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Eight New Records of Lizards and Snakes (Reptilia: Squamata) from subhumid areas in El Paraíso, Honduras, and morphometry of the poorly-known pitviper *Agkistrodon howardgloydi*

James R. McCranie¹, Ramón Dionicio Centeno^{2,3}, Josué Ramos², Leonardo Valdés Orellana⁴, Julio Enrique Mérida² & Gustavo Adolfo Cruz²

1. 10770 SW 164th Street, Miami, Florida, 33157 USA; jmccrani@bellsouth.net
2. Museo de Historia Natural, Universidad Nacional Autónoma de Honduras, Bulevar Suyapa, Tegucigalpa, Distrito Central, Honduras; juliomerid@yahoo.com
3. Fundación Yuscarán, Yuscarán, El Paraíso, Honduras; fundacionyuscaran2005@yahoo.es
4. Gerente General de "Hondufauna," Investigador Privado, Colonia América, Bloque 9, Casa 1806, Comayagüela, MDC, Honduras; leovalor@hotmail.com

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ABSTRACT

El Paraíso is one of the most understudied departments in Honduras. We add eight species of lizards and snakes to its reptile checklist and report on morphological data of an additional specimen of the rarely collected pitviper *Agkistrodon howardgloydi*. The localities discussed herein contain some of the best-preserved lowland arid forests and premontane dry forests remaining in Honduras. We recommend faunal inventories and management plans to protect some of the remaining vegetation patches occurring in the El Paraíso region.

KEY WORDS: El Paraíso, Honduras, lowland arid forest, premontane dry forest, lizards, snakes, *Agkistrodon howardgloydi*.

RESUMEN

El Paraíso es uno de los departamentos menos estudiados en Honduras. Añadimos ocho especies de lagartijas y serpientes a su listado de especies reptilianas y presentamos datos morfológicos de un espécimen de la poco recolectada *Agkistrodon howardgloydi*. Las localidades contempladas aquí contienen algunos de los remanentes mejor preservados de bosque árido de bajura y bosque seco premontano en Honduras. Sugerimos que se realicen inventarios de fauna y planes de gestión para la protección de las zonas de vegetación restantes localizadas en la región de El Paraíso.

PALABRAS CLAVE: El Paraíso, Honduras, bosque seco de tierras bajas, bosques secos, lagartijas, serpientes, *Agkistrodon howardgloydi*.

McCranie (2011) demonstrated that the department of El Paraíso in southeastern Honduras was among the most understudied departments in the country concerning its snake fauna. The same holds true for its lizard fauna (McCranie, unpub. data). During 2011, we conducted nine field trips in the vicinities of El Rodeo, Las Crucitas, and Oreálí in the middle portion of the Río Choluteca valley in south-central El Paraíso (Fig. 1). This is one of the driest regions in Honduras, with the areas lying on the lower elevations of the river valley receiving only about 800 to 1 000 mm of rainfall per year (Anonymous, 2006). The region is also characterized by an extended severe dry season (December to May) and high temperatures during the year with a mean annual temperature of about 22°C (Zúniga, 1990) and temperatures frequently reaching 32–34°C during the day. El Rodeo (13°53.634'N,

86°46.859'W) lies at 490 m elevation along a tributary of the Río Choluteca and is surrounded by low mountains. Las Crucitas (14°33.600'N, 86°27.000'W) lies at 700 m elevation in moderate elevation mountains. Oreálí (13°52.226'N, 86°47.563'W) lies at 470 m elevation in low mountains. The region lies in the lowland arid forest (LAF; below about 600 m) and the premontane dry forest (PDF; above about 600 m) formations of Holdridge (1967). Patches of LAF are very scarce in Honduras and those in the vicinity of the localities discussed herein are the best-preserved fragments of that forest type in the country.

Herein, we report four species of lizards and four species of snakes that are new for the department of El Paraíso. Mérida, Centeno and Cruz (2012) reported *Agkistrodon bilineatus* (now *A. howardgloydi*) for the first time from El Paraíso based on two specimens (UNAH

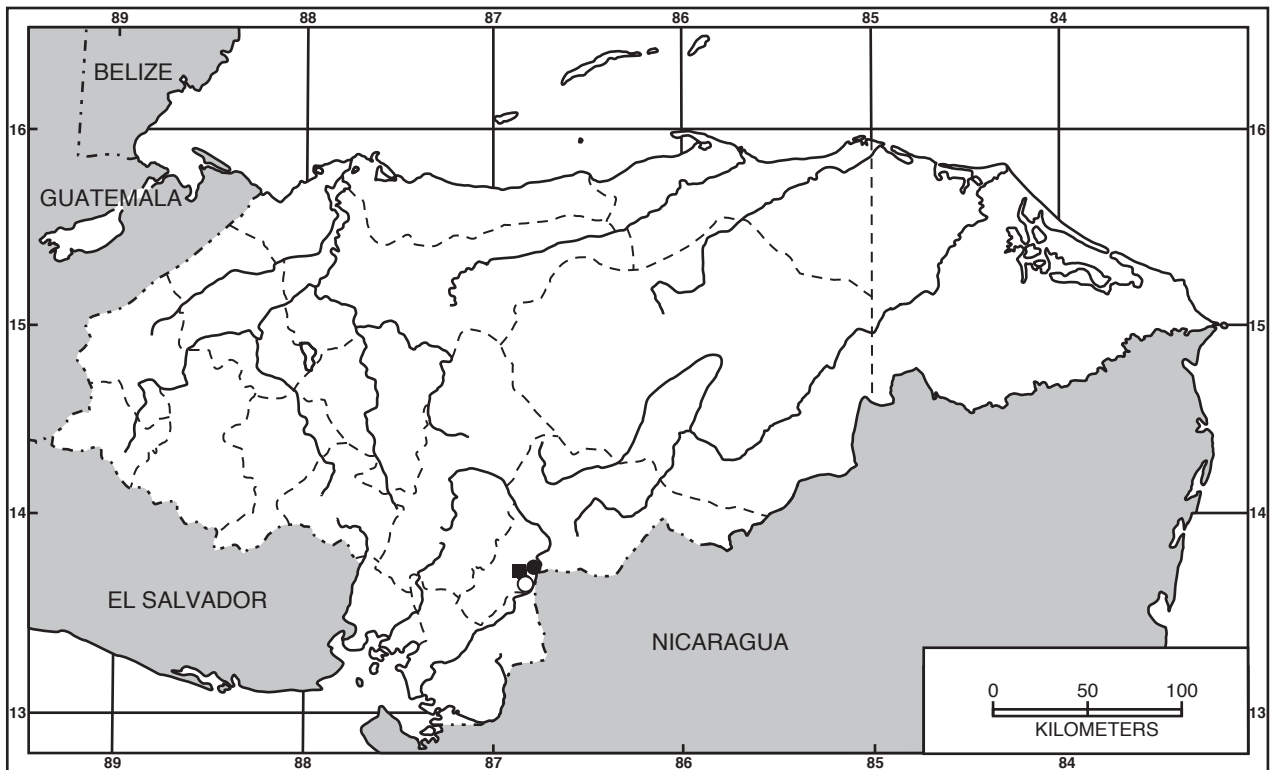


Fig. 1. Locations of the El Paraíso localities, Honduras. Solid circle = El Rodeo; Open circle = Las Crucitas; and Square = Orealí.

5649–50) collected coiled on the ground at Orealí. Herein, we provide new information from an additional specimen collected near Orealí. All specimens reported herein are deposited in the UNAH and USNM collections.

MATERIAL AND METHODS

Field trips were conducted during 2011 as follows: from 6–9 July (Ramón Dionisio Centeno [RDC] and Josué Ramos [JR]), 25–30 August (RDC and JR), 2–23 September (RDC and JR), 5–7 October (RDC and JR), 8 November (RDC and JR), 4–7 November (Leonardo Valdés Orellana [LVO] and JR), 23–25 November (RDC and JR), 26 November–2 December (James R. McCraine [JRM] and LVO), and 5–9 December (RDC and JR). Collecting (Dictamen DVS-ICF-016-2009) and export (Constancia 006-2012–DVS-ICF) permits were issued to JRM and LVO.

LIST OF SPECIES

Coleonyx mitratus (Peters). A single specimen of this nocturnal eublepharid gecko (UNAH 5656) was collected

near El Rodeo during September 2. It was active among dead mango (*Mangifera indica*; Anacardiaceae) leaves on the ground at about 1 900 h.

Ctenosaura praeocularis Hasbún and Köhler. Spiny-tailed iguanas somewhat tentatively assigned to this species were seen or collected on every trip to the area. Adults, subadults (Fig. 2), and juveniles of this sun-loving species were extremely common in trees that contained holes or hollows for retreat and in old rock walls used as fencerows. A few voucher specimens from the vicinity of El Rodeo and Orealí were deposited in the UNAH collection (UNAH 5658, 5674–77); the first four from El Rodeo and the last one from Orealí. A larger series of specimens (from the vicinities of El Rodeo and Orealí), as well as a series from the adjacent department of Choluteca, is also being retained in the first author's collection for a morphological and molecular study to verify the identity of these iguanas. Regardless of the outcome of that study, no species of the *C. quinquecarinata* group, to which *C. praeocularis* belongs, had previously been reported from El Paraíso.

Ctenosaura similis (Gray). This spiny-tailed iguana species was considerably less common than that of the *C.*



Fig. 2. Subadult female of *Ctenosaura praeocularis* (UNAH 5675). J.R. McCranie.

praeocularis discussed above. Adults were occasionally seen in trees during the day. Two subadults (UNAH 5678, USNM 579863) were collected at about 2000h on the night of November 26 while they were sleeping, one on an upright wooden plank, and the other on a wall, in an abandoned house. Another subadult, that was not collected, was sleeping in spiny vegetation on the night (about 2050h) of November 28 at 340 m elevation about 2 m above the ground and approximately 20 m from the Río Choluteca SSE of El Rodeo. Another specimen (UNAH 5657) was collected on September 28 on a tree (about 0850 h) and two others (UNAH 5662, 5664) were found dead during the mornings of August 25 and September 3, respectively, all in the vicinity of El Rodeo.

Mesoscincus managuae (Dunn). A single adult of this diurnal and terrestrial skink (USNM 579864) was collected about 2Km SE of Orealí approximately at 0250 h on December 1. The lizard was under a large rock in scrubby vegetation on a hillside between an old groove of mango trees and a cornfield (*Zea mays*; Poaceae). The lizard

disappeared on repeated occasions by crawling under adjacent rocks, but was finally caught when the original rock where it was under was overturned a second time.

Epictia ater (Taylor). One adult (USNM 579865) of this nocturnal and diurnal, tiny, semifossorial blindsnake was collected under a rock just outside of El Rodeo at about 1100h on December 2. Another (UNAH 5660) was also found and collected on a road at El Rodeo at about 1175h on September 3.

Trimorphodon quadruplex Smith. A single adult (USNM 579866) of this nocturnal, terrestrial and arboreal, rear-fanged lyre snake was crossing a trail at about 2050h on November 26 near El Rodeo. Two others, that were not preserved, were found dead, one in the village of Orealí on November 28 and the other in a cornfield near Orealí on December 1. Both had been in direct sunlight for several hours, thus were in somewhat bad condition.

Coniophanes piceivittis Cope. One adult (USNM 579867; Fig. 3) of this nocturnal snake was taken under a log at about 0150h in a relatively mesic area of a stream



Fig. 3. Adult female of *Coniophanes piceivittis* (USNM 579867). J.R. McCranie.

overflow zone near Orealí on November 28. Another (USNM 580327) was collected from under a pile of dead grass near El Rodeo during the day of November 5. A third (UNAH 5659) was found at about 1100h near Orealí on September 22 in leaf litter beneath mango trees.

Crotalus simus Latreille. Three specimens (UNAH 5679–81) of this rattlesnake were taken from the vicinity of El Rodeo. One adult (UNAH 5681) was found on November 30 coiled in high cane grass near a small river during the day by workers clearing the cane grass. A juvenile (UNAH 5679) was found on December 2 under similar conditions. A large adult (UNAH 5680; Fig. 4) was coiled at about 1050h in a rocky area in scrubby thorn forest near El Rodeo on December 2. That specimen, although it rattled frequently, seemed rather calm as it made no attempt to strike as it was lifted into a five gallon bucket brought to the scene by a resident of El Rodeo. Numerous photographs of that snake were taken on December 4, and the snake did not rattle or strike during that time. Another (UNAH 5663) was collected at Las Crucitas on November 23 in a cornfield at about 1100h.

Agkistrodon howardgloydi Conant. Mérida and collaborators (2012) presented morphological data on two specimens of this rarely collected and highly venomous pitviper (as *A. bilineatus howardgloydi*) from the Orealí area. A third specimen (USNM 579868) was taken from under a pile of old corn stalks in a cornfield near Orealí at about 0400h on November 27. The new specimen is a subadult female with a total length of 362mm (SVL 293 mm). The snake has 128 ventrals, an entire cloacal scute, 55 subcaudals with the first two divided, numbers 3–32 entire, and numbers 33–55 divided, 25–23–21 keeled dorsal scale rows with paired apical pits on many scales, and a tail length/total length ratio of 0.191.

Porras, Wilson, Schuett and Reiserer (2013) suggested elevating the three subspecies of *Agkistrodon bilineatus* (Günther) to full species. Thus, *A. b. howardgloydi*, the form occurring in southern Honduras becomes *A. howardgloydi*. Porras et al. (2013) considered *A. howardgloydi* to be endangered with a revised Environmental Vulnerability (EVS) score of 17 (see their discussion of the parameters of the EVS). Our report of *A. howardgloydi* from a second



Fig. 4. Adult male of *Crotalus simus* (UNAH 5680). J.R. McCranie.

forest formation (LAF) reduces its EVS score to 16, but the species remains endangered using the same algorithm (Porras et al., 2013).

DISCUSSION

With the addition of the eight species of lizards and snakes from El Paraíso reported herein, the department now contains 27 lizard species as compared with the 29 species in Francisco Morazán Department which borders the western side of El Paraíso, the 37 species in Olancho Department to the north, and the 19 species in Choluteca Department to the south (McCrairie, unpub. data). Regarding the snakes, there are now 37 species known from El Paraíso compared with 49 species from Francisco Morazán, 63 species known from Olancho, and 28 species known from Choluteca. Thus, El Paraíso compares favorably to surrounding departments in its lizard fauna, but still appears to remain understudied regarding its snake fauna when compared to Francisco Morazán and Olancho (based on the field experience of JRM).

The area surrounding El Rodeo and Oreálí, El Paraíso, contain large patches of old second growth LAF. The only remaining area in Honduras with relatively large tracts of LAF outside of southern El Paraíso and adjacent Choluteca is the middle portion of the Río Aguán Valley in Yoro (McCranie, 2011). However, most of those Yoro forests that remained preserved during 2004 have undergone dramatic disturbance by human activities during the last 10 years (McCranie, pers. observ.). Because of that, the LAF of the El Rodeo and Oreálí areas of El Paraíso need to be exhaustively inventoried and monitored to know their fauna composition. Additionally, management plans must be designed to protect the forest from the ongoing human destructive activities. Currently, there are 16 species of lizards and 11 species of snakes known from the LAF forests of El Paraíso. In comparison, there are six species of lizards and 10 species of snakes known from the LAF of Yoro that remain unknown from those forests in El Paraíso, with most of them likely to occur in El Paraíso. Moreover, the LAF of El Paraíso might contain the only remaining stable population in Honduras of the endangered pitviper *Agkistrodon howardgloydi*.

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