

Notes on the Herpetofauna of Mexico 30:

A New Food Item for the Gray-banded Kingsnake, *Lampropeltis alterna* (A. E. Brown, 1901)

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Abstract

A specimen of *Lampropeltis alterna* (Gray-banded Kingsnake / *Culebra Real Gris*) from the outskirts of the town of Bustamante, Nuevo León, Mexico, was collected and a fecal sample was analyzed. Various food contents were found in the stool, including a small portion of a feather from *Thryomanes bewickii* (Bewick's Wren / *Chirivín Cola Oscura*) and many scales belonging to *Sceloporus couchii* (Couch's Spiny Lizard / *Lagartija Espinosa de las Rocas*). This is the first time this lizard, endemic to Mexico, has been documented as a prey item for *L. alterna*.

Resumen

Después de analizar una muestra de heces de un ejemplar de *Lampropeltis alterna* (Gray-banded Kingsnake/Culebra Real Gris) colectado en las afueras de la cabecera municipal de Bustamante, Nuevo León. En la excreta encontramos restos de diversos alimentos, como una pequeña porción de una pluma de *Thryomanes bewickii* (Bewick's Wren / Chirivín Cola Oscura) y muchas escamas que resultaron ser de *Sceloporus couchii* (Couch's Spiny Lizard / Lagartija Espinosa de las Rocas). Esta es la primera vez que esta especie de lagartija endémica de México se documenta como una fuente de alimento para *L. alterna*.

Introduction

The observation reported herein arose as part of a research project being conducted to determine the herpetofaunal composition of Sierra de Gomas, which occupies the municipalities of Bustamante, Villaldama, Mina and Salinas Victoria in the state of Nuevo León, Mexico.

Background: *Lampropeltis alterna*

The gray-banded kingsnake, *Lampropeltis alterna*, occurs from southwestern Texas and extreme southeastern New Mexico southward through the Chihuahuan Desert of Coahuila to extreme northeastern Durango (Lemos-Espinal et al., 2015). In Nuevo León it has been found in the northern mountains of the state and in ranges alongside the Monterrey Metropolitan Area (Lazcano and Banda-Leal, in press).

Lampropeltis alterna is one of the most spectacularly colored and patterned of snakes (Lemos-Espinal et al., 2015). Lemos-Espinal et al. (2015) provides a good description of the species. The dorsal pattern is exceptionally variable. Usually it consists of 15 or more red or orange, black-bordered blotches on a pale to very dark gray ground color; the interspaces are about as long as or longer than the blotches themselves. The black borders are narrowly edged with white, even in very dark specimens. The size of the blotches varies greatly, from 20 scale lengths or more to 2–3; the smaller ones may even be broken into small, irregular streaks. The shorter the blotches, the more restricted the orange color, which is absent in the shortest blotches. The orange color may be so densely suffused with black that those blotches are scarcely distinguishable. The venter has irregular black markings. The head is gray, the same color as the inter-

spaces between blotches; a postocular dark stripe extending to the corner of the mouth is usually present, but markings on the dorsal surface are quite variable in size, shape and number. This is true throughout the range of the species, but especially in Texas.

Gray-banded kingsnakes feed primarily on lizards. They will also occasionally feed on small rodents, frogs, and the eggs of ground nesting birds, lizards and other snakes (Werler et al., 2000; Ernst and Ernst, 2003; Lazcano-Villareal et al., 2010; Lemos-Espinal et al., 2015). Various authors have documented the diet of these kingsnakes. For example: Murray (1939) reported observing an adult female in the Chisos Mountains attempting to swallow a *Sceloporus poinsettii* (as *Sceloporus torquatus poinsetti*). Mecham and Milstead (1949) found remains of *Sceloporus consobrinus* (as *S. undulatus consobrinus*)



A road-killed female *Lampropeltis alterna* from a canyon in Sierra Gomas Bustamante, Nuevo León. Photograph by Manuel Nevárez de los Reyes.

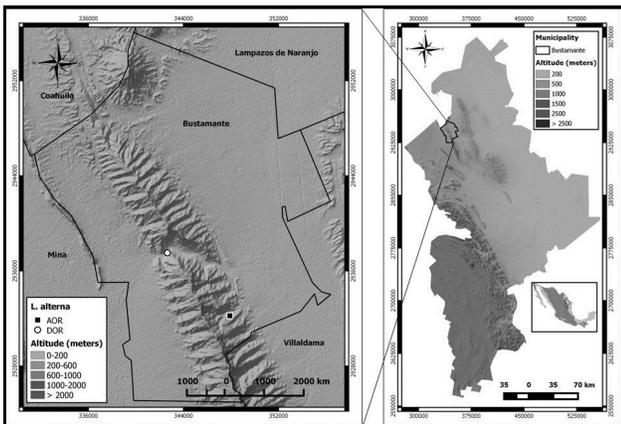
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A male *Lampropeltis alterna* crawling on the wall of a canyon in Sierra Gomas Bustamante, Nuevo León. Photograph by Manuel Nevárez de los Reyes.

in a DOR voucher specimen. Axtell (1951) documented that in captivity the snakes would eat mice, but when this prey was refused, they would resort to providing *Sceloporus merriami* and *S. olivaceus*, which they would readily take. Gehlbach and Baker (1962) reported *Plestiodon* sp. (as *Eumeces* sp.), *Sceloporus undulatus* and *S. poinsettii* (as *poinsetti*) as food items. Degenhardt et al. (1996) mention finding *Aspidoscelis scalaris septemvittata* (as *Cnemidophorus septemvittatus*) in the stomach of a road-killed specimen; they also cite a personal communication that an adult male in Brewster County had regurgitated an adult *Cophosaurus texanus*. Miller (1979) extensively documents the natural history of the species. Switak



Dots indicate the two specimens of *Lampropeltis alterna* collected (UANL-7662- DOR / UANL-7672-AOR) in Sierra Gomas, Bustamante, Nuevo León. Map by Javier Banda-Leal.

(1984) reports finding the remains of two snake eggs in a captured snake's feces. Tennant (1984) mentions that a captured specimen had regurgitated a canyon treefrog (*Hyla arenicolor*).

Gray-banded kingsnakes typically occupy limestone hills with agave communities, along with mesquite and creosote bushes. These kingsnakes are very active on limestone walls seeking refuge or prey. Their activity increases at the onset of the rainy season. They also shift their peak activity to more nocturnal hours as ambient temperature rises over the seasons. *Lampropeltis alterna* has been found between 450 and 2286 masl (Lemos-Espinal et al., 2015; Lazcano and Banda-Leal, in press).

Lampropeltis alterna is considered threatened in Mexico (SEMARNAT, 2010). The species has no protection status from the IUCN (IUCN, 2016).

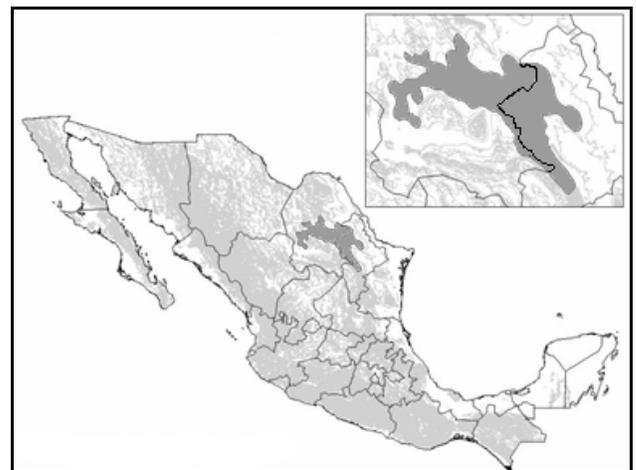
Background: *Sceloporus couchii*

Sceloporus couchii is a small, colorful species of *Sceloporus* endemic to northeastern Mexico. The species is distributed from the sierras of northern Coahuila southeastward to west-central Nuevo León (Lemos-Espinal et al., 2015). In Nuevo León it has been collected in the municipalities of Bustamante, Cerralvo, Higuera, Monterrey, Montemorelos, Sabinas Hidalgo, Santa Catarina, Santiago and Rayones. The species can undoubtedly be found within the adjoining municipalities toward the center and north of the state (Lazcano and Banda Leal, in press). It is found at altitudes between 450 and 2286 masl, in microhabitats very similar to those occupied by *L. alterna*.

Since a map of the entire distribution of *S. couchii* is lacking in the literature, we took on the task of developing a range map based on records from the literature, naturalists' observations, and vouchered specimens from the vertebrate collection of the Universidad Autónoma de Nuevo León and the personal database of observational records from one of the authors (MNR), resulting in the map below.

Lemos-Espinal et al. (2015) and Lazcano and Banda-Leal (in press) provide descriptions of the species:

Females are olive-gray above and on sides, with a series of seven or eight rounded dark spots which start off small on the neck but posteriorly get increasingly larger on either side of the



Distribution of *Sceloporus couchii* in the states of Coahuila and Nuevo León, Mexico. Map by Manuel Nevárez de los Reyes.



A male *Sceloporus couchii* from Sierra de Gomas, Bustamante, Nuevo León. Photograph by Manuel Nevárez de los Reyes.

vertebral region. A faint, slightly darker stripe extends from tympanum to the base of the tail. The ventral surfaces are tinged with blue, sometimes with faint, oblique, white stripes on the underside of the head.

During the breeding season males are quite colorful, with an overall pale blue tone. The dorsolateral series of dark spots, highly conspicuous in females is faint or scarcely evident on males; the dorsal area is gray-blue with small, scattered black flecks. A broad black band, sometimes mottled and irregular, extends from the axilla to groin and base of tail. This dark band is bordered above by a distinct, but not sharp, white stripe, also present ventrally, where it is not as evident. In front of the foreleg insertion is a bright vertical blue stripe that joins dorsolaterally with a pale stripe that interrupts the lateral black stripe. The blue stripe is preceded by the vertical black stripe, the upper part of which extends forward on the sides of the neck. A bright blue spot encircled by black flanks either side of the neck. The entire ventral surface is tinged with blue, darker on the flanks and the rear of the mid-throat. The underside of the head has numerous very dark blue streaks converging postero-medially into a light blue area, where the streaks are more dully colored. Around the periphery of the throat the pale interspaces are whitish. The lizard's extraordinarily complex coloration serves to enhance reproductive, foraging and defensive behaviors.

Habitat for *Sceloporus couchii* is associated with piedmont scrub, which is further divided into semi-thorn and rosetophilous desert scrubland, apparently without dominance of any particular plant species. The Spanish common name for the species, *Lagartija Espinosa de las Rocas* (spiny lizard of the rocks), was given precisely because it lives on mountain slopes with rocky limestone substrates. They are highly territorial and when threatened they lift and lower their body in response. Peak daily activity occurs in the morning and crepuscular hours. The altitude gradient for the species is from 400 to 2000 masl (Lemos-Espinal et al., 2015, Lazcano and Banda-Leal, in press).

This endemic lizard species has not been categorized by Mexican legislation as needing protection (SEMARNAT, 2010). Similarly, the IUCN lists it as LC (least concern) (IUCN, 2016).

Biogeography

The state of Nuevo León lies between 98°17' and 101°07'W,

and between 23°06' and 27°50'N. Neighboring states are Tamaulipas to the east, Texas on the northeastern border, Coahuila to the northwest and west, and Zacatecas and San Luis Potosí to the southwest. Shaped as an irregular rhombus exceeding 500 km at its longest (north/south) axis, its area is 64,081.94 km². Most of the state falls within the Northern Temperate Zone. However, a small portion extends south of the Tropic of Cancer (Cantú-Ayala et al., 2013).

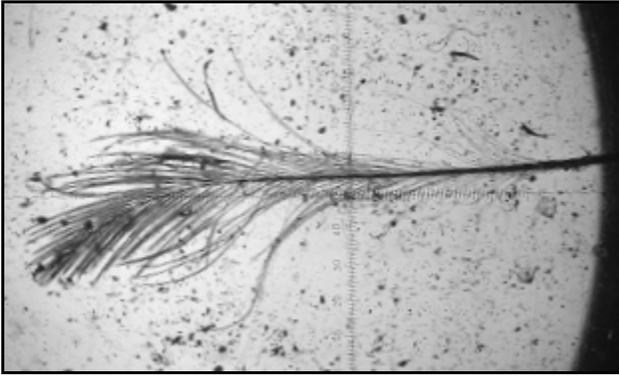
Nuevo León encompasses a transition zone between the Nearctic and Neotropical biogeographic divisions, giving the state a variety of ecosystems that have an enormous influence on the distributional patterns of vertebrate groups (Cantú-Ayala et al., 2013). Some of the following vegetation types are present: gypsophyllous plants, piedmont, rosetophilous scrub, chaparral, and oak and pine-oak forests (Cantú-Ayala et al., 2013). These vegetation assemblages play an extremely important role in species distribution.. To analyze the distribution of the species involved in this account, throughout the state of Nuevo León, we used the classification system of physiographic regions (= subprovinces) developed by INEGI (1986). The species reported herein, are inhabitants of the Sierra Madre Oriental in Nuevo León and Coahuila, in the subprovinces Gran Sierra Plegada, Pliegues Saltillo-Parras, Sierras y Llanuras Coahuilenses and Sierra de la Paila (Nevárez-de los Reyes et al., 2016).

Results

We document herein the previously unreported predation on *Sceloporus couchii* by *Lampropeltis alterna* (UANL-7672, male). The snake was found 2 July 2016 at 2202 hrs in a roadcut 7 km on the road to Grutas de Bustamante in the municipality of the same name (Latitude 26.502450°N, Longitude 100.526222°W, datum WGS 84, elevation 840 masl). It was active on a rock wall within a piedmont vegetation community. The area is a portion of Sierra de Gomas in this municipality. This was also the first live *Lampropeltis alterna* found by our research group. The *L. alterna* measured snout-vent length = 595 mm, tail length = 115 mm, total length = 610 mm, mass = 50.9 g. The prey was determined by analyzing a fecal sample that was obtained when the animal arrived at our laboratory. We found



Lampropeltis alterna fecal sample (70×) showing *Sceloporus couchii* scales. Photomicrograph by Carlos Solís-Rojas.



Lampropeltis alterna fecal sample (70×) showing a tiny section of a *Thryomanes bewickii* feather. Photomicrograph by Carlos Solís-Rojas.

many scales in the fecal matter, which were identified as those belonging to *Sceloporus couchii*. We also found in the feces a small section of a feather from *Thryomanes bewickii* (Bewick's Wren / *Chivirín Cola Oscura*), and many insect fragments that were likely from the lizard's stomach contents.

The first *Lampropeltis alterna* found by our group (UANL-7662, female) was a salvaged specimen found on the road in Bustamante Canyon (UTM 342 647 2937 520, (Latitude 26.549595°N, Longitude 100.579611°W, datum WGS 84, elevation 521 masl). Its measurements were snout-vent length = 326 mm, tail length = 67 mm, total length = 393 mm, mass = 16.8 g.

Our presence here was part of an ongoing survey on the herpetofauna of the sierra. These canyon areas have yielded interesting records, resulting in the addition of 10 previously unreported species for this region. The new species records include: *Bogertophis subocularis*, *Coluber schottii*, *Leptodeira septentrionalis*, *Pantherophis emoryi* and *Micrurus tener*. Unfortunately, these were all salvaged road-kills. *Hypsiglena jani*, *Nerodia rhombifer*, *N. erythrogaster* and *Thamnophis proximus* were observed live.

Conclusion and Discussion

The gray-banded kingsnake is one of the best documented snakes of the south-central United States. This interesting desert dweller has been present in the pet trade for decades, where herpetoculturists have been able to work with their many morphs. The same cannot be said about its presence in Mexico, since the pet trade in Mexico has grown only slightly with the years, due to the exorbitant market price of pet reptiles in the country.

The herpetological collection of the Autonomous University of Nuevo León contains a total of seven preserved specimens (UANL-0459, 5018, 6986, 7405, 7485, 7486 and 7662) all collected from municipalities close to the Monterrey Metropolitan Area. The stomach contents of the preserved specimens have not been examined. Even though the populations from the U.S. have undergone extensive life history studies, data regarding Mexican populations is lacking. More collecting or surveying in the northern part of Nuevo León is needed to find other populations of *L. alterna*, especially in sierras such as Cerro de La Popa, Fraile-San Miguel, Milpillas, Minas Viejas, Lampazos, Papagayos, Sierra del Medio, Sierra del Arco, Cerro Boludo and Pico Candela, and throughout all the valleys in between. A reasonable effort within all the aforementioned sierras is likely to find other populations of *L. alterna*. These may in turn lead to more life history studies for Mexican populations of *L. alterna*, providing more information regarding their diet.

Acknowledgments

To all our teammates in the field and laboratory for working meticulously and enthusiastically. To the San Antonio and Los Angeles Zoos, Bioclon Laboratories S.A. de C.V., Universidad Autónoma de Nuevo León its research programs PAICYT [Programa de Apoyo a la Investigación Científica y Tecnológica (CN361-15)], and scholarship obtained by one of the authors from CONACYT MNL = Convención 445411) for financing part of this project. SEMARNAT for providing collecting permits OFICIO NUM.SGPA/DGVS/05579/15/25 de Mayo 2015 and OFICIO NUM.SGPA/DGVS/008371/16/11 de Agosto 2016.

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