NATURE NOTES

Amphibia: Anura

***Dendropsophus microcephalus*. Predation.** *Dendropsophus microcephalus* is a small, arboreal, insectivorous, yellowish-orange or tan treefrog (snout–vent length 27–32 mm), characterized by irregular, dark markings, often in the form of an H or X at the level of the shoulders; this species occurs at low elevations along the Gulf and Caribbean slopes from southern Veracruz, Mexico, and across the Yucatan Peninsula to northern Honduras, and on the Pacific slope from Nicaragua to Panama, Colombia, and to the Amazon Basin (Lee, 1996, 2000; Köhler, 2008). During night sampling on 22 April 2016, we observed a Tiger Wandering Spider (*Cupiennius salei*; family Ctenidae) preying on an adult *D. microcephalus* at a height of 80 cm above the ground on shrubby vegetation. The spider had subdued the frog by puncturing its dorsum with its chelicerae (Fig. 1A), and soon after began to ingest it (Fig. 1B). The event occurred at Villahermosa, Tabasco, Mexico (17°59'26"N, 92°58'16"W; datum WGS 84; elev. 10 m) in a patch of secondary vegetation at the División Académica de Ciencias Biológicas, Universidad Juárez Autónoma de Tabasco.

Fig. 1. A Tiger Wandering Spider, *Cupiennius salei*, preying on a *Dendropsophus microcephalus* at Villahermosa, Tabasco, Mexico. © Ana Laura de la Cruz-Ulín

Many studies have reported spiders attacking and consuming amphibians (e.g., Menin et al., 2005; Toledo, 2005; Maffei et al., 2010; Palumbo et al., 2012), but to our knowledge this is the first record of a ctenid spider preying on *D. microcephalus*, an event likely related to the preferentially nocturnal habits of both groups.

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Prevalence and characteristics of overwintering intradermal parasites in Western Narrow-mouthed Toads, *Gastrophryne olivacea* (Anura: Microhylidae)

Larval *Hannemania* mites, commonly known as chiggers, are known to parasitize several amphibian species (Jung et al., 2000; Sladky et al., 2000) by burrowing intradermally in the stratum spongosium, where they appear as conspicuous orange to red pustules (Malone and Paredes, 2005). Some of the costs associated with high chigger infections on amphibians include inflammation, necrosis, and reduced mobility (Sladky et al., 2000). One of the infected frogs (*Hyla arenicolor*) examined by Sladky et al. (2000) died prior to being treated for chiggers, and two more died during the course of treatments with Ivermectin® to remove the mites. Additionally, recent literature suggests that reduced mobility and associated costs in treated individuals likely are a consequence of greater parasite loads on the limbs of the anuran hosts (Malone and Paredes, 2005; Espino del Castillo et al., 2011).

Gastrophryne olivacea is one of 22 anuran species known to occur in the Lower Rio Grande Valley of Texas (Dixon, 2013). The distribution of this species extends from southern Nebraska southward to Texas, with isolated populations in Arkansas, Colorado, and New Mexico, in the United States, and in Mexico southward and westward to Chihuahua, Durango, Tamaulipas, and San Luis Potosí (Frost, 2016). *Hannemania multifemorala* is the only chigger mite known to infect *G. olivacea*. Intradermal parasite infections of this species, however, have not been described extensively in Texas.

On 21 November 2014 from 1800 to 2300 h, we visited Estero Llano Grande State Park, Texas (26.126411°N, -97.956518°W; WGS 84). During our survey, we collected and released 33 individuals of *G. olivacea* along hiking trails and the fringes of shallow bodies of water throughout the site. All of the examinations were *in-situ*, and the individuals were released unharmed at the site of collection. The assessment consisted of a visual count of chigger mites, a photograph of each individual, and a record of how many of the mites were present on the dorsal side of the head, vocal sac, forelimbs, thigh, lower hind limbs (tibia and foot), ventral trunk, dorsal trunk, and pelvic patch. For consistency, only one researcher examined all the individuals.

During an analysis of our records, we found that the prevalence of infection was 97% (32/33). The mean and median of intensity in the infected individuals of *G. olivacea* were 14.5 and 6, respectively. We then assessed the normality of the data by using the Shapiro-Wilk test. As the data lacked normality ($P < 0.5$), we used Friedman's test to determine significant differences in the level of parasitism among the anuran body regions; this statistic confirms the existence of significant differences in the nine infected anuran body regions ($P < 0.0001$). We then performed a Nemenyi test to identify the body regions with a significantly different parasite load. We used this post-hoc test, because the sample sizes when comparing the body regions ($n = 33$) were equal. After performing the post-hoc test, we found that the parasite load on the pelvic patch differed significantly to the one on the head ($P < 0.0001$), the forelimb ($P < 0.01$), the thigh ($P < 0.0001$), the dorsal trunk ($P < 0.01$), the ventral trunk ($P < 0.05$), and the vocal sac ($P < 0.0001$). Additionally, the parasite load on the thigh differed significantly from the one on the head ($P < 0.01$), the thigh ($P < 0.01$), and the vocal sac ($P < 0.05$). Finally, we found statistical differences in parasite load

when comparing the limb to the head ($P < 0.01$) and the thigh ($P < 0.01$). From these results, we suggest that the pelvic patch and the thigh might be more parasitized than the remaining predefined body regions of *G. olivacea.* These results were surprising, as previous work has shown that chigger mite infections typically are greater on the hind limbs, and not on the pelvic seat. We performed all statistical analyses using R. v. 3.1.2.

For anuran species, the energetic and physiological consequences of high parasite loads are poorly understood. Beyond showing lesions and swollen extremities, which may limit locomotion, the individuals appeared healthy. Due to the nature of the parasite/host relationship, we believe that high larval *Hannemania* infestations do not cause direct mortality, but instead increase the risk of mortality by reducing the ability of the host to escape predators, and possibly disrupt the water and electrolyte balance in the host owing to the relatively high surface area being affected on a small species such as *G. olivacea*. Heavy parasitism of the pelvic seat might be particularly deleterious in frogs, as McClanahan and Baldwin (1969) stated that in *Anaxyrus punctatus* the pelvic patch accounts for only 10% of an individual's surface area, but produces 70% of the water uptake by dehydrated *A. punctatus*. Surveys and ongoing monitoring of the population of *G. olivacea* at this site and others are being scheduled to encompass a full year of surveys to determine seasonal outbreaks and the possible effects on their behavior and mortality. Additionally, we suggest a comparative study among populations from different localities to determine if habitat characteristics (e.g. water quality parameters) create a more conducive environment for enabling greater *Hannemania* infections on amphibian assemblages occurring at given sites. Finally, we were unable to identify the *Hannemania* mite to species level, as we did not observe any adults. Our present goal is to identify the species of *Hannemania* that infects this population of *G. olivacea*, as only one reported species of *Hannemania*, from the state of Kansas, has been documented (Walters et al., 2011).

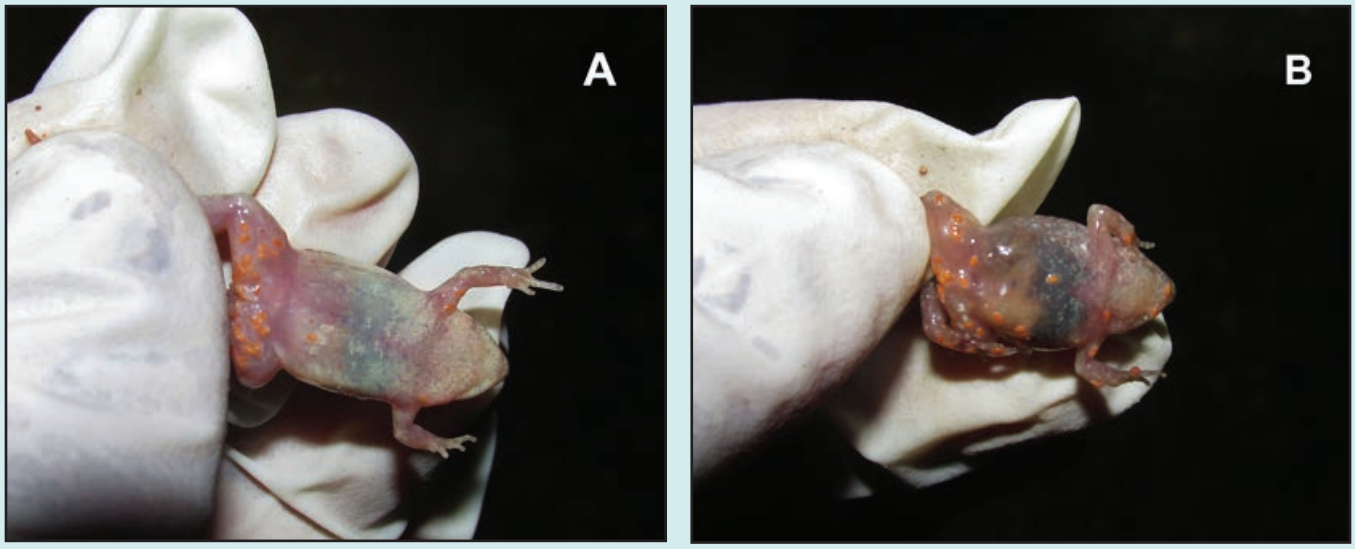

Fig. 1. (A, B) Two individuals of *Gastrophryne olivacea* examined in the current study displaying the high prevalence of chigger mites, *Hannemania* sp., near near the pelvic plate and the thigh area. © Mayra Oyervides

Acknowledgments.—We especially thank the staff at Estero Llano Grande State Park for after hour access to the study site and their continued support. Our collections were made under Texas Parks and Wildlife Scientific Permit for Research (SPR-0913-130). Additionally, we thank Dr. Tamer Oraby for his advice in conducting the statistical analyses, and Michael Forstner for comments on a draft of the manuscript. RP was supported by NIH grant 5R25GM100866-02 564, awarded to Robert K. Dearth and Jason G. Parsons.

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Reptilia: Crocodylia

***Crocodylus acutus* (Cuvier, 1807). Diet.** The American Crocodile, *Crocodylus acutus*, is a widely distributed species in coastal regions of the Neotropics (Thorbjarnarson, 1989). The feeding habits of this species vary during ontogenetic development, as during the early stages individuals feed on arachnids, aquatic and terrestrial insects, and small fishes, and as they grow they ingest larger prey and a greater diversity of prey items, including crustaceans, fishes, amphibians, reptiles, birds, and mammals (Casas-Andreu and Barrios-Quiroz, 2003; Cupul-Magaña et al., 2008; Villegas and Schmitter-Soto, 2008; Platt et al., 2013). A recent review of prey consumption across most of the distribution of *C. acutus* indicated the following 53 food items identified to species-level (Cupul-Magaña et al., 2015): arthropods (two species), crustaceans (14), fishes (10), amphibians (one), reptiles (11), birds (12), and mammals (three).

On 29 August 2016, in a water hazard at Marina Vallarta Club de Golf, Puerto Vallarta, Jalisco, Mexico (20°39'59"N, 105°15'46"W; datum: WGS 84; elev. < 5 m), we observed and photographed an adult *C. acutus* (total length ≤ 3 m; individual not captured or sexed) eating a live juvenile Green-backed Heron, *Butorides virescens* (Fig. 1). Hernández-Vázquez and Fernández-Aceves (1999) suggested that chicks of *B. virescens* falling into the water of La Manzanilla estuary, in Jalisco, Mexico, might become easy prey for *C. acutus*. To our knowledge, this note represents the first photographic record and confirmation of *C. acutus* preying on *B. virescens*.

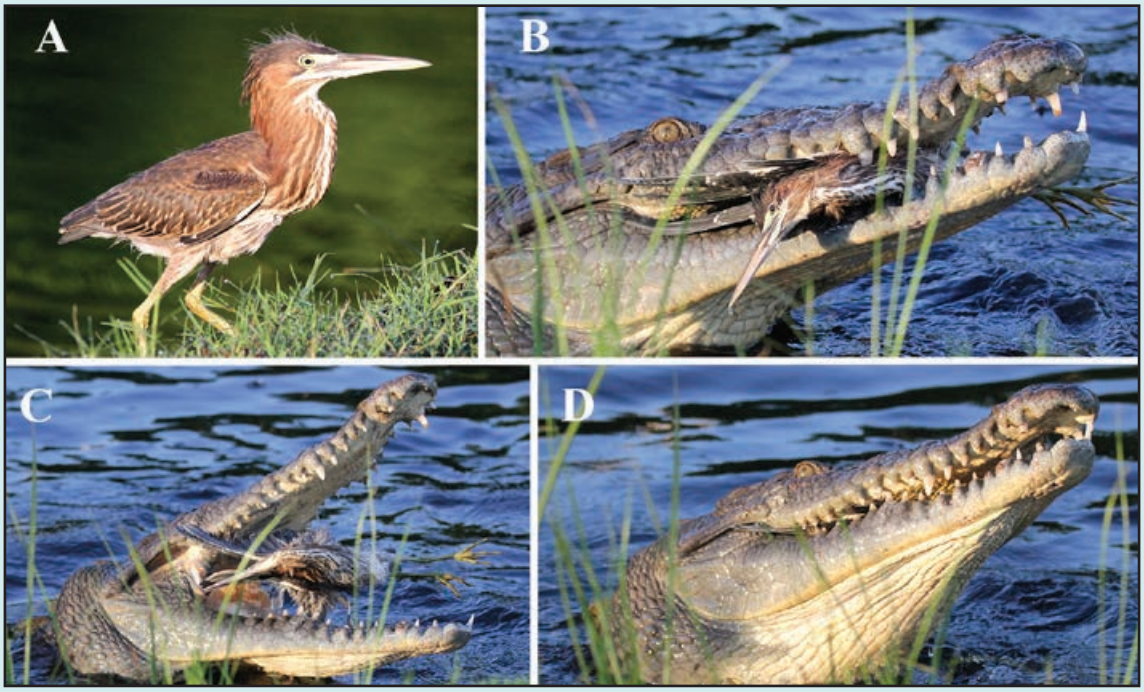

Fig. 1. Predation of *Butorides virescens* by *Crocodylus acutus* in Puerto Vallarta, Jalisco, Mexico. (A) A *B. virescens* walking along the edge of the water hazard; (B) a *C. acutus* soon after capturing a *B. virescens* as the bird was wading in the water hazard; (C) the *C. acutus* positions the *B. virescens* in its mouth; and (D) swallows the bird. © Frank Mc Cann

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Reptilia: Squamata (lizards)

***Basiliscus vittatus*. Oviposition site.** *Basiliscus vittatus* is an oviparous lizard with seasonal reproduction in Mexico (Campbell, 1998; Suárez-Varón, 2015), and with a widespread distribution that extends along the lowlands of both coasts of Mexico from southern Tamaulipas and Jalisco southward through Central America to northwestern Colombia, and also has been introduced into Florida, in the United States (Hirth, 1963; Campbell, 1998; Castañeda-Hernández et al., 2011). Previous studies have reported different reproductive attributes for *B. vittatus* (Alvarez-del Toro, 1982; Fitch, 1985; Lee, 1996; Savage, 2002; Köhler, 2008), but other than anecdotal data (Alvarez-del Toro, 1982) information on specific traits used by females to choose their nesting sites are nonexistent and only includes records for other species in the genus, e.g., *B. basiliscus* (Ortleb, 1965; Lieberman, 1980). Thus, herein we provide observational data, egg characteristics, and the physical description of a nesting site for *B. vittatus* in Mexico.

On April 18 2016 at approximately 1855 h, in Ejido López Mateos, La Selva del Marinero, Catemaco, Veracruz, Mexico (18.441361°N, -94.967611°W; WGS 84; elev. 172 m), we observed a female *B. vittatus* in the process of laying eggs, roughly 2.34 m from the shore of the Río Coxcoapan. Upon noticing our presence, the female interrupted the deposition process to avoid capture by our team. Nevertheless, upon careful examination of the nesting site we found two eggs that we marked individually for identification (Fig. 1). The nest was located among rounded river rocks, in alluvial soil composed of gravel and fine sand; the surface of the nest was located within a patch of sun and shade. The dimensions of the nest were 86 mm long × 70 mm wide × 32 mm deep. We recorded the substrate temperature outside of the nest as 28.4°C, and the inside temperature as 28°C. The eggs were oval in shape, white in coloration, and their shells were soft and pliable. The measurements and mass of the two eggs were as follows: 18.3 mm long × 12.2 mm wide with a mass of 1.5 g (egg No. 1), and 19.4 mm long × 10.7 mm wide with a mass of 1.5 g (egg No. 2). To our knowledge, this is the first report that describes the specific characteristics of a natural nest and egg measurements from a recent oviposition event of *B. vittatus* in Mexico.

Fig. 1. A nest of *Basiliscus vittatus* excavated by a female in the process of laying eggs before noticing the presence of our research team, at La Selva del Marinero, Catemaco, Veracruz, Mexico. © Orlando Suárez-Rodríguez

Acknowledgments.—We thank to the community of La Selva del Marinero for field assistance.

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Reproductive and parental care notes for *Norops beckeri* (Boulanger, 1891) in northern Guatemala

Köhler (2010) reviewed the species of anoles related to *Norops* (as *Anolis*) *pentaprion* in Central America, based on an analysis of coloration, morphometrics, and scalation, and recognized seven species in the region. Of these, *Norops* (as *Anoli*s) *beckeri* (Boulenger, 1881) was resurrected from synonymy for the *pentaprion*-like populations of anoles distributed from southeastern Mexico to northern Nicaragua. *Norops beckeri* can be distinguished from species related to *N. pentaprion* in Central America in that the proximal subdigital scales of the toes are differentiated as slightly broadened lamellae, and the dewlap in males contains 5–6 gorgetal-sternal scale rows, with about 16–18 scales per row. From 1 June to 14 July of 2015, during an excursion with Indigo Expeditions to Estación Biológica Las Guacamayas, Parque Nacional Laguna del Tigre, Departamento de Petén, Guatemala, we observed the behavior of a female *N. beckeri* that presumably had deposited a clutch of seven eggs in a bromeliad (Bromeliaceae).

On 9 July at approximately 1130 h, we found seven eggs within the leaves of a bromeliad in a tree, at a height of ca. 5 m above the ground. The tree was located next to a balcony at the research station, which allowed us an opportunity to observe the eggs. The color of one of the eggs was brown, and it was lying partially in a pool of water at the base of the leaves. One of the eggs appeared indented, which often is a sign that hatching is imminent (Fig. 1).

Fig. 1. Seven *Norops beckeri* eggs deposited on the base of a bromeliad leaf at Estación Biológica Las Guacamayas, Parque Nacional Laguna del Tigre, Departamento de Petén, Guatemala. The top egg was indented, often a sign that hatching is imminent, and the color of the bottom egg (partially submerged in water) was a pale brown, unlike the rest of the clutch.

We did not observe any changes to the eggs on 10 or 11 July, but the following day at 1030 h, we witnessed an adult female *N. beckeri* grasping a leaf perpendicular to the eggs. The female kept examining the eggs and appeared to be exhaling heavily over them, and then started licking them. The female then retreated to the top of the bromeliad, but after approximately 2 min returned to the eggs and repeated the aforementioned behaviors. She repeated this process four times, before retreating higher up in the tree; 15 min later, however, she repeated these behaviors. We took photographs and video footage at a distance, so as not to disturb the female (Fig. 2A–C).

On 14 July at 1000 h, we observed the female on a different leaf of the bromeliad, at a distance of ca. 30 cm from the eggs. The female appeared to have positioned herself in an area where she could observe the eggs. On 15 July, we observed a Mexican Parrot Snake (*Leptophis mexicanus*) in the vicinity of the clutch, perhaps attempting to prey on the adult female. During this time an 8th egg was deposited, and all of the other eggs apparently had hatched.

We believe the female *N. beckeri* displayed maternal care in two ways. The first was by guarding the eggs and apparently distracting a potential predator. By retreating from the eggs, the female *N. beckeri* might have been drawing the attention of the snake away from the eggs. Although the diet of *L. mexicanus* consists largely of anurans, this species feeds on a variety of food items, including anoles and bird eggs (Henderson, 1982: Lee, 1996; Savage, 2002); anole eggs, therefore, might constitute part of the natural diet of this snake. The second way of displaying maternal care was by actively tending to the eggs and the nest. The female was observed examining the clutch, exhaling air over the eggs, and what appeared to be either cleaning of the eggs with her tongue or removing water from the base of the bromeliad; this conclusion was difficult to confirm owing to the angle of our observations. Cleaning the eggs seems unlikely, however, as most reptiles lay their eggs underground where they are subject to a large amount of substrate debris, as well as bacteria. The female perhaps was exhaling air over the eggs to provide fresh air, presumably to prevent the air around the eggs from stagnating. The eggs were deposited in an area that likely would accumulate water, thereby resulting in unviable eggs. We propose that the female was exhibiting a combination of the last two behaviors.

Additionally, our observations support the proposal that anoles lay independent, single eggs every 5–25 days during the breeding season (Losos, 2009), as the female *N. beckeri* deposited an additional egg to the clutch we first observed. These observations allowed us to report previously unknown behavioral traits by an interesting species, but they also bring additional questions. Further work is necessary to answer questions regarding the selection of an oviposition site that was prone to flooding, and to clarify the potential behaviors of the parental care we observed.

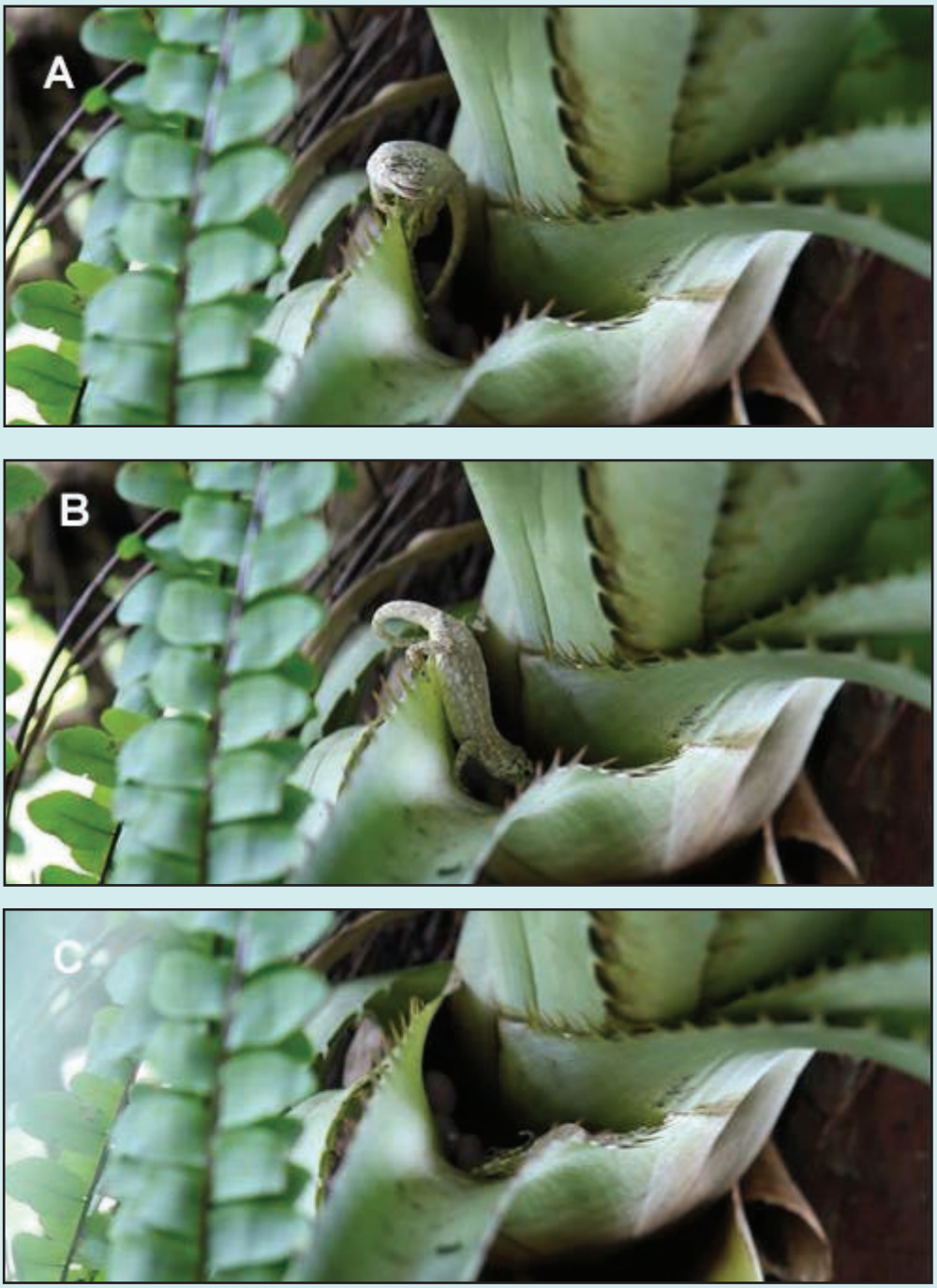

Fig. 2. Video stills of the female *Norops beckeri*: (A) grasping the edge of a bromeliad leaf; the female was observed lapping her tongue after entering the bromeliad to lick her eggs and/or the water at the base of the leaf; (B) entering the bromeliad; and (C) inspecting the eggs prior to exhaling air and licking them. © Kimberly C. Carter

Acknowledgments.—We thank the staff at Estación Biológica Las Guacamayas for their courtesies and hard work, and Stuart Graham for providing comments on early drafts of this manuscript. The data presented in this paper was collected under Indigo Expeditions research permit 008/2015 issued by Consejo Nacional de Areas Protegidas (CONAP), Guatemala. Finally, we thank CONAP for their continued support of our work.

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Phrynosoma solare. **Nocturnal activity**. Several reports in the literature have noted nocturnal activity in primarily diurnal reptiles, including *Gopherus agassizii* and *Gambelia wislizenii* (Huey, 1982), *Sceloporus clarkii* (Martínez-Méndez et al., 2013), and the horned lizards *P. platyrhinos*, *P. cornutum*, *P. modestum*, and *P. asio* (Harris, 1958; Williams, 1959; Lara-Resendiz et al., 2013; Raya-García, 2014). Most of these records are from arid environments.

On 28 August 2016 at 0049 h, we observed an adult male Regal Horned Lizard, *Phrynosoma solare*, active at night in desert scrub habitat near Hermosillo, Sonora, Mexico (28°48'45.74"N, 110°49'27.06"W; datum WGS 84; elev. 235 m). We assume the individual was active because it was found in an open area, with rocky soil and no evidence of a refuge (bunchgrass, shrubs, or a hole) within 4 m, and also because it was near (1.5 m) an active ant nest.

In the Sonoran Desert, diurnal lizards such as *Phrynosoma* are exposed to high diurnal temperatures (up to 43ºC; Lara-Resendiz et al., 2014), which shortens their time for diurnal activity and forces their retreat. After sunset, however, they can prolong their potential foraging time, as high diurnal temperatures result in elevated temperatures in the air, tree trunks, the soil, and rocks, which might be enough to maintain a lizard's body temperature in the activity range until midnight or later. Thus, this observation suggests the possibility that *P. solare* might complete its biological activities at night, because of the high daytime temperatures.

Acknowledgments.—We thank Rancho La Viguita for their accommodations and use of their facilities during our stay, and Jules Wyman for comments on the manuscript. The collection permit was SEMARNAT FAUT 074.

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***Phyllodactylus xanti*. Thermoregulatory activity**. In ectotherms like lizards, thermoregulation is key to performing biological and social functions (Hertz et al., 1993). A plethora of thermoregulatory studies are available for diurnal lizards (Sinervo et al., 2010), but those for nocturnal lizards are less abundant (Lara-Resendiz et al., 2013). Moreover, little information is available on the natural history of some Mexican endemic nocturnal lizards. Such is the case with *Phyllodactylus xanti*, as information on thermoregulatory activity along its distribution in the Baja California Peninsula and the islands of Gulf of California, Mexico, remains unavailable. Moreover, lizards of the genus *Phyllodactylus* have shown a tendency for high levels of genetic divergence in nearby regions (Blair et al., 2013)tropical dry forests (TDF, and in *P. xanthi* insular populations might represent a different species from those on the mainland. Here we present new data on thermoregulatory activity in *P. xanti* from Isla San Esteban, in the Gulf of Baja California.

During fieldwork in 2005 (7–11 September) we captured and released 15 *P. xanti* at night. We recorded the time of capture and perch site, as well as the body temperature (*Tb*) of the individuals via the cloaca, the substrate temperature (*Ts*), and the air temperature (*Ta*: 2 cm above the site perch) using a Miller & Weber quick reading thermometer. We encountered the geckos from 1700 to 2259 h. The mean *Tb* for all the lizards was 31.6 ± 0.41, and the *Ts* and *Ta* were 29.05 ± 0.74 and 29.57 ± 0.75, respectively. The *Tb* showed a positive relationship with *Ta* (r = 0.57; $P < 0.05$) and *Ts* ($r = 0.56$, $P < 0.05$); nevertheless both environmental temperatures explain the same proportion of variance ($r^2 = 0.32$). Of the total number of collected geckos, 12 (80%) were found in rocks and 3(20)% in vegetation (on columnar cacti: *Pachycereus pringlei* (Fig. 1A, B).

In general, members of the genus *Phyllodactylus* are active at night, perhaps because of the high daytime temperatures in the regions they inhabit (tropical dry forest and desert scrub; Dixon, 1964). On Isla San Esteban, *P. xanti* shows such nocturnal activity. Regarding its habitat use, *P. xanti* is a saxicolous species (Grismer, 2002), although our data suggests arboreal perching for conducting thermoregulatory activities, foraging, camouflage, and presumably for finding refuges on the crevices. Additional information on the natural history of *P. xanti* on the Baja California peninsula and the islands of the Sea of Cortés is necessary to better understand the ecology of this species, as well as its evolutionary patterns and possible risk of extinction associated with climate change.

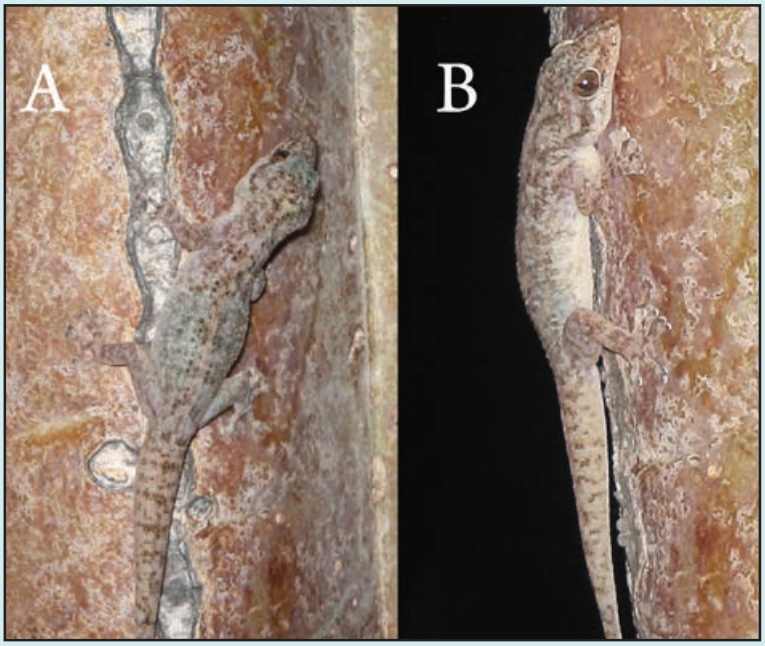

Fig. 1. (A, B) *Phyllodactylus xanti* perching and thermoregulating on a columnar cacti (*Pachycereus pringlei*) in Isla San Esteban, Gulf of Baja California, Mexico. © Rafael A. Lara-Resendiz

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First record of snake predation in Xenosaurid lizards: *Xenosaurus platyceps* feeding on *Adelphicos quadrivirgatum*

The diet of xenosaurid lizards has been relatively well documented, and in most species studied the diet has consisted mostly of insects (Lemos-Espinal et al., 2012; Zamora-Abrego and Ortega-León, 2016). Nevertheless, lizards of the genus *Xenosaurus* are known to feed on vertebrates. Presch (1981) reported the remains of a lizard of the genus *Sceloporus* (tentatively *S. formosus*) and Ballinger et al. (1995) found the remains of a teiid lizard (either *Ameiva* or *Aspidoscelis*) in the stomach contents of *X. grandis*. Mammal remains also have been documented in the stomach contents of *X. newmanorum* (Lemos-Espinal et al., 2003) and *X. phalaronatereon* (García-Vázquez et al., 2009). Snakes, however, have not been reported in the diet of *Xenosaurus*.

On 18 June 2003, during a mark-recapture study in sub-perennial tropical forest (= tropical semi-deciduous forest) at an elevation of 420 m within Reserva de la Biosfera El Cielo, Gómez Farías, Tamaulipas, Mexico, we found a gravid female of *X. platyceps* snout–vent length [SVL] = 123 mm, body mass = 30 g) with middle part of its body exposed in a crevice (2.35 cm tall, 31 cm wide, 35 cm deep) positioned at a 45° angle from the horizontal ground. The tail of a snake was visible in the lizard's mouth, and when the lizard was extracted from the crevice she regurgitated a dead adult female *Adelphicos quadrivirgatum* (SVL = 270 mm, body mass = 8.4 g).

Based on the stomach contents found in 27 specimens of *X. platyceps*, Lemos-Espinal et al. (2003) noted that the diet of this species consists primarily of insects, mostly adult coleopterans (in quantity) and orthopterans (in volume), but found no evidence of vertebrate consumption. Our finding, therefore, is the first report of vertebrate consumption in *X. platyceps*. The consumption of the prey item represents a relative prey mass (dividing the prey mass by the mass of the predator; Rodríguez-Robles, 2002) of 0.28, which suggests a preference for high body mass prey items in xenosaurid lizards (Zamora-Abrego and Ortega-León, 2016). This information is relevant in context of the reproductive condition, given the energetic requirements of females of *X. platyceps* at this site and their reproductive stage; their relative litter mass has been reported as 0.26, and parturition begins in July (Rojas-González et al., 2008), approximately one month before our observation. The opportunistic consumption of vertebrate prey in xenosaurid lizards might offer an energetic advantage to members of this secretive lizard family. Further investigation is necessary to increase information on the diet of these lizards. Additionally, vertebrates need to be considered in studies on prey availability and prey preferences for xenosaurid lizards.

Acknowledgments.—We thank Jaime Zúñiga-Vega, Angela Ortega-León and Norberto Martínez-Méndez for field assistance, and Selene Meza for his valuable English revision. Fieldwork was conducted under permits DOO.02.-6049,ERV06/2001, NUM/DGVS/00305 from DGVS-INE and CEVS-SE-DUE-Tamaulipas.

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Reptilia: Squamata (snakes)

***Adelphicos quadrivirgatum*. Reproduction.** The Middle American Earth Snake, *Adelphicos quadrivirgatum* Jan, 1862, occurs in lowland moist forest, premontane wet forest, premontane moist forest, and lower montane moist forest from central Veracruz, Mexico, to northern Nicaragua, on the Atlantic versant, and on the Pacific versant from central Oaxaca, Mexico, to southwestern Honduras, at elevations from near sea level to 1,900 m (LaDuc, 1996; McCranie, 2011; Farr et al., 2013). The available reproductive information on *A. quadrivirgatum* consists of reports of egg clutches. Four eggs were found "in a nest" in May at San Marcos, Guatemala (Livezey and Peckham, 1953: 175); and a clutch of three eggs was discovered in a termite nest in June, Veracruz, Mexico (Pérez-Higareda and Smith, 1989). Stuart (1948) reported that the congener *A. veraepacis* deposited eggs in May before the start of the rainy season in the department of Alta Verapaz, Guatemala. Martin (1955) reported that in another congener, *A. q. newmanorum* (= *A. newmanorum*; see Farr et al., 2013), five of seven specimens collected in April in Tamaulipas, Mexico, contained eggs, with the largest female containing four. In this note, I add information on the reproductive cycle of *A. quadrivirgatum* based on a histological examination of museum specimens.

I examined 31 specimens of *A. quadrivirgatum* (8 males, mean snout–vent length [SVL] = 231.3 mm ± 34.6 SD, range = 197–307 mm; 23 females, SVL = 264 mm ± 28.5 SD, range = 222–318 mm) deposited in the herpetology collection of the Carnegie Museum (CM), Pittsburgh, Pennsylvania, United States: GUATEMALA: Departamento de Zapata: CM 57203, 57205, 57207, 57208, 57213, 57215, 57217, 57219, 57221, 57222, 57224, 57229, 57230, 57232, 57235, 57239, 57245, 57249, 57250, 57252– 27256, 57264, 57266, 57267, 57270, 57271; HONDURAS: Departamento de Cortés: CM 68816; and MEXICO: Chiapas: Municipio de Ocosingo: CM 88754. The snakes were collected from 1971 to 1972.

I removed the left ovary from females and the left testis and vas deferens from males for histological examination, and embedded the tissues in paraffin, cut into 5 µm sections, mounted on glass slides, and stained with Harris hematoxylin followed by eosin counterstain (Presnell and Schreibman, 1997). I examined the slides to ascertain the stage of the testicular cycle or the presence of yolk deposition. I deposited the histology slides at CM.

The testicular histology was similar to that reported by Goldberg and Parker (1975) for the colubrid snakes *Masticophis taeniatus* and *Pituophis catenifer* (as *P. melanoleucus*). The only stage present in the testicular cycle was spermiogenesis, in which the seminiferous tubules were lined by sperm or clusters of metamorphosing spermatids. The vasa deferentia contained sperm. The males were collected in the following months: June (1); August (5); and September (2). The smallest reproductively active male (spermiogenesis) measured 197 mm in SVL (LACM 68816), and was collected in June.

Two stages were present in the ovarian cycle: (1) quiescent, no yolk deposition; and (2) early yolk deposition, basophilic granules in ooplasm (Table 1). The smallest reproductively active female measured 227 mm in SVL (yolk deposition), and was collected in August (CM 57221).

Previous reports of the occurrence of *A. quadrivrgatum* egg clutches in May and June (Livezey

Table 1. Monthly stages in the ovarian cycle of 23 adult females of *Adelphicos quadrivirgatum*.

Month	*n*	Quiescent	Yolk Deposition
August	12	10	2
September	9	7	2
November	2	0	2

and Peckham, 1953; Pérez-Higareda and Smith, 1989) indicates reproductive activity in the first six months of the year. My data, however, show *A. quadrivirgatum* to be reproductively active during August, September, and November, in the second six months of the year. It remains unknown when the vitellogenic females in Table 1 would have produced egg clutches. The above information indicates that an extended reproductive season is present in *A. quadrivirgatum*. Nonetheless, an examination of specimens of *A. quadrivirgatum* collected in additional months is necessary before the exact duration of the reproductive cycle can be ascertained.

Acknowledgments.—I thank Jose Padial and Stephen P. Rogers for permission to examine specimens of *Adelphicos quadrivirgatum*, and for facilitating the loan.

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***Boa sigma* (Smith, 1943). Diet.** Card et al. (2016) identified extensive population structure across the range of the genus *Boa*, with three widely distributed clades in North-, Central-, and South America, and recognized a third species in the genus, with *Boa sigma* (Smith, 1943) corresponding to the North American clade. Although Card et al, (2016: 109) noted the distribution of this taxon along "the Pacific coast of Mexico to west of the Isthmus of Tehuantepec," their study did not include samples from the Tres Marías Islands (= Las Islas Marías) from where the holotype and paratypes were collected. Woolrich-Piña et al. (2016) tentatively accepted the conclusions of Card et al. (2016).

The diet of *B. imperator*, a congener with a distribution primarily in Mesoamerica, has been documented relatively well (Greene, 1983; Boback et al., 2000; Bakkegard and Timm 2001; Greene et al., 2003; Leenders and Watkins-Colwell, 2003; Bobak, 2004, 2005; Solórzano, 2004; Pérez-Higareda et al., 2007; Reed and Rodda, 2009; Pavón-Vázquez et al., 2016). Although some regional works have reported on the varied diet of *B. constrictor* (*sensu lato*) (e.g., García and Ceballos, 1994; Lemos-Espinal et al., 2013; Rorabaugh and Lemos-Espinal, 2016), to our knowledge information on the diet of *B. sigma* is limited to an account of an individual from Las Islas Marías in which "the digestive tract of one *Boa* was crammed with plant material, evidently from a *Ctenosaura* the snake had eaten" (Zweifel, 1960: 99). Herein, we report an additional food item for this species.

On 1 September 2013 at ca. 0917 h, at ejido el Cora, Municipio de San Blas, Nayarit, Mexico (21.433988°N, 105.135329°W, WGS 84; elev. 230 m), we observed an adult *B. sigma* in an area of tropical dry forest planted with

teak trees (*Tectona grandis*) consuming a young Collie's Squirrel (*Sciurus colliaei*). The squirrel had ascended one of the teak trees to a height of ca. 7 m, where it was preyed upon by the snake. The event lasted about 17 min, from the time of capture until the squirrel was swallowed. The *B. sigma* then descended and sought shelter in a burrow among some rocks. The *S. colliaei* might have been distracted by our presence, as we had stopped to photograph the animal and the squirrel perhaps did not see the snake.

Fig 1. A *Boa sigma* found at ejido el Cora, Municipio de San Blas, Nayarit, Mexico, consuming a young Collie's Squirrel (*Sciurus colliaei*). © Sandino González

Acknowledgments.—We thank Sandino González, especially for his interest in nature photography, as well as for field assistance and some of the information included in this note.

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***Bothrops asper* (Garman, 1883). Predation.** *Bothrops asper* is a large pitviper found mostly in tropical lowland wet and moist forest, premontane rainforest, and evergreen seasonal forest, and less frequently in drier regions. This species occurs at low and moderate elevations (sea level to 1,300 m in Mexico) and ranges from south-central Tamaulipas, Mexico, throughout much of the Atlantic versant to northeastern Venezuela, and on the Pacific versant in an isolated population in Chiapas, Mexico and Guatemala, and from northwestern Costa Rica southward to the Ecuador–Peru border (Campbell and Lamar, 2004, Heimes, 2016). Although substantial information is available on the natural history of this species, little is known about its natural predators (Bogert, 1954; Buttenhoff and Vogt, 1995; Campbell and Lamar, 2004; Dehling, 2008; Heimes, 2016). Herein, we report a predation event on *B. asper* by a tarantula in the Eastern Highlands physiographic region of Chiapas, Mexico (Johnson et al., 2010).

On 3 November 2016 at 1440 h, after a heavy rain, one of us (SLG) observed a neonate *B. asper* being eaten by a Guatemalan Redrump Tarantula (*Brachypelma sabulosum*) (Fig. 1) at Edificio 19 (known as "El Laberinto") in the Zona Arqueológica de Yaxchilán, Ocosingo, Chiapas, Mexico (16°53'56.11"N, 90°57'57.38"W; WGS 84), elev. ca 122 m. The event took place ca. 2 m above the ground on a wall in the basement of the archeological ruin. At the time of the observation, the tarantula was ingesting and holding the snake by the head, as the snake was showing muscle contractions. When the spider noticed the presence of SLG, it released the snake and moved backwards toward its burrow. After a few seconds, however, it began to approach the snake and grabbed its body, closer to the anterior end. SLG photographed the event and continued his observations for an additional 5 min, and left the site with tarantula and snake in the same position. To date, reported predators of *B. asper* include a land crab, *Gecarcinus quadratus* (Dehling, 2008), a larger juvenile female *B. asper* (Buttenhoff and Vogt, 1995), a Mussurana, *Clelia clelia* (Bogert, 1954), a Hog-nosed Skunk, *Conepatus mesoleucus* (Bogert, 1954), and a Nine-banded Armadillo, *Dasypus novemcinctus* (Bogert, 1954). To the best of our knowledge this is the first published report of a prey-predator interaction between *B. asper* and *B. sabulosum*, respectively. Zona Arqueológica de Yaxchilán is a Natural Protected Area founded in 1992, and located next to the Río Usumacinta in eastern Chiapas. The vegetation at the site is characterized by tropical rain forest (Johnson et al., 2010).

Fig. 1. A Guatemalan Redrump Tarantula (*Brachypelma sabulosum*) preying on a neonate Nauyaca (*Bothrops asper*) at Monumento Natural Yaxchilán, Ocosingo, Chiapas, Mexico. © Silvano López-Gómez

Acknowledgments.—A special thanks to the Siyaj Chan environmental tourism group (Turismo Bioarqueológico) and to Silvano López-Gómez's family for their support and company.

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***Crotalus ravus* (Cope, 1865). Predation.** The Mexican Pygmy Rattlesnake, *Crotalus ravus*, is distributed across the Trans-Mexican Volcanic Belt in the states of Veracruz, Querétaro, Hidalgo, Tlaxcala, Puebla, Oaxaca, Guerrero, México, Morelos, and the Distrito Federal (Uribe-Peña et al., 1999; Campbell and Lamar, 2004; Fernández-Badillo et al., 2011). This species occurs in xeric shrubland, cloud forest, boreal forest, tropical deciduous forest, and pine-oak forest, and is most abundant in relatively flat areas such as plateaus, floodplains, and alluvial fans or basins, at elevations from 1,490 to 3,000 m (Uribe-Peña et al., 1999; Campbell and Lamar, 2004; CONANP, 2014). *Crotalus ravus* is terrestrial and usually diurnal, but can be found at night (Armstrong and Murphy, 1979; Campbell and Lamar, 2004), and has been reported to feed on insects, lizards, snakes, and small mammals (Díaz de la Vega-Pérez et al., 2016, and references therein).

On 22 January 2016 at 1105 h, an individual of *C. ravus* was observed attempting to eat a fledgling American Brown Creeper (*Certhia americana*; Fig. 1) in pine forest at Parque Nacional La Malinche (19°14'33.1"N, 97°58'30.6"W; datum WGS 84), at an elevation of 2,988 m; the park is located in the states of Tlaxcala and Puebla. At the time of the encounter the bird was moving its wings, but a few seconds later it died, with the *C. ravus* in close proximity. While examing the body, we noticed two small holes on the breast/abdominal area of the bird, suggesting it was bitten by the rattlesnake. The snake was not collected. This episode occured next to a pine tree in a grassland dominated by *Festuca tolucensis* and *Muhlenbergia macroura*, where several nests of *C. americana* were present among the grasses. This encounter highlights the oportunistic nature of *C. ravus*, and to our knowledge is the first report of an apparent predatory attempt by this species on a bird.

Fig. 1. A fledgling American Brown Creeper (*Certhia americana*) lying on the ground after an apparent predatory attempt by *Crotalus ravus* at Parque Nacional La Malinche, Mexico. © Mario García-Guerrero

Acknowledgments.—We thank Dr. Patricia Ramirez-Bastida for helping identify the bird species, and Dr. Aníbal Diaz de la Vega and Mario García Guerrero for field assistance and photographs. We also want to thank

Dr. M. Martínez-Gómez and Dr. J. Vázquez-Pérez for their valuable help with logistics and use of the facilities at the scientific station "La Malinche." This work was conducted with financial support of project PAPIIT IA204416 UNAM, and under scientific permit number SGPA/DGVS/02145/16 issued by the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

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***Micrurus browni* Schmidt and Schmidt, 1943. Diet.** Brown's Coralsnake, *Micrurus browni*, is a medium sized species with a relatively limited geographic distribution in Mexico and Guatemala. In Mexico it has been reported in the states of Michoacán, Estado de México (including Ciudad de México), along the the Pacific coast of Guerrero, Oaxaca and Chiapas, as well as in the western mountains of Guatemala (Roze, 1996; Campbell and Lamar, 2004, and citations there in; Reyes-Velasco et al., 2012). The elevational range for *M. browni* has been reported from near sea level to 2,200 m (Roze, 1996; Campbell and Lamar, 2004; Wilson and Johnson, 2010). Unfortunately, little information is available on its natural history of this species, including its diet.

On 23 June 2016 at 2200 h, two of us (VMS and AR) found a freshly killed adult *M. browni* on the road to Puerto Escondido-Oaxaca (131), 5.8 km E (straight line) of San Juan Lachao, Municipio de San Juan Lachao, Oaxaca, Mexico (16.153878°N, -97.069861°W; WGS 84; elev. 958 m). The snake (snout–vent length [SVL] = 730 mm; tail length [T] = 90 mm; and total length = 820 mm) was nearly finished ingesting an adult male *Coniophanes fissidens* (SVL = 284 mm; T = 20 mm [most of the tail missing, likely detached by a passing vehicle]) when it was killed (Fig. 1). The coralsnake had ingested most of the body of the *C. fissidens* except for the tail. We were unable to determine if the *M. browni* found the *C. fissidens* alive or dead on the road. Both specimens (CIB 5032, CIB 5033, *M. browni* and *C. fissidens*, respectively) are deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo.

To date, *M. browni* has been reported to feed only on snakes, including *Indotyphlops braminus*, *Epictia bakewelli*, *Geophis sallei*, *Ninia sebae*, *Tantilla rubra*, *Adelphicos quadrivirgatus*, and *Stenorrhina freminvillei* (Roze, 1996; Campbell and Lamar, 2004; Bello-Sánchez et al., 2016). To the best of our knowledge this observation represents the first report of *C. fissidens* in the diet of *M. browni*.

Fig. 1. An adult female Brown's Coralsnake (*Micrurus browni*) killed while ingesting a male Yellow-bellied Snake (*Coniophanes fissidens*) in Municipio de San Juan Lachao, Oaxaca, Mexico. © Vicente Mata-Silva

Acknowledgments.—We are grateful to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the voucher number.

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Predation of *Stenorrhina freminvillei* (Duméril, Bibron & Duméril, 1854) by *Erythrolamprus bizona* Jan, 1863

Snakes of genus *Stenorrhina* (Colubridae) are semi-fossorial diurnal snakes with a distribution extending from southern Mexico to Venezuela and Ecuador (Savage, 2002; Solórzano, 2004). These snakes primarily prey on scorpions and tarantulas, but occasionally also on other arthropods (Savage, 2002; Solórzano, 2004). The Northern Scorpion-eater (*S. freminvillei*) is a relatively uncommon species that in Costa Rica is found in the northwestern and central parts of the country (Solórzano, 2004; Abarca Alvarado, 2012; McConnell, 2014). Predation reports on this species rarely are documented, perhaps because of its secretive behavior, much as occurs with other fossorial or semi-fossorial herpetofauna (Ramírez-Fernández and Solís DelValle, 2014; Acosta-Chaves and Villalobos-Chaves, 2015). Based on an examination of museum material, Savage (2002) reported finding an individual of this species in the stomach contents of a Central American Coralsnake (*Micrurus nigrocinctus*, Elapidae). Here we report a predation event on *S. freminvillei* by a Black-ringed False Coralsnake (*Erythrolamprus bizona*, Dipsadidae) in the Pacific central of Costa Rica.

On 18 October 2016 at approximately 1425 h, an *E. bizona* was found subduing an *S. freminvillei* along a muddy road in Zona Protectora El Rodeo, Cantón de Mora, Provincia de San José, Costa Rica (9.926815°N, 84.292284°W; datum WGS 84; elev. 630 m). The *E. bizona* was restraining the body of the *S. freminvillei*, with a wound visible next to where the *E. bizona* was holding on, suggesting that the *S. freminvillei* already had been bitten (Fig. 1a). The event was observed for ca. 5 min, and during this time the *S. freminvillei* curled its body repeatedly, as the *E. bizona* held on (Fig. 1B); eventually, the *S. freminvillei* reduced its movements. The entire swallowing process was not observed by the eyewitness to avoid interrupting the process, as well as because of a strong, sudden rain (M. González, pers. observ.).

Erythrolamprus bizona feeds primarily on other snakes, and occasionally on lizards (Savage, 2002; Solórzano, 2004). Reported prey items for this species include the snakes *Hydromorphus* sp. and *Tantilla* sp. (Savage, 2002). Despite the fact that the *S. freminvillei* tolerates its favorite prey's (scorpions) venom to some degree (Solórzano and Greene, 2012), the venom of *E. bizona* appeared to have a significant effect on the individual because of its toxic properties (Lemoine and Rodríguez-Acosta, 2003). To the best of our knowledge, this is the first report that records predatory interaction between these species.

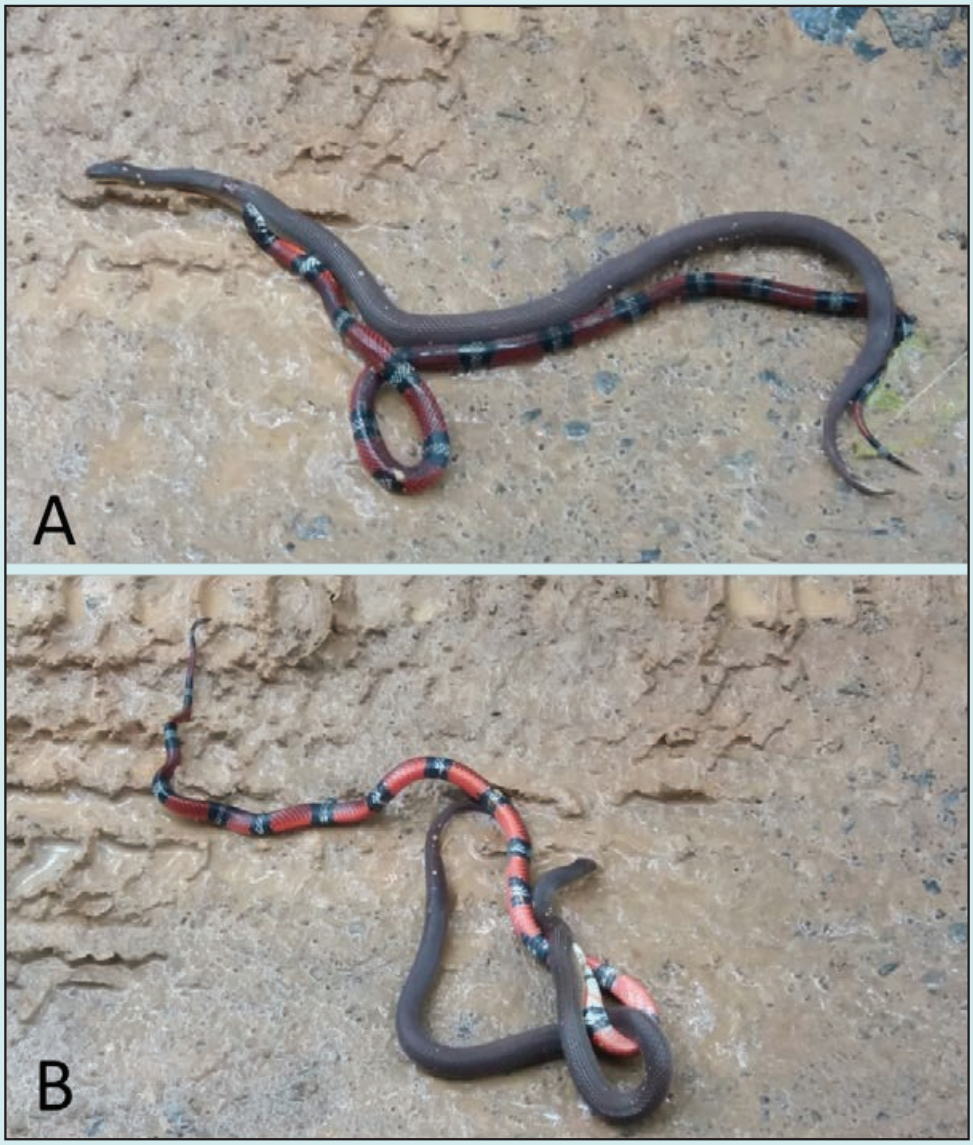

Fig. 1. (A) An *Erythrolamprus bizona* firmly holding a *Stenorrhina freminvillei* by the body, and (B) as a response the *S. freminvillei* curls its body in an attempt to lose its predator. © Maureen González

Acknowledgments.—I thank Maureen González for unselfishly sharing her photos and a detailed account of the observation, and Ignacio Acosta and Víctor Acosta Chaves for corroborating with the identification of the snakes. Víctor Acosta Chaves also provided comments that improved the manuscript.

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***Thamnophis rossmani* Conant, 2000. Reproduction.** Rossman's Gartersnake (*Thamnophis rossmani*) was described in 2000 by Roger Conant based on series of specimens he collected from 1949 to 1965, and others collected by Douglas Rossman in 1969 in Nayarit, western Mexico. Both series of specimens were found in a very small area—the pools, ditches, and irrigation canals near Río San Cayetano a small stream that flows northwest from Tepic, the capital of the state of Nayarit. In his description, Conant (2000: 5) mentioned, "available evidence indicates that *Thamnophis rossmani* may be in grave danger, if not already extinct." Several years later, Luja and Grünwald (2015) reported the finding two other *T. rossmani* in the same area reported years earlier by Rossman and Conant.

As part of a project to monitor populations of *T. rossmani*, on 20 September 2016 at 1700 h, on the El Pantanal–El Armadillo road, Municipio de Tepic, Mexico (21.443122°, -104.844728°W; WGS 84; elev. 923 m), JALS and OAH found an adult female *T. rossmani* (snout–vent length [SVL] = 46 mm; total length [TL] = 13mm; and body mass = 45g) in a wetland area used as a garbage dump (Fig. 1). The snake was maintained in captivity, and on 26 September 2016 gave birth to four fully formed offspring (Fig. 2). The mean SVL of the four neonates was 48.5 ± 2.36 (45–50 mm), the mean TL was 14.3 ± 1.65 (11.9–15.5 mm), and the mean body mass was 1.5 ± 0.37 (1.1–2 g).

Thamnophis rossmani is the only reptile species endemic to Nayarit and is one of the state's most endangered species (Woolrich-Piña et al., 2016); little information is available on its natural history. To our knowledge this is the first report on the reproduction of *T. rossmani*.

Fig. 1. A *Thamnophis rossmani* from the El Pantanal–El Armadillo road, Municipio de Tepic, Mexico. © Víctor H. Luja

Fig. 2. The female *Thamnophis rossmani* soon after giving birth to four fully formed offspring. © Víctor H. Luja

Acknowledgments.—The specimen was collected under scientific permit number SGPA/DGVS/01890/16 issued by the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

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Reptilia: Testudines

Preliminary notes on caudal prehensility in the Hicatee, *Dermatemys mawii* (Testudines: Dermatemydidae)

Dermatemys mawii is a Critically Endangered freshwater turtle that inhabits rivers, lagoons, and oxbow lakes in southeastern Mexico, Guatemala, and Belize (Vogt et al., 2016). As a fully-aquatic, non-basking, and frequently nocturnal species that is capable of remaining submerged for extended periods due to its ability to uptake oxygen underwater through buccopharyngeal respiration (Winokur, 1988; Vogt et al., 2011), this species can be difficult to observe in nature (Davy and Fenton, 2013). Aside from descriptions of its foraging behavior (Moll, 1989), little information is available on its behavioral repertoire. As the only extant member of the family Dermatemydidae, whose divergence from its closest living relatives, the kinosternids, dates back more than 72 million years (Knauss et al., 2011), *D. mawii* may possess unique or unusual behavioral attributes that are not represented in other extant chelonians.

Although uncommon in zoological collections (Smith, 2015; Mendyk and Smith, 2016), captive specimens of *D. mawii* maintained in zoological parks offer valuable opportunities for studying aspects of the species' behavior that otherwise would be difficult to observe in the field.

Captive Observations

The Jacksonville Zoo and Gardens presently maintains an adult trio of *Dermatemys mawii*, comprised of a 40+ year-old male and two 20+ year-old females (Mendyk and Smith, 2016). The group is maintained together in a ca. 151,000-L pool located inside a walk-through aviary, with a maximum water depth of ca.160 cm. Heat exchangers maintain the pool's water temperature between 25.5 and 27.7°C, and filtration is accomplished through a combination of high pressure sand filters and a slipstream ozone system. In addition to aquatic and wading birds that regularly utilize the pool, several other Neotropical chelonians, including *Trachemys venusta*, *Chelus fimbriatus*, and *Mesoclemmys gibba* are housed together with the *D. mawii*, as well as several large Pirapatinga (*Piaractus*

brachypomus) and suckermouth catfish (*Pterygoplichthys* spp.*)*. Several submerged logs and branches resting at the bottom of the pool provide cover for some of the turtle species. The staff adds weekly cuttings of mulberry branches (*Moras* spp.*)* to the pool; the leaves are consumed by many of the pool's inhabitants, including *D. mawii*, and also provide additional refuge. All of the behavioral observations described below occurred between 0730 and 1800 h.

Historically, a single female *D. mawii* (JZG #403307) had been maintained in the exhibit pool since October of 2004. In October of 2015, a male (JZG #415327) was acquired from another zoo and introduced to the exhibit with the original female, after a 30-day quarantine period. The male showed immediate interest in the female, approaching her from behind when resting on the bottom of the pool and investigating her cloacal region and rear limbs with his nares, in what appeared to be heavily-focused olfactory behavior similar to what has been described in *Rhinoclemmys pulcherrima* (Hidalgo, 1982). Over the next two months, the male showed continued interest in the female, following her around the pool, investigating her cloaca and rear limbs, and occasionally biting at the supracaudal scutes of her carapace, leading to two noticeably degraded depressions in the shell. Most observed interactions between these individuals occurred while both animals were walking along the bottom of the pool, and in most cases the male approached or trailed the female from behind. If and when detected by the female, the male would turn around and quickly retreat, even though no aggressive or defensive movements or displays were made by the female. Occasionally, the male would approach the female head-on, usually stopping at a distance of around 1 m or more, but maintained eye contact with the female; in some cases, such staring behavior was observed while the male was floating in the water column. Some unusual courtship behaviors were observed between this pair on several occasions, particularly tandemized swimming, in which the male swims directly underneath the female and mirrors the female's swimming movements at top speeds around the exhibit pool. Although copulation was not observed between this pair, a clutch of 12 eggs was deposited by the female on 25 March 2016, with an additional egg laid in the pool a few days later.

On one occasion on 16 February 2016 at around 1100 h, the male was observed slowly approaching the female head-on along the bottom of the pool. At a distance of around 0.6 m and in full visual contact with the female, the male halted his approach and floated his body upward at an inclination of ca. 45 degrees, with all four limbs outstretched to the sides. The male remained motionless and maintained eye contact with the female, maintaining his suspended positioning in the water column through the use of his tail, which partially was wrapped around a submerged tree limb ca. 10 cm in diameter. After ca. 20 s of motionless visual contact with the female in this position, the male released his grip from the limb, turned back, and quickly swam away from the female. After noticing this peculiar usage of the tail, further observations were made of the male using his tail to gently grip onto submerged tree limbs as he passed over them. When walking along the bottom of the pool, the tail often is angled downward so that it catches, or comes into contact with, submerged tree limbs as he passes over them, and occasionally gripping onto them. This behavior appears to contrast that described in other long-tailed aquatic turtles, such as *Chelydra serpentina*, in which the tail is extended outward as a counterbalance to the head while traveling along the bottom of a pool (Willey and Blob, 2004). Caudal prehensility has not been observed in either female *D. mawii* at JZG, and due to the substantially shorter tails of female *D. mawii* (Campbell, 1972; Fig. 1), we doubt whether females of this species are capable of physically using the tail in this capacity.

Discussion

These observations provide the first description of caudal prehensility in *Dermatemys mawii*. Caudal prehensility has been documented in several other chelonians, although tail usage varies widely between taxa. For example, *Platysternon megacephalum* and *Chelydra serpentina* have been reported to use their muscular, prehensile tails to assist with righting themselves when flipped over (Ashe, 1970; Finkler and Claussen, 1997). In sea turtles, prehensile tails are used in intraspecific signaling (Schofield et al., 2007) and to block rival males from gaining access to a female during copulation (Booth and Peters, 1972). In other species, males utilize a prehensile tail in forced insemination (Berry and Shine, 1980). The present account of caudal prehensility in *D. mawii* appears to be the first documented example of a turtle using its tail to grasp onto physical elements of its environment, although Brode (1958) speculated such "fifth limb" usage in nature for *C. serpentina* and *Macrochelys temminckii*.

Since female *D. mawii* do not possess large tails that would be capable of grasping objects in their environment, and younger males do not develop longer, thicker tails until maturity (RWM, pers. observ.; J. Marlin, pers. comm.), the primary function of caudal prehensility in *D. mawii* unlikely is for grasping onto submerged objects

within their environment or it would be expected to occur in both sexes. Instead, caudal prehensility likely serves some role in courtship and/or copulation. *Dermatemys mawii* does share common ancestry with the kinosternids, of which males of several genera including *Sternotherus*, *Kinosternon*, and *Staurotypus* have been reported to use their tails in forced insemination (Berry and Shine, 1980). Attempted copulation was observed at JZG on one occasion between the male and a second female (JZG# 416300), shortly after her introduction to the exhibit in April of 2016. Smaller in overall size than the female, the male appeared to use its strong, muscular tail to forcibly access the female's tail for copulation, although actual intromission could not be observed. The female did not appear to be receptive to the male's advances, and retreated shortly thereafter. No further copulation attempts were observed, and as of September 2016, no eggs have been produced by this female.

Further observations on captive *D. mawii* at JZG might shed additional light on the potential role and importance of caudal prehensility in courtship and copulation in this species, as well as other aspects of its behavioral repertoire.

Fig. 1. Tail length comparison between an adult male (left) and female (right) *Dermatemys mawii* at the Jacksonville Zoo and Gardens. © Robert W. Mendyk

Acknowledgments.—We thank the Smithsonian Institution Libraries for providing useful literature, Jason Bell, Robert Hill, Brad Lock, and Dustin Smith for their assistance with consolidating captive *Dermatemys* in AZA zoos; Dustin Smith, Jacob Marlin, Rick Hudson, Thomas Rainwater and Dick Vogt for useful discussions on *Dermatemys* ecology, reproduction and behavior; and the herpetology department of the Jacksonville Zoo and Gardens for their assistance and support.

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Reptilia: Testudines

***Trachemys gaigeae* (Hartweg, 1939). Behavior**. The Big Bend Slider occurs in the Río Conchos, Río Grande, and Río Nazas river systems of the southwestern United States and northeastern Mexico (Stuart and Ernst, 2004). This turtle species has received little scientific attention relative to other freshwater emydids in the United States, in part because historically it was classified as a subspecies of *T. scripta* (Gibbons, 1990; Stuart and Ernst, 2004; Ernst and Lovich, 2009). Sexual dimorphism in *T. gaigeae* is similar to its United States congener *T. scripta* in that males generally are smaller than females in carapace length, but differs in that males of *T. gaigeae* lack the elongated foreclaws used during courtship by males of *T. scripta* (Stuart and Ward, 2009). Accordingly, male courtship in *T. gaigeae* is considered to be more similar to Mesoamerican species of *Trachemys* than to *T. scripta* (Degenhardt et al., 1996; Ernst and Lovich, 2009). For example, male courtship tactics of *T. gaigeae* include head nodding (up-and-down) and wagging (side-to-side), and nasal squirting (Stuart and Miyashiro, 1998), in contrast to the facial stroking and biting observed in males of *T. scripta* (Cagle, 1950). The reproductive behavior of *T. gaigeae* is known from just a few sporadic notes (e.g., Legler, 1960; Stuart, 1995; Stuart and Painter, 1997; Stuart and Painter, 2006) and the most detailed account describes underwater courtship from individuals in captivity (i.e., Stuart and Miyashiro, 1998). Here we report an observation on above water behavior of *T. gaigeae* in natural conditions, which seemed to be associated with courtship.

Beginning at 0900 h on 23 April 2016, in the southeastern region of Big Bend National Park, Brewster County, Texas, along the United States/Mexico border (29.204636°N, 102.913620°W; WGS 84; elev. 563 m), we observed three adult *T. gaigeae* (2 males, 1 female) in the Río Grande river at Boquillas Canyon—the type locality for *T. gaigeae*—engaged in pursuit behavior we interpret to be linked with courtship. The weather conditions on the morning of our observations were overcast with light, scattered rainfall. Two of the turtles initially were found breaking the surface of the water < 5 m from the shore, and resting upon the branches of a sunken tree (ca. depth < 0.3 m) (Fig. 1A). A large female *T. gaigeae* surfaced first, and soon was followed by the surfacing of a smaller male. Once both turtles were positioned along the surface, the male rapidly pursued the female and climbed onto her carapace. The male made several attempts to climb onto her carapace with approaches from lateral and posterior positions (Fig. 1A–F). When his forelimbs were positioned firmly on the female's carapace, his movement stopped, upon which he pressed up and elevated his head above the surface of the water (Fig. 1B). The female occasionally dove underwater, and the male pursued her quickly. When the female resurfaced and rested upon a log, the male reappeared and repeatedly attempted to gain position on her carapace. This process of surfacing, pursuit, positioning on the carapace, pressing up, and submerging was repeated several times. After nearly 10 min, a larger male *T. gaigeae* surfaced simultaneously with the original two turtles (Fig. 1G). The two males quickly pursued the female and seemed to jostle for a posterior position on her carapace (Fig. 1H). Abruptly, the female dove underwater and both males immediately followed her. After 1 min, the larger male surfaced unaccompanied, then dove underwater and was not observed again (Fig. 1I). Shortly thereafter, the small male surfaced alone for a short time, rested on a submerged branch, and dove underwater again (Fig. 1J). About 7 min later, the female resurfaced and rested upon a branch of the sunken tree. She was trailed by the small male, who again made repeated attempts to climb and settle upon her carapace by approaching her from alternate sides (Fig. 1K–O). The duration of our observations lasted for more than 30 min. Also encountered was a single adult *Apalone spinifera* during some of these observations (see Fig. 1G–H, J).

Most courtship and mating in *T. gaigeae* are thought to occur in April and May, prior to the nesting season (ca. late-May–July) (Morjan and Stuart, 2001). From wild-caught individuals of *T. gaigeae* maintained in outdoor artificial ponds, both head movements and nasal squirting were observed in April–May and head nodding alone in January–February (Stuart and Miyashiro, 1998). The limited published reports on the seasonality of courtship (April–May) and accounts of pre-courtship pursuit by males of females in *T. gaigeae* generally are consistent with our behavioral observations in the wild, suggesting that what we observed likely was associated with courtship. This species currently is listed as Vulnerable by the IUCN, because of its restricted range in rivers subjected to intensive hydrological management (van Dijk, 2013). Recently, Wilson et al. (2013) supported this IUCN listing for *T. gaigeae*, and extended it by assigning this species to the upper level of the high vulnerability category with an Environmental Vulnerability Score of 18. The dearth of empirical information regarding the basic reproductive biology of *T. gaigeae* renders this a noteworthy observation, and more research into the natural history and behavior of this species will be fundamental to improve its conservation outlook into the future.

Fig. 1. Time-stamped serial photographs documenting above surface behavior of male and female Big Bend Sliders (*Trachemys gaigeae*) in the Río Grande, Boquillas Canyon, Big Bend National Park, Brewster County, Texas, along the United States/Mexico border. © Daniel F. Hughes

Acknowledgements.—We thank the staff of both Big Bend National Park and the United States National Park Service.

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Amphibia: Anura

Family Eleutherodactylidae

***Eleutherodactylus pallidus* (Duellman, 1968).** MEXICO: NAYARIT. Municipio de Tecuala, Ejido Las Lumbres, 3 km E of El Guastecomate (22.289436°N, 105.315871°W; WGS 84); elev. 84 m; 4 November 2015; Jesús A. Loc-Barragán and Emmanuel Miramontes-Medina. Two frogs (Fig. 1) were found under a log at night, immediately after a heavy rain. Photos vouchers of these individuals are deposited at The University of Texas at Arlington Digital Collection (UTADC-8681–82). These vouchers represent a new municipality record and a range extension of 83.8 km to the N (airline) from the nearest reported locality at San Blas, Municipio de San Blas, Nayarit (Lynch, 1970).

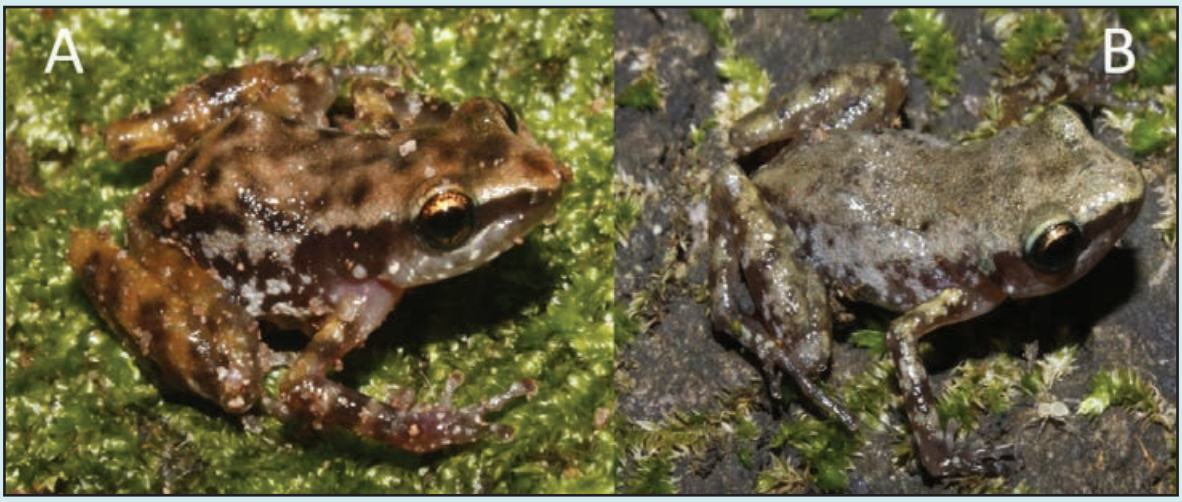

Fig 1. Two individuals of *E. pallidus* (UTADC-8681, 8682; A, B, respectively) from 3 km E of El Guastecomate, Ejido Las Lumbres, Municipio de Tecuala, Nayarit, Mexico. © Jesús Loc-Barragán

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

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Family Hylidae

***Exerodonta sumichrasti* Brocchi, 1879.** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, near El Obispo (16.175215°N, -97.322873°W; WGS 84), elev. 1,216 m; 16 June 2016; Vicente Mata-Silva, Dominic, L. DeSantis, Elí García-Padilla, and Larry David Wilson. The frog (CIB-5038) was found active after a rain at 0120 h, on a plant near a stream (Fig. 1A).

Another individual (photo voucher UTEP G-2016.29) was found in the same municipality, ca. 1 km E of El Pedimento (16.243806°N, -97.241407°W; WGS 84), elev. 1,992 m; 20 June 2016; Vicente Mata-Silva, Dominic, L. DeSantis, Elí García-Padilla, and Larry D. Wilson. This frog (Fig. 1B) was found calling after a rain in vegetation near a stream, in an area surrounded by remnants of pine-oak forest.

Additionally, on 19 June 2016, one individual (photo voucher UTEP G-2016.30) was found in Municipio de San Juan Lachao, ca. 1.5 km (straight line) N of Santa Rosa de Lima (16.182241°N, -97.095880°W; WGS 84), elev. 1,316 m; Vicente Mata-Silva, Dominic, L. DeSantis, Elí García-Padilla, and Larry D. Wilson. This frog (Fig. 1C) was found in cloud forest, calling from vegetation after a rain.

A second individual from Municipio de San Juan Lachao was found on 26 June 2016 near El Vidrio (16.262047°N, -97.152026°W; WGS 84), elev. 1,710 m; Vicente Mata-Silva and Arturo Rocha. This frog was calling from a plant along a rocky stream during a light rain, in an area consisting of patches of pine-oak forest (Fig. 1D). A photograph of this individual is deposited in the University of Texas at El Paso Biodiversity Digital Collection (photo voucher UTEP G-2016.31).

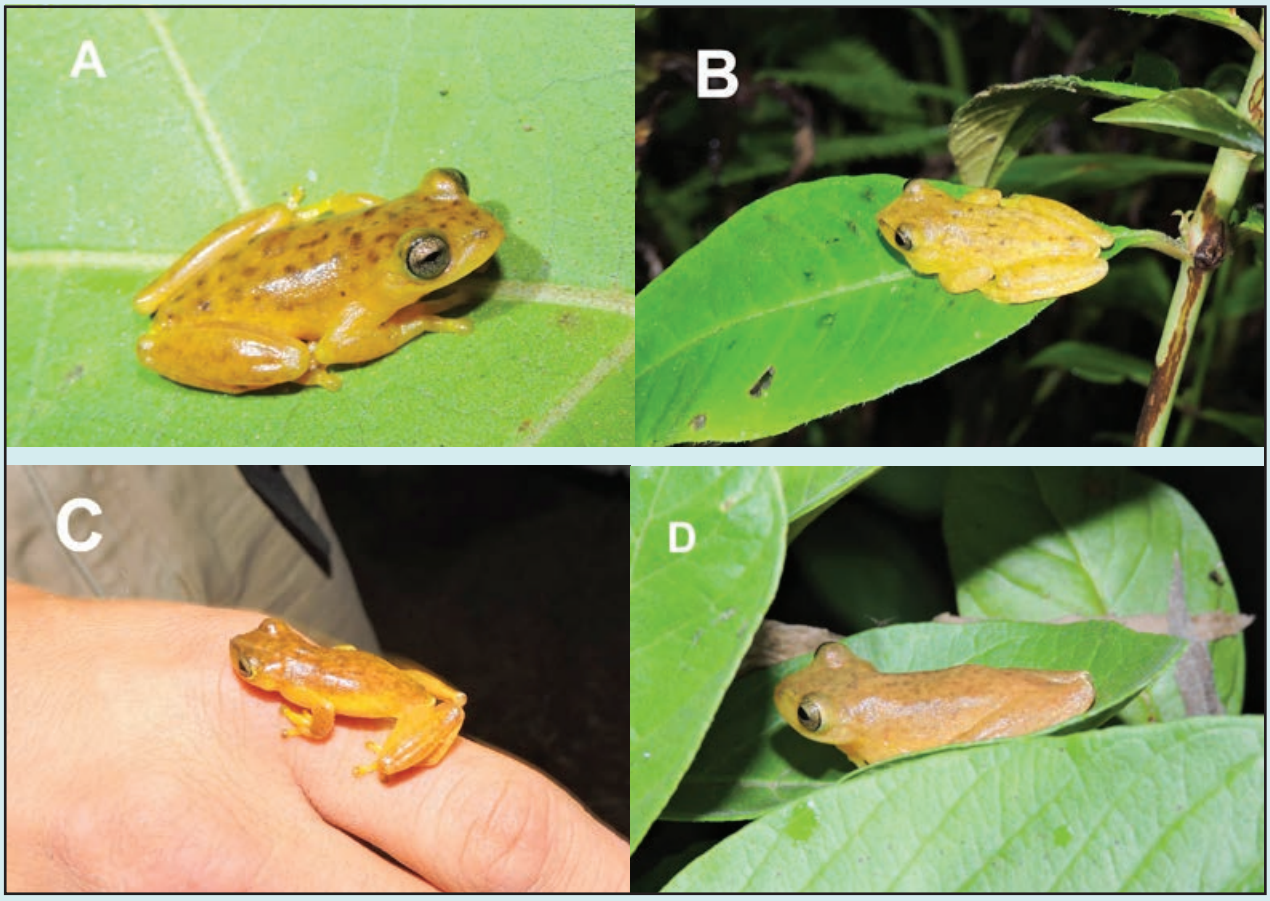

Fig. 1. Individuals of *Exerodonta sumichrasti* repoted from Oaxaca, Mexico. (A) (CIB-5038) from near El Obispo, Municipio de Santa Catarina Juquila; (B) an adult male (UTEP G-2016.29) from near El Pedimento, Municipio de Santa Catarina Juquila; (C) an adult male (UTEP G-2016.30) from near Santa Rosa de Lima, Municipio de San Juan Lachao; and (D) an adult male (UTEP G-2016.31) from near El Vidrio, Municipio de San Juan Lachao. © Vicente Mata-Silva

These above individuals represent new municipality records for San Juan Lachao and Santa Catarina Juquila. The record from near El Obispo also represents the westernmost distribution of this species along the Sierra Madre del Sur in Oaxaca (Duellman, 2001). The collected specimen is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo, and the photo vouchers in the University of Texas at El Paso Biodiversity Digital Collection.

Acknowledgments.—A special thanks goes to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the specimen number, and Arthur Harris kindly provided the photo voucher numbers.

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***Sarcohyla ameibothalame* (Canseco-Márquez, Mendelson and Gutiérrez-Mayén, 2002).** MEXICO: OAXACA. Municipio de San Felipe Tejalápam, Jalapa del Valle, Paraje El Capulín (17°02'13.7"N, 96°54'43.7"W; datum WGS 84), elev. 2,091 m; 26 August 2015; Pablo R. Simón-Salvador. The frog was found active at dusk in pine-oak forest. A photograph of this individual is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.33). This voucher (Fig. 1) represents a new municipality record, and a range extension of ca. 82 km to the SE (airline distance) from the vicinity of Santa María Nativitas, Oaxaca (Canseco-Márquez et al., 2002). This voucher also represents the third known locality (previously known from Yosocuno and Nativitas) and the lowest known elevation for this species (Canseco-Márquez et al., 2002), with all three localities in the Montañas y Valles de Occidente physiographic region (Mata-Silva et al., 2015).

Fig. 1. An adult *Plectrohyla ameibothalame* (UTEP G-2016.33) from Paraje El Capulín, Jalapa del Valle, Municipio de San Felipe Tejalápam, Oaxaca, Mexico. © Pablo R. Simón-Salvador

Acknowledgments.—A special thanks goes to Arthur Harris for kindly providing the photo voucher number, and to Luis Canseco-Márquez for confirming the identification of the species.

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***Sarcohyla pentheter* (Adler, 1965).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, 3.8 km E of Santa Catarina Juquila (16.236936ºN, -97.255507ºW; datum WGS 84), elev. 1,794 m.; 16 June 2016. Dominic L. DeSantis, Vicente Mata-Silva, Elí García-Padilla, and Larry David Wilson. A photograph of this specimen is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.37, Fig. 1A).

In addition, two more individuals (Fig. 1B, C) were found near El Obispo, in the same municipality (16.175215ºN -97.322873ºW; WGS 84), elev. 1,216 m; 14 June 2016. Dominic L. DeSantis, Vicente Mata-Silva, Elí García-Padilla, and Larry David Wilson. The two specimens (CIB-5074 and CIB-5075) are deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo.

These three individuals represent new municipality records, and also slightly extend the distribution of *S. pentheter* in the state ca. 16 and 24 km (3.8 km from Santa Catarina Juquila and near El Obispo, respectively) to the west of various records in the Municipio de San Juan Lachao (Duellman, 2001; Köhler et al., 2016). The individual encountered near Santa Catarina Juquila was an adult female found on a paved road through fragmented pine-oak forest during light rain. The individuals from near El Obispo also were found during light rain, but on riparian vegetation along a large stream in pine-oak forest. In addition to the two males collected, several more were heard calling at the same locality.

Fig. 1. An adult female *Sarcohyla pentheter* (UTEP G-2016.37) from 3.8 km E of Santa Catarina Juquila (A), and two adult males (CIB-5074 and CIB-5075) from near El Obispo, in Municipio de Santa Catarina Juquila (B and C), Oaxaca, Mexico.
© Vicente Mata-Silva

Acknowledgments.—We are grateful to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the voucher number, and Arthur Harris the photo voucher number.

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Family Microhylidae

***Hypopachus variolosus* (Cope, 1866).** MEXICO: HIDALGO: Municipio de San Felipe Orizatlán, near Piedra Hincada (21.28855ºN, -98.55405ºW; WGS 84); elev. 133 m; 25 June 2015; Hansel Hernández-Córdoba. The specimen was deposited in the herpetological collection of the Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo (CH CIB 4787). The frog was found in tropical forest, after it fell into a pitfall trap used in a dung beetle survey for HHC's Master's project.

This specimen represents a new municipality record, with the closest known locality 88.4 km to the SE (airline distance) in the municipality of Hueuetla, Hidalgo (Berriozabal-Islas, 2012; Ramírez-Bautista et al., 2010; 2014), and 72.3 km to the NE (airline distance) in the municipality of Jacala de Ledezma, Hidalgo (Cruz-Elizalde et al., 2016). This specimen also represents the fifth published record of *Hypopachus variolosus* in the state. Previous records for this species in Hidalgo are from the municipalities of Acaxochitlán (Lemos-Espinal and Dixon, 2016), Huehuetla (Berriozabal-Islas, 2012; Ramírez-Bautista et al., 2010; 2014), Jacala de Ledezma (Cruz-Elizalde et al., 2016), and Huautla (Ramírez-Bautista et al., 2010; 2014). The last record, however, lacks locality information (Ramírez-Bautista et al., 2010), as the specimen and its collecting data no longer are available in the herpetological collection of the Instituto Tecnológico de Huejutla.

Acknowledgments.—We thank SEP-CONACyT Ciencia Básica 222632 project for funding and logistic support, and SEMARNAT for the collecting permit (FAUT-0052) provided to Irene Goyenechea. We are especially grateful to the Barragan family for their hospitality during our stay in San Felipe Orizatlán.

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Amphibia: Caudata

Family Plethodontidae

***Bolitoglossa striatula* (Noble, 1918)**. NICARAGUA: BOACO: Municipio de Camoapa, southern slope of Cerro Masigüe, Finca Santa Elena (12.53579°N, 85.35665°W; WGS 84); elev. 540 m; 15 October 2015; Lenin Alexander Obando. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8764; Fig. 1). The adult male salamander was found active at 2000 h during heavy rain, ca. 20 m away from a river and about 0.7 m above the ground on a leaf, in an area secondary vegetation in Lowland Moist Forest (Holdridge, 1967; Savage, 2002). This locality represents a new record for the department of Boaco. In Nicaragua, this relatively common species has been recorded from at elevations from near sea level to 1,380 m, in the following departments: Atlántico Norte, Atlántico Sur, Chontales, Granada, Jinotega, Matagalpa, Nueva Segovia, Río San Juan, and Rivas (Noble, 1918; Villa, 1972; Köhler and McCranie, 1999; Köhler, 2001; Sunyer et al., 2008, 2009, 2012, 2014; Barquero et al., 2010; García-Roa et al., 2014; HerpetoNicas, 2015).

Fig. 1. An adult male *Bolitoglossa striatula* from Finca Santa Elena, Departamento de Boaco, Nicaragua.
© Lenin Alexander Obando

Acknowledgments.—We thank Carl J. Franklin for providing the photo voucher number. The authors are members of the Amphibian Specialist Group of Nicaragua.

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***Pseudoeurycea mixteca* (Cope, 1885).** MEXICO: OAXACA. Municipio de San Agustín Etla, Paraje Ex-planta Hidroeléctrica (17°12'14.68"N, 96°43'34.21"W; WGS 84), elev. 1,986 m; 8 July 2016; César Mayoral-Halla. The specimen was found under a log near a river, in oak forest. A photograph of this specimen is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.32). This individual (Fig. 1) represents a new municipality record, as well as the first record for the Sierra Madre de Oaxaca physiographic region (Mata-Silva et al., 2015), with the closest reported locality ca. 80 km NNW in the vicinity of the type locality at San Pedro Jocotipac, Oaxaca (Canseco-Márquez and Gutiérrez-Mayén, 2005).

Fig. 1. A *Pseudoeurycea mixteca* (UTEP G-2016.32) from Paraje Ex-planta Hidroeléctrica, Municipio de San Agustín Etla, Oaxaca, Mexico. © Pablo R. Simón-Salvador

Acknowledgments.—A special thanks goes to Arthur Harris for kindly providing the photo voucher number, and to Luis Canseco-Márquez for confirming the identification of the species.

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Reptilia: Squamata (lizards)

A new locality for *Corytophanes hernandesii* (Wiegmann, 1831), (Squamata: Corytophanidae) in western Honduras, with comments on its distribution

Members of the Neotropical genus *Corytophanes* (Boie, 1827) are moderate-sized lizards that are characterized by the presence of a conspicuous parietal blade (Lang, 1989), and which primarily are arboreal (Pianka and Vitt, 2003; Vitt and Caldwell, 2009). On the Atlantic versant their distribution extends from southeastern San Luis Potosí, Mexico, to northwestern Colombia, and on the Pacific versant from Chiapas, Mexico, to western El Salvador and southwestern Honduras, and then from northwestern Costa Rica to central Panama, at elevations from near sea level to 2,200 m. (Townsend et al., 2004). The genus consists of three species: *C. cristatus* (Merren, 1820), *C. hernandesii* (Wiegmann, 1831), and *C. percarinatus* (Duméril, 1856) (Savage, 2002; Köhler, 2003; Townsend et al., 2004). All three species are found in Honduras (Solís et al., 2014; McCranie, 2015).

Hernandez's Helmeted Basilisk (Turipache de Montaña), *C. hernandesii*, occurs on the Atlantic versant from southeastern San Luis Potosí, Mexico, to northwestern Honduras, at elevations from near sea level to 1,300 m (Townsend et al., 2004). In Honduras *C. hernandesii* is an uncommon species, known only from four localities in the departments of Cortés and Santa Barbara (McCranie and Espinal, 1998; McCranie et al., 2004; J. McCranie, pers comm. [see below]). Here we report a new locality for this species, and discuss the provenance of other records from the country.

In October of 2015, we conducted a field survey in western Honduras. On 4 November 2015 at 2023 h, we collected an adult female *C. hernandesii* in the community of El Bijao, Trinidad, Departamento de Copán (14°58'19.3"N, 88°46'27.0"W; WGS 84; elev. 731 m). The lizard was sleeping on a branch at a height of 0.5 m.

A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8772; Fig. 1A). The measurements for the lizard were as follows: head length = 42.1 mm; total length = 362 mm; shank length = 36.9 mm; snout–vent length = 105.9 mm; and tail length = 256.1 mm. Like other members of *Corytophanes*, the cryptic and disruptive coloration of *C. cristatus* is typical of a highly specialized sit-and-wait predator (Andrews, 1979; Lang, 1989; Sasa and Monrós, 2000). The dark shades in the individual of *C. hernandesii* ranged from sepia in the cephalic region and conspicuous spots in the dorsolateral, scapular, and sacral regions, to a network of mahogany shades in the scapular region, and pale (olive yellow/color 52) lines on the supralabials, infralabials, and the venter and limbs (colors based on Smithe, 1975).

The lizard was found in a patch of Premontane Wet Forest (Holdridge, 1987; see map in McCranie and Wilson, 2002: 20) near a road and close to a farm with livestock. The individual represents a new departmental record and the southernmost record for the species, with the nearest known locality at Las Rosas, in the department of Santa Bárbara (McCranie and Espinal, 1998; Fig. 2). McCranie et al. (2004) indicated two localities for *C. hernandesii* in Honduras, of which one is the record provided by McCranie and Espinal (1998). We were unable to find the second locality, but according to J. McCranie (pers. comm.) it was based on an old record. Although *C. hernandesii* first was recorded from Honduras by McCranie and Espinal (1998), previously Campbell (1982) noted a specimen from the Northwestern Honduran Highlands at an elevation of 850 m. Apparently, the specimen was collected in 1973 in the department of Cortés and deposited in the Carnegie Museum, and it actually represents the first record of this species from the country. Additionally, in an Operacion Wallacea expedition in 2006, a *C. hernandesii* was reported from a buffer zone camp (Buenos Aires) at Parque Nacional Cusuco (McInnes et. al., 2006). According to Jonathan Kolby (pers. comm.), the presence of this species was based on a photograph; this photo represents the second individual known from the Sierra de Omoa. In 2008, ME found a *C. hernandesii* (CM 158759; Fig. 1B) at Totoca, Departamento de Santa Barbara, the second record from the department.

Fig. 1. Individuals of *Corytophanes hernadesii* in this report. *(*A) UTADC-8772 from El Bijao, Trinidad, Departamento de Copán; and (B) CM 158769) from Totoca, Departamento de Santa Barbara.

Based on a review of the literature, with the specimen of *C. hernandesii* reported herein four specimens of this species are known from Honduras, in addition to the individual in the Cusuco report. Of these records, three are from the Sierra de Merendón and one from the Sierra de Omoa, parallel mountain ranges separated by a depression formed by the Río Chamelecón. All of the records are from the Northern Cordillera of Serranía Region (see McCranie and Wilson 2002: 15). Whereas records from the Sierra de Omoa lack precise data or were not collected, the mountain systems of Omoa, Espiritu Santo, and Merendón are interconnected, so this species likely occurs in the Sierra Espiritu Santo. *Corytophanes hernandesii* has been evaluated as Least Concern by IUCN, based on its wide distribution (Ariano-Sánchez et al., 2013), and using an environmental vulnerability measure Johnson et al., (2015) assessed this species a medium vulnerability score (EVS = 13). In Honduras, forests where this species has been found have become highly fragmented due to human disturbance, and conserving the remaining forest patches and connectivity among these areas is important for the survival of this species and much of the accompanying herpetofauna.

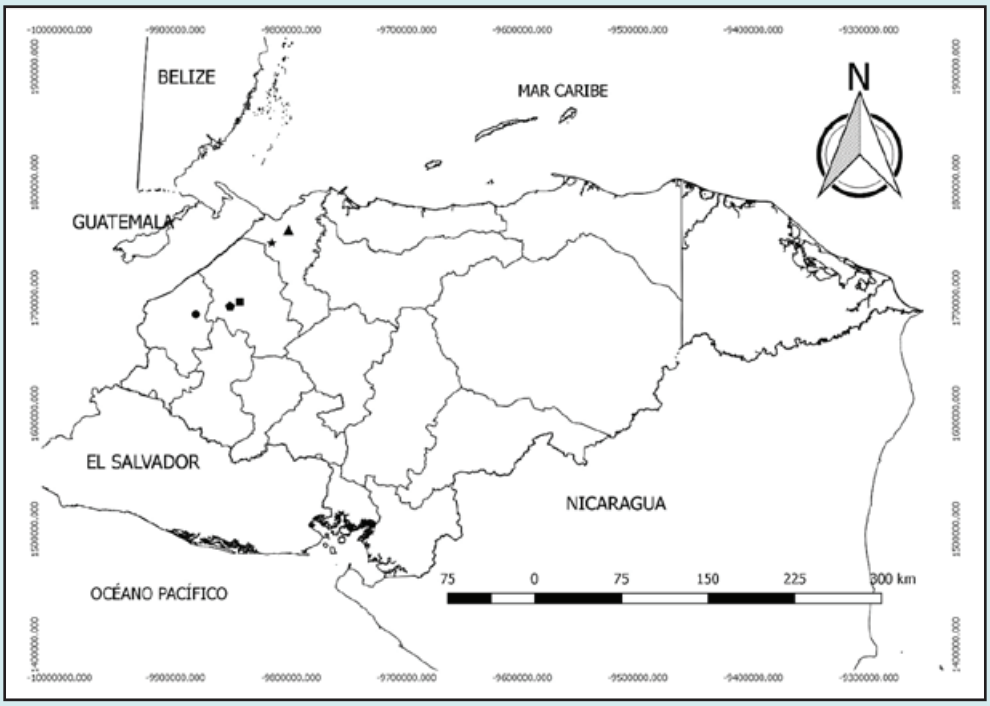

Fig. 2. Recorded localities for *Corytophanes hernandesii* in Honduras. The square represents the locality in McCranie and Espinal (1998), the star the locality in McInnes et. al. (2006), the triangle the locality for the specimen cited in Campbell (1982), and the pentagon the locality provided by ME. The circle represents the new record from the department of Copán.

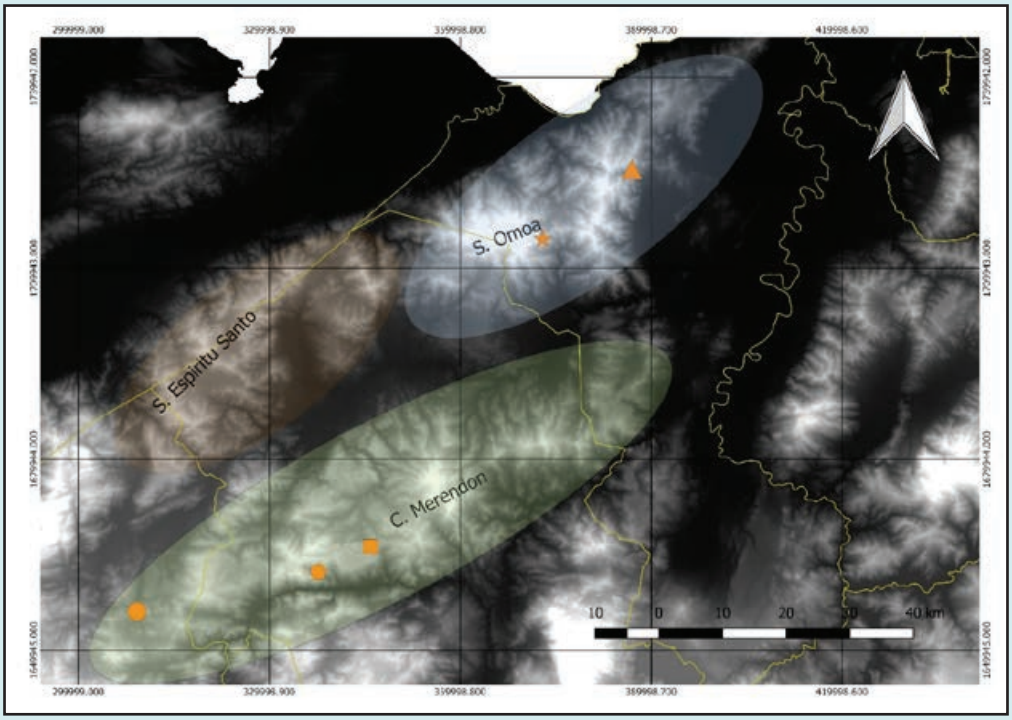

Fig. 3. Map showing localities for all the known *Corytophanes hernandesii* in northwestern and western Honduras. The shaded area in blue is the Sierra de Omoa; the one in orange the Sierra Espiritu Santo; and the one in green the Sierra de Merendón. The star represents the locality in McInnes et. al., 2006; the triangle the locality for the specimen cited in Campbell (1982); and the square the locality provided by ME. The circle indicates the new record from El Bijao, Trinidad, Departamento de Copán.

Acknowledgments.—We thank José Mario Solís for providing literature, "Marlon" for assisting with our fieldwork, and Said Lainez and Roberto Downing of the Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre [ICF]), Tegucigalpa for other courtesies. We also thank Carl J. Franklin for providing the photo voucher number.

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Family Eublepharidae

***Coleonyx fasciatus* (Boulenger, 1885)**. MEXICO: SONORA: Municipio de Nacozari de García, Pilares de Nacozari, 6.5 km (airline distance) SE of Nacozari de García, Sierra Nacozari (30.32833°N, -109.62972°W; WGS 84), elev. 1,413 m; 9 August 2015; Patrick H. H. Brown. The individual was found at ca. 2230 h, emerging from a crack in a concrete staircase among the abandoned buildings of Pilares de Nacozari. A photo voucher (UAZ 57635-PSV) was deposited in the University of Arizona Museum of Natural History Amphibian and Reptile Collection. Data collection and an image of the same individual (Fig. 1) also are available in the Madrean Discovery Expedition database (www.madreandiscovery.org; record mde-3993). This observation represents a new municipality record, with the closest published locality ca. 47 km to the W in the vicinity of Arizpe (Rorabaugh, 2005). The burnt orange coloration on the head and neck of this voucher is unusual for this species.

The transition between the New World tropics and the northern temperate zone lies at about 29°N in east-central Sonora. Foothills thornscrub (*matorral espinoso*) is an important biotic community in Sonora, which is transitional between Sonoran desertscrub and tropical deciduous forest in southern Sonora and oak woodland in eastern Sonora (Van Devender et al., 2013). The transition between foothills thornscrub (FTS) and desert grassland in the north is limited by freezing temperatures. In the north FTS is replaced by desert grassland, as winters become colder and periodic fires become ecological processes. The northern limits of FTS in Sonora are at about 30°11'N east of Sinoquipe in the Río Sonora Valley (just north of Arizpe) and 30°26'N at Presa Angostura on the Río Bavispe at the southern end of the Sierra El Tigre. FTS does not reach Arizona, but the distributions of several squamates that inhabit thornscrub extend into southern Arizona in desert grassland or oak woodland (e.g., *Gyalopion quadrangulare* and *Oxybelis aeneus*). On the south side of the Sierra de Nacozari there are local patches of thornscrub with tree ocotillo (*Fouquieria macdougallii*) near Pilares de Nacozari. Other tropical species, including *Boa sigma,* reach their northern distributional limits in the Río Sonora Valley just north of Arizpe. *Coleonyx fasciatus* at Arizpe and Pilares de Nacozari are similar records of a tropical species reaching its northern limits. This species mostly is known from tropical deciduous forest in southern Sonora, 375 km to the SSE of Pilares de Nacozari.

Fig. 1. A *Coleonyx fasciatus* (UAZ 57635-PSV) from Pilares de Nacozari, Municipio de Nacozari de García, Sonora, Mexico.
© Patrick H. H. Brown

Acknowledgments.—We thank Mario Cirett-Galán, the staff of the Reserva Forestal Nacional y Refugio de Fauna Silvestre *Ajos-Bavispe,* and the Madrean Discovery Expeditions volunteers.

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Family Phrynosomatidae

***Phrynosoma orbiculare* (Linnaeus, 1758).** MEXICO: OAXACA. Municipio de Santo Domingo Yanhuitlán, Cruz de Tabla (17.575927°N, -97.352579°W; WGS 84), elev. 2,539 m; 28 September 2012. Clarita Alicia Ibarra-Contreras. A photograph of this individual is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.38). This voucher (Fig. 1) represents the first record of *P. orbiculare* in the state of Oaxaca, and extends the range ca. 95 km to the S from the closest known published locality at San Diego Chalma, Puebla, Mexico (Smith and Taylor, 1950). The lizard was found at noon on rocky substrate with scarce vegetation, with the surrounding area consisting of pine-oak forest; this location lies in the Montañas y Valles del Occidente physiographic region (Mata-Silva et al., 2015). While researching the distribution of this species in the state of Puebla, we became aware of a specimen of *P. orbiculare* (CM 38890) deposited at the Carnegie Museum of Natural History, and its information is available on VertNet (2016). The locality for this specimen is Zapotitlán de Las Salinas, and it was collected by Epping Otto M. in 1963. We decided, however, to omit this record as the nearest locality because this species has not been reported from this region (Mata-Silva, 2003; Woolrich-Piña et al., 2005; Canseco-Márquez and Gutiérrez-Mayén, 2006; Canseco-Márquez and Gutiérrez-Mayén, 2010), and the site does not correspond with the typical habitat of *P. orbiculare*. At VertNet (2016) we also found information on a specimen (ROM 0849) deposited at the Royal Ontario Museum, which was identified as *P. orbiculare* and supposedly was found in Oaxaca; however, we verified that the specimen actually was found in northern Puebla (10 km S of Zaragoza by M. Villegas in 1969).

Fig. 1. An adult *Phrynosoma orbiculare* (UTEP G-2016.38) from Cruz de Tabla, Municipio de Santo Domingo Yanhuitlán, Oaxaca, Mexico. © Clarita Alicia Ibarra-Contreras

Acknowledgments.—A special thanks goes to the people of the community of Santo Domingo Yanhuitlán and to the Naturalista-CONABIO platform (www.naturalista.mx), where this observation initially was shared. We also are grateful to David C. Evans and Kevin Seymour of the Royal Ontario Museum and Stephen P. Rogers of the Carnegie Museum of Natural History for providing information on specimens ROM 0849 and CM 38890, respectively.

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Family Xenosauridae

***Xenosaurus tzacualtipantecus* Woolrich-Piña and Smith, 2012.** MEXICO: HIDALGO: near Alumbres, Municipio de Metztitlán (20.6714630ºN, -98.6904373ºW; WGS 84) elev. 2,090 m; 28 August 2016; Miguel Ángel Flores-Hernández. This individual (CH-CIB 79; Fig. 1A) represents a new municipality record, with the closest known locality 9.9 km to the NW (airline distance) in the vicinity of La Mojonera, Municipio de Zacualtipán de Ángeles, Hidalgo (Woolrich-Piña and Smith, 2012; Ramírez-Bautista et al., 2014; Lemos-Espinal and Dixon, 2016; Nieto-Montes de Oca et al., 2016). The lizard was found inside a rock crevice in pine-oak forest. A rock mine was located ca. 200 m from the site where we saw the lizard. Local residents indicated seeing other individuals near the mine, and thus the species at this locality would seem to be at high risk of disappearing.

We saw two other individuals of *Xenosaurus tzacualtipantecus*. The first (CH-CIB 80; Fig. 1B) was north of Alumbres, Municipio de Zacualtipán de Ángeles (20.679452ºN, -98.685174ºW; WGS 84) elev. 2,002 m; 25 September 2015; Miguel Ángel Flores-Hernández. This individual was found within construction panels behind a cabin located in oak-sweetgum/pine-forest, and represents the first record for this species known to use a human modified environment as a microhabitat. This record is located 1.0 km N of the Municipio de Metztitlán locality (see above), and 9.6 km to the NW from the vicinity of La Mojonera, Municipio de Zacualtipán de Ángeles (Woolrich-Piña and Smith, 2012; Ramírez-Bautista et al., 2014; Lemos-Espinal and Dixon, 2016). The second individual (CH-CIB 81; Fig. 1C) was found near La Mojonera, Municipio de Zacualtipán de Ángeles (20.635478°N, -98.617732°W; WGS 84) elev. 1,976 m; 7 August 2016; Cristian Raúl Olvera-Olvera. This record is located 1.7 km to the E from the previous locality.

The records from Alumbres fill a distribution gap between the locality of La Mojonera, Municipio de Zacualtipán de Ángeles (Woolrich-Piña and Smith, 2012), and the other two known localities (Aguatitla and Atezca) from the Municipio de Molango de Escamilla (Ramírez-Bautista et al., 2014; Juárez-Escamilla, 2016).

The photo vouchers (CH-CIB 79–81), are deposited in the photographic collection of the Herpetological Collection of the Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo. All of the photographs were taken *in-situ*, and the lizards were not collected.

Acknowledgments.—We thank Christian Said Berriozabal-Islas for helping to identify the lizards, and Luis Canseco-Márquez for corroborating their identification. We also thank Diego Juárez-Escamilla for providing information on the localities in Molango de Escamilla, Hidalgo, and Carlos Maciel-Mata for providing information on the species. Irene Goyenechea graciously allowed us to deposit the photographs in the CH-CIB herpetological collection.

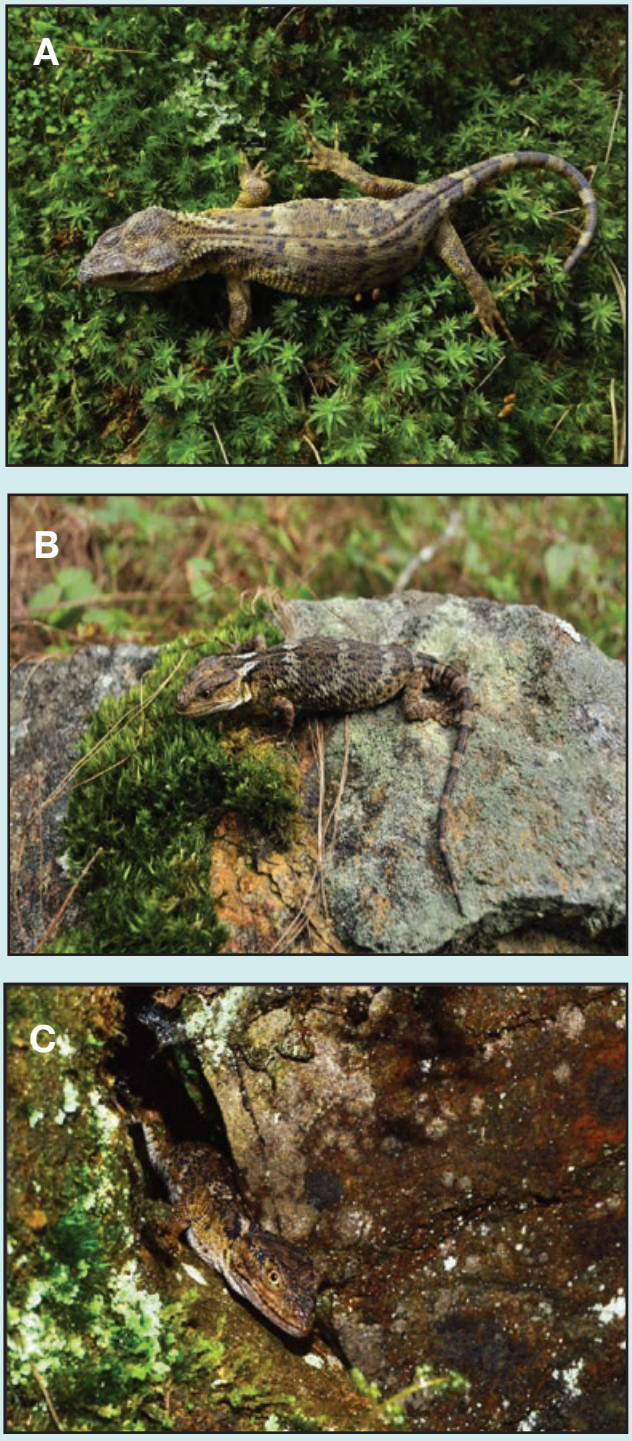

Fig 1. Individuals of *Xenosaurus tzacualtipantecus* from Hidalgo, Mexico: (A) near Alumbres, Municipio de Metztitlán (CH-CIB 79); (B) near Alumbres, Municipio de Zacualtipán de Ángeles (CH.-CIB 80); and (C) near la Mojonera, Municipio de Zacualtipán de Ángeles (CH-CIB 81).

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New departmental records for lizards in Nicaragua

Nicaragua is one of the poorest (if not the poorest) herpetologically surveyed countries in Mesoamerica, and traditionally has fallen behind in the distributional knowledge of its herpetofauna. Although several attempts have been made to compile the available records of amphibians and reptiles from the country, a detailed picture of their distributions is far from complete (Sunyer and Köhler, 2010). Most of the 17 political departments in Nicaragua have not been surveyed adequately, and considerable gaps are apparent in the distribution of many species.

As a result of recent field surveys, herein we report several new departmental records and range extensions for selected lizard species in Nicaragua. Searches were made during the day and night, and individuals or specimens were photographed and/or captured by hand. We handled all animals according to the approved IACUC standards and protocols (IACUC #16–13). For euthanasia, we applied an intracardial injection of T61 (Intervet) the day after capture. For preservation, we injected the soft parts of each specimen with a solution of formalin [4], and after fixation submerged it in a closed bottle filled with the same solution. We include photographs for all the records that lack voucher specimens; the photographs are vouchered at The University of Texas at Arlington Digital Collection (UTADC). The acronyms for the museum collections follow Sabaj-Pérez (2013).

We placed each of the mentioned localities (Fig. 1) within the nine forest formations recognized for the country based on the life zone concept proposed by Holdridge (1967) and used by Savage (2002) and Sunyer and Köhler (2010), as follows [all elevations asl]: Lowland Wet Forest (Río Pijibaye); Lowland Moist Forest (portions of Cerros Masigüe and Saslaya below 600 m); Premontane Moist Forest (portions of Cerro Masigüe above 600 m); and Lower Montane Moist Forest (portions of Departamento Estelí above 1,200 m). Portions of Departamento Madriz ranging from 600 to 1,200 m correspond to a transitional area between Premontane Moist and Dry forests. Reserva Silvestre Privada La Conga, and to a lesser degree Reserva Silvestre Privada El Abuelo, correspond to a transitional area between Lowland Moist and Dry forests.

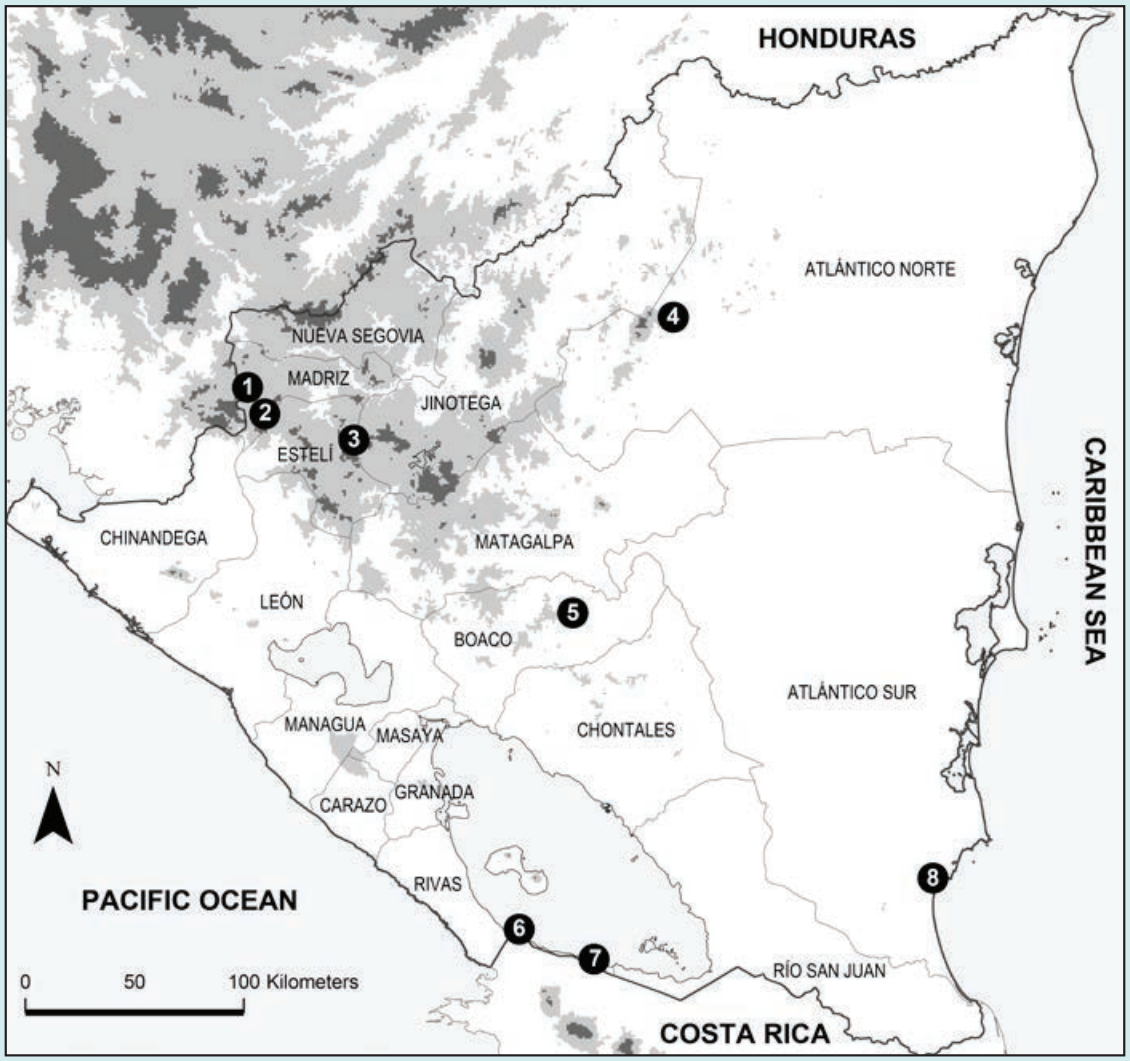

Fig. 1. Map of Nicaragua showing the collecting localities mentioned in the text: (1) Monumento Nacional Cañón de Somoto; (2) Laguna La Bruja; (3) Reserva Natural Miraflores; (4) Parque Nacional Cerro Saslaya; (5) Finca Santa Elena; (6) Reserva Silvestre Privada La Conga; (7) Reserva Silvestre Privada El Abuelo; and (8) Río Pijibaye. Water surfaces = pale gray; areas 600–1,200 m in elevation = gray; and areas above 1,200 m in elevation = dark gray.

Order Squamata (lizards)

Family Anguidae

***Diploglossus monotropis* (Kuhl, 1820).** ATLÁNTICO SUR: Río Pijibaye (11.46726°N, 83.88084°W; WGS 84); elev. 15 m; 20 April 2014; Milton Salazar-Saavedra, Daniel Urbina, José Antonio Orozco, and Arcadio Gómez; MHUL 179 (see below). Additionally, a photo voucher of an adult female is deposited at The University of Texas at Arlington Digital Collection (UTADC-8766; Fig. 2B). The two individuals were collected in a pitfall trap on the same day, a juvenile male (MHUL 179) during the morning and an adult female (Fig. 2B) during the afternoon. In Nicaragua, this species only has been recorded from a single locality in the department of Río San Juan (Villa, 1971; Köhler, 2001). The records from Atlántico Sur previously were included in HerpetoNicas (2015) based on photographs, but because of the relatively low number of copies of this free, limited edition publication, which only is available at the national level, herein we are providing these records. The Río Pijibaye locality, therefore, corresponds to the second known locality for Nicaragua and the northernmost record for this species, and extends its distribution ca. 71 km to the NE.

Family Corytophanidae

***Basiliscus vittatus* Wiegmann, 1828.** BOACO: Municipio de Camoapa, southern slope of Cerro Masigüe, Finca Santa Elena (12.53579°N, 85.35665°N; WGS 84); elev. 535 m; 18 September 2009; Javier Sunyer and Lenin A. Obando; MHUL 174. We found an adult male at night, sleeping on low vegetation. RIVAS: Municipio de Cárdenas, Reserva Silvestre Privada El Abuelo (11.12435°N, 85.28355°W; WGS 84); elev. 35 m; 18 March 2015; José G. Martínez-Fonseca and Luis Gutiérrez-López. A photo voucher of this individual is deposited at The University of Texas at Arlington Digital Collection (UTADC-8767; Fig. 2C). This young female was found active at 1750 h, perched ca. 2 m above the ground on the trunk of a Panama Tree (*Sterculia apetala*) located near the mouth of a small stream that empties into Lago de Nicaragua. Several individuals of both sexes and different age classes were seen in the same general area. In Nicaragua, this relatively abundant species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Chinandega, Chontales, Estelí, Jinotega, Managua, Matagalpa, and Río San Juan (Köhler, 2001; Gómez et al., 2011).

Family Dactyloidae

***Norops biporcatus* (Wiegmann, 1834).** MADRIZ: Laguna de la Bruja, El Pegadero (13.35494°N, 86.62511°W; WGS 84); elev. 1,155 m; 15 October 2010; Javier Sunyer, Lenin A. Obando, and Liliana Solano; MHUL 175. We found an individual sleeping at night on vegetation. In Nicaragua, this relatively abundant species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Boaco, Carazo, Granada, Jinotega, Managua, Matagalpa, Río San Juan, and Rivas (Köhler, 2001; Köhler and Veselý, 2003; Salazar et al., 2009; Travers et al., 2011; HerpetoNicas, 2015).

***Norops capito* (Peters, 1863).** BOACO: Municipio de Camoapa, southern slope of Cerro Masigüe, Finca Santa Elena (12.53437°N, 85.36208°W; WGS 84); elev. 740 m; 29 May 2010; Javier Sunyer, Lenin A. Obando, Kirsten E. Nicholson, John G. Phillips, and Jenny A. Gubler; MHUL 176. We found an adult male at night sleeping on a branch ca. 1.5 m above a stream. In Nicaragua, this species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Estelí, Jinotega, Matagalpa, and Río San Juan (Köhler, 2001; Köhler et al., 2005).

***Norops laeviventris* (Wiegmann, 1834).** ESTELÍ: Reserva Natural Miraflores (13.24722°N, 86.25750°W; WGS 84); elev. 1,325 m; 17 October 2010; Javier Sunyer, Lenin A. Obando, and Liliana Solano; MHUL 177. We found an individual at night sleeping on vegetation. In Nicaragua, this species has been recorded from the departments of Jinotega and Matagalpa (Köhler, 2001).

***Norops oxylophus* (Cope, 1875).** RIVAS: Municipio de Cárdenas, Reserva Silvestre Privada La Conga (11.23386°N, 85.57801°W; WGS 84); elev. 57 m; 15 October 2011; José G. Martínez-Fonseca and Luis Gutiérrez-López. A photo voucher of this individual is deposited at The University of Texas at Arlington Digital Collection (UTADC-8768; Fig. 2D). This young male was found at 2130 h, sleeping on a branch ca. 1.2 m above a three meter-wide stream. In

Nicaragua, this species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Boaco, Chontales, Jinotega, Matagalpa, and Río San Juan (Köhler, 2001; HerpetoNicas, 2015). The La Conga locality also represents the westernmost record for this species in Nicaragua and the first on the Pacific versant of the country, and extends its distribution ca. 138 km to the W from the closest locality at Refugio Bartola (Köhler, 2001).

Family Mabuyidae

***Marisora alliacea* (Cope, 1876).** ATLÁNTICO SUR: Río Pijibaye, Caño Indio (11.42775°N, 83.87397°W; WGS 84); elev. 25 m; 2 December 2013; Milton Salazar-Saavedra, Daniel Urbina, José Antonio Orozco, and Arcadio Gómez; MHUL 178. We collected an individual (Fig. 2E) at night, sleeping under a fallen rotten log near a stream. In Nicaragua, this species only has been recorded from the department of Río San Juan (Köhler, 2001; Sunyer et al. 2015), and thus the Río Pijibaye locality represents the northernmost record for this species, extending its distribution over 40 km to the N from its closest record at Dos Bocas de Río Indio (Sunyer et al., 2015).

Family Polychrotidae

***Polychrus gutturosus* Berthold, 1845.** ATLÁNTICO NORTE: Parque Nacional Cerro Saslaya (13.75306°N, 84.94267°W; WGS 84); elev. 465 m; 18 May 2011; Milton Salazar-Saavedra and Juan Mena. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8769; Fig. 2F). We found the lizard at 2140 h, perched on herbaceous vegetation. In Nicaragua, this species has been recorded from the departments of Atlántico Sur, Chontales, and Río San Juan (Köhler, 2001; Ruiz et al., 2016). The Saslaya record, therefore, represents the first locality in northern Nicaragua and fills in a gap of over 220 km in the distribution of this species, between central Nicaragua and southern Honduras.

Family Teiidae

***Aspidoscelis motaguae* (Sackett, 1941).** MADRIZ: Monumento Nacional Cañón de Somoto (13.46468°N, 86.69594°W; WGS 84); elev. 700 m; 20 September 2015; José G. Martínez-Fonseca and Abigail Arauz-Jirón. A photo voucher of this individual is deposited at The University of Texas at Arlington Digital Collection (UTADC-8770; Fig. 2G). We photographed a juvenile on the ground at 1440 h, near some pine trees in the canyon above the river at an elevation of ca. 130 m, and saw another adult individual 20 min later on the lower portion of the canyon. In Nicaragua, this species only has been recorded from a single locality in the department of Nueva Segovia (Köhler et al., 2013). The Somoto locality represents a new departmental record, the second record of this species in Nicaragua, and the southernmost record for this species, extending its distribution ca. 32 km to the S.

Family Xantusiidae

***Lepidophyma flavimaculatum* Duméril, 1851.** RIVAS: Municipio de Cárdenas, Reserva Silvestre Privada El Abuelo (11.11079°N, 85.26960°W; WGS 84); elev. 42 m; 6 July 2013; Milton Salazar-Saavedra and José G. Martínez-Fonseca. A photo voucher of this individual is deposited at The University of Texas at Arlington Digital Collection (UTADC-8771; Fig. 2H). The lizard was found under a log at 0650 h, ca. 150 m from the edge of Lago de Nicaragua. In Nicaragua, this species has been recorded from the departments of Atlántico Norte, Atlántico Sur, Jinotega, Matagalpa, and Río San Juan (Köhler, 2001; Gómez et al., 2011). Additionally, Bezy (1989) and Bezy and Camarillo (2002) included AMNH 16402 from Tule or Tuli Creek in the department of Chontales, whereas Köhler (2001) regarded this specimen as from the department of Río San Juan. Although Tule is a locality in each of these adjacent departments, the Rivas locality represents the westernmost record for this species in Nicaragua.

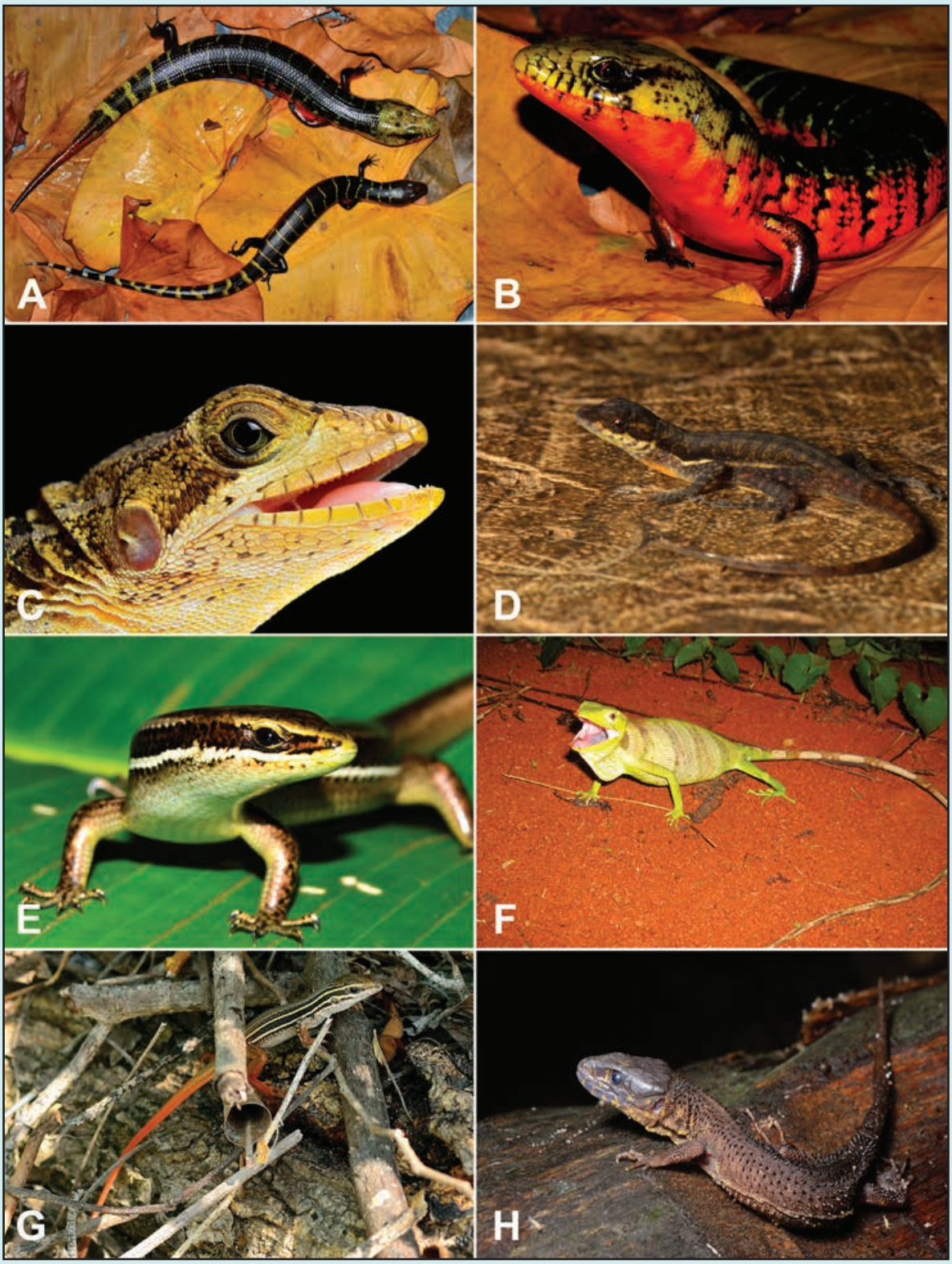

Fig. 2. (A) A juvenile male and an adult female and (B) the same adult female of *Diploglossus monotropis* from the department of Atlántico Sur; (C) *Basiliscus vittatus* from the department of Rivas; (D) *Norops oxylophus* from the department of Rivas; (E) *Marisora alliacea* from the department of Atlántico Sur; (F) *Polychrus gutturosus* from the department of Atlántico Norte; (G) *Aspidoscelis motaguae* from the department of Madriz; and (H) *Lepidophyma flavimaculatum* from the department of Rivas.
© José Gabriel Martínez-Fonseca (C, D, G, H) and Milton Salazar-Saavedra (A, B, E, F)

Acknowledgments.—Collecting and exportation permits were provided by the personnel of MARENA (Ministerio del Ambiente y los Recursos Naturales), Managua, Nicaragua. We thank Lenin A. Obando, Liliana Solano, Luis Gutiérrez-López, Daniel Urbina, José Antonio Orozco, Arcadio Gómez, Juan Mena, Abigail Arauz-Jirón, Kirsten E. Nicholson, John G. Phillips, and Jenny A. Gubler, for field assistance. We also thank Carl J. Franklin for providing the photo voucher numbers.

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Reptilia: Squamata (snakes)

Noteworthy records of snakes of the *Lampropeltis mexicana* complex from northeastern Mexico

The geographic distribution of kingsnakes in the *Lampropeltis mexicana* complex in Mexico remains poorly known. Species in this complex range across rocky regions of the Chihuahuan Desert, Central Mexican Plateau, Sierra Madre Occidental, and northern Sierra Madre Oriental. Over the past decade, several reports have enhanced our knowledge of the distribution of these snakes in Mexico (Ingrasci et al., 2008; Farr et al., 2009; Hansen and Bryson, 2009; Savage and Hansen, 2009; Ahumada-Carrillo et al., 2011; Hansen et al., 2011; Roth-Monzón et al., 2011; Price et al., 2012; Ahumada-Carrillo et al., 2014; Carbajal-Márquez and Quintero-Díaz, 2014; Hansen et al., 2015; Hernández-Melo and Fernández-Badillo, 2015; Terán-Juárez et al., 2015; Grünwald et al., 2016; Hansen et al., 2016). Here we present new records for two species in the complex, *L. alterna* and *L. mexicana*, from the states of Coahuila and Nuevo León in northeastern Mexico. We follow the most recent taxonomy for the *L. mexicana* complex (Bryson et al., 2007). Previous studies, however, allocated *L. mexicana* from Coahuila and Nuevo León to the subspecies *L. m. thayeri* (Gehlbach, 1967; Hilken and Schlepper, 1998). We determined the geocoordinates using map datum WGS 84. The museum acronyms follow Sabaj (2016).

***Lampropeltis alterna*:** NUEVO LEÓN: Municipio de Hidalgo, Sierra El Fraile y San Miguel, Potrero Chico (25.949634°N, 100.476592°W); elev. 710 m; 8 June 2013; Adriana González-Martínez. Photo voucher TNHC 100686 (Fig. 1A). The snake was active during the day and photographed by rock climbers. This voucher represents a new municipality record.

***Lampropeltis alterna*:** NUEVO LEÓN: Municipio de Bustamante, Cañón de Bustamante (26.549595°N, 100.579611°W); elev. 521 m; 22 May 2016; Manuel Nevárez-de los Reyes; UANL 7662 (Fig. 1B). Camino de las Grutas (26.502450°N, 100.526222°W); elev. 840 m; 2 July 2016; Manuel Nevárez-de los Reyes; UANL 7672 (Fig. 1C). These specimens, both from the Sierra Gomas, represent a new municipality record and the northernmost records for this species in Nuevo León. Both collection sites are located in steep, rocky terrain within a submontane shrub (*matorral*) plant community. At the first site, the characteristic vegetation consists of *Populus nigra*, *Salix* sp., *Prosopis glandulosa*, and *Acacia farnesiana*. The dominant vegetation at the second locality includes *Acacia rigida*, *Fraxinus greggi*, and *Helietta parvifolia*.

***Lampropeltis alterna*:** NUEVO LEÓN: Municipio de García, vic. of Industrias del Alcali (25.758655°N, 100.558685°W); elev. 724 m; 13 June 2014; Iván Sánchez-Montiel; UANL 7405 (Fig. 1D). This specimen represents a new municipality record.

***Lampropeltis* cf. *mexicana*:** COAHUILA: Municipio de Saltillo, ca. 1.0 map km SW of Jagüey de Ferniza (25.222670°N, 101.045218°W); elev. 2,024 m; 16 July 2016; Arturo Cruz-Anaya; Photo voucher TNHC 100687 (Fig. 1E). This voucher, a field photo of a live snake partly obscured by vegetation, represents a new municipality record. Based on the dorsal pattern of the snake, we provisionally assign this individual to *L. mexicana*. Although a pattern of black-bordered orange blotches is found in both *L. alterna* and *L. mexicana*, the brown ground color is a better fit for the latter rather than regionally proximate *L. alterna*. The habitat consists of scrub dominated by *Larrea tridentata*, and was bordered by a cultivated area. Additional material from this area is necessary to confirm the identification of the species.

***Lampropeltis mexicana*:** COAHUILA: Municipio de Saltillo: Mina de La Lechuza, Ejido Cuauhtémoc, Sierra Zapalinamé (25.279037°N, 100.956886°W); elev. 2,283 m; 28 July 2016; Javier Banda-Leal and Arturo Cruz-Anaya; UANL 7693 (Fig. 1F). This specimen represents the second record for the municipality of Saltillo, and the first documented example of a melanistic individual found in the wild. Although anecdotal field reports exist for melanistic specimens from Nuevo León, and the genetic basis for melanism in captive *L. mexicana* is well known (Osborne, 1983), there are no melanistic specimens in museum collections and the geographic distribution of melanistic phenotypes is unknown. The collection site is located within an open pine forest with *Agave*, *Hechtia*, and *Opuntia*.

***Lampropeltis mexicana*:** COAHUILA: Municipio de Arteaga, Carretera entronque a El Diamante (25.367818°N, 100.814711°W); elev. 2,025 m; 13 September 2016; Arturo Cruz Anaya; UANL 7705 (Fig. 1G). this specimen represents the third record from the municipality of Arteaga (Garstka, 1982), which spans an extensive area and range of habitats in the northern Sierra Madre Oriental.

Fig. 1. Records of the *Lampropeltis mexicana* complex from northeastern Mexico: (A) *L. alterna* (TNHC 100686) from Sierra El Fraile y San Miguel, Potrero Chico, Municipio de Hidalgo, Nuevo León; (B, C) *L. alterna* (UANL 7662, 7672) from Sierra Gomas, Municipio de Bustamante, Nuevo León; (D) *L. alterna* (UANL 7405) from vic. of Industrias del Alcali, Municipio de García, Nuevo León; (E) *L. mexicana* (TNHC 100687) from ca. 1.0 km (by air) SW of Jagüey de Ferniza, Municipio de Saltillo, Coahuila; (F) *L. mexicana*, melanistic phenotype (UANL 7693) from Sierra Zapalinamé, Municipio de Saltillo, Coahuila; and (G) *L. mexicana* (UANL 7705) from Municipio de Arteaga, Coahuila. 📷 © Adriana González-Martínez (A), Manuel Nevárez-de los Reyes (B, C, and F), Robert W. Bryson, Jr. (D), and Arturo Cruz-Anaya (E, G)

Acknowledgments.—We thank the Universidad Autónoma de Nuevo León (Programa de Apoyo a la Investigación Científica y Tecnológica [PAICYT CN315-15]) for support, and Arturo Cruz-Anaya, Jonathan Campbell, Joseph Forks, and Gerry Salmon for assistance. Travis LaDuc processed the photo vouchers at TNHC. Fieldwork was partly funded by a grant (No. 445411) to MNR by Consejo Nacional de Ciencia y Tecnología (CONACYT). Field research and specimen collection were conducted under permits SGPA/DGVS/08371/16 and SGPA/DGVS/08377/16 from 11 August 2016, issued to David Lazcano by Dirección General de Vida Silvestre of the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

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Family: Colubridae

***Stenorrhina freminvillii* (Duméril, Bribon and Duméril, 1854).** MEXICO: OAXACA. Municipio de San Bartolo Coyotepec, Paraje El Palenque (16°56'51.4"N, 96°40'31.7"W; datum WGS 84), elev. ca. 1,600 m; 20 March 2016; Pablo R. Simón-Salvador. The snake, an adult male (Fig. 1), was found in riparian vegetation. A photograph of this individual is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.34). This voucher (Fig. 1) represents a new municipality record, and fills a gap between the closest reported localities at ca. 16 km to the N (airline distance) in the vicinity of Agencia de San Luis Beltrán, Municipio de Oaxaca de Juárez, and at ca. 43 km to the ESE (airline distance) in the vicinity of Hierve El Agua, Municipio de San Lorenzo de Albarradas (García-Padilla and Mata-Silva, 2014).

Fig. 1. An adult *Stenorrhina freminvillii* (UTEP G-2016.34) from Paraje El Palenque, Municipio de San Bartolo Coyotepec, Oaxaca, Mexico. © Pablo R. Simón-Salvador

Acknowledgments.—A special thanks goes to Arthur Harris for kindly providing the photo voucher number.

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***Tantilla rubra* Cope, 1863.** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, near El Obispo (16.175215°N, -97.322873°W; WGS 84), elev. 1,216 m.; 16 June 2016. Vicente Mata-Silva, Dominic, L. DeSantis, Elí García-Padilla, and Larry David Wilson. The specimen (CIB-5036) was found dead on road through pine-oak forest, and is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo. This snake (female, snout–vent length = 235 mm, tail length = 21 mm; Fig. 1) represents a new municipality record, and fills a gap between the closest reported localities at ca. 24.7 km to the E in the vicinity of Santa Rosa, Municipio de San Juan Lachao (UCM-52611–12) and ca. 339 km to the WNW in a locality described as "11.3 mi (= 18.1 km) NE Atoyac, on road to Puerto del Gallo, Sierra Madre del Sur" (MVZ 17193); both localities are listed in Wilson and Mata-Silva (2014).

Fig. 1. An adult *Tantilla rubra* (CIB-5036) from near El Obispo, Municipio de Santa Catarina Juquila, Oaxaca, Mexico.

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Acknowledgments.—A special thanks goes to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the photo voucher number.

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Family Dipsadidae

***Coniophanes fissidens* (Günther, 1858).** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, 2.6 km SSW of Zacatepec (16.117266°N, -97.377425°W; WGS 84), elev. 419 m.; 16 June 2016; Vicente Mata-Silva, Dominic, L. DeSantis, Elí García-Padilla, and Larry David Wilson. The specimen (CIB-5035) was found dead on road across remnants of tropical dry forest, and is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo. This snake (female; snout–vent length = 298 mm; tail length = 41 mm; Fig. 1) represents a new municipality record, with the closest reported locality ca. 33 km to the E in the vicinity of San Juan Lachao, Municipio de San Juan Lachao (Mata-Silva et al., *This Issue*).

Fig. 1. A *Coniophanes fissidens* (CIB-5035) from 2.6 km SSW of Zacatepec, Municipio de Santa Catarina Juquila, Oaxaca, Mexico. © Vicente Mata-Silva

Acknowledgments.—A special thanks goes to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the photo voucher number.

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***Tropidodipsas sartorii* (Cope, 1863).** MEXICO: HIDALGO: Municipio de Metztitlán (20.47684ºN, -98.67752ºW; WGS 84) elev. 1,315 m; 22 June 2016; Guillermo Sánchez-Martínez. The specimen (CH-CIB 5027) was found dead on a road through xeric scrub and donated to the Herpetological Collection of the Centro de Investigaciones Biológicas, Universidad Autónoma del Estado de Hidalgo. It represents a new record for the municipality and for the Reserva de la Biósfera Barranca de Metztitlán, with the closest known locality ca. 46.38 km to the SE (airline distance) in the vicinity Tetipanchalco, Municipio de Molango de Escamilla (Juárez-Escamilla, 2016). This species is uncommon in areas of Meztitlán where walnuts are grown, but is abundant in other municipalities (e.g., Ixmiquilpan) that contain alfalfa fields.

Acknowledgments.—We thank Ferdinand Torres Angeles for fixing the specimen and Diego Juárez Escamilla, for providing the collecting data from the Molango de Escamilla's specimen. We also are grateful to SEMARNAT for the collecting permit (FAUT-0052) provided to Irene Goyenchea.

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Family Elapidae

***Micrurus browni* Cope, 1863.** MEXICO: OAXACA. Municipio de Santa Catarina Juquila, near Santa Catarina Juquila (16.237544°N, -97.266829°W; datum WGS 84), elev. 1,582 m; 27 June 2016; Vicente Mata-Silva and Arturo Rocha. A photograph of this individual is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.36, Fig. 1A).

Another *Micrurus browni* (Fig. 1B) was found in the town of Pie del Cerro, in the same municipality (16.098357°N, -97.396050°W; WGS 84), elev. 128 m.; 24 June 2016; Vicente Mata-Silva and Arturo Rocha. The specimen (CIB-5034) is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo.

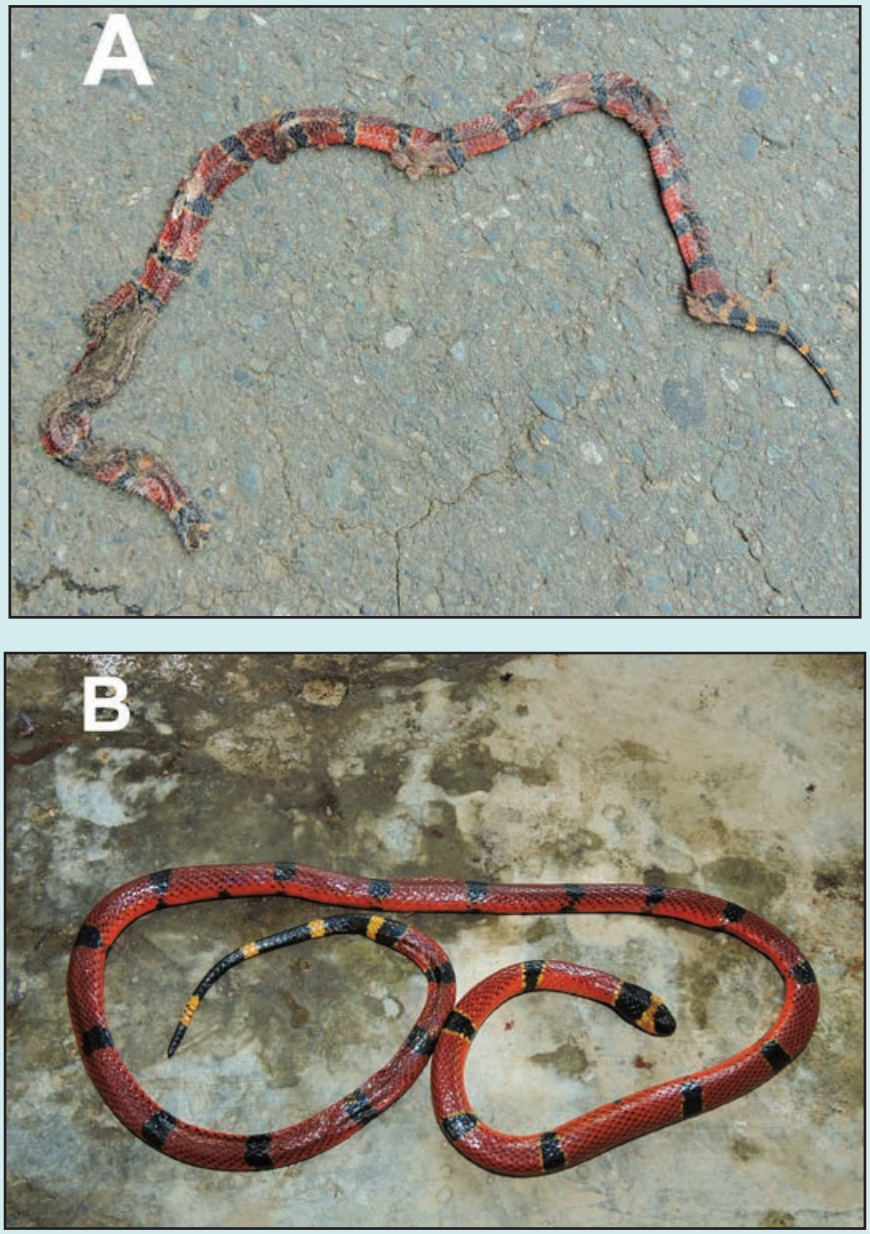

Fig. 1. Adult *Micrurus browni*: (A) from near Santa Catarina Juquila (UTEP G-2016.36), and (B) from Pie del Cerro (CIB-5034, B), both in Municipio de Santa Catarina Juquila, Oaxaca, Mexico. © Vicente Mata-Silva

Both snakes were found dead on paved roads, and represent new records for the municipality. These records fill a gap between the closest reported localities at ca. 23 km SE and 35 km E (from near Santa Catarina and Pie del Cerro, respectively) from several records in the municipality of San Juan Lachao, Oaxaca (Mata-Silva et al., *This Issue*; UCM 40079–40082, 41228, 52519–52522, 52524, 52526, 52569, 52570, 52613, www.vernet.org; accessed 1 November 2016), and ca. 80 km to the NW in a locality reported as "46 km S of Putla (= Putla de Guerrero)," (MVZ 106869; www.vernet.org; accessed 1 November 2016). The habitat near Santa Catarina Juquila consists of fragmented pine-oak forest, and that of Pie del Cerro is comprised of secondary tropical dry forest and pastureland.

Acknowledgments. —A special thanks goes to Eduardo Mata-Silva for his invaluable assistance in the field, and to the Bolán-Mata family for their great hospitality. We also thank Raciel Crúz-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, AR, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the specimen number, and Arthur Harris the photo voucher number.

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***Micrurus ephippifer* (Cope, 1886).** MEXICO: OAXACA. Municipio de Santa Catarina Ixtepeji, Carretera Oaxaca–Tuxtepec, km 198 (17°8'29.19"N, -96°37'1.00"W; datum WGS 84), elev. 2,251 m; 28 July 2016; Elí García-Padilla, Emiliano Méndez-Salinas, and Elfilia G. Sandoval. The specimen is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo (CIB-5039). The individual was found at ca. 1630 h, and recently had been killed by workers removing roadside vegetation in an area of pine-oak forest. The specimen (Fig. 1) represents a municipality record, with the closest reported locality ca. 8.4 km to the WSW, at Cerro San Felipe, Agencia de San Felipe del Agua, Municipio de Oaxaca de Juárez (UCM-41229, www.vernet.org; accessed 2 August 2016).

Fig. 1. A *Micrurus ephippifer* (CIB-5039) from Carretera Oaxaca-Tuxtepec km 198, Municipio de Santa Catarina Ixtepeji, Oaxaca, Mexico. © Elí García-Padilla

Acknowledgments.—A special thanks goes to Aurelio Ramírez-Bautista, Raciel Crúz-Elizalde, Christian Berriozabal-Islas, and José Daniel Lara-Tufiño for logistical support. The collecting permit (SGPA/DGVS/04287/16) was issued by SEMARNAT to Aurelio Ramírez-Bautista, with extensions to VMS, EGP, DLD, and LDW. Irene G. Mayer-Goyenechea kindly provided the voucher number.

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Family Viperidae

***Bothriechis schlegelii* (Berthold, 1845).** NICARAGUA: BOACO: Municipio de Camoapa, southern slope of Cerro Masigüe, Finca Santa Elena (12.53579°N, 85.35665°W; WGS 84); elev. 550 m; 23 September 2016; Lenin Alexander Obando. A photo voucher of this individual is deposited at The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8765; Fig. 1A.). The viper was found during the day ca. 0.5 m above the ground on the trunk of a tree in a young cacao plantation located in disturbed Lowland Moist Forest (Fig. 1B; Holdridge, 1967; Savage, 2002). This locality represents a new record for the department of Boaco. In Nicaragua, this relatively common species has been recorded from the following departments: Atlántico Norte, Atlántico Sur, Chontales, Jinotega, Matagalpa, and Río San Juan (Günther, 1895; Boulenger, 1896; Villa, 1984; Köhler, 2001).

Fig. 1. (A) Closeup of a *Bothriechis schlegelii* from Finca Santa Elena, Departamento de Boaco, Nicaragua; and (B) an *in situ* photograph of the snake. © Lenin Alexander Obando

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

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First report of *Bothriechis schlegelii* (Serpentes: Viperidae: Crotalinae) from the state of Oaxaca, Mexico

Bothriechis schlegelli is a widely distributed New World species of pitviper, with a distribution extending from northern Chiapas, Mexico, to northern Peru and western Venezuela; in Chiapas it has been reported from various localities in the state (Alvarez del Toro, 1982; Campbell and Lamar, 2004; Grünwald et al., 2016). Campbell and Lamar (2004) included southern Tabasco in the shaded portion of their distribution map, and while this species possibly occurs there, we are unaware of any specimens from that state. During a recent examination of specimens of *Bothriechis* from Mexico, DBW encountered a specimen of *B. schlegelii* from Oaxaca in the collection at the University of Illinois Museum of Natural History (UIMNH). Since this species has not been reported from Oaxaca and is not considered part of the state's herpetofauna (Köhler, 2008; Johnson et al., 2010, Mata-Silva et al., 2015; Schätti and Stutz, 2016), we report this specimen below.

***Bothriechis schlegelii* (Berthold 1846).** MEXICO: OAXACA: Municipio de Santa María Chimalapa, "near La Gloria" probably Rancho La Gloria (16.803972°N, -94.609012°W); elev. 520 m; 12 January 1950; Thomas B. MacDougall. The specimen (UIMNH 27839), an adult female, represents the first record of *B. schlegelii* from the state of Oaxaca, and extends the known distribution 93 km to the west W of the nearest record at Selvas de Mercadito, Municipio de Cintalapa, Chiapas (Alvarez del Toro, 1982). This record suggests the continuous distribution of this species along the Atlantic piedmont of southeastern Mexico to the Isthmus of Tehuantepec in Oaxaca, lends credibility to the species occurring in southern Tabasco, as well as its possible occurrence in extreme southeastern Veracruz. To our knowledge this species has not been collected in either state, but we stress the potential for students of herpetology to search for *B. schlegelii* in those areas.

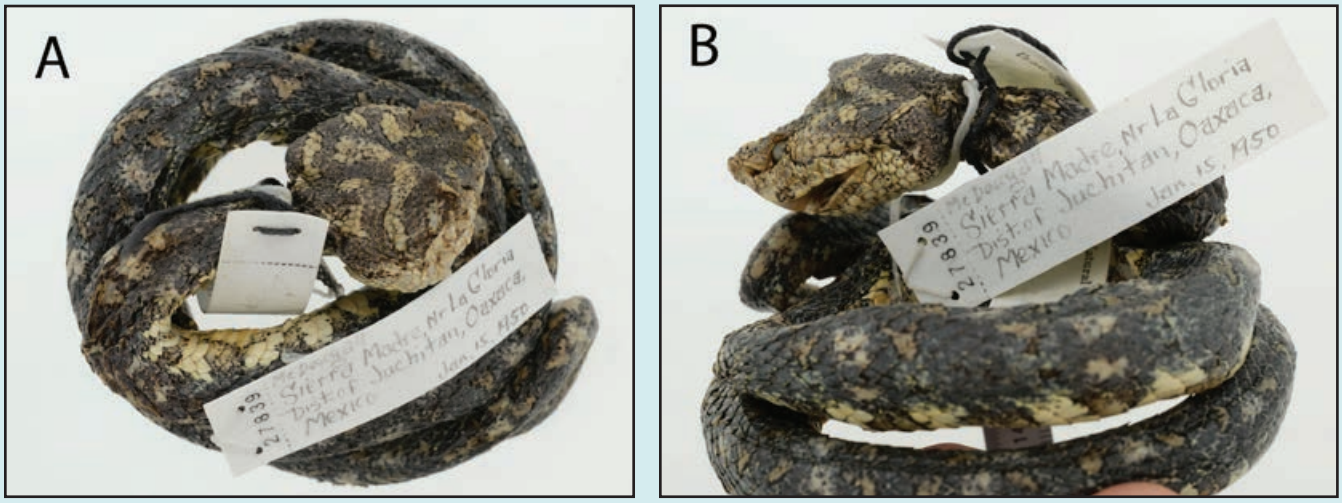

Fig 1. (A, B) Dorsal and lateral views of an adult female *Bothriechis schlegelii* from "near La Gloria," Municipio de María Chimalapa, Oaxaca, Mexico. © Daniel B. Wylie

Acknowledgments.—We thank the late Thomas B. MacDougall for his extraordinary field collecting activities and for his insurmountable contributions to the University of Illinois Museum of Natural History Collection. We also are grateful to Jacobo Reyes-Velasco for verifying the identification of the specimen.

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***Crotalus culminatus* (Klauber, 1952)**. MEXICO: ESTADO DE MÉXICO: Municipio de Tonatico, San Miguel Tonatico, Parque Niltze (18.786°N, -99.6701°W; datum WGS 84); elev. 1,591 m; March 2016; Luis Pera-Gómez. A subadult individual was found along the entrance of a rural home, with the surrounding habitat consisting of *Juniperus flaccida* trees in disturbed tropical deciduous forest. A photo voucher of the snake was deposited in The University of Texas at Arlington Collection of Vertebrates Digital Collection (UTADC-8747, Fig. 1). This voucher represents the third verified record for the state and first for the municipality of Tonatico, and extends the known distribution of this species ca. 24.2 km to the SW (airline distance) from the nearest locality at Ciudad de Malinalco (Peralta-Fonseca and García-Padilla, 2015), and fills a distributional hiatus of 100.3 km between the Malinalco and the Tejupilco records in the Sierra de Nanchichitla (Casas-Andreu and Aguilar-Miguel, 2005).

Crotalus culminatus is widely distributed in southwestern Mexico from southern Michoacán to about the Isthmus of Tehuantepec, particularly along semiarid and arid regions in dry tropical forest, thorn woodland, arid scrub forest, and limestone outcroppings in more mesic forests (Campbell and Lamar, 2004). These habitats are extensive throughout much of the Depresión del Balsas region, near our record, but many areas in the vicinity lack records for this or other herpetofaunal species.

Fig. 1. A subadult *Crotalus culminatus* (UTADC-8747), found in Parque Niltze, Municipio de Tonatico, Estado de México, Mexico. © J. Diego Arias-Montiel

Acknowledgments.—We thank Carl J. Franklin for providing the photo voucher number, and Luis Pera-Gómez and Cristina Leticia Delgado-Ayala for their assistance and hospitality during our fieldwork.

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***Ophryacus undulatus* (Jan, 1859).** MEXICO: OAXACA. Municipio de San Agustín Etla, Paraje Mano de León (17°12'37.7"N, 96°41'25.2"W; WGS 84), elev. ca. 2,200 m; 16 October 2015; Francisco Ramírez-Jiménez. The snake (Fig. 1) was found on a log in an ecotone consisting of tropical deciduous forest and oak forest. A photograph of this individual is deposited in the University of Texas at El Paso Vertebrate Digital Collection (Photo Voucher UTEP G-2016.35). This voucher (Fig. 1) represents a new municipality record, with the closest reported localities ca. 12 km to the S (airline distance) in Cerro de San Felipe near Oaxaca de Juarez (Lynch and Smith 1966), and ca. 10 km to the E (airline distance) at 25 km NE of Ciudad de Oaxaca (KU 116949; www.herpnet.org; accessed 28 October 2016).

Fig. 1. *Ophryacus undulatus* (UTEP G-2016.35) from Paraje Mano de León, Municipio de San Agustín Etla, Oaxaca, Mexico. © Francisco Ramírez-Jiménez

Acknowledgments.—A special thanks goes to Arthur Harris for kindly providing the photo voucher number.

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Rediscovery of the Critically Endangered frog, *Craugastor angelicus*, in Costa Rica

Craugastor angelicus (Savage, 1975) has been rediscovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, at an elevation of ca. 1,550 m. Along with my wife, Aura Reyes, we discovered a single adult male *C. angelicus* (Fig. 1) in July of 2016, during one of our regular amphibian surveys in the country. We found the individual at night while making a random stop along the road between Santa Elena de Monteverde and San Gerardo to listen to anuran vocalizations. The *C. angelicus* was not heard vocalizing, but was observed on the gravel substrate along the edge of the road. The frog was collected and deposited in the taxonomic reference collection of the Costa Rican Amphibian Research Center (CRARC 0243). This discovery comes more than two decades after the last reported observation of this species, which in recent years has been considered as possibly extinct (Pounds et al., 2008).

Craugastor angelicus is endemic to Costa Rica, with populations recorded from the Cordillera de Guanacaste (Cerro Cacao), the Cordillera de Tilarán, and the Cordillera Volcánica Central at elevations from 656 to 1,600 m (Savage, 2002). This species has been assigned to the *Craugastor punctariolus* species group, which is comprised of 34 species that are endemic to Central America (Chaves et al., 2014). Eight species from this group have been documented in Costa Rica, and all are believed to have suffered major declines, with seven of the eight species listed on the IUCN Red List as Critically Endangered (IUCN, 2016); extant populations of only three of the eight species native to Costa Rica (i.e., *C. fleischmanni*, *C. ranoides*, and *C. taurus*) were known to exist due to confirmed observations or collections made during the last decade (Puschendorf et al., 2005; Ryan et al., 2011; Chaves et al., 2014). Herein I confirm the presence of a fourth species (*C. angelicus*) in Costa Rica.

Craugastor angelicus is distinguished from the other members of the *C. punctariolus* species group in lower Mesoamerica based on the presence of white nuptial pads and the absence of vocal slits (Savage, 1975, 2002). The male specimen we rediscovered displays white nuptial pads (Fig. 2) and lacks vocal slits, confirming its identification as *C. angelicus* according to our current taxonomic understanding of the *C. punctariolus* species group. *Craugastor angelicus* is one of two species in the *C. punctariolus* species group that has been documented to inhabit the Cordillera de Tilarán; the other species documented from this area is *C. ranoides*, but at elevations below 1,300 m (Savage, 2002).

Fig. 1. An adult male *Craugastor angelicus* (SVL 50.8 mm) discovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, in July of 2016. © Brian Kubicki

Fig. 2. The white nuptial pad structure evident on Finger I of the male *Craugastor angelicus* discovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, in July of 2016. © Brian Kubicki

Acknowledgments.—I collected the specimen under scientific collecting permit SINAC-SE-CUS-PI-R-058-2016, issued to me by the Ministerio de Ambiente y Energía (MINAE).

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Comments on the distribution and conservation of Morelet's Leaf Frog, *Agalychnis moreletii* (Amphibia: Hylidae), in Oaxaca, Mexico

Agalychnis moreletti (Dumeril, 1853) is distributed in disjunct populations on the Atlantic versant from northeastern Puebla and southeastern Veracruz, Mexico, to northwestern Honduras, and on the Pacific versant from south-central Guerrero, Mexico, to central El Salvador, at elevations from 200 to 2,130 m (Köhler, 2011; Frost, 2016).

On 17 June 2016 at 1940 h, we observed an adult female *A. moreletii* crossing Mexican federal highway 131 at ca. 1.7 km (straight line) SSW of San Gabriel Mixtepec, Municipio de San Gabriel Mixtepec, Oaxaca, Mexico (16.079700ºN, -97.085831ºW; WGS 84), elev. ca. 781 m. The frog was found next to a small roadside stand of coffee trees, where we then found a single adult male. We returned to the same site on 19 June at 2200 h, and found four additional adult males calling from branches in coffee trees (Fig. 1). A photograph of one of these individuals is deposited in the University of Texas at El Paso Biodiversity Digital Collection (Photo Voucher UTEP G-2016.28).

Agalychnis moreletii has been reported from several localities in Oaxaca: Campamento Vista Hermosa, K.U. (2, 1 tadpole); Mirador, A.M.N.H. (10); Nuevo Raza Zacatepec, U.I.M.N.H. (1); 28.2 km N of Pochutla, U.M.M.Z.; 7.1 km N of San Gabriel Mixtepec, U.T.A. (1); 13 km S of San Gabriel Mixtepec, U.S.N.M. (2, 1 egg, 1 tadpole*); 2 km S of Vista Hermosa, K.U. (23, 2 tadpoles, 2 eggs) (Duellman, 2001). Caldwell (1974) also reported *A. moreletii* N of San Gabriel, in 1969 and 1970. This species, however, was not detected during surveys conducted by Lips et al. (2004) at the same localities in July of 2000. Consequently, Lips et al. (2004) suggested that *A. moreletii* potentially had been extirpated from the Sierra Madre del Sur in Oaxaca, and Guerrero, since it had not been collected in this region since 1984. Delia et al. (2013) reported rediscovering the species when they revisited the region in 2007. Additionally, Caviedes-Solis et al. (2015) reported finding *A. moreletii* in 2007 at Pluma Hidalgo, in the Sierra Madre del Sur, and Vázquez-Vega et al. (2015) also found this species in Pluma Hidalgo in 2008, and then

in San José Tenango in 2013 (a new locality), in the Sierra Madre de Oaxaca. The locality we report here lies between two preexisting localities (7.1 km N of San Gabriel Mixtepec, and 13 km S of San Gabriel Mixtepec) reported by Duellman (2001). These recent discoveries of *A. moreletii* from historical localities, and new localities within its distribution, suggests that the species might be recovering from the declines reported in the 1970s and 80s, which were attributed to *Batrachochytridium dendrobatidis* infection and habitat loss.

Although we view ongoing habitat loss as a serious problem throughout this region, it is encouraging to find a breeding colony of *A. moreletii* within modified habitat (coffee plantation and secondary forest). Currently, this species is categorized as Critically Endangered (CR) by the IUCN, but it was assigned a low Environmental Vulnerability Score (= 7) by Wilson et al. (2013) based on geographic distribution, habitat characteristics of reported localities, and reproductive mode. This species was not assigned a conservation status by SEMARNAT (2010).

Fig. 1. One of the adult *Agalychnis moreletii* (UTEP G-2016.28) found ca. 1.7 km (straight line) SSW of San Gabriel Mixtepec, Municipio de San Gabriel Mixtepec, Oaxaca, Mexico. © Vicente Mata-Silva

Acknowledgments.—A special thanks to Eduardo Mata-Silva for his invaluable assistance in the field, to the Bolán-Mata family for their great hospitality, and to Aurelio Ramírez-Bautista, Raciel Crúz-Elizalde, and Christian Berriozabal-Islas for logistical support. The collecting permit (SGPA/DGVS/04287/16) was issued by SEMARNAT to Aurelio Ramírez-Bautista with extensions to VMS, AR, EGP, DLD, and LDW. Arthur Harris kindly provided the photo voucher number.

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Additional comments on the geographic distribution and conservation status of the recently rediscovered Voiceless Treefrog, *Charadrahyla altipotens* (Duellman, 1968) from Oaxaca, Mexico

Long considered a rare species, *C. altipotens* is known from only a handful of localities along the Pacific slopes of the Sierra Madre del Sur and Montañas y Valles de Occidente physiographic regions in Oaxaca, Mexico (Duellman, 1970; Mata-Silva et al., 2015). Among the many cloud forest frog populations of southern Mexico (Guerrero, Oaxaca, and Chiapas) reported to be in severe decline by Lips et al. (2004), *Charadrahyla altipotens* was among those species considered to be possibly extinct (Stuart et al., 2008). This montane stream-breeding hylid had not been collected since 1970 (VertNet, 2016), presumably due to a population decline driven by a combination of habitat loss and *Batrachochytrium dendrobatidis* infections (Santos-Barrera and Canseco-Márquez, 2004).

Recently, Barrio-Amorós et al. (2016) reported the rediscovery of this species with the finding of three adult individuals from three new localities, two in Municipio de San Pedro El Alto, and one in Municipio de San Agustín Loxicha, as well as "hundreds" of tadpoles that presumably were those of *C. altipotens*.

Herein we report additional distribution and life history information for *C. altipotens*, and make additional comments regarding its conservation status. In June of 2016, we encountered three individuals of *C. altipotens* from two new localities in the Sierra Madre del Sur, Oaxaca, Mexico, both representing slight westward extensions from the type locality (Duellman, 1968; 37 km N (by road) San Gabriel Mixtepec, Oaxaca, Mexico). On 16 June 2016 at 2311 h, we found a single adult female (Fig. 1) on the branch of a broadleaf tree overhanging a fast-flowing stream (Fig. 2). The stream intersects a road approximately 5.6 km E of the town of Santa Catarina Juquila, Oaxaca, Mexico (16.243931°N, -97.241367°W; elev. 1,995 m). This locality lies ca. 10 km W of a paratype locality and ca. 11 km WSW of the type locality. Our locality also represents an elevational extension for the species from 1,900 to 1,995 m. The individual was found approximately 2.5 m above the surface of the water, perched within 2 m of a calling male of another imperiled and recently rediscovered hylid, *Plectrohyla hazelae* (Heimes and Aguilar, 2011; Caviedes-Solis et al., 2015). In addition to this adult, on 16 and 18 June 2016 we encountered two juvenile *C. altipotens* (Fig. 3) on a paved road approximately 3.6 km (16.235620°N, -97.257109°W; 1,750 m) and 3.8 km E (16.236936°N, -97.255507°W; 1,794 m) of Santa Catarina Juquila. These two frogs likely were recent metamorphs, as the SVL of the individual we examined (19.0 mm) was similar to that of two metamorphs reared from tadpoles in captivity (17.5 and 19.7 mm) (Duellman, 1970). Both juveniles were found shortly after heavy rains in the area. The adult frog is deposited in the herpetological collection of the Centro de Investigaciones Biológicas of the Universidad Autónoma del Estado de Hidalgo (CIB-5037) and a photograph of each of the two juveniles is deposited in the University of Texas at El Paso Biodiversity Collection (Photo Vouchers UTEP G-2016.26 and G-2016.27).

Fig 1. Adult female Yellow-bellied Voiceless Treefrog (*Charadrahyla altipotens*; CIB-5037), from Municipio de Santa Catarina Juquila, Oaxaca, Mexico. © Vicente Mata-Silva

Fig 2. Habitat where an adult female *Charadrahyla alitpotens* was found. © Vicente Mata-Silva

During a study of hylid frogs in the Sierra Madre del Sur from September of 1969 to August of 1970, Caldwell (1974) documented most of what is known regarding the natural history of *C. altipotens*. During those surveys, adults and juveniles seldom were encountered away from streams, and no individuals were observed more than 120 cm from the water's edge (Caldwell, 1974). Caldwell's (1974) surveys also indicated that *C. altipotens* breeds during the dry season (November–May) with metamorphosis occurring during the rainy season (June–October), further corroborating our presumption that the juveniles we encountered on 16 and 18 June 2016 were recent

metamorphs. Interestingly, neither of the two juveniles reported here were found near streams, indicating that metamorphs might use frequent summer rains to facilitate dispersal across otherwise unfavorable habitats in search of new streamside haunts.

The habitat where all three individuals were found was moderately- to heavily-disturbed montane pine-oak forest, with the adult being found in dense riparian streamside vegetation. The stream where the adult was collected was under anthropogenic pressure from logging on its banks and associated pollution from those activities (oil and gasoline in water, littered plastics, etc.). Santos-Barrera and Canseco-Márquez (2004) noted that the range of *C. altipotens* encompasses no protected areas, and in the light of this species' recent rediscovery, increased efforts for the protection of the dwindling remaining habitat for this montane streamside specialist must occur. The discovery of this species in multiple new localities, as well as those reported here proximate to the type locality, is an encouraging sign that this species is persisting despite being found in unprotected and altered habitats. Currently, this species is assigned to the Critically Endangered (CR) threat category by the IUCN (Santos-Barrera and Canseco-Márquez, 2004), designated as Protected (Pr) by SEMARNAT (2010), and assessed as a species with medium environmental vulnerability (score = 12) with the EVS system (Wilson et al., 2013; Mata-Silva et al., 2015). Until further information regarding this species' current geographic distribution is gathered, we recommend maintaining the current conservation statuses designated by both the IUCN and SEMARNAT systems.

In addition to *C. altipotens*, we discovered breeding colonies of several other hylids of conservation concern in the same area, including *P. hazelae*, *Ptychohyla leonhardshultzei*, and *Sarcohyla pentheter* (DeSantis et al., *This Issue*). Thus, despite being modified by human activities and likely exposed to *Batrachochytrium dendrobatidis* (Lips et al., 2004), the areas surrounding the town of Santa Catarina Juquila appear to allow for the persistence of seemingly sensitive cloud forest hylid populations. Further, this situation is illustrated by the recent rediscovery of breeding colonies of another "lost" hylid from near Santa Catarina Juquila, *Plectrohyla thorectes* (Caviedes-Solis et al., 2015). Lastly, the appropriately named Yellow-bellied Voiceless Treefrog (*C. altipotens*) lacks vocal slits and a vocal sac (Duellman, 1970), and the absence of conspicuously calling males might have contributed to the extensive period of time between the last known specimens and those recently reported by Barrio-Amorós et al., (2016) and herein. In support of the report by Delia et al. (2013), we further emphasize the value of continued survey efforts in areas of past occurrence for other "lost" anurans even when historical localities are under increasing human related pressures (Mata-Silva et al., 2015).

Fig 3. Two juvenile *Charadrahyla alitpotens*, found on a paved road in the Municipio de Santa Catarina Juquila on 16 (A) and 18 (B) June 2016 (UTEP G-2016.26 and G-2016-27, respectively). © Vicente Mata-Silva

Acknowledgments.—Our sincere gratitude to Eduardo Mata-Silva for assisting in the field; to the Bolán-Mata family for their great hospitality; to Raciel Crúz-Elizalde, and Christian Berriozabal-Islas for logistical support; and to William E. Duellman for species confirmation. The collecting permit (SGPA/DGVS/04287/16) was issued by SEMARNAT to ARB with extensions to DLD, VMS, EGP, AR, and LDW. Irene G. Mayer-Goyenechea kindly provided the specimen number, and Arthur Harris the photo voucher numbers.

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Notes on a leucistic *Ambystoma flavipiperatum* Dixon, 1963 (Caudata: Ambystomatidae)

The Yellow-peppered Salamander, *Ambystoma flavipiperatum* Dixon, 1963, is endemic to the Mexican state of Jalisco (Frost, 2016). The known distribution of *A. flavipiperatum* is restricted to the Sierra de Quila in the municipality of Tecolotlán, Jalisco (Santiago-Pérez, et al., 2012; Rosas-Espinoza, et al., 2013; Ahumanda-Carrillo, et al., 2014).

This mountain range has been established as a wildlife refuge (as Área de Protección de Flora y Fauna Sierra de Quila), and its principal vegetation type is pine-oak forest (Santiago-Pérez et al., 2012). The herpetofauna of this range was studied by Santiago-Pérez et al. (2012), who recorded 69 species, including 21 anurans, two salamanders, 45 squamates, and one turtle.

On 2 October 2016, we conducted vegetation sampling at a site in oak-pine forest (20°17'05.92"N, 104°01'12.24"W; WGS 84), elev. 2,179 m, located ca. 23 km E of Atengo and ca. 9 km NNE of Tecolotlán, Jalisco. During our sampling, we came across a stream about 30 m from our campsite, along which closed-canopy gallery forest was growing. The spring was spring-fed and submerged and reemerged at intervals. About 100 m downstream from a point where the water resurfaced, we found a pool that measured 65.5 cm in depth, 5.07 m in width, and 2.6m in length (Fig. 1B). We encountered approximately six aquatic individuals of *A. flavipiperatum* in the pool, of which one lacked the typical coloration and displayed the characteristics of a leucistic individual Bechtel (1995). We found approximately 50 other individuals in the stream, all with normal coloration.

In the original description of *A. flavipiperatum*, Dixon (1963) did not indicate the body shape or coloration of the larvae. Santiago-Pérez et al. (2012), however, mentioned that the larvae and neotenic individuals are brown to yellowish brown in coloration, with rounded black spots and small yellow spots on the dorsal portion of the body (Fig. 2B).

The leucistic individual (Figs. 2A, 3) measured 122.9 mm in total length and 65.2 mm in snout–vent length. The coloration of this individual was recorded as follows: anterodorsal portion of head Pinkish White (Color 216), becoming Smokey White (Color 261) on the remainder of head; dorsum of body with a Pinkish White (Color 216) stripe from nuchal region along middorsum to tail, with scattered punctations; lateral portions of body Smoky White (Color 261), with irregularly distributed Pale Buff (Color 1) spots and very small black punctations (description based on Köhler, 2012). This leucistic individual is paedomorphic, with three external gills on either side, each with numerous black-tipped reddish filaments; the reddish coloration apparently is the result of vascularization, as at or near maturity some Axolotls (*A. mexicana*) are known to acquire a degree of pigmentation (Bechtel, 1995). A thesis on the population ecology of *A. flavipiperatum* at the same locality makes no mention of the presence of atypically colored individuals (Urzúa Sánchez, 2016).

This individual represents the first record of leucism in *A. flavipiperatum*. The salamander was easy to locate and collect in the wild (Fig. 4), whereas normally colored individuals were well camouflaged against the debris on the bottom of the pool.

Ambystoma flavipiperatum is one of two herpetofaunal species endemic to Jalisco; the other species is *Eleutherodactylus grunwaldi* (D. Cruz-Sáenz et al., F. Muñoz-Nolasco, V. Mata-Silva, J. Johnson, E. García-Padilla, and L. Wilson, unpublished). This salamander has been assessed as Endangered by the IUCN, as a species of Special Protection by SEMARNAT, and was given an Environmental Vulnerability Score of 14, placing it at the lower limit of the high vulnerability category (Wilson et al., 2013). Given the relatively imperiled conservation status of this salamander, fortunately its entire known range lies within a state-level protected area (D. D. Cruz-Sáenz, F. Muñoz-Nolasco, V. Mata-Silva, J. Johnson, E. García-Padilla, and L. Wilson, unpublished).

Fig. 1. (A) Oak-pine forest at the collection site of the leucistic individual of *Ambystoma flavipiperatum*. (B) The stream in which the leucistic individual of *A. flavipiperatum* was found. © Erika Sugey Mata-García

Fig. 2. Neotenic individuals of *Ambystoma flavipiperatum* from the Área de Protección de Flora y Fauna Sierra de Quila, Jalisco. (A) The leucistic individual of *Ambystoma flavipiperatum*; and (B, C) the earlier and later stages of normally-colored individuals of *A. flavipiperatum*. © Erika Sugey Mata-García

Fig. 3. A leucistic paedomorphic individual of *Ambystoma flavipiperatum* from the Área de Protección de Flora y Fauna Sierra de Quila, Jalisco. © Erika Sugey Mata-García

Fig. 4. A leucistic individual of *Ambystoma flavipiperatum* in a pool in the stream at the collection site. © Erika Sugey Mata-García

Acknowledgments.—We thank Lizett Carolina Núñez-Carrillo, Julio Alejandro Arias-Hernández, and Diego Brizuela-Torres for field assistance, and Erika Sugey Mata-García for the use of her photographs. The collecting permit was issued to Fausto R. Mendez-de la Cruz by SEMARNAT OFICIO NÚM. (SGPA/DGVS/01629/16) with an extension to DCS.

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***Aquiloeurycea quetzalanensis* (Parra-Olea, Canseco-Márquez, and García-París, 2004). Elevation.** The plethodontid genus *Pseudoeurycea* (*sensu lato*) recently was partitioned into the genera *Isthmura*, *Aquiloeurycea*, and *Pseudoeurycea* (*sensu stricto*) (Rovito et al., 2015). Together with *Ixalotriton*, these genera comprise a highly speciose clade of morphologically divergent salamanders, generally occurring at high (> 2,000 m) elevations along mountain chains in Mexico and Guatemala (Wiens et al., 2007). Ongoing research efforts, however, revealed that some species occur at much lower elevations (e.g. Parra-Olea et al., 2005; Wiens et al., 2007; Rovito et al., 2015). *Aquiloeurycea quetzalanensis* can be found at mid- to high elevations along the northern versant of the Sierra Madre Oriental in northeastern Puebla, Mexico (Parra-Olea et al., 2004; Mociño-Deloya et al., 2007). During the evening of 13–14 February 2015, we observed two adult individuals of *A. quetzalanensis* walking on top of large leaves along the banks of the Río Cuichat, at ca. 500 m S of San Andrés Tzicuilan, Municipio de Cuetzalan del Progreso, Puebla, Mexico (20.009086°N, -97.506067°W, WGS 84; elev. 830 m). The individuals were identified as *A. quetzalanensis* based on their small size, the presence of glandular convergent ridges on the tail, nearly fully-webbed hands and feet, pale brown tail tips, and presence of scattered metallic blue spots on the flanks (Fig. 1). Syntopic herpetofauna included *Ecnomiohyla miotympanum*, *Craugastor decoratus*, and *Norops* cf. *naufragus*.

Aquiloeurycea quetzalanensis has been reported to inhabit elevations from 905 to 1,400 m, with its distribution largely restricted to mesophilic forest (Parra-Olea et al., 2004; Canseco-Márquez and Gutierrez Mayen, 2006). Subsequently, Mociño-Deloya et al. (2007) reported this species from pine-oak forest and montane cloud forest, and also reported an individual found at an elevation of 1,900 m, the highest known for this species. Although modest in absolute extent, the record we report expands the elevational range of this species, a significant finding because it represents an exceptionally low occurrence for *Pseudoeurycea* (*sensu lato*). Of the 54 species previously attributed

to this taxon, only *Isthmura maxima* is known to occur at even lower elevations (730 m; Parra-Olea et al., 2005). Perhaps *A. quetzalanensis* has reached this low elevation and persists there by adapting to the largely undisturbed, humid, mesophilic forest along the steep and deeply carved valley of the Río Cuichat (Fig. 2). Determining if Mesoamerican salamanders, or other generally montane herpetofaunal species, often occupy such peripheral habitats would be an interesting research project.

Fig. 1. An adult individual of *Aquiloeurycea quetzalanensis* found along the banks of the Río Cuichat, at ca. 500 m S of San Andrés Tzicuilan, Municipio de Cuetzalan del Progreso, Puebla, Mexico. © Wouter Beukema

Fig. 2. Mesophilic forest along the steep and deeply carved valley of the Río Cuichat, in Puebla, Mexico. © Wouter Beukema

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Second individual of a recently discovered species of salamander, *Bolitoglossa chucantiensis* (Caudata: Plethodontidae), from eastern Panama

Bolitoglossa is the largest and most widely distributed genus of plethodontid salamanders, which includes about 16% of the recognized species (Parra-Olea et al., 2004). In total, 131 species of *Bolitoglossa* are distributed from northeastern Mexico to Peru, Bolivia, and Brazil (AmphibiaWeb, 2016; Kubicki and Arias, 2016). Four species of this genus, regarded as in the *adspersa* group, were known from eastern Panama (*B. biseriata*, *B. cuna*, *B. medemi*, and *B. taylori*; Jaramillo et al., 2010), and Batista et al. (2014) described a new species (*B. chucantiensis*) of this group from this region. *Bolitoglossa chucantiensis* differs from these congeners by the presence of a greater number of maxillary teeth in proportion to the snout–vent length (SVL), a brown dorsal coloration with large patches with yellow speckling, and the feet are completely webbed, with a slight indentation present between the tips of the toes and fingers.

After the description of *B. chucantiensis*, two trips were made to the type locality to search for additional specimens, specifically to gather data for evaluating the morphological variation and ecology of this species. During the first trip to this area (2–4 April 2015), three of us (AB, MM, and MP) conducted an unsuccessful search. On the second trip we spent five nights (10–14 October 2016) camping in cloud forest in the vicinity of the type locality, at elevations from 1,200 and 1,449 m. On 14 October 2016 at 0118 h, we found a specimen of *B. chucantiensis* (08.80467°N, 78.45896°W; datum WGS 84), 200 m N from where the holotype was collected. This specimen (deposited at the Museo Herpetológico de Chiriquí, MHCH 3217, original field number AB 2087; Fig. 1) was found at an elevation of 1,424 m, 100 m N from the top of Cerro Chucantí, at a temperature of 21°C. The salamander was found 2 m above the ground on a bromeliad leaf, when a gentle breeze was blowing. A heavy rain, however, had fallen the previous evening from 1500 to 1700 h. Characteristics of the new specimen resembled the description of the *B. chucantiensis* (Batista et al., 2014), as it measured 52 mm in snout–vent length (SVL), 59 mm in tail length

(TL), and had a count of 65 maxillary teeth (MT), (Table. 1); compared to the holotype (SMF 97141), however, it also shows marginal differences, with the number of teeth being the most conspicuous (Table 1). Nonetheless, no significant morphometric differences are present between the holotype and this topotypic specimen, as the proportions are similar (Table 1).

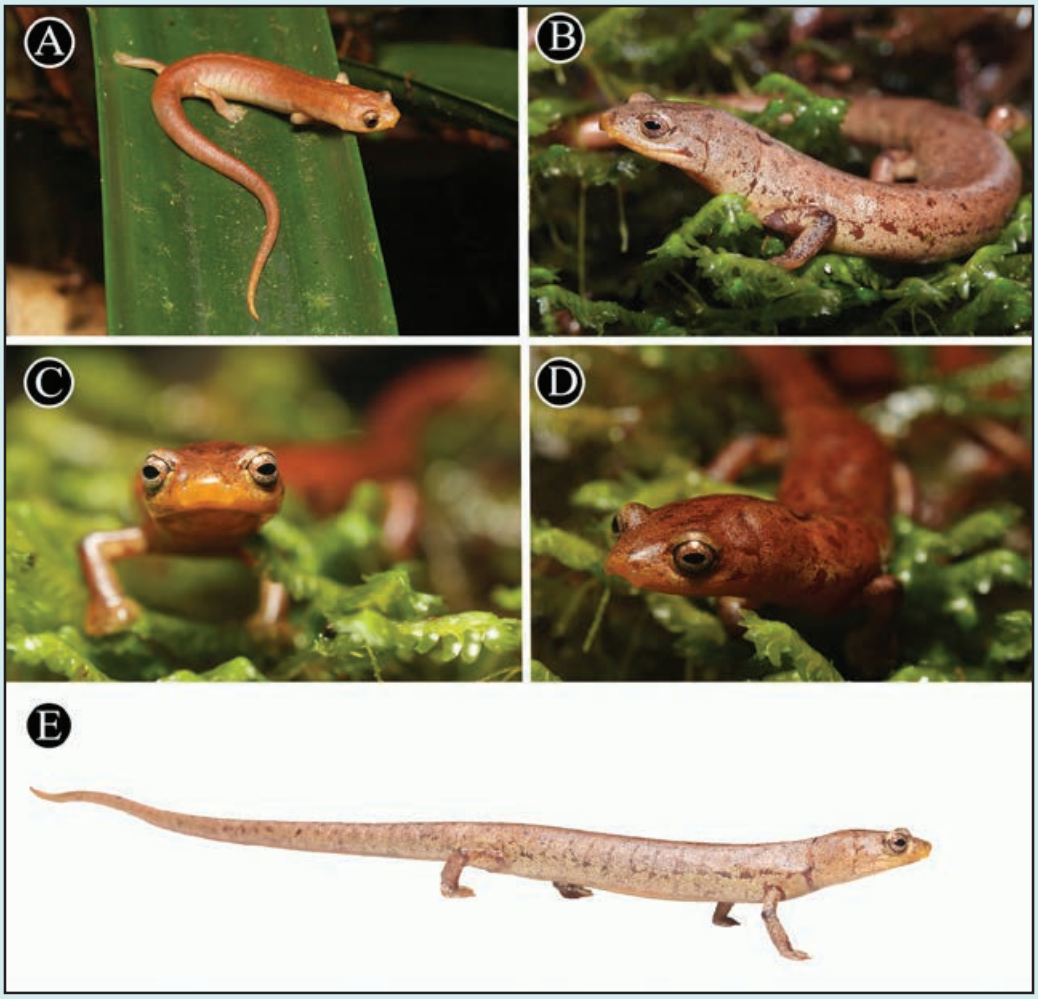

Fig. 1. The second specimen of *Bolitoglossa chucantiensis* found at the type locality. (A) At the site of encounter; (B) a lateral view of the head, one day after collection; (C, D) a frontal view; and (E) a lateral view of the body.

Bolitoglossa chucantiensis only is known from premontane cloud forest on Cerro Chucantí, with the two specimens having been found on a bromeliad and a palm leaf, at elevations above 1,200 m; its known distribution currently is estimated at fewer than 2 km^2, at the summit of Cerro Chucantí (see Batista et al., *This issue*). To date, we have spent 147 man/h searching for amphibians and reptiles in the vicinity of the type locality, and encountered only two specimens. Because of the intensive surveys we have conducted on Cerro Chucantí and other areas of the Cordillera de Majé, in addition to other fieldwork in cloud forests in eastern Panama (in the province of Darién), we presume that the distribution of *B. chucantiensis* is restricted to Cerro Chucantí. Accordingly, we suggest that by applying the IUCN red list criteria B1ab(ii,iii)+2ab(ii,iii) (IUCN, 2012), this species should be assessed as Critically Endangered. The distribution of this species is extremely restricted, as it has been found in only one isolated peak, in an area where the quality of the habitat and area of occupancy of this species continues to decline as a result of habitat degradation caused by logging for pastures. This species also has been assessed an Environmental Vulnerability Score of 18, placing it in the upper portion of the high vulnerability category (Johnson et al., 2015).

Table 1. Measurements and proportions of the two known specimens of *Bolitoglossa chucantiensis*. Abbreviations are the same as in Batista et al. (2014).

Measurements			Proportions		
Characters (mm)	Holotype	Topotype	Characters	Holotype	Topotype
SLV	47	52	TL/SVL	1.17	1.13
TL	55	59	HW/SVL	0.16	0.15
SG	11.74	12	MT/SVL	1.6	1.25
HW	7.63	8	VT/SVL	0.53	0.44
HD	6.41	4	HAW/SVL	0.08	0.06
AX	23.18	27	FW/SVL	0.1	0.08
HLL	10	10	SG/SVL	0.25	0.23
FLL	11	9	VT/MT	0.33	0.35
HAW	3.67	3	SVL/HW	6.6	6.5
FW	4.63	4			
LI	13	27			
PMT	2	3			
MT right	38	30			
MT left	37	32			
MT total	75	65			
VT right	13	11			
VT left	12	12			
VT total	25	23			

Acknowledgments.—We thank Jesus Pérez, Benjamín, Luis de León, Sr. Juan Zarzavilla from Rio Pavo and Austin Garrido for field assistance and help with the translation, and Guido Berguido for his support during our stay at the Chucanti private reserve. This work was supported financially by ADOPTA Panama.

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A new locality for the Endangered *Abronia gaiophantasma* Campbell and Frost, 1993 (Squamata: Anguidae) in Alta Verapaz, Guatemala, with notes on morphology

Abronia gaiophantasma is endemic to the mountains of central Guatemala (Campbell and Frost, 1993; Köhler, 2008; Acevedo et al., 2010). Because of its small range with no more than five known sites of occurrence, combined with a projected population decline, this species has been classified as Endangered in the IUCN Red List of Threatened Species (Ariano-Sánchez et al., 2014). Herein we provide information on a new site record for this species. We used software ESRI ArcView 3.2 for the spatial analyses.

During bird observations in Reserva Natural Privada (RNP) Chelemhá, Montaña Yalijux, Municipio San Pedro Carchá, Departamento de Alta Verapaz, Guatemala, on 21 May 2016 at 1200 h KE encountered two lizards of the genus *Abronia* at (15°23'03.8"N 90°03'51.9"W; WGS 84) elev. 2,270 m. Both individuals were found attached to each other (probably mating) on the ground, in primary cloud forest (30–40 m tall) at approximately 100 m from the forest edge. One of the individuals was photographed at the site of the encounter. MA identified the individual from the images as adult male *A. gaiophantasma* (Figs. 1, 2). Voucher photographs are deposited at the University of Texas at Arlington Digital Collection (UTADC-8675–80). An unidentified *Abronia* sp. as prey of a female Resplendent Quetzal, *Pharomachrus mocinno* (Aves: Trogonidae) in RNP Chelemhá, elev. 2,530 m, was photographed in 2011 (Eisermann, 2013), and might pertain to the same species. The nearest confirmed record of *A. gaiophantasma* is from Chicacnab at Montaña Caquipec (Franzen and Haft, 1999), 13 km to the west (Fig. 3A). The cloud forest at Montaña Caquipec has become isolated from the forest at Montaña Yalijux as a result of deforestation (Fig. 3A).

The observation of *A. gaiophantasma* in RNP Chelemhá is noteworthy because it represents the first record of this globally Endangered species for this reserve, and also represents an increase in its documented area of distribution (Fig. 3). The extent of occurrence (polygon with the shortest continuous boundary encompassing all sites and all inner angles < 180°) covers approximately 650 km^2. *Abronia gaiophantasma* has been recorded at elevations from 1,600 to 2,350 m (Wilson and Johnson, 2010) in two life zones: subtropical wet forest (cold), and subtropical lower montane rain forest (Acevedo et al., 2010). The potential area of distribution according to IUCN (Ariano-Sánchez et al., 2014) covers approximately 2,700 km^2, which includes an arid valley in the western part with unsuitable habitat (Fig. 3B). A more realistic extent of the potential area of distribution, based on continuous elevation above 1,500 m, covers 2,300 km^2 (Fig. 3B).

According to the coverage of protected areas in Guatemala (CONAP, 2013), of the 2,300 km^2 of potential area of distribution of *A. gaiophantasma*, 1,190 km^2 (52%) are legally protected (Table 1), but only 12.1 km^2 (0.5%) are covered by strictly protected areas of IUCN categories I or II (IUCN, 2008). The only protected area of this category with records of *A. gaiophantasma* is Biotopo Protegido Mario Dary Rivera, which covers 11.5 km^2. Most of the protected areas within the range of *A. gaiophantasma* are private nature reserves (Reservas Naturales Privadas). Although many of these reserves currently are among the best protected in Guatemala, driven by strong personal interests of the owners, the national law of protected areas (Decreto 4–89, Congreso de la República de Guatemala, Acuerdo Gubernativo 759–90) does not require a long-term commitment for conservation, or continued conservation efforts by future land owners. The long-term protection of *A. gaiophantasma* is threatened by the lack of strict legal area protection, combined with ongoing habitat fragmentation caused by deforestation (Fig. 3A; see also Renner et al., 2006; Pope et al., 2015).

Photographs of the adult male *A. gaiophantasma* in RNP Chelemhá taken at the site of encounter show the number of longitudinal scale rows. The individual displayed 15 longitudinal rows of large dorsal scales, with scales 1–7 being the lateral scales and number 8 the central scale (Fig. 2). We counted the scale rows based on Campbell and Frost (1993: p. 11, footnote), who noted that the number of scale rows used in the key refers only to the large scales, and not the smaller scales along the ventrolateral fold. The number of longitudinal dorsal scale rows differed from the 12 rows indicated by Campbell and Frost (1993) and Köhler (2008), the latter in a more recent key for the genus in Central America. Franzen and Haft (1999), however, reported 12 dorsal scale rows in a male, and 14 in a female. The color of the throat, belly, and ventral surface of the hind legs and tail of the male in RNP Chelemhá closely matched the Light Greenish Yellow in the color catalogue of Köhler (2012) (Fig. 1C, D, G). The ventral coloration of individuals in life has not been indicated previously in identification keys (Campbell and Frost, 1993;

Köhler, 2008), but Franzen and Haft (1999: 152) noted a "yellowish" venter in a male. The observations on the higher number of scale rows and the ventral coloration, based on photographs, may be useful for future revisions of a key to species of the genus *Abronia*.

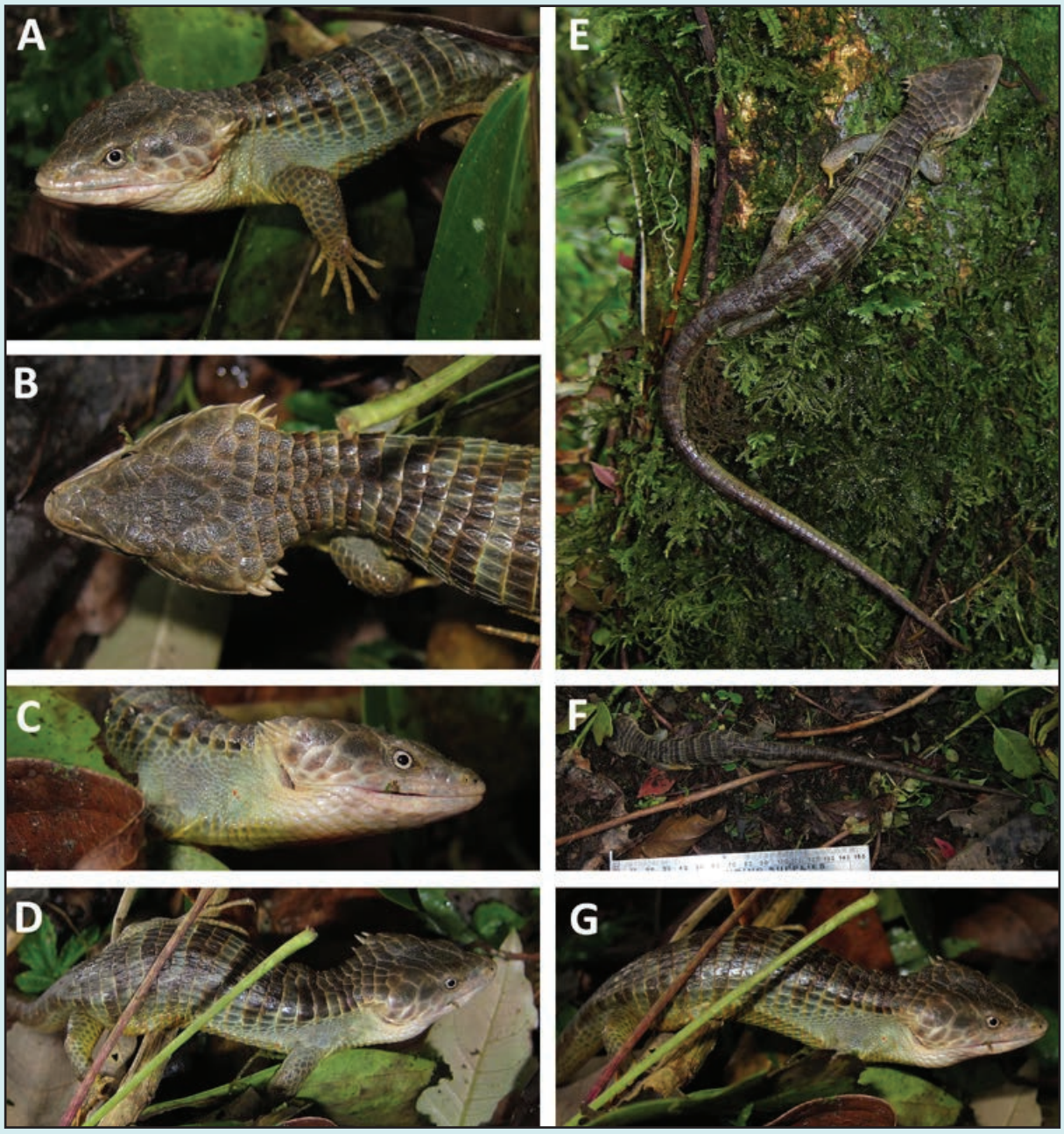

Fig. 1. A male *Abronia gaiophantasma* observed at Reserva Natural Privada Chelemhá, Montaña Yalijux, Municipio San Pedro Carchá, Departamento de Alta Verapaz, Guatemala. (A) A dorsolateral view of the head and abdomen (UTADC-8675); (B) a dorsal view of the head (UTADC-8676); (C) a lateral view of the head and throat; (D) a dorsolateral view; (E) a dorsal view of the body and tail (UTADC-8678); (F) a view of the individual next to a metric scale (150 mm) (UTADC-8679); and (G) a lateral view of the body. © Knut Eisermann

Fig. 2. A close-up of the head and anterolateral portion of the body of the male *Abronia gaiophantasma* in Figure 1. The white numbers indicate the longitudinal scale rows (scale 8 is the central scale). High-resolution voucher photograph UTADC-8680. © Knut Eisermann

Table 1. Coverage of protected areas within the potential area of distribution of *Abronia gaiophantasma* (blue polygon in Fig. 3B).

CONAP (2013) Protected Area Category	**Number of Reserves**	**Area in km²**	**IUCN (2008) Protected Area Category**
Parque Nacional	1	0.6	I
Biotopo Protegido	1	11.5	II
Reserva Natural Privada	30	146.8	V
Reserva de Biosfera	1	999.8	VI
Zona de Veda Definitiva	1	31.3	—
Total	**34**	**1,190.0**	

Much of the natural history of members of the genus *Abronia* remains to be discovered (Campbell and Frost, 1993; Köhler, 2008), including demography, population density, food, and predators. A Resplendent Quetzal (*Pharomachrus mocinno*) preying on *Abronia* (Eisermann, 2013) in RNP Chelemhá, most likely *A. gaiophantasma*, therefore is noteworthy.

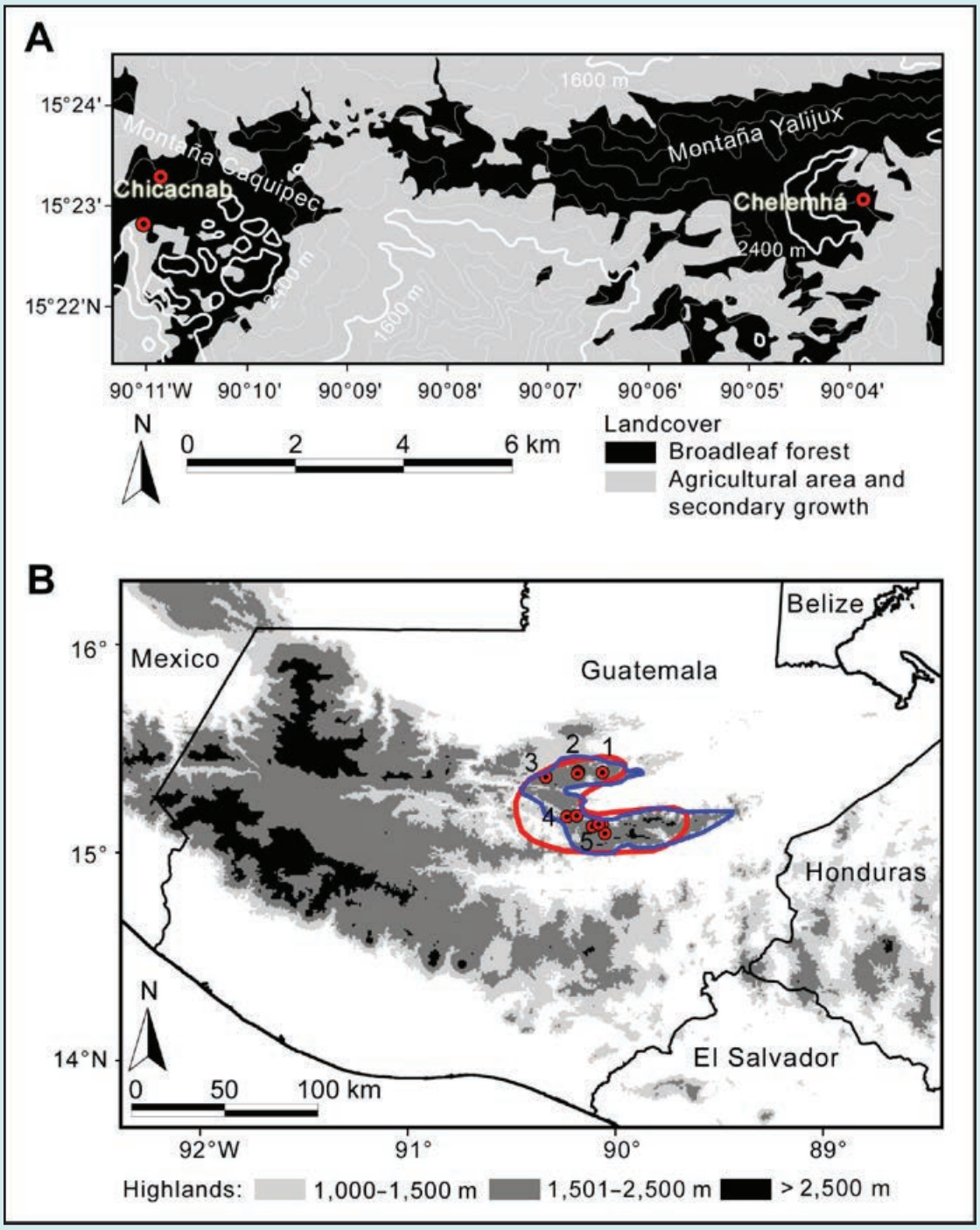

Fig. 3. Distribution of *Abronia gaiophantasma*. (A) Forest cover based on a satellite image from May of 2011 at Montaña Caquipec and Montaña Yalijux. The red dots mark the sites of encounter of *A. gaiophantasma* in Chicacnab (Franzen and Haft, 1999) and in RNP Chelemhá. Note the broken connection between the forests of Caquipec and Yalijux, as a result of deforestation. Isohypses of the lower and upper limits of the documented distribution of *A. gaiophantasma* (1,600 and 2,400 m) are marked in bold. (B) Sites of *A. gaiophantasma* (red dots): 1–RNP Chelemhá; 2–Chicacnab (Franzen and Haft, 1999); 3–Finca Rubel Chaim (Griffin and Mei, 2015); 4–Cerro Verde and Cerro Quisís (Campbell and Frost, 1993), and 5–surroundings of Chilascó (Campbell and Frost, 1993). The red polygon marks the potential area of distribution according to IUCN (Ariano-Sánchez et al., 2014); and the blue polygon marks a more realistic delimitation of the potential area of distribution.

Acknowledgments.—We thank the association Unión para Proteger el Bosque Nuboso (UPROBON) for logistical support in RNP Chelemhá. Carl. J. Franklin kindly incorporated photographs in the University of Texas at Arlington Digital Collection (UTADC) and provided the voucher numbers. We appreciate comments on the manuscript by Louis W. Porras. The observation was made during a trip supported by Cayaya Birding, Guatemala.

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***Aspidoscelis costata*. Scale variation**. *Aspidoscelis costata* (formerly *Cnemidophorus costatus*) is the available name for an assemblage of moderately large whiptail lizards (Squamata: Teiidae) in continental western Mexico, which has not been adequately subjected to genetic analyses for reliable species partitioning (Duellman and Zweiflel, 1962; Maslin and Secoy, 1986; Reeder et al., 2002). Nevertheless, Duellman and Zweifel (1962) correctly indicated that all populations tentatively allocated to the *A. costata* complex possess enlarged postantebrachial scales on the posterior aspect of each forearm (Fig. 1A). This conclusion, and that this typically is an invariable character, was based on their analyses of several hundred specimens, as well as our collective observations. Here, we offer the first

report of the occurrence of an unusual individual of *A. costata* with slightly enlarged postantebrachial scales, from an area in Mexico where morphological variation in this species has not been assessed.

On 27 May 2016, during an ecological investigation at Ixtapan de la Sal, Estado de México, Mexico (18°50'34.5"N, 99°40'51.8"W; datum WGS 84; elev. 1,800 m), we captured and released individuals of *A. costata* (*n* = 51). Field examinations of these lizards revealed that one male presented slightly enlarged postantebrachial scales (Fig. 1B). These individuals were captured within private property in an urban habitat near an asphaltic road where *A. costata* was the only whiptail lizard species present. We verified our diagnosis by comparing other morphological characters and dorsal and ventral color patterns in the lizards with the account of *A. costata* provided by Duellman and Zweifel (1962). This finding deserves additional research to evaluate the extension of this character variation to other populations, and suggests that the field diagnosis for *A. costata* should also include additional scutellation traits than just the morphology of postantebrachial scales.

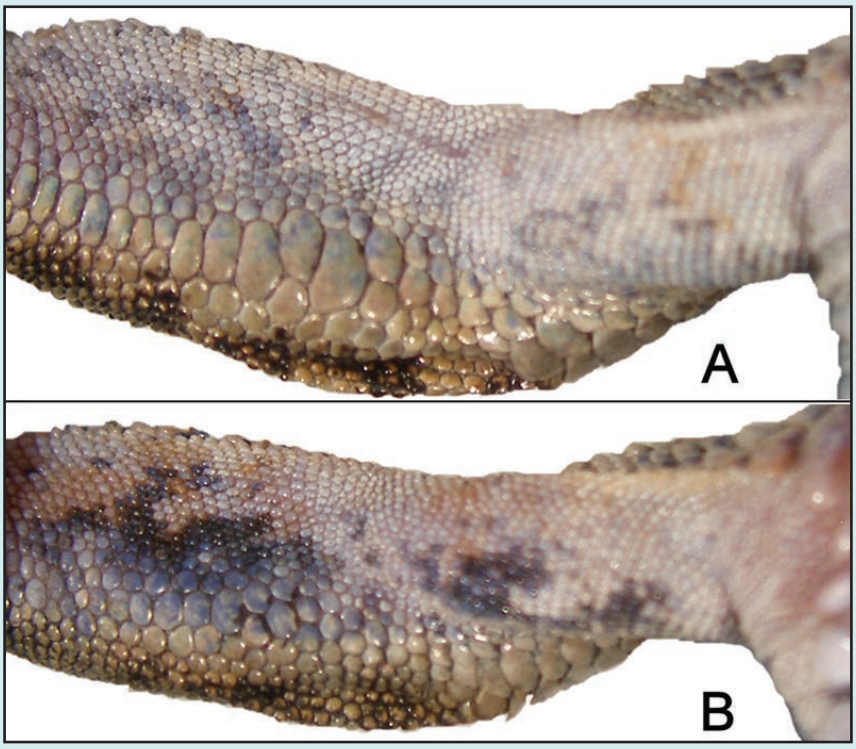

Fig. 1. (A) Forearm of a male (110 mm SVL) *Aspidoscelis costata* showing enlarged postantebrachial scales; and (B) forearm of a male (96 mm SVL) showing slightly enlarged postantebrachial scales. Both individuals are from Ixtapan de la Sal, Estado de México, Mexico. SVL = snout vent length. © Aldo Gómez-Benitez

Acknowledgments.—We thank the Delgado family for permission to capture and release individuals of *Aspidoscelis costata* on their property.

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First record and distributional extension for *Polychrus gutturosus* Berthold, 1845 (Squamata: Polychrotidae) in the Península de Nicoya of northwestern Costa Rica, with a new record from Provincia de San José

The genus *Polychrus* is widely distributed in Latin America, but of the seven recognized species only *P. gutturosus* occurs in Central America (Köhler, 2003; Koch et al., 2011). The distribution of *P. gutturosus* has been reported to extend from northern Honduras to northwestern Colombia, on the Atlantic versant, and on the Pacific versant from northwestern Costa Rica to northwestern Ecuador (Peters, 1967; Peters and Donoso-Barros, 1970; Ayala, 1986; Köhler, 2001, 2008; Savage, 2002; Koch et al., 2011; Gómez-Hoyos et al., 2015). This species is widely distributed in Costa Rica at elevations to at least 1,000 m, but to date has not been recorded from the subhumid northwestern part of the country (Leenders, 2001; Savage, 2002; Köhler, 2008; Herr and Herr, 2014); in Colombia, *P. gutturosus* is known to occur at a maximum elevation of 1,300 m (Castro-Herrera and Vargas-Salinas, 2008). In northwestern Costa Rica this species has been recorded from the Cordillera de Guanacaste and the Cordillera de Tilarán (Taylor, 1956; Savage, 2002: map 10.11), but it has not been reported from Tropical Dry Forest.

Polychrus gutturosus predominantly is a canopy-dweller that apparently occurs in low population densities, and thus rarely is seen in the wild (Köhler, 2003). Accordingly, Taylor (1956) noted that this species is rare in museum collections. Herein, we report three new records of *P. gutturosus* from Costa Rica, including one from dry habitat in the Península de Nicoya, and also another record from a nearby locality. Because relatively few specimens of *P. gutturosus* have been deposited in museum collections, we also report one individual from the southwestern part of Provincia de San José.

On 7 September 2016, OAS observed two male *P. gutturosus* fighting in low scrub vegetation at a height of ca. 3 m above the ground along a dirt road 800–900 m S of Hojancha, Provincia de Guanacaste, Costa Rica (10.0456°N, 85.4197°W; WGS 84; elev. 355 m). Both individuals subsequently fell to the ground, where one remained in low vegetation and the other started walking slowly across the road. OAS photographed the latter individual using a mobile phone camera (Fig. 1A, B); neither individual appeared startled by the presence of OAS. This observation was made during the wet season, after heavy rains seemingly had triggered an increase in reptile activity.

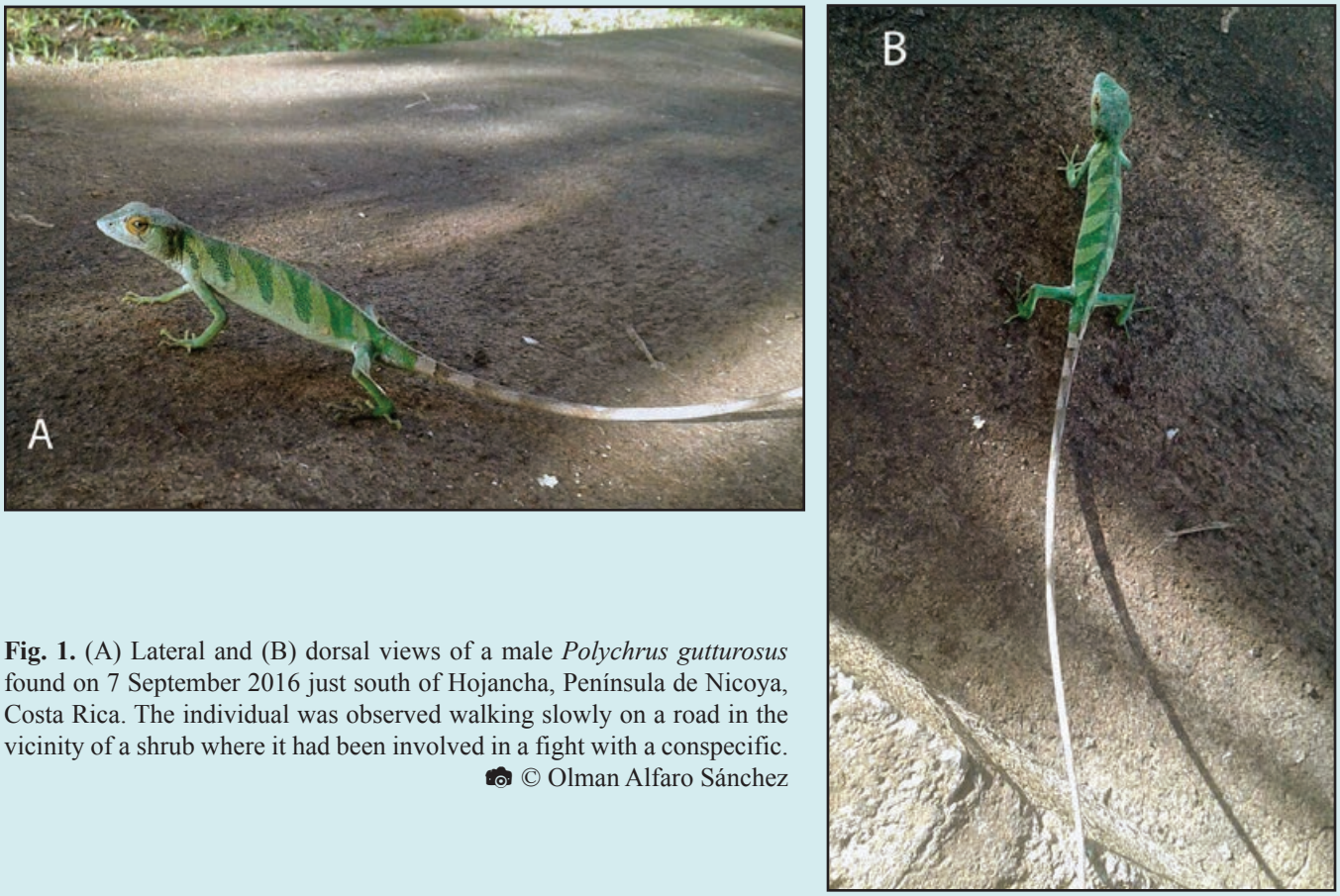

Fig. 1. (A) Lateral and (B) dorsal views of a male *Polychrus gutturosus* found on 7 September 2016 just south of Hojancha, Península de Nicoya, Costa Rica. The individual was observed walking slowly on a road in the vicinity of a shrub where it had been involved in a fight with a conspecific. © Olman Alfaro Sánchez

The area consisted of dry cultivated land and pastures with a scattering of human settlements, among which were patches of xerophytic scrub vegetation. Within this area, the habitat of *P. gutturosus* consisted of a ca. 50 m wide belt of dense scrub vegetation along a 3–4 m wide permanent stream. During the dry season, however, the width of the stream is reduced substantially, as much of it turns into small ponds or puddles. The small amount of microhabitat along the stream does not dry out completely, but during the dry season most of the scrub dries out.

In 2011 or 2012, OAS also observed one individual of *P. gutturosus* in a shrub at a height of ca. 3 m, approximately 200 m N from the above-mentioned locality (10.0476°N, 85.4194°W; WGS 84; elev. 352 m); the habitat was similar to the one in the 2016 observation. Although the lizard undoubtedly was a *P. gutturosus*, unfortunately no verification for this observation exists.

On 13 December 2015, HOH and HB found one adult male *P. gutturosus* in rainforest habitat at Reserva Los Campesinos, ca. 25 km E of Quepos, in the southwestern part of Provincia de San José (9.4568°N, 84.0033°W; WGS 84; elev. 180–185 m). The individual was encountered sleeping at 1822 h on top of twigs and large leaves on a shrub, at a height of ca. 4 m. The shrub was growing on a steep slope, and the lizard was spotted from above (Fig. 2).

The two records of *P. gutturosus* from Hojancha constitute an important range extension into the dry Península de Nicoya. In terms of habitat, in the pertinent literature cited in this note *P. gutturosus* has been noted to occur exclusively in humid forest or rainforest (e.g., Savage, 2002; Köhler, 2003, 2008). Leenders (2001: 189) mentioned that this species "is absent from very dry areas like Guanacaste Province," and thus, our records from Tropical Dry Forest in the Península de Nicoya represent a new habitat for this species. We believe that the riparian habitat in this area, although limited in extent during the dry season, is crucial for the survival of *P. gutturosus* and suggest that populations of this species likely occur in other riparian areas of the peninsula.

Although expected, the record of *P. gutturosus* from Reserva Los Campesinos contributes new distributional information. According to Savage (2002: map 10.11), the nearest localities are 60 km (straight line) to the NW, N, NE, and SE.

Fig. 2. A male *Polychrus gutturosus* found on 13 December 2015 at Reserva Los Campesinos, ca. 25 km E of Quepos, in the southwestern part of Provincia de San José, Costa Rica. © Henrik Bringsøe

Certain areas of the Península de Nicoya contain semi-humid forest (e.g., along a large stream 4–5 km to the S of our new reported locality), which likely constitute suitable habitat for *P. gutturosus*. Would it be possible to judge when *P. gutturosus* dispersed into the Península de Nicoya? Deforestation in the peninsula has continued into recent years, especially during the 1950s, after which it began to decrease markedly (Sader and Joyce, 1988). Evidence indicates that major deforestation occurred on the lower slopes of Volcan Miravalles from 5,000 to 5,500 years ago (Arford and Horn, 2004; Horn and Haberyan, 2016). Was the climate of the Península de Nicoya more humid in earlier times? Over the last 100,000 years, the climate of the northern part of the Península de Nicoya probably was neither wetter nor more humid than today (Lachniet et al., 2009: fig. 5; M. Lachniet, pers. comm.), but according to Horn (1985) the vegetation of southern Central America changed during the late Quaternary and during this interval moist tropical forest covered the Península de Nicoya. Consequently, the peninsula likely was covered with rainforest during the late Quaternary, more than 100,000 years ago, which would have provided the conditions necessary for the survival of *P. gutturosus*. Although in more recent times the Península de Nicoya generally has been covered with Tropical Dry Forest, *P. gutturosus* might have been able to disperse into the peninsula along riparian corridors.

Acknowledgments.—We thank Sally P. Horn (Department of Geography, University of Tennessee, Knoxville, Tennessee), Gunther Köhler (Senckenberg Forschungsinstitut und Naturmuseum, Frankfurt am Main, Germany), Matthew Lachniet (Department of Geoscience, University of Nevada, Las Vegas, Nevada), and Jay M. Savage (Department of Biology, San Diego State University, San Diego, California) for valuable help and comments. Jan Grathwohl (Næstved, Denmark) kindly provided literature.

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Elevational range extension and new habitat for *Thamnophis fulvus* (Bocourt, 1893) (Squamata: Natricidae)

The Mesoamerican Gartersnake, *Thamnophis fulvus*, is endemic to the highlands of central Chiapas, Mexico, through southern Guatemala into southwestern Honduras and adjacent El Salvador, at elevations from 1,400 to 3,500 m (Rossman, 1996; Köhler, 2008; Wilson and Johnson, 2010).

During bird observations at a site locally known as Planes del Diablo (15°31'14"N, 91°33'56"W; datum WGS 84), in the central part of Parque Regional Municipal "K'ojlab'l Tze' Te' Tnom Todos Santos Cuchumatán" (hereafter PRM Todos Santos Cuchumatán), Sierra de los Cuchumatanes, Departamento de Huehuetenango, Guatemala, on 27 August 2016 at 1230 h, CA, KE, and EM encountered and photographed two individuals of *Thamnophis fulvus*. Voucher photographs are deposited at the University of Texas at Arlington Digital Collection (UTADC-8716–19). Both snakes were similar in length (ca. 40 cm). The dorsal ground color of one individual was grayish brown,

whereas that of the other was rufous brown (Fig. 1). MA confirmed the identification of both individuals after viewing the photographs. Both individuals were observed for approximately 5 min in an area dominated by rocks, small patches of low grasses and herbs, and sparsely distributed, short (30 cm) juniper shrubs (*Juniperus standleyi*), at an elevation of 3,710 m, before the snakes retreated into cavities among the rocks.

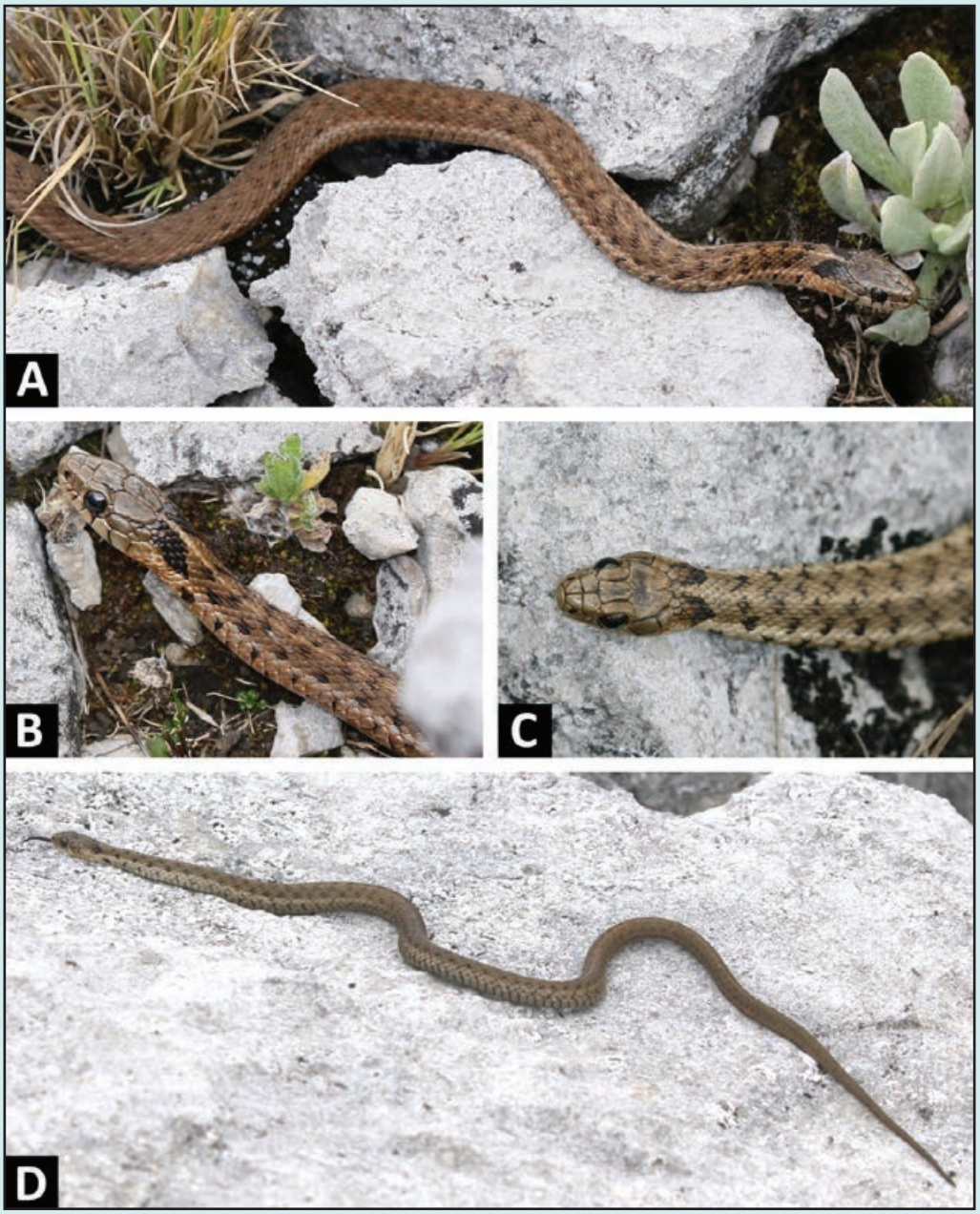

Fig. 1. Two individuals of *Thamnophis fulvus* found at an elevation of 3,710 m in PRM Todos Santos Cuchumatán, Sierra de los Cuchumatanes, Departamento de Huehuetenango, Guatemala. (A, B) individual with a rufous brown dorsal ground color (UTADC-8716, 8717); and (C, D) individual with a grayish brown dorsal ground color (UTADC-8718, 8719).
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Within a radius of 100 m around the site of the encounter, temporary, small and shallow water bodies are formed during the rainy season. The principal vegetation in the immediate vicinity is páramo grassland dominated by *Agrostis tolucensis* (Poaceae) (Fig. 2), but open pine woodland dominated by Hartweg's Pine, *Pinus hartwegii*,

occurs at a distance of 150 m. Glaciers shaped the area during the late Quaternary (Lachniet and Roy, 2011). A temperate climate prevails in the area, with a mean minimum annual temperature of 5°C and mean maximum annual temperature of 20°C. The mean annual precipitation is 1,500 mm, and the mean monthly precipitation ranges from 10 to 25 mm during the dry season (December–March), and from 70 to 300 mm during the rainy season (April–November) (MAGA, 2002).

Fig. 2. Habitat of *Thamnophis fulvus* at 3,700 m in PRM Todos Santos Cuchumatán, Sierra de los Cuchumatanes, Departamento de Huehuetenango, Guatemala, a páramo grassland in a landscape shaped by glaciers during the late Quaternary.
© Knut Eisermann

This observation expands the upper elevational limit of *T. fulvus* by more than 200 m (to 3,710 m), as Köhler (2008) and Wilson and Johnson (2010) had reported the elevational range of this species as 1,400–3,500 m. *Thamnophis fulvus* also had been recorded in the Sierra de los Cuchumatanes, but at elevations of ca. 2,800 m (Campbell et al., 1998; Acevedo, 2006). *Thamnophis fulvus* is known to occur in different montane forest types, including broadleaf forests (rain and cloud forest) and mixed and coniferous forests (pine-oak and pine forest) (Johnson et al., 2010; Acevedo et al., 2010). To our knowledge, *T. fulvus* has not been reported from páramo grassland, similar to the site in PRM Todos Santos Cuchumatán. In national conservation status assessments, *T. fulvus* has been evaluated as medium to highly vulnerable in all the countries of occurrence (Acevedo et al., 2010; Greenbaum and Komar, 2010; Johnson et al., 2010; Townsend and Wilson, 2010), suggesting the need to reassess this taxon in the IUCN Red List of Threatened Species, where it is currently listed as Least Concern (Campbell and Muñoz-Alonso, 2013).

Acknowledgments.–We thank Carl. J. Franklin for incorporating the photographs into the University of Texas at Arlington Digital Collection (UTADC), and for providing the voucher numbers. We appreciate relevant literature and comments on the manuscript provided by Louis W. Porras. The observation was made during a trip supported by Cayaya Birding, Guatemala.

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Confirmation of the night snake *Hypsiglena tanzeri* in Hidalgo, Mexico, and a new record for Reserva de la Biósfera de la Barranca de Metztitlán

The genus *Hypsiglena* is comprised of nine described species (Mulcahy, 2008; Mulcahy et al., 2014; Uetz et al., 2016). Six species (*H. affinis*, *H. catalinae*, *H. tanzeri*, *H. torquata*, *H. sleveni*, and *H. unaocularus*) are endemic to Mexico, and the distribution of five species is restricted to western Mexico; *H. affinis* and *H. torquata* are known from the mainland, *H. slevini* from the central and southern portion of the Baja California Peninsula and some Pacific islands, and the distribution of *H. catalinae* and *H. unocularis* is restricted to islands in the Pacific Ocean (Mulcahy, 2008; Mulcahy et al., 2014; Uetz et al., 2016). Conversely, the distribution of *H. tanzeri* is restricted to central Mexico, where it inhabits arid areas in south-central San Luís Potosí and northeastern Querétaro (Mulcahy, 2008; Dixon and Lemos-Espinal, 2010; Lemos-Espinal and Dixon, 2013; Mulcahy et al., 2014). Recently, Heimes (2016) suggested its presence in northwestern Hidalgo, but did not indicate a specific locality. Presently, therefore, there is no evidence to verify the distribution of this species in Hidalgo.

Confirmed records for *H. jani* are available for the state of Hidalgo (Fernández-Badillo and Goyenechea, 2010; Ramírez-Bautista et al., 2014, Lemos-Espinal and Smith, 2015; Lemos-Espinal and Dixon, 2016), from the municipalities of Ixmiquilpan (Fernández-Badillo and Goyenechea, 2010; Lemos-Espinal and Dixon, 2016) and Tasquillo (Morales-Capellán, 2010). Herein, we provide evidence for the occurrence of *H. tanzeri* in southwestern and central Hidalgo. Additionally, we report a record for this species from Reserva de la Biósfera de la Barranca de Metztitlán.

While conducting a herpetofaunal survey, a juvenile *H. tanzeri* was found (CH-CIB 1949; Fig. 1) at La Paila, Río Verde, Municipio de Tecozautla, Hidalgo (20. 566825°N, -99.617083°W; WGS 84) elev. 1,600 m; 15 March 2009; Nallely Morales-Capellán. The snake was found in xerophytic scrub and erroneously recorded as *H. jani* (López-Mejía, 2011), but after a detailed examination its identification was determined to be *H. tanzeri.* The specimen measured 153.8 mm in snout–vent length (SVL) and 197.5 mm in total length (TL), and the scalation characters are as follows: preoculars 1-1; postoculars; loreals 1; temporals 1+2+3, supralabials 7, infralabials 10; ventrals 178, and dorsal scale rows 21-21-17. The above scalation characters coincide with those reported for *H. tanzeri* (Dixon and Lieb, 1979; Dixon and Lemos-Espinal, 2010; Lemos-Espinal and Dixon, 2013).

Fig. 1. *Hypsiglena tanzeri* (CH-CIB 1949), from La Paila, Tecozautla, Hidalgo. © Adriana López-Mejía

Fig. 2. *Hypsiglena tanzeri* (CH-CIB 78), from Tlatepexe, Metztitlán, Hidalgo. © Cristián Raúl Olvera-Olvera

Additionally, on 26 April 2016 a specimen of *H. tanzeri* (CH-CIB 78; Fig. 2) was found at Reserva de la Biósfera de la Barranca de Metztitlán, in Tlatepexe, Municipio de Metztitlán, Hidalgo (20.611272°N, -98.781795°W; WGS 84) elev., 1,302 m. The snake was found within a quarry surrounded by xerophytic shrub. This record increases the snake richness within the reserve to 21 species; previous records were reported by Vite-Silva et al. (2010), Cruz-Elizalde et al. (2015), and Fernández-Badillo et al. (2016a). The snake was measured, photographed, and realesed. The measuremnts were 163 mm (SVL) and 215.2 mm (TL) and the remaining scalation characters coincide with those reported for this species (Dixon and Lieb, 1972; Dixon and Lemos-Espinal, 2010; Lemos-Espinal and Dixon, 2013). Luis Canseco-Márquez corroborated the identification of both specimens.

These are the southernmost records for *H. tanzeri*, and increase the distribution of this species 73.46 km to the SW and 86 km to the SE (respectively) from the closest know locality (Fig. 3) at 4 mi (= 6.4 km) W of Landa de Matamoros, Querétaro (Dixon and Lieb, 1979). This records also increases the herpetofaunal list reported for both ecoregions of the Hidalgo arid zone to 83 species, as previously reported by Fernández-Badillo et al. (2016b).

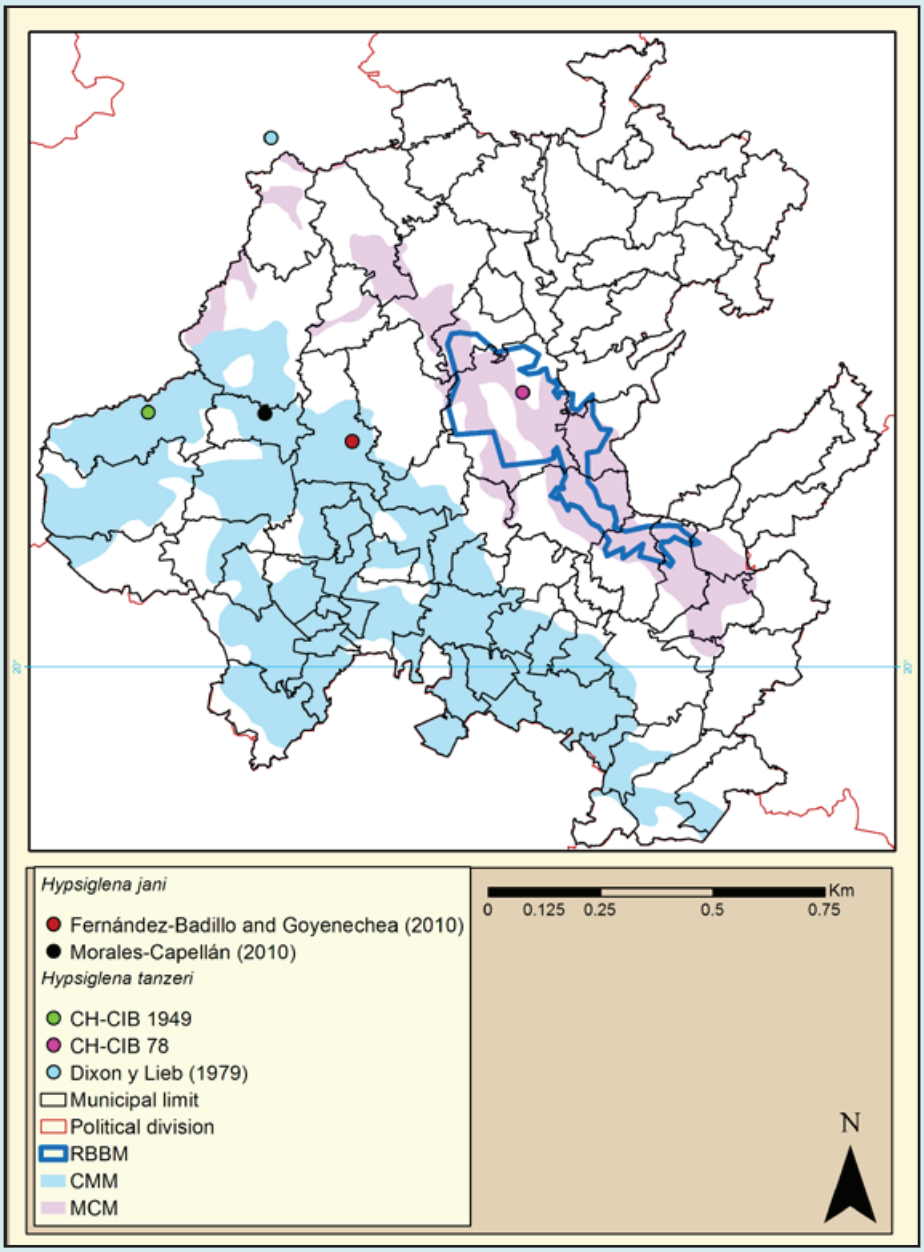

Fig. 3. Distribution map of *Hypsiglena jani* in Hidalgo; first records of *H. tanzeri* from Hidalgo, including both ecoregions in the arid zone of Hidalgo; CMM = Central Mexican Matorral; MCM = Meseta Central Matorral, the Reserva de la Biósfera de la Barranca de Metztitlán (RBBM), and the closest record of *H. tanzeri* in Querétaro.

Acknowledgments.—Funding and logistical support was provided by Projects FOMIX-CONACyT-HGO-2012-191908. We thank SEMARNAT for issuing the collecting permit to Irene Goyenechea FAUT 022. We also are grateful to Maximino Sánchez-Cabrera for finding the second snake and allowing us to take the data, and to Cristián Raúl Olvera-Olvera for providing photos of the animal.

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Captive longevity for *Micrurus nigrocinctus* (Serpentes: Elapidae) at Insituto Clodomiro Picado, Costa Rica

As presently understood, the distribution of the Central American Coralsnake, *Micrurus nigrocinctus*, extends from Mexico to northwestern Colombia (Campbell and Lamar, 2004). In Costa Rica, this species is found in lowlands and premontane slopes, including the Meseta Central, and marginally into lower montane areas, at elevations from sea level to 1,500 m (Savage, 2002). The average adult length of *M. nigrocinctus* is 60–75 cm, but the maximum known total length is 115 cm (Savage, 2002; Campbell and Lamar, 2004). Its diet consists of a variety of amphibians and reptiles, but primarily snakes (Savage, 2002; Solórzano, 2004).

In captivity most coralsnakes refuse to feed and generally die within a few months (Serapicos and Merusse, 2002b); feeding them, therefore, is a major problem to overcome when maintaining a substantial collection to provide enough venom for the production of antivenom (Chacón et al., 2012). Herein, we report a captive longevity record for an individual of *M. nigrocinctus* maintained for venom production at the Instituto Cloromiro Picado (ICP), located in Dulce Nombre de Coronado, Provincia de San José, Costa Rica.

Husbandry and Venom Extraction

A male *Micrurus nigrocinctus* was brought to the ICP on 6 November 1989 and assigned collection number 89-08, and then placed in quarantine. The individual had been collected in Orotina, Provincia de Alajuela. Housing for the snake consisted of an enclosure with a metal frame that provided support for the acrylic plastic used for the floor and walls, with metallic mesh on the top for ventilation. The enclosure was divided into two parts, in which individual snakes were maintained. Each side of the enclosure measured 34 × 35 × 15.5 cm (L × W × H). Paper was used as a substrate and water was supplied *ad libitum*, and both these were changed twice per week. A heating pad that provided a temperature gradient of 23–26°C was placed beneath the enclosure, and the relative humidity within the enclosure ranged from 77 to 88%.

The *M. nigrocinctus* was fed a diet of three different food items (Fig. 1). The first was snakes of the genus *Geophis*, which were maintained at the serpentarium; the snakes were euthanized with CO_2, and kept frozen until they were used. When the coralsnake was fed, a *Geophis* sp. was selected according to its body mass and length, then thawed in water at room temperature. The food item was held with forceps and presented to the *M. nigrocinctus*, moving it slowly to stimulate feeding behavior (Chacón et al., 2012) (Fig. 3). Later, the snake accepted a second diet consisting of laboratory mice (*Mus musculus*) with a body mass of 1.2–2.2 g (1–8 neonates were offered every 15 days). The mice were dead and presented to the snake with forceps, again to stimulate a feeding response (Fig. 3). The snake then was offered a third diet, fish consisting of tilapia (*Oreochromis* sp.) fillets, which were presented every 15 days; Chacón et al. (2012) described the preparation of this diet. The size of the elongated piece of fish was based on the body mass and length of the snake, considering the potential size of a natural prey item, and presented with forceps while simulating snake-like movements to elicit a feeding response (Chacón et al., 2012; Fig. 3).

During the time the *M. nigrocinctus* was maintained in captivity, it subjected to venom extractions on an average of about three times per year, followed by an interval of four months to reduce stress on the animal (Fig. 1). The snake was grasped carefully behind the head, and the venom was extracted from each fang while gently massaging the corresponding venom gland. The length and body mass of the snake were recorded during each extraction.

Results and Conclusions

The staff of the serpentarium maintained the *Micrurus nigrocinctus* alive for nearly 25 years, from 6 November 1989 to 14 August 2014, and during this time the individual was fed on three different food items (Fig. 1). After the coralsnake adapted to captivity, it began to accept the *Geophis*; it was maintained on this diet from 23 January 1990 to 9 February 2000. Because of the difficulty of maintaining a constant supply of *Geophis*, however, the serpentarium staff decided to begin feeding the snake on young laboratory mice; this diet was maintained from 19 March 2000 to 3 May 2005.

In 2005, unforeseen problems with the breeding program at the ICP rodent facility led to a scarcity of laboratory mice, which prompted the staff to search for another food item that also would provide the necessary nutritional requirements. Consequently, the third food item consisting of tilapia fillets was offered and accepted by the snake, and it was maintained on this diet from 1 June 2005 to 8 August 2014 (Fig. 3). Venom extraction during the first 10 years (when the diet consisted of *Geophis*) was more intensive, but during the last nine years (when it consisted of tilapia) venom only was extracted three times per year (Fig. 1).

The body mass of the *M. nigrocinctus* fluctuated during its time in captivity (Fig. 2). A significant loss in body mass was recorded during the first two years, but during the next 17 years, an increase in body mass was recorded, including during the transition from the snake-based to the fish-based diet. During the last four years of captivity, however, the body mass began to decrease; nevertheless, the body mass of the snake increased a total of 23.2 g from the time the snake entered quarantine and until the last time it was recorded.

Maintaining snake colonies in captivity for general or specific purposes, whether in museums (including scientific collections), zoos, or in private collections can be a complicated process (Ashley and Burchfield, 1969; Murphy and Armstrong, 1978). Furthermore, with snakes, a preference for keeping vipers, boids/pythons, and non-venomous snakes exists over elapids, and especially coralsnakes (Serapicos and Meruse, 2002a, 2002b; Braz et al., 2012). Nevertheless, with regard to species of *Micrurus*, three snakes in this genus have been maintained in captivity from between 10+ and 19+ years (Slavens and Slavens, 2016). The *M. nigrocinctus* reported herein was maintained in captivity for 24 years, nine months, and eight days, which to our knowledge represents a longevity record not only for the species, but also for members of this genus.

Chacón et al. (2012: 252) used two groups of *M. nigrocinctus* that were fed on different food items (one group on snakes, the other on fish), and their results indicated that the "two groups do not differ significantly in terms of body weight gain, venom yield, venom HPLC pattern and LD_{50}; additionally, snakes fed with fish showed a significantly higher survival time in captivity." The results shown in this note further corroborate those findings.

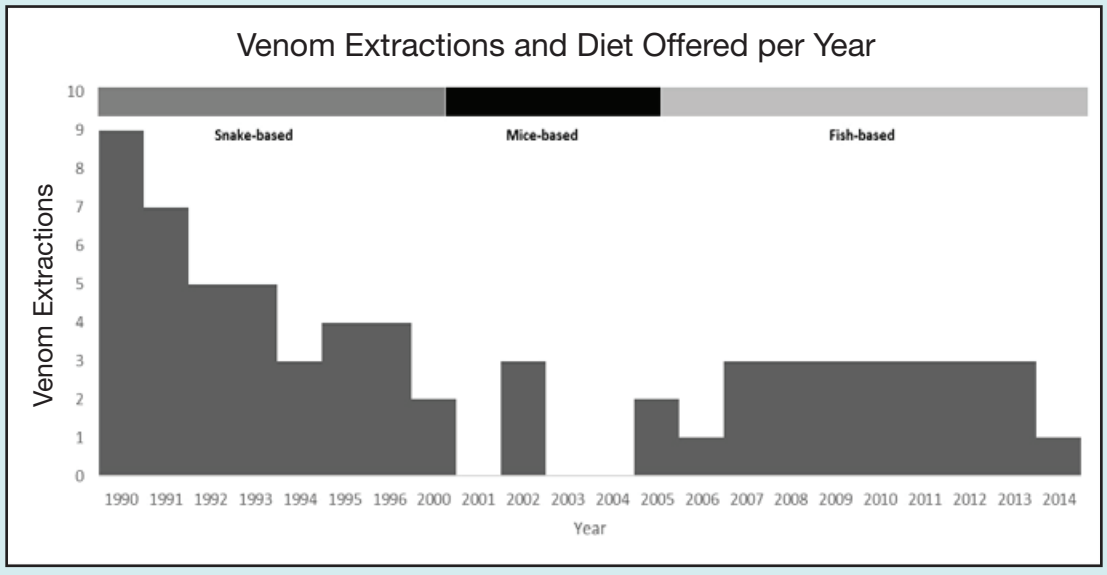

Fig. 1. Venom extraction processes performed per year and the period of food items offered to the *Micrurus nigrocinctus*.

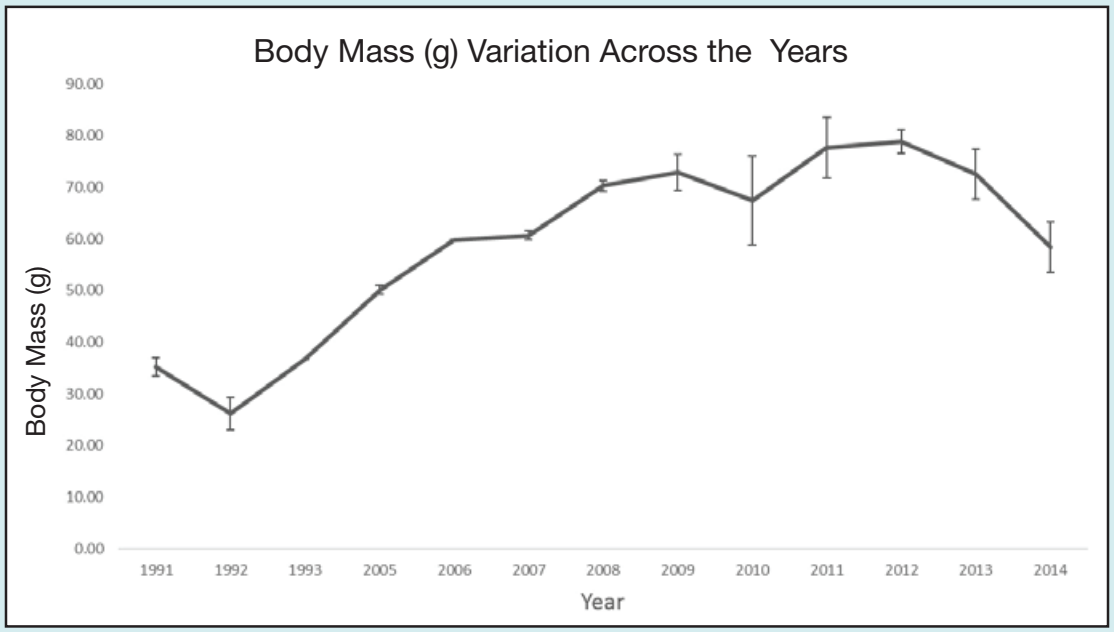

Fig. 2. Variation in the body mass of the *Micrurus nigrocinctus* throughout its time in captivity.

Fig. 3. Three different food items accepted by the *Micrurus nigrocinctus*. (A).A snake based diet; (B) a mouse based diet, and (C) a fish based diet. © Greivin Corrales (A), Danilo Chacón (B), and Aarón Gómez (C)

Acknowledgments.—We thank Santos Rodríguez for help with the maintenance of this coralsnake.

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First report of *Porthidium ophryomegas* (Serpentes: Viperidae: Crotalinae) from Mexico, with comments on the status of an endangered biogeographical formation

An effort was made to determine if any medically important venomous snakes with a known distribution limited to Central America might occur within the boundaries of Mexico. A review of literature on the venomous snakes of Central America (Köhler, 2008; Campbell and Lamar, 2004) revealed the distribution of two venomous snakes in western Guatemala that have not been reported from Mexico (*Micrurus stuarti* and *Porthidium ophryomegas*).

In 2016 we made an effort to determine if the distribution of *P. ophryomegas* extends into Mexico. The closest known record of this species to Mexican territory is at Champerico, Departamento de Retalhuleu, Guatemala (Campbell and Lamar, 2004), a locality in Guatemalan Tropical Dry Forest (*sensu* Grünwald et al., 2015). Using rainfall data and municipality border overlays available online (Herp MX, 2009), and data from INEGI, we determined that an 80 km × 20 km stretch of Guatemalan Tropical Dry Forest exists (or existed) along the coastal plain of the Socunusco region of Chiapas. We searched this area and interviewed local residents about the venomous snakes inhabiting this region, and discuss the results below. Museum abbreviations are UTADC for the University of Texas-Arlington Digital collection and CBUVG for the Universidad del Valle de Guatemala Colección Biológica.

***Porthidium ophryomegas* (Bocourt, 1868).** MEXICO: CHIAPAS: Municipio de Tapachula, Tinajas 1a. Sección (14.694986°N, -92.346860°W); elev. 12 m; 17 September 2016; Omar Aguilar-Moreno. An adult of unknown sex (Photo vouchers UTADC-8741–42) was found dead on a trail in the afternoon near a mango (*Mangifera* sp.) orchard in Tropical Dry Forest (Fig. 1A, B). This voucher represents the first record of this species for Mexico, as well as for the state of Chiapas. It also extends the known distribution of *Porthidium ophryomegas* 64 km to the NW from the nearest record (CBUVG 2777), which was collected at Finca Ixtlán, in Champerico, Departamento de Retalhuleu, Guatemala (14.3139°N, -91.89788°W). A second adult of unknown sex was killed in the vicinity of the same orchard on 8 October 2016 (Photo vouchers UTADC-8743–44) by local farmers and photographed by Omar Aguilar-Moreno (Fig. 1C, D). Neither snake was collected.

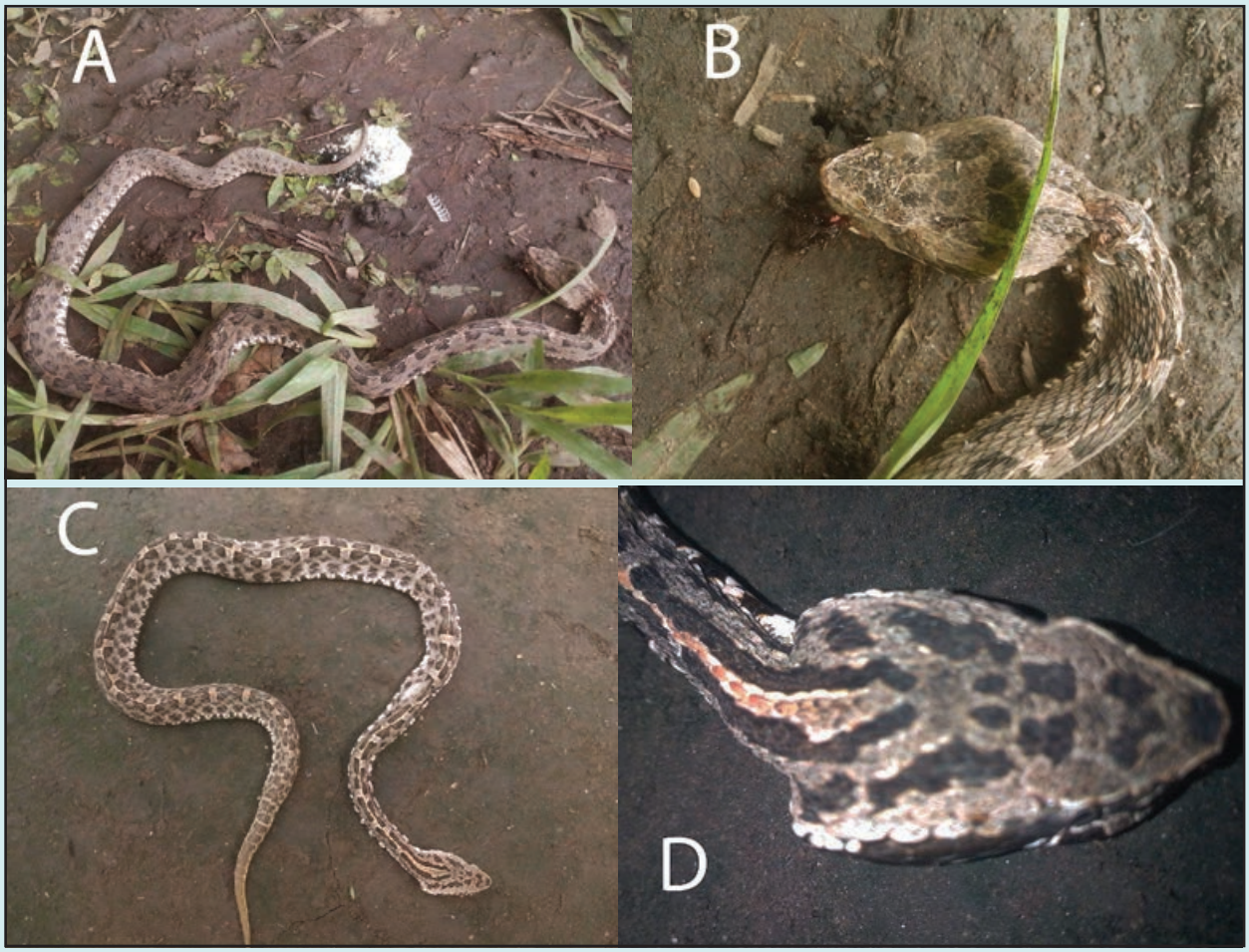

Fig 1. (A, B, C, D) Dorsal views (A,C) and close-ups of the heads (B, D) of two individuals of *Porthidium ophryomegas* that were found dead by locals in Municipio de Tapachula, Chiapas, Mexico in 2016. © Omar Aguilar Moreno

In Mexico, *P. ophryomegas* only is known from the Guatemalan Tropical Dry Forest biogeographic formation (*sensu* Grünwald et al., 2015; Fig. 2), This species is not expected to occur elsewhere in the country, as the Guatemalan Tropical Dry Forest biogeographical formation extends only along the coast in the municipalities of Suchiate, Tapachula, and Mazatán. This habitat has been decimated by agricultural activities and only tiny "islands" of the original habitat remain (see Fig. 2), including the Aeropuerto Internacional de Tapachula and a series of hammocks in the mangroves between Puerto Chiapas and Playa El Gancho, where agricultural activities have not commenced because of the inaccessability of the mangroves for tractors. A final "island" of what might be considered suitable habitat is present around Barra San Simón, although this habitat is more mesic and might not support the same fauna. Importantly, Guatemalan Tropical Dry Forest is the most degredaded biogeographical formation in Mexico, and species in Mexico restricted to this habitat should be regarded as endangered in the country.

The authors observed two individuals of this species at the same mango orchard on 14 December 2016 (Fig. 3A, B) while this note was in press, and included these photos here to supplement the photographic material available for this species in Mexico.

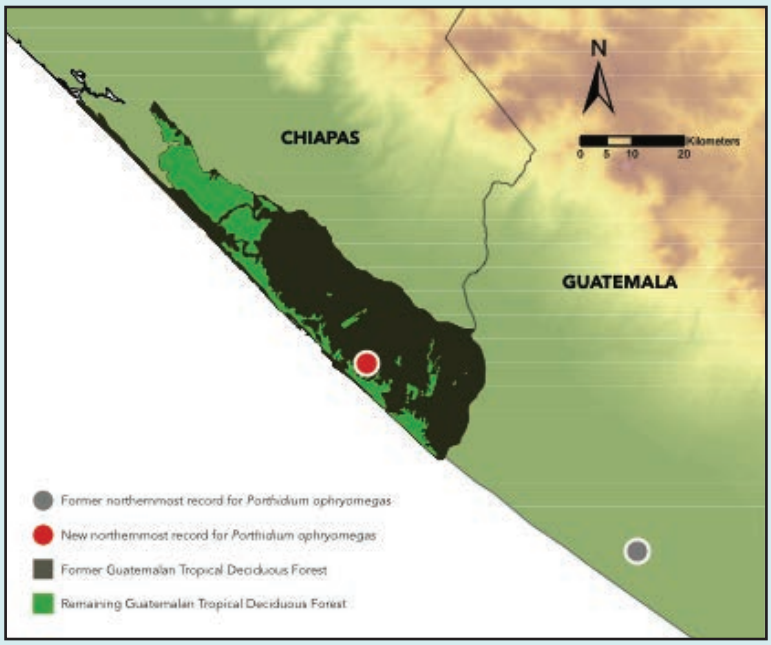

Fig 2. Map of former and new northernmost record of *Porthidium ophryomegas*, depicting the former extent of the Guatemalan Tropical Dry Forest in Mexico and the remnants thereof.

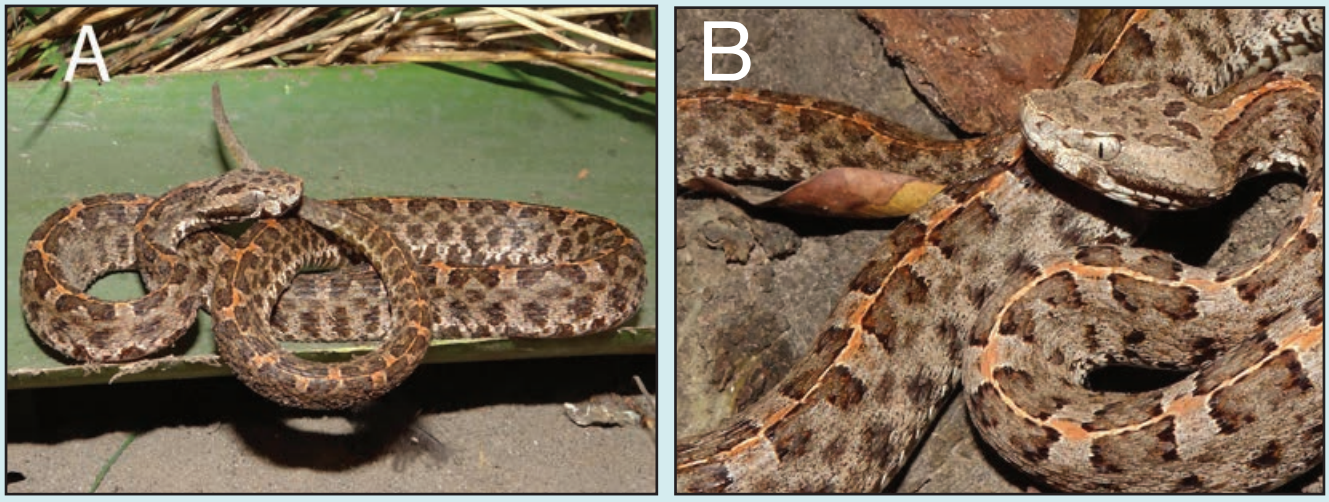

Fig 3. (A, B) Lateral views of two live individuals of *Porthidium ophryomegas* from Municipio de Tapachula, Chiapas, Mexico, observed by the authors in December of 2016 while this note was in press. © Christoph I. Grünwald

Acknowledgments.—We thank Nadia Pérez-Rivera for her untiring assistance in the field, and for help with other logistics in the municipalities of Huixtla, Tapachula and Suchiate. We also are grateful to Jonathan Campbell and Jacobo Reyes-Velasco for identifying the snakes and providing information on specimens collected in Guatemala.We thank Omar Aguilar-Moreno for providing photographs of the snakes, and Carl J. Franklin of the University of Texas-Arlington for cataloguing the digital photographs.

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New herpetofaunal records for Parque Nacional Montecristo, El Salvador

Historically, amphibians and reptiles have been relatively understudied in El Salvador, with the first major work conducted by Mertens (1952). Since that time, several works on the herpetofauna of the country involving museum specimens, conservation, or geographic distribution have been published (Köhler et al., 1998; Leenders and Watkins-Colwell, 2004; Greenbaum and Komar, 2010; Morán-Hidalgo and Ruballo-Marroquín, 2012; Hidalgo et al., 2013; Ruballo-Marroquín and Moran-Hidalgo, 2013; Morán et al., 2015).

In a conservation assessment of protected areas in El Salvador, Greenbaum and Komar (2010) reported the number of amphibian and reptiles species in the department of Santa Ana as 22 and 66, respectively. The most current list for Parque Nacional Montecristo (PNM), located in the department of Santa Ana and the municipialty of Metapán (Fig. 1), indicates records for 15 species of amphibians and 34 of reptiles (Ministerio de Ambiente y Recursos Naturales, 2010). In this note we provide information on new herpetofaunal records for PNM (5 amphibians, 10 reptiles), and range extensions for areas within the department of Santa Ana. All of the localities for the vouchers below are within PNM, except where noted (1 species). We deposited the digital vouchers at the University of Texas Arlington Digital Collection (UTADC), and express all geographic coordinates in map datum WGS 84.

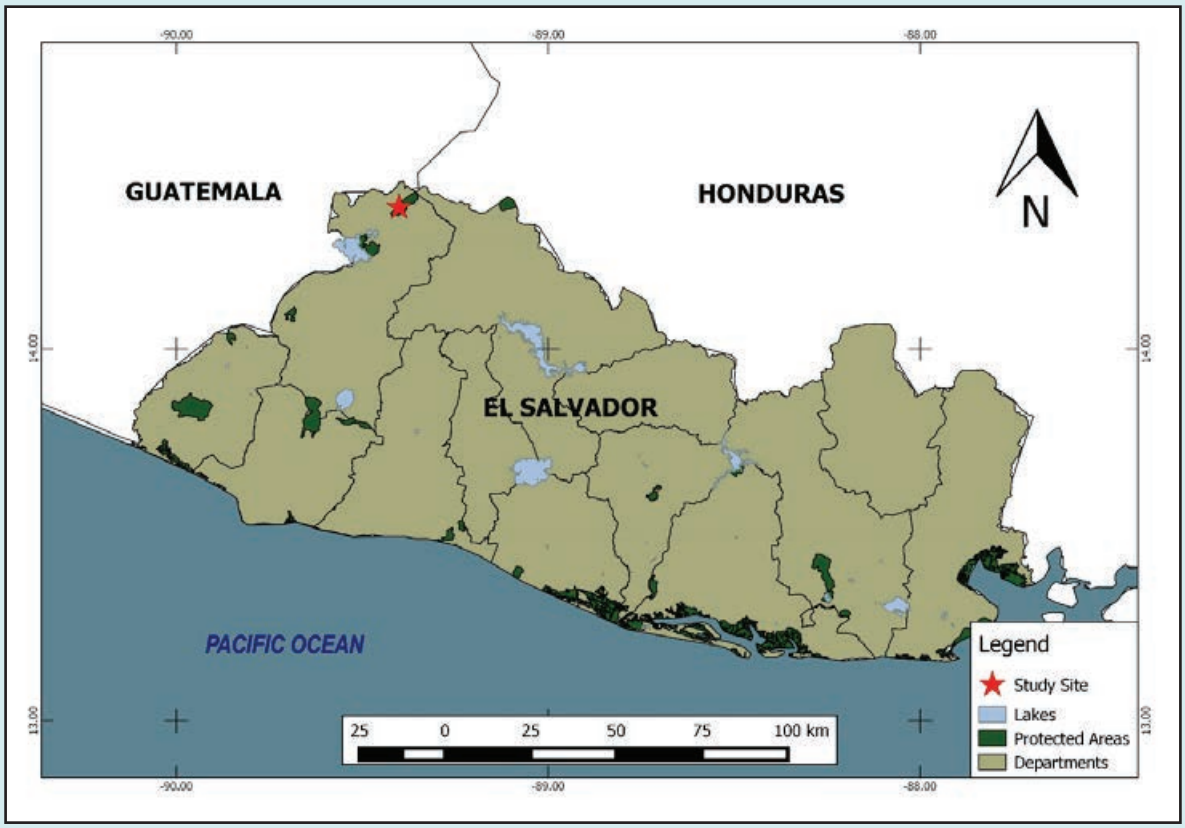

Fig. 1. Map of El Salvador, with star indicating the location of the study site in Parque Nacional Montecristo.

Amphibia: Caudata

Family Plethodontidae

***Bolitoglossa mexicana* (Duméril, Bibron & Duméril, 1854).** SANTA ANA: Municipio de Metapán (14.380160°N, 89.400700°W; WGS 84); elev. 1,225 m; 23 February 2015; Carlos Juárez Peña; UTADC-8724; Fig. 2A. The individual was found active on a road in a transition zone between semi-deciduous and oak-pine forest. This voucher represents an elevational record for this species in the country, with an increase of 222 m, as well as the second reported locality for the country and the first for the department (Morán et al., 2015).

***Oedipina taylori* (Stuart, 1952).** SANTA ANA: Municipio de Metapán (14.361987°N, 89.402643°W; WGS 84); elev. 845 m; 12 April 2007; Nohemi Guerra; UTADC-8725; Fig. 2 B. The salamander was found in an area of heliconias ca. 500 m from the park boundary. This voucher represents a new departmental record, with the closest localities in the departments of Ahuachapán, La Libertad, and Sonsonate (Greenbaum and Komar, 2010; VertNet, 2016).

Amphibia: Anura

Family Hylidae

***Dendropsophus robertmertensi* (Taylor, 1937).** SANTA ANA: Municipio de Metapán (14.376898°N, 89.400599°W; WGS 84) elev. 1,210 m; 8 August 2015; Carlos Juárez Peña; UTADC-8726; Fig. 2 C. The frog was found vocalizing in a fishpond called Majaditas, located in a transition zone between semi-deciduous and oak-pine forest. CJP observed more individuals at a lower elevation in subdeciduous forest. This voucher represents a new departmental record, with the closest localities in the departments of Chalatenango, La Libertad, and Sonsonate (Greenbaum and Komar, 2010; VertNet, 2016).

Family Leptodactylidae

***Leptodactylus fragilis* (Brocchi, 1877).** SANTA ANA: Municipio de Metapán (14.376898°N, 89.400599°W; WGS 84) elev. 1,210; 24 May 2015; Carlos Juárez Peña; UTADC-8727; Fig. 2 D. The frog was found in a transition zone between semi-deciduous and oak pine forest, in a fishpond called Majaditas. This voucher represents a new departmental record, with the closest localities in the departments of Chalatenango, La Libertad, and Sonsonate (Greenbaum and Komar 2010; VertNet, 2016).

Family Microhylidae

***Hypopachus ustus* (Cope, 1866).** SANTA ANA: Municipio de Metapán (14.376898°N, 89.400599°W; WGS 84) elev. 1210 m. 24 May 2015. Carlos Juárez Peña. UTADC-8728; Fig. 2 E. Two males (calling) and one female were found in a transition zone between semi-deciduous and oak-pine forest, in a fishpond called Majaditas. These individuals represent the ninth reported locality for this species in the country, which includes some records in the department of Santa Ana, with the closest records in the department of La Libertad (Greenbaum and Komar, 2010).

Reptilia: Testudines

Family Geoemydidae

***Rhinoclemmys pulcherrima* (Gray, 1855).** SANTA ANA: Municipio de Metapán (14.365092°N, 89.399697°W; WGS 84) elev. 936 m; 3 September 2015; Carlos Juárez Peña; UTADC-8729; Fig. 2 F. Three individuals were found in the semi-deciduous forest, within a stream that traverses the community of San José; a fourth individual also was observed at a higher elevation in cloud forest. The records the twenty-first and twenty-second locality for this species in the country, respectively. The nearest reported localities are in the departments of Ahuachapán, La Libertad, and Sonsonate (Greenbaum and Komar 2010; VertNet, 2016).

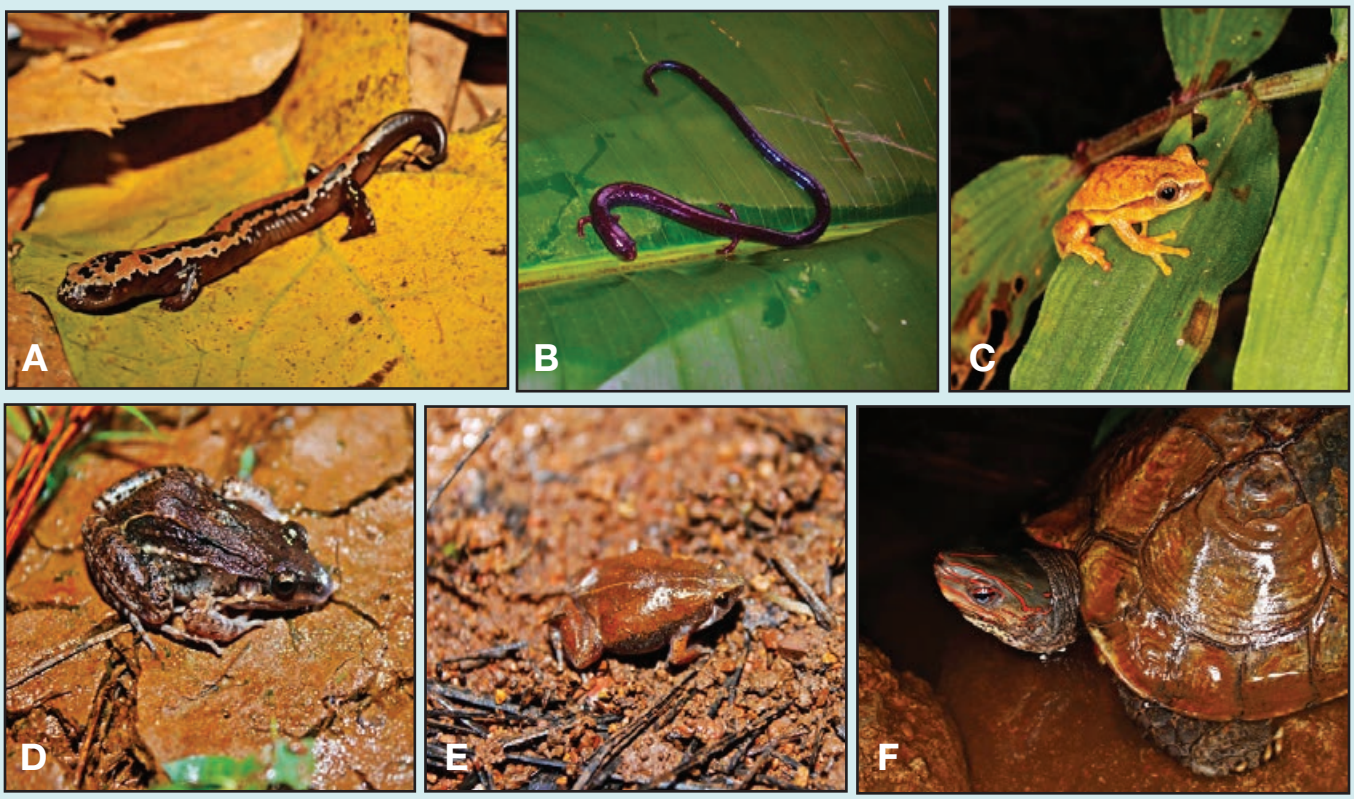

Fig. 2. (A) *Bolitoglossa mexicana*; (B) *Oedipina taylori*; (C) *Dendropsophus robertmertensi*; (D) *Leptodactylus fragilis*; (E) *Hypopachus ustus*; and (F) *Rhinoclemmys pulcherrima*. © Carlos Peña (A, C, D, E, F) and Nohemí Guerra (B)

Family Kinosternidae

***Kinosternon scorpioides* (Linnaeus, 1766).** SANTA ANA: Municipio de Metapán (14.366246°N, 89.402221°W; WGS 84) elev. 920 m; 21 November 2015; Carlos Juárez Peña; UTADC-8730; Fig. 3 A. The turtle was found in semi-deciduous forest, in a fishpond. This species has been recorded in all the departments in the country (Greenbaum and Komar, 2010; VertNet, 2016).

Reptilia: Squamata (lizards)

Family Anguidae

***Celestus bivittatus* (Boulenger, 1869).** SANTA ANA: Municipio de Metapán (14.383333°N, 89.350000°W; WGS 84) elev. 1,731 m; 2 September 2015; Fredi Arnoldo Magaña; UTADC-8731–32; Fig. 3 B. The lizard was found in disturbed pine forest, in the buffer zone outside the park and along the periphery of a school. This voucher represents the second locality for department and for third the country, with the nearest locality in the department of Ahuachapán (Greenbaum and Komar, 2010).

Reptilia: Squamata (snakes)

Family Colubridae

***Enulius flavitorques* (Cope, 1869).** SANTA ANA: Municipio de Metapán (14.361987°N, 89.402643°W; WGS 84) elev. 845 m; 22 May 2015; Carlos Juárez Peña; UTADC-8733; Fig. 3 C. The snake was found in semi-deciduous forest. This voucher represents the eleventh locality in the country, which includes some records in the department of Santa Ana, with the nearest record the the department of La Libertad (Greenbaum and Komar, 2010; VertNet, 2016).

***Leptophis mexicanus* (Duméril, Bibron & Duméril, 1854).** SANTA ANA: Municipio de Metapán (14.350000°N, 89.383333°W; WGS 84) elev. 941 m; May 2012; Jeniffer Abrego; UTADC-8734; Fig. 3 D. The snake was found in semi-deciduous forest, and represents the ninth locality for the country. The nearest recorded localities are in the departments of Chalatenango and La Libertad (Greenbaum and Komar, 2010; VertNet, 2016).

***Mastigodryas dorsalis* (Bocourt, 1890).** SANTA ANA: Municipio de Metapán (14.383333°N, 89.350000°W; WGS 84) elev. 1493 m; 7 April 2016; José Ruiz; UTADC-8735; Fig. 3 E. The snake was found in cloud forest inside a house. This voucher represents the fourteenth locality for the country, with the nearest recorded localities in the departments of Ahuachapán, Chalatenango, and La Libertad (Greenbaum and Komar, 2010; VertNet, 2016).

***Mastigodryas melanolomus* (Cope 1868).** SANTA ANA: Municipio de Metapán (14.350000°N, 89.240000°W; WGS 84) 830 m; 30 April 2013; Nohemi Guerra; UTADC-8736; Fig. 4 A. The snake was found in semi-deciduous forest, and represents the fourth locality in the country, which includes some records in the department of Santa Ana (Greenbaum and Komar, 2010).

***Ninia sebae* (Duméril, Bibron & Duméril, 1854).** SANTA ANA: Municipio de Metapán (14.362800°N, 89.400923°W; WGS 84) elev. 872 m; 9 August 2015; Carlos Juárez Peña; UTADC-8737; Fig. 4 B. The snake was found in semi-deciduous forest, crossing the road through the town at night. This voucher represents the first record for the department, with other records in the neighboring departments of Ahuachap*á*n, Chalatenango, and La Libertad (Greenbaum and Komar, 2010; VertNet, 2016).

***Scolecophis atrocinctus* (Schlegel, 1837).** SANTA ANA: Municipio de Metapán (14.388056°N, 89.374722°W; WGS 84) elev. 1,800 m; 30 April 2015; Nohemi Guerra; UTADC-8738; Fig. 4 C. The snake was found in oak pine forest, and represents a departmental record. This species has been recorded in the neighboring departments of Ahuachapán, La Libertad, and Sonsonate (Greenbaum and Komar, 2010; VertNet, 2016).

Fig. 3. (A) *Kinosternon scorpioides*; (B) *Celestus bivittatus*; (C) *Enulius flavitorques*; (D) *Leptophis mexicanus*; and (E) *Mastigodryas dorsalis*. © Carlos Peña (A, C), Fredi Magaña (B), Jennifer Abrego (D), and José Ruíz (E)

***Sibon anthracops* (Cope, 1868).** SANTA ANA: Municipio de Metapán (14.370561°N, 89.404405°W; WGS 84) elev. 1,060 m; 25 May 2015; Carlos Juárez Peña; UTADC-8739; Fig. 4 D. The snake was found in semi-deciduous forest, crossing the road at night. This voucher represents the first record for the park and the fourth locality for the country; this species previously was recodeed in the departments of Cuscatlán and San Salvador (Greenbaum and Komar, 2010).

***Stenorrhina freminvillei* (Duméril, Bibron & Duméril, 1854).** SANTA ANA: Municipio de Metapán (14.362363°N, 89.407184°W; WGS 84) elev. 858 m; 16 July 2013; Alvin Melara; UTADC-8740; Fig. 4 E. The snake was found dead along the edge of a road through semi-deciduous forest. Other records are available for the department of Santa Ana (Greenbaum and Komar, 2010; VertNet, 2016).

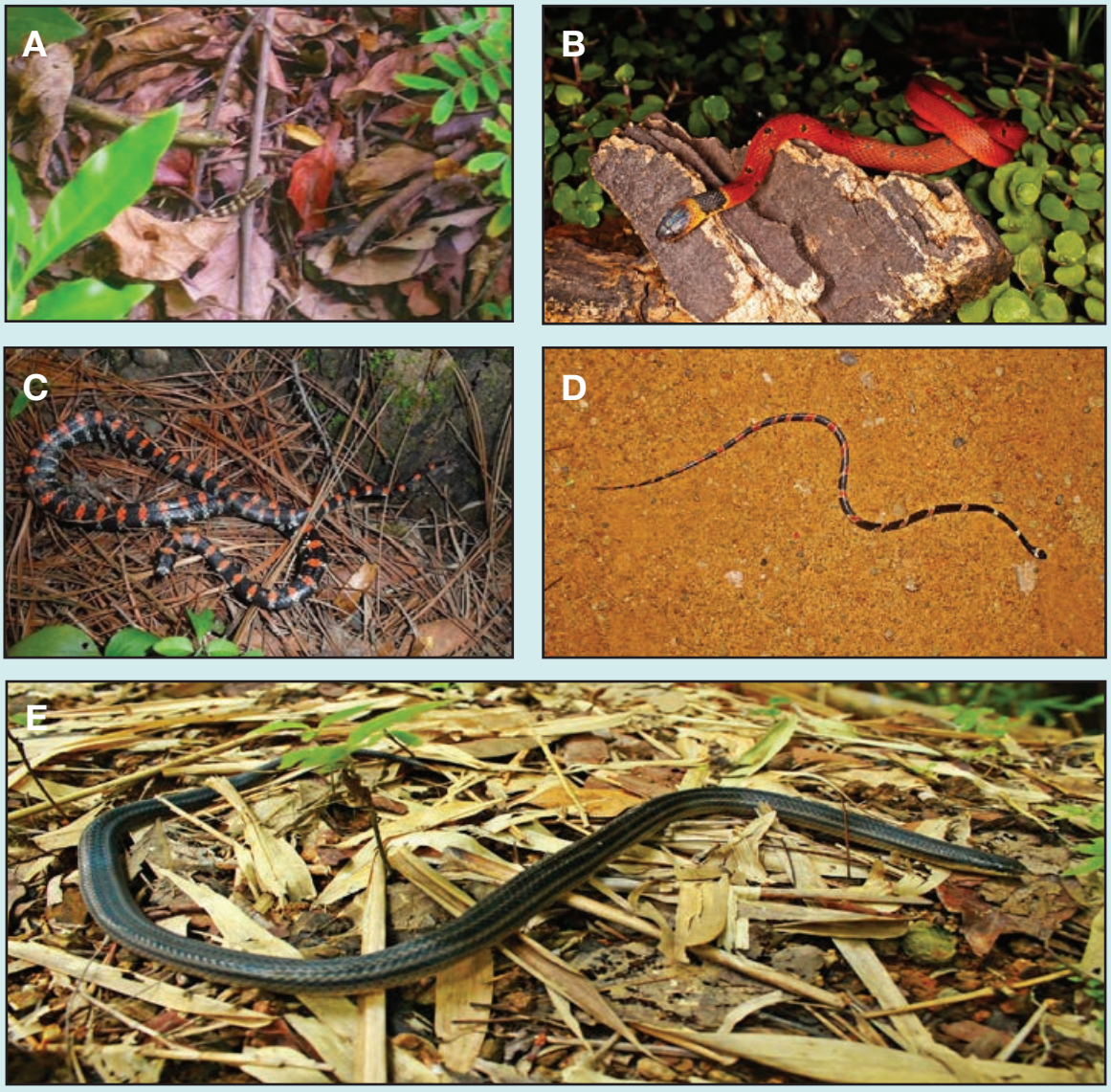

Fig. 4. (A) *Mastigrodryas melanolomus*; (B) *Ninia sebae*; (C) *Scolecophis atrocinctus*; (D) *Sibon anthracops*; and (E) *Stenorrhina freminvillei.* © Nohemí Guerra (A, C), Carlos Peña (B, D), and Alvin Melara (E)

Acknowledgments.—We thank Maritza Guido, Nohemi Guerra, forest rangers at Parque Nacional Montecristo field assistance, Eli Greenbaum and Vladlen Henriquez for confirming the species identification, Carl J. Franklin for providing the photo voucher numbers, Jaime Mejía for assisting with literature, and Louis Porras for his comments and recommendations.

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