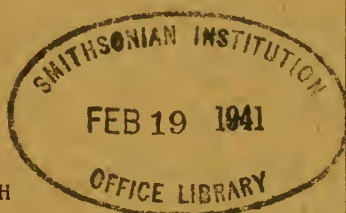


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GENUS GEOPHIS

BY  
HOBART M. SMITH



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## NOTES ON MEXICAN SNAKES OF THE GENUS GEOPHIS

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The species here combined in the genus *Geophis* were distributed by Boulenger (Cat. Snakes Brit. Mus., vol. 2, 1894) in three genera—*Geophis*, *Atractus*, and *Dirosema*. That this arrangement cannot stand was originally pointed out by Dunn (Amer. Mus. Nov., No. 314, 1928), who refers *bicolor* and *brachycephala* directly to *Geophis*, and provisionally places *latifrontalis*, *longiceps*, *isthmicus*, and *omiltemana* in the same genus. The latter four species differ from all other *Geophis* in the possession of an anterior temporal, but this character does not, I believe, indicate closer relationship inter se than between any one of them and typical *Geophis*. *G. blanchardi*, for instance, very closely resembles *latifrontalis* in size, character of pattern, shape of head, and in many details of scutellation. The chief difference rests in the temporal character. *Geophis dugesii* shows a close resemblance to *omiltemana*, and in general appears more closely related to this than to *blanchardi*, which like it has no anterior temporal.

The hemipenes and maxillary dentition of *blanchardi* and *latifrontalis* are practically identical, although both differ to some extent from certain other *Geophis*, such as *semidoliatus*.

In view of these data, I cannot observe that there are characters sufficiently stable to remove any species, here referred to *Geophis*, from that genus. Accordingly I follow Dunn in placing all *Dirosema* (except *psophotum*) and all Mexican "Atractus" in *Geophis*.

This study was completed and a portion of the material utilized was collected during tenure of a Walter Rathbone Bacon Scholarship.

### GEOPHIS CANCELLATUS, new species

*Holotype*.—U.S.N.M. No. 46440, female, Chicharras, Chiapas, February 1896, collected by Nelson and Goldman; paratype, U.S.N.M. No. 46441, locality not certain, but probably same as type.

*Diagnosis*.—Maxilla extending forward anterior to suture between first and second supralabial, a considerable distance beyond end of palatines (which extend one-third the length of the second supralabial anterior to the suture between that and third labial); 6 labials, third

and fourth entering eye, fifth very long and in contact with parietal; no internasals; 15 scale rows; ventrals 171; caudals 21 to 23; 28 to 32 cross bands on body, 4 to 6 on tail, not extending onto ventrals; ventral surface white.

*Description of holotype.*—Rostral somewhat enlarged, broader than high, scarcely pointed behind, portion visible from above measuring one-third its distance from frontal; no internasals; prefrontals much longer (3.5 mm.) than broad (2 mm.), entering orbit; frontal about as long (2.7 mm.) as broad (2.8 mm.); supraocular present, small, somewhat larger than postocular; parietals broad, more than half as wide (2.7 mm.) as long (4.3 mm.); 6 labials, third and fourth higher than long and entering eye, fifth much longer than high and more than twice as large as any other, remaining labials about as long as high; fifth labial broadly in contact with parietal; nasal divided; posterior section of nasal somewhat smaller than anterior; loreal about twice as long as broad; no preocular; 1 large temporal; 6 infralabials on one side, 8 on other; 2 pairs of chin shields, anterior separated from mental and in contact with 3 (4) infralabials, posterior pair not separated medially and about two-thirds size of anterior.

Dorsal scales in 15 rows, smooth, not pitted; ventrals 171; anal entire; caudals 23. Total length, 410 mm.; tail, 31.5 mm.

Ground color (long preserved) cream; top and sides of head dark brown, with a slightly reddish tinge; a nuchal collar, narrow medially (about 1 scale wide), laterally extending to middle of fifth labial; about 32 dark cross bars on body, 6 (including black tip) on tail; cross bars on body terminating laterally at the first scale row, all covering  $3\frac{1}{2}$  to 6 scale lengths medially (except the 2 anterior, the first of which covers 10, the second 8 scale lengths); light spaces between cross bars covering 1 to  $1\frac{1}{2}$  scale lengths on the middorsal line, 3 to 5 scale lengths laterally; ventral surface of tail dark brown, except near the base, where it is speckled; mental, infralabials, and anterior chin shields dark brown; otherwise ventral surfaces white.

*Paratype.*—The paratype shows similar scutellation of the head, except the infralabials, which are 6-7. Ventrals 171; caudals 21; female. Coloration like that of type, except cross bars somewhat broader, and less numerous (28 on body, 4 on tail). The cross bars are sometimes narrowly connected middorsally. Total length, 292 mm.; tail, 23 mm.

**GEOPHIS CHALYBEUS (Wagler)**

*Catostoma chalybeum* WAGLER, Syst. Amph., p. 194, 1830 (Mexico).

*Rhabdosoma guttulatum* COPE, Proc. Amer. Philos. Soc., vol. 22, p. 385, 1885 (Veracruz).

*Geophis chalybeus* PETERS, Monatsb. Akad. Wiss. Berlin, 1859, p. 275.

*Diagnosis.*—Parietal in contact with fifth labial; scales in 17 rows (or 15); a supraocular and 1 postocular; belly white (light); rostral not enlarged (less than half its distance from frontal); internasals present; scales perfectly smooth.

*Range.*—Known only from "Veracruz."

*Remarks.*—Since the time of Bocourt's Mission Scientifique au Mexique (1883), the name *chalybeus* has been applied to a Mexican species with keeled scales. I can see no reason whatever for this action, for Wagler specifically states in the original description that the scales are very smooth ("squamae notaei imbricatae, homogeneae, laevisssimae"). Peters (loc. cit.) redescribes the types, which he compares with *semidoliatus*, but made no mention of keeled scales. The keels are so distinct in the Mexican keeled species, that it is not probable that both Wagler and Peters would have overlooked that character had it been present.

Although the available descriptions of the types of *chalybeus* leave much to be desired (not even the number of ventrals and caudals is known), it is surprisingly easy to allocate the name with another described species. This is *guttulatus* Cope, known from "Veracruz." The data presented by Wagler and Peters supply the following pertinent facts: (1) 6 labials, fifth in contact with parietal (eliminates *isthmicus*, *longiceps*, *latifrontalis*, *omiltemana*); (2) scales in 17 rows (eliminates *semidoliatus*, *dugesii*, *sallaci*, *petersi*); (3) a supraocular (eliminates *rhodogaster*, *anocularis*); (4) scales smooth (eliminates *dubius*, *rostralis*, *chalybeus auct.*); (5) dark above ("notaeo atrochalybaeo"), light below ("gastraeo flavido") (eliminates *blanchardi*, *cancellatus*, partly eliminates *bicolor*); (6) 1 postocular (completely eliminates *bicolor*). These characters define *guttulatus*, and cannot be construed to refer to any other species at present known.

The types of *chalybeus* were collected by Deppe, whose collections were predominantly from the Veracruz area, although some species were apparently collected elsewhere.

**GEOPHIS SIEBOLDII (Jan)**

*Elapoides sieboldii* JAN, Arch. Zool. Anat. Phys., vol. 2, pp. 21-22, 1862 ("Mexico" and "Guadalupa"); JAN and SORDELLI, Icon. Gen., livr. 12, pl. 1, fig. 5 (well illustrated), 1865.

*Diagnosis.*—Parietal in contact with fifth labial; scales in 17 rows, distinctly keeled on posterior part of body, feebly keeled on anterior part, smooth on all of tail; dark above, light below, a row of light spots involving centers of scales of lateral dorsal scales; portion of rostral visible from above about half its distance from prefrontals; internasals present, small; a supraocular, 1 postocular; scales of posterior chin shields separated medially by an azygous scale.

*Range.*—The type locality.

*Remarks.*—See remarks under *nasalis*.

**GEOPHIS NASALIS (Cope)**

*Catostoma nasale* COPE, Proc. Acad. Nat. Sci. Philadelphia, 1868, p. 131, fig. (Guatemala City).

*Catostoma chalybeum* SLEVIN, Proc. California Acad. Sci., ser. 4, vol. 23, pp. 404-406, 1939.

*Diagnosis.*—Parietal in contact with fifth labial; scales in 17 rows, distinctly keeled on posterior part of body, feebly keeled on anterior part, smooth on posterior half of tail; dark above, light below, no light spots in centers of scales of outer row; portion of rostral visible from above as long as, or longer than, its distance from prefrontals; internasals present, small; a supraocular, 1 postocular; scales of posterior chin shields usually in contact medially.

*Range.*—Definite locality records show a range from southern Chiapas to Guatemala City.

*Remarks.*—The removal of the name *chalybeus* from the species with keeled scales brings up the question of the identity of Cope's *nasalis*, Jan's *sieboldii*, and of various specimens reported by others as *chalybeus*. Obviously more than one species is involved, for the total range in ventral counts of the specimens referred to *chalybeus* by other authors is 116 to 154, and caudals vary from 24 to 42.

As an index to the amount of variation occurring in a single species of this complex, Slevin's counts on 217 specimens (loc. cit.) from Finca El Ciprés, Volcan Zunil, Guatemala, are invaluable. The range in ventral counts in this large series is 116 to 130, in caudals 24 to 37. I have examined two specimens (U.S.N.M. Nos. 46611, 46613) from Chicharras, Chiapas, which I believe are the same as Slevin's species, having 126 and 118 ventrals, and 31 and 33 caudals,



respectively (female, male). Certain features of the pattern and scutellation of these specimens, as well as Slevin's counts, indicate rather clearly that these are not *sieboldii*, which is described from four specimens (two from "Mexico," one from "Guadalupa," another from an unknown locality) having 146 to 154 ventrals and 34 to 38 caudals. The illustration of one of the cotypes of *sieboldii* (in Jan and Sordelli, *Icon. Gen.*, livr. 12, pl. 1, fig. 5, 1865) shows that the rostral is very small, the portion visible from above much less than its distance from prefrontals (greater in the Chicharras specimens); a row of white spots in the centers of the scales of the outer row of dorsals is shown (not present in the Chicharras specimens); the scales of the second pair of chin shields are shown widely separated by an azygous scale (in contact in the Chicharras specimens)<sup>1</sup>; and the keeling of the dorsal scales terminates abruptly at the anus (continues on proximal half of tail in both Chicharras specimens).

Although I have not seen Cope's cotypes of *nasalis*, and his description does not mention all the characters above compared, the scale counts (131, 133, 134, caudals 25, 30, in three specimens), contact of the scales of the second pair of chin shields, and the larger size of the rostral, all indicate that these are the same as Slevin's series and the Chicharras specimens. The type locality also indicates the possible correctness of this conclusion.

It is impossible to allocate with these two species, *nasalis* and *sieboldii*, the specimens recorded by Bocourt (*Miss. Sci. Mex.*, pp. 530-1, fig. 11, 1883), Boulenger (*Cat. Snakes*, vol. 2, pp. 318-9, 1894) and Ahl (*Zool. Anz.*, vol. 106, p. 184, 1934). Bocourt mentions 10 specimens, from "Guatemala and Mexico," which he says have 126 to 144 ventrals, 26 to 42 caudals. The figure appears to be of a specimen of *nasalis*. Boulenger's specimens include one from Amula, Guerrero (132 ventrals, 40 caudals) and two others from Dueñas, Guatemala (138, 140 ventrals, 30 caudals, females). Ahl refers to a specimen, not described, from Xochitempa, near Chilapa, Guerrero. These Mexican specimens are arbitrarily referred to *nasalis*, in the absence of a better alternative.

#### KEY TO MEXICAN *GEOPHIS*

- |   |   |
|---|---|
| 1. An anterior temporal separating parietal from labials..... | 2 |
| No anterior temporal, parietal in contact with a labial.....  | 5 |

<sup>1</sup>This character is subject to some variation, as discovered by Dr. Joseph R. Slevin, to whom I am indebted for data taken on his large series of this species. In 216 specimens, Dr. Slevin finds the posterior chin shields in contact (sometimes very narrowly) in 166, separated in 50.

2. Six supralabials ..... 3  
 Seven supralabials; about 40 irregular cross bars on body and tail.  
*isthmicus*
3. Sixth labial much the longest.....*omiltemana*  
 Fifth labial the longest..... 4
4. Prefrontals much longer than broad.....*longiceps*  
 Prefrontals little longer than broad.....*latifrontalis*
- 5 Scales in 17 rows..... 6  
 Scales in 15 rows..... 15
6. No supraoculars ..... 7  
 Supraoculars present ..... 8
7. One postocular; ventrals 135 to 144.....*rhodogaster*  
 No postocular; ventrals 124.....*anocularis*
8. Length of portion of rostral visible from above two-thirds its distance  
 from frontal ..... 9  
 Length of portion of rostral visible from above half or less than half its  
 distance from frontal..... 10
9. First infralabial in contact with its mate medially.....*dubius*  
 Mental in contact with chin shields.....*rostralis*
10. No internasals; reddish with black dorsal cross bands.....*cancellatus*  
 Internasals present; no dorsal cross bands..... 11
11. Scales keeled posteriorly..... 12  
 Scales smooth on entire body..... 13
12. Scales of posterior chin shields in contact medially; scales on proximal  
 half of tail keeled; length of portion of rostral visible from above  
 equal to, or greater than, its distance from prefrontal.....*nasalis*  
 Scales of posterior chin shields separated medially; all dorsal caudal  
 scales smooth; length of portion of rostral visible from above about  
 half its distance from prefrontal.....*sieboldii*
13. Diameter of eye equal to, or less than, its distance from labial border;  
 3 labials in contact with anterior chin shields; belly checkered..*blanchardi*  
 Diameter of eye greater than its distance from labial border; 4 labials  
 in contact with anterior chin shields; belly light, sometimes black-  
 spotted, tail with ventral black marks in some..... 14
14. Two postoculars; belly spotted, subcaudals with their anterior portions  
 black .....*bicolor*  
 One postocular; belly and tail light, unspotted.....*chalybeus*
15. Diameter of eye greater than its distance from labial border...*chalybeus*<sup>2</sup>  
 Diameter of eye less than its distance from labial border..... 16
16. Tail and body distinctly banded; 5 supralabials.....*semidoliatus*  
 Tail not banded, anterior part of body sometimes banded; 6 supralabials 17
17. Length of portion of rostral visible from above two-thirds its distance  
 from frontal .....*petersii*  
 Length of portion of rostral visible from above half or less than half  
 its distance from frontal..... 18
18. Scales faintly keeled; no bands; ventrals 129 to 133.....*sallaci*  
 Scales smooth; bands present on anterior part of body, sometimes faint;  
 ventrals 150 to 164.....*dugesii*

<sup>2</sup> One of the three types of *guttulatum* (= *chalybeus*) has 15 scale rows, while the other two have 17. The aberrant specimen has short rows intercalated between the others on various parts of the body.