# VI. LEPTODEIRA ALBOFUSCA (LACÉPÈDE) A SYNONYM OF LEPTODEIRA ANNULATA (LINNÆUS).

By Lawrence Edmonds Griffin.

*Coluber annulatus* Linnæus, Mus. Ad. Frid., 1754, p. 34, plate VII, fig. 2; Syst. Nat., Ed. XII, I, 1766, p. 386.
*Coluber albofuscus* Lacépède, Serp., II, 1789, pp. 94 and 312.
*Leptodeira annulata* Boulenger, Cat. Snakes, III, 1896, p. 97.
*Leptodeira albofusca* Boulenger, Cat. Snakes, III, 1896, p. 95.

*Leptodeira annulata* is one of the earliest known and commonest serpents of South America. Since originally described it and its varietal forms have been referred to at least six other species, all of which Boulenger (*loc. cit.*) reduced to synonyms of *L. annulata* and *L. albofusca*. In the course of an examination of the collection of snakes from South America in the Carnegie Museum I was impressed by the difficulty of satisfactorily separating these two species, finally reaching the conclusion that there was only one species represented in the collection, namely, *L. annulata*.[1] A careful study of the species in question has been facilitated by the Museum of Comparative Zoölogy, which has very kindly loaned me its entire representation of these two species, making a total of sixty-nine specimens available for comparison. The specimens of the Museum of Comparative Zoölogy have been identified by several naturalists, mostly as *L. annulata*. I have submitted them and the specimens of the Carnegie Museum to a critical re-examination, with the result that I find myself unable to make a satisfactory distinction between *L. annulata* and *L. albofusca*. In order to be as brief as possible I shall omit the tabulated measurements and counts which were made, and shall submit only the condensed results. All counts and measurements were made under a binocular microscope.

The best definitions of the two species which are generally available are those of Boulenger (*Catalogue of Snakes in the British Museum*,

[1] Griffin, Lawrence Edmonds: "A Catalog of the Ophidia from South America at Present (June, 1916) Contained in the Carnegie Museum with Descriptions of Some New Species," *Memoirs of the Carnegie Museum*, VII, 1916, pp. 163–228; Plate XXVIII.

Vol. III, pp. 95–98). For the purpose of showing clearly the characters which have been used to distinguish the species (not to criticise so excellent a naturalist) the principal features of his diagnoses are presented in parallel columns.

| *Leptodeira albofusca* | *Leptodeira annulata* |
|---|---|
| Rostral twice as broad as deep. | Rostral once and a half to once and two-thirds as broad as deep. |
| Frontal once and a quarter to once and two-thirds as long as broad. | Frontal once and a half to once and two-thirds as long as broad. |
| Loreal as long as deep, or a little longer than deep. | Loreal as long as deep, or a little longer than deep. |
| One or two pre-oculars. | One pre-ocular. |
| A small subocular. | Rarely a very small subocular. |
| Temporals 1+2, or 1+3. | Temporals 1+2. |
| Eight upper labials, fourth and fifth, (rarely third, fourth, and fifth) entering the eye. | Eight (rarely seven) upper labials, third, fourth, and fifth (rarely third and fourth, or fourth and fifth only) entering the eye. |
| Four to six lower labials in contact with the anterior chin-shields. | Five or six lower labials in contact with the anterior chin-shields. |
| Anterior chin-shields as long as, or a little shorter than, the posterior, | Anterior chin-shields as long as, or a little longer than, the posterior. |
| Scales in 21 or 23 rows. | Scales in 19 (exceptionally 17 or 21) rows. |
| Gastrosteges 170–211. | Gastrosteges 175–196. |
| Urosteges 71–95. | Urosteges 78–107. |
| A lateral series of spots. | Lateral spots usually small or absent. |
| Lower parts whitish, frequently with fine brown specks. | Lower parts white. |
| Tropical America. | Tropical South America. |

As all of the characters given vary enough to cross the narrow boundary between the species, only a constant combination of several characters can be made the basis of distinction between the two supposed species. The number of scale-rows, the proportions of the rostral shield, the presence or absence of a subocular, the number of upper labials bordering the orbit, and the number of gastrosteges and urosteges, are the most important characters used in the definition of the species, and if these occur in constant combinations the two species can be distinguished, otherwise not.

Several authors have used the number of scale-rows and the proportions of the rostral as the chief characters by which to identify the two supposed species. The number of scale-rows certainly appears

to be the best character to use as basic; by placing the other principal characters in conjunction with it the constancy or variability of the alleged specific differences will be made clear. Twenty-six of the specimens at my disposal have nineteen scale-rows; forty-three have twenty-one, twenty-three, or twenty-five rows. I have not always included every specimen in the following tabular statements, the omissions being due to defects in some of the specimens.

PROPORTIONS OF THE ROSTRAL.

| | Rostral Twice as Broad as as Deep. | Rostral Less Than Twice as Broad as Deep. | Limits of Variation. |
|---|---|---|---|
| Specimens with twenty-one to twenty-five scale-rows (43) | 10 (23%) | 33 (77%) | 1–1/3:1–2:1 |
| Specimens with nineteen scale-rows (25) | 4 (16%) | 21 (84%) | 1–1/4:1–2:1 |

The rostral is twice as broad as deep in only a small proportion of either those having twenty-one to twenty-five or those having nineteen scale-rows. Its usual proportion of width to depth in both categories is about one and two-thirds to one. No distinction can be based on this character.

OCCURRENCE OF A SUBOCULAR.

| | A subocular on one or both sides. | No subocular. |
|---|---|---|
| Specimens with twenty-one to twenty-five scale rows (42) | 32 (76%) | 10 (24%) |
| | On only one side, 2. | |
| Specimens with nineteen scale-rows (24) | 10 (42%) | 14 (58%) |
| | On only one side, 5. | |

This is the most definite of the possibly distinguishing characters. The majority of the snakes with twenty-one to twenty-five scale-rows do have a sub-ocular, but as nearly half of those with nineteen scale-rows also possess the shield, the distinction is not as sharp as it should be to serve as a specific character.

NUMBER OF LABIALS ENTERING THE MARGIN OF THE ORBIT.

| | Two Labials. | Three Labials. |
|---|---|---|
| Specimens with twenty-one to twenty-five scale-rows (42) | 36 (86%) | 6 (14%) |
| Specimens with nineteen scale-rows (25) | 17 (68%) | 8 (32%) |

The majority of all the specimens have only two supralabials bordering the orbit, though the proportion of such is greater in those

having twenty-one to twenty-five scale-rows. This character is decidedly of little value in differentiating the two supposed species. Of still less value is the comparative length of the anterior and posterior chin-shields.

COMPARATIVE LENGTH OF ANTERIOR AND POSTERIOR CHIN-SHIELDS.

| | Anterior Chin-shields the Longer. | Chin-shields Equal. | Posterior Chin-shields the Longer. |
|---|---|---|---|
| Specimens with twenty-one to twenty-five scale-rows (43) | 7 (16%) | 22 (51%) | 14 (33%) |
| Specimens with nineteen scale-rows (26) | 6 (23%) | 17 (65%) | 3 (12%) |

The shape of the loreal of the specimens with twenty-one to twenty-five scale-rows agrees well with the diagnosis of *L. albofusca*; but the loreal of the specimens having nineteen scale-rows is almost as often longer than deep as deeper than long.

SHAPE OF LOREAL.

| | Longer Than Deep. | As Deep as Long. | Deeper Than Long. |
|---|---|---|---|
| Specimens with twenty-one to twenty-five scale-rows (42) | 26 (62%) | 13 (31%) | 3 (7%) |
| Specimens with nineteen scale-rows (25) | 6 (24%) | 11 (44%) | 8 (32%) |

The counts of the gastrosteges and urosteges which I have made extend the limits of numerical variation of these characters, and also serve to bring the snakes having seventeen to nineteen and those having twenty-one to twenty-five rows nearer to the same extremes. They are therefore of little value for specific differentiation.

NUMBER OF GASTROSTEGES AND UROSTEGES.

| | Gastrosteges | Urosteges. |
|---|---|---|
| Specimens with twenty-one to twenty-five scale-rows (43) | 164–205 | 68–98 |
| Specimens with nineteen scale-rows (26) | 170–203 | 73–95 |

The lateral spots vary to the same degree in both classes of specimens, making it impossible to use this character for diagnostic purposes.

If the distributional areas of the supposed species were separate such differences as appear to exist might mean a good deal, but the area of *L. annulata* is much more limited than, and entirely within, that of *L. albofusca*.

As there seems to be no combination of characters which definitely

distinguishes *L. albofusca* from *L. annulata* there is evidently only a single, variable species, *Leptodeira annulata* (Linnæus).

A tabulation has been made of the scale formulæ of the sixty-nine specimens examined by me and of those reported in the available literature of the two species. The results suggest that, though we may not be able to recognize more than one species in the assemblage, there may be tendencies toward the formation of subspecies in different parts of its range. But the entire number of *L. annulata* which has been collected is only a few score, and makes too small a series from which to draw any conclusions. These also come from widely separated localities, making it quite likely that, when collections have been made in intermediate regions, the apparent distinction between specimens from different localities may be bridged. I do not, therefore, regard these tabulations as more than interestingly suggestive.

SCALE-CHARACTERS OF SPECIMENS FROM VARIOUS REGIONS.

| Locality | Scale-rows. | Gastrosteges. | Urosteges. |
|---|---|---|---|
| Mexico and Central America | 21–25 | 164–211 | 71–97 |
| Ecuador | 19[2]–23 | 183–198 | 68–89 |
| Colombia, Venezuela, and Guiana | 19–23 | 170–194 | 75–95 |
| Brazil | 19–21 | 186–205 | 76–98 |
| Bolivia | 19–21[3] | 170–196 | 73–98 |
| Peru | 17[4]–21 | 179–190 | 88–91 |
| Uruguay and Paraguay | 21 | 176–202 | 72–95 |

The specific characters of *Leptodeira annulata* may be summarized as follows:

Rostral once and a quarter to twice as broad as deep, scarcely visible from above; internasals shorter than the prefrontals; frontal once and one-fourth to once and two-thirds as long as broad, as long as, or a little longer than, its distance from the tip of the snout, shorter than the parietals; loreal of nearly equal dimensions; one pre-ocular (rarely two), in contact with, or narrowly separated from, the frontal; frequently a small subocular below the pre-ocular; two post-oculars (rarely three); temporals 1, 2, (rarely 1, 3); eight upper labials (rarely seven), the fourth and fifth (or less frequently, the third, fourth, and fifth) bordering the orbit; five or six (rarely four) lower labials in contact with the anterior chin-shields; anterior and posterior chin-shields of nearly equal length.

[2] A single specimen reported by Steindachner.

[3] A single specimen reported by Griffin.

[4] A single specimen reported by Boulenger.

Scales usually in nineteen to twenty-three rows, occasionally in seventeen or twenty-five rows, the vertebrals sometimes slightly enlarged; gastrosteges one hundred and sixty-four to two hundred and eleven; anal divided; urosteges sixty-eight to one hundred and seven

Yellowish above, with one or two rows of reddish brown spots, which are often confluent into an undulating or zigzag band, or form cross-bars; a lateral series of spots of extremely variable size, sometimes scarcely visible; often a dark median line on the occiput; a dark streak behind the eye; lower surface white, or occasionally with fine brown dots; lower surface of tail frequently brownish.

*Habitat.*—From Mexico to Argentina.