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A NEW ALLIGATOR LIZARD (GENUS *GERRHONOTUS*) FROM THE CUATRO CIENEGAS BASIN, COAHUILA, MEXICO

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ABSTRACT. *Gerrhonotus lugoi* sp. nov., from the Cuatro Ciénegas Basin (26° 59' North, 102° 04' West), Coahuila, México, differs from other members of the genus in having smooth dorsal scales, anterior internasals present, postrostral absent, supranasals not enlarged, suboculars not in contact with lower primary temporals, and color pattern of dorsal crossbands and immaculate lips and venter. A relict species, *G. lugoi* is possibly derivative of ancestral *Gerrhonotus-Elgaria* stock isolated in the Cuatro Ciénegas Basin since the early Tertiary. Unlike surrounding populations of *Gerrhonotus liocephalus*, which occur as montane isolates in transition zone forests, *G. lugoi* inhabits talus slopes in canyon terrain near the desert floor.

The intermontane basin of Cuatro Ciénegas in central Coahuila, México (26° 59' North, 102° 04' West) harbors one of the richest endemic faunas in North America. The aquatic snails (Taylor, 1966), isopod crustaceans (Cole and Minckley, 1966), fishes (Minckley, 1962, 1969; Miller and Minckley, 1963; Hubbs and Miller, 1965; Miller, 1968) and turtles (Legler, 1960; Webb and Legler, 1960; Webb, Minckley and Craddock, 1963) include many autochthonous subspecies, species, and genera. Levels of differentiation in these groups suggest long isolation of the basin and its aquatic fauna. Terrestrial animals of the Cuatro Ciénegas Basin are less well known, but preliminary studies of the scorpions (Williams, 1968) and reptiles (McCoy and Minckley, in preparation) have revealed extensive local speciation. Among the endemic reptiles of the basin is a distinctive anguid lizard, for which I propose the name

***Gerrhonotus lugoi*, sp. nov.**

Holotype. Carnegie Museum 49012, immature female, collected 6 July 1968 by Max A. Nickerson and John N. Rinne at the northern tip of Sierra de San Marcos, approximately 11 km SW of Cuatro Ciénegas de Carranza, Coahuila, México, elevation ca. 800 M. (Figs. 1 and 2).
Paratype. ASU 8818, immature female, collected in December, 1965

by José Lugo, Jr. at the “rastros municipal”, 2.7 km SW of Cuatro Ciénegas de Carranza, elevation ca. 740 M.

Diagnosis. A species of *Gerrhonotus* (*sensu* Stebbins, 1968) distinguished from other species of the genus by the following combination of characters: dorsal scales smooth; anterior internasals present; supranasals not enlarged; postrostral scale absent; suboculars not in contact with lower primary temporals; color pattern of dorsal crossbands, lips and venter immaculate.

Description of Holotype. Measurements in mm (after preservation): snout-vent length 79.4, axilla to groin 44.0, fore leg 16.0, hind leg 20.5, snout to posterior edge of ear 18.0, head width 11.4, tail incomplete.

Head scales smooth, slightly convex, highly polished. Postrostral absent; anterior internasals expanded, separating nasals from rostral and meeting on middorsal line; supranasals elongate, not expanded dorsally; postnasals 2–2, lowermost contacting supralabials three and four; posterior internasals enlarged, in contact with anterior canthals and meeting along a middorsal suture. Loreals 2–2; canthals 2–2; preoculars 2–2; superciliaries 6–6, the anteriormost not in contact with prefrontal. Suboculars 3–3, the last not reaching lowest primary temporal; postoculars 3–3. Frontonasal broader than long, contacting both anterior and posterior canthals; frontal in contact with interparietal. Primary temporals 5–5; secondary temporals 4–4; second primary temporal in contact with lower three secondary temporals, but separated from fifth medial supraocular by broad contact of third primary temporal with upper postocular. Supralabials 14–14; infralabials 11–11; sublabials 6–6; postmentals paired.

Dorsal scales smooth, slightly convex, highly polished, in 18 longitudinal and 56 transverse rows; lateral fold reduced to two or three rows of granules at midbody; ventrals smooth and polished, in 14 longitudinal and 64 transverse rows.

Dorsal ground color (in alcohol) light grayish brown, shading to much lighter gray on lower sides. Dorsum crossed by 10 light bands between neck and base of tail, each band a single irregular row of whitish scales with scattered darker scales at edges; first band at middle of neck, second over forelegs, last between hind legs. Tail light-banded at five-scale intervals, each band with distal dark edge. Top of head and upper sides of legs ash brown; venter immaculate pearly white, ends of dorsal bands faintly visible on outer scale rows; sides of head and labials immaculate.

Description of Paratype. The paratype agrees with the holotype in most details of scutellation, except that the postrostral series consists of three, rather than two scales. The extra scale results from an irregular division of the right anterior internasal just above the labials. There are 13–13 supralabials, 12–12 infralabials, 53 transverse rows of dorsal scales and 65 transverse rows of ventrals. The tail is fragmented, and it is uncertain whether all the pieces have been saved. The color pattern has been affected by long storage in formalin, and the entire body is pallid, with only faint traces of cross bands. Measurements in mm are: snout-vent length 74.8, axilla to groin 40.0, fore leg 17.5, hind leg 21.0, snout to posterior edge of ear 17.0, head width 10.0.

Comparisons. *Gerrhonotus lugoi* is a member of the subgenus *Gerrhonotus* (*sensu* Stebbins, 1958), probably most closely related to *Gerrhonotus liocephalus* Wiegmann. The combination of lack of contact between suboculars and temporals, absence of granular scales on shank and forearm, presence of an azygous frontonasal, and cross-banded color pattern distinguishes *G. lugoi* from species of the subgenus *Barisia* (genus *Barisia* of Tihen, 1949). *Gerrhonotus lugoi* differs from *G. kingii* (Gray), *G. panamintinus* Stebbins, *G. multicarinatus* (Blainville), *G. cedrosensis* Fitch, *G. paucicarinatus* Fitch, and *G. coeruleus* Wiegmann (genus *Elgaria* of Tihen, 1949) in having nasals separated from the rostral by the anterior internasals, and by absence of contact between the last subocular and the lower primary temporal. The cross-banded pattern of *G. kingii* and *G. panamintinus* (Stebbins, 1958: 4–5) consists of alternating dark and light bands of approximately equal width, unlike the narrow, sometimes dark-edged, light bands of *G. lugoi* and *G. liocephalus*. Adults of other *Elgaria* species tend to become banded with age, but the bands represent realignments of melanic pigment from lateral stripes into narrow, dark (not light) dorsal bands (Stebbins, 1966: plate 25). Young of these species have a distinct light mid-dorsal stripe and dark lateral fields.

In color pattern and scutellation of head and body *G. lugoi* finds closest agreement with *Gerrhonotus liocephalus*. Principal points of difference are reduction of the postrostral scale series and absolutely smooth body scales of *lugoi*. In the long-snouted *liocephalus* the rostral is bordered not only by the anterior internasals, but also by an azygous postrostral wedged between the anterior and posterior internasals. The supranasals are expanded dorsally, extending between the anterior and posterior internasals to contact the postrostral. This area between frontonasal and rostral is shortened in *lugoi*, the supranasals are not

expanded dorsally, and the postrostral area is covered only by anterior and posterior internasals.

The smooth, polished dorsal scales of *G. lugoi* contrast sharply with the heavily keeled dorsal scales of *liocephalus*. It is possible that keeling is a late development in the ontogeny of *lugoi*, not yet evident in the subadult holotype and paratype. Since keels are present in *liocephalus* at hatching (Werler, 1951: plate 3, figs. 6 and 7), I regard the observed difference as significant. The slightly convex, highly polished dorsal scales of *lugoi* are unlike those of any other species of *Gerrhonotus*. In glossiness they most resemble the polished scales of *Ophisaurus*.

Gerrhonotus lugoi is strikingly different from the Coahuila subspecies of the widespread and variable *Gerrhonotus liocephalus*. *Gerrhonotus liocephalus infernalis*, which occurs at higher elevations throughout Coahuila, is a large subspecies with heavily keeled dorsal scales, a boldly marked venter, and dark-edged dorsal bands. Unlike *lugoi*, *infernalis* usually has 12 longitudinal rows of ventrals, and fewer than 54 transverse rows of dorsals. In the tendency for increased body scale counts and reduction of the color pattern *lugoi* resembles the more southerly subspecies *Gerrhonotus liocephalus loweryi* (type-locality Xilitla, San Luis Potosí). In *loweryi*, however, the second primary temporal contacts the fifth medial supraocular.

A specimen of *Gerrhonotus* from Ciudad del Maiz, San Luis Potosí (LSUMZ 488) was cited by Tihen (1948) as lacking a postrostral. I have examined this specimen and concur in allocating it to *loweryi*, but disagree with Tihen's interpretation of the head scales. A postrostral is present, but it is divided, and the anterior internasals are reduced and inconspicuous.

The relationships of *Gerrhonotus lugoi* will be clarified when adult specimens are collected, and maximum amount of dorsal scale keeling, length of tail, definitive color pattern, and mode of reproduction become known.

Ecology. The paratype of *Gerrhonotus lugoi* was taken under unusual circumstances, in the municipal slaughterhouse of the town of Cuatro Ciénegas de Carranza. Perhaps *lugoi* does not occur naturally in the sandy and saline flats around the slaughterhouse, but was transported there with livestock. The holotype was collected under natural conditions, and provides the only certain information on the habitat of the species. This specimen was found in a rock slide on the north side of Sierra de San Marcos, near the base of the mountain. A photograph taken near the type-locality has been published by Williams (1968:

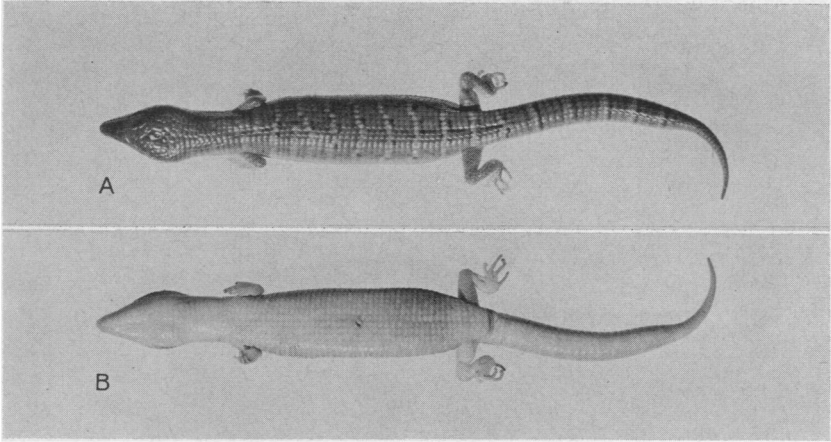


Fig. 1. *Gerrhonotus lugoi* sp. nov., dorsal and ventral views of the holotype, CM 49012, 79.4 mm snout-vent length.

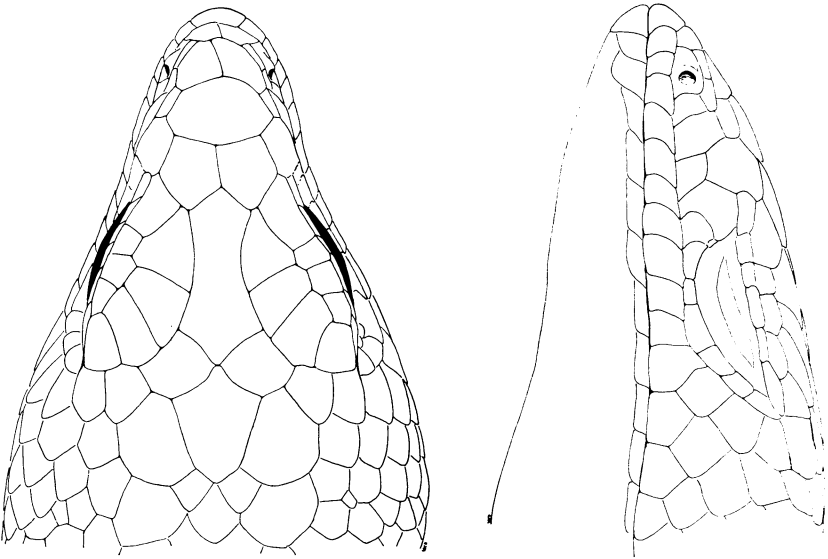


Fig. 2. *Gerrhonotus lugoi* sp. nov., dorsal and lateral views of the head of the holotype, CM 49012.

23). The lizard was seen just at dusk moving in an area of loose rocks, and immediately went underground when pursued. The collectors dug out the lizard from under a pile of loose rocks. According to the collector's field notes (Max A. Nickerson, pers. comm.), the lizard ap-

peared to use its tail as an aid in maneuvering among the rocks, and partially wrapped its tail around the fingers of the collector after capture.

Two other similar-sized individuals were seen within 0.5 km of the type-locality in 1968; both escaped in loosely piled boulders. Although *Gerrhonotus lugoi* is known unquestionably only from the area of the type-locality, similar habitats lie around the eastern and northern edges of the Cuatro Ciénegas Basin.

DISCUSSION. Most anguids are not well adapted for life in extremely arid regions, and in desert areas the distribution of alligator lizards is mostly limited to mesic islands, either the tops of higher mountain ranges (Bogert and Porter, 1967), or desert oases (Richmond, 1965). The montane island type of distribution is exemplified by the Coahuila populations of *Gerrhonotus liocephalus*. I have examined series of *Gerrhonotus liocephalus* from the Sierra del Carmen to the north of the Cuatro Ciénegas Basin (CAS 10500–10501, 10509–10513, USNM 103700–103705), and from the Sierra de la Gloria near Monclova, east of the Cuatro Ciénegas Basin (FM 48528–48530). All of these lizards were collected in Upper Sonoran and Transition zone forests, at or above 1500 m. elevation. The scanty ecological information available suggests that *Gerrhonotus lugoi* is a species of the desert floor, or at least of rocky areas in the lower reaches of canyons near the desert floor. The polished scales, shortened snout, and shorter toes (28 lamellae under fourth toes of hind feet; 33–37, average 34.7 in Coahuila *liocephalus*) might be interpreted as adaptations to a skink-like burrowing existence in such areas. Regardless of details of the habits of *lugoi*, the differences in physiological requirements of life in basin and montane situations indicates a long history of divergent evolution of these two species.

The evolutionary history and ultimate relationships of *Gerrhonotus lugoi* are conjectural, but simple differentiation *in situ* from surrounding populations of *G. liocephalus* is not supported. According to Tihen (1949) ancestral stock of the *Gerrhonotus-Elgaria* group moved to the southern Texas border region from the Mexican Plateau during the Lower Oligocene. From this center of differentiation one series spread southward as *liocephalus*, and another lineage produced the series of *Elgaria* species. *Gerrhonotus lugoi* could represent an early isolate of proto-*liocephalus* stock, or perhaps of undifferentiated *Gerrhonotus-Elgaria* stock. *G. lugoi* has persisted through the dispersal of *liocephalus* over much of northeastern México, and through events that produced the present fragmentation of the range of *liocephalus* (Milstead, 1960).

Early derivation of *G. lugoi* from ancestral *Gerrhonotus-Elgaria* stock is supported by the conception of the Cuatro Ciénegas Basin as an isolated refugium dating from middle or early Tertiary time (Cole and Minckley, 1966; Taylor, 1966) or earlier (Minckley, 1969). An analogous hypothesis of origin from prototypic *Elgaria* stock has been advanced for the California montane *Gerrhonotus panamintinus* (Stebbins, 1958: 15).

Gerrhonotus lugoi is named for José Lugo, Jr. of Cuatro Ciénegas, in recognition of his contributions to studies of the Cuatro Ciénegas Basin fauna. I thank W. L. Minckley of Arizona State University (ASU) for permission to describe this species, and for cooperation in preparation of the manuscript. Arthur C. Hulse and Max A. Nickerson provided information on the habitat of the holotype specimen. Max A. Nickerson, Neil D. Richmond, and Joseph A. Tihen kindly read and commented on the manuscript. Field work was sponsored by National Science Foundation grants GB 2461 and GB 6477 (to Minckley). I thank George Iannarone, Chicago Academy of Sciences (CAS); Robert F. Inger, Field Museum (FM); Douglas A. Rossman, Museum of Zoology, Louisiana State University (LSUMZ); Ernest E. Williams, Museum of Comparative Zoology, Harvard; and James A. Peters, United States National Museum (USNM) for loans of Mexican *Gerrhonotus*. Permission for collecting in México granted by the Departamento de Conservación y Propagación de la Fauna Silvestre, Secretaría de Agricultura y Ganadería, is gratefully acknowledged.

LITERATURE CITED

- BOGERT, CHARLES M., and ANN P. PORTER. 1967. A new species of *Abronia* (Sauria, Anguidae) from the Sierra Madre del Sur of Oaxaca, Mexico. *Amer. Mus. Novitates* 2279: 1-21.
- COLE, GERALD A., and W. L. MINCKLEY. 1966. *Speocirolana thermydronis*, a new species of cirolanid isopod crustacean from central Coahuila, México. *Tulane Stud. Zool.* 13: 17-22.
- HUBBS, CARL L. and ROBERT RUSH MILLER. 1965. Studies of cyprinodont fishes. XXII. Variation in *Lucania parva*, its establishment in western United States, and description of a new species from an interior basin in Coahuila, México. *Misc. Publ. Mus. Zool. Univ. Michigan* 127: 1-104.
- LEGLER, JOHN M. 1960. A new subspecies of slider turtle (*Pseudemys scripta*) from Coahuila, México. *Univ. Kansas Publ., Mus. Nat. Hist.* 13: 73-84.
- MILLER, ROBERT RUSH. 1968. Two new fishes of the genus *Cyprinodon* from the Cuatro Cienegas Basin, Coahuila, Mexico. *Occas. Papers Mus. Zool. Univ. Michigan* 659: 1-15.
- MILLER, ROBERT RUSH, and W. L. MINCKLEY. 1963. *Xiphophorus gordonii*, a new species of platyfish from Coahuila, México. *Copeia* 1963: 538-546.
- MILSTEAD, WILLIAM W. 1960. Relict species of the Chihuahuan Desert. *Southwestern Nat.* 5: 75-88.

- MINCKLEY, W. L. 1962. Two new species of fishes of the genus *Gambusia* (Poeciliidae) from northeastern Mexico. *Copeia* 1962: 391-396.
- . 1969. Environments of the Bolsón of Cuatro Ciénegas, Coahuila, México, with special reference to the aquatic biota. Univ. Texas at El Paso Publ., Sci. Series 2: 1-65.
- RICHMOND, NEIL D. 1965. Distribution of *Gerrhonotus paucicarinatus* Fitch. *Copeia* 1965: 375.
- STEBBINS, ROBERT C. 1958. A new alligator lizard from the Panamint Mountains, Inyo County, California. *Amer. Mus. Novitates* 1883: 1-27.
- . 1966. A field guide to western reptiles and amphibians. Houghton Mifflin, Boston. xvi + 279 pp.
- TAYLOR, DWIGHT W. 1966. A remarkable snail fauna from Coahuila, México. *Veliger* 9: 152-228.
- TIHEN, J. A. 1948. A new *Gerrhonotus* from San Luis Potosi. *Trans. Kansas Acad. Sci.* 51: 302-305.
- . 1949. The genera of gerrhonotine lizards. *Amer. Midl. Nat.* 41: 580-601.
- WEBB, ROBERT G., and JOHN M. LEGLER. 1960. A new soft-shelled turtle (genus *Trionyx*) from Coahuila, Mexico. *Univ. Kansas Sci. Bull.* 40: 21-30.
- WEBB, ROBERT G., W. L. MINCKLEY, and JAMES E. CRADDOCK. 1963. Ecological observations on the Coahuilan box turtle, *Terrapene coahuila* (Testudines, Emydidae). *Southwestern Nat.* 8: 89-99.
- WERLER, JOHN E. 1951. Miscellaneous notes on the eggs and young of Texan and Mexican reptiles. *Zoologica (New York)* 36: 37-48, pl. 1-7.
- WILLIAMS, STANLEY C. 1968. Scorpions from northern Mexico: five new species of *Vejovis* from Coahuila, Mexico. *Occas. Papers California Acad. Sci.* 68: 1-24.

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