

ON THE SNAKES OF THE CALIFORNIAN GENUS *LICHANURA*.

BY

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In a recent paper on some forms of the Boid genus *Lichanura* (Proc. U. S. Nat. Mus., XII, 1889, pp. 98-99) the present writer remarked "that it is more than probable that additional material will alter the above results," and that "the manifest great variability of the characters derived from the number and shape of scales and plates in these snakes makes it quite likely that some of the forms here recognized, in the future will be recognized only as varieties."

I have subsequently had the opportunity to study the extreme variability in the allied genus *Charina* (Proc. U. S. Nat. Mus., XIII, 1890, pp. 177-182), about which I had occasion to state (p. 179) that in an extensive series "no two specimens are alike as far as the plates of the head are concerned," and that "there is hardly an individual with both halves of the head alike."

These results had already greatly influenced my views in regard to the various species of *Lichanura*, and additional material since received, for which we are again under obligations to Mr. Charles R. Orentt, of San Diego, California, has made it desirable to review the whole question.

The result would have been very unsatisfactory, however, or I should perhaps say it would have been still more unsatisfactory than even now, had it not been for the liberality of the authorities of the Philadelphia Academy of Natural Sciences, who promptly and generously granted my request for the loan of the type specimens of *L. myriolepis* and *roseofusca*.

A series of 9 specimens of these rare snakes is a material greater than any one before me has been able to compare. The enormous individual variability, which I shall demonstrate later on, renders the result, nevertheless, somewhat doubtful, and although it may be regarded as a step towards the final settlement of the question, I must still regard it as only preliminary. In treating of it I shall therefore adhere to the same conservative proceeding which I employed in regard to *Charina* (*tom. cit.*, p. 181), viz, to recognize as distinct any form which can not be conclusively proven to be only an individual variation of some other form.

The comparative large size of the eye in *L. trivirgata*, coupled with the very pronounced pattern of coloration, might tempt one to regard it as the young of one or another of the forms since described, but the fact that the second specimen (U. S. Nat. Mus., No. 12602), although very much larger than the smallest of the other forms, in color and size of eye agrees completely with the type (No. 15502)—a very young individual—seems to prove the distinctness of this species, which has so far been found only at the southern extremity of the Lower Californian peninsula. The low number of gastrosteges may also be a character of this species.

In addition to this larger size of the eye *L. trivirgata* shows a very pronounced difference in coloration from the forms collected farther north, it being creamy white, with three broad and abruptly defined blackish-brown longitudinal bands, while the others are either entirely uniform above, or with only faint indication of brownish zigzag bands on a bluish ground. Both specimens of this form at hand are identical in this respect, although of very unequal size, and judging from the original description the only other specimens of this species recorded—at least two (see Proc. Phila. Acad., 1861, p. 304)—were of the same well-marked pattern.

The same reason which prevented us from regarding the largeness of the eye as due to young age, operates against explaining the distinct color pattern as a sign of immaturity, for the type of *L. myriolepis* is considerably smaller than Belding's specimen of *L. trivirgata*, and yet it is not more distinctly marked than all the other specimens found to the north.

As far as scutellation is concerned it may at once be stated that *L. trivirgata* shows no character (with one possible exception) by which it can be separated from the forms described as *L. myriolepis*, *roseofusca*, and *simplex*. The extent of the variability in these forms may be gathered from a glance at the table of specimens given below, to supplement which I may use the same words in which I characterized a similar condition in *Charina* (Proc. U. S. Nat. Mus., XIII, 1890, p. 179), viz, "there are no two specimens alike," and "there is hardly an individual with both halves of the head alike."

The possible exception referred to above is the low number of gastrosteges (218); but in view of the extent of variation in this respect among the other specimens (224 to 241) this character can hardly be expected to hold.

As to the forms from "northern Lower California," collected by Gabb, and those from southern Upper California, the inspection of the type specimens of *L. myriolepis* and *roseofusca* has simplified matters considerably. The former is a specimen of comparatively small size, but fairly well preserved; the latter is a skin in alcohol of a large individual and in a very bad shape. To this unfortunate circumstance is undoubtedly due the inaccuracies and incompleteness of the original

description. I have reëxamined the specimen with great care and minuteness, and with the original description before me I note the following discrepancies:

The number of scale-rows in the type of *L. roseofusca* is not thirty-six, but at least forty; the number of scales in the orbital ring is nine on one side, ten on the other, not seven and eight; anterior fused into a large preocular on one side only; loreals $\frac{2}{1}$ on one side only, $\frac{3}{3}$ on the other.

When I add that I have only been able to count forty-three scale-rows in the type of *L. myriolepis*, it will be seen that the difference between the alleged two species, or varieties, has been reduced to a difference of three scale rows, as the slight difference in coloration, now entirely obliterated, is hardly worth mentioning, the other specimens showing that no line can be drawn in this respect. The difference alluded to is so slight, however, and the irregularity of the number of scale rows in the same individual so great, that I have no hesitation in now pronouncing *L. roseofusca* and *myriolepis* to be the same thing, and as the former name is mentioned first, the species will have to take that name.

Practically identical with these specimens are three others received from Mr. Orcutt (U. S. Nat. Mus., Nos. 16327, 16850, and 14129). They demonstrate the great variability of the scales which have been called subloreal (those written below the line in the diagnoses), though in reality only detached pieces of the supralabials*), and, on the other hand, they seem to establish the number three as the characteristic number of the true loreals.

The type of *L. simplex* (U. S. Nat. Mus., No. 13810) agrees in the main with the above, the only difference consisting in the small number of scales in the eye-ring. But as the number varies between nine and ten in the other specimens, and as the paucity is due to the plain and irregular fusion of several of the scales, I have no hesitation in saying that the above name should in the future only figure in the synonymical lists of *L. roseofusca*.

The status of *L. oreutti* differs materially from that of the names already discussed. The low number of scale rows stands so far unapproached, but for its distinction I rely more upon the number of true loreals, which is only two though in all the other specimens of the genus there are three true loreals. This low number is not due to fusion of any two shields, nor to a shortening of the distance between the eye and the nostril. In addition hereto we have the unusually protruding rostral, so that, all taken into consideration, *L. oreutti* seems to be the

* It will be seen that I have altered somewhat the loreal formula of the specimens previously described by me, in as much as I have not here recognized any supraloreals. I was then quite uncertain as to what shields Professor Cope included among the "loreal" of his original descriptions, but after having seen his specimens I have modified my nomenclature so as to be comparable with his.

best differentiated form of the group. In the features here referred to none of the other specimens offer an approach, so that I have no other choice but to regard it as a good species.

Its status is somewhat like that of *Charina brachyops* as compared with *Ch. plumbea*, and resting as it does upon only a single specimen the connecting link may some day turn up. Then will be the time to drop it, but not till then.

I am thus forced to recognize, for the present, three species which may be distinguished as follows:

- a*¹ Eye large, its diameter more than one-third the distance from anterior canthus to tip of muzzle; gastrosteges about 218; color whitish with three blackish-brown longitudinal bands in strong contrast.....1. *L. trivirgata*.
- a*² Eye smaller, its diameter, one-third or less the distance from anterior canthus to tip of muzzle; gastrosteges 224-241; color brownish or bluish above, with or without longitudinal bands, which, when present, contrast but little against the ground color.
- b*¹ True loreals, 3; scale-rows, 39-43.....2. *L. roseofusca*.
- b*² True loreals, 2; scale-rows, 35.....3. *L. orcutti*.

List of specimens examined.

Species.	Museum and number.	Collector.	Locality.	Scales.	Scales in eye-ring.	Loreals.	Ratio of diameter of eye to its distance from tip of snout.	Gastrosteges.	Total length (millimetres).	Tail (millimetres).	Remarks.
<i>L. roseofusca</i>	Phila. Ac.	W. M. Gabb	Lower California.....	40	9-10	3-1	224	Type: Mutil. skin.
<i>L. (nagroides)</i>	do	do	do	43	10-10	3-1	1:3	226	518	66	Type.
<i>L. (simplex)</i>	U. S., 13810.	Rosa Smith	San Diego, Cal.	40	7-8	3-1	1:4	232	765	80	Do.
<i>L. roseofusca</i>	U. S., 16327.	C. R. Orcutt	San Diego County, Cal.	43	9-9	3-1	1:3.4	233	695	90	
<i>L. roseofusca</i>	U. S., 16850.	do	do	39	9-10	3-1	1:3.75	241	775	60	Tail defective.
<i>L. roseofusca</i>	U. S., 14129.	do	San Diego, Cal.	43	9-10	3-1	1:3.3	232	860	117	
<i>L. oreutii</i>	U. S., 15503.	do	Colorado Desert, Cal.	35	9-10	3-1	1:3.7	232	870	110	Type.
<i>L. trivirgata</i>	U. S., 15502.	J. Xantus	Cape San Lucas, Lower California.	40	10-11	3-1	1:2.5	218	305	33	Do.
<i>L. trivirgata</i>	U. S., 12602.	L. Belding	La Paz, Lower California.	41	9-10	3-1	1:2.4	218	635	95	Median upper loreal counted as one, though divided horizontally.