
Additions to the herpetofauna of Parque Nacional El Cusuco, Honduras

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ABSTRACT — We report 50 species of amphibians and reptiles (5 salamanders, 12 anurans, 12 lizards, and 21 snakes) from Parque Nacional El Cusuco, a cloud forest preserve in northwestern Honduras, an increase of 20 species from the previously reported total. Four of the newly recorded species are new to science. An update on the conservation status of the herpetofauna of the park is provided.

RESUMEN — Nosostros reportamos 50 especies de anfibios y reptiles (5 salamandras, 12 anuros, 12 lagartillas, y 21 culebras) del Parque Nacional El Cusuco, una reserva del bosque nublado en Honduras del noroccidental, un aumento de 20 especies del previamente informado total. Cuatro de las especies nuevamente recordadas son nuevas para ciencia. Un actualiza del estado de conservación del herpetofauna está proveída.

A long series of studies has amply demonstrated the biological significance of the herpetofauna of Honduras (e.g., McCranie & Wilson, 2002; Wilson & McCranie, 2004a), a country located within the Mesoamerican biodiversity 'hotspot' (Conservation International, 2005). It is fortunate, therefore, that the government of Honduras has established a sizable system of biotic reserves that, while not providing total protection for the herpetofauna, does present significant potential for its protection (Wilson *et al.*, 2001; McCranie & Wilson, 2002).

One of the best-developed biotic reserves in Honduras is Parque Nacional El Cusuco, located in the Sierra de Omoa of northwestern Honduras. According to its original demarcation in 1987, the park has an area of about 234 km², of which approximately 7.7 km² above 1800 m elevation was considered the nuclear zone (Wilson & McCranie, 2004b). Since that original delineation, the nuclear zone has been expanded to 75.9 km²

(COHDEFOR, 2005), and now includes the majority, if not all, of the cloud forest remaining in the Sierra de Omoa. This development has been enhanced since the Operation Wallacea Honduran Forest Research Project has been headquartered in this park. Operation Wallacea "is a series of biological and social science expedition projects designed to underpin the achievement of specific wildlife conservation aims" (Operation Wallacea Research Programme, 2005). The program has been in operation in Honduras since 2003. Its purpose is to conduct research that will 'provide hard data on the effectiveness of conservation management programmes' (Operation Wallacea Research Programme, 2005).

Beginning in 2004, we developed and implemented a series of herpetofaunal inventory and monitoring projects at a number of sites in and around Parque Nacional El Cusuco, within the framework and support structure of Operation Wallacea. The primary goals of the herpetology

teams were to complete an inventory of species composition in the park, assess the conservation status of these species, and to inform the development of management strategy for their continuing protection within the park.

Wilson & McCranie (2004b) recently discussed the herpetofauna of Parque Nacional El Cusuco and provided the point from which the survey work described in the preceding paragraph was based. They reported a herpetofauna consisting of 30 species, including four salamanders, nine anurans, six lizards, and 11 snakes. Recent work in this national park has led to the discovery of a significant number of additions to the herpetofaunal inventory, which are enumerated below.

MATERIAL AND METHODS

Herpetofaunal sampling was accomplished using diurnal and nocturnal opportunistic searching, drift fence arrays with pitfall traps checked daily or twice daily, and leaf litterbags and dipnetting for tadpole collection. Specimens were preserved in 10% formalin solution and transferred within a week to 70% ethanol. Species identifications in the field were made using keys and descriptive information in McCranie & Wilson (2002) and Köhler (2003), and were later verified using additional sources and comparative material. Specimens were deposited in the collections of the Florida Museum of Natural History (UF), Gainesville, Florida, and the National Museum of Natural History (USNM), Washington, D.C. Fieldwork was carried out by JHT, SMH, and TLP from 24th June to 10th September of 2004, by JHT from 26th February to 5th March 2005, and by JHT, LDW, BLT, DCF, and TLP from 23rd June to 19th August of 2005. Generic taxonomy used in this paper follows Crawford & Smith (2005), Faivovich *et al.* (2005), Frost *et al.* (2006), and Poe (2004).

Description of Field Sites

In connection with the Operation Wallacea Honduran Forest Research Project, several field camps were established, which were utilized by the authors for herpetofaunal collecting. All of the localities visited were in Depto. Cortés, except for La Fortuna and La Fortuna Camp, which are in

Depto. Santa Barbara. Field camps and other localities mentioned in this paper are characterized below.

Centro de Visitantes (15°29.6'N, 88°12.9'W) — Also referred to as Base Camp by Operation Wallacea, the Centro de Visitantes for Parque Nacional El Cusuco is situated at 1550 m alongside the Río Cusuco in the southeastern sector of the park. This camp also encompasses a set of trails that fan out into the forest from this center. These trails include Sendero Las Minas, Sendero El Danto, Sendero El Quetzal, and Sendero El Pizote. Collections were made from 1450 m to 1800 m elevation.

Cascada de Quetzal (15°29.8'N, 88°12.3'W) — A tall (>25 m) waterfall in the Río Cusuco to the southeast of the Centro de Visitantes. Collections were made around the pool at the base of the waterfall, as well as along the trail between the waterfall and the road from 1430 m to 1490 m elevation.

Bosque Enano (15°30.5'N, 88°13.9'W) — The highest portions of Cerro Cusuco and Cerro Jilincó host the bosque enano, or elfin forest, ecosystem. This unique habitat is typified by having growth-stunted trees covered with a thick layer of epiphytic bromeliads, mosses, and fungi. Collections were made from 1990 m to 2242 m elevation.

Cantiles (15°30.8'N, 88°14.5'W) — This camp is located at 1780 m elevation in primary broadleaf forest WNW of Cerro Cusuco. The camp is near a stream, Quebrada de Cantiles, which drains northward into the Río Cuyamelito and into the Caribbean. Collections were made from 1780 m to 1990 m elevation along trails and the stream.

Finca of Makrín Ramírez (15°29.7'N, 88°13.3'W) — A small farm cut from cloud forest at 1580 m elevation near the Centro de Visitantes upstream along the Río Cusuco.

Guanales (15°28.9'N, 88°13.3'W) — This camp is located at 1220 m elevation in broadleaf secondary and primary forest in a steep canyon. The river adjacent to the camp flows southwesterly into the Río Naco. Collections were made from 1220 m to 1450 m elevation on steep trails leading up the slopes on both sides of the river.

La Fortuna (15°29.3'N, 88°15.4'W) — The village of La Fortuna lies within the southern portion of the park, across the Río Naco valley from the canyon where Guanales Camp is located. The town sits along a ridge from about 1330 m to 1400 m in elevation. Two nights were spent in the village in June and July 2005 while transiting in and out of the La Fortuna campsite.

La Fortuna Camp (15°29.9'N, 88°17.2'W) — This campsite is ca. 4 airline km west of La Fortuna at the edge of a remote agricultural clearing and primary forest, above a tributary of Quebrada La Ruidosa at 1300 m elevation. Quebrada La Ruidosa flows westward into Guatemala, where it eventually drains into the Río Motagua. Collections were made from 1250 m to 1350 m. This campsite was only visited by JHT and TLP from 30th June 2005 to 6th July 2005.

RESULTS

As noted above, Wilson & McCranie (2004b) reported 30 species of amphibians and reptiles from Parque Nacional El Cusuco. We herein report an additional 20 species from the park based on our work and other published reports, providing a current total of 50 species (Tables 1 & 2). These 50 species include five salamanders (10%) and 12 anurans (24%) for a total of 17 amphibians (Table 1), and 12 lizards (24%) and 21 snakes (42%) for a total of 33 reptiles (Table 2). Four of the newly reported species (*Oedipina* sp., *Hyla* sp., *Rhadinaea* sp., and *Geophis nephodrymus*) represent previously undescribed taxa (McCranie, submitted; McCranie & Castañeda, in press, submitted; Townsend & Wilson, 2006). Including these new species, a total of 352 species of amphibians and reptiles are now known to occur in Honduras, of which six are marine in distribution (McCranie, 2004a, b; McCranie & Castañeda, 2004; McCranie & Wilson, 2002; McCranie *et al.*, 2002, 2003a,b, 2005; Townsend *et al.*, 2005a,b; Wilson & McCranie, 2002; Wilson *et al.*, 2003). The number of species now known from Parque Nacional El Cusuco represents 14.5% of the 346 species recorded from mainland and insular habitats in Honduras.

CLASS AMPHIBIA
ORDER CAUDATA
FAMILY PLETHODONTIDAE
Oedipina sp. (Fig. 1)

Localities: Cantiles.

Remarks: A single specimen representing an undescribed species was found under debris near the campsite. This species is being described by McCranie (Submitted).

ORDER ANURA
FAMILY HYLIDAE
'*Hyla*' sp. (Figs. 2 and 3)

Localities: Bosque Enano.

Remarks: A single specimen representing an undescribed species of hyloid frog was discovered as it jumped from a bromeliad in elfin forest. This species is being described by McCranie & Castañeda (submitted).

Smilisca baudinii (Duméril & Bibron)

Localities: La Fortuna Village.

Remarks: Three different males were heard calling during two nights spent in the village, at around 1350 m elevation.

FAMILY LEPTODACTYLIDAE
Craugastor charadra (Campbell & Savage)
Localities: Guanales.

Remarks: This species is an uncommonly encountered inhabitant of the riparian area around the river next to Guanales camp.

CLASS REPTILIA
ORDER SQUAMATA
FAMILY ANGUILLIDAE
Celestus montanus Schmidt (Fig. 4)

Localities: Cantiles, Guanales.

Remarks: In addition to the juvenile specimen from Guanales reported on by Townsend *et al.* (2005c), UF 144903 was collected on 19th July 2005 near Cantiles Camp. Relevant data for UF 144903 is: snout-vent length about 72 mm, tail length about 118 mm, three prefrontals, two rows of internasals, the nasal contacts the rostral, the frontal is 1.7 times as long as its width at the widest point, the interparietal is clearly smaller than the parietals, three loreals, 11/11 supralabials, supralabials 7–9 directly under the orbit, 7/8

Species	Wilson and McCranie (2004b)	2004 and 2005 records				
		Centro de Visitantes	Bosque Enano	Guanales	La Fortuna	Cantiles
Plethodontidae: 5						
<i>Bolitoglossa conanti</i>	X	X		X	X	X
<i>Bolitoglossa diaphora</i>	X	X				X
<i>Bolitoglossa dunni</i>	X	X				
<i>Cryptotriton nasalis</i>	X		X	X		
<i>Oedipina</i> sp.						X
Bufonidae: 1						
<i>Cranopsis valliceps</i>	X					
Hylidae: 7						
<i>Bromeliohyla bromeliacia</i>	X	X		X		
<i>Duellmanohyla soralia</i>	X	X		X	X	
"Hyla" sp.			X			
<i>Plectrohyla dasypus</i>	X	X			X	X
<i>Plectrohyla exquisita</i>	X	X		X		
<i>Ptychohyla hypomykter</i>	X	X		X	X	
<i>Smlisca baudinii</i>					X	
Leptodactylidae: 3						
<i>Craugastor charadra</i>				X		
<i>Craugastor milesi</i>	X					
<i>Craugastor rostralis</i>	X	X		X	X	
Ranidae: 1						
<i>Lithobates maculatus</i>	X					
TOTAL	13	9	2	8	6	4

Table 1. Amphibians of Parque Nacional El Cusuco, Honduras, with a comparison of species collected at different survey sites during 2004 and 2005 (for site descriptions see text).

infralabials, 66 scales along the dorsal midline, 23 subdigital lamellae on the fourth toe.

FAMILY PHRYNOSOMATIDAE

Sceloporus variabilis Wiegmann

Localities: Centro de Visitantes.

Remarks: A single adult male was found basking on a rock pile in a cleared area in front of the Visitor's Center.

FAMILY POLYCHROTIDAE

Anolis capito (Peters)

Localities: Guanales.

Remarks: A single specimen was found near camp on a fallen log at 1300 m.

Anolis ocelloscapularis (Köhler, McCranie, & Wilson)

Localities: Guanales, La Fortuna Camp.

Remarks: This species was reported from Guanales by Townsend *et al.* (2005d), and was commonly encountered around La Fortuna Camp in an edge area where primary forest meets an agricultural clearing.

Anolis petersii (Bocourt)

Localities: Guanales, La Fortuna Camp.

Remarks: In addition to the specimen reported from La Fortuna Camp by Townsend & Plenderleith (2005), a subadult was collected at Guanales at 1410 m elevation.

FAMILY SCINCIDAE

Sphenomorphus incertus (Stuart)

Localities: Near the Centro de Visitantes, on a trail leading to the finca of Makrín Ramírez; Sendero Las Minas.

Remarks: One specimen was collected as it ran across a trail in disturbed cloud forest at 1550 h at 1570 m (Townsend, 2005), and another was found in a pitfall trap at 1580 m.



Figure 1. *Oedipina* sp. Photograph © B. L. Talley.



Figure 2. *Hyla* sp. Photograph © B. L. Talley.



Figure 3. *Hyla* sp., on same species of bromeliad from which it was collected. Photograph © Dan Pupius.



Figure 4. *Celestus montanus*. Photograph © B. L. Talley.



Figure 5. *Geophis nephodrymus*. Patternless variant. Photograph © B. L. Talley.



Figure 6. *Geophis nephodrymus*. Blotched variant. Photograph © B. L. Talley.



Figure 7. *Atropoides mexicanus*. Photograph © B. L. Talley.

FAMILY COLUBRIDAE

Adelphicos quadrivigatum Jan

Localities: Guanales; Parque Nacional El Cusuco on road from Buenos Aires to the Centro de Visitantes.

Remarks: One specimen was found dead on road and another alive on road. An adult female was collected at Guanales at 1300 m elevation.

Geophis nephodrymus Townsend & Wilson (Figs. 5 and 6)

Localities: Cantiles; Finca of Makrín Ramírez; Sendero El Danto; Sendero El Quetzal; Sendero Las Minas.

Remarks: This species was described by Townsend & Wilson (2006) based on a single specimen collected in a pitfall trap near the Centro de Visitantes in 2004. Townsend (2006) described considerable morphological variation in this species based on an additional material collected during 2004 and 2005.

Lampropeltis triangulum (Lacépède)

Localities: Sendero Las Minas.

Remarks: One adult was collected as it crossed a trail between Guanales Camp and Centro de Visitantes on 16th August 2005 at 1450 m elevation.

Omoadiphas aurula Köhler, Wilson, & McCranie

Localities: Trail to Cerro Cusuco.

Remarks: A single male specimen (UF 144905) was found on trail to landslide at ca. 1900 m. The relevant data on UF 144905 are as follows: male (hemipenes not everted); ventrals 163; cloacal scute divided; subcaudals 35; 17 dorsal scale rows; 7/7 supralabials, third and fourth entering orbit;

8/8 infralabials, first pair in medial contact, first four touching anterior chinshields, fourth largest; loreal single, elongate; no preocular; two postoculars, lower smaller; anterior temporal absent, single posterior temporal; total length 282 mm; tail length 35 mm; tail length/total length ratio 0.124. The color pattern in preservative after one year is as follows: dorsum medium chocolate brown with dark brown stripe on entire middorsal row and another on adjacent halves of third and fourth rows; head dark brown dorsally and laterally, with cream spotting on supralabials; venter cream, save for small dark brown spots on infralabials. The specimen is also in significant agreement with the remainder of the features indicated by Köhler *et al.* (2001) in the holotype.

Pseustes poecilonotus (Günther)

Localities: Guanales.

Remarks: An adult male was collected at 1420 m as it moved through moderately disturbed broadleaf forest.

Rhadinaea montecristi Mertens

Localities: Cantiles.

Remarks: A single adult male collected as it crawled through Cantiles, representing a notable northern range extension for this species (Wilson *et al.*, 2006).

Rhadinaea sp.

Localities: Centro de Visitantes.

Remarks: This species was recently described from the park (McCranie & Castañeda, In press).

Scaphiodontophis annulatus (Duméril, Bibron, & Duméril)

Localities: Centro de Visitantes.

Remarks: An adult female was collected during the day near the visitor's center building at 1550 m.

FAMILY VIPERIDAE

Atropoides mexicanus (Duméril, Bibron, & Duméril) (Fig. 7)

Localities: Guanales.

Remarks: One adult female was found in a hollow log during the daytime in 2004. In 2005, an adult male was found coiled at the base of a sapling alongside a trail at 1310 m during the daytime. A juvenile and was found during the day at 1320 m near a stream.

Species	Wilson and McCranie (2004b)	2004 and 2005 records				
		Centro de Visitantes	Bosque Enano	Guanales	La Fortuna	Cantiles
Anguidae: 2						
<i>Celestus montanus</i>				X		X
<i>Mesaspis moreletii</i>	X		X			X
Phrynosomatidae: 2						
<i>Sceloporus malachiticus</i>	X	X	X		X	X
<i>Sceloporus variabilis</i>		X				
Polychrotidae: 6						
<i>Anolis amplisquamosus</i>	X		X			X
<i>Anolis capito</i>				X		
<i>Anolis cusuco</i>	X	X			X	
<i>Anolis johnmeyeri</i>	X	X	X	X		X
<i>Anolis ocelloscapularis</i>				X	X	
<i>Anolis petersii</i>				X	X	
Scincidae: 2						
<i>Sphenomorphus cherriei</i>	X					
<i>Sphenomorphus incertus</i>		X			X	
Colubridae: 16						
<i>Adelphicos quadrivirgatum</i>		X		X		
<i>Drymarchon melanurus</i>	X					
<i>Drymobius chloroticus</i>	X	X		X		
<i>Geophis nephodrymus</i>		X				X
<i>Imantodes cenchoa</i>	X	X				
<i>Lampropeltis triangulum</i>				X		
<i>Leptophis ahaetulla</i>	X			X		
<i>Mastigodryas dorsalis</i>	X			X		
<i>Ninia espinali</i>	X					
<i>Omoadiphas aurula</i>		X				
<i>Pseustes poecilonotus</i>				X		
<i>Rhadinaea montecristi</i>						X
<i>Rhadinaea sp.*</i>						
<i>Scaphiodontophis annulatus</i>		X				
<i>Stenorhina degenhardtii</i>	X					
<i>Tantilla schistosa</i>	X	X		X		
Elapidae: 1						
<i>Micrurus diastema</i>	X			X	X	
Viperidae: 4						
<i>Atropoides mexicanus</i>				X		
<i>Bothriechis marchi</i>	X	X		X		X
<i>Bothrops asper</i>				X		
<i>Cerrophidion godmani</i>	X	X	X			X
TOTAL	17	16	5	16	6	9

Table 2. Reptiles of Parque Nacional El Cusuco, Honduras, with a comparison of species collected at different survey sites during 2004 and 2005 (for site descriptions see text). *Being described by McCranie and Castañeda (In press).

Bothrops asper (Garman)

Localities: Guanales.

Remarks: Three female specimens were recorded

in 2005 in the vicinity of Guanales, one at 1450 m elevation, a record high elevation for this species in Central America (Talley *et al.*, 2005).

CONSERVATION STATUS OF DECLINING AND RECENTLY-REPORTED SPECIES

There were six members of Parque Nacional El Cusuco's herpetofauna that were regarded by Wilson & McCranie (2004b) as species of conservation significance. Of these six, one species (*Craugastor milesi*) was considered to be extinct, a situation that had also been discussed by McCranie & Wilson (2002) and Wilson & McCranie (2004a). Despite deliberate and considerable efforts by our team to locate this frog over the course of more than 21 weeks in 2004 and 2005, no *C. milesi* were observed, further supporting the conclusion that this species is extinct, or at the very least extirpated around its type locality.

Three amphibian species previously known from the park were described as having declining populations (Wilson & McCranie, 2004b): *Duellmanohyla soralia*, *Craugastor rostralis*, and *Lithobates maculatus*. We recorded *Duellmanohyla soralia* from the Río Cusuco in the vicinity of the Centro de Visitantes, from along the trail to Cascada de Quetzal, at the pool under Cascada de Quetzal, and in and around a tributary of Quebrada La Ruidosa below La Fortuna Camp. This species was very abundant at the latter locality when La Fortuna Camp was visited in late June and early July 2005, with as many as nine individuals observed in a single night in the vegetation along a 20 m stretch of stream and numerous individuals were recorded from the forested hillsides above the stream. The stream also had hundreds of *D. soralia* tadpoles present. Unfortunately, a large area along the stream discussed above had been cleared recently by *campesinos* from the nearby village of Nueva Esperanza, and there are a number of other clearings and shade coffee plantations on the hillsides above the stream. The future survival of the *D. soralia* population around La Fortuna Camp is clearly endangered by human activities, despite the supposedly protected location of the site within the boundaries of Parque Nacional El Cusuco. Due to these concerns and despite the local abundance of *D. soralia* in at least some sites within the park, we support the continued recognition that this species has declining populations.

Craugastor rostralis, was recorded by our team in the following localities: Centro de Visitantes, Guanales, and La Fortuna Camp. While the species is not regularly encountered around the Centro de Visitantes, the species is an abundant inhabitant of leaf litter on hillsides at both the lower elevation localities. Populations of *C. rostralis* at lower elevations within Parque Nacional El Cusuco appear healthy, and this species is apparently able to persist in disturbed habitats such as shade-grown coffee farms around La Fortuna Camp.

Lithobates maculatus, was not encountered by our team during 2004 or 2005, although it was collected below the park near the village of Buenos Aires at around 1250 m elevation. The possibility exists that *L. maculatus* is extirpated within the boundaries of Parque Nacional El Cusuco. Two snakes were regarded as having declining populations by Wilson & McCranie (2004b): the colubrid *Drymobius chloroticus* and the viper *Bothriechis marchi*. We encountered both of these species within the park in 2004 and 2005, but only rarely.

Of the four stream-breeding frog species collected in the 2005 season (*Duellmanohyla soralia*, *Plectrohyla dasypus*, *Plectrohyla exquisita*, and *Ptychohyla hypomykter*), only one species (*P. hypomykter*) had tadpoles that exhibited mouthpart malformations similar to those described by Wilson & McCranie (2004b). All *P. hypomykter* tadpoles collected within park limits in 2003 had normal mouthparts, with stable adult population (Wilson & McCranie 2004b). As was reported by Wilson & McCranie (2004b), the current adult population of *P. hypomykter* in the Río Cusuco appears stable. However, mouthpart malformations among tadpoles varied from minor to extreme, including incomplete tooth rows and poorly keratinized jaw sheaths. Tadpoles with malformed mouthparts were collected to examine extensiveness of malformations. McCranie & Wilson (2002) documented *P. hypomykter* tadpoles with malformed mouthparts found between 1050–1460 m elevation, from areas between central Olancho and southern Ocotepeque.

Of the 20 species added to the herpetofauna of the park, only *Celestus montanus* and *Anolis ocelloscapularis* were considered to have declining populations by Wilson & McCranie (2004a). Only two specimens of *C. montanus* have been collected in the park, but due to the secretive nature of members of this genus we do not necessarily see this as an indication of population health. Data from La Fortuna Camp and Guanales indicate that *A. ocelloscapularis* has stable populations at both of those sites.

During the entire course of our fieldwork during 2004 and 2005, there were six species reported by Wilson & McCranie (2004b) that we did not record inside the park: *Cranopsis valliceps*, *Craugastor milesi*, *Lithobates maculatus*, *Sphenomorphus cherriei*, *Drymarchon melanurus*, and *Ninia espinali*. The status of two of these species is discussed above (*C. milesi* and *L. maculatus*), and another (*C. valliceps*) is a widespread species at lower elevations and is most abundant in disturbed areas, so it is not necessarily unexpected that the species would not be encountered in the more pristine areas of the park. *Sphenomorphus cherriei* was not recorded, but its congener *S. incertus* was collected at a number of sites throughout the park. Both *D. melanurus* and *N. espinali* lack sufficient baseline population data to judge whether their absence during our surveys is of any conservation significance.

Anolis amplisquamosus, which was reported to have a stable population by Wilson & McCranie (2004a & b) and was originally described based on a series of 26 specimens collected around the Centro de Visitantes (McCranie *et al.*, 1992), was not encountered until the final week of fieldwork on 14th August 2005. At that time, a single adult male was collected at night as it slept on a fern at Bosque Enano. This was the only time this species was collected during over 21 weeks of fieldwork. Without any explanation, a species that was abundant in previous years has apparently experienced a dramatic population decline, made even more alarming by the fact that the entire documented range of *A. amplisquamosus* lies within the boundaries of Parque Nacional El Cusuco. If this is the case, it is a disturbing

development and only further indicates the need for both an extensive and intensive monitoring program at Parque Nacional El Cusuco to determine what steps need to be taken in order to better protect its endemic herpetofauna.

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APPENDIX

Referred specimens

- Craugastor charadra*.- UF 145411.
Celestus montanus.- UF 142324, 144903.
Anolis capito. - UF 144745.
Anolis ocelloscapularis.- UF 144266.
Anolis petersii.- UF 144333, 144744.
Sceloporus variabilis.- UF 144110.
Sphenomorphus incertus.- UF 144061, 144731-32.
Adelphicos quadrivigatum.- UF 144668-69, 144692.
Geophis nephodrymus.- UF 142577, UF 143022-25, USNM 561824-25.
Lampropeltis triangulum.- UF 144912.
Omoadiphas aurula.- UF 144905.
Pseustes poecilonotus.-UF 144661.
Rhadinaea montecristi.- UF 144648.
Scaphiodontophis annulatus.-UF 144683.
Atropoides mexicanus.- UF 144678, 144757.
Bothrops asper.-UF 144698-99.