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A New Species of *Leiolopisma* (Reptilia: Sauria) from Mexico*

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ABSTRACT. *Leiolopisma caudaequinae* is described from Horsetail Falls, near Monterrey, Nuevo León, Mexico, the type in the Museum of Natural History, University of Illinois. The status of the other four North American members of its group is discussed and *L. forbesorum* and *L. gemmingeri* are regarded as subspecies. A key to the five forms is appended.

A *Leiolopisma* recently received as a gift to the University of Illinois Museum of Natural History from Mr. J. P. Craig, and collected at Horsetail Falls in Nuevo León, Mexico, differs markedly, but chiefly in leg proportions, from its closest geographic relative, *L. forbesorum* of high elevations in the state of Hidalgo. A query to the authority on Mexican *Leiolopisma*, Dr. Edward H. Taylor, revealed that for a number of years he has possessed specimens of the long-legged northern species from San Luis Potosí. Upon his suggestion the form is named herewith. I am indebted to him for the loan of comparative material and assistance in preparing this account, and to J. P. Craig for the gift of the type.

Leiolopisma caudaequinae † sp. nov.

Holotype. Univ. Ill. Mus. Nat. Hist. No. 10131, an adult male from Horsetail Falls, 25 miles south of Monterrey, Nuevo, León, collected by J. P. Craig, April 19, 1946. *Paratypes.*—Two, E. H. Taylor Coll. Nos. 23886, 23892, from a locality 10 miles west of Naranjo, San Luis Potosí, on the Antiguo Morelos-San Luis Potosí highway, along a small creek. *Hypoparatypes.* Four, E. H. Taylor Coll. Nos. 23888-23891 (all juveniles), from the same locality as the paratypes.

* Contribution from the Museum of Natural History and the Department of Zoology, University of Illinois, Urbana, Illinois.

† In reference to Horsetail Falls, the type locality.

Diagnosis.—A member of the genus *Leiolopisma* similar and related to *L. silvicolum*, having a divided frontoparietal, 61-70 dorsals, a brown lateral stripe involving ear, 28-32 scale rows, and large, strong limbs overlapping in adults when adpressed and the forelimb reaching eye; differing from *silvicolum* in having usually 1 pair of nuchals, 17-19 lamellae under the fourth toe, and a continuous, unbroken dorsolateral light stripe.

Description of holotype.—A mature male; frontal elongate, width $\frac{4}{5}$ of length, its distance from tip of snout $\frac{3}{4}$ its length, which is about $\frac{5}{6}$ length of frontoparietals and interparietal combined; internasal very large, almost as long as broad, in contact with frontal by a suture almost as long as that with rostral; prefrontals a fourth larger than nasals; frontoparietal divided, the median suture $\frac{2}{3}$ length of interparietal; parietals in contact behind frontal with a suture $\frac{1}{5}$ length of interparietal. Four supraoculars, anterior narrowly in contact with prefrontal, 2nd narrowly in contact with frontoparietal, 3rd smallest; 7 superciliaries, anterior largest. Nasal entire; postnasal $\frac{2}{3}$ size of nasal (divided into 2 superimposed scales on 1 side); a nearly square loreal $\frac{1}{4}$ larger than anterior superciliary; one large (lower) and 3 (4 on one side) small preoculars; 2 presuboculars above 4th supralabial, a little smaller than large lower preocular; 2 tiny suboculars above 5th supralabial; two postsuboculars in contact with 6th supralabial; 3 large and several small postoculars; nine upper and 12 lower palpebrals. Seven supralabials, 6th slightly larger than 7th, 4th smallest; mental with a longer labial border than rostral; 6 infralabials, 5th longest, 1st smallest; postmental nearly twice as large as mental, in contact laterally with 2 infralabials; 3 chinshields on each side, the scales of the anterior pair in contact medially, those of 2nd separated by 1 scale, the 3rd by 3; a small postgenial, longer than broad.

Ear large, 1.6 x 1.1 mm., tympanum deeply sunken; anterior temporal very slightly larger than lower secondary; upper secondary temporal very large, $\frac{2}{3}$ size of parietal; two relatively large postlabials followed by 3 vertical rows of small scales in front of ear; 1 large pair of nuchals, in contact with secondary temporal; on one side a smaller nuchal behind the other; two tertiary temporals, lower largest, between nuchal and postlabials.

Dorsal and lateral scales with several minute keels or pits, especially prominent on lateral scales; 63 scales from interparietal to level of posterior edge of hind leg; 30 scale rows at middle of body; 17 lamellae on 4th toe.

Limbs large, overlapping 3 scale-lengths, forelimb reaching rear corner of eye opening; median subcaudals a little wider than adjacent scales, and a little longer, every other scale in contact laterally with two scales (a large and a small), the alternating scales in contact with one on each side; regenerated portion of tail with broad median subcaudals each in contact laterally with one scale.

Ground color a dark tan; dorsal surface not marked; a fine dorsolateral light line, lacking melanophores, with a well-defined lateral border (formed by a very dark brown lateral band), and a dimly evident median border, following median edge of the 4th scale row, originating on snout and terminating near base of tail; a lateral, very dark brown, continuous band (not interrupted by light streaks) below this, occupying 2 and 2 half scale rows, its lower edge rather irregular and tending to blend gradually with the adjacent slate color; sides below band sparsely pigmented; belly not pigmented; a few melanophores on sides of ventral surfaces of neck and head; a poorly defined light line from snout below eye and through ear to arm insertion.

Variation.—The paratypes are very similar to the type. Variations in important features are indicated in the accompanying table. The four hypoparatypes likewise are very similar, and agree in all diagnostic characters, even limb proportions. Since a differential growth rate occurs in these lizards, the most reliable proportions are, however, those of the adult, to which generalizations here are restricted. The dorsal scales number 62, 64 and 67 in hypoparatypes which can be counted, and the scale rows around middle of body 28, 28, 30, 32 (all carefully checked several times). The nuchals are 1 pair in two, 1-½ pairs in one, 2 pairs in one; the members of the anterior pair are separated from upper secondary temporal in 3, from each other in 1. The lamellae under the 4th toe are 18 (two) and 19 (two).

Comparisons.—From *forbesorum* the present form differs chiefly in length of foreleg (reaching orbit) and extent of overlap of adpressed limbs (touching or overlapping as much as 7 scale lengths). In *forbesorum* the foreleg does not extend forward beyond a point halfway between eye and ear, and the adpressed limbs are separated by from 1 to 8 scales. The most conspicuous difference is in limb proportions, those of *caudaequinae* being conspicuously larger and longer than those of *g. forbesorum*. In addition the new species possesses a different curve of variation in scale row count around middle of body (28, four; 30, two; 32, one), although it overlaps

that of *g. forbesorum* (26, two; 27, one; 28, seven) so greatly that it has no diagnostic value, and even its significance is questionable.

L. gemmingeri, like *forbesorum*, has short limbs. *L. silvicolium*, the only other species in Mexico of this group, has long limbs as in *caudaequinae*, but the nuchals are usually in 2 rows, the lamellae under the 4th toe 20, the dorsolateral light stripe is broken, and the scale rows more regularly 30 or 32.

Relationships.—The “Oligosoma” group of Taylor (Copeia, 1937, p. 11) in North America consists of *laterale*, *gemmingeri*, *forbesorum*, *caudaequinae* and *silvicolium*. It is characterized by having a divided frontoparietal, and a peculiar variation in size of the paraventral subcaudals, so that many scales of the median row are in contact laterally with 2 scales instead of the normal single scale. The only other North American members of the genus belong to the “Mocoa” group of Taylor (*loc. cit.*) and are characterized by a single frontoparietal, and normal median subcaudals each of which is in contact laterally with a single scale.

Of the “Oligosoma” group, *laterale* is easily distinguished from others by having the upper tertiary temporal (occasionally split) in contact with the parietal and usually 3 pairs of nuchals. All others of the group have the upper tertiary temporal separated from the parietal by contact of the upper secondary temporal and nuchal (sometime split), and usually 2 or fewer pairs of nuchals. The other four species fall naturally into two groups, one characterized by long limbs that overlap when adpressed, the foreleg reaching the eye, and scale rows usually 28 or 30, sometimes 32 (*silvicolium*, *caudaequinae*) the other having short limbs failing to overlap or reach the eye, and scale rows usually 26 or 28, sometimes 25 or 30 (*gemmingeri*, *forbesorum*). Each group is represented by a northern species (*caudaequinae*, *forbesorum*), having usually one pair of nuchals, separated by a distance of 150 (in the short-legged group) to 300 miles from a southern species having usually two pairs of nuchals. For the most part all four species appear to occupy their ranges to the exclusion of all others of the group, and probably even the other group does not usually (if ever) occur sympatrically. Allopatry in species of this genus in North America seems to be virtually invariable.

One apparent exception to this rule deserves comment. A single short-legged specimen of *L. forbesorum* bears the same data as the series of *caudaequinae* from San Luis Potosí (EHT No. 23887). It agrees well with others of the species (now known also from the type locality at La Placita, Hidalgo, and possibly Río Verde, San

Luis Potosí *) except in scale row count, which is 30 at the middle of the body. Counts and measurements are given in the accompanying table. Possibly some error occurred in recording the locality data for the specimen, but no indication of such error exists in the catalogue, on the tag or in the condition of the specimen.

L. forbesorum has been recorded no nearer the known range of *gemmingeri* than La Placita, Hidalgo; the nearest locality known for *gemmingeri* is Tequeyutepec, Veracruz, about 150 miles distant. They occupy much the same habitat, both occurring at relatively high elevations. Localities recorded for *gemmingeri* are: Oaxaca: "Tehuantepec,†" 17 mi. N. Niltepec, Ixcuintepec, Tres Cruces, San José Manteca, Cafetal Concordia; Veracruz: Jalapa, Orizaba, La Perla, Tequeyutepec; Hidalgo: Zacualtipan.‡

All of the differences between these are relatively minor and the curves of variation either are known to overlap or assuredly can be expected to do so. The differences are: number of nuchals (*gemmingeri* usually 2 pairs, *forbesorum* usually 1 pair, the number somewhat variable in both ¶); lateral light line along head and neck (poorly defined in *gemmingeri*, fairly well defined in *forbesorum*); axilla-groin/snout-vent percentage (59% in *gemmingeri*, 56% in *forbesorum*); maximum snout-vent length (65 mm. in *gemmingeri*, 54 mm. in *forbesorum*).

In view of the fact that these two forms occur in the same habitat, in areas known to be closely approximated if not actually adjacent, and differ incompletely, it is not unreasonable to regard them as subspecies (*Leiopisma gemmingeri gemmingeri* (Cope) and *Leiopisma gemmingeri forbesorum* Taylor).

The long-legged species, *silvicolum* and *caudaequinae*, differ from each other to a somewhat greater degree than the preceding races do from each other (see *Comparisons*). Unfortunately only the type and paratype of the arboreal *silvicolum* have been described in detail; but little information is available for the specimens from Oaxaca. The known degree of difference undoubtedly will be altered by larger series. *L. silvicolum*, known only from San José de Gracia, Veracruz, and Cuicatlán, Oaxaca, does not so clearly occupy

* This specimen (U. S. Nat. Mus. No. 32372), labeled simply "Rio Verde" (presumably San Luis Potosí, but not certainly) cannot now be found.

† Undoubtedly in reference to the area, or Isthmus; the species does not occur at or near the city of this name.

‡ Neither Doctor Taylor nor I have seen this specimen (a Cope record); if correctly assigned it brings the ranges of the two species much closer, into the same range. Even if referable to *forbesorum*, the result is the same so far as range approximation is concerned.

¶ Nuchals on the two sides 0-1 to 3-3 in 21 *gemmingeri*, 89% 1-2 or more (0-1, one; 1-1, one; 1-2, three; 2-2, twelve; 2-3, two; 3-3, two); nuchals 0-0 to 2-3 in 12 *forbesorum*, 88% 1-1 or less (0-0, one; 0-1, two; 1-1, seven; 2-2, one; 2-3, one).

the same habitat as *caudaequinae* of Nuevo León and San Luis Potosí, although all these localities are on the Atlantic drainage and at relatively low elevations. That these forms, like those of the short-legged group, may actually be subspecies is quite possible, but information currently available does not at the present time warrant assumption of subspecific status.

KEY TO MEXICAN MEMBERS OF THE "OLIGOSOMA" GROUP OF LEIOLOPISMA

1. Upper tertiary temporal (occasionally split) in contact with parietal; usually 3 or more pairs of nuchals.....*laterale*
Upper tertiary temporal separated from parietal by contact of upper secondary temporal and nuchal; usually less than 3 pairs of nuchals..... 2
2. Limbs, when adpressed, touching or overlapping in adults, forelimb reaching rear corner of eye; scale rows at middle of body often 30 or 32..... 3
Limbs, when adpressed, separated from each other by 1 or more scale lengths; scale rows at middle of body rarely 30 and apparently never 32..... 4
3. Usually one pair of nuchals or less; lamellae under 4th toe 19 or fewer; dorso-lateral light stripe continuous.....*caudaequinae*
Usually two pairs of nuchals; lamellae under 4th toe 20 (constant?); dorsolateral light stripe dark spotted, interrupted.....*silvicolum*
4. Usually nuchals on the two sides 1-2 or more (89%); lateral light line along head and neck poorly defined; axilla-groin/snout-vent percentage 59; 65 mm. maximum snout-vent measurement.....*gemmingeri gemmingeri*
Usually nuchals on the two sides 1-1 or less (88%); lateral light line along head and neck fairly well defined; axilla-groin/snout-vent percentage 56; 54 mm. maximum snout-vent measurement.....*gemmingeri forbesorum*

TABLE OF VARIATION IN LEIOLOPISMA*

Number	10131	23892	23886	23887
Sex	♂	♂	♀	♀
Snout to vent.....	49.0	47.0	49.0	52.0
Snout to eye.....	3.5	3.6	3.4	3.3
Snout to ear.....	9.0	9.0	8.3	8.5
Snout to foreleg.....	18.0	17.6	17.0	17.5
Eye to foreleg.....	11.8	11.3	11.3	11.0
Axilla to groin.....	25.8	24.0	26.5	30.3
Tail	71.0	78.0
Head width	7.1	6.7	6.8	6.2
Head length to nuchal.....	8.7	8.7	8.3	8.2
Arm	11.3	11.5	11.0	10.5
Leg	17.8	17.5	16.5	16.2
Longest toe	7.0	6.6	6.2	6.1
Scales behind ear.....	35	36	38	38
Scales around neck.....	30	30	32	32
Scales 2 mm. behind axilla.....	35	35	36	35
Scales about middle of body.....	28	28	30	30
Scales in row from parietal to rear of thighs....	63	61	62	70
Lamellae under 4th toe.....	17	17	18	18
Legs overlapping by scales.....	3	7	0	-8
Nuchals	1-2	1-2	1-1	1-1
Anterior nuchal contacting upper 3-2 temporal, 0-+	0-+	0-+	0-+	0-+
Anterior nuchals separated from each other....	0	0	+	0

* No. 10131, holotype, Nos. 23886, 23892, paratypes, of *L. caudaequinae*; No. 23887, *L. g. forbesorum* from the same locality as the paratypes of the preceding. Measurements in mm.



Smith, Hobart M. 1951. "A new species of *Leiolopisma* (Reptilia: Sauria) from Mexico." *The University of Kansas science bulletin* 34, 195–200.

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