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A NEW MEXICAN GARTERSNAKE (GENUS *THAMNOPHIS*)  
WITH NOTES ON RELATED FORMS

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AMONG the herpetological specimens recently collected by various expeditions of the Museum of Zoology, University of Michigan, are nine examples of a new species of *Thamnophis* from Durango. In allusion to a striking feature of its coloration I name this snake

*Thamnophis nigronuchalis*, new species

(Plates I and II)

HOLOTYPE.—UMMZ 113611, adult female, collected at San Luis, Durango, 9000 feet elevation, on July 22, 1955, by Richard Parker.

PARATYPES.—UMMZ 102288-90, between San Luis and San Luis del Rio, 8500 feet; UMMZ 102291-3, San Luis, near Cerro Huehuento, 8500 feet; UMMZ 113612, San Luis, 9000 feet; UMMZ 112525, 5.6 miles west of El Salto, 8500 feet.

DIAGNOSIS.—A medium-sized, stocky gartersnake closely related to *T. rufipunctatus*. This species is peculiar within the genus in having the following combination of characters: 21-21-19-17 scale rows; 149-165 ventrals; 63-70 caudals; an ovate head; two supralabials entering the orbit; two preoculars; a distinct and undivided black nuchal blotch; a dorsal color pattern consisting of 5-10 rows of reddish brown spots outlined with black; no dorsal or lateral stripes; heavily pigmented ventrals, the pigment tending to form an irregular black longitudinal stripe.

DESCRIPTION OF HOLOTYPE.—Rostral visible from above, length 3.7 mm., width 2.5 mm., pentagonal with labial edge notched, in contact posteriorly with the nasals and the internasals. Internasals triangular, 2.7 mm. long and 2.3 mm. wide, in contact posteriorly with the prefrontals. Suture between prefrontals as long as width of internasals; width of internasals equal to length of prefrontals. Prefrontal in contact with the postnasals, loreals, upper preoculars, supraoculars, and frontal.

Supraoculars elongate, pointed anteriorly, rounded posteriorly, about 1.9 times as long as broad. Frontal hastate, 5 mm. long, 3 mm. broad, widest anteriorly; anterior edge straight; posterior end pointed. Parietals subovate, suture between them 6 mm. long; greatest length of parietals 8 mm.; greatest width 4.5 mm. Loreal as long as suture between prefrontals, slightly longer than wide. Upper preocular pentagonal, about same length as loreal. Lower preocular about two-thirds size of upper. Postoculars subequal, slightly smaller than lower preocular. Temporals 1-1-3. Supralabials 8-8 (sixth and seventh on left side partly fused), increasing in size from first through seventh; eighth smaller than seventh; fourth and fifth entering orbit. Lower labials 10-10, first five in contact with anterior chinshield, fifth and sixth in contact with posterior chinshield. Mental triangular, 3 mm. wide, 1.8 mm. long. Anterior chinshields pointed at both ends, 6 mm. long and 2 mm. wide. Posterior chinshields elongate, rounded posteriorly and pointed anteriorly, 6.5 mm. long and 1.7 mm. wide, separated from each other by three gular scales. General shape of head ovate, canthus rounded. Length of head 23.7 mm.; greatest width 11.7 mm.; width of orbit 3 mm.; orbit-snout length 6.6 mm. Scale rows 21-21-19-17; scales strongly keeled except first scale row which is weakly keeled posteriorly and smooth anteriorly. Ventrals 149; caudals 65; anal plate single; total length, 543 mm., tail, 125 mm.

The coloration of the holotype, freshly preserved in alcohol, is as follows. Ground color light olive brown. Dorsum covered with eight rows of reddish brown spots, outlined with black; many spots of two dorsal rows fused to form crossbands. Longitudinal extent of spots averages about  $1\frac{1}{2}$  scale lengths, and transverse extent about 2-3 scale rows; spots obsolescent on tail. Nuchal blotch distinct, shiny black, subrectangular, 11 scale rows wide, and about  $3\frac{1}{2}$  scales long. Supralabials barred along posterior edges. Black bar from middle postocular scale to posterior end of mouth. Dorsal head scales strongly stippled with black. Throat cream color. Ventrals and caudals heavily pigmented with black, the amount of pigment increasing posteriorly and gradually forming an irregular, black band which occupies full width of posterior ventrals.

VARIATION.— Of the head scales, the temporals and labials are the most variable. The first temporal is often fused with others, and any or all of the temporals may be fused or divided in various fashions. The supralabials are generally 8, but 9, 10, or 7 occasionally occur. Two labials enter the orbit in all specimens, usually the fourth and fifth, occasionally the fifth and sixth.

The scale row formula is constant: 21-21-19-17. The range in number of ventrals is 149-165, females having 149-157, and males 158-165. The range in subcaudal number is 63-77, females having 63-70, and males 69-77. The anal scale is single in eight specimens and divided in one. The total length varies from 213 mm. to 547 mm. The average tail/body length of four females is 29.72 per cent, range 28.3-30.9; for four males 29.87 per cent, range 28.4-32.2. Each of three specimens examined had 26 maxillary teeth.

There are from five to ten rows of spots on the dorsum. The ground color is generally brown or olive brown in freshly preserved specimens. One large female (UMMZ 102292) is very dark, and the dorsal pattern may be distinguished only when the specimen is immersed. The ventrals are heavily pigmented with black in all specimens examined. Usually this pigmentation forms an irregular longitudinal stripe which may be confined to the medial one-fourth of the ventrals, or may occupy their entire width.

ECOLOGY.—Six specimens collected by Paul S. Martin were found in wet meadows at an elevation of 8500 feet. One specimen collected by me, also at 8500 feet, was beside a small stream that trickled through a recently lumbered area; the vegetation consisted of grasses and a few small pine trees. The outcropping rock of the immediate area was limestone.

Martin's specimens contained remains of *Rana pipiens*, *Hyla* sp., and earthworms.

At all localities, *T. nigronuchalis* was found associated with *T. eques*, which was by far the more common.

### *Thamnophis rufipunctatus* (Cope)

(Plates I and II)

*Chilopoma rufipunctatum* Cope, in Yarrow, Wheeler's *Rep. Geog. Geol. Expl. Surv. W. 100th Mer.*, Zool., 5(1875):544. (Type locality, southern Arizona).

*Thamnophis rufipunctatus*, Smith, *Zoologica*, 27 (1942):120-21.

*Atomarchus multimaculatus* Cope, *Amer. Nat.*, 17 (1883):1300-1301. (Type locality, San Francisco Rio, New Mexico; type unknown).

*Thamnophis multimaculatus*, Taylor and Knobloch, *Proc. Biol. Soc. Wash.*, 53 (1940):129-30.

*Thamnophis angustirostris*, Ruthven, *U.S. Nat. Mus. Bull.*, No. 61 (1908):120-24 (in part).

*Natrix angustirostris*, Lowe, *Copeia*, No. 4 (1955):307-9.

DIAGNOSIS.—A medium-sized *Thamnophis* with 21-21-19-17 scale rows; head elongate and laterally compressed; a single supralabial en-

tering the orbit; two preoculars; 151-180 ventrals; and 65-87 subcaudals; ground color above, olive brown; dorsum covered with 3-9 rows of reddish brown spots outlined with black; no dorsal or lateral stripes; basal half of each ventral heavily pigmented with black, the pigment tending to form a row of spots on each side of the belly.

DESCRIPTION AND VARIATION.—The scale rows are 21-21-19-17, and are strongly keeled except for the first row which may be smooth. Ventrals in males 151-180, average 166.8; in females 151-173, average 162.6. Caudals in males 70-87, average 79.2; in females 65-78, average 70.9. The head is elongate and laterally compressed. In adults the sides of the head are concave. The nostrils are lateral; the canthus is strongly angulate posteriorly and rounded anteriorly. The eyes are medium in size, being slightly less than one-half the distance from the orbit to the tip of the snout. They are located slightly less than one-half the distance from the anterior tip of the rostral to the posterior end of the parietals. There are usually 8 supralabials, occasionally 9, rarely 7 or 10; either the fourth or fifth enters the orbit, only very rarely do both. Infralabials are usually 10, occasionally 9 or 11, rarely 12. Preoculars are 2, occasionally 3, rarely 4. Postoculars are generally 3, often 4 or 2. The supraocular is elongate, pointed anteriorly, and rounded posteriorly. The rostral is about one-half as high as wide, visible dorsally, and is in contact with the nasals and internasals. The internasals are about one-half the width of the rostral, are slightly longer than wide, and are triangular. Occasionally there is a small, circular third internasal, anterior to the other two, separating them from the rostral. The prefrontals are one and one-half times the length of the paired internasals; they are rectangular, slightly broader than long. Posteriorly the prefrontals are in contact with the upper preoculars, the frontal, and occasionally the supraoculars. The frontal is pentagonal, slightly wider anteriorly than the rostral, and is a little less than one and one-half times as long as broad. The lateral edges converge posteriorly to a point where they are slightly more than one-half as far apart as they are anteriorly. The posterior margins come together to form an angle of about 90°. The parietals are subovate, as long as the combined length of the frontal and prefrontals, and are slightly less than twice as long as wide. The nasals, postnasals, and loreals are all quite variable in size and shape. The temporals are variously fused or divided. The mental is equilaterally triangular. The anterior chinshields are twice as long as wide, and are in contact with the first 4 or 5 infralabials. The posterior chinshields are about as long as the anterior and are in contact with the fifth and sixth infralabials.

In total length males vary from 195 to 627 mm., and females from 200 to 760 mm.; the tail/body ratio is 24.5–33.7 per cent for males, average 30.78; and 23.3–33.5 for females, average 28.71.

Four characters in the scutellation vary latitudinally: the number of ventrals, caudals, supraoculars, and internasals. In northern Arizona the ventrals range from 160 to 172 (females 160–171, average 164.5; males 164–172, average 171.2). The caudals vary from 71 to 87 (females 71–74, average 72.3; males 81–87, average 83.9). In central and southern Chihuahua and Durango, the ventrals vary from 151 to 172 (females 151–171, average 162.1; males 160–172, average 165.6). The caudals vary from 66 to 79 (females 66–74, average 72.2; males 72–79, average 75.3). In the southern extreme of the range, the supraoculars are generally in contact with the prefrontals; in northern Arizona and New Mexico, they are seldom in contact. In southern Chihuahua and Durango there are usually two internasals, and in northern Arizona there are usually three. The latitudinal trend of these four characters is so gradual that subspecific recognition based on them is not warranted.

The color of this snake is different from that of any other *Thamnophis*, although in many respects it is similar to that of *nigronuchalis*. The ground color is olive brown. The dorsum is covered with 3–9 rows of black-bordered reddish brown circular spots. These spots are about 1–2 scales long, and are 2–8 scale rows wide; the average length of a spot is  $1\frac{1}{2}$  scales, and the width is 2–3 scale rows. Toward the posterior part of the body the spots decrease in size and distinctness and become obsolete on the tail. The labials are yellow-white, their posterior edges barred with black. The head is dark slate gray, stippled and speckled with black. A nuchal blotch, which may or may not be present, is commonly divided by a faint yellow stripe. The throat is cream color and fades into the gray of the ventrals. The basal part of each ventral is heavily pigmented with black; the pigment is arranged in spots anterolaterally on each ventral so that two rows are formed. These spots continue to the under surface of the tail where they gradually become obsolete. Occasional specimens do not have the typical arrangement of spots, but have an irregular bar across the basal quarter of each ventral.

RELATIONSHIPS.—This species is most closely related to *Thamnophis nigronuchalis*, with which it shares the following characters: (1) several rows of reddish brown spots on the dorsum, (2) body without dorsal or lateral stripes, (3) ventrals heavily pigmented with black, (4) 21–21–19–17 scale rows, (5) 8 supralabials, and (6) 2 preoculars. *T. rufipunctatus* may be distinguished from *nigronuchalis* by (1) the number of labials entering the orbit, (2) the pattern of pigmentation on the

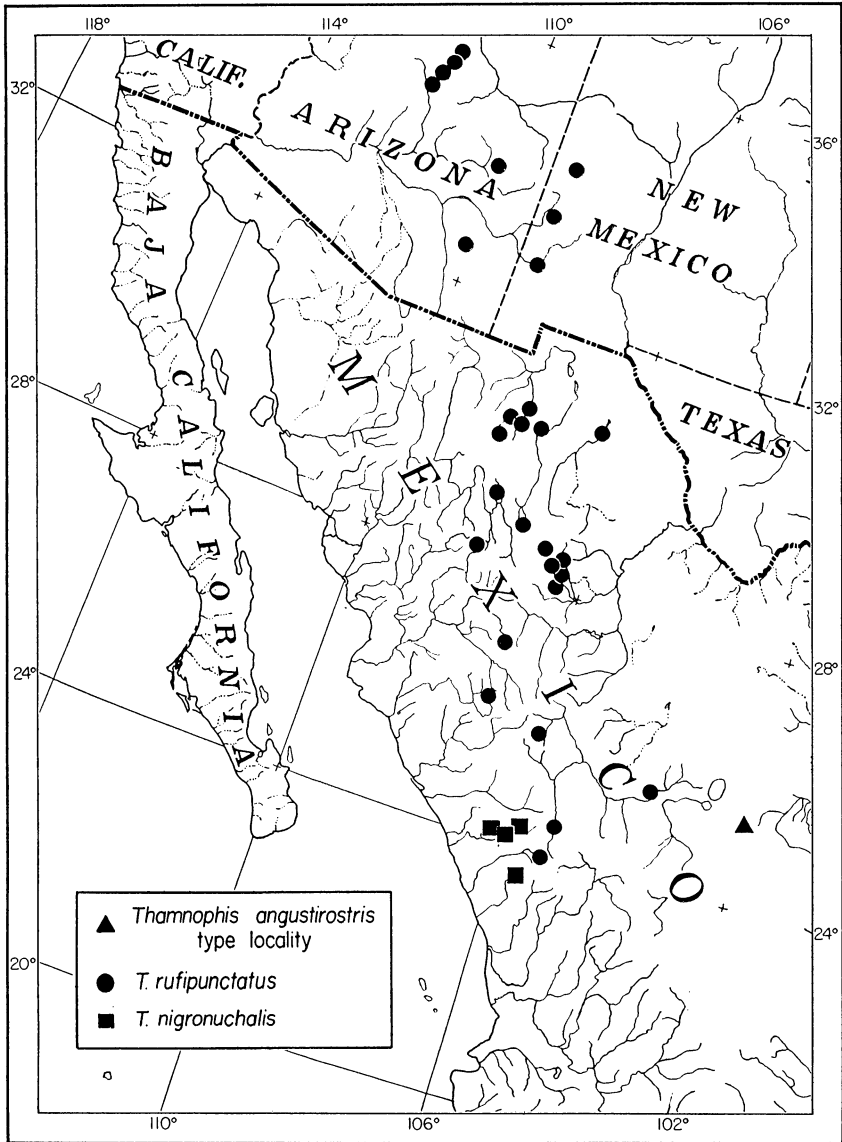
ventrals, (3) the shape of the head, (4) the incidence and character of the nuchal blotch, and (5) the average number of ventrals and caudals. The only other species in the genus *Thamnophis* which has heavily pigmented ventrals is *T. melanogaster*. However, unlike *rufipunctatus* and *nigronuchalis*, *melanogaster* has 19 scale rows anteriorly, usually has lateral stripes, and the pigment on the ventrals is arranged in a definite mid-ventral black stripe.

I regard *Thamnophis rufipunctatus* and *T. nigronuchalis* as species because available specimens of the former from Coyotes and from 33 miles northeast of El Salto, Durango, and specimens of the latter from geographically adjacent populations show no evidence of intergradation. Locality records showing the distribution of both species, and the type locality of *T. angustirostris* are shown on Map 1.

REMARKS.—Since the original description of *Chilopoma rufipunctatum* (Cope, in Yarrow, 1875) there has been much confusion as to the status of the name *Eutaenia (Thamnophis) angustirostris* Kennicott; this is partly due to the fact that Kennicott's description omitted many diagnostic scale characteristics. Ruthven (1908) synonymized *rufipunctatus* with *angustirostris* on the supposition that the "type" of *angustirostris* was an abnormal specimen of its species. Taylor and Knobloch (1940: 120–30), however, maintained that the "type" of *angustirostris* could not be associated with *rufipunctatus*. In his account of Mexican *Thamnophis*, Smith (1942: 120–21) suggested that the "type" of *angustirostris* is a hybrid between *rufipunctatus* and *T. melanogaster*, and therefore the name *angustirostris* could not be applied validly to any form of the genus. Schmidt (1953: 167), however, pointed out that the name could still be used, "since the action of earlier authors allocates the name." Recently, Smith (1955: 167–69) suggested that *angustirostris* and *melanogaster* may be subspecifically related.

It is clear that when Kennicott described *angustirostris*, he had more than one specimen before him. At present, however, the only specimen of the type lot that can be found is the juvenile that he referred to as being exceptionally black. In subsequent references to *angustirostris* authors have regarded this specimen as the "type," even though Kennicott did not designate it as such. In order to prevent any confusion in the future should others of the type lot be found, I designate this juvenile specimen (USNM 959) as the lectotype of *Thamnophis angustirostris*.

During the summer of 1955 at Parrás de la Fuente, Coahuila (referred to as Parras, Coahuila, by Kennicott), I secured four specimens of *T. marcianus* that agree very closely in scale characters with the lectotype



MAP 1. Locality records of *Thamnophis rufipunctatus*, *T. nigronuchalis*, and *T. angustirostris*.

of *angustirostris*. These specimens and the lectotype of *angustirostris* all have two labials entering the orbit, a characteristic typical of *marcianus*, 1-1 preoculars, a characteristic never recorded for *rufipunctatus*. There are 21-21-19-17 scale rows, and the number of ventrals (151-164) and caudals (60-70) falls well within the limits of variation given for *marcianus* by Mittleman (1943: 244-48).

Characteristics of the lectotype of *angustirostris* strongly suggest that it is a melanistic specimen of *marcianus*. As Kennicott stated, dorsal and lateral stripes are present. The lateral stripes are on the second and third scale rows and are evident when the specimen is immersed. The dorsal stripe is more distinct than the lateral ones and is half the width of the vertebral scale row. Behind the head this stripe widens and divides the nuchal blotch, a trait that is typical of *marcianus*. The six rows of spots that are present in *marcianus* can also be seen in the lectotype of *angustirostris*. Not a single specimen of the 102 *rufipunctatus* that I examined, has any trace of dorsal or lateral stripes (a nuchal stripe is often present).

In view of the evidence, I believe that *Eutaenia angustirostris* Kennicott is conspecific with *Eutainia marcianus* Baird and Girard and that the name belongs in the synonymy of the latter species. The name *angustirostris* was misapplied by Ruthven and by subsequent authors; most references to this name in the literature since 1908 actually apply to *Thamnophis rufipunctatus*.

Lowe (1955) recently placed *Thamnophis angustirostris* (*rufipunctatus* of this paper) in the genus *Natrix* on the basis of (1) the divided character of the anal plate, (2) the dorsal location of the nostril, (3) the spotted color pattern, and (4) the snake's aquatic habitat preference. In the past the type of anal plate has been most useful in separating *Thamnophis* from North American *Natrix*. In a population sample of 14 specimens, Lowe found the anal plate divided in six, entire in six, and creased in two. My examination of these and 14 additional specimens of the same population has revealed the presence of only seven with divided or partly divided anal plates, and in a total of 102 specimens from the entire range of the species only eight have divided anal plates. Such a low percentage of exceptions does not warrant the exclusion of this character from a generic definition.

The nostril is not more dorsally located in *rufipunctatus* than in other species of *Thamnophis*. The nostril appears to occupy a more dorsal position because of the rounded shape of the canthus anteriorly, but it actually occupies the same relative position as it does in other forms of *Thamnophis*.



The presence or absence of stripes cannot be used to show generic affinity in this group of snakes. Several species of North American *Natrix* have stripes and several forms of *Thamnophis* do not. Within the species *Thamnophis elegans*, some subspecies have stripes and no spots, and some have spots and no stripes.

The habits of this snake are not diagnostic of its generic status. Many forms of *Thamnophis* that occur in western North America are largely aquatic.

The following specimens of *Thamnophis rufipunctatus* have been examined:

ARIZONA<sup>1</sup>: Apache Indian Res. (USNM 53399); Cocconino Co., 8 mi. N of Sedona, Oak Creek (ASDM 561-2; WHW 424, 427-487, 516, 719-20, 1216, 1222); Oak Creek Canyon (USNM 51889, 56042-5; AMNH 62115, 64375-81, 64402-3; UMMZ 84429; FAS 5524); Oak Creek Canyon 18.5 mi. S of Flagstaff (CNHM 51748-9); Oak Creek Canyon, Manzanito Camp (MVZ 59459-61); Greenlee Co., Diamond Rock Camp on the Black R., SW of Alpine (ASDM 629); Navajo Co., near Fort Apache (UMMZ 105650); Yavapai Co., Sedona, 7 mi. S of Maury Ranch (ASDM 713).

NEW MEXICO: Catron Co. (UMMZ 85616); Grant Co., 1 mi. above XSX Ranch, East Fork Gila R. (MVZ 49939-40); Lincoln Co., West Fork Gila R., 7500 ft. (CNHM 29473).

CHIHUAHUA: Arroyo del Alamos, 70-74 km. S of Neuva Casas Grandes (USNM 42874-5); Ahumada (CNHM 1259); 3 mi. S of Colonia Garcia, 7200 ft. (MVZ 21031); Colonia Juarez (CNHM 1096); Guerrero, Rio Papigochic (USNM 95607); Sierra Madre, Guadalupe y Calvo (USNM 46368); Meadow Valley (USNM 26592); Norogachi (AMNH 73754-5); Pacheco (UMMZ 56992-3); Primavera, 5500-6000 ft. (AMNH 68286); Rio Casas Grandes (USNM 26591); Minaca, Rio Papigochic, 6300 ft. (MVZ 59208-13); Rio Sta. Maria near Progreso (USNM 104658-61); 33 mi. NE of Rio Verde, 7600 ft. (MVZ 59228-9); San Andres (CNHM 1275a); San Diego (AMNH 4342); Santa Barbara, 6300 ft. (AMNH 68252); 7 mi. SW of El Vergel (Lagunita), 7800 ft. (MVZ 59214-34).

DURANGO: Coyotes, 8000 ft. (CNHM 1501-2); nr. Guanacevi (USNM 46369); Rio Nazas, nr. La Goma (UIMNH 33956, 36129); 33 mi. ENE of El Salto, 7200 ft. (MVZ 59235).

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<sup>1</sup> Trapido (1942: 54) recorded a specimen from near Palo Pinto, Palo Pinto Co., Texas. I consider this record as invalid.

Woodin, Arizona-Sonora Desert Museum (ASDM and WHW); and Richard G. Zweifel, American Museum of Natural History (AMNH). In particular I wish to thank the following people from the University of Michigan Museum of Zoology (UMMZ) who have been helpful and have offered unlimited suggestions for this study: Norman Hartweg, Charles F. Walker, William E. Duellman, George B. Rabb, and Harold J. Walter. I also wish to thank Paul S. Martin who collected the major part of the type series of *Thamnophis nigroneuchalis*, and allowed me to use his field notes for ecological references.

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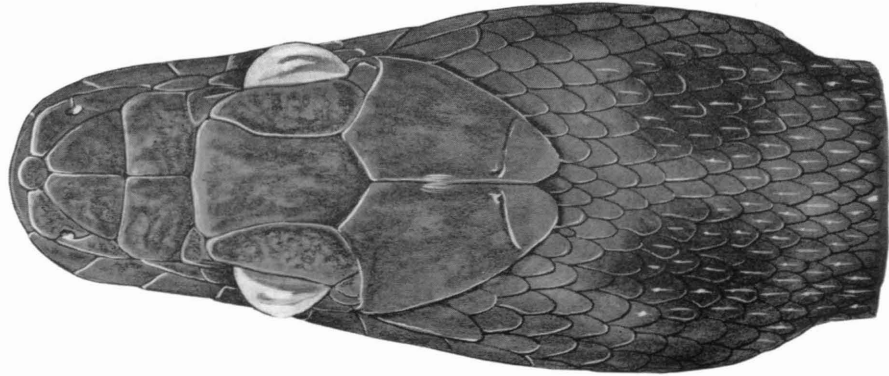
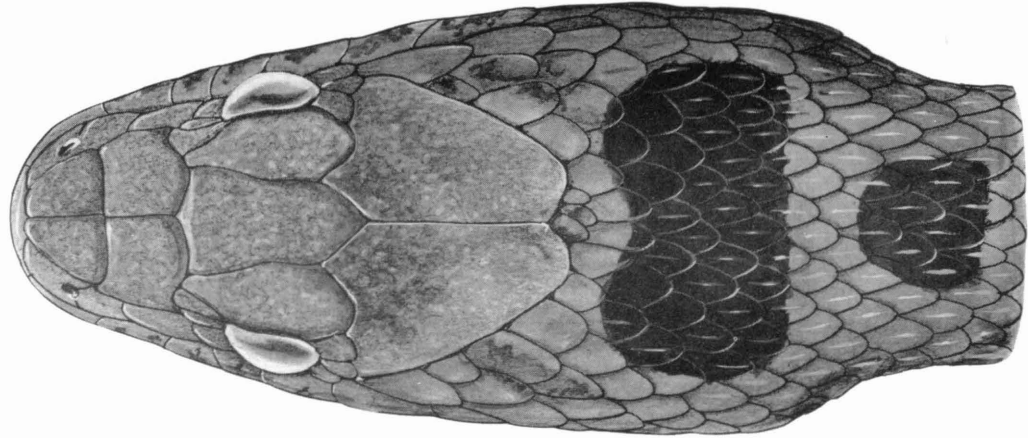
PLATES

Fred G. Thompson

PLATE I

Dorsal view of head of *Thamnophis rufipunctatus* (UMMZ 59662, left) and *Thamnophis nigronuchalis* (UMMZ 113611, holotype, right). Drawn by William L. Brudon.

PLATE I



*Fred G. Thompson*

PLATE II

Color Pattern of *Thamnophis rufipunctatus* (UMMZ 105650, upper left; UMMZ 84429, upper right), and *Thamnophis nigronuchalis* (UMMZ 112525, paratype, lower left; UMMZ 113611, holotype, lower right). Drawn by William L. Brudon.

PLATE II

