

NOTES ON THE HERPETOFAUNA OF WESTERN MÉXICO: NEW RECORDS FROM SINALOA AND THE TRES MARÍAS ISLANDS¹

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ABSTRACT: Two species of snakes, *Hypsiglena torquata* and *Tantilla bocourti*, are reported for the first time from the Tres Marías Islands. The salamander *Ambystoma rosaceum*, the frogs *Bufo cognatus* and *Rana tarahumarae*, the lizards *Eumeces parviauriculatus*, *Sceloporus poinsettii*, *S. spinosus* and *S. virgatus* and the snakes *Chilomeniscus cinctus*, *Tantilla bocourti* and *T. wilcoxi* are added to the fauna of Sinaloa. Each specimen is compared with individuals of the same species from other parts of its range. These records, together with deletions of two species and notes on six others, contribute to our knowledge of the variation, distribution and biogeography of the herpetofauna of western México.

INTRODUCTION

More is known about the distribution of the faunas of western México than of any other part of that country. This generalization is true especially of amphibians and reptiles where several major works (Bogert and Oliver 1945; Duellman 1958, 1961, 1965; Zweifel 1959, 1960; Hardy and McDiarmid 1969) have provided in-depth treatments of the faunal composition and species distributions in this biogeographically interesting area. As well known as the herpetofauna is, additional field work continues to produce significant specimens. In this paper range extensions, additions and deletions to the herpetofaunas of the Tres Marías Islands and of Sinaloa, México, are reported.

Most of the material from the Tres Marías Islands was collected by James R. Northern and Roy R. Snelling between 17 and 30 March 1964. Their expedition was sponsored by Richard F. Dwyer of the American Foundation of Oceanography in conjunction with the Natural History Museum of Los Angeles County (LACM). The field party visited Isla María Magdalena and Isla María Cleofas in the Tres Marías group and Isla Isabel, a small island located between the Tres Marías Islands and the Mexican mainland. The new material from Sinaloa is contained in several collections that became available after the manuscript on the herpetofauna of Sinaloa was submitted for publication (Hardy and McDiarmid 1969). One fairly large collection was made in the northeastern part of the state by Copp (JFC) and Breedlove during the dry seasons between 1967 and 1971. Animals were taken at several localities at various elevations

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and in different habitats along the road from Los Hornos (= El Orno of Gentry 1946) to Surutato (= Surotato of Gentry) and in adjacent canyons in the remote and rugged Sierra de Surutato. The specimens collected in México by Breedlove will be deposited in the collections of the California Academy of Sciences.

The vegetation of the Sierra de Surutato is composed of a diverse mixture of tropical and temperate forest types. Gentry (1946) gave a brief description of the vegetation and listed some major elements. At the lower elevations thorn forest and tropical deciduous forest are common. Some elements of seasonal evergreen forests are found in the outwashes of the major canyons such as the Cañon de Tarahumare. A riparian forest with *Platanus*, quite reminiscent of those found in the mountains of southern California, Arizona and Sonora, occurs along the canyons at middle elevations. At 1000 m the tropical deciduous forest grades imperceptibly into pine-oak forest, which at higher elevations becomes more mesic and includes *Juglans* and *Arbutus*. A forest reminiscent of evergreen cloud forests (Breedlove 1973; mesophytic mountain forest of Rzedowski and McVaugh 1966) occurs in a few moist, protected canyons at high elevations. This forest is composed of several genera of broadleaf evergreen trees, *Carpinus* and the conifer *Pseudotsuga*. The flora is characterized by a high degree of endemism. *Gentrya*, a Scrophulariaceae (Breedlove and Heckard 1970), is known to occur only here. This mountain range is also the northernmost station for many tropical and temperate-tropical species of plants.

SPECIES ACCOUNTS

LAS TRES MARÍAS AND ISABEL ISLANDS

Individuals of the following species known previously from the islands were collected during the 1964 trip or on earlier unreported expeditions. They include *Phyllodactylus tuberculosus saxatilis*, *Anolis nebulosus*, *Ctenosaura pectinata*, *Mastigodryas melanolomus slevini* and *Oxybelis aeneus* from María Cleofas; *Anolis nebulosus*, *Ctenosaura pectinata*, *Urosaurus ornatus lateralis*, *Cnemidophorus communis mariarum*, *Boa constrictor imperator*, *Mastigodryas melanolomus slevini* and *Masticophis striolatus* from María Magdalena; and *Ctenosaura pectinata*, *Sceloporus clarkii boulengeri*, *Cnemidophorus costatus huico* and *Lampropeltis triangulum nelsoni* from Isabel Island. In addition to these species, three snakes are worthy of separate consideration.

Hypsiglena torquata (Günther).—A single specimen of this nocturnal species was collected on Isla María Magdalena on 23 March 1964. The snake was moving over a rocky beach near the water's edge between 2200 and 2300 hours. The specimen (LACM 25247), a female, measures 434 mm total length, of which 63 mm (12.2%) is tail. It has the following scale characteristics: 179 ventrals, 44 subcaudals, divided anal plate, 21-21-17 dorsal scale rows, 8-8 supralabials, 10-10 infralabials, 1-1 preoculars, 2-3 postoculars, 1+2-1+2 temporals. There are 63 body blotches and 22 tail blotches on the dorsum; many of the dorsal blotches run together, especially on the tail. A dark brown collar involving eight scales on the midline continues well onto the parietal scales of the head as a thin stripe. The nuchal collar is bordered anteriorly by

a narrow (1-3 scales), pale brown band that passes through the angle of the mouth. This anterolateral extension of the band separates the brown eye stripe from the dark collar. This pattern is more similar to "*ochrorhyncha*" types from Sinaloa (Hardy and McDiarmid 1969) than to specimens from Nayarit, which have "*torquata*" collar types with a wider, cream-colored band. The Tres Marías specimen also is more similar to Sinaloa than to Nayarit specimens in ventral, subcaudal and ventral plus subcaudal (V+Sc) counts. The V+Sc count (222) for the Tres Marías specimen is within the range for Sinaloa specimens (210-229; "*ochrorhyncha*" collar types \bar{x} = 223; "*torquata*" collar types \bar{x} = 220) but higher than for Nayarit specimens (208-219; \bar{x} = 212, all "*torquata*" types).

This specimen is the first record of *Hypsiglena torquata* to be reported from the Tres Marías Islands. If the Tres Marías population is related more closely to Sinaloan populations to the north than to adjacent mainland populations, as indicated by certain scale characteristics and color pattern, then its distribution parallels that of *Urosaurus ornatus* (Zweifel 1960:118-120). Mertens (1934) pointed out that snakes from insular populations frequently have more ventral scales than do their mainland relatives. This same pattern was confirmed by Zweifel (1960) with respect to nearly all of the snake species that were known then from the Tres Marías Islands. Additional material is needed to clarify the relationship of this insular population of *Hypsiglena torquata*.

Leptophis diplotropis (Günther).—The field party, collecting in a canyon on Isla María Magdalena on 26 March 1964, between 1000 and 1100 hours, found a large specimen of *Leptophis* lying in a small water hole. The snake apparently was "drinking." Zweifel (1960) cited the presence of several species of snakes in close proximity to sources of permanent water on María Magdalena. This record (LACM 25248) represents the first report of *Leptophis diplotropis* from Isla María Magdalena. Unfortunately, the snake, which died several days later, was not preserved immediately. Although it is in relatively poor condition the following information is available: adult male, 189 ventrals, divided anal plate, incomplete tail, 8-8 supralabials, 9-9 infralabials, 1-1 loreal, 1-1 preocular, 2-2 postoculars, 1+2-1+2 temporals.

Tantilla bocourti (Günther).—A single specimen of *Tantilla bocourti* (LACM 25251) was collected in leaf litter along a dry stream bed on Isla María Cleofas on 29 March 1964. This specimen is the first record of the species from the Tres Marías and extends its known range about 240 kilometers to the west. That this is the first report of the species from a locality lower than 1500 meters elevation and from a habitat other than the pine and oak forests typical of many of the mainland localities is of even greater interest.

In attempting to allocate the Tres Marías snake to a known species of *Tantilla*, a large series of *T. bocourti* and specimens of several closely related species were examined. The known distribution of *Tantilla bocourti* is shown in figure 1.

The Tres Marías specimen is an adult female differing in some respects from other female *T. bocourti*. It has a slightly shorter tail and fewer ventrals and subcaudals than the average of the specimens examined. Data in Table 1 indicate that there is sexual dimorphism in the ratio of tail length to total length and in the numbers of ventral and subcaudal scales. However, the mean number of ventrals plus subcaudals is essentially the same for males and females. This pattern of dimorphism has been reported

for other species of *Tantilla* as well (Hardy and Cole 1968; McDiarmid 1968). Other characteristics of the Tres Mariás specimen are: 15-15-15 scale rows, 1-1 preoculars, 2-2 postoculars, 1+1-1+1 temporals, a posterior temporal as wide as long (scalelike), 7-7 supralabials, 6-6 infralabials, and no contact between the mental and chinshields. Two other specimens of *T. bocourti* have the mental and chinshields in contact. This last character probably is of little value in distinguishing species of *Tantilla* since it is



FIGURE 1. Map of central México showing known locality records of *Tantilla bocourti* (Günther).

TABLE 1

Selected character states of *Tantilla bocourti* from the Tres Mariás Islands, Sinaloa, and of other specimens selected from localities throughout the range of the species.

	Sex	Tail Length/ Total Length in %	Ventrals	Subcaudals	V + Sc
Tres Marias	♀ (1)	17.6	171	45	216
Sinaloa	♀ (1)	21.5	179	59	238
Other ^a	♀ (13)	16.0-20.0 \bar{x} = 18.2	166-195 \bar{x} = 178.4	47-58 \bar{x} = 52.1	219-252 \bar{x} = 231.7
	♂ (9)	21.0-22.5 \bar{x} = 21.7	160-179 \bar{x} = 172.8	55-61 \bar{x} = 59.1	220-240 \bar{x} = 231.9

^aSeveral authors record proportions and counts higher or lower than those reported here. Our re-examination of some of these specimens indicates that certain reports are in error; either specimens were incorrectly sexed or incorrectly measured or counted. Other reports (not included in Table 1) have not been verified for this study, including: ♂ subcaudals - 54 (Taylor and Smith 1939); ♀ subcaudals - 46 (Taylor 1940); ♀ subcaudals - 59, ♀ V + Sc - 216, and ♂ ventrals - 180, ♂ subcaudals - 48, 65, ♂ V + Sc 219, 244 (Smith 1942); ♀ subcaudals - 41 and ♂ subcaudals - 43 and 51 (Davis and Dixon 1959); ♀ subcaudals - 44 and 45 and ♂ subcaudals - 53; ♀ tail/total length - 15.1, ♂ tail/total length 18.1-20.5 (Davis and Smith 1953).

variable in several of them. The cephalic coloration and scalation are shown in figure 2. We assign this snake to *T. b. bocourti* (see later discussion).

Although the Tres Mariás specimen differs from other known mainland specimens in the lower number of ventral and subcaudal scales, the majority of other characteristics is typical of the species. As indicated above, most of the snakes on the Tres Mariás average more ventral scales than their mainland counterparts. The only other exception to this rule is the other Tres Mariás black-headed snake *Tantilla calamarina* that also has fewer ventrals than mainland individuals of the same species. It would be interesting to know whether this apparent reduction in ventral and/or subcaudal counts in insular populations of *Tantilla*, but not of other Tres Mariás snakes when compared with their mainland counterparts, is an artifact of small sample size, is characteristic of snakes of the genus *Tantilla* only, or is associated with the ecologies of the species involved (e.g., semifossorial versus terrestrial or arboreal).

SINALOA

The collection from the Sierra Surutato includes the following species: *Ambystoma rosaceum* (107 specimens), *Bufo occidentalis* (14), *B. punctatus* (1), *Pachymedusa dacnicolor* (1), *Hyla arenicolor* (18), *Rana pipiens* (11), *R. tarahumarae* (6), *Anolis nebulosus* (6), *Ctenosaura hemilopha* (1), *Holbrookia maculata* (8), *Sceloporus clarkii* (1), *S. horridus* (2), *S. spinosus* (2), *S. virgatus* (3), *S. poinsettii* (2), *S. jarrovii* (47), *S. nelsoni* (11), *Urosaurus bicarinatus* (5), *Eumeces callicephalus* (4), *E. parviauriculatus* (9), *Cnemidophorus costatus* (4), *Gerrhonotus kingii* (4), *Masticophis flagellum* (1), *M. striolatus* (1), *Salvadora bairdi* (1), *S. hexalepis* (1), *Storeria storerioides* (4), *Thamnophis cyrtopsis* (2), *Tantilla bocourti* (1), *T. calamarina* (1),

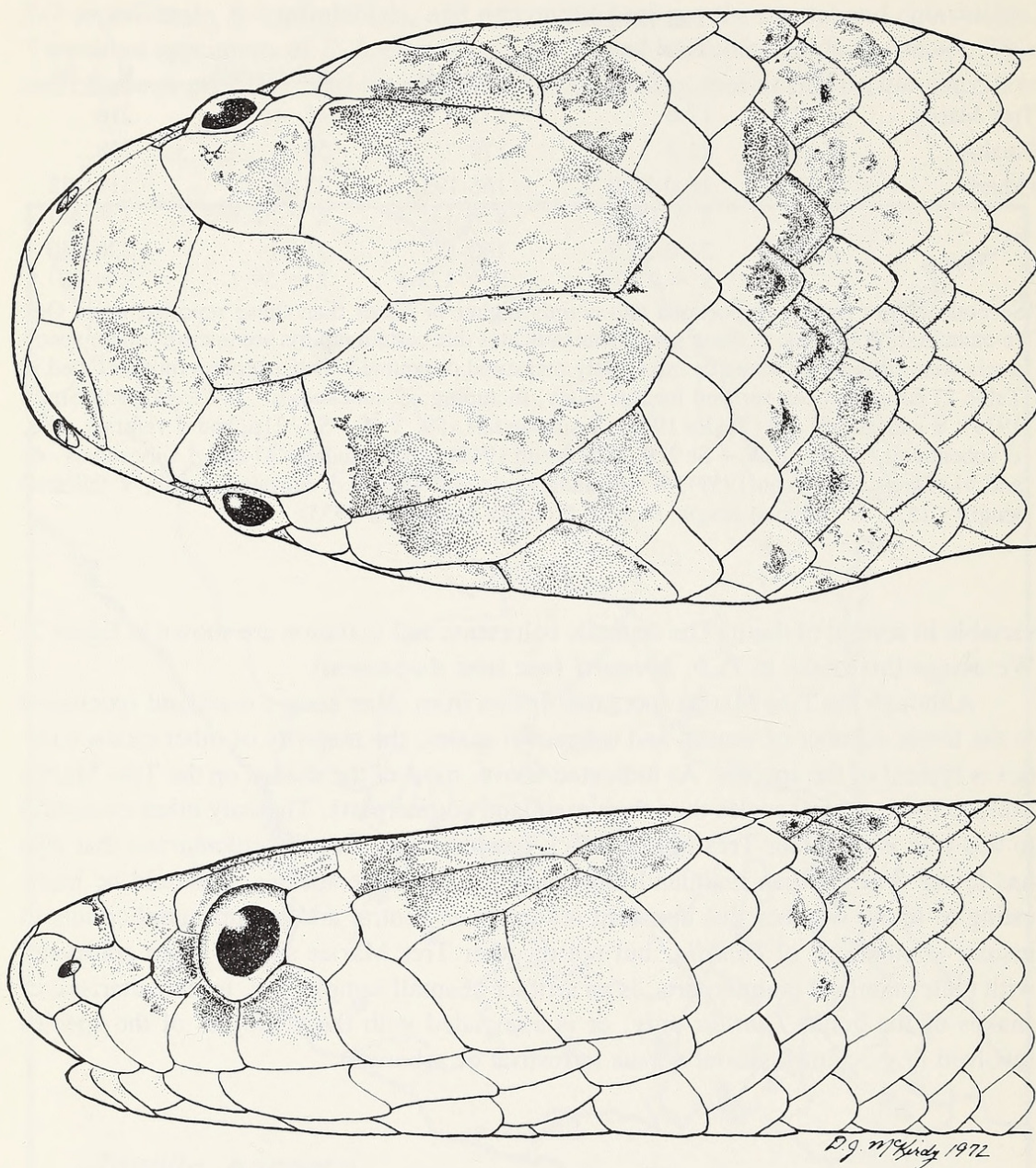


FIGURE 2. Dorsal and lateral view of the head of a female *Tantilla bocourti* (LACM 25251) from Isla María Cleofas, Tres Mariás Islands.

T. wilcoxi (1). Several of these species represent important additions to the herpetofauna of Sinaloa or are of interest for other reasons. They are discussed below together with other species from the northern or southern part of the state.

Ambystoma rosaceum Taylor.—A large series of this salamander, including eggs, hatchlings, larvae and neotenes, was taken at several localities in the Sierra Surutato. This species appears to be restricted to small streams at higher elevations in the pine-oak-madrone forest. Thirty-five small larvae (16-30 mm total length; JFC uncataloged) were taken in two small tributaries of the Rio Sinaloa, 0.2 mi W Los Hornos and 0.4 mi N Los Hornos (elevation 1890 m) on 19 and 22 February 1968; and 24 eggs and hatchlings (JFC uncataloged) from a stream in the Arroyo Ocurahui (ca. 1920 m) were collected on 22 February 1969. The clustered eggs were attached to the underside of a large rock that had fallen into the stream. Other specimens are 15 larvae (83-117 mm; JFC 69-1 to 69-15) and one neotene (162 mm; JFC 69-16) taken in deep, spring fed pools at the source of a stream in the Arroyo de Rancho El Madroño, 6.1 mi by road NE La Cienega (ca. 2135 m) on 24 February 1969; 20 larvae (21.5-70 mm; JFC 71-1 to 71-18+2) and one neotene (142 mm; JFC 71-19) from Los Hornos (ca. 1890 m), 8 March 1971; and one larva (85 mm; JFC 71-20) from El Triguito (ca. 1860 m), 10 March 1971.

These specimens are interesting from several standpoints. They are the first salamanders to be reported from Sinaloa; the nearest known localities for *Ambystoma rosaceum* are about 100 kilometers to the east-northeast near El Vergel, Chihuahua, and about 310 kilometers to the southeast near Las Adjuntas, Durango (Anderson 1961). They represent the first report of eggs and hatchlings for this salamander as well as the first record of neoteny in the species, and they represent a population that breeds in February rather than at the beginning of the wet season in June or July, as is characteristic of other populations of *A. rosaceum*. Dr. James D. Anderson who currently is studying this material will provide more detailed information on these specimens in a later publication.

Bufo cognatus Say.—A single live specimen (UAZ 38720) was collected about 2200 hours by Mike Robinson on the road 9.2 mi SW San Blas on 6 June 1974. The road was dry and no rain had fallen. This is the first record of *Bufo cognatus* in Sinaloa and extends the range of this species about 110 kilometers southwest from previously known localities between Huatabampo and Navojoa, Sonora (McDiarmid 1966). McDiarmid (1966) predicted a southeastward extension of *B. cognatus* into Sinaloa in association with the extensive agricultural development along the lower Río Mayo and Río Fuerte drainages.

Rana tarahumarae Boulenger.—Two males (JFC 67-14 and 67-15) were collected on 26 March 1967 in a creek in pine-oak-madrone forest at Los Hornos (1890 m). These specimens were mentioned by Zweifel (1968) as representing the first records of this frog for Sinaloa as well as the southernmost locality for the species. They extend the known range of *Rana tarahumarae* approximately 95 kilometers to the southwest from Arroyo Tecolote de Los Loera, Chihuahua (Zweifel 1955). Four additional specimens were taken on 19 and 24 February 1969. Two (JFC 69-61 and 69-62) were collected in a riparian habitat below the pine-oak forest in Arroyo San Rafael at La Joya

(1370 m) and the others (JFC 69-63 and 69-64) were taken around spring-fed pools in a meadow surrounded by pine-oak-madrone forest at Arroyo de Rancho El Madroño (2135 m). One of these specimens is a gravid female measuring 102.4 mm body length. The latter two specimens were secured at an elevation about 300 m higher than previously recorded for this species (Zweifel 1968). Pertinent measurements and proportions are presented in Table 2.

TABLE 2

Pertinent measurements and proportions for Surotato specimens assigned to *Rana tarahumarae*.

No.	Sex	Body Length ^a	Tibia Length	Head Length	Head Width	HL/HW	TL/BL
67-14	♂	70.0	37.0	20.0	25.0	0.800	0.528
67-15	♂	72.0	37.0	21.5	27.0	0.796	0.514
69-61	♂	61.5	31.0	20.0	23.0	0.869	0.504
69-62	♀	102.4	47.4	32.4	39.5	0.820	0.463
69-63	♀	47.5	22.5	15.0	17.7	0.847	0.474
69-64	♀	82.5	44.2	27.0	32.0	0.844	0.536

^aAll measurements in mm; taken according to Zweifel (1955).

Welbourn and Loomis (1970) reported a single specimen of *Rana tarahumarae* from 8 km W Ameca, Jalisco as a host for a new species of chigger. This locality is within the range of *Rana pustulosa* but considerably south of the southernmost records for *R. tarahumarae*. The proportions of *R. tarahumarae*, the Surotato specimens and *R. pustulosa* are represented in Table 3. In both proportions the Surotato specimens are intermediate between *R. tarahumarae* and *R. pustulosa*. They are more similar to *R. tarahumarae* in HL/HW and more similar to *R. pustulosa* on TL/BL. Dorsolateral folds are present but faint in the three males and either very faint or absent in the females from Surotato. The tympanum is indistinct and covered by minute, white tubercles. In other details the Surotato frogs are more similar to *R. tarahumarae*, two of which were so referred by Zweifel (1968). However, the intermediate nature of the Surotato specimens in certain characteristics previously used to distinguish the two species, suggests that *R. pustulosa* and *R. tarahumarae* probably are conspecific. A detailed study of this group of frogs in Western México is needed.

TABLE 3

Proportions of samples of *Rana tarahumarae*, Surotato specimens and *Rana pustulosa*.

Samples	N	HL/HW	TL/BL
<i>R. tarahumarae</i> ^a	31	0.812±0.006(0.755-0.879)	0.486±0.004(0.418-0.522)
Surotato specimens	6	0.829±0.012(0.796-0.869)	0.503±0.012(0.463-0.536)
<i>R. pustulosa</i> ^a	66	0.851±0.004(0.755-0.923)	0.508±0.003(0.436-0.563)

^aData from Zweifel (1955); figures represent mean, standard error of mean and range.

Sceloporus spinosus Wiegmann.—Two immatures of this lizard were taken in the Sierra Surotato: JFC 68-33, from beneath a log in pine-oak-madrone forest, 0.4 mi by road N Los Hornos, *ca.* 1890 m, 22 February 1968; and JFC 69-67, collected on a fence post at Ocurahui, *ca.* 1920 m, 22 February 1969. These are the first specimens from Sinaloa and the westernmost localities reported for the species (Smith 1939). These also are the first records of this species from pine-oak-madrone forest habitat. Cole (1970) indicated that the species is found primarily in subtropical savanna and thorn scrub. They represent range extensions of approximately 355 km to the west-northwest from the nearest previously published locality, Durango, Durango (Smith 1939) and about 225 km in the same direction from Santiago Papasquiaro, Durango (JFC 66-78). Discovery of *Sceloporus spinosus* in the Surotato indicates that, contrary to the conclusion that Smith (1939:93) expressed, the elevated western margin of the Mexican Plateau has failed to present an effective barrier to the northwestward dispersal of this species. Pertinent data are 35.4, 44.1 mm snout-vent length; 28, 28 dorsal scales; 48, 46 ventral scales; 12-11, 12-12 femoral pores; 4-4, 4-4 supraoculars. The number of dorsals closely resembles the mean for the geographically nearby nominate subspecies as well as for the far-removed *S. s. apicalis* Smith and Smith of Oaxaca; the ventral and femoral pore counts most closely approach the means for *S. s. caeruleopunctatus* Smith of Guerrero and Oaxaca; and the number of supraoculars best fits the mean for *S. s. spinosus* (Smith 1939; Smith and Smith 1951). Since the data from our specimens is within the known range of variation for the nominate subspecies, and also on geographic grounds, we provisionally allocate the Sinaloan specimens to *S. s. spinosus*. A series of adults from this area will allow a more complete understanding of the relationships of this population to others of the species.

Sceloporus virgatus Smith.—Three specimens of this species include a juvenile, 25 mm SV length (JFC 69-133) and two adult males, 45.6 and 47.3 mm SV (JFC 70-12; 70-13). They are typical representatives of the species in details of scalation and general coloration (Cole 1968). These are the first records of *Sceloporus virgatus* for Sinaloa and extend the known range of the species about 170 kilometers south-southeast from between Cerocahui and Barranca de Urique, Chihuahua (Cole 1963). The lizards were taken near rocky streams at El Triguito, *ca.* 1860 m, on 4 November 1969 (JFC 69-133) and at a site 2 mi by road SE Los Hornos, 2075 m, on 4 October 1970 (JFC 70-12; 70-13).

Sceloporus poinsettii Baird and Girard.—Two specimens of this large sceloporine lizard (JFC 69-135, adult male, 125 mm SV and 69-134, adult female, 99 mm SV) were collected 1.1 mi by road SE La Cienega, *ca.* 1800 m, on 4 November 1969. The male is the largest known specimen of this species, exceeding the previous record by 8 mm in snout-vent length (Taylor & Knobloch 1940; Stebbins 1966). Both were taken during the day on a rocky road cut in pine-oak forest. These first records of *Sceloporus poinsettii* from Sinaloa help to fill the hiatus in the western range of the species in México. Previously, the specimens nearest to Sinaloa had been collected about 130 kilometers to the northeast near Guachochic, Chihuahua (Smith and Chrapliwy 1958) and about 315 kilometers to the southeast near El Salto, Durango (Smith and Chrapliwy 1958). Smith and Chrapliwy diagnosed *S. poinsettii macrolepis* from southwestern Chihuahua, southern Durango, and west-central Zacatecas as having fewer dorsal

scales (85% with 26-29) than *S. p. poinsettii* (only 3% with less than 30). In this regard the two Sinaloan lizards with 30 and 32 dorsal scales are more similar to the northern subspecies of *S. p. poinsettii* than they are to populations from adjacent localities in the intervening area. The nearest specimens of the nominate subspecies are from northern and eastern Chihuahua, while those from the southwestern portion of the same state were assigned to *S. p. macrolepis*. Additional specimens from west-central Chihuahua were considered "... intergrades between *poinsettii* and *macrolepis*, tending strongly toward the latter race" (Smith and Chrapliwy 1958:268). In the same paper these authors characterized *S. p. polylepis* from southeastern Chihuahua and eastern Durango as possessing more dorsals (83% with 36-41) than *S. p. poinsettii* (only 4% with more than 35). At the same time they pointed out that *S. p. macrolepis* occurs at higher elevations than the nominate subspecies, while *S. p. polylepis* occupies desert foothills at comparatively low elevations. We suggest that the single character that serves to distinguish these three subspecies—the number of dorsal scales—may be merely a function of environmental temperature and aridity. If additional collecting in eastern Durango and eastern Sinaloa indicates the species to have a nearly continuous range (which we suspect), then the geographic and elevational distribution of the number of dorsal scales should be examined carefully.

Eumeces callicephalus Bocourt.—Four males of this species were taken on 19 and 20 February 1968 in the Sierra Surutato. Two (JFC 68-100; 68-101) are from beneath rocks along a stream in a logged-over valley surrounded by pine-oak-madrone forest 0.5 mi by road SE Los Hornos (ca. 1920 m); the others (JFC 68-102; 68-103), also beneath rocks, were found in the Cañon de Tarahumare between La Joya and Barranca de las Tahonitas (ca. 1310 m). The latter locality lies in an ecotone between riparian forest and tropical deciduous forest, immediately below pine-oak forest. The first specimen measures 58.5 mm in SV length and has the Y-shaped head-color pattern typical of *Eumeces callicephalus* as depicted by Stebbins (1966). However, the other three specimens (JFC 68-101; 68-102; 68-103) are very large males (72.0, 66.8, and 67.0 mm SV) and have either very faint head markings or lack them completely. The largest specimen is approximately 8 mm longer in SV length than the maximum reported for this species (Stebbins 1966). All specimens are representative of *E. callicephalus* in most other characteristics. Other salient data for these four specimens are: 27 or 28 (3) scale rows, the median dorsals unwidened; 56, 58 or 59 (2) dorsal scales (including nuchals); 7-7 supralabials; 6-6 infralabials; 2-2 loreals; 1-1 preoculars; 2-2 presuboculars; 2-2 postoculars; 4-4 postsuboculars; 1+2-1+2 temporals; 4-4 supraoculars; 5-8, 7-8 (2) or 8-8 supraciliaries. The prefrontals are separated (by contact of the frontal and frontonasal) in 68-100, fused (no seam) in 68-101, and touching (in contact) medially in 68-102 and 68-103. A postnasal is present on both sides in 68-100, absent on both sides in 68-101, and present on the left but absent from the right side of 68-102 and 68-103. The parietals are in contact behind the interparietal in 68-100 and 68-102 and separated in the others. A pair of scales separates the single postmental from the mental in 68-100; the other specimens have two postmentals. The scale bordering the medial margin of each postgenial is longer than wide. A distinct dorsolateral pale stripe is present on the smallest male but is faintly represented only on the anterior part of the body of the three large males. There are four dorsal scale rows

between the dorsolateral stripes anterior to the insertion of the forelimbs. A dark lateral stripe is present on all animals, although it is faint in the large specimens. At midbody this dark lateral stripe involves from one and one-half to two and one-quarter scale rows. The paler dorsal color between the lateral dark stripes at midbody covers six full and two half scale rows, eight scale rows, or eight full and two quarter scale rows. Addressed limbs of the smaller male touch; they do not touch in the other three specimens. Mr. Carl S. Lieb examined these specimens and confirmed our identifications.

Eumeces parviauriculatus Taylor.—Nine specimens of this small skink were collected at the following localities: 1 mi by road SE Los Hornos, *ca.* 1980 m, 26 March 1967 (JFC 67-17; 67-18); 0.4 mi by road N Los Hornos, *ca.* 1890 m, 22 February 1968 (68-104); 2.7 mi by road SE Los Hornos, 2135 m, 23 February 1969 (69-82); Arroyo El Pie la Cuesta, 1.8 mi by road NW Surutato, 1680 m, 23 February 1969 (69-85; 69-86); 1 mi by road E Buenas Juntas, 2075 m, 1 October 1970 (70-15; 70-16); Rancho El Madroño, 2135 m, 10 March 1971 (71-21). Most specimens were taken under rocks or in crevices in rocky cliffs in pine-oak forest. These are the first records for the state, realizing the prediction by Legler and Webb (1960) that *Eumeces parviauriculatus* would eventually be taken in northern Sinaloa. The specimens extend the known range of this species about 200 kilometers southeast from previously reported localities near Álamos, Sonora, and about 190 kilometers south-southeast from near Témore, Chihuahua (Legler and Webb, 1960). Four females (SV 43.2, 52.0, 53.1, 54.0 mm) contain developing eggs. Two (67-17, 67-18) have three eggs measuring 5 mm and a fourth measuring 2 mm; the others have a total of 7 and 8 very small eggs. The specimens range from 37 to 54 mm snout-vent length. In the two specimens with complete tails (male, 70-15; female, 67-18), the tail lengths are 61.4 and 64.9% of the total length. Other important diagnostic data are: 4 supraoculars, no postnasals, 1 postmental, parietals not in contact behind interparietals, frontal in contact with frontonasal, 20 scale rows, and 58 (damaged), 60, 62, 63 or 64 dorsal scales.

These specimens were compared with 5 specimens of *E. parviauriculatus* (MVZ 74187-90, 74198) from a streamside locality (elevation 2000 m) on the Sonora-Chihuahua border above Álamos, Sonora. The Sinaloan specimens are similar in most respects to this Sonoran material and to specimens reported in the literature (Taylor, 1933; Taylor and Knobloch, 1940; Legler and Webb, 1960). This new material increases the number of reported specimens of this small skink from five to nineteen.

Chilomeniscus cinctus Cope.—This first record of *Chilomeniscus* from Sinaloa is based on a specimen (LACM 121310) collected on 22 September 1975, at Rancho Palo Verde, 2.7 mi W Miguel Hidalgo Dam. Pertinent data are: juvenile female; 97 mm total length; 12 mm tail length; 15-13-13 dorsal scale rows; 111 ventrals; 24 subcaudals; 7-7 supralabials; 8-8 infralabials; 1-1 preoculars; 2-2 postoculars; 1+1-1+1 temporals. A loreal scale is present on the right side but absent on the left. There are 20 dorsal black crossbands, 15 on the body, 4 on the tail, and 1 across the head. The dorsal interspaces were reddish orange, with color restricted to the middle 5-7 scale rows. In most respects this specimen is similar to one from southern Sonora reported by Bogert and Oliver (1945). The occurrence of *C. cinctus* in Sinaloa is not unexpected as specimens are known from Sonora at localities 55 km to the northwest at Álamos (Bogert and Oliver, 1945) and 50 km to the west at a point 14.2 mi N Sinaloa-Sonora

border on México Highway 15 (UMMZ 134106, W. Van Devender, personal communication).

Sonora aemula (Cope).—A third specimen of *Sonora aemula* from Sinaloa extends the known range (Hardy and McDiarmid, 1969) of this species about 400 kilometers southward. Its occurrence in the southern limits of the tropical semiarid forest is not surprising, as it is relatively common in this habitat in southern Sonora. The southern distribution of this snake parallels those of *Coleonyx variegatus* and *Salvadora hexalepis*. This specimen (LACM 51563) was found DOR by John K. Cross on 12 September 1967, on Highway 15, 40 mi S Mazatlán. It is a female measuring 280 mm in total length and 39 mm in tail length, with 149 ventrals, 34 subcaudals, 17-15-15 dorsal scale rows, 7-7 supralabials, 7-7 infralabials, 1 loreal (1 fused with preocular), 1-1 preoculars, 2-2 postoculars, and 1+2-1+2 temporals. The animal has a pale snout, black head cap, black collar, reddish ground color, four dyads and one triad on the body, two dyads on the tail, and the tail tip is black. Three of the body dyads are black-yellow-black, one is yellow-black-yellow and the triad is black-yellow-black-yellow-black. The highly variable color pattern is representative of the species.

Tantilla bocourti (Günther).—An adult female containing six enlarged ova (three on each side) is the first specimen from Sinaloa and extends the known range of the species (Fig. 1) about 345 kilometers northwest along the Pacific versant of the Sierra Madre Occidental from near Pueblo Nuevo in southwestern Durango (Webb and Baker 1962). The snake (JFC 68-111) was unearthed from rocky substratum during road repairs in pine-oak forest 1.1 mi by road N La Joya, *ca.* 1525 m, on 21 February 1968.

This specimen has more subcaudals and a longer tail than any other female examined (Table 1) but in other respects is representative of the species. Other pertinent data are: 349 mm total length; 75 mm tail length; 7-7 supralabials; 6-6 infralabials; 1-1 preoculars; 2-2 postoculars; and mental in contact with chinshields. The primary temporals are single and elongate (length is 3.5 times width); there is a small, scale-like secondary temporal (length about equal to width) on the left. On the right side the secondary temporal is lacking so that the parietal and seventh supralabial are in contact. The tertiary temporals are single and scale-like on both sides. Two ova on each side measure 6 mm in length while the antermost on each side is smaller (3 mm). We assign this specimen to *Tantilla b. bocourti*, since it agrees with the nominate subspecies rather than *T. b. deviatrice* Barbour in all characters that have been used to differentiate the two forms. The ventral count is well above the known maximum for *T. b. deviatrice*, while the number of subcaudals falls below the minimum for the latter subspecies. The scale-like secondary temporal is characteristic of *T. b. bocourti* as opposed to the narrow, elongate condition in the other subspecies. Typical of the nominate subspecies is the widespread distribution of dark pigment on the head, which is markedly reduced in extent in *T. b. deviatrice*. This morphological evidence is consonant with the geographic picture, since *T. b. deviatrice* is known only from valley habitats in the distant state of San Luis Potosí.

Tantilla calamarina Cope.—A single male (JFC 69-91) of this small secretive snake was found in a rock crevice along a trail in mixed oak and tropical deciduous

forest in the Cañon Tarahumares at Vado Ceboletas, *ca.* 1190 m, on 20 February 1969. This record extends the known range of the species about 275 kilometers north from near Mazatlán (Hardy and McDiarmid 1969). Pertinent data are: 147 mm total length; 29 mm tail length; tail 19.7% of total length; 136 ventrals; 44 subcaudals; 6-6 supralabials and infralabials; 1-1 preoculars and postoculars; and 1+1-1+1 temporals. The prefrontals and parietals are separated from the labials. Both the ventral and subcaudal counts (and, consequently, the V + Sc count) are higher than those previously reported for the species. In other respects, however, the scalation is typical of the species as described by Smith (1942) and others (*e.g.*, Peters 1954; Zweifel 1960).

This specimen is distinct in many aspects of coloration. The dorsal ground color is pale brown; the venter is grayish white. The lateral edges of the ventrals and subcaudals, the labials, and the mental have faint scattered tan flecks. A brown stripe extends middorsally from the head cap to the tail tip. Anteriorly it involves all of scale row eight and the adjacent edges of scale rows seven and nine from the head cap back to a position above ventral ten. From here the stripe is restricted to the central portion of scale row eight, gradually fading as it approaches the tail. Distinct lateral stripes are present. They consist of brown pigment spots on the upper third of the scales in row three and the posterior quarter of scales in row four. This arrangement gives the lateral stripes a zigzag appearance. In addition, there are dashes of brown pigment on the posteromedial parts of scales in rows one, two, five, and six. These dashes give the impression of discontinuous faint stripes, similar to the lateral stripes in a Tres Marías specimen (Zweifel 1960). The head cap is connected to the middorsal stripe but is separated from the lateral stripes by two crescent-shaped marks. These crescents arise on each side behind the parietals and extend anteriorly across the upper third to half of the secondary temporals, along the lateral edges of the parietals, through the upper third of the postoculars, and across the supraoculars and lateral parts of the prefrontals onto the internasals. These marks are white on the upper half of the scales in row five, the entire scale in row six, and most of the scale in row seven and clearly sets off the dark head cap from the ground color on the body. Anterior to the parietals, the crescentic marks gradually darken to the pale brown ground color. The lateral stripes continue onto the head where they broaden to form a dark eye mask that separates the crescents from the pale lower portions of the supralabials. The head cap is brown mottled with paler flecks that increase in size on the prefrontal, internasal, and rostral scales.

Much of the described variation in head coloration of specimens of *Tantilla calamarina* (Taylor 1937; Peters 1954; Zweifel 1960) is the result of a break up of the crescentic marks on the head. This specimen apparently has a much more discrete color pattern than any previous specimens and lends additional support to the suggestion that *Tantilla martindelcampoi* and *T. calamarina* are conspecific.

Tantilla wilcoxi Stejneger.—A single specimen of this relatively rare snake was collected in a rock crevice in a road cut in pine-oak-madrone forest 4.8 mi by road SE Los Hornos, 2075 m, on 19 February 1968. It is the first record for Sinaloa and extends the known range about 250 kilometers south from Mojárachic, Chihuahua (Smith 1942) and about 360 kilometers to the west-northwest from near Chorro, Durango (Webb and Hensley 1959). The specimen (JFC 68-112), an adult female, has the following characteristics: 295 mm total length; 70 mm tail length; tail 23.7% of total

length; 157 ventrals; 63 subcaudals; 7-7 supralabials; 6-6 infralabials; 1-1 preoculars; 2-1 postoculars; 1+1-1+1+1 temporals; mental separated from chinshields. A continuous white collar one and one-half scales wide on the midline includes the posterior quarter of the parietals. The posterior dark border is irregular and only one-half scale wide. Most of the fifth supralabial and an adjacent part of each anterior temporal are white. Additional aspects of color pattern are essentially the same as described for other specimens of *Tantilla wilcoxi* by Smith (1942), Webb and Hensley (1959), and Stebbins (1966). In life, the dorsum was dark olive-green; the posterior two-thirds of the venter and entire underside of the tail was orange-red. Inasmuch as both ventral and subcaudal counts fall well within the reported ranges of variation for females of the nominate subspecies and above the ranges for *T. w. rubricata* Smith, and since the dorsal coloration is dark rather than reddish, we refer our specimen to *T. w. wilcoxi*. This snake adds further confirmation to the prediction by McCoy (1964) that in México the nominate subspecies occupies the Sierra Madre Occidental to the west, while *T. w. rubricata* occurs in the Chihuahua Desert to the east.

Crotalus stejnegeri Dunn.—Two specimens of this apparently rare rattlesnake have been collected in Sinaloa since Hardy and McDiarmid (1969) reported a specimen from near Santa Lucía. The first of these new specimens is a large male collected at night by Carlton Hall as it crossed Highway 40, 10 mi NE Concordia in August 1967. The specimen (LACM 37718) is 615 mm in total length. The tail is 91 mm long and 14.8% of the body length. In addition, this snake has the following pertinent characteristics: 176 ventrals of which ventral 97 and 103 are half scales; 48 subcaudals of which 41 are entire and the last seven divided; 27-23-29 dorsal scale rows; 15-15 supralabials; 16-15 infralabials; 2-2 preoculars; 4-4 postoculars; 3-3 suboculars; 32 dorsal body blotches; and more than 10 tail blotches. The posterior tail blotches are difficult to count due to darkening of the ground color. The matrix of the proximal rattle is black at its base; the rattle is complete, with four segments and a terminal button. In addition to being the largest specimen of the species reported in the literature, this snake has a slightly longer tail, fewer body blotches, and fewer dorsal scale rows at midbody than other known examples.

The second specimen (RS 901 HSH/RSS,NHSM) was collected on Highway 40 between 10 and 15 mi NE Concordia on 10 July 1972. The snake was found at a point where the road crosses a dry creek bed. It was dusk, the air temperature being about 24°C, and the road temperature about 27°C. According to the collector, this locality is about two miles west of the beginning of the pine forest, probably in subtropical dry forest (Hardy and McDiarmid 1969). Herbert S. Harris provided collecting data and the following information: juvenile female, 350 mm total length; 34 mm tail length; tail 9.5% of body length; 172 ventrals; 36 subcaudals; 27-27-20 dorsal scale rows; 14-15 supralabials; 18-17 infralabials; 2-2 preoculars; 4-4 postoculars; 2-3 suboculars; 40 body blotches; 10 tail blotches; 1 segment plus button comprising rattle.

QUESTIONABLE RECORDS FOR SINALOA

We take this opportunity to correct a statement concerning the southern limit of the range of *Uta stansburiana*. Tinkle (1969, Fig. 1) stated "The range of the southwestern race should extend slightly farther south into northern Sinaloa than shown

(Royce Ballinger, personal communication).'' In a recent letter concerning the accuracy of the map, Tinkle indicated that the comments in the caption were in error, and neither he nor Royce Ballinger know of any records of *Uta stansburiana* from Sinaloa.

In 1969 Peters and Donoso-Barros reported the distribution of *Mabuya mabouya alliacea* as ''Veracruz and Sinaloa, México to Costa Rica.'' Apparently their report of *Mabuya* from Sinaloa is based on Burger's (1952) incorrect transcription of the range of the species. He listed specimens from Colima but cited the distribution as ''México from the states of Veracruz on the Atlantic and Sinaloa on the Pacific coast. . . .'' We know of no verified records of *Mabuya mabouya* from Sinaloa. Some of the old records for northern states in México are vague and unsubstantiated and may well be based on misidentifications. Hobart Smith (personal communication) knows of neither specimens nor literature records for *Mabuya* in Sinaloa. We suggest that the report is in error; on the west coast of México, *Mabuya* is known from Colima south.

CONCLUSION

The report of *Hypsiglena torquata* and *Tantilla bocourti* from the Tres Marías brings the insular herpetofauna of this island group to a total of 21 species, including 2 frogs, 1 turtle, 5 lizards, and 13 snakes. The new records of amphibians and reptiles from Sinaloa, including the reports of *Enulius oligostichus* (McDiarmid and Bezy 1971) and *Hyla bistincta* (Duellman 1970) and the deletion of *Uta stansburiana* and *Mabuya mabouya*, bring the native terrestrial herpetofauna of that state to 133 species, including 1 salamander, 34 frogs, 5 turtles, 1 crocodilian, 35 lizards, and 57 snakes.

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RESUMEN

Desde Las Tres Marías nos viene por primera vez informe sobre dos especies de serpientes, a saber: *Hypsiglena torquata* y *Tantilla bocourti*. Como resultado de dicho informe y refiriéndonos únicamente al susodicho grupo de islas, llega el total de la herpetofauna conocida a 21a especies, o sean 2 ranas, 1 tortuga, 5 lagartijas y 13 serpientes. La salamandra *Ambystoma rosaceum*, las ranas *Bufo cognatus* y *Rana*

tarahumarae, las lagartijas *Eumeces parviauriculatus*, *Sceloporus poinsettii*, *S. spinosus* y *S. virgatus*, y las serpientes *Chilomeniscus cinctus*, *Tantilla bocourti* y *T. wilcoxi* se añaden a la fauna de Sinaloa. A cada espécimen se le compara con otros miembros de la misma especie, procedentes de diferentes puntos del área de distribución geográfica de la especie. Estos datos, juntos con los apuntes sobre seis otras especies, añaden intensamente a nuestro conocimiento de la variedad, distribución, y biogeografía de la herpetofauna de México Occidental. Se suprimen de la fauna sinaloense *Uta stansburiana* y *Mabuya mabouya*. Resulta pues que la herpetofauna terrestre y oriunda de Sinaloa, se compone de 133 especies, a saber: 1 salamandra, 34 ranas, 5 tortugas, 1 cocodrilo, 35 lagartijas y 57 serpientes.

LITERATURE CITED

- ANDERSON, J. D. 1961. The life history and systematics of *Ambystoma rosaceum*. *Copeia*, 1961:371-377.
- BOGERT, C. M. AND J. A. OLIVER. 1945. A preliminary analysis of the herpetofauna of Sonora. *Bull. Amer. Mus. Nat. Hist.*, 83:301-425.
- BREEDLOVE, D. E. AND L. R. HECKARD. 1970. *Gentrya*, a new genus of Scrophulariaceae from Mexico. *Brittonia*, 22:20-24.
- BREEDLOVE, D. E. 1973. The phytogeography and vegetation of Chiapas (Mexico), Chapter 5, in *Vegetation and vegetational history of northern Latin America*. Edited by Alan Graham. Elsevier, Amsterdam. 393 pp.
- BURGER, W. L. 1952. Notes on the Latin American skink, *Mabuya mabouya*. *Copeia*, 1952:185-187.
- COLE, C. J. 1963. Variation, distribution, and taxonomic status of the lizard, *Sceloporus undulatus virgatus* Smith. *Copeia*, 1963:413-425.
- . 1968. *Sceloporus virgatus*. *Cat. Amer. Amphib. Rept.*, 72.1-72.2.
- . 1970. Karyotypes and evolution of the *spinosus* group of lizards in the genus *Sceloporus*. *Amer. Mus. Novitates*, 2431:1-47.
- DAVIS, W. B. AND J. R. DIXON. 1959. Snakes of the Chilpancingo region, Mexico. *Proc. Biol. Soc. Wash.*, 72:79-92.
- DAVIS, W. B. AND H. M. SMITH. 1953. Snakes of the Mexican state of Morelos. *Herpetologica*, 8:133-143.
- DUELLMAN, W. E. 1958. A preliminary analysis of the herpetofauna of Colima, Mexico. *Occ. Pap. Mus. Zool. Univ. Michigan*, 589:1-22.
- . The amphibians and reptiles of Michoacán, México. *Univ. Kansas Publ. Mus. Nat. Hist.*, 15:1-148.
- . 1965. A biogeographic account of the herpetofauna of Michoacán, México. *Univ. Kansas Publ. Mus. Nat. Hist.*, 15:627-709.
- . 1970. The hylid frogs of Middle America. *Monogr. Mus. Nat. Hist. Univ. Kansas*, 1:1-753.
- GENTRY, H. S. 1946. Notes on the vegetation of Sierra Surotato in northern Sinaloa. *Bull. Torrey Bot. Club*, 73:451-462.
- HARDY, L. M. AND C. J. COLE. 1968. Morphological variation in a population of the snake, *Tantilla gracilis* Baird and Girard. *Univ. Kansas Publ. Mus. Nat. Hist.*, 17:613-629.
- HARDY, L. M. AND R. W. MCDIARMID. 1969. The amphibians and reptiles of Sinaloa, México. *Univ. Kansas Publ. Mus. Nat. Hist.*, 18:39-252.
- LEGLER, J. M. AND R. G. WEBB. 1960. Noteworthy records of skinks (genus *Eumeces*) from northwestern Mexico. *Southwestn. Nat.*, 5:16-20.
- MCCOY, C. J., JR. 1964. Notes on snakes from northern Mexico. *Southwestn. Nat.*, 9:46-48.

- McDIARMID, R. W. 1966. A study in biogeography: the herpetofauna of the Pacific Lowlands of western México. Masters Thesis, Univ. So. California. 296 pp.
- . 1968. Variation, distribution and systematic status of the black-headed snake *Tantilla yaquia* Smith. Bull. So. Calif. Acad. Sci., 67:159-177.
- McDIARMID, R. W. AND R. L. BEZY. 1971. The colubrid snake *Enulius oligostichus* in western México. Copeia, 1971:350-351.
- MERTENS, R. 1934. Die Insel-Reptilien, ihre Ausbreitung, Variation und Artbildung. Zool. Stuttgart, 84:1-209.
- PETERS, J. A. 1954. The amphibians and reptiles of the coast and coastal sierra of Michoacán, Mexico. Occ. Pap. Mus. Zool. Univ. Michigan, 554:1-37.
- PETERS, J. A. AND R. DONOSO-BARROS. 1970. Catalogue of the Neotropical Squamata: Pt. II. Lizards and amphisbaenians. U.S. Natl. Mus. Bull., 297:1-293.
- RZEDOWSKI, J. AND R. McVAUGH. 1966. La Vegetation de Nueva Gallica. Contr. Univ. Michigan. Herb., 9:1-123.
- SMITH, H. M. 1939. The Mexican and Central American lizards of the genus *Sceloporus*. Zool. Ser. Field Mus. Nat. Hist., 26:1-397.
- SMITH, H. M. 1942. A résumé of Mexican snakes of the genus *Tantilla*. Zoologica, New York, 27:33-42.
- SMITH, H. M. AND P. S. CHRAPLIWY. 1958. New and noteworthy Mexican herptiles from the Lidicker collection. Herpetologica, 13: 267-271.
- SMITH, P. W. AND H. M. SMITH. 1951. A new lizard (*Sceloporus*) from Oaxaca, Mexico. Proc. Biol. Soc. Washington, 64:101-103.
- STEBBINS, R. C. 1966. A field guide to western reptiles and amphibians. Boston, Houghlin Mifflin. 279 pp.
- TAYLOR, E. H. 1933. New species of skinks from Mexico. Proc. Biol. Soc. Washington, 46:175-182.
- . "1936" (1937). Notes and comments on certain American and Mexican snakes of the genus *Tantilla*, with descriptions of new species. Trans. Kansas Acad. Sci., 39:335-348.
- . "1939" (1940). Some Mexican serpents. Univ. Kansas Sci. Bull., 25:445-487.
- TAYLOR, E. H. AND I. W. KNOBLOCH. 1940. Report on an herpetological collection from the Sierra Madre Mountains of Chihuahua. Proc. Biol. Soc. Washington, 53:125-130.
- TAYLOR, E. H. AND H. M. SMITH. "1938" (1939). Miscellaneous notes on Mexican snakes. Univ. Kansas Sci. Bull., 25:239-258.
- TINKLE, D. W. 1969. Evolutionary implications of comparative population studies in the lizard *Uta stansburiana*, pp. 133-154. In: Systematic Biology, Proc. Internat. Conf. Nat. Acad. Sci., 1969, Washington D.C.
- WEBB, R. G. AND R. H. BAKER. 1962. Terrestrial vertebrates of the Pueblo Nuevo area of south-western Durango, Mexico. Amer. Midl. Nat., 68:325-333.
- WEBB, R. G. AND M. HENSLEY. 1959. Notes on reptiles from the Mexican state of Durango. Publ. Mus. Michigan St. Univ., Biol. Ser., 1:249-258.
- WELBOURN, W. C., JR. AND R. B. LOOMIS. 1970. Three new species of *Hannemania* (Acarina, Trombiculidae) from amphibians of western Mexico. Bull. So. Calif. Acad. Sci., 69:65-73.
- ZWEIFEL, R. G. 1955. Ecology, distribution, and systematics of frogs of the *Rana boylei* group. Univ. California Publ. Zoöl., 54:207-292.
- . 1959. Additions to the herpetofauna of Nayarit, Mexico. Amer. Mus. Novitates, 1953:1-13.
- . 1960. Results of the Puritan-American Museum of Natural History expedition to western Mexico. 9. Herpetology of the Tres Mariás Islands. Bull. Amer. Mus. Nat. Hist., 119:77-128.
- . 1968. *Rana tarahumarae*. Cat. Amer. Amphib. Rept., 66.1-66.2.

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