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## Additions to the Herpetofauna of Nayarit, Mexico

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### INTRODUCTION

The purpose of the present paper is to record the presence in the State of Nayarit of several species of amphibians and reptiles not previously known there. Some of these records represent substantial extensions of known ranges, while others merely verify the presence in Nayarit of species that from their known distributions were inferred to occur there.

Three of the species recorded, *Urosaurus bicarinatus*, *Sonora michoacanensis*, and *Crotalus basiliscus*, were discussed by Malkin (1958) in a paper dealing with ethnozoology of the Cora Indians. Inasmuch as Malkin did not specify the exact locality from which the specimens came, it seems desirable to repeat the records here with fuller documentation.

Most specimens mentioned in this paper were collected by C. M. Bogert. Others were included in collections made by Paul R  thling and Borys Malkin. Dr. C. H. Lowe, Jr., kindly made available to me specimens of *Ameiva* collected by Dr. Alan R. Phillips; Dr. Thomas H. Lewis sent specimens of lizards for my examination. Dr. Doris Cochran facilitated my study of specimens in the United States National Museum. Dr. William E. Duellman called my attention to specimens in the Museum of Zoology, University of Michigan, which were sent to me through the courtesy of Dr. Norman Hartweg and Dr. Charles F. Walker. I acknowledge with thanks the assistance given by these persons. The following abbreviations are used with reference to catalogue numbers:

A.M.N.H., the American Museum of Natural History

A.R.P., field catalogue of Alan R. Phillips, specimens at the University of Arizona

P.M., Paris Museum

T.H.L., field catalogue of Thomas H. Lewis, specimens at the College of Puget Sound

U.M.M.Z., University of Michigan Museum of Zoology

U.S.N.M., United States National Museum

Place names mentioned in this paper are found on the American Geographical Society's "Map of Hispanic America, 1:1,000,000," or are referred in the text to localities on that map. An exception is Peñitas, Nayarit, located at the junction of Federal Highway 15 and the Río San Pedro.

### ACCOUNTS OF SPECIES

#### *Eleutherodactylus vocalis* Taylor

Buenos Aires, 15 miles (by road) northwest of Tepic (A.M.N.H. Nos. 59064–59079, plus 28 untagged).

These frogs were found by C. M. Bogert on January 21 and February 23, 1956, under rocks in a wet area about a spring at an elevation of 2000 feet. The nearest locality from which this species is known is La Resolana, Jalisco, approximately 140 miles south-southeast of Tepic (Duellman, 1958, p. 7).

The specimens from Nayarit agree well with the description and illustrations of the species published by Taylor (1940a, pp. 401–405, pl. 44, fig. 8). Duellman (*ibid.*) had no adult male individuals among his specimens from Colima, Jalisco, and Michoacán, so could not check the presence of the vocal sac, supposedly a diagnostic character of the species. Only one of three males measuring about 34–36 mm. from snout to vent in the collection of the American Museum possesses vocal slits. Whether this represents individual variation or ontogenetic variation such as has been noted in *Eleutherodactylus augusti* (Zweifel, 1956, p. 23) cannot be inferred from the limited material at hand. None of these three males shows evidence of an external vocal sac.

Sexual dimorphism in tympanum size is evident. The ratio of length of tympanum (measurement including the tympanic ring) to head width averages 0.254 (0.24–0.26) in the three males, and 0.170 (0.15–0.18) in eight females ranging from 31 to 58 mm. from snout to vent.

#### *Rana megapoda* Taylor

Five and six-tenths miles southeast of Tepic on Highway 15 (A.M.N.H. Nos. 60438, 60439).

These two specimens, collected by C. M. Bogert and A. B. Grobman on September 11, 1957, extend the known range 100 miles to the west-northwest of Guadalajara, Jalisco, the northernmost locality previously recorded. One of the specimens is a juvenile, and the other is a female with a length from snout to vent of 84 mm. This larger specimen has a tympanum diameter of 5.7 mm., which is within the size range recorded for *megapoda* of similar body size (Zweifel, 1957, fig. 1). The ventral surfaces of both specimens from Nayarit are darkly reticulated, as is typical of the species.

I take this opportunity to correct a misstatement concerning the distribution of *Rana megapoda* that appears in an earlier paper (Zweifel, 1957). A record for the State of Guanajuato was given as the first outside Jalisco, but La Palma on Lake Chapala was erroneously listed as being in Jalisco, rather than in Michoacán. The species is now known from Nayarit, Jalisco, Michoacán, and Guanajuato.

*Pseudemys scripta ornata* (Gray)

Vicinity of Corrientes, about 9 miles west of Tuxpan (A.M.N.H. No. 76128).

There are published records for this species in Sinaloa and Jalisco, but this specimen, collected by C. M. Bogert, is the first to be recorded in Nayarit.

*Crocodylus acutus* Cuvier

Puerto Azul, east of Santiago Ixcuintla (A.M.N.H. Nos. 19866, 45121); San Blas (A.M.N.H. No. 75758).

Apparently the only record for this species in Nayarit is a sight record of E. W. Nelson (Stejneger, 1899, p. 64) for María Magdalena Island in the Tres Mariás. The specimens from Puerto Azul collected by Paul Rütthling, and the one from San Blas taken by C. M. Bogert, appear to be the first from the state, though the species is known as far north as Mazatlán, Sinaloa.

*Sceloporus torquatus melanogaster* (Cope)

Volcan San Juan, 4500 feet elevation, 4 miles southwest of Tepic (A.M.N.H. Nos. 75780, 75781).

The assignment of these specimens to *melanogaster* must be regarded as tentative. In two important respects, they resemble *melanogaster*: the dorsal scales number 28 and 29, which corresponds closely to the average (28.1) of 22 scale counts of *melanogaster* published by Smith ("1936" [1938], pp. 577-578); a light band, considered characteristic of

*melanogaster*, passes from the upper edge of the ear opening to the nuchal collar. The lizards from Tepic differ from typical *melanogaster* in that the nuchal collar is complete rather than broken in the mid-dorsal region.

The closest to Tepic that *Sceloporus torquatus melanogaster* is known is western Zacatecas about 110 miles northeast of Tepic, and central Jalisco, 140 miles southeast of Tepic. A related species in western Jalisco is *Sceloporus bulleri*, which resembles the Tepic lizards in having a complete collar, but has a greater number (mean 36.9) of dorsal scales. Martin (1958, pp. 60-61) has reported a fully collared form of *torquatus* (not identified to subspecies) collected at 40 kilometers north-northwest of El Salto, Durango; this locality is about 180 miles north of Tepic. It may be that the lizards from Tepic, those reported by Martin from Durango, and others from El Batel, Sinaloa, referred by Zweifel (1954, p. 145) to *S. bulleri* represent a single form that deserves recognition as a subspecies. The possible status of the poorly known *Sceloporus bulleri* as a subspecies of *torquatus* should be considered in this respect, too.

The specimens from Volcan San Juan were collected by C. M. Bogert and Lewis Yaeger on November 22, 1955. At the same time and place three other species of *Sceloporus* were found: *S. d. dugesi*, *S. horridus albiventris*, and *S. utiformis*.

#### *Urosaurus bicarinatus tuberculatus* Schmidt

Jesús María (A.M.N.H. No. 75438); Ixtlán del Río (T.H.L. No. 57-1); Sierra Alica south of San Juan Peyotán (T.H.L. Nos. 57-8 to 57-14).

This lizard has been found both north and south of Nayarit, but the present specimens appear to be the first recorded within the state. The specimen from Jesús María was obtained by Borys Malkin on July 14, 1955. Those collected by Thomas H. Lewis were taken in February, 1957.

#### *Ameiva undulata sinistra* Smith and Lafe

One mile east-southeast of Las Varas (A.R.P. Nos. 56-13, 56-14).

These specimens represent an extension of range of about 40 miles north of the previously known northern limit at Puerto Vallarta and Ixtapa, Banderas Bay, Jalisco (Smith and Grant, 1958, p. 19). They were collected by Alan R. Phillips in broad-leaf and palm woods on July 18, 1956.

*Leptotyphlops humilis dugesi* (Bocourt)

Jalisco, 5 miles south of Tepic (A.M.N.H. No. 75750); Peñitas (A.M.N.H. Nos. 75587, 75588, 75590).

The worm snake has been recorded at a few scattered localities from Sonora to Colima, but these specimens are the first recorded for Nayarit. The specimens from Peñitas were collected in February and April, 1956, by Jacques Bordaz and Richard Goldschmidt, who were conducting archeological investigations.

*Loxocemus bicolor* Cope

Rosamorada (A.M.N.H. No. 19393).

Found on November 11, 1919, by Paul R  thling. The specimen has the color pattern (pale labials and immaculate ventral surfaces) that distinguishes *bicolor* from the form *sumichrasti*, variously considered a distinct species, a subspecies of *bicolor*, or a pattern phase of *bicolor* not deserving of taxonomic recognition.

The *bicolor* pattern type has been known from southern Michoac  n (Peters, 1954, p. 21) to Costa Rica, and the *sumichrasti* type from Colima to Chiapas (Alvarez del Toro and Smith, 1956, p. 12). Taylor (1940b, pp. 445-448) believes that the two forms are species distinct in scutellation as well as pattern, but Woodbury and Woodbury (1944, pp. 360-364) report that the supposed differences in scutellation are not valid. These authors treat the two forms as subspecies. However, the presence of the *bicolor* type in Nayarit destroys any geographic sense in subspecific allocation, as that pattern phase is now known to occur throughout and beyond the area occupied by the *sumichrasti* phase. The obvious alternatives are to consider the forms as distinct species, or merely as color phases of a single species. The evidence of Woodbury and Woodbury that the two forms are highly similar if not identical in their habitat requirements, together with the absence of any demonstrable morphological differences except in color pattern, argues strongly for the view that the forms are polymorphic phases of a single species.

The record for Rosamorada extends the known range of the species 225 miles north-northwest of the previously known northern limit in Colima, and extends the range of the *bicolor* pattern phase 350 miles from southern Michoac  n.

*Coniophanes lateritius lateritius* Cope

Six and seven-tenths miles east of San Blas, 10 feet elevation, Nayarit (U.M.M.Z. No. 114539).

This rare species has been reported only four times. Smith and Grant (1958, pp. 20–22) record a specimen from Puerto Vallarta, Jalisco, as *C. l. lateritius*, and resurrect the name *melanocephalus* (Peters) as a subspecific designation for two others recorded from Puebla and Guerrero. The remaining specimen, now lost, is the type of *C. lateritius* supposedly from Guadalajara, Jalisco, but probably from somewhere nearer the coast (see Smith and Grant, 1958, p. 22; Zweifel, 1959, p. 5).

The specimen from San Blas is a male with 148 ventral and 95 subcaudal scales. It is closely similar in color and pattern to the individual from Puerto Vallarta described by Smith and Grant, and so serves to confirm the subspecific separation proposed by these authors.

*Drymarchon corais rubidus* Smith

Rosamorada (A.M.N.H. No. 19564).

Captured by Paul R  thling on November 19, 1919. The occurrence of this species in Nayarit was expected, as it is known from the adjacent states both north and south.

*Elaphe triaspis intermedia* (Boettger)

Five miles west of Buenos Aires, about 20 miles (by road) northwest of Tepic (A.M.N.H. No. 80591).

This species is known from the adjacent states north and south of Nayarit, so its presence in Nayarit is not astonishing. The specimen was found dead on the road at an elevation of about 1000 feet by C. M. Bogert on August 7, 1958.

*Sonora michoacanensis mutabilis* Stickel

Jes  s Mar  a (A.M.N.H. No. 74951).

This specimen was secured by Borys Malkin on June 29, 1955. Localities for the species closest to Nayarit are Magdalena, Jalisco (the type locality), and Mezquit  l del Oro, Zacatecas. These localities are, respectively, 100 miles south-southeast and 110 miles southeast of Jes  s Mar  a.

There is in addition to the above-mentioned localities only one other locality recorded for the subspecies. This is Distrito Federal, based on A.M.N.H. Nos. 19714–19716 (Stickel, 1943, p. 116). These specimens were received by the American Museum from Paul D. R  thling, who obtained them from a “German School Collection” in Distrito Federal. *Sonora m. michoacanensis* is found in Michoac  n and Guerrero, and it seems unlikely that *S. m. mutabilis* occurs in Distrito Federal so far to

the south-southeast (300–400 miles) of the verifiable localities in western Mexico. More likely the specimens in the German School Collection were not captured in the Federal District. Other specimens in the German School Collection also represent forms not otherwise known from Distrito Federal. These are *Trimorphodon tau upsilon*, *Tantilla bocourti*, *Thamnophis sauritus proximus*, *Elaphe triaspis intermedia*, and *Micrurus e. elegans*. The presence of these species in the collection strengthens the supposition that Distrito Federal is an erroneous locality for *Sonora michoacanensis mutabilis* and probably for the other species as well.

*Sibon nebulatus* (Linnaeus)

Tepic (A.M.N.H. No. 68540).

The northernmost record for this species has been La Salada, Colima (Duellman, 1958, p. 12). The specimen from Tepic was obtained by Borys Malkin on September 23, 1947, and extends the known range 180 miles north-northwest.

*Micrurus nigrocinctus browni* Schmidt and Smith

Las Varas (A.M.N.H. No. 75815).

Collected by Lewis Yaeger. The specimen is a male with 205 ventrals, an incomplete tail, and poorly developed supra-anal tubercles.

The snake has the color pattern of *browni* (Schmidt and Smith, 1943, p. 30) and agrees well with two topotypic specimens from the vicinity of Chilpancingo, Guerrero (A.M.N.H. Nos. 72489, 72490). The dorsal surface of the head is black, except for a pale ring across the parietals, which also involves part or all of the fourth through seventh supralabials. The nuchal black ring includes the tips of the parietals and extends posteriorly the length of five dorsal scales. There are 18 black rings on the body, all complete ventrally. The black rings are three scales wide on the dorsum and two on the venter. Most scales of the red rings are tipped with black. The yellow rings separating black and red are one-half to one scale wide.

*Micrurus nigrocinctus browni* has been recorded no farther north than Chilpancingo, Guerrero, about 450 miles southeast of Las Varas.

*Micrurus distans distans* (Kennicott)

*Elaps distans* KENNICOTT, 1860, Proc. Acad. Nat. Sci. Philadelphia, p. 338, type locality, Batosegachic, Chihuahua.

*Micrurus diastema distans*, SCHMIDT, 1933, Publ. Field Mus. Nat. Hist., zool. ser., vol. 20, p. 39 (part).

Schmidt (1933, p. 39) applies the name *M. diastema distans* to coral snakes from Sinaloa, southern Sonora, and western Chihuahua. The feature cited as distinguishing *distans* from *diastema* is a higher number of ventral scales. *Micrurus d. diastema*, "is defined and restricted to include the west Mexican coral snakes in which the black rings tend to disappear either by reduction in number, by loss of the ventral portion, or by constriction of the black on the sides." The range given for *diastema* is "Western Mexico, from Nayarit to Oaxaca," but in a later paper (Schmidt and Smith, 1943), *diastema* is restricted to Colima and Jalisco, and snakes of Michoacán and Guerrero are reassigned to *M. diastema michoacanensis* and *M. browni*, the latter a new species.

In subsequent papers, Smith ("1946" [1947]) places *Micrurus browni* as a race of the Central American species *M. nigrocinctus*, and Smith and Chrapliwy (1958), describe *M. diastema proximans* from San Blas, Nayarit.

I do not agree with the taxonomy currently in use. Snakes from Sonora, Sinaloa, and Chihuahua are consistent in certain features of pattern. There is always some light color on the first three supralabials, and often the supralabials are predominantly pale; also, the snout usually bears some light markings. The yellow ring on the head is relatively wide; its posterior border falls behind the tips of the parietal scales, usually one to one and one-half scales back. The black rings are complete ventrally and number from 12 to 14 on the body in specimens examined. The red rings are immaculate, without black tips to the scales. This pattern is not restricted to the region mentioned above, but also occurs in specimens from Nayarit and Colima. Five male specimens have 208 to 213 ventrals (mean 210.2), and six females have 215 to 232 (mean 220.8). Specimens with this pattern have been placed in both *M. diastema diastema* and *M. diastema distans* by previous authors.

A very different pattern phase has also been included within *M. d. diastema*. In this form, the snout and anterior labials are black, and the yellow head ring is narrow, so that the posterior tips of the parietal scales are black. The number of black rings is similar to that seen in the form previously discussed, but the rings are often broken ventrally and may be represented only by dorsal spots. The scales of the red rings are tipped with black. Three specimens of this form are in the collection of the American Museum (A.M.N.H. Nos. 19705, 19707, 19709). Unfortunately, the specimens are without specific locality data, but they may have come from Colima, where the collector (Paul Rütting) obtained numerous specimens for the Museum. There are 12



black rings on the body in two specimens, but only one ring is complete ventrally in one of these. The third specimen has 11 rings, of which nine are complete or narrowly incomplete. Ventral scales number 196 in a male and 203 and 213 in two females.

The lectotype of *diastema* designated by Schmidt (1933, p. 39) was not described by him, but certain pertinent details are available in the original description (Duméril, Bibron, and Duméril, 1834–1854, p. 1222): The snouts of the three cotypes are black, and the scales of the red rings are tipped with black. The illustration of *Elaps fulvius* var. *diastema* published by Duméril, Bocourt, and Mocquard (1870–1909, pl. 74, fig. 5) shows that the yellow ring on the head is narrow, and the posterior tips of the parietal scales are black.

Through the courtesy of Dr. Janís Roze, I have received the following information extracted from notes by Dr. Schmidt now in the possession of Dr. Roze: The lectotype of *diastema*, P.M. No. 4620, is a female with 208 ventrals and 13 black rings on the body. The type specimen of *Elaps epistema* Duméril, Bibron, and Duméril (a specimen of *diastema* with rings reduced to dorsal spots), P.M. No. 4625, is a male with 198 ventrals, 47 subcaudals, and 17 black rings."

The *diastema* and *distans* pattern phases evidently coexist in Colima, as Schmidt (1933, p. 39) states that "the rings are reduced to dorsal spots . . . in three specimens definitely from Colima," and I have examined snakes with the *distans* pattern from the state. Alternative explanations for the situation are: (1) two or more species have been confused under the name *diastema*, or (2) locally in Colima, *Micrurus diastema* exhibits two strikingly different pattern phases. I think that concurrence of differences in pattern and scutellation indicates that the first explanation is the correct one, and offer the following definition of *Micrurus distans*: Light markings present on anterior supralabials and usually on snout; pale head ring relatively broad, with posterior margin falling behind the tips of the parietal scales; black rings on body complete ventrally; red rings immaculate, scales without black tips; males lacking supra-anal tubercles. Ventrals 208–214 in males, 215–232 in females.

*Micrurus distans* may be subdivided into two subspecies. A northern form, *M. distans distans* (Kennicott), has 12 to 14 black rings on the body and is found from southern Sonora and western Chihuahua to Colima. The southern form, *M. distans michoacanensis* (Dugès), has six to eight black body annuli and is known from Michoacán and Guerrero. The relatively high ventral counts of *M. d. distans* are seen also in *michoacanensis*: two males have 211 and 214 ventrals, and two females

each have 226. The following specimens have been examined: *Chihuahua*: Batosegachic (U.S.N.M. No. 1144, type of *Elaps distans* Kennicott). *Sinaloa*: Twelve miles southeast of Los Mochis (A.M.N.H. No. 62264); Escuinapa (A.M.N.H. Nos. 3928–3931). *Nayarit*: Peñitas (A.M.N.H. No. 75589). *Colima*: East of Manzanillo (A.M.N.H. No. 19837); Periquillo (A.M.N.H. No. 12780). *Michoacán*: Apatzingán (U.S.N.M. No. 111333).

It seems unlikely that *Micrurus diastema* (as restricted here to exclude *M. distans*) is limited in distribution to Colima, but its relationship to forms of other regions is not clear. *Micrurus nuchalis taylori*, known from a single specimen from Acapulco, Guerrero, closely resembles *M. diastema* in head and body pattern (Schmidt and Smith, 1943, p. 31), but possesses well-developed supra-anal tubercles, structures lacking in male *diastema*. An additional confusing note is added when it is seen that the characters of *M. n. taylori*, so far as can be told from the description, are within the range of variation attributed to *M. nigrocinctus browni*, a form described in the same paper.

Smith and Chrapliwy (1958, p. 270) have described a coral snake from 4 miles northeast of San Blas, Nayarit, as *M. diastema proximans*. This form is clearly distinct from *M. distans* which occurs in typical form only 30 miles from San Blas at Peñitas, but the proper specific assignment of *proximans* remains to be determined. I have examined a female specimen from 3 miles east of San Blas (U.M.M.Z. No. 114443) that is nearly topotypic, and undoubtedly the same species as Smith and Chrapliwy's type. It agrees closely with the description of *proximans*, differing mainly in that only three of the 24 black rings are complete ventrally, whereas 16 of 23 are complete in the type. The type (a female) has 213 ventrals; the second specimen, 219.

With the presence of *Micrurus nigrocinctus browni* established in southern Nayarit (see preceding species account), the question of whether *proximans* should be referred to *nigrocinctus* or *diastema* arises. The tendency to ventral disruption of the black rings brings similarity to *diastema*, but the high number of rings is more characteristic of *nigrocinctus*. The specimen of *browni* from Nayarit has black rings that are only two scales wide ventrally, rather than three or four scales as is usual in specimens from Guerrero. This may be indicative of a trend culminating in the broken rings of *proximans*. The ventral counts are of no help, as they are intermediate between the maximum of 213 for *diastema* and the minimum of 220 for *M. n. browni* (Schmidt and Smith, 1943, p. 30). Though I strongly suspect that *proximans* is a race of *nigrocinctus*, settlement of the question

must await the appearance of male specimens of *proximans*. The presence of supra-anal tubercles would dictate reference of the form to *nigrocinctus*, and their absence would suggest that *diastema* was the species represented.

There remains one peculiar specimen to be discussed. This is U.S.N.M. No. 67374 from Magdalena, Jalisco. It was called *M. diastema distans* by Schmidt and Smith (1943, p. 28) and Smith and Taylor (1945), *M. diastema diastema* by Smith (1943), and was made a paratype of *M. diastema proximans* by Smith and Chrapliwy (1958). This specimen exhibits a curious mixture of the pattern characters of the species *distans* and those of *nigrocinctus*. The head pattern is typical of *distans*, with light markings on the rostral and internasals, light supralabials, and a broad pale band with the posterior edge behind the tips of the parietals. The body pattern, though, is quite different from anything seen in *distans*. The black body rings are more numerous (20) than in *distans*, and the scales of the red rings are black-tipped. The black rings are three to four scales wide ventrally, and all are complete. The specimen gives the appearance of an individual with the head of *distans* on the body of *nigrocinctus*. The snake is a female, so the critical character of supra-anal tubercles cannot be determined. In addition to the peculiar pattern, the specimen is unique in scutellation, as it possesses 237 ventrals, more than are recorded for any other *Micrurus* of western Mexico. I am inclined to assign more significance to the head pattern and high ventral count than to the body pattern, and suspect that this specimen represents a distinct population of *Micrurus distans*. If additional specimens confirm this supposition, the definition of *distans* must be modified to include snakes with and without black spotting in the red rings.

To summarize, there appear to be three species of *Micrurus* in western Mexico. *Micrurus distans* is distinguished by immaculate scales of the red rings, presence of pale coloration on the anterior supralabials and (usually) snout, and a broad pale head ring with its rear margin behind the posterior tips of the parietal scales. *Micrurus diastema* and *M. nigrocinctus browni* have the scales of the red rings tipped with black, snout and anterior supralabials black, and a narrow, pale, head ring with its rear margin falling anterior to the tips of the parietal scales. The males of *nigrocinctus* have supra-anal tubercles, structures lacking in *diastema*. The number of black rings is probably greater in *nigrocinctus* (17 or more) than in *diastema* (11 to 17). The specific status of *Micrurus diastema proximans* from the vicinity of San Blas,

Nayarit, is not settled, and a specimen of *Micrurus* from Magdalena, Jalisco, cannot be referred to species with certainty.

*Crotalus basiliscus basiliscus* (Cope)

Jesús María (A.M.N.H. No. 74959); Río San Pedro, 1 mile east of Peñitas (A.M.N.H. No. 75754).

The specimen from Jesús María was obtained by Borys Malkin on August 24, 1955. The one from Peñitas was found dead on the road by C. M. Bogert on January 8, 1956. This species has been suspected to occur in Nayarit, as it is found to the south and north of that state, but Klauber (1956, p. 30) had no records for Nayarit.

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