

## A New Kingsnake from Mexico, with Remarks on the *Mexicana* Group of the Genus *Lampropeltis*

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IN the summer of 1958, a small kingsnake belonging to the *mexicana* group of the genus *Lampropeltis* was obtained in south-western Durango, México. About 9:45 P.M. Mr. J. Keever Greer and I found the snake pinned in a sprung mouse trap set at 7 P.M. on a steep, north-facing slope of a small, rocky canyon. These circumstances suggest crepuscular or nocturnal habits. Only one specimen is available for study, but its combination of characters seems to justify its nomenclatorial recognition.

I am indebted to the Michigan State University Development Fund for providing assistance in financing field work, to Mr. Alvie Adams, owner of Rancho Santa Barbara, to Mr. Fredrick R. Gehlbach for criticism of the manuscript, and to the following persons and institutions for permission to examine specimens in their care: Dr. Ernest E. Williams, Museum of Comparative Zoology, Harvard College (MCZ); Dr. Robert F. Inger, Chicago Natural History Museum (CNHM); Dr. W. Frank Blair, Texas Natural History Collection, University of Texas (TNHC). Measure-

ments (except body and tail length) of the holotype were made to the nearest one-tenth millimeter with dial calipers.

### *Lampropeltis greeri* sp. n.

#### Greer's Kingsnake

*Holotype*.—Michigan State University 190, young male (Fig. 1); obtained from Rancho Santa Barbara (Weicher Ranch), 29 miles west-southwest of Ciudad Durango, Durango, México, on July 18, 1958, ca. 7400 feet.

*Diagnosis*.—A species of kingsnake most closely resembling *Lampropeltis alterna* but differing from that species in having (1) bands uninterrupted by dorsal ground color (in *alterna*, alternating bands usually interrupted forming a scatter of black marks dorsally and laterally), (2), black-edged, red bands in anal region, and nuchal blotch having pale buff centers (in *alterna*, blotches and bands lack buff centers), (3) more than two-thirds of black bands widely split with red (in *alterna*, one-half or less of bands split with red), (4) distinct black pattern on

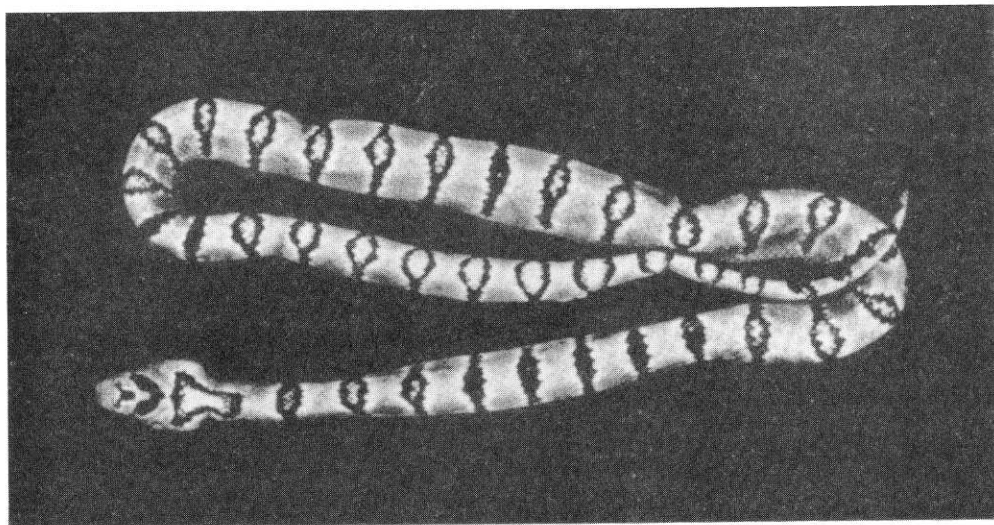


Fig. 1. *Lampropeltis greeri*, holotype (approx.  $\times 1$ ), dorsal view, 28.4 mi. WSW and 2 mi. S Durango, Durango, Mexico.

top of head (in *alterna*, distinct pattern on head lacking, but scattered black marks sometimes present), and (5) triangular blotch on neck (in *alterna*, triangular blotch lacking, but elongate marks sometimes present).

*Description of holotype*.—Male; body length 306 mm.; tail length 58 mm.; tail 15.9 percent of total length; 202 ventrals (including first widened scale); anal entire; 60 divided subcaudals, including cornified tip; dorsal scales smooth, having indistinct apical pits; dorsal scale reductions as follows (Dowling, 1951):

$$25 \begin{matrix} -12 & (24) \\ -13 & (17) \end{matrix} \quad 23 \begin{matrix} +7 & (101) \\ +6 & (91) \end{matrix} \quad 25 \begin{matrix} -6 & (107) \\ -6 & (95) \end{matrix} \quad 23 \begin{matrix} -6 & (127) \\ -6 & (126) \end{matrix} \quad 21 \begin{matrix} -5 & (148) \\ -5 & (143) \end{matrix} \quad 19 \quad (202)$$

Some scale additions and deletions not noted above are: addition of sixth row on right side opposite ventral 76 and its reduction opposite ventral 82; addition of one scale, the seventh, on left side opposite ventral 82; addition of four scales (sixth row) on right side opposite ventrals 88, 90–92; addition of four scales (seventh row) on right side opposite ventrals 112–115; addition of two scales (twelfth row) on right side opposite ventrals 137–138; and doubling of tenth row on right side opposite ventrals 157–158, 160–162.

Head (9.5 mm. wide) somewhat triangular, distinct from neck (5.3 mm. wide); snout truncate; rostral about twice as wide as high; nasal divided, nostril in anterior part; loreal

wider than high; one preocular, higher than wide; two postoculars;  $\frac{2}{3}$  temporals, lower anterior temporal on right side not contacting lower postocular, and intercalary scale on left side; dorsal head scales symmetrical consisting of paired internasals, prefrontals, supraoculars and parietals and single frontal; prefrontals contact loreal; posterior border of parietals uneven; eye large, diameter (2.5 mm.) greater than one-half length of snout (4.1 mm., measured from anterior margin of eye to tip of snout); seven supralabials, third and fourth entering orbit, sixth largest; nine

(right) and ten (left) infralabials; mental triangular; first pair of infralabials in contact behind mental; two pairs of enlarged chin shields, anterior pair longest; five rows of scales between posterior pair of chin shields and first widened ventral scale.

Dorsal shields on head gray, having symmetrical black pattern in two parts; large V on parietals having widened arms that extend onto supraoculars, and small spot on frontal having two anterolateral projections onto supraoculars; small black flecks on prefrontals; lower postoculars blackish; margins of most other scales bordering eyes blackish; posterior borders of first, second and third supralabials dusky-blackish; lower margin of upper anterior temporal black on right side

of head; nuchal blotch largest on body, triangular (apex posterior, truncate), having black border and buff center (few scales red anteriorly and posteriorly).

Pattern on body of black bands or black-edged, red bands on gray background; bands narrowly edged in white (about one scale wide); 33 bands (excluding nuchal) on body, 9 on tail; no consistent sequence of black (8, some scales with red flecks) and black-edged, red bands (25); extent of red in black bands variable; black-bordered, red bands in anal region slightly larger (about four or five scales wide) than anteriorly (three scales wide), and having pale buff centers; bands widest middorsally; lateral parts of most anterior black bands (red absent) not extending below third scale row; lateral parts of most posterior black bands extending onto ventrals; red in posterior black bands extending more laterad than in anterior bands; red extending onto subcaudals and sometimes not enclosed laterally in black; bands separated dorsally by three to four scales (including narrow white borders), and laterally by five scales.

Ventral surface whitish with irregular black flecks and blotches, some blotches representing narrow lateral extensions of dorsal bands; lateral parts of some ventrals having buff-brown or gray suffusion on part of body that forms pale midventral stripe; tendency for dorsal bands to form rings under tail; underside of head whitish; margins of infralabials dusky.

*Comparisons.*—*Lampropeltis greeri* resembles *alterna*, and differs from the other members of the *mexicana* group in having a dorsal pattern on the body of narrow, black bands or black-bordered, red bands. *Lampropeltis greeri* differs from *alterna* in having none of the bands interrupted middorsally, the red of some posterior bands and the nuchal blotch split with buff centers, and most black bands widely split with red.

*Lampropeltis greeri* resembles *mexicana* and differs from the other members of the *mexicana* group in having distinct patterns of the same shape (smaller in *greeri*) as in some *mexicana* on the neck and top of the head. Remnants of these patterns occur in some specimens of *alterna*. *Lampropeltis greeri* is most closely allied to *alterna*, and a link between *alterna* and *mexicana*.

*Relationships.*—*Lampropeltis greeri* belongs to the *mexicana* group (Smith, 1942: 206; 1944:141), which is characterized by a pattern of black-bordered, red bands alter-

nating with white-bordered, gray bands. The *mexicana* group is composed of six, little-known, monotypic species (*mexicana*, *thayeri*, *leonis*, *blairi*, *alterna*, and *greeri*).

Smith provided illustrations of the holotype of *Oreophis boulengeri* Dugès (= *Lampropeltis mexicana*, Dunn, 1922:226), and commented on the variation of the 13 known specimens (1942:202–03, 207, pl. 1, figs. 2 and 3). Smith and Necker described the holotype in detail (1943:206–08, pl. 5, fig. 3). The pattern on the head and the nuchal blotch indicate alliance of *mexicana* and *greeri*. The blotches on the nape and head are variable in configuration in *mexicana*. In the holotype of *greeri* the pattern on the head is of the same general shape as in some *mexicana* (Smith, *op. cit.*: fig. 2; MCZ 4652) but is smaller and solid black (never solid black in *mexicana*). The nuchal blotch of *greeri* resembles that of some *mexicana* (MCZ 19023), but has less red and a large central buff area.

Some specimens of *mexicana* (MCZ 19022, 24977) and *thayeri* (Smith, 1944:140; CNHM 30819–20) resemble each other in having buff areas bordered by a narrow black line inside the red blotches. Two specimens of *thayeri*, CNHM 30821 and the holotype (Fig. 2; Loveridge, 1924), have an almost ringed pattern; some black-bordered, red bands end laterally on the first and second dorsal scale rows, whereas other bands are open laterally having the black borders extending onto the ventrals. The other two known specimens of *thayeri* (CNHM 30819–20), differ from CNHM 30821 and the holotype of *thayeri*, and resemble *mexicana*, in having blotched, dorsal patterns. In 30820 the blotches are interconnected forming a dorsal, zig-zag pattern, or are broken forming dorsolateral marks. The head pattern of the four specimens consists of a large irregular red blotch (incorporating the supraoculars, frontal and anterior parts of the parietals) having an interrupted black border that is usually widest posteriorly. The nuchal blotch of the holotype of *thayeri* and of CNHM 30821 is not appreciably different from other red areas on the body, although the nuchal blotch is slightly larger; in 30819 the posterior dark border is broken and continuous with the first blotch on the body, whereas in 30820, the nuchal blotch lacks a definite pattern and dark posterior border, having only scattered, pigmented areas. The anterior black border of the nuchal blotch of the holotype of *thayeri* extends anteriorly into a point on

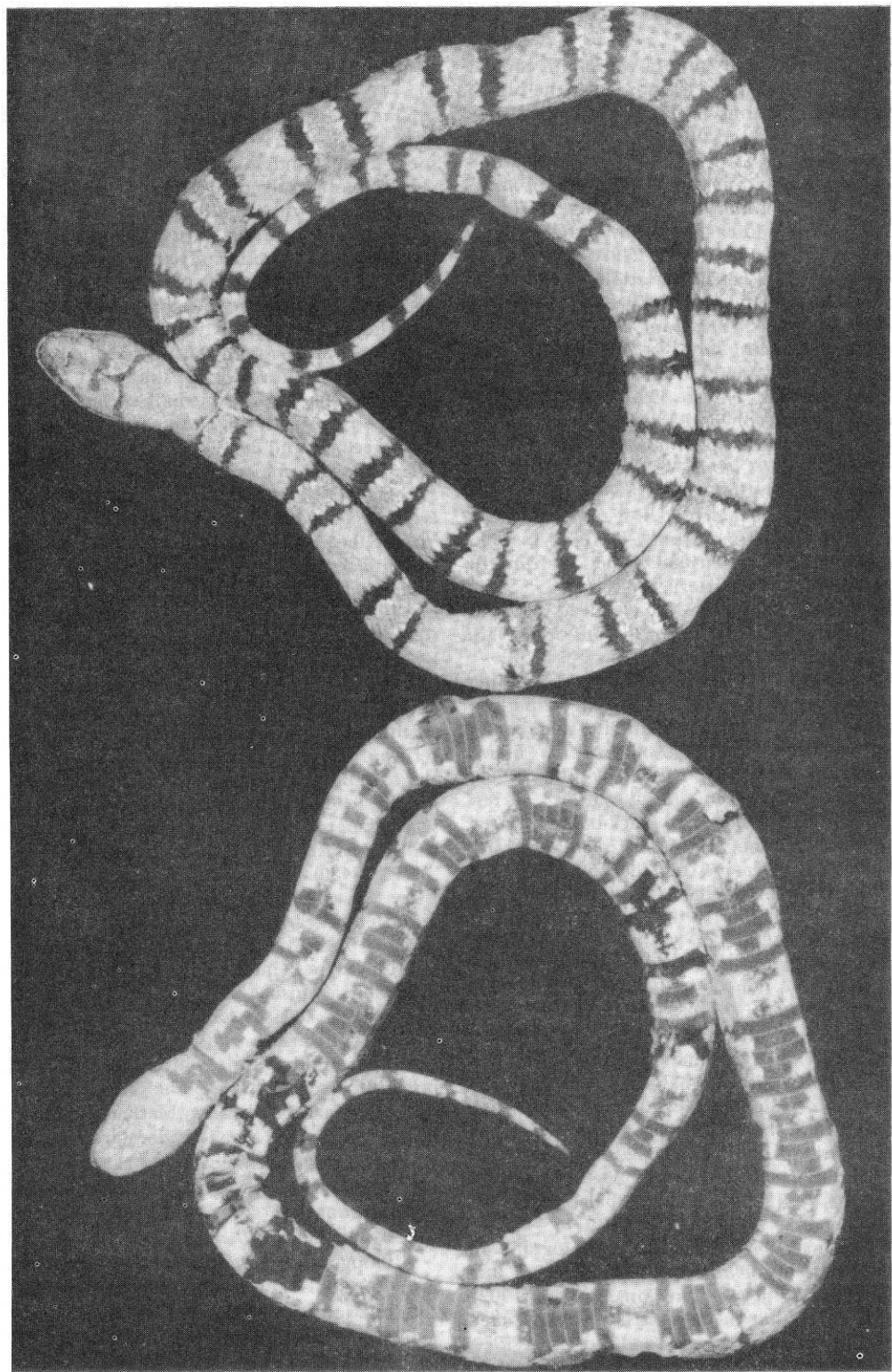


Fig. 2. *Lampropeltis thayeri*, holotype ( $\times \frac{2}{3}$ ), Miquihuana, Tamaulipas, Mexico. Top.—Dorsal view. Bottom.—Ventral view.

the parietals and almost comes in contact with the posterior black border of the blotch on the head, thus nearly separating a wide gray area middorsally on the back of the head (Fig. 2). This feature suggests relationship with *mexicana*; some specimens of *mexicana* show a middorsal anterior extension of the nuchal blotch that may (MCZ 19022, 24976), or may not (MCZ 24978) contact the blotch on the head. Variation of the three CNHM specimens (30819-20, combining characteristics of *mexicana* and *thayeri*, and 30821, resembling holotype of *thayeri*), which are from the same locality (Ojo de Agua, near Galeana, Nuevo León), suggests conspecificity of, or perhaps hybridization between, *mexicana* and *thayeri*.

*Lampropeltis leonis*, known only from the holotype (Günther, 1893:110, pl. 39A), has a  $\cap$ -shaped, nuchal blotch; a pattern on the head of three black spots, each having red centers (two on parietals, one on frontal); and a blotched pattern on the body. Some *mexicana* (MCZ 19023) have head patterns resembling that of *leonis*, but they are slightly larger in *mexicana*.

*Lampropeltis blairi*, although resembling *thayeri*, in having an almost ringed pattern seems to be the most distinctive member of the *mexicana* group. *Lampropeltis blairi*, known from only two specimens (Flury, 1950; Axtell, 1951), has a dorsal pattern of few (13 and 14), widened, black-bordered, red blotches; the nuchal blotch is enlarged but resembles other red blotches on the body, and the holotype has distinct black marks on the head, mostly on the parietals. The species is notable in having 25 to 27 scale rows (occurring on a large anterior segment of the body) that show little reduction. *Lampropeltis blairi*, *alterna* and *greeri* differ from *thayeri* and *mexicana* (and to a lesser extent, *leonis*) in having distinctly widened heads, long tails, normally a maximum of 25 or more scale rows, and narrowly white-edged, gray bands that are wider (less so in *blairi*) than the black-edged, red bands. Also, the holotypes of *blairi* and *greeri*, and some *alterna* (TNHC 4181) have black marks on the head.

Conant (1957) provided a photograph of the holotype of *alterna* (different from that in the original description, Brown, 1902), and wrote that the seventh known specimen of the species was not reported until 1950. *Lampropeltis greeri* resembles *alterna* in having a dorsal pattern of black, or black-bordered, red bands that are narrower than the

adjacent gray interspaces (less so in *greeri*, Fig. 1). The total number of dorsal bands (including the narrow, interrupted, black ones of *alterna*) is about the same in both species. All bands on the body are uninterrupted middorsally in *greeri*, whereas many black bands (usually alternating bands) are interrupted forming a scatter of small marks in *alterna*. Some posterior bands on the body and the nuchal blotch have pale buff areas inside the red in *greeri*, whereas no bands or blotches of *alterna* have the red split with pale areas. More than two-thirds of the bands (25 of 33, 76%) are widely split with red in *greeri*, whereas about one-half or less of the bands on the body in *alterna* are split with red. Meham and Milstead (1949:140), however, reported a specimen of *alterna* having 20 of 35 (57%) black bands split with red. *Lampropeltis greeri*, having a black pattern on the head (Fig. 1), differs from *alterna*, which lacks a definite pattern, but may have an irregular pale area having scattered black marks. Wright and Wright (1957:340) wrote that one specimen of *alterna* had a U-shaped, black patch on the prefrontals; TNHC 4181 has the frontal speckled and the parietals adorned with larger black marks that are oriented to suggest remnants of a black pattern on the head. *Lampropeltis alterna* lacks the conspicuous pattern of the nuchal blotch of *greeri* (Fig. 1), but may have two elongate, lateral spots (Smith, 1942:205), or a longitudinal, bifurcated blotch (CNHM 47090, TNHC 7420). The ventral surface of *alterna* is mostly white (Mecham and Milstead, *op. cit.*), or dark gray, having a black mottling, and in indistinctly margined, midventral, whitish stripe (Jameson and Flury, 1949). The ventral surface of *greeri* is mostly whitish having a few scattered black marks; part of the undersurface is also grayish having an indistinct, midventral, whitish stripe, thus resembling some *alterna*. The only specimen of *greeri* lacks a distinct black, postocular stripe (parts of some scales are black), whereas most specimens of *alterna* have a black streak from eye to angle of mouth. The ventral count of *greeri* (202) may average lower than that of *alterna* (215-221).

Although there are too few specimens of most species of the *mexicana* group to indicate relationships properly, the kinds of characters and their occurrence in some species suggest a subspecific relationship. *Lampropeltis greeri* is intermediate between *alterna* and *mexicana*, and possible conspecificity of

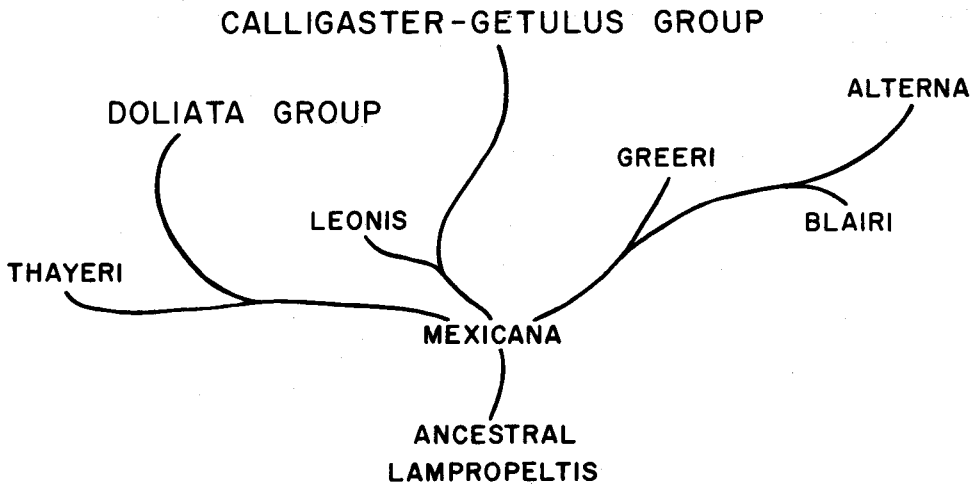


Fig. 3. Possible relationships of the species of the *mexicana* group; spatial arrangement of phyletic lines is not intended to show degree of interrelationship.

#### SUMMARY

A new kingsnake, *Lampropeltis greeri*, of the *mexicana* group from southwestern Durango seems most closely related to *L. alterna*. The characters of *greeri* suggest that it is a link between *alterna* and *mexicana*. Relationships of the six species of the *mexicana* group indicate that three stocks were derived from *mexicana*: *greeri*, *alterna*, and probably *blairi*; *leonis* and the *calligaster-getulus* group; and *thayeri* and the *doliata* group. *Lampropeltis mexicana* is most nearly like the ancestral *Lampropeltis*. It is suggested that all other kinds of North American *Lampropeltis* are derived from the *mexicana* group.

*Specimens examined* (total, 18).—*Lampropeltis mexicana* (10 specimens): MCZ 4652-53 (syntypes), near San Luis Potosí, San Luis Potosí; MCZ 19022-25, 24976-79, Alvarez, San Luis Potosí. *Lampropeltis thayeri* (4 specimens): MCZ 19551 (holotype), Miquihuana, Tamaulipas; CNHM 30819-21, Ojo de Agua, near Galeana, Nuevo León. *Lampropeltis blairi* (1 specimen): TNHC 4772 (holotype), 8.8 mi. W Dryden, Terrell Co., Texas. *Lampropeltis alterna* (3 specimens): CNHM 47090, near Cuatro Ciénegas, Coahuila; TNHC 4181, 11 mi. W Valentine, Presidio Co., Texas; TNHC 7420, ca. 15 mi. W Bakersfield, Pecos Co., Texas.

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