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## A New Species of Lizard (Genus *Cnemidophorus*) from Mexico

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Throughout much of the range of the genus *Cnemidophorus* there are found sympatric pairs of apparently closely related species. Thus *Cnemidophorus guttatus* and *C. deppei* coexist in the tropical lowlands of both eastern and western Mexico. In southern Arizona and northern Sonora, *Cnemidophorus stictogrammus* and *C. sacki exsanguis* are found together (Lowe, 1956). The Tepalcatepec Valley of Michoacán is inhabited by *Cnemidophorus sacki* and *C. calidipes* (Duellman, 1955). Farther south, in the basin of the Río Balsas, *Cnemidophorus gigas* and *C. s. sacki* form a pair (Davis and Smith, 1952).

In the vicinity of the city of Oaxaca the very large *Cnemidophorus sacki australis* is found together with *C. sacki bocourti*, a smaller form.<sup>1</sup> *Cnemidophorus s. australis* also occurs in northern Oaxaca and adjacent Puebla and is paired with a smaller species that has escaped the critical attention of herpetologists. With reference to its position as the smaller member of a species pair, I name this form:

### *Cnemidophorus parvisocius*, new species

*Cnemidophorus communis australis* GADOW, 1906, p. 352 (part; some of the specimens from Cuicatlán, Oaxaca).

*Cnemidophorus sexlineatus gularis*, BURT, 1931, p. 117 (part; some of the specimens from Cuicatlán, Oaxaca).

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<sup>1</sup> I am well aware of the anomaly in the occurrence of two subspecies of a single species at one locality. The nomenclature here is faulty and will be corrected in a forthcoming paper (Duellman and Zweifel, MS).

TYPE: A.M.N.H. No. 65774, adult male, collected by H. O. Wagner at Cuicatlán, Oaxaca, Mexico, at an elevation between 580 and 650 meters between June 7 and June 12, 1944.

PARATYPES: A.M.N.H. Nos. 65771–65773, 65775, and five untagged specimens, all from the type locality; C.N.H.M. No. 1022 (12 specimens), also from the type locality, collected by S. E. Meek, June, 1901; and A.M.N.H. Nos. 65762–65765, collected by Wagner at Teotitlán, Oaxaca, 900–1050 meters, May 20, 1944.

DIAGNOSIS: A species of the *sexlineatus* group that differs from all other known species of the group in possessing the following combination of characters: size moderately small, the largest among 27 specimens measures 80 mm. snout to vent; scales around midbody (excluding enlarged ventrals) average about 94; post-antibrachial scales not markedly enlarged; third supraocular usually not in contact with frontoparietal, but separated from it by a row of circumorbitals.

DESCRIPTION OF TYPE SPECIMEN: Length from snout to vent, 70 mm.; tail length, 180 mm. There are four supraoculars, and a row of small scales separates the first and second supraoculars. A row of circumorbital scales extends from the rear of the orbit to a point just anterior to the suture between the second and third supraoculars, completely separating the third supraocular and frontoparietal on each side of the head. Scales of the gular fold (mesoptychials) are large and abruptly set off from the granular scales in the fold. Post-antibrachial scales are relatively small, little more than twice the diameter of the granules above and below them, and grade gradually into the granules without an abrupt transition in size. There are 95 scales around midbody (excluding eight rows of enlarged ventrals), and approximately 234 scales along the midline from the interparietal to the base of the tail. There are four rows of small scales between the ventrals and the enlarged anal series of two scales on the midline and a posterior pair. There are 44 femoral pores—21 right and 23 left.

Although the specimen is discolored, certain features of the pattern can be made out. A faint vertebral light stripe can be traced from the interparietal approximately to midbody. The paravertebral stripes are more distinct than the vertebral and extend from the interparietals to the rump, where they are very faint. The paravertebrals are separated by 12 scale rows at midbody. The dorsolateral stripes are broader than the paravertebrals and run from the posterior corner of the eye to the rump. They are not continued, however, onto the tail. The lateral stripes are faintly visible between the eye and ear and are distinct and continuous from the ear to above the foreleg. At the level of the fore-

leg, the lateral stripe breaks up into a series of spots. The dark field below the lateral stripe bears vertically elongate light spots that for the most part correspond in position to the spots of the lateral stripe. Faint traces of light spots can be made out in the upper lateral and dorsolateral dark fields.

The chin is pale and almost immaculate, with only a few tiny dark flecks. The scales of the throat and chest are dark, with light margins, and those of the abdomen are almost totally dark. The lower surfaces of the forelegs and hind legs, the anal region, and the under side of the tail are pale and virtually without markings.

**VARIATION IN SCUTELLATION:** In 23 specimens of the type series the circumorbital series extends anteriorly at least to the level of the frontoparietal-frontal suture, completely separating the frontoparietal from the third supraocular. In 13 of these lizards, the circumorbital series terminates anterior to the suture between the second and third supraoculars, and in the other 10 at or anterior to the frontoparietal-frontal suture. In two specimens the circumorbitals terminate slightly posterior to the frontoparietal-frontal suture, and in another the frontoparietal is in contact with the third supraocular for half of the length of the frontoparietal.

The single specimen from Puebla (A.M.N.H. No. 18996) has a complete series of circumorbitals, separating the second, third, and fourth supraoculars from the median head scales. Complete series are also seen in two specimens from Cuicatlán.

The number of scales around midbody in 26 specimens ranges from 86 to 104, mean  $93.5 \pm 0.8$ . The number of femoral pores ranges from 33 to 46 in 27 specimens, mean  $40.5 \pm 0.6$ . No obvious sexual dimorphism in scale counts is evident, though a larger sample might reveal subtle differences.

None of the specimens has abruptly enlarged post-antebrachial scales. At the largest, these scales are about three to four times the diameter of the smallest granules above and below them, and grade imperceptibly from one extreme to the other.

**VARIATION IN SIZE:** The largest specimen in the series is a male 80 mm. in length from snout to vent. The largest female contains large eggs and measures 68 mm. Other gravid females are 65 and 66 mm. long.

**VARIATION IN COLOR PATTERN:** The specimens composing the type series are much discolored, so a detailed account of the ontogenetic development of pattern cannot be given. However, enough of the pattern can be made out in specimens from Cuicatlán to permit a

general description. The smallest specimen (snout to vent length, 49 mm.) has distinct lateral, dorsolateral, and paravertebral stripes that run the length of the trunk. The dorsolateral and lateral stripes are present on the neck, but only the lateral stripe is continuous on to the tail, where the dorsolateral stripe is represented by spots. A vertebral stripe is present and can be traced to the rump but is distinct only on the neck and anterior part of the trunk. There are no light spots in any of the fields. The gular region is pale, with a few dark flecks at the edges. The chest is pale, but many of the abdominal scutes have the anterior half darkened.

A specimen only slightly larger (56 mm. in snout to vent length) has large light spots in the field below the lateral stripe; a few of these spots spread vertically, forming bars. Traces of faint light spots are seen in the predominantly dark lateral and dorsolateral fields. The gular region is pale, with a few dark flecks, and the remainder of the ventral surfaces from throat to abdomen is black.

The chief changes in pattern with growth are three: the spots of the field below the lateral stripe spread vertically; the lateral stripe breaks up into spots which fuse with the vertical bars derived from the spots of the lower field; small light spots appear on the hind limbs, and the spots of the dorsolateral and lateral fields become slightly intensified.

The pattern changes are not well correlated with body size in the small sample in which the pattern can be determined. One measuring 66 mm. in snout to vent length has the lateral stripe broken into spots, but barring in the lower field is poorly developed. Other specimens of similar size are identical in pattern to the specimen 56 mm. in length described above, so far as can be told. The largest specimen on which the pattern can be seen measures 72 mm. in snout to vent length and has well-developed bars in the lower field. The lateral stripe bears periodic constrictions but is not fragmented into spots. The small light spots of the dorsolateral and lateral fields are more distinct than in the smaller specimens, though spots are not particularly prominent on the hind limbs.

One specimen has paired vertebral stripes, but only a single stripe is present in the others. In no case is the vertebral stripe so distinct as are the paravertebrals or dorsolaterals, and usually the vertebral cannot be traced posterior to the shoulder region. The lateral stripe is somewhat broader and lighter in color than the other stripes and probably was a different color in life.

The description of the ventral surface of the individual 56 mm. in length applies with little modification to the larger specimens. The

ventral surfaces were probably largely dark blue or black in life, though some darkening seen in the specimens may have been caused by formalin.

Separation of the paravertebral stripes can be determined in only 14 specimens. The average separation is 11.6 scales, range 9–14. The ratio of paravertebral separation to scales around midbody (PV/SA) ranges from 0.098 to 0.144, mean  $0.124 \pm 0.004$ .

The single specimen from Puebla closely resembles the specimens from Oaxaca in scutellation, but differs slightly in dorsal pattern. Despite the fact that the specimen, which measures 67 mm. from snout to vent, is in a better state of preservation than those from Cuicatlán, no distinct spots are seen in the lateral or dorsolateral fields. Even the spots in the lower lateral field are faint and ill defined. There is a pair of vertebral stripes, and the faint paravertebrals are separated at midbody by about 16 scale rows (PV/SA = 0.172). The ventral surfaces, however, are much as in the other specimens. The chin is pale and immaculate, the chest solid black, and the abdomen heavily suffused with black or dark blue.

COMPARISON WITH OTHER SPECIES: *Cnemidophorus parvisocius* resembles its sympatric relative *C. sacki australis* in having relatively small scales on the posterior surface of the forearm, but is well distinguishable otherwise in scutellation and in size. The scales around midbody number more than 120 in *australis* (maximum 104 in *parvisocius*), and the frontoparietal and third supraocular of *australis* are almost always (38 of 39 specimens examined by me) in contact. The largest *parvisocius* measures only 80 mm. in snout to vent length, but *australis* attains a length greater than 150 mm.

Southeast of the city of Oaxaca, in the vicinity of Tlacolula and Mitla, *C. sacki australis* is sympatric with *C. s. bocourti*. In addition to the ecological similarity of their association with the larger and more widespread species, *bocourti* and *parvisocius* also bear some physical resemblance to each other. The largest of 20 *bocourti* is 89 mm. from snout to vent, little larger than the 80 mm. maximum known for *parvisocius*. Scales around midbody in 20 *bocourti* average 90.7 (82–98), probably not significantly fewer than in *parvisocius* (mean 93.5, range 86–104). The two forms are clearly different in the relative size of the post-antebrachial scales, which are always enlarged in *bocourti*, usually markedly and abruptly so. The frontoparietal and third supraocular are in contact in 19 of 20 specimens of *bocourti*, and the scutellation of the unique individual appears abnormal and irregular. By comparison, only three of 27 *parvisocius* have these scales

in contact. Femoral pores in *bocourti* average 32.3 (range 28–37), which is significantly fewer than in *parvisocius* (mean 40.5, range 33–46). The larger specimens of *parvisocius* are striped and spotted, not spotted without stripes as is *bocourti*. Although it is conceivable that intermediates between *bocourti* and *parvisocius* exist, the differences noted are suggestive of specific rather than subspecific relationship.

*Cnemidophorus sacki sacki* is the smaller member of a species pair (with *C. gigas*) in Morelos and Guerrero and thus should be compared to *parvisocius*. *Cnemidophorus s. sacki* is larger, reaching at least 110 mm. in snout to vent length. It is similar to *parvisocius* in dorsal scutellation, having an average of 98 scales around midbody (range 91–113), but has enlarged post-antibrachial scales (Zweifel, 1959). The frontoparietal and third supraocular are separated in only five of 35 specimens.

A species that resembles *parvisocius* in having extensive development of the circumorbital scales is *C. calidipes*, the smaller member of a species pair inhabiting the Tepalcatepec Valley in Michoacán. This species differs from *parvisocius* in having a more extensive circumorbital series, usually separating the second as well as the third supraocular from the median head scales. The post-antibrachials are enlarged, and the dorsal scales of the body are more coarse than in *parvisocius*, averaging about 75 (66–86) around midbody (W. E. Duellman, personal communication). The largest *calidipes* in the type series of 18 specimens measures 74 mm. from snout to vent (Duellman, 1955), suggesting that this species and *parvisocius* are quite similar in maximum size.

Another species resembling *parvisocius* in having well-developed circumorbital series is *C. neomexicanus* (*C. perplexus*, *fide* Maslin, Beidleman, and Lowe, 1958) of the Río Grande Valley in New Mexico and adjacent Texas. This species resembles *parvisocius* also in having small post-antibrachial scales. The dorsal scutellation, however, is much coarser, with an average of 74.9 (71–80) scales around midbody.

It seems unnecessary to detail further the comparison of *Cnemidophorus parvisocius* with other species in the *sexlineatus* group. So far as is known, *parvisocius* is unique in the combination of characters of scutellation given in the diagnosis.

**TAXONOMIC STATUS OF *Cnemidophorus parvisocius*:** To judge from the literature, *parvisocius* has been studied by only two persons previous to my investigation—Gadow (1906) and Burt (1931).

Gadow's type series of *Cnemidophorus communis australis* (no holo-

type was specified) included "twelve specimens collected by Dr. Meek near Cuicatlan" (p. 353) and "seven specimens collected by Dr. Meek [actually collected by Heller and Barber, according to records of the Chicago Natural History Museum] at Lagunas . . . on the western slope of the Isthmus [of Tehuantepec, Oaxaca]" (p. 352). Certain of these specimens were obtained by the British Museum (Natural History) in exchange with the Chicago Natural History Museum. One of the exchange specimens, B.M.(N.H.) No. 1906.7.19.11, was designated the lectotype of *Cnemidophorus sacki australis* by Smith and Taylor (1950, p. 182), and the type locality was restricted to Cuicatlán, Oaxaca. Through the courtesy of Mr. J. C. Battersby, I am informed that the lectotype of *australis* measures 138 mm. from snout to vent and has 124 scales around midbody. It is evident that the name *australis* cannot be applied to the smaller of the two species at Cuicatlán, here named *parvisocius*.

Burt (1931, p. 107) remarks that "the original description of *Cnemidophorus communis australis* from Oaxaca by Gadow (1906) is very confusing and is so involved that it is sometimes contradictory." A major source of confusion is that Gadow had three distinct forms, including at least two species, in his type series. The lizards from Cuicatlán are *C. sacki australis* and *C. parvisocius*. Those from Lagunas are a large form possibly subspecifically related to *australis*, but quite distinct in color pattern. The solution for the confusion offered by Burt is to assign all *Cnemidophorus* of the *sexlineatus* group in Mexico (excepting only those from the extreme northwestern part of the country) to one form, *C. sexlineatus gularis*. Studies by several investigators in recent years have revealed that Burt's assumption of a single form was greatly in error.

Though it might, at first consideration, seem the best and most conservative course to include all the allopatric smaller members of the species pairs (excluding *C. deppei*, a member of another species group) in a single species, such a solution would contribute nothing to our understanding of the true situation and would almost certainly be biologically incorrect. For example, the smaller member of the pair in the Balsas Valley of Guerrero and Morelos, *Cnemidophorus s. sacki*, evidently belongs to the same species as the larger member of the pair in the tributary Tepalcatepec Valley of Michoacán. The pairing is evidently an ecological adjustment that may in some instances, but not in all, reflect close phylogenetic relationship of corresponding members of allopatric pairs.

DISTRIBUTION: *Cnemidophorus parvisocius* is known from Cuicatlán

and Teotitlán in northern Oaxaca. A specimen (A.M.N.H. No. 18996) from between Venta Salada and San Sebastian, northwest of Teotitlán in Puebla, appears to represent this species but differs slightly in color pattern from the Oaxacan specimens, as noted above.

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#### BIBLIOGRAPHY

BURT, CHARLES E.

1931. A study of the teiid lizards of the genus *Cnemidophorus* with special reference to their phylogenetic relationships. Bull. U. S. Natl. Mus., no. 154, pp. i-viii, 1-286, figs. 1-38.

DAVIS, WILLIAM B., AND HOBART M. SMITH

1952. A new whiptailed lizard (genus *Cnemidophorus*) from Mexico. Herpetologica, vol. 8, pp. 97-100.

DUELLMAN, WILLIAM E.

1955. A new whiptail lizard, genus *Cnemidophorus*, from Mexico. Occas. Papers Mus. Zool., Univ. Michigan, no. 574, pp. 1-7, figs. 1-2.

GADOW, HANS

1906. A contribution to the study of evolution based upon the Mexican species of *Cnemidophorus*. Proc. Zool. Soc. London, vol. 1, pp. 277-375, figs. 61-83, pl. 20.

LOWE, CHARLES H., JR.

1956. A new species and a new subspecies of whiptailed lizards (genus *Cnemidophorus*) of the inland Southwest. Bull. Chicago Acad. Sci., vol. 10, pp. 137-150, figs. 1-4, tables 1-3.

MASLIN, T. PAUL, RICHARD G. BEIDLEMAN, AND CHARLES H. LOWE, JR.

1958. The status of the lizard *Cnemidophorus perplexus* Baird and Girard (Teiidae). Proc. U. S. Natl. Mus., vol. 108, pp. 331-345.

SMITH, HOBART M., AND EDWARD H. TAYLOR

1950. An annotated checklist and key to the reptiles of Mexico exclusive of the snakes. Bull. U. S. Natl. Mus., no. 199, pp. i-v, 1-253.

ZWEIFEL, RICHARD G.

1959. Variation in and distribution of lizards of western Mexico related to *Cnemidophorus sacki*. Bull. Amer. Mus. Nat. Hist., vol. 117, pp. 57-116, figs. 1-6, pls. 43-49, tables 1-4.