western North America, occurring from the Mojave Desert through the Sonoran and Chihuahuan deserts to central Mexico (Stebbins, 2003). This species can be distinguished from other rattlesnakes by features of color pattern and scalation, and especially by the presence of enlarged plates (scutes) on the head, located between the eyes (Degenhardt, et al., 1996). Other common names for this species include Mohave Rattlesnake, Chiauuhcōatl (note: the Náhuatl meaning = female rattlesnake), Víbora de Cascabel (Campbell and Lamar, 2004), Cascabel de Pradera, and Northern Mojave Rattlesnake (Liner and Casas-Andreu (2008).

During the course of field research for the “Temporal and spatial patterns of survival of the grassland specialist genus *Ammodramus* using radio-telemetry during the winter season in the Chihuahuan Desert of Mexico” project, conducted in the Grassland Priority Conservation Area Valle Colombia in northern Coahuila, Mexico, we recorded the predation of a Grasshopper Sparrow (*A. savannarum*) by a *C. scutulatus*. For this study, we had tagged 60 birds with bands and radio-transmitters (Lotek PicoPip Ag379), and monitored them from mid-December of 2016 to mid-March of 2017. The *A. savannarum* involved in the predation event was captured through the use of mist nets on 14 December 2016, in the grazing grassland of El Perdido (28.39143°N, 102.296495°W; datum WGS 84; elev. 1,370 m; Figs. 1, 2). Before releasing the bird, we measured its wing chord length (61 mm), tail length (46 mm), and tarsal length (20 mm), and also recorded its body mass (15.6 g). The bird’s age could not be determined, but it was sexed as a female using a tail feather and molecular techniques, as described by Fridolfsson and Ellegren (1999). After following the bird for 16 days, on 1 January 2017 at 1226 h, we detected an immobile signal and observed a *C. scutulatus* (~35 cm total length; Fig. 3) that obviously had swallowed the tagged *A. savannarum*. At the time of this discovery, we determined the temperature as 24.1°C and the relative humidity as 24.6% by using a Kestrel® 4500 pocket weather tracker. The rattlesnake was lying in an area of grassland dominated by *Bouteloua* sp. and *Eragrostis* sp. (Fig. 4). We took advantage of the ingested transmitter and followed the pulses it emitted for 16 days, and checked it every other day between 0800 and 1800 h to verify if the radio-transmitter was still inside the rattlesnake’s digestive system. Most of the time we were able to observe the rattlesnake, but on a few occasions we located the signal at the entrance of a burrow, ~5 m from where the snake originally was found. Using the rattlesnake locations and software ArcMap and Hawth’s Tools (Beyer, 2006), we calculated a Minimum Convex Polygon (MCP) and defined the rattlesnake’s movement area during daytime as 86 m<sup>2</sup> (Fig. 1). In addition to the *C. scutulatus*, during the survey, we observed five other rattlesnakes (individuals of *C. atrox* and *C. scutulatus*).





**Fig. 1.** A map of the study area indicating the locations of *Crotalus scutulatus*. GPCA = Grassland Priority Conservation Area; and MCP = Minimum Convex Polygon. Map by Irene Ruvalcaba-Ortega.

*Crotalus scutulatus* primarily preys on mammals, but several other types of prey have been reported. Reynolds and Scott (1982) found mammals in 91.7% of the stomachs of the Chihuahua specimens containing food items they examined, including kangaroo rats in 39.6%, pocket mice in 20.8%, white-footed mice in 16.5%, ground squirrels in 10.4%, jackrabbits in 4.2%, and cottontails in 2.1%. Klauber (1972) found mammal remains in 21 specimens of *C. s. scutulatus*, but lizard remains in only two, as well as mammal remains in two *C. s. salvini*. Prey is selected on the basis of size, and that which either is too large or too small is rejected, and potential prey that possibly could harm the snake is not accepted (Reynolds and Scott, 1982). Both live prey and carrion are consumed (Ernst and Ernst, 2012).

Known natural prey include mammals (kangaroo rats [*Dipodomys merriami*, *D. paramintinus*, *D. spectabilis*], pocket mice [*Perognathus flavus*, *P. intermedius*, *P. longimembris*, *P. pencillatus*], white-footed mice [*Peromyscus eremicus*, *P. maniculatus*], ground squirrels [*Ammospermophilus leucurus*, *Spermophilus spilosoma*, *S. tereticaudus*], and hares and rabbits [*Lepus californicus*, *Sylvilagus audubonii*]); bird eggs; reptiles (lizards [*Coleonyx brevis*, *Aspidoscelis tigris*, *Holbrookia* sp., *Phrynosoma platyrhinos*, *Sceloporus* sp., *Uta stansburiana*] and (snakes [*Phyllorhynchus decurtatus*]); amphibians (toads [*Bufo* sp. = *Anaxyrus* sp.], spadefoots [*Scaphiopus* sp., *Spea* sp.] and frogs), and centipedes and insects (Boone, 1937; Huey, 1942; Kauffeld, 1943; Johnson et al., 1948; Dammann, 1961; Klauber, 1972; Parker, 1974; Reynolds, 1978; Cromwell, 1982; Reynolds and Scott, 1982; Tennant, 1984; Lowe et al., 1986; Brown, 1997; Plummer, 2000; Cardwell, 2005, 2006; Ernst and Ernst, 2012). In addition, captives have consumed Brown Rats (*Rattus norvegicus*), House Mice (*Mus musculus*), Woodrats (*Neotoma*

*albigula*), lizards (*Anolis carolinensis*, *Eumeces* [=*Plestiodon*] *fasciatus*, *Holbrookia* sp., *Uta stansburiana*), and a snake (*Crotalus cerastes*) (Vorhies and Taylor, 1940; Klauber, 1972; Brown and Lillywhite, 1992; Strimple, 1993). Brennan and Holycross (2006) noted that this species feeds on birds, but did not provide additional information. Recently, Cardwell (2013), in his study investigating behavioral changes of *C. scutulatus* in response to drought, did not find avian prey in the diet of this population, only mammals.

Conversely, *A. savannarum* is a species that feeds and nests on the ground, which frequently runs rather than flies when approached (Rising, 1996) and thus it is exposed to many ground predators. The most common predators are snakes, and specifically colubrids, but only during the breeding season (eggs and nestlings; e.g., Giocomo et al., 2008; Renfrew et al., 2003; Sutter and Ritchison, 2005; Vos and Ribic, 2013; and Wray et al., 1982). Even during this stage, however, confirmed records of bird predation are scarce, but include two regurgitated post-fledglings ingested by unidentified snakes (Hovick et al., 2011), as well as four separate attempts to eat this species' nestlings by the Eastern Gartersnake, *Thamnophis sirtalis* (Hovick, 2010). To our knowledge this is the first report of a specific avian species as food item for *C. scutulatus*.



**Fig. 2.** A Grasshopper Sparrow (*Ammodramus savannarum*) used in this study.

© Alexander Peña-Peniche



**Fig. 3.** The *Crotalus scutulatus* that preyed upon the tagged *Ammodramus savannarum*.

© Miguel A. Demeneghi Reyes



**Fig. 4.** The Inter-mountain Grasslands at Rancho Valle Colombia, with two dominant grasses of the genera *Bouteloua* and *Eragrostis*. © Alexander Peña-Peniche

**Acknowledgments.**—Fieldwork was funded by Alianza WWF-Fundación Carlos Slim, Neotropical Migratory Bird Conservation Act/US Fish and Service (Project No. F16AP00608), Consejo Nacional de Ciencia y Tecnología (CONACYT; Project No. CB-2013-01-222920) and APP scholarship (No.371044/250334), and Universidad Autónoma de Nuevo León (PAICYT CN315-15 y CN375-15). We are especially thankful to Octavio Bermúdez-Finan from Rancho Valle Colombia, for allowing us to use his land and the facilities for this study. The bird trapping and handling was conducted under permit SGPA/DGVS/10768/16, issued by Secretaria de Medio Ambiente, Recursos Naturales y Cambio Climático. Lastly, we thank Martin J. Feldner for his time in helping us with the manuscript.

#### LITERATURE CITED

- BEYER, H. L. 2006. Hawth's analysis tools: an extension for ArcGIS. ([www.spatial ecology.com/](http://www.spatial ecology.com/); accessed 7 August 2017).
- BRENNAN, T. C., AND A. T. HOLYCROSS. 2006. A Field Guide to Amphibians and Reptiles in Arizona. Arizona Game and Fish Department, Phoenix, Arizona, United States.
- BOONE, A. R. 1937. Snake hunter catches snakes for fun. *Popular Science Monthly* 131(4): 54–55.
- BROWN, P. R. 1997. A Field Guide to the Snakes of California. Gulf Publishing Co., Houston, Texas, United States.
- BROWN, T. W., AND H. B. LILLYWHITE. 1992. Autecology of the Mojave Desert Sidewinder, *Crotalus cerastes cerastes*, at Kelso Dunes, Mojave Desert, California, United States. Pp. 279–308 In J. A. Campbell and E. D. Brodie, Jr. (Eds.), *Biology of the Pitvipers*. Selva, Tyler, Texas, United States.
- CAMPBELL, J. A., AND W. W. LAMAR. 2004. The Venomous Reptiles of the Western Hemisphere. 2 Volumes. Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.
- CARDWELL, M. D. 2005. Natural History Notes. *Crotalus scutulatus* (Mohave Rattlesnake). *Behavior. Herpetological Review* 36: 192.
- CARDWELL, M. D. 2006. Rain-harvesting in a wild population of *Crotalus s. scutulatus* (Serpentes: Viperidae). *Herpetological Review* 37: 142–144.
- CARDWELL, M. D. 2013. Behavioral Changes by Mohave Rattlesnakes (*Crotalus scutulatus*) in Response to Drought. Unpublished M.Sc. thesis, California State University, Sacramento, California, United States.
- CROMWELL, W. R. 1982. Underground desert toads. *Pacific Discovery* 35: 10–17.
- DAMMANN, A. E. 1961. Some factors affecting the distribution of sympatric species of rattlesnakes (genus *Crotalus*) in Arizona. Unpublished Ph.D. dissertation, University of Michigan, Ann Arbor, Michigan, United States.
- DEGENHARDT, W. G., C. W. PAINTER, AND A. H. PRICE. 1996. *Amphibians and Reptiles of New Mexico*. University New Mexico Press, Albuquerque, New Mexico, United States.
- ERNST, C. E., AND E. M. ERNST. 2012. *Venomous Reptiles of the United States, Canada and Northern Mexico*. 2 Volumes. Johns Hopkins University Press, Baltimore, Maryland, United States.
- FRIDOLFSSON, A. K., AND H. ELLEGREN. 1999. A simple and universal method for molecular sexing of non-ratite birds. *Journal of Avian Biology* 30: 116–121.
- GIOCOMO, J. J., E. D. MOSS, D. A. BUEHLER, AND W. G. MINSER. 2008. Nesting biology of grassland birds at Fort Campbell, Kentucky and Tennessee. *The Wilson Journal of Ornithology* 120: 111–119.

- HOVICK T. J., J. R. MILLER, R. R. KOFORD, D. M. ENGLE, AND D. M. DEBINSKI. 2011. Postfledging survival of Grasshopper Sparrows in grasslands managed with fire and grazing. *The Condor* 113: 429–437.
- HOVICK, T. J. 2010. Survival of Grasshopper Sparrows (*Ammodramus savannarum*) During Two Important Life Stages in Grassland Managed with Fire and Grazing. Unpublished M.Sc. thesis, Iowa State University, Ames, Iowa, United States.
- HUEY, L. M. 1942. A vertebrate faunal survey of the Organ Pipe Cactus National Monument, Arizona. *Transactions of the San Diego Society of Natural History* 9: 353–376.
- JOHNSON, D. H., M. D. BRYANT, AND A. H. MILLER. 1948. Vertebrate animals of the Providence Mountains area of California. *University of California Publications in Zoology* 48: 221–375.
- KAUFFELD, C. F. 1943. Field notes on some Arizona reptiles and amphibians. *American Midland Naturalist* 29: 342–359.
- KLAUBER, L. M. 1972. Rattlesnakes: Their Habits, Life Histories, and Influence on Mankind. 2 Volumes. University of California Press. Berkeley and Los Angeles, California, United States.
- LINER, E. A., AND G. CASAS-ANDREU. 2008. Nombres Estándar en Español en Inglés y Nombre Científicos de los Anfíbios y Reptiles de México / Standard Spanish, English and Scientific Names of the Amphibians and Reptiles of Mexico. 2<sup>nd</sup> ed. Herpetological Circular 38, Society for Study of Amphibians and Reptiles, Shoreview, Minnesota, United States.
- LOWE, C. H., C. R. SCHWALBE, AND T. B. JOHNSON. 1986. The Venomous Reptiles of Arizona. Arizona Game and Fish Department, Phoenix, Arizona, United States.
- PARKER, W. S. 1974. Home range, growth, and population density of *Uta stansburiana* in Arizona. *Journal of Herpetology* 8: 135–139.
- PLUMMER, M. V. 2000. Natural History Notes. *Crotalus scutulatus* (Mojave Rattlesnake). Thermal stress. *Herpetological Review* 31: 104–105.
- RENFREW, R. B., AND C. RIBIC. 2003. Grassland passerine nest predators near pasture edge identified on videotape. *The Auk* 120: 371–383.
- REYNOLDS, R. P. 1978. Resource Use, Habitat Selection, and Seasonal Activity of a Chihuahuan Snake Community. Unpublished Ph.D. dissertation, University of New Mexico, Albuquerque, New Mexico, United States.
- REYNOLDS R. P., AND N. J. SCOTT, JR. 1982. Use of a mammalian resource by a Chihuahuan snake community. Pp. 99–118 *In* N. J. Scott, Jr. (Ed.), *Herpetological Communities: a symposium of the Society for the Study of Amphibians and Reptiles and The Herpetologists' League*, August 1977. *Wildlife Research Report* 13, U.S. Fish and Wildlife Service, Washington D.C., United States. iv + 239 pp.
- RISING, J. D. 1996. A Guide to the Identification and Natural History of the Sparrows of the United States and Canada. Academic Press, San Diego, California, United States.
- STEBBINS, R. C. 2003. A Field Guide to Western Reptiles and Amphibians. 2<sup>nd</sup> ed. Houghton Mifflin Company, Boston Massachusetts, United States.
- STRIMPLE, P. 1993. De geboorte in gevangenschap va de Mojave ratelslang *Crotalus scutulatus scutulatus*. *Litteratura Serpentiologia* 13: 170–172.
- SUTTER, B., AND G. RITCHISON. 2005. Effects of grazing on vegetation structure, prey availability, and reproductive success of Grasshopper Sparrows. *Journal of Field Ornithology* 76: 345–351.
- TENNANT, A. 1984. The Snakes of Texas. Texas Monthly Press, Austin, Texas, United States.
- VORHIES, C. T., AND W. P. TAYLOR. 1940. Life history and ecology of the White-throated Woodrat, *Neotoma albigula albigula* Hartley, in relation to grazing in Arizona. *The University of Arizona Agriculture Experiment Station Technical Bulletin*. 86:453–529.
- VOS, S. M., AND C. A. RIBIC. 2013. Nesting success of grassland birds in oak barrens and dry prairies in west central Wisconsin. *Northeastern Naturalist* 20: 131–142.
- WRAY, T., K. A. STRAIT, AND R. C. WHITMORE. 1982. Reproductive success of Grassland Sparrows on a reclaimed surface mine in West Virginia. *The Auk* 99: 157–164.

ALEXANDER PEÑA-PENICHE<sup>1,3</sup>, DAVID LAZCANO<sup>2</sup>, IRENE RUVALCABA-ORTEGA<sup>3</sup>, AND LARRY DAVID WILSON<sup>4</sup>

<sup>1</sup>Instituto de Ecología, A.C.; Laboratorio de Bioclimatología; Carretera Antigua Coatepec No. 351, El Haya, 91070 Xalapa, Veracruz, México. E-mail: alexander.pena@posgrado.ecologia.edu.mx

<sup>2</sup>Universidad Autónoma de Nuevo León, Facultad de Ciencias Biológicas, Laboratorio de Herpetología, Apartado Postal 513, San Nicolás de los Garza, Nuevo León, Mexico. E-mail: imantodes52@hotmail.com


<sup>3</sup>Universidad Autónoma de Nuevo León, Facultad de Ciencias Biológicas, Laboratorio de Biología de la Conservación y Desarrollo Sustentable, Av. Universidad s/n, Cd. Universitaria, San Nicolás de los Garza, Nuevo León, Mexico 66455. E-mail: irene.ruvalcabart@uanl.edu.mx (Corresponding author)

<sup>4</sup>Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, Honduras; 16010 SW 207<sup>th</sup> Avenue, Miami, Florida 33187-1056, United States. E-mail: bufodoc@aol.com

***Crotalus totonacus* Gloyd and Kauffeld, 1940. Diet.** The Totonacan Rattlesnake (*Crotalus totonacus*) is a Mexican endemic that inhabits the coastal plain of the Gulf of Mexico and the adjacent areas on the eastern versant of the Sierra Madre Oriental, and has been reported from the states of Hidalgo, Nuevo León, Querétaro, San Luis Potosí, Tamaulipas, and Veracruz, and a plausible photographic record from the state of Guanajuato, municipality of Xichú, posted on the Internet (Farr et al., 2015). This species has not been evaluated on the IUCN Red List ([www.redlist.org](http://www.redlist.org)) or by Mexican law (SEMARNAT, 2010), but Wilson et al. (2013) assigned *C. totonacus* an Environmental Vulnerability Score of 17, which placed it in the middle of the high vulnerability category. Little information is available on the natural history of *C. totonacus*, including its diet, but based on its size and relationships to other closely related members of its genus, this rattlesnake is expected to feed mostly on mammals. Klauber (1972) noted that three specimens of *C. totonacus* contained mammal hair and one feathers, but did not provide additional data. This species also has been reported to feed on rats (*Neotoma* sp.), squirrels (*Otospermophilus variegatus*, *Sciurus alleni*), and an opossum (*Didelphis* sp.) (Campbell and Lamar, 2004; Farr et al., 2015).

On 23 April 2010 at 1300 h, a male *C. totonacus* (snout–vent length = 1,268 mm; tail length = 110 mm; and body mass = 960 g; Fig 1.) was found dead just after it had been killed by local people at 1.9 km NE of La Nueva Reforma, Alaquines, San Luis Potosí, Mexico (22.12464°N, 99.506626°W; WGS 84; elev. 1,396 m), in mesophilic mountain forest (or tropical montane cloud forest) consisting largely of Copalillo Trees (*Liquidambar styraciflua*) in the Sierra Madre Oriental Plegada, region 1 of high national priority for this vegetation type (CONABIO, 2010). Upon dissecting the snake, we found digested mammal remains that included the dorsal guard hairs of a White-eared Cotton Rat (*Sigmodon leucotis*), which we identified based on the hair characteristics and known distribution if this species (Álvarez-Castañeda et al., 2016). The specimen of *C. totonacus* was deposited in the herpetological collection at El Colegio de la Frontera Sur (ECOSUR) at Chetumal, Quintana Roo, Mexico (ECO-CH-H-3857). This note represents the first record of the genus *Sigmodon* (and of *S. leucotis*) in the diet of *C. totonacus*. These anecdotal records demonstrate the need for a systematic study on the diet of this species, to shed insights on its ecological requirements to help generate future conservation strategies.



**Fig. 1.** A male *Crotalus totonacus* (ECO-CH-H-3857) found dead at 1.9 km NE of La Nueva Reforma, Alaquines, San Luis Potosí, Mexico, which contained the remains of a *Sigmodon leucotis*.  © Gustavo E. Quintero-Díaz

## LITERATURE CITED

- ÁLVAREZ-CASTAÑEDA, S.T., I., CASTRO-ARELLANO, T., LACHER, AND E. VÁZQUEZ. 2016. *Sigmodon leucotis*. The IUCN Red List of Threatened Species 2016: e.T20215A22355853. ([www.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T20215A22355853.en](http://www.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T20215A22355853.en); accessed 21 July 2017).
- CAMPBELL, J. A., AND W. W. LAMAR. 2004. The Venomous Reptiles of the Western Hemisphere, 2 Volumes. Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.
- CONABIO (COMISIÓN NACIONAL PARA EL CONOCIMIENTO Y USO DE LA BIODIVERSIDAD). 2010. El Bosque Mesófilo de Montaña en México: Amenazas y Oportunidades para su Conservación y Manejo Sostenible. Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., Mexico. ([www.biodiversidad.gob.mx/ecosistemas/pdf/BMM\\_parte%201.pdf](http://www.biodiversidad.gob.mx/ecosistemas/pdf/BMM_parte%201.pdf))
- FARR, W. L., M. NEVÁREZ-DE LOS REYES, D. LAZCANO, AND S. E. ORTÍZ-HERNÁNDEZ. 2015. *Crotalus totonacus* (Totonacan Rattlesnake). Diet. Herpetological Review 46: 103.
- KLAUBER, L. M. 1972: Rattlesnakes: Their Habits, Life Histories, and Influence on Mankind. 2 Volumes. University of California Press, Berkeley, California, United States.
- SEMARNAT (SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES). 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, protección ambiental–especies nativas de México de flora y fauna Silvestre–categorías de riesgo y especificaciones para su inclusión, exclusión o cambio–lista de especies en riesgo. Diario Oficial de la Federación, Segunda Sección, 30 de diciembre de 2010, Ciudad de México, Mexico.
- WILSON, L. D., V. MATA-SILVA, AND J. D. JOHNSON. 2013. A conservation reassessment of the reptiles of Mexico based on the EVS measure. Contribution to Special Mexico Issue. Amphibian & Reptile Conservation 7: 1–47.

RUBÉN ALONSO CARBAJAL-MÁRQUEZ<sup>1,4</sup>, GUSTAVO E. QUINTERO-DÍAZ<sup>2,4</sup>, AND GUILLERMO MARTÍNEZ-DE LA VEGA<sup>3,4</sup>

<sup>1</sup>*El Colegio de la Frontera Sur: Departamento de Conservación de la Biodiversidad. Unidad Chetumal, Av. Centenario Km 5.5, 77014, Chetumal, Quintana Roo, Mexico. E-mail: redman031@hotmail.com (RACM, Corresponding author)*

<sup>2</sup>*Universidad Autónoma de Aguascalientes, Centro de Ciencias Básicas, Departamento de Biología, C.P. 20131, Aguascalientes, Aguascalientes, Mexico.*

<sup>3</sup>*Instituto de Investigación de Zonas Desérticas de la Universidad Autónoma de San Luis Potosí, Altair No. 200, Fracc. Del Llano, C.P. 78377, San Luis Potosí, San Luis Potosí, Mexico.*

<sup>4</sup>*Conservación de la Biodiversidad del Centro de México, A. C. Andador Torre de Marfil No. 100, C.P. 20229, Aguascalientes, Aguascalientes, Mexico.*

***Oxybelis fulgidus* (Daudin, 1803). Diet.** The Green Vinesnake, *Oxybelis fulgidus*, is a large, diurnal, fast and agile, and primarily arboreal opisthoglyphous colubrid with a widespread Neotropical distribution that extends from Mexico to Argentina (Savage, 2002; Solórzano, 2004). This species is an opportunistic sit-and-wait predator that occasionally forages for prey (Martins and Oliveira, 1998), and feeds primarily on lizards and birds (Scartozzoni et al., 2009), but occasionally on insects, frogs, and mammals (Köhler, 2001; Savage, 2002).

*Oxybelis fulgidus* is known to prey on the following bird species: Bucconidae (*Monasa nigrifrons* [Endo et al., 2007]); Columbidae (*Columbina passerina* [Fraga et al., 2012], and *C. squammata* [Miranda et al., 2013]); Emberizidae (Sosa-Bartuano and Rodríguez-Beitía, 2015); Fringillidae (*Spinus notatus* [Stuart, 1948]); Furnariidae (*Dendrocincla homochroa* [Leenders and Colwell, 2003, 2004]); Icteridae (*Leistes militaris* [Capurcho and Costa, 2012]); Muscicapidae (neonate) and Parulidae (Scartozzoni et al., 2009); Pipridae (*Pipra* sp. [Martins and Oliveira, 1998]); Rallidae (*Rufirallus viridis* [Bringsøe, 2002]); Thamnophilidae (*Taraba major* [Silva Pena et al., 2017]); Thraupidae (*Tangara episcopus* [Martins and Oliveira, 1998], and *Volatinia jacarina* [Scartozzoni et al., 2009]); Trochilidae (*Amazilia tzacatl* [van Dort, 2011]); Troglodytidae (*Troglodytes aedon* [Sosa-Bartuano and Rodríguez-Beitía, 2015]); Turdidae (*Turdus grayi* [Figueroa and Valerio, 2011, and Solórzano and Simms, 2015], and *T. leucomelas* [Viana et al., 2014]); and Tyrannidae (*Elaenia* sp. [Rodrigues et al., 2005], *Pitangus sulphuratus* [Viana et al., 2014], and *Tyrannus melancholicus chloronotus* [Hayes, 2002]). Here, we report a new species and family

of avian prey for *O. fulgidus* with a predation record of a Turquoise-browed Motmot (*Eumomota superciliosa*: Momotidae), which is the national bird of Nicaragua and El Salvador.

On 15 May 2017 at 1130 h, in Las Parcelas, Escamequita (11.20621°N, 85.80041°W; datum WGS 84; elev. 25 m), Municipio de San Juan del Sur, Departamento de Rivas, Nicaragua, one of us (DLC) was alerted by the loud screams of two Turquoise-browed Motmots and observed an adult *O. fulgidus* preying on a third *Eumomota superciliosa* (Momotidae; Fig 1) ca. 8 m above the ground on a tree in a dry river bed in Lowland Dry Forest (Holdridge, 1967; Savage, 2002). After taking a photograph, he left and returned ca. 40 min later to find that the snake had almost finished swallowing the bird. Neither the bird nor the snake were collected.



**Fig. 1.** An *Oxybelis fulgidus* preying on a Turquoise-browed Motmot (*Eumomota superciliosa*) at Las Parcelas, Escamequita, Municipio de San Juan del Sur, Departamento de Rivas, Nicaragua. © David Lee Cherry, Jr.

### LITERATURE CITED

- BRINGSØE, H. 2002. Herpetology in French Guiana 5. Green Vine Snake, *Oxybelis fulgidus*, feeding on Water Rail. Nordisk Herpetologisk Forening 45: 95–96.
- CAPURUCHO, J. M. G., AND H. C. COSTA. 2012. Natural History Notes. *Oxybelis fulgidus* (Green Vinesnake). Diet. Herpetological Review 43: 495–495.
- ENDO, W., M. AMEND, AND L. C. FLECK. 2007. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Prey. Herpetological Review 38: 209.
- FIGUEROA, A., AND E. ROJAS VALERIO. 2011. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Diet. Herpetological Bulletin 118: 41–42.
- FRAGA, R., V. T. CARVALHO, AND R. C. VOGT. 2012. Natural History Notes. *Oxybelis fulgidus* (Green Vinesnake). Diet. Herpetological Review 43: 495–496.
- HAYES, F. E. 2002. Predation on birds by snakes in Trinidad and Tobago. Nature Notes. Living World, Journal of the Trinidad and Tobago Field Naturalists' Club 2002: 59–61.
- HOLDRIDGE, L. R. 1967. Life Zone Ecology. Revised ed. Tropical Science Center, San José, Costa Rica.
- KÖHLER, G. 2001. Reptilien und Amphibien Mittelamerikas. Band 2: Schlangen. Herpeton, Offenbach, Germany.

- LEENDERS, T. A. A. M., AND G. J. WATKINS-COLWELL. 2003. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Prey. Herpetological Review 34: 152.
- LEENDERS, T. A. A. M., AND G. J. WATKINS-COLWELL. 2004. Notes on a collection of amphibians and reptiles from El Salvador. Postilla 231: 1–31.
- MARTINS, M., AND M. E. OLIVEIRA. 1998. Natural history of snakes in forests of the Manaus region, Central Amazonia, Brazil. Herpetological Natural History 6: 78–150.
- MIRANDA, J., J. COSTA, F. SCARPA, AND C. ROCHA. 2013. Predation on *Columbina squammata* (Aves: Columbidae) by the Green Vine Snake *Oxybelis fulgidus* (Serpentes: Colubridae) at the Lençóis Maranhenses National Park, Maranhão, Brazil. Herpetology Notes 6: 187–188.
- PENA, A. S., W. S. NASCIMENTO, J. C. SOUSA, C. E. COSTA-CAMPOS. 2017. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Diet. Herpetological Review 48: 216–217.
- RODRIGUES, D. J., M. M. LIMA, V. A. B. PINTO, AND C. S. MARTINS. 2005. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Prey. Herpetological Review 36: 325–326.
- SAVAGE, J. M. 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas. The University of Chicago Press, Chicago, Illinois, United States.
- SOSA-BARTUANO, A. AND B. RODRÍGUEZ-BEITÍA. 2015. Nature Notes. *Oxybelis fulgidus*. Diet. Mesoamerican Herpetology 2: 527–528.
- SCARTOZZONI, R. R., M. GRACA SALOMÃO, AND D. ALMEIDA-SANTOS. 2009. Natural history of the vine snake *Oxybelis fulgidus* (Serpentes, Colubridae) from Brazil. South American Journal of Herpetology 4: 81–89.
- SOLÓRZANO, A. 2004. Serpientes de Costa Rica: Distribución, Taxonomía e Historia Natural / Snakes of Costa Rica: Distribution, Taxonomy, and Natural History. Instituto Nacional de Biodiversidad (INBio), Santo Domingo de Heredia, Costa Rica.
- SOLÓRZANO, A., AND F. SIMMS. 2015. Nature Notes. *Oxybelis fulgidus*. Diet. Mesoamerican Herpetology 2: 201–202.
- STUART, L. C. 1948. The amphibians and reptiles of Alta Verapaz Guatemala. Miscellaneous Publications, University of Michigan 69: 1–109.
- VAN DORT, J. 2011. Natural History Notes. *Oxybelis fulgidus*. Diet. Herpetological Bulletin 117: 37–38.
- VIANA, P. F., D. M. MENDES, AND R. C. VOGT. 2014. Natural History Notes. *Oxybelis fulgidus* (Green Vine Snake). Diet. Herpetological Review 45: 518–519.

DAVID LEE CHERRY, JR.<sup>1</sup>, JAVIER SUNYER<sup>2,3</sup>, AND JOSÉ GABRIEL MARTÍNEZ-FONSECA<sup>2,3</sup>

<sup>1</sup>1500 Washington Street Beaufort, South Carolina 29902, United States.

<sup>2</sup>Grupo HerpetoNica (Herpetólogos de Nicaragua), Nicaragua. E-mail: jsunyermaclennan@gmail.com (JS, Corresponding author)

<sup>3</sup>Universidad Nacional Autónoma de Nicaragua (UNAN), Nicaragua.

***Rhinocheilus lecontei* Baird and Girard, 1853. Diet.** The Western Long-nosed Snake (*Rhinocheilus lecontei*) is a terrestrial and almost exclusively nocturnal species, with a widespread distribution that extends throughout much of the southwestern to the south central United States, and in Mexico from Baja California, Sonora, Chihuahua, San Luis Potosí, Tamaulipas, Nayarit, Jalisco to southwestern Aguascalientes, and Zacatecas (Hammerson et al., 2007; Carbajal-Márquez et al., 2011; Lemos-Espinal and Dixon, 2013; Wallach et al., 2014; Carbajal-Márquez et al., 2015). The taxonomic status of members of this genus, however, has been controversial (see Grismer, 1999; Lemos-Espinal et al., 2004; Manier, 2004; Wallach et al., 2014; Rorabaugh and Lemos-Espinal, 2016).

The Western Mexico Whiptail (*Aspidocelis costata*) is a fast-moving, terrestrial and diurnal lizard that is endemic to Mexico, and ranges from southeastern Sonora and southwestern Chihuahua southward through Pacific coastal plain to Colima, and eastward through the Balsas Depression to Puebla and western Veracruz (Frost et al. 2007; Lemos-Espinal and Smith, 2009).



Rodríguez Robles and Greene (1999) reported lizards (66%), mammals (26%), squamate eggs (7%) and insects (0.7%) as part of the diet of *R. lecontei*, of which teiid lizards of the genus *Aspidoscelis* comprised 72% of the diet (*Aspidoscelis* sp., *A. ceralbensis*, *A. marmorata*, *A. sexlineata*, *A. tessellata*, *A. tigris*, *A. cf. tigris*, and *A. uniparens*).

On 13 April 2017 at 0817h, at Playa Novillero, Municipio de Tecuala, Nayarit, Mexico (22.369505°N, -105.682296°W; WGS 84; elev. 7 m), one of us (JALB) found an adult *R. lecontei* that recently had been killed, which contained a partially digested individual of *A. costata* (Fig. 1). To our knowledge, this is the first report of *A. costata* in the diet of *R. lecontei*.



**Fig. 1.** (A) A Western Long-nosed Snake (*Rhinocheilus lecontei*) found dead at Playa Novillero, Municipio de Tecuala, Nayarit, Mexico; and (B) the stomach contained a Western Mexico Whiptail (*Aspidocelis costata*). © Jesús A. Loc-Barragán

**Acknowledgments.**—We thank Louis W. Porras for commenting on a previous draft of this note.

#### LITERATURE CITED

- CARBAJAL-MÁRQUEZ, R. A., G. E. QUINTERO-DÍAZ, AND Z. Y. GONZÁLEZ-SAUCEDO. 2011. Geographic Distribution. *Rhinocheilus lecontei* (Long-nosed Snake). *Herpetological Review* 42: 244.
- CARBAJAL-MÁRQUEZ, R. A., G. E. QUINTERO-DÍAZ, AND E. A. OCHOA-MEDINA. 2015. Geographic Distribution. *Rhinocheilus lecontei* (Long-nosed Snake). *Herpetological Review* 46: 386.

- FROST, D. R., G. A. HAMMERSON, AND H. GADSDEN. 2007. *Aspidoscelis costatus*. The IUCN Red List of Threatened Species 2007: e.T64259A12759232. (www.dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T64259A12759232.en; accessed 23 June 2017).
- GRISMER, L. L. 1999. An evolutionary classification of reptiles on the islands in the Gulf of California, México. *Herpetologica* 55: 446–469.
- HAMMERSON, G. A., D. R. FROST, AND G. SANTOS-BARRERA. 2007. *Rhinocheilus lecontei*. The IUCN Red List of Threatened Species. 2007: (e.T63909A12725667. www.dx.doi.org/10.2305/IUCN.UK.2007.RLTS.T63909A12725667.en; accessed 29 May 2017).
- LEMONS-ESPINAL, J. A., AND J. R. DIXON. 2013. Amphibians and Reptiles of San Luis Potosí. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.
- LEMONS-ESPINAL, J. A. AND H. SMITH. 2009. Anfíbios y Reptiles del Estado de Chihuahua, México / Amphibians and Reptiles of the State of Chihuahua, Mexico. Universidad Nacional Autónoma de México, Tlalnepantla, Estado de México, and Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., Mexico.
- LEMONS-ESPINAL, J. A., H. M. SMITH, D. CHISZAR, AND G. WOOLRICH-PIÑA. 2004. 2003 snakes from Chihuahua and adjacent states of Mexico. *Bulletin of the Chicago Herpetological Society* 39: 206–213.
- MANIER, M. K. 2004. Geographic variation in the Long-nosed Snake *Rhinocheilus lecontei* (Colubridae): beyond the subspecies debate. *Biological Journal of the Linnean Society* 83: 65–85.
- RODRÍGUEZ-ROBLES, J. AND H. W. GREENE. 1999. Food habits of the Long-nosed Snake (*Rhinocheilus lecontei*), a “specialist” predator? *The Zoological Society of London* 248: 489–499.
- RORABAUGH, J. C., AND J. A. LEMONS-ESPINAL. 2016. A Field Guide to the Amphibians and Reptiles of Sonora, Mexico. ECO Herpetological Publishing and Distribution, Rodeo, New Mexico, United States.
- WALLACH, V., K. L. WILLIAMS, AND J. BOUNDY. 2014. Snakes of the World: A Catalogue of Living and Extinct Species. CRC Press, Taylor & Francis Group, Boca Raton, Florida, United States.

JESÚS ALBERTO LOC-BARRAGÁN<sup>1</sup> AND RUBÉN ALONSO CARBAJAL-MÁRQUEZ<sup>2,3</sup>

<sup>1</sup>*Dependencia Nayarit-Fotógrafos de Naturaleza A.C. Bella Italia N° 170, Col. Lomas del Valle, C.P. 63066, Tepic, Nayarit, Mexico. Email: biolocbarragan@gmail.com (Corresponding author)*

<sup>2</sup>*El Colegio de la Frontera Sur. Departamento de Conservación de la Biodiversidad. Unidad Chetumal, Av. Centenario Km 5.5, 77014, Chetumal, Quintana Roo, Mexico*

<sup>3</sup>*Conservación de la Biodiversidad del Centro de México, A.C., Andador Torre de Marfil No. 100, C.P. 20229, Aguascalientes, Aguascalientes, Mexico.*

***Trachemys ornata* (Gray, 1831). Predation and reproduction.** The Ornate Slider, *Trachemys ornata*, is an endemic freshwater turtle that occurs in western Mexico (Legler and Vogt, 2013); its distribution ranges from Culiacán, Sinaloa, to Puerto Vallarta, Jalisco (Casas-Andreu et al., 2015; Parham et al., 2015). For some time the taxonomic status of this species was uncertain, but in a molecular study Parham et al. (2015) showed that *T. ornata* from the type region are not phylogenetically nested within *T. venusta*. To date, some studies have reported certain aspects of this species, including its cultural uses by humans (Cupul-Magaña and Mountjoy, 2012), morphology (Legler and Vogt, 2013), and feedings habits (Hernández-Macias et al., 2017). Nonetheless, other aspects such as demography, ecology and/or life history remain somewhat limited, but these are necessary to evaluate its conservation status (e.g., information on natural predators remains unavailable). Herein we report the first records of Great Blue Heron, *Ardea herodias* Linnaeus, 1758, the Yellow-crowned Night-Heron, *Nyctanassa violacea* (Linnaeus, 1758), and the Tropical Fire Ant, *Solenopsis geminata* (Fabricius, 1804), preying on hatchlings of *T. ornata*.

*Ardea herodias* is one of the most widespread and adaptable wading birds in North America; its diet includes fishes, frogs, salamanders, lizards, snakes, shrimp, crabs, crayfishes, arthropods (land and aquatic), other birds, and small mammals (Terres, 1991). *Nyctanassa violacea* occurs in North America, the West Indies, and along the coasts of Central- and South America, and its opportunistic, carnivorous diet includes freshwater and shore crustaceans (crayfishes, crabs, and amphipods), amphibians (frogs), reptiles (lizards, and snakes), molluscs, annelids (leeches, earthworms, and polychaetes), centipedes, scorpions, aquatic insects, fishes, and small mammals (IUCN Heron Specialist Group, 2011). Trager (1991: 166) noted that *Solenopsis geminata*, apparently is “native from the

southeast coastal plain and Florida to Texas (lacking in Alabama, Mississippi and Louisiana?) south through Central America to northern South America, including the coastal areas of northern Brazil, west through the Guianas to the Orinoco Basin, the western Amazon Basin and coastal areas of Peru.” Further, Trager (1991) indicated that the populations of this fire ant in the Antilles and the Galapagos, and possibly the ones in the southeastern United States, have been introduced but have resided in these areas for several centuries, and that this species also has been introduced into both tropical Asia and Africa. In addition to foraging for insects and general scavenging, this ant also is known to harvest seeds (Risch and Carroll, 1981; Carroll and Risch, 1984).

On 28 June 2017, at Marina Vallarta Club de Golf, Puerto Vallarta, Jalisco, Mexico (20°40'01"N, 105°15'51"W; datum: WGS 84; elev. < 4 m), one of us (FMC) observed and photographed an adult *A. herodias*, an adult *N. violacea*, and a swarm of *S. geminata* preying on hatchlings of *T. ornata* (Fig. 1). Both of the birds captured the turtles and tossed them in the air before swallowing them, whereas the ants were feeding on a dead individual (Fig. 1). We assume that the turtles had hatched recently, because evidence of freshly hatched eggs was found in a nest near the observation site.



**Fig. 1.** Individuals of *Ardea herodias* (A), *Nyctanassa violacea* (B), and a swarm of *Solenopsis geminata* (C) preying on hatchlings of *Trachemys ornata* at Marina Vallarta Club de Golf, Puerto Vallarta, Jalisco, Mexico. 📷 © Frank Mc Cann

With regard to reproductive information, Legler and Vogt (2013) indicated that egg laying in *T. ornata* occurs in early May. In addition, during a four-year period we observed turtles at Marina Vallarta Club de Golf laying eggs from mid- to late April. Based on our observations, the nesting season could begin in April, and hatching could extend to late June or early July. Nevertheless, additional studies are needed to fully understand the reproductive and nesting ecology of *T. ornata* in modified habitats within tropical dry forest.

## LITERATURE CITED

- CARROL, C. R., AND S. J. RISCH. 1984. The dynamics of seed harvesting in early successional communities by a tropical ant *Solenopsis geminata*. *Oecologia* (Berlin) 61: 388–392.
- CASAS-ANDREU, G., F. G. CUPUL-MAGAÑA, AND S. M. CHÁVEZ-AVILA. 2015. Primer registro preciso de *Trachemys ornata* (Gray, 1831) (Testudines: Emydidae) para el estado de Jalisco, México. *Acta Zoológica Mexicana* (n.s.) 31: 477–479.
- CUPUL-MAGAÑA, F. G., AND J. B. MOUNTJOY. 2012. *Trachemys ornata* (Gray, 1831) (Testudines: Emydidae) en un yacimiento arqueológico del occidente de México. *Acta Zoológica Mexicana* (n. s.) 28(1): 222–226.
- HERNÁNDEZ-MACÍAS, N. E., A. R. RAYMUNDO-HUIZAR, R. GARCÍA DE QUEVEDO-MACHAIN, M. VÁSQUEZ-BOLAÑOS, G. CASAS-ANDREU, AND F. G. CUPUL-MAGAÑA. 2017. Nature Notes. *Trachemys ornata* (Gray, 1831). Diet. *Mesoamerican Herpetology* 4: 188–190.
- IUCN HERON SPECIALIST GROUP. 2011. Yellow-crowned Night Heron *Nyctinassa violaceus* (Linnaeus). ([www.heronconservation.org/styled-5/styled-66/](http://www.heronconservation.org/styled-5/styled-66/); accessed 3 July 2017).
- LEGLER, J. M., AND R. C. VOGT. 2013. *The Turtles of Mexico: Land and Freshwater Forms*. University of California Press, Berkeley, California, United States.
- PARHAM, J. F., T. J. PAPPENFUSS, J. R. BUSKIRK, G. PARRA-OLEA, J. Y. CHEN, AND W. B. SIMISON. 2015. *Trachemys ornata* or not *ornata*: reassessment of a taxonomic revision for Mexican *Trachemys*. *Proceedings of the California Academy of Sciences* 62: 359–367.
- RISCH, S. J., AND C. R. CARROLL. 1981. Effect of a keystone predaceous ant, *Solenopsis geminata*, in a nonequilibrium community. *Ecology* 63: 1,979–1,983.
- TERRES, J. K. 1991. *The Audubon Society Encyclopedia of North American Birds*. Wings Books, New York, United States.
- TRAGER, J. C. 1991. A revision of the fire ants, *Solenopsis geminata* group (Hymenoptera: Formicidae: Myrmicinae). *Journal of the New York Entomological Society* 99: 141–198.

ARMANDO H. ESCOBEDO-GALVÁN<sup>1</sup>, FRANK MC CANN<sup>2</sup>, MIGUEL VÁSQUEZ-BOLAÑOS<sup>3</sup>, GUSTAVO CASAS-ANDREU<sup>4</sup>, AND FABIO GERMÁN CUPUL-MAGAÑA<sup>1</sup>

<sup>1</sup>Centro Universitario de la Costa, Universidad de Guadalajara, Av. Universidad 203, Delegación Ixtapa, C.P. 48280, Puerto Vallarta, Jalisco, Mexico. E-mail: [fabiocupul@gmail.com](mailto:fabiocupul@gmail.com)

<sup>2</sup>Condominio Girasol departamento 12, carretera a Mismaloya km 8.5, C.P. 48390, Puerto Vallarta, Jalisco, Mexico.

<sup>3</sup>Entomología, Centro de Estudios en Zoología, Departamento de Botánica y Zoología, Centro Universitario de Ciencias Biológicas y Agropecuarias, Universidad de Guadalajara, Apartado Postal 134, Zapopan, Jalisco, Mexico.

<sup>4</sup>Instituto de Biología, Universidad Nacional Autónoma de México, Apartado Postal 70-153, C.P. 04510, Ciudad de México, Mexico.

# DISTRIBUTION NOTES

## Amphibia: Anura

### Family Eleutherodactylidae

*Eleutherodactylus maurus* (Hedges, 1989). MEXICO: ESTADO DE MÉXICO: Municipio de Ocuilán de Arteaga, Parque Nacional Lagunas de Zempoala (19.7932°N, 99.32435°W; WGS 84) elev. 3,020 m; 14 May 2017; Carlos Jesús Balderas-Valdivia. A photo voucher (UNAM; IBH-RF 435) is deposited in the Colección Nacional de Anfibios y Reptiles of the Universidad Nacional Autónoma de México. We observed a juvenile *Eleutherodactylus maurus* at ca. 1310 h, jumping in leaf litter and volcanic rock in pine-oak forest. The individual (Fig. 1) measured 15 mm in snout–vent length, and its description and microhabitat correspond with the information provided by Davis and Dixon (1955) and Hedges (1989). Casas-Andreu (1997) and Aguilar and Casas-Andreu (2009) reported *E. maurus* from Estado de México, but did not provide specific localities. Although informal records of this species appear in websites, this is the first report of *E. maurus* occurring in a specific locality within Estado de México. To the best of our knowledge, this specimen also represents an elevational record for this species, as Wilson and Johnson (2010) reported the highest known elevation as 2,682 m.



**Fig. 1.** An *Eleutherodactylus maurus* (UNAM; IBH-RF 435) photographed at Parque Nacional Lagunas de Zempoala, Ocuilán de Arteaga, Estado de México, Mexico.  © Carlos Jesús Balderas-Valdivia

**Acknowledgments.**—We thank Víctor Hugo Reynoso-Rosales for kindly providing the photo voucher number, Luis Canseco-Márquez for corroborating the identity of the individual, and Juan Flores-Ganoa and Marcelo Aranda-Sánchez (Comisión Nacional de Áreas Naturales Protegidas) for providing facilities to access Parque Nacional Lagunas de Zempoala. Our research was conducted under collecting permit SEMARNAT SGPA/DGVS/06296/16 (CJBV).

## LITERATURE CITED

- AGUILAR, X. and G. CASAS-ANDREU. 2009. Anfibios y reptiles. Pp. 125–130 In G. Ceballos, R. List, G. Garduño, R. López Cano, M. J. Muñozcano Quintanar, E. Collado, and J. E. San Román, (Compilers), *La Diversidad Biológica del Estado de México. Estudio de Estado. Biblioteca Mexiquense del Bicentenario, Colección Mayor, Estado de México: Patrimonio de un Pueblo. Gobierno del Estado de México, Toluca de Lerdo, Estado de México, Mexico.*
- CASAS-ANDREU, G., X. AGUILAR-MIGUEL, AND E. O. PINEDA-ARREDONSO. 1997. Pp. 9–54 In X. Aguilar-Miguel, G. Casas-Andreu, M. A. Gurrola, J. Ramírez-Pulido, A. Castro, U. Aguilera-Reyes, O. Monroy-Vilchis, E. O. Pineda-Arredondo, and N. Chávez (Eds.), *Lista Taxonómica de los Vertebrados Terrestres del Estado de México. Universidad Autónoma del Estado de México, Toluca, Estado de México, Mexico.*
- DAVIS, W. B., AND J. R. DIXON. 1955. Notes on Mexican toads of the genus *Tomodactylus* with the description of two new species. *Herpetologica* 11: 154–160.
- HEDGES, S. B. 1989. Evolution and biogeography of West Indian frogs of the genus *Eleutherodactylus*: slow-evolving loci and the major groups. Pp. 305–370 In C. A. Woods (Ed.), *Biogeography of the West Indies: Past, Present and Future. Sandhill Crane Press, Gainesville, Florida, United States.*
- WILSON, L. D., AND J. D. JOHNSON. 2010. Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot. Pp. 30–235 In L. D. Wilson, J. H. Townsend, and J. D. Johnson (Eds), *Conservation of Mesoamerican Amphibians and Reptiles. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.*

CARLOS JESÚS BALDERAS-VALDIVIA<sup>1</sup> AND ADRIANA GONZALEZ-HERNÁNDEZ<sup>2</sup>

<sup>1</sup>*Dirección General de Divulgación de la Ciencia, Universidad Nacional Autónoma de México, Zona Cultural de Ciudad Universitaria, Coyoacán, C.P. 04510, Ciudad de México, Mexico. E-mail: cjbv@unam.mx. (Corresponding author)*

<sup>2</sup>*Posgrado en Ciencias Agropecuarias y Recursos Naturales. Centro de Investigación en Ciencias Biológicas Aplicadas. Universidad Autónoma del Estado de México. Carretera Toluca-Ixtlahuaca km 14.5 San Cayetano Morelos, C.P. 50200, Toluca de Lerdo, Mexico. E-mail: adricnar@yahoo.com.mx*

## Family Hylidae

***Ecnomiophyla miliaria* (Cope, 1886).** NICARAGUA: RÍO SAN JUAN: along the Río San Juan, in front of the northern side of Isla El Diamante (10.92582°N, 84.31060°W; WGS 84); elev. 40 m; 7 May 2017; Yarlen Díaz Gómez. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8948; Fig. 1A, B). The individual, which was not collected, was found at 0900 h, perched at 1.2 m above the ground on the trunk of a plant called Caña-agria (*Costus guanaiensis*) near a small, slow-moving stream in pristine Tropical Wet Forest (Holdridge, 1967). In Nicaragua, this species only was known from the holotype (Sunyer et al., 2009), collected between 22 January and 29 April 1885 “between El Castillo and San Juan del Norte, along the Río San Juan and its tributaries, Departamento Río San Juan, Nicaragua” (Savage, 1973). Our record, therefore, represents the second individual known from Nicaragua, the first with an exact locality, and first photographs in life of this species from the country.



**Fig. 1.** Two photographs (A, B; UTADC-8948) of the same individual of *Ecnomiohyla miliaria* from the Río San Juan, Departamento de Río San Juan, Nicaragua. 📷 © Yarlen Díaz Gómez

#### LITERATURE CITED

- HOLDRIDGE, L. R. 1967. Life Zone Ecology. Tropical Science Center, San José, Costa Rica.
- SAVAGE, J. M. 1973. Herpetological collections made by Dr. John F. Bransford, Assistant Surgeon, U.S.N. during the Nicaragua and Panama Canal Surveys (1872–1885). *Journal of Herpetology* 7: 35–38.
- SUNYER, J., G. PÁIZ, M. DEHLING, AND G. KÖHLER. 2009. A collection of amphibians from Río San Juan, southeastern Nicaragua. *Herpetology Notes* 2: 189–202.

**YARLEN DÍAZ GÓMEZ<sup>1</sup>, JAVIER SUNYER<sup>2,3</sup>, JULIO LOZA<sup>2,3</sup>, MAYNOR FERNÁNDEZ<sup>2,3</sup>, MILTON SALAZAR-SAAVEDRA<sup>2,3,4</sup>, AND JOSÉ GABRIEL MARTÍNEZ-FONSECA<sup>2,3</sup>**

<sup>1</sup>*Hotel Victoria 300m al Este, Municipio de El Castillo, Río San Juan, Nicaragua*

<sup>2</sup>*Universidad Nacional Autónoma de Nicaragua (UNAN), Nicaragua.*

<sup>3</sup>*Grupo HerpetoNica (Herpetólogos de Nicaragua), Nicaragua. E-mail: jsunyermaclennan@gmail.com (JS, Corresponding author)*

<sup>4</sup>*Red Mesoamericana y del Caribe para la conservación de Anfibios y Reptiles (Red MesoHerp).*

***Ecnomiohyla miliaria*. Distribution in Pacific Costa Rica.** The genus *Ecnomiohyla* was erected by Faivovich et al. (2005) to accommodate the former *Hyla tuberculosa* group (*sensu* Savage, 2002). Ron et al. (2016) placed *Ecnomiohyla tuberculosa* in the genus *Tepuihyla*, and noted that the type species of *Ecnomiohyla* is *Hypsiboas miliaris* Cope, 1886. Of the 12 species of *Ecnomiohyla* currently recognized, only four are known to occur in Costa Rica: *Ecnomiohyla bailarina* Batista, Hertz, Mebert, Köhler, Lotzkat, Ponce, and Vesely, 2014; *E. fimbri-membra* (Taylor, 1948); *E. miliaria* (Cope, 1886); and *E. sukia* Savage and Kubicki, 2010. In Costa Rica, members of *Ecnomiohyla* primarily occur along the Atlantic versant. *Ecnomiohyla miliaria* is the most widely distributed of these species, and along the Atlantic versant of the country it occurs at elevations from sea level to 900 m (Leenders, 2016); on the Pacific slope, it is known from two localities in the southwestern portion of the Cordillera de Talamanca, both from near San Vito de Coto Brus, Provincia de Puntarenas, at elevations of 1,200 and 1,400 m (Savage and Kubicki, 2010). The distribution of this species also has been reported from few Honduran, Nicaraguan, Panamanian, and Colombian localities (Köhler, 2011; Leenders, 2016; Díaz Gómez et al., *This Issue*). The biogeography of *E. miliaria* remains poorly understood, and in Costa Rica the two known localities on Pacific versant are disjunct from those along the Caribbean. Accordingly, the specimens from this region perhaps should be reexamined, as they might represent a distinct (but similar) species.

Herein we report a new locality for *E. miliaria* from along the Pacific versant of Costa Rica. Although based on photographs it is difficult to differentiate between *E. miliaria* and *E. sukia*, the presence of enlarged tubercles on the eyelids can be used as a distinguishing characteristic (Savage and Kubicki, 2010). On 21 June 2016, one of us (HT) encountered and photographed an *E. miliaria* at Esquipulas, near Quepos, Provincia de Puntarenas, Costa Rica (9°33'0.5472"N, 84°3'35.0748"W; WGS 84; elev. 555 m; Fig. 1). The animal was found sleeping on a tree trunk in primary forest on an overcast day, at a height of 1.6 m. This note constitutes the first report for *E. miliaria* from the Pacific central region of Costa Rica. We believe this species is more widely distributed along the premontane forests along the Pacific versant than records indicate, because as a high-canopy dweller *E. miliaria* rarely is encountered.



**Fig. 1.** An *Ecnomiohyla miliaria* from Esquipulas, near Quepos, Provincia de Puntarenas, Costa Rica. © Horacio Torres



## LITERATURE CITED

- DÍAZ GÓMEZ, Y., J. SUNYER, J. LOZA, M. FERNÁNDEZ, M. SALAZAR-SAAVEDRA, AND J. G. MARTÍNEZ-FONSECA. 2017. Distribution Notes. *Ecnomyohyla miliaria* (Cope, 1886). Mesoamerican Herpetology 4: 658–659.
- FAIVOVICH J., C. F. B. HADDAD, P. C. A. GARCIA, D. R. FROST, J. A. CAMPBELL, AND W. C. WHEELER. 2005. Systematic review of the frog family Hylidae, with special reference to Hylinae: phylogenetic analysis and taxonomic revision. Bulletin of the American Museum of Natural History 294: 1–240.
- KÖHLER, G. 2011. Amphibians of Central America. Herpeton, Offenbach, Germany.
- LEENDERS, T. 2016. Amphibians of Costa Rica: A Field Guide. A Zona Tropical Publication, Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.
- RON, R. R., P. J. VENEGAS, H. M. ORTEGA-ANDRADE, G. GAGLIARDI-URRUTIA, AND P. E. SALERNO. 2016. Systematics of *Ecnomyohyla tuberculosa* with the description of a new species and comments on the taxonomy of *Trachycephalus typhonius* (Anura, Hylidae). ZooKeys 630: 115–154. doi: 10.3897/zookeys.630.9298
- SAVAGE, J. M. 2002. The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas. The University of Chicago Press, Chicago, Illinois, United States.
- SAVAGE, J. M. AND KUBICKI, B. 2010. A new species of fringe-limb frog, genus *Ecnomyohyla* (Anura: Hylidae), from the Atlantic slope of Costa Rica, Central America. Zootaxa 2,719: 21–34.

CÉSAR L. BARRIO-AMORÓS<sup>1</sup> AND HORACIO TORRES<sup>2</sup>

<sup>1</sup>Doc Frog Expeditions, Uvita, Puntarenas, Costa Rica. E-mail: cesarlba@yahoo.com

<sup>2</sup>Student at Universidad Nacional a Distancia (UNED) de Costa Rica, San José, Costa Rica.

***Megastomatohyla mixomaculata* (Taylor, 1950).** MEXICO: VERACRUZ: Municipio de Los Reyes, Ocotepéc, Finca Santa Martha (18°40'32.44"N, 97°1'30.39"W; WGS 84); elev. 1,650 m; 5 June 2017; Jesse Hofmann. A photo voucher is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8939; Fig. 1). The frog was found in a private ranch located in cloud forest, where the vegetation consists mostly of *Liquidambar*, *Quercus*, and *Cupressus* trees.

MEXICO: VERACRUZ: Municipio de Zongolica, La Compañía (18°38'59"N, 97°00'30."W; WGS 84); elev. 1,316 m, 12 July 2015; Erasmo Cázares-Hernández. Two specimens are deposited in the Colección Científica del Instituto Tecnológico Superior de Zongolica, Veracruz (ITSZ-A-036, 110; collecting permit SEMARNAT-08-049). This species is abundant in cloud forest in the Sierra de Zongolica, Veracruz, along permanent streams with abundant vegetation at elevations from 1,200 to 1,600 m.

In this note we provide new municipality records for this species. The localities are close to one another, with the nearest reported for both at Coscomatepec de Bravo (Taylor, 1950), which lies ca. 45 km to the south.



**Fig. 1.** A *Megastomatohyla mixomaculata* (UTADC-8939) from Finca Santa Martha, Ocotepéc, Municipio de Los Reyes, Veracruz, Mexico.

© Jesse Hofmann

**Acknowledgments.**—ECH thanks Dr. Ramiro Sánchez-Uranga (General Director) and Lic. Yamil Vargas-Rivera (Deputy Director of Research) at the Instituto Tecnológico Superior de Zongolica for supporting our internal research projects, and Carl J. Franklin for providing the photo voucher number.

### LITERATURE CITED

TAYLOR, E. H. 1950. A new bromeliad frog from the Mexican state of Veracruz. *Copeia* 1950: 274–276.

MIGUEL A. DE LA TORRE-LORANCA<sup>1</sup>, ERASMO CÁZARES-HERNÁNDEZ<sup>2</sup>, AND LUIS CANSECO-MÁRQUEZ<sup>3</sup>

<sup>1</sup>*Finca Santa Martha. Km 32 Carretera Federeal Orizaba-Zongolica Ocotepéc, Los Reyes, C.P. 95000, Veracruz, Mexico. E-mail: delatorreloranca@yahoo.com.mx*

<sup>2</sup>*Instituto Tecnológico Superior de Zongolica, Km. 4.5 Carretera a la Compañía s/n, Tepetlitlanapa, Zongolica, C.P. 95000, Veracruz, Mexico. E-mail: caeh72@hotmail.com*

<sup>3</sup>*Laboratorio de Herpetología, Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, Apartado Postal.70-399, México, D.F. 04510, Mexico. E-mail: lcanseco@gmail.com*

***Ptychohyla zophodes* Campbell and Duellman, 2000.** MEXICO: VERACRUZ: Municipio de Los Reyes, Ocotepéc, Finca Santa Martha (18°40'32.44"N, 97°1'30.39"W; WGS 84; elev. 1,650 m); 4 June–7 July 2017, Miguel Ángel de la Torre Loranca. A photo voucher is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8940; Fig. 1). Three individuals were found at night in a private ranch located in cloud forest, within a ca. 400 ha patch of forest consisting mostly of *Liquidambar*, *Quercus*, and *Cupressus* trees. The frogs agree with the description provided by Campbell and Duellman (2000). The specimens are deposited in the Colección Científica del Instituto Tecnológico Superior de Zongolica (ITSZ-A-103, ITSZ-A-104 y ITSZ-A-109; collecting permit SEMARNAT-08-049).

MEXICO: VERACRUZ: Municipio de Tezonapa, Unión y Progreso (18°38'16"N, 96°50'40"W; WGS 84); elev. 1,361 m; 15 July 2017; Mauro Daniel Castro-Morales. Three specimens, collected in a transition area between tropical rainforest and cloud forest, are deposited in the Colección Científica del Instituto Tecnológico Superior de Zongolica, Veracruz (ITSZ-A-U-10, 12-13; collecting permit SEMARNAT-08-049). These specimens represent the first records for the state, as previously this species had been reported only from Oaxaca and Puebla (Campbell and Duellman, 2000; García-Vázquez et al., 2009), with the nearest locality ca. 22 km NW of Eloxochitlán, Puebla (García-Vázquez et al., 2009).

*Ptychohyla zophodes* is abundant at the above localities and reproduces throughout the rainy season, which lasts for over eight months. Areas of cloud forest and tropical rainforest along the Sierra Zongolica receive a substantial amount of rainfall, as a result of the proximity to the Gulf of Mexico.



**Fig. 1.** An individual of *Ptychohyla zophodes* (UTADC-8940) from Finca Santa Martha, Los Reyes, Veracruz.

© Ivan Ahumada-Carrillo

**Acknowledgments.**—ECH thanks Dr. Ramiro Sánchez-Uranga (General Director) and Lic. Yamil Vargas-Rivera (Deputy Director of Research) at the Instituto Tecnológico Superior de Zongolica for supporting our internal research projects, and Carl J. Franklin for providing the photo voucher number.

#### LITERATURE CITED

- CAMPBELL, J. A., AND W. E. DUELLMAN. 2000. New species of stream-breeding hylid frogs from the northern versant of the highlands of Oaxaca, Mexico. *Scientific Papers. Natural History Museum, University of Kansas* 16: 1–28.
- GARCÍA-VÁZQUEZ U. O., L. CANSECO-MÁRQUEZ, J. L. AGUILAR-LÓPEZ, I. SOLANO-ZVALETA, AND R. J. MACEDA-CRUZ. 2009. Noteworthy records of amphibians and reptiles from Puebla, México *Herpetological Review* 40: 467–70.

**MIGUEL A. DE LA TORRE-LORANCA<sup>1</sup>, ERASMO CÁZARES-HERNÁNDEZ<sup>2</sup>, AND LUIS CANSECO-MÁRQUEZ<sup>3</sup>**

<sup>1</sup>Finca Santa Martha. Km 32 Carretera Federeal Orizaba-Zongolica Ocotepc, Los Reyes, C.P.95000, Veracruz, Mexico. E-mail: delatorreloranca@yahoo.com.mx

<sup>2</sup>Instituto Tecnológico Superior de Zongolica, Km. 4.5 Carretera a la Compañía s/n, Tepetlitanapa, Zongolica, C.P. 95000, Veracruz, Mexico. E-mail: caeh72@hotmail.com

<sup>3</sup>Laboratorio de Herpetología, Museo de Zoología, Facultad de Ciencias, Universidad Nacional Autónoma de México, Apartado Postal 70-399, México, D.F. 04510, Mexico. E-mail: lcanseco@gmail.com

## Amphibia: Caudata

### Family Plethodontidae

*Pseudoeurycea mystax* Bogert, 1966. MEXICO, OAXACA, Municipio Totontepec Villa de Morelos, 8.6 km W of Totontepec Villa de Morelos (17°16'31.49"N, 96°6'27.71"W; WGS 84); elev. 2,038 m; 10 March 2014; Roberto Flores-Diego, Sandra O. Peláez-Santiago, César T. Aldape-López, and Mario C. Lavariega-Nolasco. During a biological survey in an Indigenous and community conserved area (ICCA; see Martin et al., 2011) in the town of Totontepec Villa de Morelos, in the Sierra Mixe, at 1604 h we observed an individual of *Pseudoeurycea mystax*. The salamander was found along the road from Totontepec Villa de Morelos to San Andrés Yaa, 28 km to the NW of the type locality at “0.9 kilometers east-northeast of Ayutla, Oaxaca, in the Distrito de Villa Alta” (Bogert, 1967: 12; Fig. 1). The individual was found in cloud forest near a bromeliad (*Catopsis* sp.) lying on the ground, where it was photographed (Fig. 2). A photo voucher of this individual is deposited at the University of Texas at El Paso (UTEP)’s Biodiversity Collections (Herpetology Observations); photo voucher UTEPObs:Herp120.

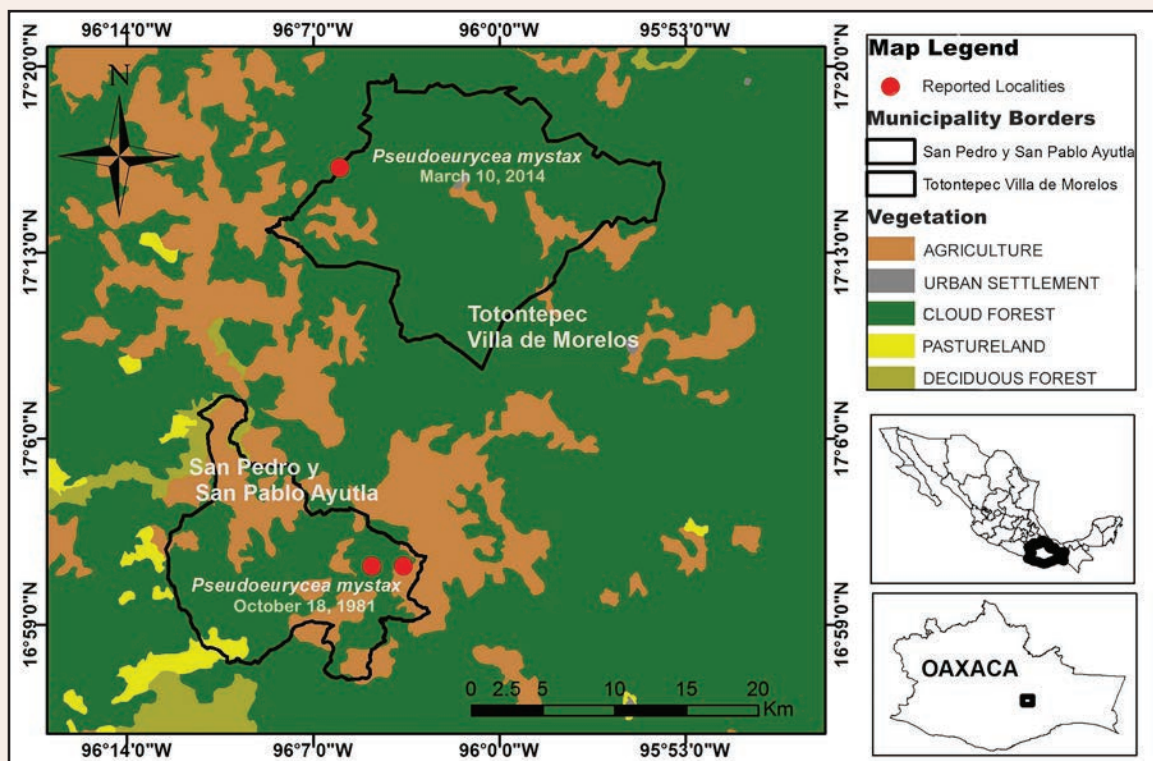


Fig. 1. Historical and current records for *Pseudoeurycea mystax* in the Sierra Mixe, Oaxaca, Mexico.

We identified the individual as *P. mystax* based on the presence of round, black spots on the dorsum and flanks anterior to the insertion of the hind limbs, as well as faint traces of pink pigment along the back and snout. Additionally, a few black spots were present on the tail, with large, black-bordered white spots mostly concentrated laterally. Among the most conspicuous elements of the color pattern were the presence of irregularly-sized white spots on the tail and occasionally on the rear flank of the trunk, as reported by Bogert (1967). *Pseudoeurycea mystax* was described based on two specimens (AMNH No. 76363 and 76362) collected by C. M. Bogert on July 26, 1966 under rocks along a creek locally known as the Rio Alacrán, at an elevation of ca. 2,050 m. Subsequently, on 18 October 1981 David B. Wake collected four specimens, plus an additional specimen with Theodore J. Papenfuss, in a canyon 1 km E of the towns of San Pedro and San Pablo Ayutla (Arctos, 2017), and collectively these remain the only known specimens of this species.

The distance between the historical records and the record reported herein suggests that *P. mystax* might occur in cloud forest along Cerro Zempoaltépetl in Oaxaca. Furthermore, our voucher represents the first record in 34 years, and highlights the need for conducting biological inventories in this region. According to Mexican law, *P. mystax* is endemic to the Sierra Mixe of Oaxaca and is categorized as threatened (A = amanazada; SEMARNAT, 2010), whereas the International Union for Conservation of Nature (IUCN) lists this species as Critically Endangered (IUCN, 2016). Furthermore, Wilson et al. (2015) assessed this species an Environmental Vulnerability Score (EVS) of 18, which is in the upper portion of the Endangered category. The conservation of *P. mystax*, as well as the species with which it coexists and their habitats, might depend on the decisions taken by residents to target that area as an ICCA, an emerging conservation strategy in the state of Oaxaca (Ortega del Valle et al., 2010).



**Fig. 2.** An individual of *Pseudoeurycea mystax* (UTEPObs:Herp120) found 8.6 km W of Totontepec Villa de Morelos, Municipio de Totontepec Villa de Morelos, Oaxaca, Mexico. 📷 © Roberto Flores-Diego

**Acknowledgments.**—The authors thank the authorities of Totontepec Villa de Morelos for providing the facilities for this study, and Teresa Mayfield for providing the photo voucher number.

## LITERATURE CITED

- ARCTOS (HERPETOLOGICAL COLLECTION OF THE MUSEUM OF VERTEBRATE ZOOLOGY AT BERKELEY). 2017. University of California, Berkeley, California, United States ([www.arctos.data.base.museum/guid/MVZ:Herp:158791](http://www.arctos.data.base.museum/guid/MVZ:Herp:158791); accessed 4 September 2017).
- BOGERT, C. M. 1967. New salamanders of the plethodontid genus *Pseudoeurycea* from the Sierra Madre del Sur of Mexico. *American Museum Novitates* 2,314: 1–27.
- IUCN SSC Amphibian Specialist Group. 2016. *Pseudoeurycea mystax*. The IUCN Red List of Threatened Species 2016: ([www.dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T59388A53983330.en](http://www.dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T59388A53983330.en); accessed 30 August 2017).
- MARTIN, G. J., S. ANTA FONSECA, F. CHAPELA MENDOZA, AND M. A. GONZÁLEZ ORTÍZ. 2011. Indigenous and community conserved areas in Oaxaca, Mexico. *Management of Environmental Quality* 22: 250–266.
- SEMARNAT (Secretaría de Medio Ambiente y Recursos Naturales). 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010, Protección ambiental—Especies nativas de México de flora y fauna Silvestre—categorías de riesgo y especificaciones para su inclusión, exclusión o cambio—Lista de especies en riesgo. *Diario Oficial de la Federación*, 30 de diciembre de 2010, Segunda Sección, Ciudad de México, Mexico.
- ORTEGA DEL VALLE, D., G. SÁNCHEZ, C. SOLANO, M. HUERTA, V. MEZA, AND C. GALINDO-LEAL. 2010. Áreas de Conservación certificadas en el estado de Oaxaca. World Wildlife Fund (WWF), Gland, Switzerland, Comisión Nacional de Áreas Naturales Protegidas (CONANP), and Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT), Ciudad de México, Mexico.
- WILSON, L. D., J. D. JOHNSON, AND V. MATA-SILVA. 2015. A conservation reassessment of the amphibians of Mexico based on the EVS measure. 2015. *Amphibian & Reptile Conservation* 7: 97–127.

ROBERTO FLORES-DIEGO, SANDRA OLIMPIA PELÁEZ-SANTIAGO, CÉSAR TONATIUH ALDAPE-LÓPEZ, AND MARIO CÉSAR LAVARIEGA-NOLASCO

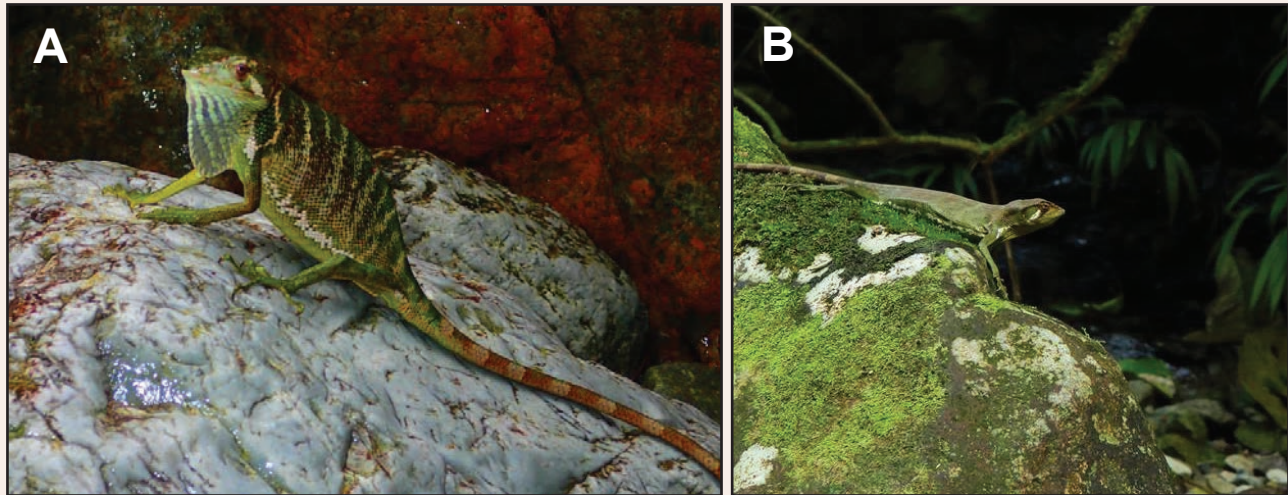
*Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional, Unidad Oaxaca, Instituto Politécnico Nacional, Hornos 103, Santa Cruz Xoxocotlán. Oaxaca. Mexico, 71230. E-mail: yesca23fum@hotmail.com (CTAL, Corresponding author)*

## Reptilia: Squamata (lizards)

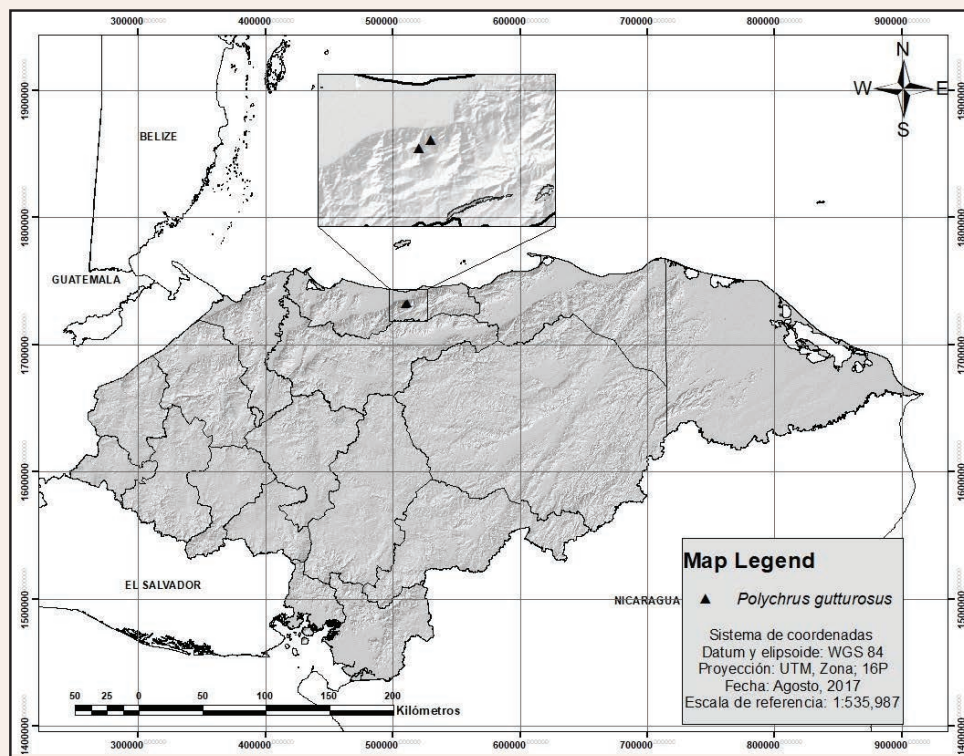
### Family Polychrotidae

***Polychrus guttuerosus* Berthold, 1845.** HONDURAS: ATLÁNTIDA: Parque Nacional Pico Bonito, The Lodge & Spa at Pico Bonito; two individuals of *Polychrus guttuerosus* were observed within the park. The first was found by Chris Benson on 9 December 2014 at 0930 h, basking on a boulder along the Río Coloradito (15°39'53.89"N, 86°54'29.17"W; WGS 84; elev. 326 m). A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8935; Fig. 1A). On 27 March 2017 at 1020 h, one of us (JA) observed the second individual basking on a boulder along the Río Corinto (15°40'33.06"N 56°53'26.92"W; WGS 84; elev. 410 m; Fig. 1B), despite the roaring water and mist produced by a nearby waterfall.

In Honduras, this species has been recorded in two ecophysiological regions (the Eastern Caribbean Lowlands that contain parts of the departments of Cortés and Yoro, and the Western Caribbean Lowlands that contain the departments of Gracias a Dios and a part of El Paraíso; McCranie and Wilson, 2002; McCranie et al. 2006); however the only confirmed records of this species are from the department of Gracias a Dios between Biosfera del Río Platano and Reserva Biológica de Rus Rus (McCranie et al., 2006). The voucher (UTADC-8935) and photograph of the second individual reported herein represent the northernmost records along the Caribbean coast of the country (Fig. 2), as well as from its entire range, which extends from northwestern Honduras and western Costa Rica to northwestern Ecuador (Savage, 2002; Köhler, 2008; Koch et al., 2011).



**Fig. 1.** (A) An adult male *Polychrus guttuerosus* (UTADC-8935) basking on a rock along the Río Corinto in Parque Nacional Pico Bonito, Departamento de Atlántida, Honduras; and (B) a second individual also photographed in the park, basking on a boulder along the Río Corinto. © Chris Benson (A) and James Adams (B)



**Fig. 2.** A new locality for *Polychrus guttuerosus* at Parque Nacional Pico Bonito, The Lodge & Spa at Pico Bonito, Municipio de El Porvenir, Departamento de Atlántida, Honduras.

**Acknowledgments.**—We thank Chris Benson for providing the photograph and information for the first observation in this note, Joel Mejía for being an exceptional guide at “The Lodge & Spa” at Parque Nacional Pico Bonito, Larry D. Wilson and Louis W. Porras for comments that improved an earlier draft of the manuscript, and Carl J. Franklin for providing the photo voucher number.

## LITERATURE CITED

- KOCH, C., PABLO, J. V., GARCIA-BRAVO, A., AND W. BÖHME. 2011. A new bush anole (Iguanidae, Polychrotinae, *Polychrus*) from the upper Marañon basin, Peru, with a redescription of *Polychrus peruvianus* (Noble, 1924) and additional information on *P. guttuosus* Berthold, 1845. *ZooKeys* 141: 79–107. doi: 10.3897/zookeys.141.1678.
- KÖHLER, G. 2008. *Reptiles of Central America*. 2<sup>nd</sup> ed. Herpeton, Offenbach, Germany.
- MCCRANIE, J. R., AND L. D. WILSON. 2002. *The Amphibians of Honduras*. Contributions to Herpetology, Volume 19, Society for the Study of Amphibians and Reptiles, Ithaca, New York, United States.
- MCCRANIE, J. R., TOWNSEND, J. H., AND WILSON, L. D. 2006. *The Amphibians and Reptiles of the Honduran Mosquitia*. Krieger Publishing Company, Malabar, Florida, United States.
- SAVAGE, J. M. 2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas*. The University of Chicago Press, Chicago, Illinois, United States.

JOSÉ MARIO SOLÍS<sup>1,3,4</sup>, JAMES ADAMS<sup>2</sup>, AND CARLOS M. O'REILLY<sup>3,5</sup>

<sup>1</sup>Facultad de Ciencias, Escuela de Biología, Universidad Nacional Autónoma de Honduras, Depto. de Francisco Morazán, Tegucigalpa, Honduras. E-mail: jm9biol@yahoo.es

<sup>2</sup>Lodge & Spa at Pico Bonito, La Ceiba, Depto. de Atlántida, Honduras.

<sup>3</sup>Grupo de Investigación de Reptiles y Anfibios de Honduras (GIRAH).

<sup>4</sup>Red Mesoamericana y del Caribe para la Conservación de Anfibios y Reptiles (MesoHERP).

<sup>5</sup>Calle la Fuente, edificio Landa Blanco No. 1417 Apto. 11, Tegucigalpa, Honduras.

## Family Xantusiidae

***Lepidophyma flavimaculatum* Duméril, 1851.** NICARAGUA: BOACO: Municipio de Camoapa, southern slope of Cerro Masigüe, Finca Santa Elena (12.53579°N, 85.35665°W; WGS 84); elev. 540 m; 4 September 2017; Lenin Alexander Obando. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8949; Fig. 1). The lizard was found at 1700 h, ca. 3 m above the ground on the wall of a latrine surrounded by disturbed Lowland Moist Forest (Holdridge, 1967; Savage, 2002). This locality represents a new record for the department of Boaco. In Nicaragua, this species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Jinotega, Matagalpa, Río San Juan, and Rivas (Köhler, 2001; Gómez et al., 2011; Sunyer et al., 2016). Additionally, Bezy (1989) and Bezy and Camarillo (2002) included AMNH 16402 from Tule or Tuli Creek in the department of Chontales, but Köhler (2001) regarded this specimen as from the department of Río San Juan.



**Fig. 1.** An adult *Lepidophyma flavimaculatum* (UTADC-8949) from Finca Santa Elena, Departamento de Boaco, Nicaragua.

© Lenin Alexander Obando



**Acknowledgments.**—We thank Carl J. Franklin for providing the photo voucher number.

### LITERATURE CITED

- BEZY, R. L. 1989. Morphological differentiation in unisexual and bisexual Xantusiid lizards of the genus *Lepidophyma* in Central America. *Herpetological Monographs* 3: 61–80.
- BEZY, R. L. AND J. L. CAMARILLO R. 2002. Systematics of Xantusiid lizards of the genus *Lepidophyma*. *Contributions in Science* 493: 1–41.
- GÓMEZ, M. J., I. GUTIÉRREZ, T. BENJAMIN, F. CASANOVES, AND F. DECLERCK. 2011. Conservación y conocimiento local de la herpetofauna en un paisaje ganadero. *Avances de Investigación. Agroforestería en las Américas* 48: 65–75.
- HOLDRIDGE, L. R. 1967. *Life Zone Ecology*. Tropical Science Center, San José, Costa Rica.
- KÖHLER, G. 2001. *Anfibios y Reptiles de Nicaragua*. Herpeton, Offenbach, Germany.
- SAVAGE, J. M. 1973. Herpetological collections made by Dr. John F. Bransford, Assistant Surgeon, U.S.N. during the Nicaragua and Panama Canal Surveys (1872–1885). *Journal of Herpetology* 7: 35–38.
- SUNYER, J., MARTÍNEZ-FONSECA, J.G., AND M. SALAZAR-SAAVEDRA. 2016. Distribution Notes. New departmental records for lizards in Nicaragua. *Mesoamerican Herpetology* 3: 1,049–1,054.

LENIN ALEXANDER OBANDO<sup>1</sup>, AND JAVIER SUNYER<sup>1,2</sup>

<sup>1</sup>*Museo Herpetológico de la UNAN-León (MHUL), Departamento de Biología, Facultad de Ciencias y Tecnología, Universidad Nacional Autónoma de Nicaragua-León, León, Nicaragua.*

<sup>2</sup>*Grupo HerpetoNica (Herpetólogos de Nicaragua), Nicaragua.*

*E-mails:* lobandosamp@gmail.com and jsunyermaclennan@gmail.com

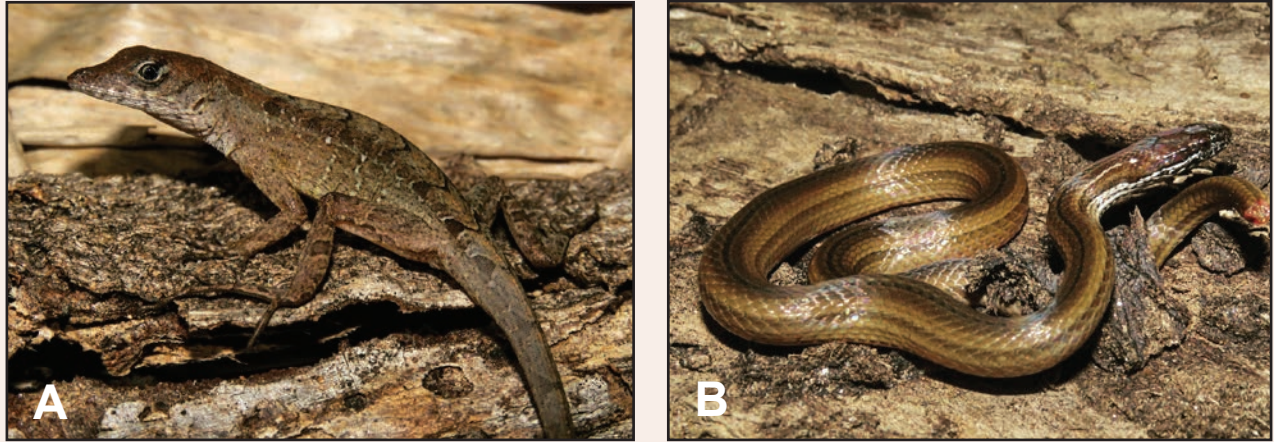
## New records for two reptiles from the Bay Islands, Honduras

### Family Dactyloidae

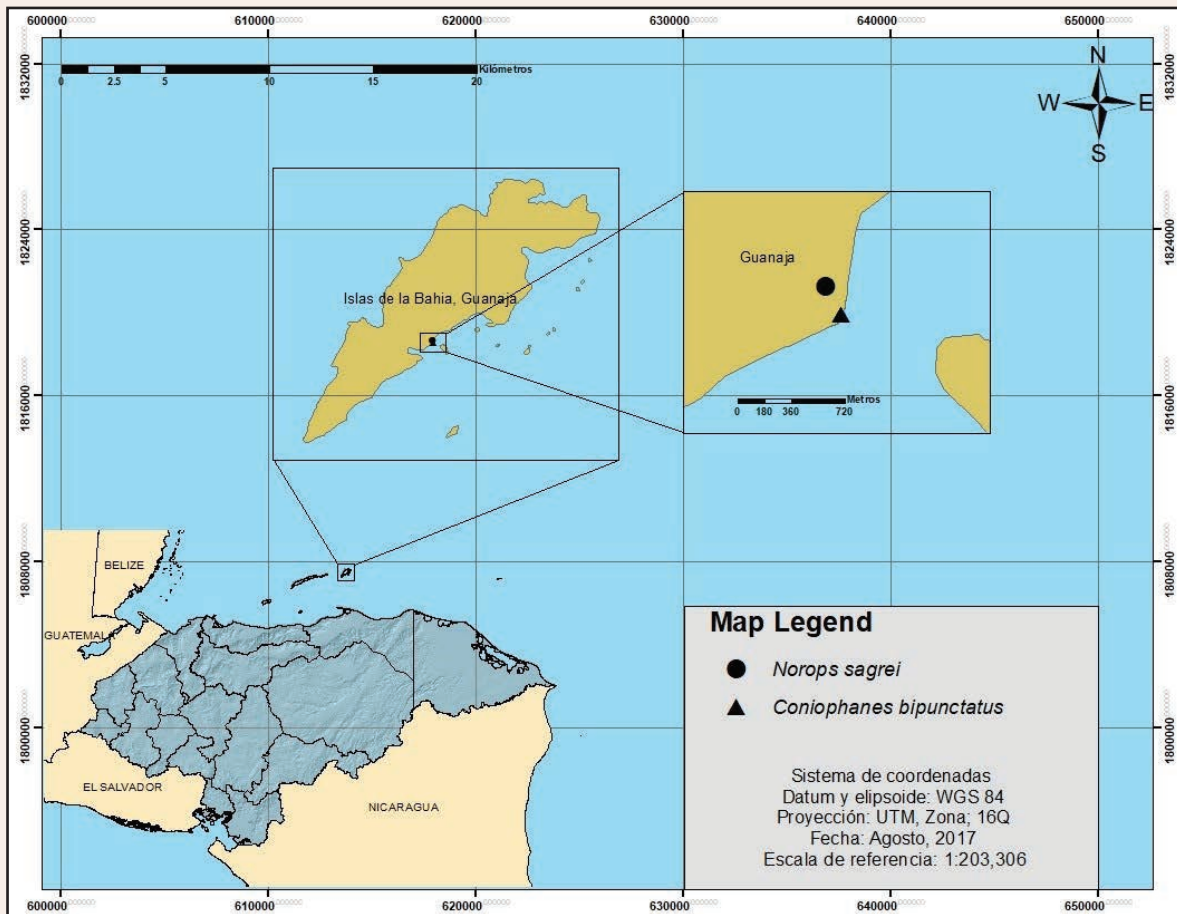
***Norops sagrei* (Duméril & Bibron, 1837).** HONDURAS: ISLAS DE LA BAHÍA: Guanaja (16°26.781'N, 85°53.724'W; WGS 84); elev. 11 m; 10 July 2017; José Mario Solís. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8936; Fig. 1A). JMS found the lizard at 0945 h, foraging in the low vegetation, and we observed other individuals in the area perched on low branches at night. In Honduras, this introduced lizard has been recorded from the mainland departments of Atlántida, Cortés, and Santa Bárbara (Espinal et al., 2014; McCranie and Köhler, 2015). This voucher represents an expansion of this lizard in the department (Fig. 2), as previously it had been recorded on the islands of Roatán and Utila (McCranie et al., 2005; McCranie and Nuñez, 2014; McCranie and Valdéz-Orellana, 2014).

### Family Dipsadidae

***Coniophanes bipunctatus* (Günther, 1858).** HONDURAS: ISLAS DE LA BAHÍA: Guanaja (16°26.731'N, 85°53.695'W; WGS 84); elev 10 m; 13 July 2017; José Mario Solís. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8937; Fig. 1B). The snake was found at 2045 h, crawling in vegetation. The distribution of this snake in Honduras has been recorded in the mainland departments of Atlántida, Colón, Cortés, and Gracias a Dios, (McCranie, 2011). This voucher represents the second locality of this species from the department of Islas de la Bahía (Fig. 2), as previously it was reported only from the island of Roatán (McCranie et al., 2005; McCranie and Valdéz Orellana, 2014).



**Fig. 1.** New records for reptiles from the island of Guanaja, Departamento de Islas de la Bahía, Honduras. (A) An adult female *Norops sagrei* (UTADC-8936); and (B) an adult *Coniophanes bipunctatus* (UTADC-8937). © José Mario Solís



**Fig. 2.** Map indicating a new locality for *Norops sagrei* and *Coniophanes bipunctatus* from the island of Guanaja, Departamento de Islas de la Bahía, Honduras.

**Acknowledgments.**—We thank Angel Fong for his company and assistance during our fieldwork, Larry David Wilson and Louis W. Porras for commenting on a draft of this manuscript, and Carl J. Franklin for providing the photo voucher numbers.

### LITERATURE CITED

- ESPINAL, M., J. M. SOLIS, C. M. O'REILLY, L. MARINEROS, AND VEGA, H. 2014. Distribution Notes. New distributional records for amphibians and reptiles from the department of Santa Bárbara, Honduras. *Mesoamerican Herpetology* 1: 300–303.
- MCCRANIE, J. R. 2011. The Snakes of Honduras: Systematics, Distribution, and Conservation. *Contributions to Herpetology*, Volume 26, Society for the Study of Amphibians and Reptiles, Ithaca, New York, United States.
- MCCRANIE, J. R., AND G. KÖHLER. 2015. The Anoles (Reptilia: Squamata: Dactyloidae: *Anolis*: *Norops*) of Honduras. Systematic, Distribution, and Conservation. *Bulletin of the Museum of the Comparative Zoology, Special Publications Series*, No. 1, Cambridge Massachusetts, United States.
- MCCRANIE, J. R., AND S. NUÑEZ. 2014. Geographic Distribution. *Anolis sagrei* (Brown Anole; Abaniquillo Costero). *Herpetological Review* 45: 91.
- MCCRANIE, J. R., AND VALDES-ORELLANA, L. 2014. New island records and updated nomenclature of amphibians and reptiles from the Islas de la Bahía, Honduras. *Herpetology Notes* 7: 41–49.
- MCCRANIE, J. R., L. D., WILSON, AND KÖHLER, G. 2005. Amphibians & Reptiles of the Bay Islands and Cayos Cochinos, Honduras. *Bibliomania!*, Salt Lake City, Utah, United States.

JOSÉ MARIO SOLÍS<sup>1,2,3</sup>, CAROL G. AYALA-ROJAS<sup>1</sup>, AND CARLOS M. O'REILLY<sup>2,4</sup>

<sup>1</sup>Facultad de Ciencias, Escuela de Biología, Universidad Nacional Autónoma de Honduras, Depto. de Francisco Morazán, Tegucigalpa, Honduras. E-mail: jm9biol@yahoo.es (JMS, Corresponding author)

<sup>2</sup>Grupo de Investigacion de Reptiles y Anfíbios de Honduras (GIRAH)

<sup>3</sup>Red Mesoamericana y del Caribe para la Conservación de Anfíbios y Reptiles (MesoHERP).

<sup>4</sup>Calle la Fuente, edificio Landa Blanco No. 1417 Apto. 11, Tegucigalpa, Honduras.

## Reptilia: Squamata (snakes)

### A new record for *Leptophis cupreus* (Cope, 1868) (Squamata: Colubridae) for Panama and Mesoamerica

Cope (1868) described *Leptophis cupreus* (as *Thrasops cupreus*) on the basis of a female holotype (ANSP 5202) from “River Napo and Maranon, Ecuador,” interpreted as equivalent to “Napo/Orellana Prov., NE Ecuador, or Loreto Dept., NE Peru” by Wallach et al. (2014). Curiously, however, this taxon was not mentioned in the list of names proposed for the genus *Thalerophis* (= *Leptophis*) provided by Oliver (1948) in his generic revision (see Albuquerque and McDiarmid, 2010). Thus, Peters and Orcés-V. (1960) resurrected this taxon from obscurity and established it as a valid species under the name *Leptophis cupreus*. Interestingly, these authors indicated that the holotype of *Thrasops cupreus* was lost, inasmuch as it could not be located within the collections of the Smithsonian Institution (i.e., the National Museum of Natural History). Originally catalogued as USNM 6666, the holotype was located by Malnate (1971) in the collection of the Academy of Natural Sciences of Philadelphia, where it is catalogued as ASNP 5202 (see Albuquerque and McDiarmid, 2010). The resurrection of this taxon allowed it to be included in Peters (1960), in which it was stated to range on the “lower Amazonian slopes in Ecuador.”

*Leptophis cupreus* remained poorly known until relatively recently, when Albuquerque and McDiarmid (2010) redescribed the species on the basis of 18 specimens, including the holotype, upholding its resurrection by Peters and Orcés-V. (1960). Nevertheless, Albuquerque and McDiarmid (2010) still characterized this species in the title of their paper as “a rare South American colubrine snake.” These authors (p. 380) indicated *L. cupreus* to be “known from the southwestern Guayana Highlands of Venezuela and adjacent Colombia (Sierra de La Macarena), the Amazonian lowlands of Ecuador, Colombia, and Peru, and from two localities on the Pacific versant of the Andes in Colombia and Ecuador.” The locality on “the Pacific versant of the Andes in Colombia” is that for LACM 45444, i.e., the “divide between Atrato and San Juan drainages near Tado [= Tadó]; trail between right bank of San Juan, opposite Tado [= Tadó] and I. Bordo [= Ibordo] in Atrato drainage,” in the department of Chocó. This locality, the northwesternmost for *L. cupreus*, is evident in the map in Albuquerque and McDiarmid (2010: fig. 5), and lies somewhere along the trail crossing the continental divide between Tadó, lying alongside the Río San Juan on the Pacific versant, and Ibordo in the drainage of the Río Atrato on the Atlantic (Caribbean) versant. The trail apparently extends from the town of Tadó at an elevation of about 75 m to that of Ibordo at approximately 100 m. This locality seems to be at the lower end of the elevational range for this species, which, according to Albuquerque and McDiarmid (2010), extends upward to some point between 1,820 and 1,880 m on Cerro de la Neblina near the southern border of Venezuela.

Fieldwork undertaken by AB documents the presence of *Leptophis cupreus* in Panama and in Mesoamerica. The specimen (MHCH 3218 [field collecting number AB 1386]; Fig. 1) came from 2 km NW of Cocalito (7°18'22.08"N, 77°59'1.31"W; WGS 84; elev. 200 m), Jaqué, Provincia de Darién, Panama; it was collected on 22 May 2016 at 1320 h by Abel Batista. This record extends the distribution of this species ca. 283 km to the NW from the divide between the Atrato and San Juan drainages near Tado (5°18'N, 76°33'W; WGS 84), Chocó, Colombia (Albuquerque and McDiarmid, 2010). The specimen is a male preserved with its hemipenis everted. The specimen was found in a Tropical and Subtropical Moist Broadleaf Forest, within the Choco-Darién moist forest ecoregion of the world (WWF, 2017); it was found in a pristine forest beside a small stream, where it was lying on a rock.



**Fig. 1.** An adult *Leptophis cupreus* from 2 km NW of Cocalito, Jaqué, Provincia de Darién, Panama.

© Abel Batista

**Acknowledgments.**—A collecting permit was provided by the Ministerio de Ambiente (# SE/A-60-16). The expedition was supported by For-Conservation Foundation of Panamanian Primates (FCPP), Panama, Mohamed bin-Zayed Species Conservation Fund, Rufford Small Grants, and NatExplorers. The purpose of the expedition was to search for a rare spider monkey (*Ateles geoffroyi griseus*). We thank Pedro Méndez Carvaljal, the leader of the expedition and principal researcher and founder of FCPP, Barbara Réthoré and Julien Chapuis from NatExplorers, Ovidio Jaramillo and Bonarjes Rodríguez for their field support, the people of the village of Cocalito for kindly receiving us and facilitating our stay during this expedition, and SENAFRONT for aquatic transportation from Puerto Quimba to Cocalito.

#### LITERATURE CITED

- ALBUQUERQUE, N. R. DE, AND R. W. MCDIARMID. 2010. Re-description of *Leptophis cupreus* (Cope) (Serpentes, Colubridae), a rare South American colubrine snake. *Papeis Avulsos de Zoologia* 50: 375–384.
- COPE, E. D. 1868. An examination of the Reptilia and Batrachia obtained by the Orton Expedition to Ecuador and the upper Amazon, with notes on other species. *Proceedings of the Academy of Natural Sciences of Philadelphia* 20: 96–140.
- MALNATE, E. V. 1971. A catalog of primary types in the herpetological collections of the Academy of Natural Sciences, Philadelphia (ANSP). *Proceedings of the Academy of Natural Sciences of Philadelphia* 123: 345–375.
- OLIVER, J. A. 1948. The relationships and zoogeography of the genus *Thalerophis* Oliver. *Bulletin of the American Museum of Natural History* 92: 157–280.
- PETERS, J. A. 1960. The snakes of Ecuador. A check list and key. *Bulletin of the Museum of Comparative Zoology* 122: 491–541.
- PETERS, J. A., AND G. ORCÉS-V. 1960. *Leptophis cupreus* Cope. A valid South American colubrid species. *Beiträge zur Neotropischen Fauna* 2: 139–141.
- WALLACH, V. K. L., WILLIAMS, AND J. BOUNDY. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. CRC Press, Taylor & Francis Group, Boca Raton, Florida, United States.

ABEL BATISTA<sup>1,2</sup> AND LARRY DAVID WILSON<sup>3</sup>

<sup>1</sup>Universidad Autónoma de Chiriquí, David 0427, Provincia de Chiriquí, Panama.  
Email: abelbatista@hotmail.com

<sup>2</sup>Fundacion Pro-Conservación de los Primates Panameños (FCPP), Panamá, 0816-07905, Republic of Panama.

<sup>3</sup>Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento Francisco Morazán, Honduras; 16010 SW 207<sup>th</sup> Avenue, Miami, Florida 33187-1056. E-mail: bufodoc@aol.com

### First record of *Tantilla moesta* (Squamata: Colubridae) from the state of Campeche, Mexico

The genus *Tantilla* ranks second in the number of snake species in the Western Hemisphere, with 63 species currently described (Wilson and Mata-Silva, 2015; Batista et al., 2016; Koch and Venegas, 2016). The Black-bellied Centipede Snake (*Tantilla moesta*) is one of the 30 species in this genus found in Mexico (Wilson and Mata-Silva, 2014); its distribution is limited to low elevations of the Yucatan Peninsula in the Mexican states of Yucatán and Quintana Roo, and the northern portion of the Guatemalan department of El Petén (Wilson, 1982; Lee, 1996, 2000; Köhler, 2008; Wilson and Mata-Silva, 2015). Lee (1996) suggested that this species likely occurs in Belize and in the Mexican state of Campeche, but to date no published records are available to confirm its presence in these areas. Herein, we present the first record of *T. moesta* from the state of Campeche.

During a herpetofaunal survey, on 11 August 2016 at ca. 2200 h, an adult individual *T. moesta* (Fig.1) was found at “Km 20,” Reserva de la Biósfera Calakmul, Municipio de Calakmul, Campeche, Mexico (18°21'59.61"N, 89°53'8.23"W; WGS 84; elev. 224 m). The snake was found in leaf litter, in undisturbed semi-evergreen tropical forest. A photograph of the snake is deposited in the University of Texas at El Paso (UTEP)'s Biodiversity

Collections, Herpetology Observations (UTEPObs:Herp:107). This voucher represents both the first record for this species and for the genus *Tantilla* in Campeche (Wilson and Mata-Silva, 2014; González-Sánchez et al., 2017), and extends the known distribution of *T. moesta* ca. 128 km to the NNE and ca. 220 km to the SW of the nearest localities from where this species previously was reported at “Paso Ceballos” in Guatemala and “18 mi S Felipe Carrillo Puerto” in Quintana Roo, Mexico, respectively (Lee, 1996). This record increases the current number of snake species reported for the state of Campeche to 52 (González-Sánchez et al., 2017).

**Acknowledgments.**—We thank Dr. Teresa J. Mayfield for kindly providing the photo voucher number. We also thank Charles Hofer for reading the manuscript and providing useful comments.



**Fig. 1.** A *Tantilla moesta* (UTEPObs:Herp:107) from “Km 20”, Reserva de la Biósfera Calakmul, Municipio de Calakmul, Campeche, Mexico. © Edgar E. Neri-Castro

#### LITERATURE CITED

- BATISTA A., K. MERBERT, S. LOTZKAT, AND L. D. WILSON. 2016. A new species of centipede snake of the genus *Tantilla* (Squamata: Colubridae) from an isolated premontane forest in eastern Panama. *Mesoamerican Herpetology* 3: 949–960.
- GONZÁLEZ-SÁNCHEZ, V. H., J. D. JOHNSON, E. GARCÍA-PADILLA, V. MATA-SILVA, D. L. DESANTIS, AND L. D. WILSON. 2017. The herpetofauna of the Mexican Yucatan Peninsula: composition, distribution, and conservation. *Mesoamerican Herpetology* 4: 264–380.
- KOCH, C., AND P. J. VENEGAS. 2016. A large and unusually colored new snake species of the genus *Tantilla* (Squamata: Colubridae) from the Peruvian Andes. *PeerJ* 4: e2767; DOI 10.7717/peerj.2767.
- KÖHLER, G. 2008. *Reptiles of Central America*. 2<sup>nd</sup> ed. Herpeton, Offenbach, Germany.
- LEE J.C. 1996. *The Amphibians and Reptiles of the Yucatan Peninsula*. Cornell University Press. Ithaca, New York, United States.
- LEE, J. C. 2000. *A Field Guide to the Amphibians and Reptiles of the Maya World: The Lowlands of Mexico, Northern Guatemala, and Belize*. Comstock Publishing Associates, Cornell University Press, Ithaca, New York, United States.
- WILSON, L. D. 1982. A review of the colubrid snakes of the genus *Tantilla* of Central America. *Milwaukee Public Museum Contributions in Biology and Geology* 52: 1–77.
- WILSON, L. D., AND V. MATA-SILVA. 2014. Snakes of the genus *Tantilla* (Squamata: Colubridae) in Mexico: taxonomy, distribution, and conservation. *Mesoamerican Herpetology* 1: 4–95.
- WILSON, L. D., AND V. MATA-SILVA. 2015. A checklist and key to the snakes of the *Tantilla* clade (Squamata: Colubridae), with comments on taxonomy, distribution, and conservation. *Mesoamerican Herpetology* 2: 417–498.

EDGAR E. NERI-CASTRO<sup>1</sup>, CARLOS MONTALBÁN-HUIDOBRO<sup>2</sup>, AND JAVIER A. ORTIZ-MEDINA<sup>3,4</sup>

<sup>1</sup>*Departamento de Medicina Molecular y Bioprocesos, Instituto de Biotecnología, Universidad Nacional Autónoma de México, Cuernavaca, Morelos, Mexico. E-mail: neri@ibt.unam.mx*

<sup>2</sup>*Facultad de Ciencias Biológicas, Universidad Autónoma del Estado de Morelos, Av. Universidad No. 1001 Col. Chamilpa, C.P. 62209, Cuernavaca, Morelos, Mexico.*

<sup>3</sup>*Campus de Ciencias Biológicas y Agropecuarias, Universidad Autónoma de Yucatán, Km. 15.5 Carr. Mérida-Xmatkuil, C.P. 97315, Mérida, Yucatán, Mexico. E-mail: javiersnake\_@hotmail.com (Corresponding author)*

<sup>4</sup>*Unidad de Manejo para la Conservación de la Vida Silvestre Tsáb Kaan, Km. 2.8 Carr. Baca-Dzemul, C.P. 97450, Baca, Yucatán, Mexico.*

## Family Dipsadidae

***Enulius flavitorques* (Cope, 1868).** MEXICO: OAXACA. Municipio de San Sebastián Tutla, El Rosario (17.039125°N, -96.684816°W; datum WGS 84); elev. 1,608 m; 25 August 2017; Francisco Ramírez-Jiménez and César Mayoral-Halla. This individual (photo voucher UTEPObs:Herp:121; Fig. 1) represents a new municipality record, as well as the first record for the Valles Centrales de Oaxaca physiographic region (see Mata-Silva et al., 2015), with the closest reported locality ca. 107 km (straight line) to the SE at a locality cited as “54 mi WNW Tehuantepec (24 mi NW Tequisistlán) on highway 190” (TNHC 86889). The snake was found under an old carpet, in an empty lot located in the southern part of town. The lot is surrounded by houses, and contained patches of grass and herbaceous plants. The photo voucher is deposited in the University of Texas at El Paso (UTEP)’s Biodiversity Collections.



**Fig. 1.** An *Enulius flavitorques* (UTEPObs:Herp:121) from El Rosario, Municipio de San Sebastián Tutla, Oaxaca, Mexico.

© Francisco Ramírez-Jiménez

**Acknowledgments.**—A special thanks goes to Teresa Mayfield, who kindly provided the photo voucher number. The collecting permit (SGPA/DGVS/04287/16) was issued by SEMARNAT to ARB with extensions to VMS, and EGP.

## LITERATURE CITED

MATA-SILVA, V., J. D. JOHNSON, L. D. WILSON, AND E. GARCÍA-PADILLA. 2015. The herpetofauna of Oaxaca, Mexico: composition, physiographic distribution, and conservation status. *Mesoamerican Herpetology* 2: 6–62.

FRANCISCO RAMÍREZ-JIMÉNEZ<sup>1</sup>, CÉSAR MAYORAL-HALLA<sup>2</sup>, ELÍ GARCÍA-PADILLA<sup>3</sup>, VICENTE MATA-SILVA<sup>4</sup>, AND AURELIO RAMÍREZ-BAUTISTA<sup>5</sup>

<sup>1</sup>Calle Cruz del Río, Fraccionamiento Santa Cruz Amilpas, C.P. 71226, Oaxaca, Mexico. E-mail: francisco\_rj@live.com.mx

<sup>2</sup>Calle Emiliano Zapata, Colonia Reforma Oaxaca, C.P. 68050, Oaxaca, Mexico. E-mail: bordadosmayoreo@gmail.com

<sup>3</sup>Oaxaca de Juárez, Oaxaca, C.P. 68023, Mexico. E-mail: quetzalcoatl86@gmail.com

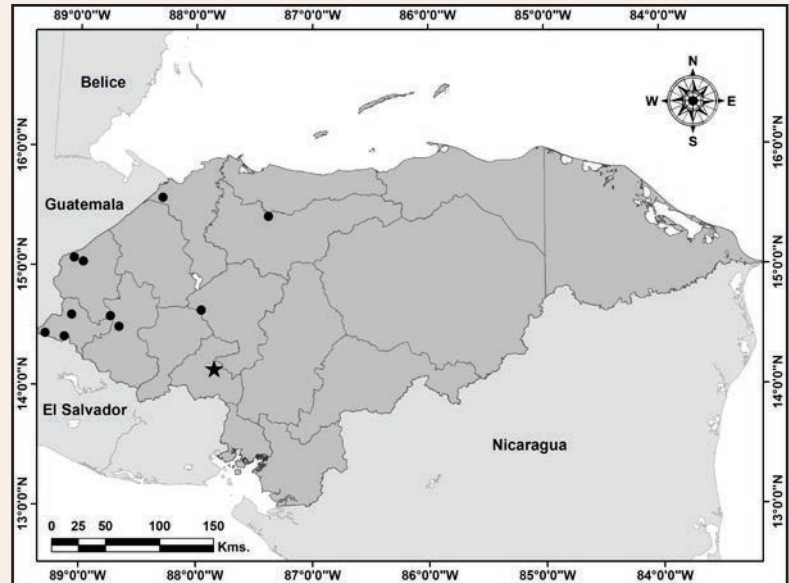
<sup>4</sup>Department of Biological Sciences, The University of Texas at El Paso, El Paso, Texas 79968-0500, United States. E-mail: vmata@utep.edu

<sup>5</sup>Centro de Investigaciones Biológicas, Instituto de Ciencias Básicas e Ingeniería, Universidad Nacional Autónoma del Estado de Hidalgo, Carretera Pachuca-Tulancingo Km 4.5, Colonia Carboneras, C.P. 42184, Mineral de la Reforma, Hidalgo, Mexico. E-mail: ramibautistaa@gmail.com

## Family Dipsadidae

***Rhadinella montecristi* (Mertens, 1952).** The Monte Cristo Graceful Brownsnake (*Culebra Marrón de Monte Cristo*), *Rhadinella montecristi*, is distributed in El Salvador, Guatemala, and Honduras, at elevations from 1,370 to 2,620 m (McCranie, 2011). Considering that the known localities of this species are isolated from one another, Wilson et al. (2014) reported the extent of occurrence of this species as 18,000 km<sup>2</sup>. In Honduras, *R. montecristi* has been reported from the departments of Comayagua, Copán, Cortés, Lempira, Ocotepeque, and Yoro (McCranie, 2011). Here we report a new departmental record of *R. montecristi* from the country.

On 19 March 2016, while on a dry season field trip to Reserva Biológica Guajiquiro, at Quesuntega, Municipio de Guajiquiro, Departamento de La Paz, Honduras (14°08'13.3"N, 87°50'36.8"W; WGS 84; elev. 2,141 m; Fig. 1), we encountered an individual of *R. montecristi* (MZUCR 22894). The snake was found in the morning, under tree bark at a height of 1.5 m above the ground. The measurements for the snake, a subadult male, were as follows: snout–vent length 300 mm; tail length 200 mm; and total length 500 (Fig. 2). This record represents a distributional extension of ca. 55 km (straight-line distance) to the SSE of the nearest reported locality in the department of Comayagua.



**Fig. 1.** Known localities for *Rhadinella montecristi* in Honduras (black dots) and the new record (star) from Reserva Biológica Guajiquiro, Quesuntega, Municipio de Guajiquiro, Departamento de La Paz, Honduras. Map courtesy of Jorge Funez.



**Fig. 2.** A *Rhadinella montecristi* (MZUCR 22894) from Reserva Biológica Guajiquiro, Quesuntega, Municipio de Guajiquiro, Departamento de La Paz, Honduras. Dorsal (A) and ventral (B) ventral views of the snake showing the coloration.

© Mario Espinal

**Acknowledgments.**—Fieldwork was completed under ICF permits and Resolución DE-MP-095-2014 and Dictamen ICF-DVS-112-2014. The specimen was deposited at the Museo de Zoología, Universidad de Costa Rica (MZUCR).



## LITERATURE CITED

- MCCRANIE, J.R. 2011. The Snakes of Honduras: Systematics, Distribution, and Conservation. Contributions to Herpetology, Volume 26, Society for the Study of Amphibians and Reptiles, Ithaca, New York, United States.
- WILSON, L. D., J. H. TOWNSEND, AND I. LUQUE. 2014. *Rhadinella montecristi*. The IUCN Red List of Threatened Species 2014 (www.doi.org/10.2305.IUCN.UK.2014-1.RLTS.T202418.A2744216.en; accessed 25 March 2016).

MARIO ESPINAL<sup>1</sup>, JOSÉ MARIO SOLÍS<sup>2,3</sup>, AND JOSÉ M. MORA<sup>4</sup>

<sup>1</sup>Centro Zamorano de Biodiversidad (CZB), Escuela Agrícola Panamericana Zamorano, Depto. de Francisco Morazán, Tegucigalpa, Honduras. E-mail: mknorops@yahoo.com (Corresponding author)

<sup>2</sup>Facultad de Ciencias, Escuela de Biología, Universidad Nacional Autónoma de Honduras, Depto. de Francisco Morazán, Tegucigalpa, Honduras. E-mail: jm9biol@yahoo.es

<sup>3</sup>Red Mesoamericana y del Caribe para la Conservación de Anfibios y Reptiles (MesoHERP)

<sup>4</sup>Instituto Internacional en Conservación y Manejo de Vida Silvestre (ICOMVIS), Universidad Nacional (UNA), Heredia, Costa Rica

***Sibon dimidiatus* (Günther, 1872).** MEXICO: VERACRUZ: Municipio de Naranjal, Naranjal (18°48'01.2"N, 96°57'07.7"W) elev. 660 m; 24 September 2016; Roberto Mora-Gallardo and Angel I. Contreras-Calvario. The individual was found and photographed in a coffee plantation (*Coffea arabica*) at 0100 h, where the surrounding vegetation consisted of tropical semi-deciduous forest. A photograph of the individual is deposited in the Colección Nacional de Anfibios y Reptiles de la Universidad Nacional Autónoma de México (IBH-RF-436; Fig. 1). This voucher represents a new municipality record and fills a gap in the known distribution, with the closest reported localities at 45 km (air distance) to the S in the vicinity of Tlacotepec de Porfirio Díaz, Puebla (Gutiérrez-Mayén et al., 2011), and ca. 280 km to the N near Los Naranjos, Veracruz (Kofron, 1990).



Fig. 1. A *Sibon dimidiatus* (IBH-RF-436) from Naranjal, Municipio de Naranjal, Veracruz, Mexico.

© Ángel I. Contreras-Calvario

## LITERATURE CITED

- GUTIÉRREZ-MAYÉN, G., L. CANSECO-MÁRQUEZ, U. O. GARCÍA-VÁZQUEZ, AND C. HERNÁNDEZ-JIMÉNEZ. 2011. Anfibios y reptiles. Pp. 152–158 *In* La Biodiversidad de Puebla: Estudio de Estado. Comisión Nacional para el Conocimiento u Uso de la Biodiversidad, México, D.F, Gobierno del Estado Puebla, Puebla, and Benemérita Universidad Autónoma de Puebla, Puebla, Mexico.
- KOFRON, C. 1990. Systematics of Neotropical gastropod-eating snakes: the *dimidiatus* group of the genus *Sibon*, with comments on the *nebulata* group. *Amphibia-Reptilia*. 11: 207–223.

ÁNGEL IVÁN CONTRERAS-CALVARIO<sup>1,2</sup>, NELSON MARTIN CERÓN-DE LA LUZ<sup>2</sup>, ROBERTO MORA-GALLARDO<sup>3</sup>, AND VÍCTOR H. JIMÉNEZ-ARCOS<sup>4</sup>

<sup>1</sup>Universidad Veracruzana, Facultad de Ciencias Biológicas y Agropecuarias, Campus Peñuela, Camino Peñuela-Amatlan, S/N Peñuela Amatlan de los Reyes, Veracruz, C.P. 94945, Mexico. E-mail: acontrerascalvario@gmail.com

<sup>2</sup>Herpetario Palancoatl, Av.19 No.5225, Col. Nueva Esperanza, Córdoba, Veracruz, Mexico.

<sup>3</sup>Estacion Ambiental Tequecholapa, calle Maravillas S/N, Naranja, Veracruz, C.P. 94880, Mexico.

<sup>4</sup>Laboratorio de Ecología, UBIPRO, FES Iztacala, Universidad Nacional Autónoma de México. Av. de los Barrios No. 1, Los Reyes Iztacala, Tlalnepantla, México, C.P. 54090, Mexico. E-mail: biol.victor.jimenez@comunidad.unam.mx

## Family Viperidae

***Crotalus intermedius* (Troschel, 1865).** MEXICO: HIDALGO: Municipio de Omitlán de Juárez (20.126504°N, -98.583045°W; WGS 84); elev. 2,681 m; 21 July 2017; Raúl Hernández-Jandete. The snake was found resting on the ground in a slope covered with oak chaparral. The measurements and weight of the snake were as follows: snout–vent length = 490 mm; tail length = 40 mm; and body mass = 118 g. The snake was photographed and released where it was found. A photo voucher (CH-CIB 92; Fig.1) is deposited in the photographic collection of the herpetological collection of the Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo. This voucher represents a new municipality record, with the closest published locality at ca. 4.76 km to the S (airline distance) in the vicinity of Ejido Sierra de las Navajas, Municipio de Singuilucan, Hidalgo (CH-CIB 37; see Fernández-Badillo et al., 2016).



**Fig 1.** An adult *Crotalus intermedius* (CH-CIB 92) from Municipio de Omitlán de Juárez, Hidalgo, Mexico.

© Raúl Hernández-Jandete

**Acknowledgments.**—A special thanks goes to Gustavo A. Rivera-Milanés for providing the photographic equipment, and to Irene Goyenechea for allowing us to deposit the photo in the photographic collection of the Herpetological Collection of the Centro de Investigaciones Biológicas. The fieldwork was conducted under collecting permit SGPA/DGVS/09687/16.

### LITERATURE CITED

FERNÁNDEZ-BADILLO, L., C.R. OLVERA-OLVERA, AND F. TORRES-ANGELES. 2016. Distribution Notes. *Crotalus intermedius* (Troschel, 1865). Mesoamerican Herpetology 3: 526–527.

**RAÚL HERNÁNDEZ-JANDETE<sup>1</sup>, LEONARDO FERNÁNDEZ-BADILLO<sup>1,2</sup>, ARNOLD IBARRA-BAUTISTA<sup>1</sup>, AND CRISTIAN RAÚL OLVERA-OLVERA<sup>3</sup>**

<sup>1</sup>*Centro de Investigaciones Biológicas (CIB), Universidad Autónoma del Estado de Hidalgo, Ciudad del Conocimiento, Km 4.5 carretera Pachuca-Tulancingo, Col. Carboneras, 42181 Mineral de la Reforma, Hidalgo, Mexico. E-mail: fernandezbadillo80@gmail.com (LFB, Corresponding author)*

<sup>2</sup>*Predio Intensivo de Manejo de Vida Silvestre X-Plora Reptilia, Reina de la Esperanza # 107. Carretera México-Tampico s/n, Pilas y granadas, 43350, Metztitlán, Hidalgo, Mexico. E-mail: xplorareptilia@hotmail.com*

<sup>3</sup>*Laboratorio de Morfología Animal, Centro de Investigaciones Biológicas (CIB), Universidad Autónoma del Estado de Hidalgo, Ciudad del Conocimiento, Km 4.5 carretera Pachuca-Tulancingo, Col. Carboneras, 42181 Mineral de la Reforma, Hidalgo, Mexico.*

## New herpetofaunal distribution records for the state of Oaxaca, Mexico

In our effort to increase the knowledge of the distribution of the Oaxacan herpetofauna, herein we provide new municipality records for 14 species in the state, and also include information on the natural history of some species. Photo vouchers are deposited at the University of Texas at El Paso (UTEP)'s Biodiversity Collections (Herpetology Observations), and collected specimens are deposited in the herpetological collection of the Centro de Investigaciones Biológicas (CIB) of the Universidad Autónoma del Estado de Hidalgo.

### Amphibia: Anura

### Family Bufonidae

***Rhinella horribilis* Wiegmann, 1833.** MEXICO: OAXACA. Municipio de San Bartolo Coyotepec, ca. 820 m S of Presa La Candelaria (16.947955°N, -96.680849°W; datum WGS 84); elev. 1,600 m; 6 October 2016; Pablo Rogelio Simón-Salvador. A second individual was found ca. 800 m N of Presa La Candelaria (16.961191°N, -96.677236°W; datum WGS 84); elev. 1,618 m; 18 June 2017; Arturo Rocha. These individuals (photo voucher UTEPObs:Herp:108, UTEPObs: Herp:109; Fig. 1A and 1B, respectively) represent a new municipality record, with the closest reported locality ca. 11.6 km (straight line) to the NW in the vicinity of Nazareno, Municipio de Santa Cruz Xoxocotlán (Calderón-Patrón et al., 2012); this record is of a toad found on pellets regurgitated by a Barn Owl (*Tyto alba*). As far we are aware, our records represent the second municipality for this species in the Valles Centrales de Oaxaca (VCO) physiographic region (see Mata-Silva et al., 2015). Both individuals were found in secondary vegetation, in what formerly consisted of thorn scrub woodland.

### Family Eleutherodactylidae

***Eleutherodactylus syristes* (Hoyt, 1965).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, ca. 2 km E of Santa Catarina Juquila (16.235446°N, -97.273292°W; datum WGS 84); elev. 1,537 m; 14 June 2017; Eduardo Mata-Silva, Dominic L. DeSantis, Elí García-Padilla, Larry David Wilson, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:110; Fig. 1C) represents a new municipality record, filling a gap between the closest reported localities at ca. 14 km (straight line) to the E from a locality cited as “approx. 8.2 km S of turn-off to Santa Catarina Juquila (MZFC 21686-7)” in Municipio de San Juan Lachao, and ca. 106 km to the WNW at a locality cited as “Road between Putla and Pinotepa, 12.3 km S of Putla (MZFC 23938)” (García-Vázquez et al., 2016). The individual was found under a rock along a creek at 1320 h, in an area that formerly consisted of pine-oak forest but recently was replaced by a cornfield.

### Family Rhinophrynidae

***Rhinophrynus dorsalis* Duméril & Bibron, 1841.** MEXICO: OAXACA. Municipio de San Pedro Mixtepec, San Pedro Mixtepec (15.979169°N, -97.075114°W; datum WGS 84); elev. 250 m; 17 June 2017; Dominic L. DeSantis, Elí García-Padilla, Eduardo Mata-Silva, Larry David Wilson, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:111; Fig. 1D) represents a new municipality record, with the closest reported locality ca. 33 km (straight line) to the W, at a locality cited as “8 km E of Río Grande”, Municipio de Villa de Tututepec de Melchor Ocampo (Webb and Baker, 1969). The toad was found during a heavy rain at 2308 h, among hundreds of other individuals that were calling, in a seasonal pond (ca. 15 m in diameter) located in an urban lot surrounded by several concrete houses; we also saw adults of *Smilisca baudinii*, *Trachycephalus typhonius*, and *Kinosternon oaxacae*. Sadly, the pond is likely to disappear in the near future.

### Reptilia: Squamata (lizards)

#### Family Sphenomorphidae

***Sphenomorphus assatus* Cope, 1864.** MEXICO: OAXACA. Municipio de Villa de Sola de Vega, near La Cumbre (16.462249°N, -97.011741°W; datum WGS 84); elev. 2,079 m; 23 June 2017; Elí García-Padilla, Eduardo Mata-Silva, Arturo Rocha, Larry David Wilson, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This voucher (CIB-5115; Fig. 1E) represents a new municipality record, and also the first record for the Montañas y Valles del Occidente physiographic region (Mata-Silva et al., 2015), with the closest reported locality ca. 33 km (straight line) to the S near the vicinity of Santa Rosa, Municipio de San Juan Lachao. The individual, an adult gravid female, was found under a log in pine-oak forest; four days later she deposited two eggs, each measuring 12 × 6 mm.

### Reptilia: Squamata (snakes)

#### Family Colubridae

***Drymobius chloroticus* (Cope, 1886).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, ca. 5 km (straight line) E of Santa Catarina Juquila (16.241427°N, -97.243522°W; datum WGS 84); elev. 1,969 m; 17 June 2017; Elí García-Padilla, Dominic L. DeSantis, Larry David Wilson, Eduardo Mata-Silva, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:112; Fig. 1F) was found dead on a road (DOR) through pine-oak forest. This voucher represents a new municipality record, with the closest record ca. 10 km (straight line) to the ENE at a locality cited as “25.2 km N of San Gabriel Mixtepec” (KUH-137657; Vert.Net, 2017).

***Leptophis diplotropis* (Günther, 1872).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, ca. 4.4 km (straight line) E of Santa María Yolotepec (16.246720°N, -97.216123°W; datum WGS 84); elev. 2,154 m; 17 June 2017; Elí García-Padilla, Dominic L. DeSantis, Larry David Wilson, Eduardo Mata-Silva, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual was found DOR in pine-oak forest (photo voucher UTEPObs:Herp:113; Fig. 1G), and represents a new municipality record, with the closest report ca. 28 km (straight line) to the SE at a locality cited as “11.6 km N of San Pedro Mixtepec” (KUH 137645; Vert.Net, 2017).

***Leptophis diplotropis* (Günther, 1872).** MEXICO: OAXACA. Municipio de San Juan Lachao, near Cerro del Vidrio (16.248279°N, -97.149311°W; datum WGS 84); elev. 1,824 m; 17 June 2017; Elí García-Padilla, Dominic L. DeSantis, Larry David Wilson, Eduardo Mata-Silva, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual was found DOR (photo voucher UTEPObs:Herp:114; Fig. 1H) and represents a new municipality record, filling a gap between the locality cited as “11.6 km N of San Pedro Mixtepec” (KUH 137645; Vert.Net, 2017) and the record from near Santa María Yolotepec (Municipio de Santa Catarina Juquila) cited herein.

***Salvadora mexicana* (Duméril, Bibron & Duméril, 1854).** MEXICO: OAXACA. Municipio de San Juan Lachao, Lachao 3 (16.209611°N, -97.108018°W; datum WGS 84); elev. 1,825 m; 16 June 2017; Dominic L. DeSantis, Elí García-Padilla, Larry David Wilson, Eduardo Mata-Silva, Julio Cesar Bolán-Mata, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:115; Fig. 1I) represents a new municipality record, with the closest reported locality ca. 35 km (straight line) to the S in the vicinity of Puerto Escondido, Municipio de San Pedro Mixtepec (Mata-Silva et al., 2012). The snake was found in cloud forest under a pile of old metal sheets. This new locality also represents an elevational record for this species, with the previously known maximum elevation reported as 1,200 m (Wilson and Johnson, 2010).

***Tantilla rubra* Cope, 1863.** MEXICO: OAXACA. Municipio de San Gabriel Mixtepec, ca. 2.5 km (straight line) NE of San Gabriel Mixtepec (16.057500°N, -97.077839°W; datum WGS 84); elev. 860 m; 17 June 2017; Dominic L. DeSantis, Elí García-Padilla, Eduardo Mata-Silva, Larry David Wilson, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:116; Fig. 1J) was found DOR in an area containing remnants of tropical dry forest. This voucher represents a new municipality record, with the closest records ca. 12.3 km (straight line) to the S in the vicinity of Santa Rosa, Municipio de San Juan Lachao (UCM-52611-12; see Wilson and Mata-Silva, 2014).

### Family Dipsadidae

***Imantodes gemmistratus* (Cope, 1861).** MEXICO: OAXACA. Municipio de San Gabriel Mixtepec, ca. 5 km (straight line) S of San Gabriel Mixtepec (16.050522°N, -97.072654°W; datum WGS 84); elev. 742 m; 17 June 2017; Dominic L. DeSantis, Elí García-Padilla, Eduardo Mata-Silva, Larry David Wilson, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp: 117; Fig. 1K) represents a new municipality record, with the closest reported locality ca. 68 km (straight line) to the ESE at a locality cited as “6 km N of Pochutla” (LSUMZ 39536; Vert.Net, 2017). The snake was found DOR in an area containing remnants of tropical dry forest.

***Leptodeira maculata* (Hallowell, 1861).** MEXICO: OAXACA. Municipio de San Pedro Mixtepec, ca. 7 km (straight line) N of San Pedro Mixtepec (16.047013°N, -97.0733144°W; datum WGS 84); elev. 744 m; 17 June 2017; Dominic L. DeSantis, Elí García-Padilla, Eduardo Mata-Silva, Larry David Wilson, and Vicente Mata-Silva. This individual (photo voucher UTEPObs:Herp:118; Fig. 1L) represents a new municipality record, with the closest reported locality ca. 16 km (straight line) to the SW at a locality cited as “17.8 km NW of Puerto Escondido” (KUH 137630; Vert.Net, 2017), in Municipio de Villa de Tututepec de Melchor Ocampo. The snake was found DOR in an area containing remnants of tropical dry forest.

***Tropidodipsas philippii* (Jan, 1863).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, ca. 3.8 km (straight line) E of Santa Catarina Juquila (16.239551°N, -97.254115°W; datum WGS 84), elev. 1,812 m.; 17 June 2017. Dominic L. DeSantis, Elí García-Padilla, Larry David Wilson, and Vicente Mata-Silva. The specimen (CIB-5114; Fig. 1M) is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo. The snake was found DOR in pine-oak forest and represents a new municipality record, with the closest reported locality ca. 17.4 km (straight line) to the ESE at a locality listed as Río Sal, Municipio de San Juan Lachao (Kofron, 1987).

### Family Leptotyphlopidae

***Epictia phenops* (Cope, 1875).** MEXICO: OAXACA. Municipio de San Pedro Juchatengo, 2.3 km NE of La Cruz (16.321831°N, -97.113286°W; datum WGS 84), elev. 1,183 m.; 14 June 2016; Larry David Wilson, Vicente Mata-Silva, Elí García-Padilla, and Dominic DeSantis. The specimen (CIB-5091; Fig. 1N) is deposited in the

herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo. The snake was found crossing a paved road through secondary tropical dry forest at 1120 h, and represents a new municipality record.

### Family Viperidae

***Crotalus simus* Latreille, 1801.** MEXICO: OAXACA. Municipio de San Pedro Totolápam, ca. 12.4 km (straight line) ENE of San Pedro Totolápam (16.707132°N, -96.193000°W; datum WGS 84); elev. 1,025 m; 4 June 2017; César Mayoral-Halla and Brenda Fernanda Montiel-Altamirano. This individual (photo voucher UTEPObs:Herp:119; Fig. 1O) represents a new municipality record and also the first record for the Montañas y Valles del Centro physiographic region (see Mata-Silva et al., 2015), with the closest reported locality ca. 127 km (straight line) to the E at a locality cited as “10 road miles S of Lagunas” (LSUMZ 79901; Vert.Net, 2017). The snake was found crossing a dry creek in tropical dry forest, near an illegal dumping site.



**Fig. 1.** Species and the municipalities where they were collected: (A, B) *Rhinella horribilis* from San Bartolo Coyotepec; (C) *Eleutherodactylus syristes* from Santa Catarina Juquila; (D) *Rhinophrynus dorsalis* from San Pedro Mixtepec; (E) *Sphenomorphus assatus* from Villa de Sola de Vega; (F) *Drymobius chloroticus* from Santa Catarina Juquila; (G) *Leptophis diplotropis* from Santa Catarina Juquila; (H) *Leptophis diplotropis* from San Juan Lachao; (I) *Salvadora mexicana* from San Juan Lachao; (J) *Tantilla rubra* from San Gabriel Mixtepec; (K) *Imantodes gemmistratus* from San Gabriel Mixtepec; (L) *Leptodeira maculata* from San Pedro Mixtepec; (M) *Tropidodipsas philippii* from Santa Catarina Juquila; (N) *Epictia phenops* from San Pedro Juchatengo; and (O) *Crotalus simus* from San Pedro Totolápam.

© Pablo Rogelio Simón-Salvador (A), Arturo Rocha (B), Vicente Mata-Silva (C–N), and César Mayoral-Halla (O)

**Acknowledgments.**—We especially thank Eduardo Mata-Silva and Julio Cesar Bolán-Mata for their invaluable assistance in the field, the Bolán-Mata family for their generous hospitality, and Raciél Cruz-Elizalde, Christian Berriozabal-Islas, and José Daniel Lara-Tufiño for logistical support. The collecting permit (SGPA/DGVS/04287/16) was issued by SEMARNAT to ARB with extensions to VMS, EGP, DLD, AR, and LDW. Irene G. Mayer-Goyenechea and Theresa Mayfield kindly provided the voucher and photo voucher numbers, respectively.

## LITERATURE CITED

- CALDERÓN-PATRÓN, J. M., J. VALENCIA-HERVERTH, R. LURÍA-MANZANO, AND L. ANDRÉS-PÉREZ. 2012. Natural History Notes. *Rhinella marina* (Cane Toad). Predation. Herpetological Review 43: 125.
- GARCÍA-VÁZQUEZ, U. O., T. J. DEVITT, A. NIETO-MONTES DE OCA, S. M. ROVITO, I. CAVIEDES-SOLIS, AND G. PARRA-OLEA. 2016. New occurrence records of *Eleutherodactylus syristes* in Guerrero and Oaxaca, Mexico. *Revista Mexicana de Biodiversidad* 87: 1,149–1,152.
- KOFRON, C. P. 1987. Systematics of Neotropical gastropod-eating snakes: the *fasciata* group of the genus *Sibon*. *Journal of Herpetology* 21: 210–225.
- MATA-SILVA, V., J. D. JOHNSON, L. D. WILSON, AND E. GARCÍA-PADILLA. 2015. The herpetofauna of Oaxaca, Mexico: composition, physiographic distribution, and conservation status. *Mesoamerican Herpetology* 2: 6–62.
- MATA-SILVA, V., J. GARCÍA-GRAJALES, AND J. D. JOHNSON. 2012. Geographic Distribution. *Salvadora mexicana* (Mexican Patch-nosed Snake). *Herpetological Review* 43: 622–623.
- VERT.NET. 2017. ([www.vernet.org](http://www.vernet.org); accessed 25 July 2017).
- WEBB, R. G., AND R. H. BAKER. 1969. Vertebrados terrestres del suroeste de Oaxaca. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México* 40, Serie Zoología 1: 139–152.
- WILSON, L. D., AND J. D. JOHNSON. 2010. Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot. Pp. 31–235 *In* L. D. Wilson, J. H. Townsend, and J. D. Johnson (Eds.), *Conservation of Mesoamerican Amphibians and Reptiles*. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.
- WILSON, L. D., AND V. MATA-SILVA. 2014. Snakes of the genus *Tantilla* (Squamata: Colubridae) in Mexico: taxonomy, distribution, and Conservation. *Mesoamerican Herpetology* 1: 5–95.

VICENTE MATA-SILVA<sup>1</sup>, ELÍ GARCÍA-PADILLA<sup>2</sup>, DOMINIC L. DESANTIS<sup>1</sup>, ARTURO ROCHA<sup>1</sup>, LARRY DAVID WILSON<sup>3</sup>, PABLO ROGELIO SIMÓN-SALVADOR<sup>4</sup>, CÉSAR MAYORAL-HALLA<sup>5</sup>, BRENDA FERNANDA MONTIEL-ALTAMIRANO<sup>5</sup>, AND AURELIO RAMÍREZ-BAUTISTA<sup>6</sup>

<sup>1</sup>Department of Biological Sciences, The University of Texas at El Paso, El Paso, Texas 79968-0500, United States. E-mails: vmata@utep.edu, turyrocha@gmail.com, and dlidesantis@miners.utep.edu

<sup>2</sup>Oaxaca de Juárez, Oaxaca, C.P. 68023. Mexico. E-mail: quetzalcoat186@gmail.com

<sup>3</sup>Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, Honduras. 16010 SW 207<sup>th</sup> Avenue, Miami, Florida 33187-1056, United States. E-mail: bufodoc@aol.com

<sup>4</sup>Laboratorio de Investigación en Reproducción Animal, Universidad Autónoma Benito Juárez de Oaxaca de Juárez, Oaxaca, C.P. 68000, Oaxaca, Mexico. E-mail: rogeliosimonsalvador@gmail.com

<sup>5</sup>Calle Emiliano Zapata, Colonia Reforma Oaxaca, C.P. 68050, Oaxaca, Mexico. E-mail: bordadosmayoreo@gmail.com

<sup>6</sup>Centro de Investigaciones Biológicas, Instituto de Ciencias Básicas e Ingeniería, Universidad Nacional Autónoma del Estado de Hidalgo, Carretera Pachuca-Tulancingo Km 4.5, Colonia Carboneras, C.P. 42184, Mineral de la Reforma, Hidalgo, Mexico. E-mail: ramibautistaa@gmail.com

# MISCELLANEOUS NOTES

## Rediscovery of *Bromeliohyala dendroscarta* at the type locality: a threatened treefrog surviving in a highly human modified landscape in Mexico

The lack of sightings or records for certain amphibian species has led several organizations to propose lists of species that must be sought in nature, because they require urgent protection. The Amphibian Survival Alliance (ASA) listed 251 species that have not been recorded for over 10 years (in some cases nearly two centuries) and called them “lost species.” In recent years, 30 of these 251 species have been rediscovered (ASA, 2017). The International Union for Conservation of Nature (IUCN) lists 113 species of amphibians that have not been recorded from between 10 and 90 years, which IUCN has tagged as Possibly Extinct or Possibly Extinct in Wild (IUCN, 2017). Although 92 of 113 species (81.4%) in this list were evaluated between 2004 and 2008, more recent assessments are necessary to more accurately determine the number of species that should be given this status. For its part, the EDGE (Evolutionary Distinct and Globally Endangered) of Existence program, launched by the Zoological Society of London, proposed a list of 799 species of amphibians in need of urgent protection; these species are characterized by their unique evolutionary histories, and all are highly threatened with extinction (ZSL, 2008).

The failure to observe or record a species might have resulted from its disappearance at known collection sites or from a decline in its populations. Such results, however, also can be related to such methodological problems as applying limited or insufficient search efforts, the difficulty in reaching historical collection sites, using an inadequate search method with respect to the particular habits of a species, dynamic breeding phenologies (Delia et al., 2013), or difficulties in detecting a species because of its body size (Lee et al., 2016).

In Mexico, the IUCN considers 27 species of amphibians as Possibly Extinct, the ASA regards 34 as Lost Species, and the EDGE program lists 93 as priority species for conservation. In total, 112 species of Mexican amphibians (29%) are included in at least one of these lists (ZSL, 2008; ASA, 2017; IUCN, 2017). In recent years, fieldwork in different areas of Mexico has resulted in the rediscovery of at least 10 amphibian species from these lists, including seven anuran (Heimes and Aguilar, 2011; Delia et al., 2013; Caviedes-Solis et al., 2015; Barrio-Amorós et al., 2016; Grünwald et al., 2016) and three caudate (Rovito, 2010; Sandoval-Comte et al., 2012) species.

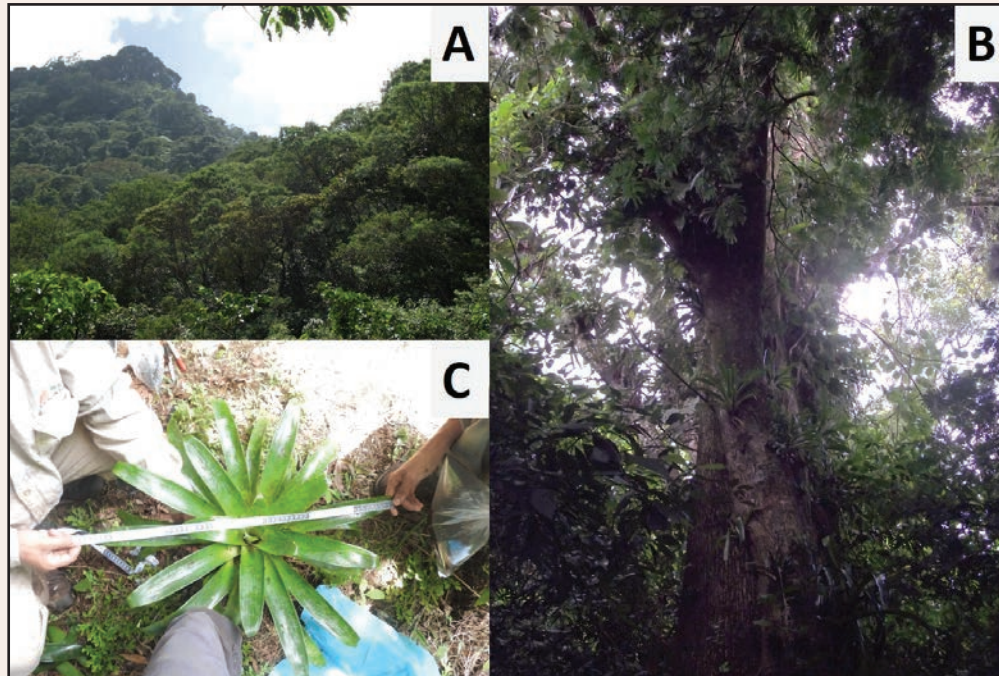
One of the species included in the ASA, IUCN, and EDGE lists is *Bromeliohyala dendroscarta* (Taylor, 1940), a small treefrog (maximum snout–vent length [SVL] = 34.6 mm) that inhabits cloud forest, and in which egg deposition and the development of the tadpoles takes place in bromeliads (Duellman, 2001). This species is endemic to Mexico and occurs in the mountainous region of central Veracruz and northern Oaxaca, at elevations from 450 to 1,900 m (Duellman, 2001; Frost, 2017). *Bromeliohyala dendroscarta* has been assessed as Critically Endangered (CR) by the IUCN (Santos-Barrera and Canseco-Márquez, 2004), and is listed as Subject to Special Protection (Pr) in the Mexican government’s threatened species list (SEMARNAT, 2010). Deforestation and disturbance of the cloud forest occupied by this species (Duellman, 2001) apparently are major threats to its persistence, and because it has not been found in suitable habitats since 1974 (Santos-Barrera and Canseco-Márquez, 2004; ASA, 2017; IUCN, 2017) the chytrid fungus, *Batrachochytrium dendrobatidis*, has been suggested as a relevant threat to its survival (Santos-Barrera and Canseco-Márquez, 2004).

As noted above, although *B. dendroscarta* reportedly was last seen in 1974, recent reports of its occurrence are available for some localities. Ramírez-Bautista et al. (2010, 2014) and Hernández-Salinas and Ramírez-Bautista (2012) reported this species from the state of Hidalgo, in localities north of its known distribution; in a footnote, however, Lamoreux et al. (2015: 121) noted that although Hernández-Salinas and Ramírez-Bautista (2015) reported finding four individuals in cloud forest during surveys in 2007–2008, they were “unable to judge the veracity of these claims.” Cabrera-Guzman and Reynoso (2012: 3,252) listed “*Bromeliohyala cf. dendroscarta*” from San Andrés Tuxtla, Veracruz, perhaps because Duellman (1970: 436) noted that specimens from this area at the KU museum “are poorly preserved and formalin blackened,” and thus Duellman was “not certain that they belong with this species.” Hernández-Benítez et al. (2012) reported the rediscovery of *B. dendroscarta*, in the Sierra Negra of Puebla, a new state record for this species. Conversely, *B. dendroscarta* was not recorded in searches conducted by



Lips et al. (2004) and Delia et al. (2013) in historical localities in Oaxaca, and by Cerón-de la Luz et al. (2016) at the type locality in Cuautlapan, Veracruz.

As part of a study on ecology and conservation of amphibians in central Veracruz, in 2010 and 2015 we conducted searches on Cerro Chicahuaxtla, Cuautlapan, Municipio de Ixtaczoquitlan. Cerro Chicahuaxtla currently is covered by fragmented cloud forest, in addition to secondary vegetation and shaded coffee plantations in the upper and intermediate levels (Fig. 1A), while chayote, sugarcane plantations, and human settlements dominate the lower level. Historically, Cuautlapan has been a locality for collecting amphibians; 28 species have been recorded from this area, mostly by Edward Taylor and Hobart Smith, but more recently by different authors (see Cerón-de la Luz et al., 2016).

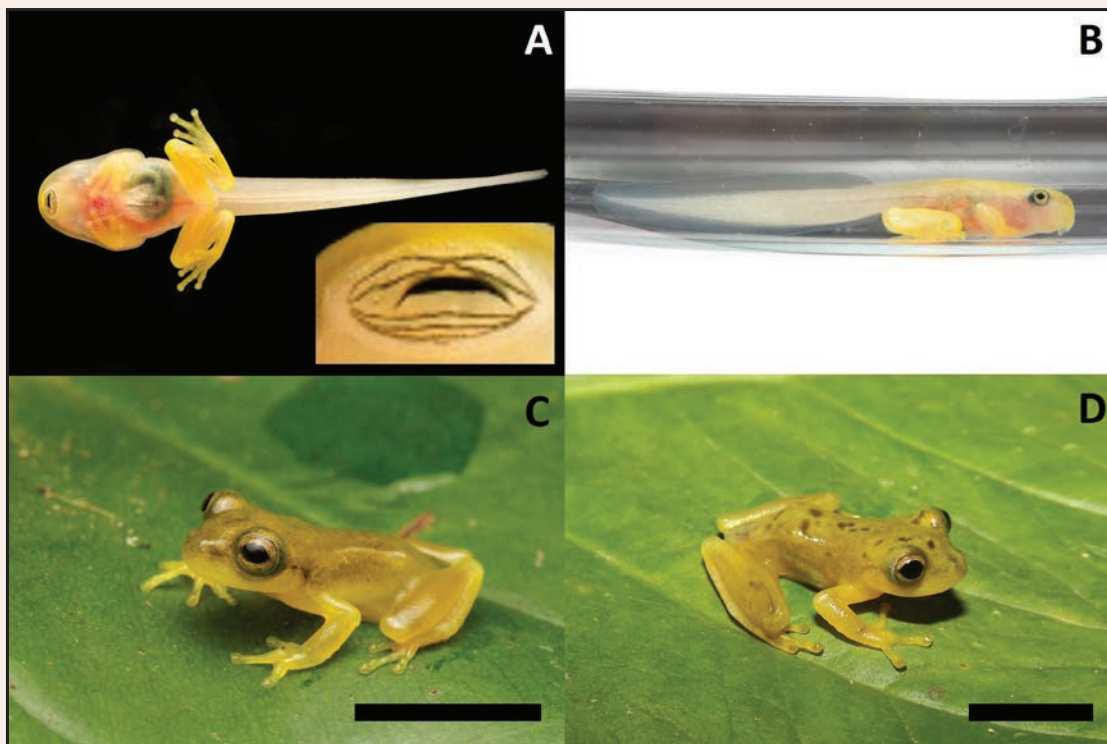


**Fig. 1.** Cerro Chicahuaxtla, Cuautlapan, Municipio de Ixtaczoquitlan, Veracruz: (A) Panoramic view of the habitat; (B) location of the bromeliads in the sampled trees; and (C) a bromeliad (*Tillandsia* sp.) in which egg clutches and tadpoles of *Bromeliohyala dendroscarta* were found. © Adriana Sandoval-Comte (A, B) and Paulina García-Bañuelos (C)

Our sampling method for recording amphibians consisted of visual encounter surveys (Crump and Scott, 1994) in microhabitats commonly occupied by amphibians, including bromeliads in trees, at heights from 4 to 20 m (Fig. 1B). In July, September, and October of 2010, we sampled shaded coffee plantations and a small portion of cloud forest. We applied a total sampling effort of 96 person-hours, but did not observe any *B. dendroscarta*. On 12 July 2015, we sampled one hectare area located within a cloud forest fragment of 30 hectares (18°51'27"N, 97°0'46"W; datum WGS 84; elev. 1,550 m), where we observed two clutches of anuran eggs, each consisting of approximately 20 eggs, and 10 tadpoles in a bromeliad located at a height of 3.6 m from the ground. Subsequently, in four other bromeliads in three other trees, we observed a total of 30 tadpoles of different sizes. All of the bromeliads that contained eggs or tadpoles were of the genus *Tillandsia*, and all were about 60 cm tall and 65 cm in diameter (Fig. 1C). We collected six tadpoles that measured approximately 2 cm in total length, and starting on 13 July maintained them in captivity in a spherical, 3-liter, glass container. The six tadpoles had a depressed body, narrow caudal fins, a small and ventral mouth, two upper and four lower rows of teeth, a pale cream color on the back, and a transparent belly (Fig. 2A, B). After maintaining the tadpoles for three months in captivity, we observed the first post-metamorphic individuals; subsequently, in January of 2016, these individuals measured 16–19 mm (SVL), 9–11 mm in tibia

length (TL), and an SVL/TL ratio of 0.5. The dorsal coloration of the recently metamorphosed frogs was yellow, with small, irregular dark spots present on the dorsal portion of the arms and legs; the belly and throat were immaculate white, and the color of the iris was golden bronze (Fig. 2C, D). The morphological and coloration characteristics of the larvae and adults agree with those given in the diagnosis presented for *B. dendroscarta* by Taylor (1940) and Duellman (2001). We did not observe signs of chytrid fungus infection in any of the individuals collected. Five individuals eventually died in captivity, of which three were preserved and deposited in the Colección de Anfibios y Reptiles del Instituto de Ecología, A.C. (CARIE-1219–1221).

Our finding of *B. dendroscarta* in Cerro Chicahuaxtla represents the most recent sighting of this species at the type locality since 1970. The tadpoles recorded in July supplement the larval record for August at the same locality (Taylor, 1940), in addition to records collected in January, February, and August from El Mirador and near Huatusco, Veracruz, 40 and 28 km north of the type locality, respectively, suggesting that this species reproduces at various times during the year. The finding of *B. dendroscarta* at the type locality provides an opportunity to study this species in greater detail, and to supplement other information that can be used for its protection. Exhaustive searches are necessary in the fragmented cloud forest canopy at this locality in an effort to find adult individuals, to generate updated and detailed information on the population, to identify the periods and patterns of activity, to obtain additional data on distribution, and to recognize the use of microhabitats. Moreover, the shade-grown coffee plantations that surround the fragmented cloud forest should be examined to assess if they can serve as refuges for the species, as documented for other amphibian species in the region (Pineda et al., 2005). Although we did not find evidence of chytrid fungus in the tadpoles we collected, this matter requires a more extensive in both adults and larvae of this population, especially since the presence of the fungus at the type locality is documented to have occurred since the 1970s (Cheng et al., 2011). Given the amount of habitat transformation that has occurred in parts of Cerro Chicahuaxtla and the surrounding region, protection of the remaining forest fragments is necessary to increase the chances of survival for *B. dendroscarta*, a species with a high risk of extinction, in addition to that of the coexisting amphibian fauna.



**Fig. 2.** Individuals of *Bromeliohylla dendroscarta* from Cerro Chicahuaxtla, Cuautlapan, Municipio de Ixtaczoquitlan, Veracruz: (A) ventral view and oral disc of a tadpole; (B) lateral view of a tadpole; and (C, D) view of a post-metamorphic individual. Black bar = 10 mm. © Alfonso Aceves-Aparicio (A, B) and José Luis Aguilar López (C, D)

**Acknowledgments.**—We thank Adriana Sandoval-Comte, Flor Vázquez-Corzas, Ricardo Luría-Manzano, and Policarpo Ronzón-Pérez for field assistance, Mauricio Ortega-Andrade for valuable comments that helped improve the manuscript, as well as Milton Díaz-Toribio, Louis W. Porras, and Larry David Wilson for carefully reviewing and correcting the English text and offering valuable suggestions. We thank Adriana Sandoval-Comte for providing photographs of the habitat of the species, and Alfonso Aceves-Aparicio for photographs of the frogs. This work was funded by JF212/CONABIO project. The specimens were collected under permits issued by the Dirección General de Vida Silvestre of the Secretaría de Medio Ambiente y Recursos Naturales (collecting permit numbers: SGPA/DGVS/03665/06 and SGPA/DGVS/03444/15).

### LITERATURE CITED

- ASA. 2017. The search for lost frogs. Amphibian Survival Alliance and Amphibian Specialist Group, London, United Kingdom. ([www.amphibians.org/lostfrogs/](http://www.amphibians.org/lostfrogs/); accessed 19 May 2017).
- BARRIO-AMORÓS, C. L., U. O. GARCÍA-VÁZQUEZ, M. DOMÍNGUEZ-LASO, AND A. NIETO-MONTES DE OCA. 2016. *Charadrahyla altipotens* (Anura: Hylidae), a Critically Endangered treefrog rediscovered in Oaxaca, Mexico. *Mesoamerican Herpetology* 3: 787–790.
- CABRERA-GUZMÁN, E., AND V. H. REYNOSO. 2012. Amphibian and reptile communities of rainforest fragments: minimum patch size to support high richness and abundance. *Biodiversity and Conservation* 21: 3,243–3,265.
- CAVIEDES-SOLIS, I. W., L. F. VÁZQUEZ-VEGA, I. SOLANO-ZAVALA, E. PÉREZ-RAMOS, S. M. ROVITO, T. J. DEVITT, P. HEIMES, O. A. FLORES-VILLELA, J. A. CAMPBELL, AND A. NIETO-MONTES DE OCA. 2015. Everything is not lost: recent records, rediscoveries, and range extensions of Mexican hylid frogs. *Mesoamerican Herpetology* 2: 230–241.
- CERÓN-DE LA LUZ, N. M., J. A. LEMOS-ESPINAL, AND G. R. SMITH. 2016. A diversity and conservation inventory of the Herpetofauna of the Cuautlapan Valley, Veracruz, Mexico. *Zootaxa* 4,205: 127–142.
- CHENG, T. L., S. M. ROVITO, D. B. WAKE, AND T. V. VANCE. 2011. Coincident mass extirpation of Neotropical amphibians with emergence of the infectious fungal pathogen *Batrachochytrium dendrobatidis*. *Proceedings of the National Academy of Sciences* 108: 9,502–9,507.
- CRUMP, M. L., AND N. J. SCOTT, JR. 1994. Visual encounters surveys. Pp. 84–92 *In* R. W. Heyer, M. A. Donnelly, R. W. McDiarmid, L. C. Hayek, and M. S. Foster (Eds.), *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians*. Smithsonian Institution Press, Washington, D.C., United States.
- DELIA, J. R. J., J. L. WHITNEY, AND T. BURKHARDT. 2013. Rediscovery of “lost” treefrogs from the Oaxacan highlands of México. *Biodiversity and Conservation* 22: 1,405–1,414.
- DUPELLMAN, W. E. 1970. *The Hylid Frogs of Middle America*. 2 Volumes. Monograph of the Museum of Natural History, The University of Kansas, Number 1. Lawrence, Kansas, United States.
- DUPELLMAN, W. E. 2001. *The Hylid Frogs of Middle America*. 2 Volumes. 2<sup>nd</sup> ed. *Contributions to Herpetology*, Volume 18, Society for the Study of Amphibians and Reptiles, Ithaca, New York, United States.
- FROST, D. R. 2017. *Amphibian Species of the World: An Online Reference*. Version 6.0. American Museum of Natural History, New York, United States ([www.research.amnh.org/herpetology/amphibia/index.html](http://www.research.amnh.org/herpetology/amphibia/index.html); accessed 19 May 2017).
- GRÜNWARD, C. I., H. FRANZ-CHÁVEZ, AND U. O. GARCÍA-VÁZQUEZ. 2016. Rediscovery of the Critically Endangered treefrog *Charadrahyla trux* in the Sierra Madre del Sur of Guerrero, Mexico. *Mesoamerican Herpetology* 3: 790–793.
- HEIMES, P., AND R. AGUILAR. 2011. *Plectrohyla hazelae* (Taylor, 1940) not extinct. *Herpetological Review* 42: 41–42.
- HERNÁNDEZ-BENITEZ, D., G. GUTIÉRREZ-MAYÉN, AND R. LURÍA-MANZANO. 2012. Redescubrimiento de *Bromeliophyla dendroscarta* (Anura: Hylidae) y sobrevivencia de larvas en cautiverio. Programa y Resúmenes de la XII Reunión Nacional de Herpetología, Tuxtla Gutiérrez, Chiapas. Comité Directivo de la Sociedad Herpetológica Mexicana, A.C., Mexico. 117 pp.
- HERNÁNDEZ-SALINAS, U., AND A. RAMÍREZ-BAUTISTA. 2012. Diversity of amphibian communities in four vegetation types of Hidalgo State, Mexico. *The Open Conservation Biology Journal* 6: 1–11.
- IUCN. 2017. Red List version 2017-1: Table 9: Possibly Extinct and Possibly Extinct in the Wild Species ([www.iucnredlist.org/about/summary-statistics](http://www.iucnredlist.org/about/summary-statistics); accessed 19 May 2017).
- LAMOREUX, J. F., W. M. MCKNIGHT, AND R. CABRERA-HERNÁNDEZ. 2015. Amphibian alliance for zero extinction sites in Chiapas and Oaxaca. *Occasional Paper of the IUCN Species Survival Commission* 53: 1–320.
- LEE, T. E., D. O. FISHER, S. P. BLOMBERG, AND B. A. WINTLE. 2016. Extinct or still out there? Disentangling influences on extinction and rediscovery helps to clarify the fate of species on the edge. *Global Change Biology* 23: 621–634.
- LIPS, K. R., J. R. MENDELSON, III, A. MUÑOZ-ALONSO, L. CANSECO-MÁRQUEZ, AND D. G. MULCAHY. 2004. Amphibian population declines in montane southern Mexico: resurveys of historical localities. *Biological Conservation* 119: 555–564.
- PINEDA, E., C. MORENO, F. ESCOBAR, AND G. HALFFTER. 2005. Frog, bat, and dung beetle diversity in the cloud forest and coffee agroecosystems of Veracruz, Mexico. *Conservation Biology* 19: 400–410.
- RAMÍREZ-BAUTISTA, A., U. HERNÁNDEZ-SALINAS, R. CRUZ-ELIZALDE, C. BERRIOZABAL-ISLAS, D. LARA-TUFIÑO, I. GOYENECHEA, AND J. M. CASTILLO-CERÓN. 2014. *Los Anfíbios y Reptiles del Estado de Hidalgo: Diversidad, Biogeografía y Conservación*. Sociedad Herpetológica Mexicana, A.C., Mexico.

- RAMÍREZ-BAUTISTA, A., U. HERNÁNDEZ-SALINAS, F. MENDOZA-QUIJANO, R. CRUZ-ELIZALDE, B. P. STEPHENSON, V. D. VITE-SILVA, AND A. LEYTE-MANRIQUE. 2010. Lista Anotada de los Anfibios y Reptiles del Estado de Hidalgo. Universidad Autónoma del Estado de Hidalgo, Pachuca, Hidalgo, and Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, México, D.F., Mexico.
- ROVITO, S. M. 2010. *Chiropetrotriton mosaueri*. Amphibian Survival Alliance. ([www.amphibians.org/lostfrogs/](http://www.amphibians.org/lostfrogs/); accessed 21 May 2017).
- SANDOVAL-COMTE, A., E. PINEDA, AND J. L. AGUILAR-LÓPEZ. 2012. In search of Critically Endangered species: the current situation of two tiny salamander species in the Neotropical mountains of Mexico. PLoS ONE 7: e34023. doi:10.1371/journal.pone.0034023.
- SANTOS-BARRERA, G., AND L. CANSECO-MÁRQUEZ. 2004. *Bromeliohyala dendroscarta*. The IUCN Red List of Threatened Species 2004: e.T55466A11315413. ([www.dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T55466A11315413.en](http://www.dx.doi.org/10.2305/IUCN.UK.2004.RLTS.T55466A11315413.en); accessed 19 May 2017).
- SEMARNAT (SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES). 2010. Norma Oficial Mexicana NOM-059-SEMARNAT-2010. Protección ambiental de especies nativas de México de flora y fauna silvestres—Categorías de riesgo y especificaciones para su inclusión, exclusión o cambio—Lista de especies en riesgo. Diario Oficial de la Federación, Segunda Sección, 30 de diciembre de 2010, Ciudad de México, Mexico.
- TAYLOR, E. H. 1940. Two new anuran amphibians from Mexico. Proceedings of the United States National Museum 89: 43–47.
- ZSL (ZOOLOGICAL SOCIETY OF LONDON). 2008. EDGE of Existence Programme. ([www.edgeofexistence.org/index.php](http://www.edgeofexistence.org/index.php); accessed 19 May 2017).

**PAULINA GARCÍA-BAÑUELOS<sup>1</sup>, JOSÉ LUIS AGUILAR-LÓPEZ<sup>1</sup>, EDUARDO PINEDA<sup>1</sup>, AND ARÍSTIDES GARCÍA-VINALAY<sup>2</sup>**

<sup>1</sup>*Red de Biología y Conservación de Vertebrados, Instituto de Ecología, A.C., Carretera antigua a Coatepec 351, El Haya, Xalapa, Veracruz, Mexico. E-mail: jlal.herp@gmail.com (JLAL, Corresponding author)*

<sup>2</sup>*Universidad Veracruzana, Facultad de Ciencias Biológicas y Agropecuarias, Camino Peñuela-Amatlán de los Reyes S/N, Veracruz, Mexico.*

## **A new locality and elevational range extension for *Rhinophrynus dorsalis* Duméril & Bibron, 1841 (Anura: Rhinophrynidae), and a noteworthy record for *Hypopachus variolosus* (Cope, 1866) (Anura: Microhylidae) in Guatemala**

The Mesoamerican Burrowing Toad (*Rhinophrynus dorsalis*) and the Sheep Frog (*Hypopachus variolosus*) range from southern Texas, United States, to northwestern Costa Rica (Fouquette, 1969; Santos-Barrera et al., 2010a, b; Frost, 2017). These anurans are fossorial and spend most of their time underground, and emerge from the soil after heavy rains and gather in temporary ponds to breed (Foster and McDiarmid, 1983; Campbell 1998, Lee, 2000; Savage, 2002; Köhler, 2011). Both species occur in habitats such as savannas and open dry forest, and modified habitats such as pastures and plantations, in very dry to wet areas (Acevedo et al., 2010; Wilson and Johnson, 2010;

Köhler, 2011). Because of their ability to occupy human-altered environments, populations of both species are not considered as threatened (Santos-Barrera et al., 2010a,b). Despite their loud and far-carrying calls during their short breeding season (Campbell, 1998; Savage, 2002; Sandoval et al., 2015), these toads can be overlooked because of their fossorial lifestyle for most of the year. *Rhinophrynus dorsalis* has been reported at elevations from sea level to 700 m (Wilson and Johnson, 2010; Köhler, 2011). Here I report a breeding population of *R. dorsalis* found at an elevation of 1,400 m, as well as a noteworthy record of *H. variolosus* from the department of Huehuetenango, Guatemala, discovered during casual observations in the area. To describe the habitat, I mapped the vegetation types along a 500 m radius of the pond, based on satellite images with a resolution of 0.5 m, from 30 April 2016, and personal observations during excursions in the area. I used software ESRI ArcView 3.2 for the spatial analyses. The nomenclature of scientific names follows Frost (2017).

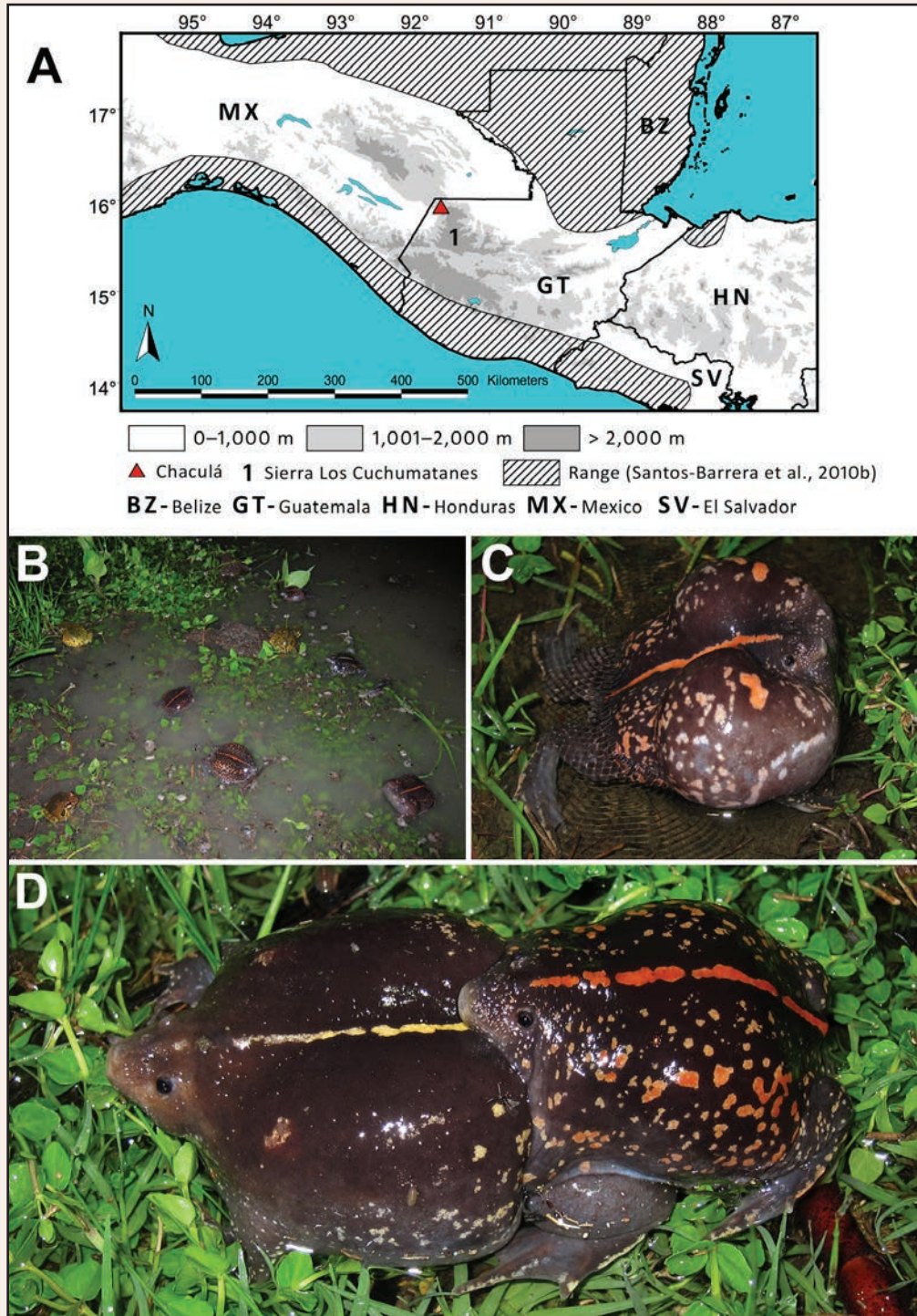
I observed and photographed *R. dorsalis* and other anurans in Chaculá (15°58'16.9"N, 91°39'04.1"W; WGS 84), Municipio Nentón, Departamento de Huehuetenango, Guatemala. Voucher photographs are deposited at the University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8893–96). Chaculá is located in the northern foothills of the Sierra Los Cuchumatanes (Fig. 1A). The climate in the area is characterized by a mean minimum annual temperature of 15°C and a mean maximum annual temperature of 26°C, the mean annual precipitation is 1,600 mm, and the mean monthly precipitation ranges from 60 to 100 mm during the dry season (February–May) and from 150 to 400 mm during the rainy season (May–January), with June being the wettest month (MAGA, 2002).

The natural vegetation of the area is dry oak forest, but due to agricultural activities much of the forest has been replaced by human-altered habitat. The temporary pond where *R. dorsalis* was observed was part of a cattle-grazing area. The vegetation within a circular radius of 500 m (78.5 ha) around the pond was as follows: oak forest (52.3%), hedges, shrubbery, and open woodland (17.9%), pasture (15.6%), conifer plantation (6.3%), gallery forest along streams (4.8%), corn fields (1.8%), permanent water bodies (1.7%), temporary water bodies (0.3%), and buildings (0.2%).

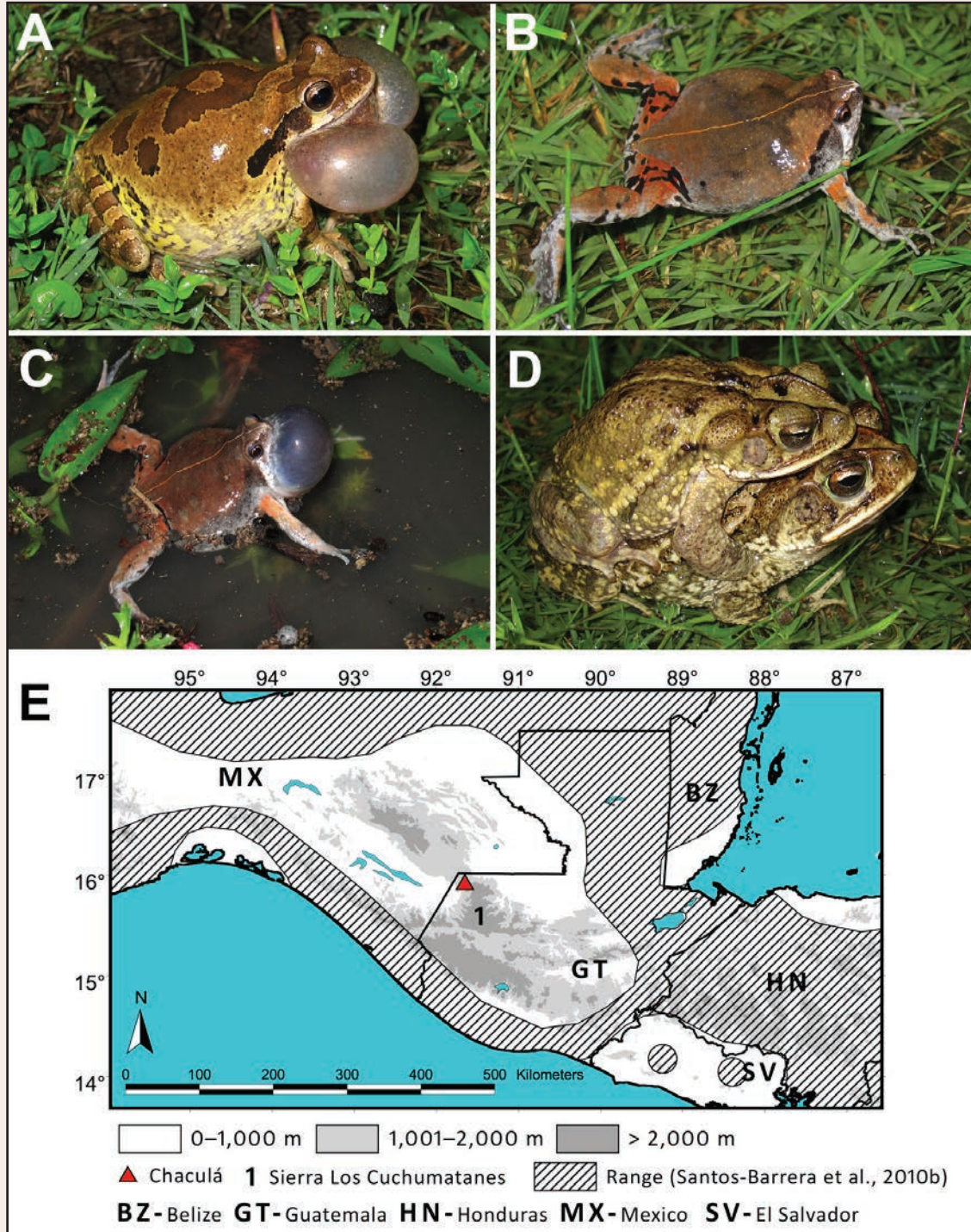
On the rainy night of 1 June 2017, from 1900 to 2100 h, a loud cacophony of anurans caught my attention. I observed at least 300 *R. dorsalis* in a temporary pond located in cattle-grazing area at the elevation of 1,400 m (Fig. 1B). The males were vocalizing (Fig. 1C) and several were in amplexus with females (Fig. 1D). Other anurans at the site included the following: > 500 *Smilisca baudinii* (Fig. 2A), five *Hypopachus variolosus* (Fig. 2B, C), > 100 *Incilius valliceps* (Fig. 2D), and 10 *Rhinella horribilis*.

The observation of the breeding population of *R. dorsalis* in Chaculá is noteworthy, because the elevation of 1,400 m represents a 700 m increase in the known elevational range of this species (Fouquette, 1969; Wilson and Johnson, 2010; Köhler, 2011). Also, the locality represents a distributional extension of more than 100 km from the previously documented range of *R. dorsalis* (Santos-Barrera et al., 2010a) (Fig. 1A).

The record of *H. variolosus* also is noteworthy. Although Chaculá is located within the documented elevational range of this species (0–2,200 m; Wilson and Johnson, 2010), it is located more than 100 km outside of the range reported by Santos-Barrera et al. (2010b; Fig. 2E). The new records for *R. dorsalis* and *H. variolosus* in Chaculá suggest that these species are more widely distributed in northern Central America and southern Mexico than previously documented (Figs. 1A, 2E). Because these records are based on casual observations, additional fieldwork in the department of Huehuetenango likely will yield new discoveries.



**Fig. 1.** Burrowing Toads, *Rhinophrynus dorsalis*, observed in Chaculá, Municipio Nentón, Departamento de Huehuetenango, Guatemala, on 1 June 2017. (A) Map showing the location of Chaculá and the previously reported distribution of *R. dorsalis* in southern Mexico and northern Central America (according to Santos-Barrera et al., 2010a); (B) five individuals of *R. dorsalis*, and three individuals of *Smilisca baudinii* in a temporary pond; (C) calling male of *R. dorsalis* (UTADC-8893); and (D) a pair of *R. dorsalis* in amplexus (UTADC-8894). © Knut Eisermann



**Fig. 2.** Other anurans observed in a temporary pond in Chaculá, Municipio Nentón, Departamento de Huehuetenango, Guatemala, on 1 June 2017. (A) A calling male of *Smilisca baudinii*; (B, C) two individuals of *Hypopachus variolosus* (UTADC- 8895–96); (D) a pair of *Incilius valliceps* in amplexus; and (E) a map showing the locality of *H. variolosus* in Chaculá and the previously reported range of this species in southern Mexico and northern Central America (according to Santos-Barrera et al., 2010b).

© Knut Eisermann

**Acknowledgments.**—I appreciate the literature recommendations and editorial improvements made by Louis W. Porras and William W. Lamar. I thank Carl J. Franklin for incorporating photographs in the University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC) and providing the voucher numbers. The observations were made during a trip supported by Cayaya Birding, Guatemala.

### LITERATURE CITED

- ACEVEDO, M., L. D. WILSON, E. B. CANO, AND C. VÁSQUEZ-ALMAZÁN. 2010. Diversity and conservation status of the Guatemalan herpetofauna. Pp. 407–434 *In* L. D. Wilson, J. H. Townsend, and J. D. Johnson (Eds.), *Conservation of Mesoamerican Amphibians and Reptiles*. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.
- CAMPBELL, J. A. 1998. *Amphibians and Reptiles of Northern Guatemala, the Yucatán, and Belize*. University of Oklahoma Press, Norman, Oklahoma, United States.
- FOUQUETTE, M. J., JR. 1969. *Rhinophrynidae, Rhinophrynus, R. dorsalis*. *Catalogue of American Amphibians and Reptiles*. 78.1–78.2.
- FOSTER, M. S., AND R. W. MCDIARMID. 1983. *Rhinophrynus dorsalis* (Alma de Vaca, Sapo Borracho, Mexican Burrowing Toad). Pp. 419–421 *In* D. H. Janzen (Ed.), *Costa Rican Natural History*. The University of Chicago Press, Chicago, Illinois, United States.
- FROST, D. R. 2017. *Amphibian Species of the World: an Online Reference*. Version 6.0. American Museum of Natural History, New York, United States ([www.research.amnh.org/herpetology/amphibia/index.html](http://www.research.amnh.org/herpetology/amphibia/index.html); accessed 19 June 2017).
- KÖHLER, G. 2011. *Amphibians of Central America*. Herpeton, Offenbach, Germany.
- LEE, J. G. 2000. *A Field Guide to the Amphibians and Reptiles of the Maya World: The Lowlands of Mexico, Northern Guatemala, and Belize*. Cornell University Press, Ithaca, New York, United States.
- MAGA (MINISTERIO DE AGRICULTURA, GANADERÍA Y ALIMENTACIÓN). 2002. *Atlas de Guatemala*. CD-Rom. Ministerio de Agricultura, Ganadería y Alimentación, Ciudad de Guatemala, Guatemala.
- SANDOVAL, L., G. BARRANTES, D. OCAMPO, AND C. SÁNCHEZ-QUIRÓS. 2015. Sexual size dimorphism and acoustical features of the pre-advertisement and advertisement calls of *Rhinophrynus dorsalis* Duméril & Bibron, 1841 (Anura: Rhinophrynidae). *Mesoamerican Herpetology* 2: 154–166.
- SANTOS-BARRERA, G., G. HAMMERSON, F. BOLAÑOS, G. CHAVES, L. D. WILSON, J. SAVAGE, AND G. KÖHLER. 2010a. *Rhinophrynus dorsalis*. The IUCN Red List of Threatened Species 2010: e.T59040A11873951. ([www.dx.doi.org/10.2305/IUCN.UK.2010-2.RLTS.T59040A11873951.en](http://www.dx.doi.org/10.2305/IUCN.UK.2010-2.RLTS.T59040A11873951.en); accessed 7 June 2017).
- SANTOS-BARRERA, G., G. HAMMERSON, G. CHAVES, L. D. WILSON, P. WALKER, F. BOLAÑOS, AND P. PONCE-CAMPOS. 2010b. *Hypopachys variolosus* (errata version published in 2016). The IUCN Red List of Threatened Species 2010: e.T57832A86163060. ([www.dx.doi.org/10.2305/IUCN.UK.2010-2.RLTST57832A11691437.en](http://www.dx.doi.org/10.2305/IUCN.UK.2010-2.RLTST57832A11691437.en); accessed 7 June 2017).
- SAVAGE, J. M. 2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas*. University of Chicago Press, Chicago, Illinois, United States.
- WILSON, L. D., AND J. D. JOHNSON. 2010. Distributional patterns of the herpetofauna of Mesoamerica, a biodiversity hotspot. Pp. 30–235 *In* L. D. Wilson, J. H. Townsend, and J. D. Johnson (Eds.), *Conservation of Mesoamerican Amphibians and Reptiles*. Eagle Mountain Publishing, LC, Eagle Mountain, Utah, United States.

### KNUT EISERMANN

*PROEVAL RAXMU Bird Monitoring Program, Cobán, Alta Verapaz, Guatemala.*  
*E-mail: knut.eisermann@proeval-raxmu.org*

