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THE TAXONOMIC STATUS, RANGE, AND NATURAL  
HISTORY OF SCHOTT'S RACER<sup>1</sup>

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UNTIL recent years the striped racer of southern Texas, *Masticophis schotti* Baird and Girard (1853), has been known to herpetologists only from the type specimen, U. S. Nat. Mus. No. 1972, collected by Arthur Schott near Eagle Pass. When the genus was monographed by Ortenburger (1928) only two additional specimens, each without a definite locality, were available. During the past three years each of the present authors more or less fortuitously came into the possession of several living examples of this form. Since so little was known regarding its variation, range, and habits, as opportunities permitted, we made independent observations which, in the hope that their usefulness would thereby be increased, have been combined in a single paper.

In order to make the study as complete as possible, all the preserved specimens of this form available to us, including the type, have been assembled. From a consideration of these a better understanding of the phylogenetic relationships and variations of the form has been gained; the known range has been considerably extended, and associated with a definite

<sup>1</sup> Contribution from the Zoological Laboratory of the University of Michigan and from the Toledo Zoological Society.

physiographic area; and some noteworthy facts concerning its natural history have been obtained.

TAXONOMIC STATUS.—Every writer who has given any considerable amount of attention to the striped racers of the Texas region has recognized a close relationship between the three forms now known as *Masticophis taeniatus girardi*, *M. schotti*, and *M. ruthveni*, but the high degree of constancy exhibited by the hitherto available specimens of *schotti* and *ruthveni* has led previous authors to regard these two forms as distinct species. Cope (1900: 812), however, in commenting upon a specimen from Matamoras, Tamaulipas, Mexico (U.S.N.M. No. 1974, = *M. ruthveni* Ortenburger, 1923), noted its differences from the type of *schotti* and suggested that it might be a subspecies of that form. Ortenburger (1923: 4-5) in connection with his description of *M. ruthveni*, mentioned two not fully grown specimens (one of which is the U.S.N.M. No. 1974 mentioned by Cope) which bear certain resemblances to *schotti*, and pointed out (p. 7) that he considered it entirely possible that *ruthveni* might prove to be a subspecies of *schotti*.

In his later monographic work Ortenburger (1928) reviewed the question of the relationships of the striped racers of this region and by careful and logical reasoning (pp. 43, 46-48, 74-78, and 84-87) based on characters of pattern and scutellation, and on geographic position, showed that from the ancestral form *taeniatus*, of the higher regions of the Basin and Range Provinces and Columbia and Colorado plateaus, a phylogenetic series has been derived which consists of *girardi*, in the Trans-Pecos and Edwards Plateau region of western and central Texas, and *schotti* and *ruthveni* in the Gulf Coastal Plain of southern Texas and eastern Tamaulipas. Since evidence of intergradation between *taeniatus* and *girardi* has been established (Ortenburger, 1928: 34-35, 41), the latter form has been given subspecific status, but the lack of specimens from intermediate localities has not permitted until now a detailed consideration of the relationships of *schotti* and *ruthveni*.

A study of the material now available indicates that the forms *girardi* (Pl. I, Figs. 1, 2) and *schotti* (Pl. II, Fig. 1) intergrade in at least two regions at the southern edge of the Edwards Plateau, and that the forms *schotti* and *ruthveni* (Pl. II, Fig. 2) intergrade in the lower part of the Rio Grande Valley. A racer collected near the southwestern edge of the Edwards Plateau (U.M.M.Z. No. 74334, near the mouth of the Pecos River, Valverde County) resembles *girardi* in general tone of coloration, has white occipital blotches and cephalic plates narrowly margined with white as in typical *girardi*, but lacks the usual white crossbands and wide chestnut brown areas on the anterior half of the body. It is similar to *schotti* in having considerable red on the sides of the neck, a well defined white stripe occupying the lateral tips of the ventrals and the lower portions of the first row of scales, and continuous white stripes on scale rows 3 and 4. This typical *schotti* pattern in combination with the general coloration and head markings of *girardi* is regarded as an unmistakable condition of intergradation between these two forms. Another case of intergradation is found in a small specimen from the southeastern border of the Edwards Plateau (Baylor Univ. Mus. No. 229, Helotes, Bexar County, about ten miles northwest of San Antonio). It has continuous longitudinal stripes nearly typical of *schotti* with no indication of light crossbands, and resembles *girardi* in possessing white occipital blotches and head shields bordered with white.

In addition to these cases of intergradation a few specimens from more southern localities have minor deviations from the typical patterns which furnish substantiating evidence of the close relationship between the forms under consideration. Two specimens of *girardi* (U.M.M.Z. No. 74071, Pl. I, Fig. 2, taken within the city limits of San Antonio, and U.M.M.Z. No. 74070, from the Classen Ranch, 20 miles north of San Antonio) show departures from the usual coloration of the typical form and tendencies toward *schotti* in the loss of the median dorsal portions of the light crossbands and a marked reduction of the white borders of the head shields. A speci-

men of *schotti* (U.M.M.Z. No. 71925, collected near George West, Live Oak County) although in general coloration similar to other examples from the heart of the range, exhibits the following tendencies toward *girardi*: (1) there is a slight trace of light edges on the head shields, (2) the dark stripe on scale row 2 is retained anteriorly, and (3) an interrupted white stripe involving the fifth row of scales is present at intervals corresponding to the anterior light crossbands of *girardi*. Another *schotti* (U.M.M.Z. No. 71341, from Pleasanton, Atascosa County) has a pair of conspicuous white marks corresponding in position to the white occipital blotches of *girardi*.

While the amount of material from the critical region between *girardi* and *schotti* is limited to a small series, it seems likely that intergradation will be found to occur at other points along the southern edge of the Edwards Plateau. Since *girardi* occupies the higher plateau area northward and westward and *schotti* the lower valley plains to the southward (see map), it is probable that the region in which they have the opportunity to intermingle is a narrow one and that the rather high degree of distinctness they have maintained may be due to the physiographic and ecological differences in their respective ranges.

A series of 12 specimens from Cameron and Hidalgo counties shows definite intergradation in coloration and pattern between *schotti* and *ruthveni*. A color description based on living examples of these intergrading specimens, one of which is figured (Pl. II, Fig. 2), is given in another section. The scutellation of all intergrading specimens examined falls within the known range of variation of the *taeniatus* group.

On the evidence of intergradation shown by the material studied, we suggest that *schotti* and *ruthveni* be treated as subspecies of *Masticophis taeniatus*, and that the trinomials *Masticophis taeniatus schotti* (Baird and Girard) and *Masticophis taeniatus ruthveni* (Ortenburger) be adopted.

Although there are three published descriptions of *Masticophis taeniatus schotti* available (Baird and Girard, 1853; Cope, 1900; Ortenburger, 1928), none of them was based upon

more than three specimens, and in only one case was living material seen by the author. We therefore consider it desirable to redescribe this form and to review the synonymy.

*Masticophis taeniatus schotti* (Baird and Girard)

Schott's Racer; Green Racer; Striped Whipsnake

Plate II, Fig. 1; Plate III, Fig. 2

- 1853 *Masticophis schotti* Baird and Girard, Cat. N. Amer. Rept., pt. 1, Serpents, app. C: 160 (Type Locality, Eagle Pass, Texas; Type, U.S.N.M. No. 1972; collected by Arthur Schott). Baird, U. S. and Mex. Bound. Surv., 1859: 20, pl. 18. Ortenburger, Occ. Pap. Mus. Zool., Univ. Mich., 139, 1923: 2, 5, 7. Blanchard, Pap. Mich. Acad. Sci., Arts and Lett., 4, pt. 2, 1925: 37. Strecker and Williams, Contrib. Baylor Univ. Mus., 12, 1927: 10, 14. Ortenburger, Mem. Univ. Mich. Mus., 1, 1928: 42-43, pls. 5-7. *Coluber schotti* (part) Stejneger and Barbour, Check List N. Amer. Amphib. Rept., 1st ed., 1917: 80. Strecker, Bull. Sci. Soc. San Antonio, 4, 1922: 23. Stejneger and Barbour, Check List N. Amer. Amphib. Rept., 2nd ed., 1923: 88. *Bascanium schottii* Cope, Proc. U. S. Nat. Mus., 14, no. 882, 1892: 629. *Zamenis schottii* (part) Cope, Ann. Rep. U. S. Nat. Mus. (1898), 1900: 811, fig. 180. *Masticophis schottii* Strecker, Contrib. Baylor Univ. Mus., 16, 1928: 15.
- 1883 *Bascanium taeniatum laterale* (part) Yarrow, Bull. U. S. Nat. Mus., 24: 113.
- 1893 *Zamenis taeniatus* (part) Boulenger, Cat. Snakes Brit. Mus., 1: 390-392.
- 1915 *Zamenis taeniatus taeniatus* (part) Strecker, Baylor Univ. Bull., 18, (4): 36.

DIAGNOSIS.—A striped racer differing from *M. t. girardi* in lacking white borders of head shields and light dorsal crossbands; in general coloration usually greenish gray instead of blackish brown. It differs from *M. t. ruthveni*, typically a unicolor form, in having a more or less conspicuous pattern of lateral stripes.

DESCRIPTION.—General dorsal coloration greenish gray or bluish gray; anterolateral edges of scales of median 7 or 8 rows cream white or pale yellow from a point approximately one-sixth of the body length behind head to just above anal region. Ground color of sides light grayish green or bluish

gray with conspicuous stripes of black alternating with white or pale yellow in the following order: (1) a light stripe occupying the lateral tips of the ventrals and lower half of first scale row; (2) a dark gray or black stripe on median portion of first row, the upper portion shading into the greenish or bluish gray lateral ground color; (3) a dark gray or black stripe on lower half of scale row 3, followed immediately by (4) a second light stripe occupying the upper half of row 3 and the lower portion of row 4 (this is usually the most sharply defined of the series); (5) a third dark or black stripe on the upper half of row 4, sometimes blending with dorsal ground color and becoming indistinct. This pattern of stripes begins in the cervical region and is distinct on the anterior half of the body but becomes obsolete posteriorly (Pl. 2, Fig. 1). In the neck region of some individuals the dark lines on scale rows 1 and 4 are also bordered above by a whitish line. One specimen (U.M.M.Z. No. 74327) has rather conspicuous black punctations on the posterolateral edges of the lateral scales and on the outer tips of the ventrals.

Top and sides of head, muzzle, and temporal region greenish gray or brownish gray; anterior edge of posterior nasal usually cream white; loreal with or without a central light spot; preoculars, and usually postoculars, with light centers; inner border of iris golden; supralabials cream white or pale yellowish white with upper edges of same color as temporals and usually with a narrow lower edge of bluish gray; infra-labials, chin shields, and gulars white, indistinctly clouded in some specimens with bluish gray. Sides of neck in life more or less heavily tinged with reddish orange which extends backward on the anterior ventrals. This color fades rapidly in alcohol and usually is not detectible in specimens which have been preserved for only a few months. Throat white or cream, occasionally with blotches of light reddish orange.

Ventral ground color cream, pale yellow, or pale gray, occasionally tinged with pink; outer ends of ventral scutes of same color as sides of body; mid-portions of scutes occasionally almost immaculate but usually more or less stippled with

bluish gray dots, sometimes sparsely with large dots, sometimes densely with fine dots almost obscuring the ground color posteriorly. Ventral side of tail usually pink but sometimes pale salmon orange or pale yellow; immaculate or with bluish gray stippling anteriorly.

The following summary of the scutellation of this form is based upon 31 specimens, 13 females and 18 males, including the type. Scale rows 15; formulae 15-15-13 or 15-13-12, occasionally 15-15-12, and rarely 15-14-14 or 15-13-11. Ventrals 192-203; females 195-203, males 192-201. Caudals<sup>2</sup> 128-145; females 128-143, males 137-145. Supralabials 8, rarely 9. Infralabials 9, occasionally 10. Preoculars 2, lower very small. Postoculars 2, in a few cases 3. Temporals usually 2-2-2, occasionally 2-3-2 or 2-2-3, and in one specimen 2-1-2. Posterior chin shields narrower and longer than anterior. Loreal longer than high, with posterior edge oblique.

DESCRIPTION OF *SCHOTTI-RUTHVENI* INTERGRADES.—Five living specimens showing intergradation between *schotti* and *ruthveni* (Pl. II, Fig. 2), collected in Cameron County, 12 to 20 miles northeast of Brownsville, were sent to us by Mr. W. A. King, Jr. In scutellation they fall within the range of variation of each of these forms but in coloration and pattern an intermediate condition is exhibited. As they resemble each other in most respects, a composite description is here given. Color names that are capitalized are those of Ridgway's *Color Standards and Color Nomenclature* (1912).

General dorsal body color (involving 8 median rows of scales anteriorly, 5 posteriorly, and the median portion of the tail) Dark Greenish Olive on anterior portion, gradually changing to Brownish Olive posteriorly. Sides of body, including lateral tips of ventrals, Artemisia Green to Light Drab, in sharp contrast from dorsal coloration. Anterolateral edges of median dorsal scales on first half of body light yel-

<sup>2</sup> Only caudal counts of tails which appeared to be complete have been recorded. It is probable, however, that even with this precaution some in which a small terminal portion had been lost are listed; hence the above limits of variation must be considered provisional.

low. A lateral pattern of stripes, most distinct in the youngest individual, as follows: (1) a stripe of Light Chalcedony Yellow on outer edges of ventrals and lower half of scale row 1, conspicuous on anterior half of body; (2) a stripe of Dark Greenish Olive through the middle portion of scale row 1, fairly prominent in neck region but gradually fading posteriorly; (3) a yellow line occupying the upper half of row 3 and the lower half of row 4, more or less distinct in the neck region and persisting through anterior third or half of body length.

Top and sides of head and temporal region Brownish Olive or Dark Greenish Olive. Post-nasal, loreal, and preoculars with white or pale yellow centers. Supralabials Pale Yellowish White with upper edges of same color as sides of head and lower edges (especially on second to fourth labials) narrowly tipped with grayish blue. Infralabials and chin shields white. Sides of neck streaked or blotched with Salmon Orange as far posteriorly as ventrals 18 or 22. Throat white, cream, or Pale Yellowish White; immaculate or sparsely blotched with Salmon Orange and spotted with black or bluish gray.

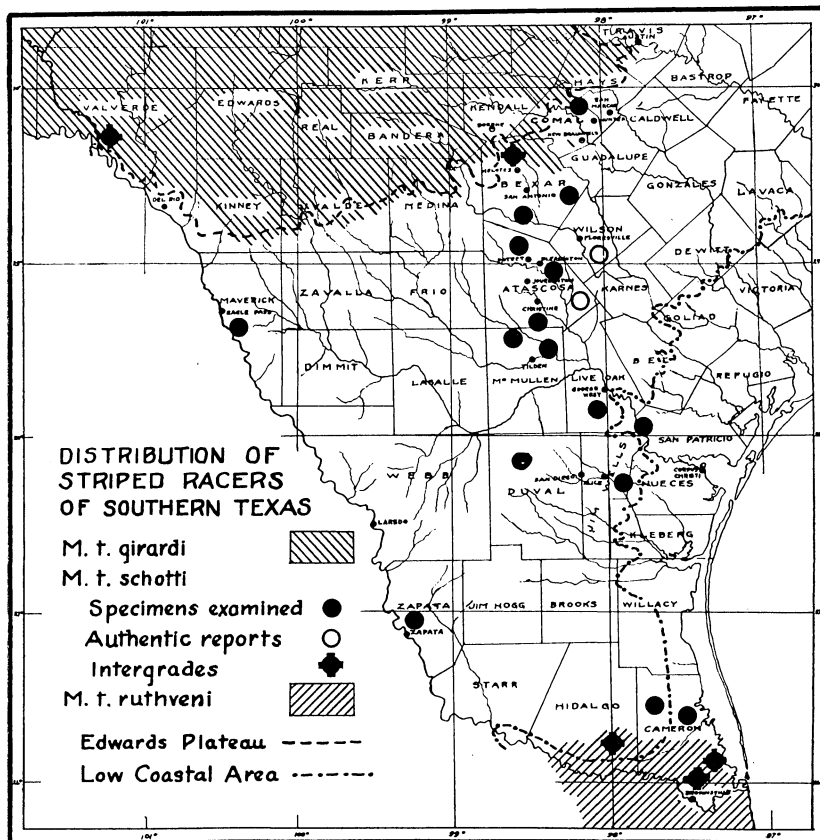
Ground color below Light Chalcedony Yellow anteriorly, becoming paler toward anal region where it grades into Flesh Pink on tail. In one individual the ventral ground color is cream with a conspicuous suffusion of Light Salmon Orange, deeper on throat and sides of neck and changing posteriorly through Orange Pink to Grenadine Pink on tail. Belly indistinctly spotted or stippled with bluish gray, especially on the anterolateral portion of each ventral, the gray increasing in amount posteriorly and in one case almost obscuring the ground color. One individual is stippled ventrally with Salmon Orange. Ventral side of tail stippled with gray in anal region, or immaculate; ground color Grenadine Pink or Flesh Pink.

RANGE.—The scarcity of specimens has made it impossible for previous writers to define the range of Schott's Racer. There are, however, a few published references which merit consideration in connection with its distribution. Strecker



(1909: 7) mentioned two specimens from Burnet County, Texas, under the name of *Zamenis taeniatus*, and although they are described as being "lustrous greenish-olive above" the remainder of the brief description might apply either to *girardi* or *schotti*. As it is subsequently stated that these snakes are known to the natives as the "black or mountain racer in contra-distinction to the prairie racer," we feel warranted in assuming that *girardi* is meant, especially since *girardi* is known to be an upland form. A later paper by the same author (Strecker, 1915: 36) does not recognize *girardi* and *schotti* as distinct from *Zamenis taeniatus taeniatus*, and under that name reference is made to two specimens from Burnet County. Through the kindness of Dr. Strecker and Dr. Williams we have been permitted to examine one of these specimens (Baylor Univ. Mus. No. 725); it proves to be a fairly typical *girardi* as the form is now understood. There is at present, therefore, no evidence of the occurrence of *schotti* in Burnet County. A specimen of racer taken at San Marcos, Hays County, is referred to this species by Strecker and Williams (1927: 10). This snake "had been run over and killed by an automobile and was too far decomposed to preserve." Since it is described as "greenish-black in color," although with white lateral stripes and pinkish underparts, it appears to have resembled *girardi* more than *schotti*. As Strecker in another paper (1927: 10) mentioned coachwhip snakes of a "distinct light green color," doubtless *schotti* and *ruthveni* although no technical name is used, inhabiting "the country southeast and south of San Antonio (the Brownsville region and westward along the Rio Grande to the mouth of the Pecos River)," he seems to have distinguished these forms from the darker *girardi* to the northward. It appears, then, that a definition of the range of this subspecies must be based solely upon the localities from which specimens are available (see list of specimens and map).

We have the verbal reports of Mr. W. A. Bevan and Mr. W. A. King, Jr., that *Masticophis t. schotti* is not uncommon near Floresville, Wilson County. A few specimens labeled



RANGES AND LOCALITY RECORDS OF THE STRIPED RACERS OF SOUTHERN TEXAS

"New Braunfels," Comal County, have found their way into museums through purchase from reptile dealers in that region. As some of these dealers usually make no effort to determine the original sources of the reptiles which they obtain from many parts of the entire area of southern Texas, and as we have definite reasons for believing that certain specimens labeled "New Braunfels" were collected in the vicinity of Floresville, some of the Comal County records are regarded as questionable. That this subspecies occurs in eastern Comal County, however, is shown by a specimen definitely known to have been taken near Hunter.

As little collecting has been done in the low Gulf Coastal strip, except in the vicinity of Brownsville where *schotti* gives place to *ruthveni*, we have been unable to determine whether or not the range of *schotti* extends into the Gulf counties to the north and east, but from a consideration of the possible differences in ecological factors it seems doubtful.

In view of the foregoing considerations, the known range of *Masticophis taeniatus schotti* can be defined as the Mesquite and Desert Grass Savanna area of the higher portion of the Gulf Coastal Plain of southern Texas, from the southern edge of the Edwards Plateau in the north, southward to the valley of the Rio Grande.

HABITAT AND HABITS.—From the experiences of Mr. Bevan in obtaining this whipsnake, and from field observations made by H. K. Gloyd in June, 1930, it appears that the habitat of *M. t. schotti* is open "brush country" (Pl. III, Fig. 1), consisting of scattered growths of mesquite, creosote bush, prickly pear, thorn bush, and desert grass. Almost nothing is known concerning the habits of this snake in its natural environment. Collectors who brought specimens to Mr. Harvey remarked that the striped racers are so difficult to catch that they seldom attempt to obtain them.

BEHAVIOR IN CAPTIVITY.—We have maintained eleven individuals of *schotti* in captivity for periods varying from a few weeks to nearly a year. During cage life, observations were made upon behavior, feeding habits, and the egg-laying of

four females. Most captive specimens were nervous and quick to resent handling and although a majority of those observed took food readily, some could not be persuaded to eat. A summary of the live animals which these snakes voluntarily consumed includes the following: white mice, house mice, small white rats, small Norway rats, fledgling English sparrows, garter snakes, leopard frogs, and green frogs. One individual ate several English sparrow eggs. In general the faster moving prey was consumed first, and the introduction of an active frog or mouse into the inclosure meant immediate excitement on the part of the snakes. Inanimate or helpless prey was leisurely devoured, but struggling animals were pressed firmly against the ground beneath a coil of the body, a habit that has been frequently noted in other forms of the genera *Coluber* and *Masticophis*.

On one occasion an instance of near-cannibalism was noted. Each of two racers in the same cage had eaten a frog and had begun an animated search for more food when the larger individual seized the smaller by the neck. The latter retaliated by securing a similar hold on the aggressor, and a lively struggle ensued for about thirty seconds before each snake released its hold. Each ate several more frogs and the incident appeared to be closed. The following morning, however, the larger racer was discovered swallowing the smaller, and a prompt rescue was necessary.

OVIPOSITION.—Three sets of eggs were deposited by captive females. The eggs were ellipsoidal, non-adherent to each other, and with leathery shells coarsely coated with small salt-like grains. Those of the first group unfortunately were destroyed before they were examined carefully; those of the second were measured and one preserved (T.Z.S. 463). The eggs of the third female received most attention. They were weighed and measured on the day of deposition and the weight and length of the female taken after egg laying. The female (U.M.M.Z. No. 74068) weighed 267 grams. The total weight of the 12 freshly laid eggs was 201.6 grams, about 43 per cent of the total weight of the snake before oviposition.

TABLE I  
SUMMARIZING DIMENSIONS AND WEIGHTS OF EGGS

Set Number	Date of Deposition	Number of Eggs	Length of Eggs in millimeters		Diameter of Eggs in millimeters		Weight of Eggs in grams	
			Extremes	Mean	Extremes	Mean	Extremes	Mean
I <sup>3</sup>	June 6, 1930 .....	3	.....	.....	.....	.....	.....	.....
II <sup>3</sup>	June 3, 1931 .....	10	38.0-49	41.6	22-25	23.8	.....	.....
III <sup>3</sup>	May 16, 1932 .....	12	36.5-47	41.0	25-27	26.1	14.8-18.1	16.8

<sup>3</sup> I—Female T.Z.S. No. 145, length 1441+ mm.; II—T.Z.S. No. 1201, length 1553+ mm.; III—U.M.M.Z. No. 74068, length 1620 mm., weight after deposition 267 gm.

In this instance egg laying occurred on May 16, 1932. At 11:35 A. M. it was discovered that ten eggs had been laid. The eleventh was extruded at 11:45 A. M. and the twelfth, in which the act of oviposition was photographed (Pl. III, Fig. 2), was laid at 12:30 P. M. Peristaltic movements began about five minutes before the appearance of the egg and the actual laying time was approximately one and one-half minutes. A fourth female at irregular intervals between May 16 and May 21, 1932, deposited eight or ten hard, yellowish yolks without the white leathery shell. These were assumed to be unfertilized eggs. A summary of dimensions and weights of eggs is given in Table I.

An attempt was made to hatch the eggs of the second and third groups. Those of the second were placed in rotting wood pulp examined at intervals. On the seventy-third day after deposition they were more or less shrunken and were much stained by the rotting wood. When some were opened the yolk was found to be in the form of a yellowish cheesy solid, and no development appeared to have taken place. The eggs of the third set were placed in moist sphagnum where they retained their plumpness for about ten days, but they also failed to hatch.

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## MATERIAL

The conclusions reached in this paper are based on the study of the following specimens, all of which were collected in the state of Texas.

*Masticophis taeniatus girardi* (Stejneger and Barbour):

Baylor 725, Clear Creek, Burnet County.

T.Z.S. 1714, southern Texas.

U.M.M.Z. 74335, 74336, Pecos River Bridge, Valverde County.

Gloyd 3000, San Antonio, Bexar County.

“ 3479, 20 miles north of San Antonio.

Specimens showing intergradation between *M. t. girardi* and *M. t. schotti*:

Baylor 228, 229, Helotes, Bexar County.

U.M.M.Z. 74334, near mouth of Pecos River, Valverde County.

*Masticophis taeniatus schotti* (Baird and Girard):

U.S.N.M. 1972, Eagle Pass, Maverick County. (Type.)

U.M.M.Z. 59036, Brownsville, Cameron County.

“ 60816, (locality unknown).

“ 69662, southern Texas.

“ 69663, 1½ miles east of Alice, Jim Wells County.

“ 71341, 71342, Pleasanton, Atascosa County.

“ 71925, George West, Live Oak County.

“ 74327, 16 miles east of San Antonio, Bexar County.

“ 74328, Hunter, Comal County.

“ 74329, Christine, Atascosa County.

“ 74330-74332, Mitchell Lake, 16 miles south of San Antonio, Bexar County.

“ 74333, northern McMullen County.

T.Z.S. 145, 184, 462, 1008, 1201, Southern Texas.

Kansas 8392, Neuces River, San Patricio County.

“ 8394, Brownsville, Cameron County.

Taylor-Smith, Pleasanton, Atascosa County.

- Cornell 612, Tilden, McMullen County.  
 " 1261, Brownsville.  
 Gloyd 2903, 2904, 7 miles east of Poteet, Atascosa County.  
 " 3072, Zapata, Zapata County.  
 " 3073, 12 miles south of San Antonio, Bexar County.  
 King, 30 miles northeast of Brownsville, Cameron County.  
 Wiley, Southern Texas.

Specimens showing intergradation between *M. t. schotti* and *M. t. ruthveni*:

- U.M.M.Z. 74073, 20 miles northeast of Brownsville, Cameron County.  
 " 74062-74064, 12 miles northeast of Brownsville.  
 " 74065, northeast of Brownsville.  
 T.Z.S. 1713, 25 miles northeast of Brownsville.  
 F.M.N.H. 6799-6801, Brownsville.  
 Cornell 589, Edinburgh, Hidalgo County.  
 " 613, Brownsville, Cameron County.  
 Kansas 8393, Brownsville.

*Masticophis taeniatus ruthveni* (Ortenburger). The following specimens were not included in Ortenburger's studies of 1923 and 1928:

- Kansas 8395, Cameron County.  
 Cornell 1262 a and b, Brownsville, Cameron County.  
 T.Z.S. 1712, 25 miles northeast of Brownsville.  
 Taylor-Smith (2 specimens), near Brownsville.

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Texas. *Ibid.*, 12: 1-16.

PLATE I

FIG. 1. *Masticophis taeniatus girardi* (Stejneger and Barbour), U. M. M. Z. No. 74336, collected near mouth of Pecos River, Valverde County, Texas. Living specimen showing pattern typical of this form in southern portion of its range.

FIG. 2. *Masticophis taeniatus girardi*, U. M. M. Z. No. 74071, San Antonio, Texas, showing tendencies toward *M. t. schotti* in loss of median dorsal portions of the light crossbands and almost complete reduction of white borders of head shields. Photographs by H. K. Gloyd.

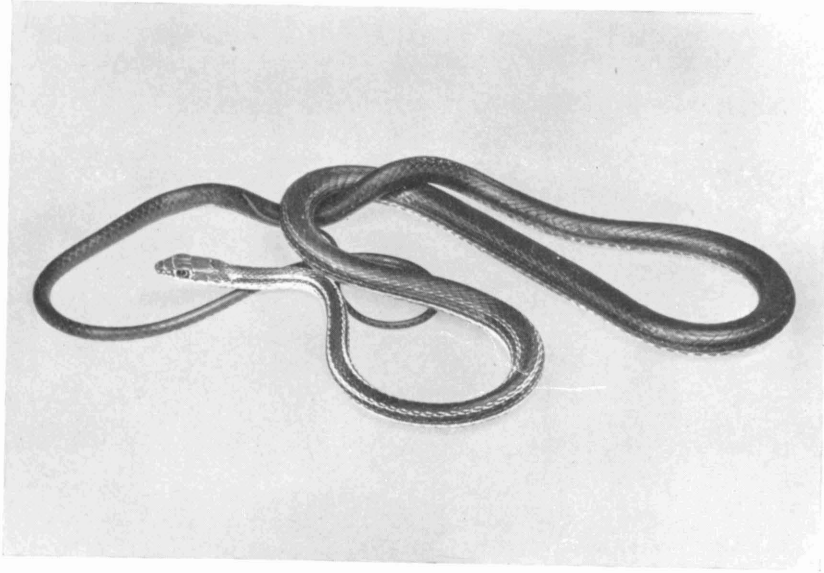


FIG. 1

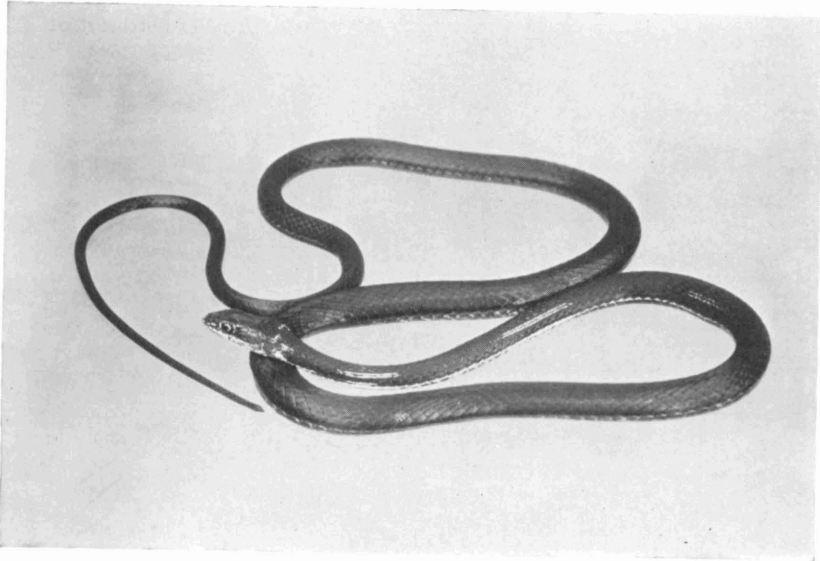


FIG. 2

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PLATE II

FIG. 1. *Masticophis taeniatus schotti* (Baird and Girard), U. M. M. Z. No. 74332, 16 miles south of San Antonio, Bexar County, Texas. From living specimen showing typical color pattern.

FIG. 2. Intergrade between *M. t. schotti* (Baird and Girard) and *M. t. ruthveni* (Ortenburger). U. M. M. Z. No. 74064, 12 miles northeast of Brownsville, Cameron County, Texas. Photographs by H. K. Gloyd.

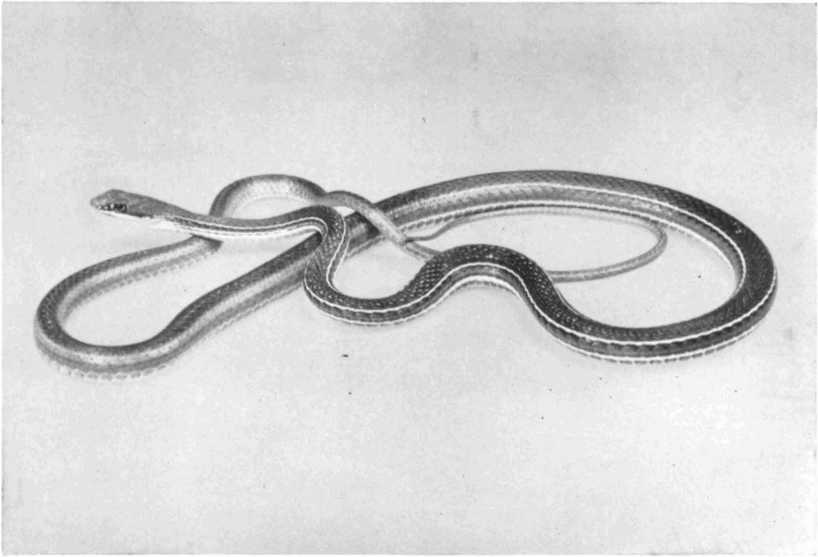


FIG. 1

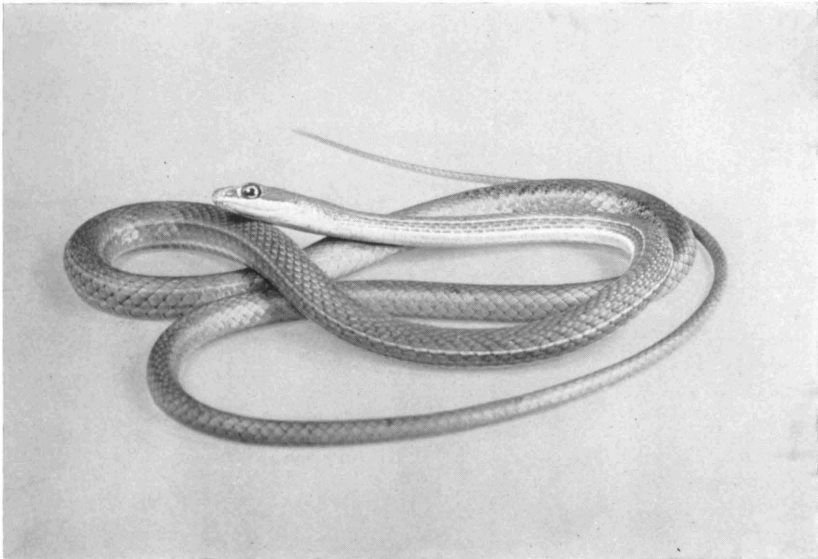


FIG. 2

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PLATE III

FIG. 1. Mesquite and desert grass savanna, typical of the habitat and range of *Masticophis taeniatus schotti*, near Hebronville, Texas, June 30, 1930.

FIG. 2. *Masticophis t. schotti* (U. M. M. Z. No. 74068) depositing eggs, May 16, 1932. The last egg just extruded. Photographs by H. K. Gloyd.

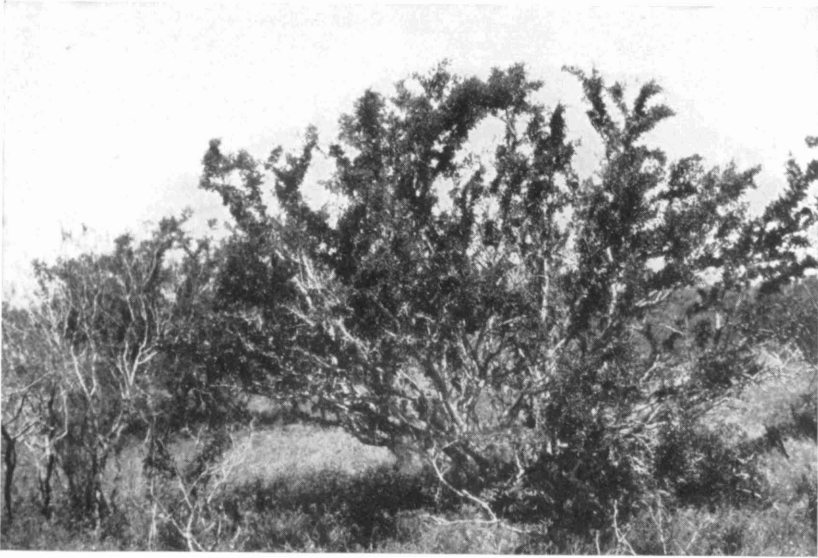


FIG. 1

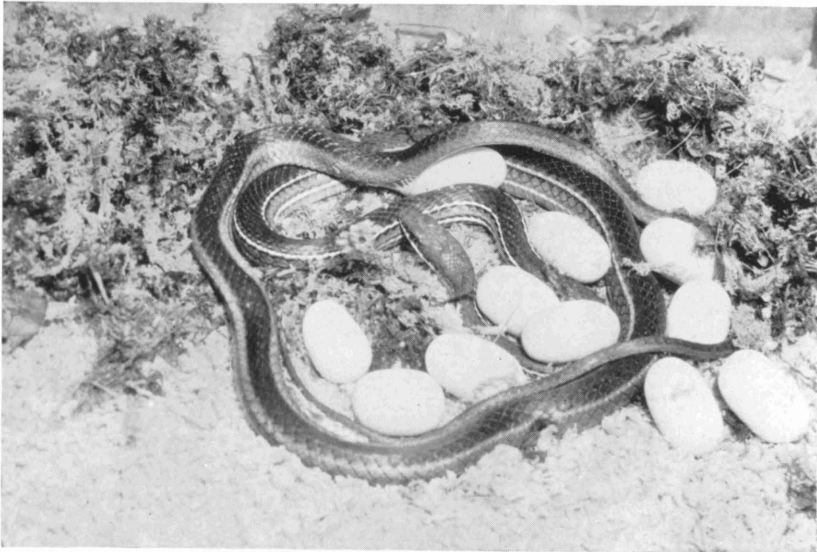


FIG. 2







