

OCCASIONAL PAPERS OF THE MUSEUM OF  
ZOOLOGY

UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

UNIVERSITY OF MICHIGAN PRESS

THE AMPHIBIANS AND REPTILES OF THE COAST AND  
COASTAL SIERRA OF MICHOACÁN, MEXICOBY JAMES A. PETERS<sup>1</sup>

THE University of Texas field studies in the Coalcomán region of the state of Michoacán are an attempt to co-ordinate the various scientific disciplines in a unified survey of a restricted geographic area. Accompanying the several field parties have been geologists, zoologists, botanists, anthropologists, and geographers. The preliminary results of this combined study are being published elsewhere. The herpetological collections resulting from the work are now deposited in the University of Michigan Museum of Zoology. In the summer of 1950 I accompanied the field party, and in 1951 the Museum of Zoology was represented by William E. Duellman.

The first field party to enter coastal Michoacán left Colima and crossed the Río Coahuayana west of the town of Coahuayana. Collections were made in that vicinity and also at La Placita and Ostula, both slightly inland and east of Coahuayana. After returning to Colima and disposing of accumulated collections, the party flew directly to Coalcomán and worked in the heart of the highland mass of the Sierra de Coalcomán. A trip to the coast in order to visit the region about the mouth of the Río Cachan was made on muleback. The 1951 field party flew from Apatzingan to Coalcomán on July 8 and used that village as a base of operations for the entire summer's activities. The studies in the vicinity of Coalcomán were supplemented by extensive muleback trips to the coast. These journeys enabled a study to be made of the coastal region from the Río Cachan eastward to the Barranca de Bejuco.

In addition to the material collected by the field parties, I have had access to the other known specimens collected in that area. These include the Hans Gadow collections at the British Museum (Natural History), and the John Xantus collections in the United States Na-

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tional Museum. A complete survey of known zoological collectors in the area, their dates of activity, and what is known of routes of travel are included in the preliminary report of the combined study. Since Gadow focused his attention on the region near the Michoacán-Guerrero border, his collection has served as a valuable supplement to later studies.

The beaches of Michoacán are either sandy or almost completely rocky and for the most part rather narrow. They are quite high, sloping away gradually on the inland side to swampy areas and brackish lagoons containing extensive mangrove stands. The beach is not continuous but along the whole coast is cut into isolated segments by outliers or "stringers" of the highland mass. These stringers cut across the coastal plain at right angles to both the highland mass proper and the ocean. Many rise several hundred feet above the beaches and extend well out into the ocean. The most prominent example is Cabeza Negra, which juts into the ocean just east of the Colima-Michoacán border and has served as a landmark for navigators along the Pacific coast. The stringer that terminates in this prominent rock lies between the valleys of Coahuayana and La Placita and makes travel between the two places difficult. The coastal region is a series of valleys separated by foothill "stringers," usually with a single large river or stream draining each of them. The valleys immediately behind the swamp and lagoon areas are covered with a heavy thorn forest, made up primarily of *Mimosa* and *Acacia*, with organ pipe, *Opuntia*, and other cacti common. Bananas and coconut palms are cultivated wherever the scrub has been cleared. The thorn scrub seems to be confined for the most part to the soils in which sand predominates.

Somewhat more inland, where sands are replaced by sandy clays, the vegetation changes from thorn to hardwoods, with an abundance of *Vitis* and such lianas as *Monstera*. In this region and higher in the foothills *Ficus*, *Ceiba*, and "Cuayote" predominate. The high, rather dry valley in which the city of Coalcomán is situated contains thornbush and other arid vegetational types. The hillsides are covered on the lower levels with deciduous trees, dominated by oaks. Slightly higher, pine stragglers appear and pine-oak forest occurs in those places where the natural vegetation has been permitted to survive. Large numbers of bromeliads are often found on the trees of the oak and pine-oak forests. The upper slopes and summits of the mountains comprising the Sierra de Coalcomán, to a height of about 6000 feet, are covered by almost pure pine stands. These pine forests have all been burned over many times; the ground is covered by black ash,

and the fauna is definitely impoverished. The fauna of the pine forests was not thoroughly investigated by either party and is very poorly represented in this study.

The study made by James A. Oliver (1937) on a part of the state of Colima, under the auspices of the University of Michigan Museum of Zoology, was of an essentially similar area. The primary difference between the surveys lies in the fact that Oliver did not have the opportunity to investigate a highland mass. Where work for the two studies was comparable, that is, on the coastal and lowland regions, results are similar. Some of the gaps in the ranges of several Guerreran species collected by Oliver in Colima have been closed by additional work in the intervening area for the present study. Specimens of three of the four species he described as new were found in Michoacán.

All localities listed in this paper are general, and more detailed information is available for individual specimens. It should be understood that the listing of a collecting locality means that one or more specimens, as indicated, came from its immediate environs.

I wish to take this opportunity to acknowledge my indebtedness to those whose assistance made my work possible. Dr. Norman Hartweg, Dr. Charles Walker, and Dr. Laurence Stuart all assisted me in the identification of material within their special interests. Dr. Robert Storer, Mr. Edward K. Miller, and Mr. Billy Turner were particularly helpful field collectors; several of my choice specimens are results of their efforts. Dr. Donald Brand, director of the field parties, constantly provided valuable information and facilitated the various studies. Dr. H. W. Parker of the British Museum (Natural History) most generously loaned material from the Gadow collections, and Dr. Doris Cochran of the United States National Museum was liberal with time and patience in helping me with the *Xantus* material. Mr. William Duellman has generously allowed me to utilize not only his collections but also his field notes and catalogues and thereby greatly increased the effectiveness of the study.

*Rhinophrynus dorsalis* Duméril and Bibron

"Near the mouth of the Balsas River."

There would be considerable reason to doubt the occurrence of this species on the coast of Michoacán were the circumstances of the record not so well known. Gadow (1930: 72) noted that he "found it in great numbers near the mouth of the Balsas River." He called it *Rhinophrynus mexicanus*. The specimens Gadow collected are still in

the British Museum (Natural History) and have been re-examined for me by Dr. H. W. Parker, who wrote that they are typical *dorsalis*. Parker noted that the museum has specimens from Agua Fria, Veracruz, collected by Gadow in 1903, and others catalogued as found "near the mouth of the Balsas River," collected in 1914. Thus Gadow clearly obtained the species on both his trips to Mexico. The possibility of mislabeling is negated by Gadow's definite statement (1930: 66) that he had been surprised to find the species in Michoacán.

*Bufo horribilis* Wiegmann

Coahuayana (2); Ojos de Agua de San Telmo; Ostula; Pómaro (3); Coalcomán (8); Chichihuas; Huahua; Barranca de Bejuco.

Common in all parts of the area studied.

*Bufo marmoreus* Wiegmann

Coahuayana (11); La Placita (10); Ostula (8); Motin del Oro; Estopilas de Salitre; San Pedro Damian; Pómaro (15); Rancho el Diezmo (2); Barranca de Bejuco; San Salvador; La Orilla.

Smith and Taylor (1948: 45) did not include Michoacán in the range of this species, although Gadow had collected it in 1908 at both La Orilla and San Salvador. It seems to be confined to lowland areas. None has been taken in the highlands of Coalcomán, although the two individuals from Rancho el Diezmo were collected at an elevation of 2920 feet.

On June 25, 1950, after a very heavy rainfall the night before, toads of this species were found breeding in a small pool behind the school house in Coahuayana. The temperature of both the air and the water was 80° F. The only sound was a low, rapid clucking made by the males, both by those clasping and by those unpaired. Clasping toads were found on land prior to egg deposition; apparently pairs are formed before they enter the water. Clasping is axillary; the male holds his legs close to his body and places his feet in the groin of the female, against the upper femur, as described in *Bufo terrestris* by Wright and Wright (1949: 202). As the eggs are deposited, the female lowers her head violently and raises her anus and the upper part of her hind limbs high, often clear of the water. At the same time the male bends sharply forward and forces his anus downward, bringing the two close together, and also pushes strongly against the femora of the female. This latter action elongates and compresses her body and

apparently aids her to discharge the eggs. One female deposited seven masses in rapid succession. Each mass settles out into strings that float on the water. Immediately after the eggs are laid, the pair deserts the pool. One male released his mate, swam rapidly to the edge of the pool, and hopped 20 feet away before stopping. The female left more slowly and stopped under a nearby log. A second pair completed egg laying, and the female with hops two and one-half to three feet long went to a nearby clump of bushes, the male tightly clasping all the way. Less than 24 hours after the eggs were laid, at 7:00 A.M. on June 26, every egg mass had either completely hatched or contained wriggling tadpoles. On June 29 the pond, which had been no more than four inches deep, had dried, except for a spot of mud in the center. The floor of the pool was blackened by dried toad larvae, and there appeared to be no survivors.

On July 10, 1950, during a light misty rain, a male of this species was collected at 11:50 P.M. in the Coahuayana schoolyard, while tightly clasping a large female *Bufo horribilis*.

Duellman noted a breeding congress at Pómaro on July 13, 1951, in a shallow, rocky stream in the forest.

#### *Bufo occidentalis* Camerano

Coalcomán (7); Las Tecates; Rancho Rincón.

This species, new to the Michoacán herpetofauna, is confined to the Sierra de Coalcomán in that state and was not collected below 3000 feet. The specimen from Las Tecates was found in an oak forest at an elevation of 6400 feet. Duellman found an individual of this species in the stomach of a *Conophis vittatus vittatus*.

#### *Tomodactylus* sp.

La Placita (3); Coalcomán (3); Pómaro.

This species, also collected in the environs of Jorullo volcano, is being studied by Duellman. My notes and color descriptions have been turned over to him, and his description should be consulted for an analysis of the species.

#### *Leptodactylus melanonotus* (Hallowell)

Coahuayana; Ostula (9); Maruata.

A not uncommon lowland species.

*Eleutherodactylus occidentalis* Taylor

La Placita (7); Ostula (4); 12 miles SW of Coire (3); Pómaro (3).

Males of this species were in full chorus in the scrub thicket east of La Placita on July 5–6, 1950. They sat on low branches of trees or were in vines and shrubs, three to seven feet above the ground and parallel to it. The call is a piercing whistle composed of five or six notes. Each single note resembles the peep of *Hyla crucifer* Wied, but the rapid repetition results in a sound more like a whistle. The call is repeated every 15 to 20 seconds.

This species was found only in the lowlands of the region studied. Oliver (1937: 4) discussed it under the name *Eleutherodactylus mexicanus* (Brocchi).

*Eleutherodactylus rugulosus* (Cope)

Estopilas de Salitre (3).

These specimens are not in complete conformity with the description given by Taylor and Smith (1945: 579) for their *Eleutherodactylus rugulosus* var. from Guerrero, but probably are most closely related to it. The largest specimen, a female, is 65 mm. long. The tibiotarsal articulations overlap in all specimens when the legs are folded at right angles to the body. The tibiotarsal articulation does not reach beyond the end of the snout in any of the three. The skin is less granular and pustular than in specimens of *rugulosus* from the more southern parts of the range. Lateral folds are clearly discernible in the large females, but are weak in the smaller males. The specimens fit the color description given by Kellogg (1932: 96) in practically all respects. Color notes made from a living specimen are: "Rusty or russet red on back, faint black markings. Sides yellow with black mottling. Flash colors on legs yellow and black mottled. Venter creamy white. Eye golden above, horizontal brown line, gray below. Dorsal surface of hind legs same color as back" (Peters, August 9, 1950).

*Diaglena reticulata* Taylor

Ostula (7).

This is the first record of the genus in Michoacán. The series was collected from a breeding congress on July 15. A detailed discussion of the specimens and the reason for assigning them to this species will be published elsewhere.

*Agalychnis dacnicolor* (Cope)

La Placita; Coahuayana (3); Coalcomán (33); Estopilas de Salitre (2).

Specimens were in chorus in the schoolyard at Coahuayana on July 10. Some were on the ground and some on a low log fence. The call is similar to the noise made by rapidly drawing the tongue away from the roof of the mouth, and it is described in my field notes as "a sort of a swallow crossed with a hiccup." A clasping pair was collected on August 5, at Estopilas de Salitre. Clasping is axillary, with the male's forefingers over the female's forearm. On both dates the night was very dark with a light, misty rain. Duellman found specimens in chorus in a flooded field at Coalcomán on July 24, 1951. They were on bushes and on leaves of banana trees and were always in a horizontal position. He noted that their eyes reflect a bright golden color visible for about 50 yards. One of the specimens was taken from the stomach of a *Leptophis diplotropis* at Coalcomán.

*Acrodytes inflata* Taylor

Barranca de Bejuco.

A specimen collected by Duellman in 1951 is the first record of the species in Michoacán. It was found in a tree, about seven feet from the ground. The species is listed by Oliver (1937: 7) as *Hyla venulosa* (Laurenti).

*Smilisca baudini* (Duméril and Bibron)

Coahuayana; La Placita; Ostula (4); Estopilas de Salitre; Maruata; San José de la Montana; Buena Vista.

Smith and Taylor (1948: 75) did not include Michoacán in the range of this species. Gadow (1930: 54) reported it as a member of the Michoacán fauna, and the specimen in the British Museum from Buena Vista verifies this record. In addition, Schmidt and Shannon (1947: 67) recorded a large series from Apatzingán.

The species is confined to the lowland part of the region studied. A full chorus was heard at Ostula on the night of July 15, 1950, during an extremely heavy rain, in concert with individuals of *Diaglena*.

*Hylella azteca* Taylor

Pómaro (3).

These specimens fit the description of this species better than they do that of *H. sumichrasti*, but the name is used provisionally. The

vocal sac is present. The undersurface of the arm is prominently granular on the most proximal part, very slightly so on the distal part, but the rest appears smooth. The specimens, collected by Duellman, were found in the interstices between rocks in a stream. The call is a nasal "haah-haah-haah," repeated rapidly and constantly for as long as 30 seconds.

*Hyla smithi* Boulenger

Ostula (8); Coalcomán (11); Estopilas de Salitre (8).

This diminutive frog is common in all parts of the region where there is sufficient moisture, and it has a striking ecological specificity for the plant *Xanthosoma roseum* Schott, commonly known as the elephant ear. This plant has extremely large leaves on stems six or more feet in length, all of which spring from a central base and closely overlap one another. Any large stand of the plant is sure to harbor a series of this frog, which lives in the area of overlap of the stems, where water collects. I have taken these frogs in precisely the same situation in Nayarít, Jalisco, and Guerrero, as well as on the coast of Michoacán.

These frogs in chorus were collected on the morning of July 15, 1950, by Dr. Robert Storer, after an extremely heavy rain. They were breeding in a quiet pool in a tiny mountain stream at the foot of a short but steep drop. Claspings are axillary. On July 16 all eggs, most of which had been attached to twigs or rocks in the pool, were in the gastrula stage. In some of the eggs the neural fold had begun to form. Duellman collected the species in chorus at Coalcomán on July 24, 1951, in a flooded field.

*Hypopachus oxyrhinus* Boulenger

Buena Vista; San Salvador.

The two specimens in the British Museum (Natural History) from the region dealt with in this paper were collected by Gadow, listed as *oxyrhinus* by Parker (1934: 114), and included under that name in the check list by Smith and Taylor (1948: 96). The specimen from Buena Vista (BMNH 1914.1.28.151) is darker dorsally than laterally and has an irregular dark stripe from occiput to groin that is broken into several spots. It is, in short, typical *oxyrhinus* as defined in Smith and Taylor's key (1948: 95). In the specimen from San Salvador (BMNH 1914.1.28.150) the sides are much darker than the dorsum and the stripe from occiput to groin is well marked and is continuous



across the legs; the specimen is 34 mm. long. In these respects it is very similar to *Hypopachus ovis* Taylor, which is not known from Michoacán.

Oliver (1937: 7) found what he called *oxyrhinus* at Queseria, but Smith and Taylor (1948: 96) listed only *H. ovis* from that locality and reported no *oxyrhinus* from Colima. Their record is apparently based on material other than Oliver's, which shows, for the most part, a stronger resemblance to *oxyrhinus* than to *ovis*. The occiput-to-groin stripe is present and fairly complete in only four specimens out of 14. The sides are lighter than the dorsum in ten and are the same color as the dorsum or darker in four. There are several specimens larger than the 36 mm. maximum given for *ovis*. I feel justified, therefore, in accepting Oliver's identification of these frogs as *oxyrhinus*.

It is noteworthy that the range of *ovis* is quite similar to that of *oxyrhinus*, and that specimens answering the descriptions of each have been found together or in neighboring localities. Although I have used the name *oxyrhinus* for both the Michoacán specimens, it is entirely possible that the one from San Salvador belongs to *ovis*. Since an examination of the Colima series shows that the characters used to define *ovis* are variable within a single population, however, I have refrained from using the name *ovis* for that individual until further comparison can be made and additional definitive characters provided.

#### *Rana pipiens* Schreber

Coalcomán (20).

Both field parties found this species in abundance in the immediate environs of Coalcomán, but it was not seen or taken in the lower regions of the Sierra. It appears to be a distinctly highland species and is strongly indicative of a faunal relationship of the Coalcomán region with the rest of the Michoacán highlands.

#### *Rana pustulosa* Boulenger

Coalcomán (3).

This species has not been previously recorded as a member of the Michoacán fauna. Robert Storer found one pair in amplexus on August 8, 1950.

#### *Chelonia mydas* (Linnaeus)

Beach between Motin and Colotlan rivers (2); Maruata.

Large numbers of females were depositing eggs in the beach sands

when the field party visited the coast from August 6 to 12. On one half-mile stretch of beach I counted 472 trails and four dead turtles. Every trail seen was counted, and presumably about half the number of trails would be a correct census of the turtles. Actual deposition was observed by me on the beach at Maruata on August 8 and 9, 1950, and by Duellman on July 14, 1951.

This species had not been taken in Michoacán prior to this collection.

*Kinosternon integrum* LeConte

Coahuayana (2); Ojos de Agua de San Telmo; Coalcomán (171); Las Higueritas; Barranca de Herradero; San Pedro Damian.

This is probably the most conspicuous reptile in the region studied. It is abundant in streams of all sizes, small pools, ponds, and mud puddles. It has been taken from sea level to as high as 5000 feet and has been seen as high as 6000 feet.

*Geoemyda rubida perixantha* Mosimann and Rabb

Coahuayana; Point of San Juan de Lima; La Placita.

These specimens were designated paratypes by Mosimann and Rabb (1953), and ecological data from my field notes are included in their paper.

*Crocodylus acutus acutus* Cuvier

3 km. E. of Boca de Apiza (2).

Gadow (1930: 50) mentioned this form (as *Crocodylus americanus*) as a "tierra caliente" species. I obtained the skulls of two individuals on the beach east of the Boca de Apiza. Members of the party saw several other specimens in lagoons along the beach, and reports from local people indicated that the "caimanes" are fairly common in Michoacán.

Gadow (1930: 50) referred to *Caiman sclerops* (Schneider) as another of the "tierra caliente species in Michoacán." Smith and Taylor (1950: 212) suggested that Gadow's record is valid for Michoacán and cited the species under its correct name, *Caiman crocodylus fuscus* (Cope). The name "caiman" is heard commonly along the coast, but it refers to the crocodile as much as to the true caiman. The British Museum has no specimens from the Gadow collections, nor does Cambridge, and Gadow questioned his own record (1930: 74). The species cannot be considered a member of the Michoacán fauna.

*Phyllodactylus lanei* Smith

La Placita; Ostula (4); Pómaro; San Pedro Damian.

A lowland species, found in the thorn and in tropical deciduous forests, *Phyllodactylus lanei* lives almost exclusively under bark of standing trees. The trees occupied are usually dead or dying, with large amounts of dead bark.

*Anolis nebulosus* (Wiegmann)

La Placita; Ostula; Coalcomán (6); Coire; Los Pozos; Nogueleras (2); Barranca de Bejuco.

Assignment of these specimens to *Anolis nebulosus* is tentative until accurate means of distinguishing the species from *nebuloides* are found. I consider the differences as given by Smith and Taylor (1950: 58) insufficient for assigning individuals and do not use their list as a basis for determination. The *nebulosus-nebuloides* complex is certainly an outstanding puzzle so far as west coast Mexican herpetology is concerned.

One specimen, UMMZ 104444, from the vicinity of San Pedro Damian, is variant in several respects and shows some similarities to *Anolis utowanae* Barbour. Since I have compared it with the type of that species at the Museum of Comparative Zoology and have found the differences as impressive as the similarities, I have omitted that possible species from this list.

*Anolis schmidti* Smith

La Placita.

This is the first record of *Anolis schmidti* from Michoacán, and the first specimen found since the type was described by Smith (1939b: 21). It fits the type description with a few minor discrepancies. This specimen, UMMZ 104443, has three large supraoculars on each side, three canthals, four rows of loreals, six supralabials from rostral to a point directly below the eye, with the infralabials six on the right and seven on the left to the same point. The ventrals are noticeably larger than the largest dorsals; their posterior edges are raised, although the scales do not overlap. There are 18 lamellae under the third and fourth phalanges of the fourth toe. A distinct dark interocular bar is present, the labials are darkly barred at wide intervals, the fingers and toes are distinctly barred, and the yellow spot on the shank is present but inconspicuous.

*Basiliscus vittatus* Wiegmann

Boca de Apiza (4); La Placita (3); Ostula; Motin del Oro; Maruata.

This species is extremely common in the thick undergrowth that surrounds the brackish lagoons along the coast. I found it only in the littoral zone and usually closely associated with brackish water, its favorite haunt being the root tangles of mangrove. Duellman and Oliver also collected it only on the coast. It is surprising, therefore, to find Gadow (1930: 52) reporting it at Arteaga, at 3000 feet, in the Sierra proper, saying ". . . whilst at Carrizal [=Arteaga] and again at the coast, it was plentiful." The British Museum has no specimens from "Carrizal" collected by Gadow, and it is likely that Gadow's note is based on a sight record, at best.

*Iguana iguana rhinolopha* Wiegmann

La Placita; Maruata.

Oliver (1937: 10) found this species uncommon in Colima. It is also scarce in Michoacán. It is seen much less often than *Ctenosaura pectinata*. Although the 1950-51 field parties found it only in the lowland regions, the United States National Museum has three specimens, collected by John Xantus, with the vague localities of "Sierra Madre in Michoacán" and "Chacan River, Michoacán."

*Ctenosaura pectinata* (Wiegmann)

La Placita (7); Coalcomán (4); Motin del Oro; Barranca de Bejuco.

Very common in all parts of the region studied, the species lives in stony hillsides, rock fences, or thick hedgerows. Specimens are often found quite high in trees.

The young of the year, with the umbilical scar still prominent, are leaf green dorsally, shading into yellowish green ventrally. The head is a darker green than the rest of the body. There is no trace of the adult pattern on the unicolor back. The upper lip is green, the lower lip yellow, and the eye reddish brown with a black pupil.

A young adult, collected at La Placita, had its stomach full of hard berries of *Cordia* sp. Two juveniles were found in the crop of a hawk, *Buteo nitida*, collected by Storer.

Schmidt and Shannon (1947: 71) remarked that this species is ". . . nearly two feet long before the normal gray and white coloration of the adults is reached." All adults I have seen had a greenish olive

or reddish orange ground color, with brown or blackish bars that often invade the ground color on the back and tail of old individuals.

A specimen collected by Xantus in Michoacán was included in the type material of *Ctenosaura brevirostris* (J. W. Bailey, 1928: 27). Bailey listed the locality as "Sierra Madre Michoacán," but Xantus' original catalogue gives it as "nr. Chacan Riv., Sierra Madre, Michoacán." The species was synonymized with *C. pectinata* by Smith (1949: 36).

*Phrynosoma asio* Cope

San Salvador.

I have examined the specimen (BMNH 1914.1.28.116) from San Salvador that Gadow discussed (1930: 51) and have compared it with the description given by Reeve (1952: 891). I find full agreement in all particulars. It should be pointed out that, although the key in Reeve's work (1952: 848) states that *asio* possesses "one row of enlarged soft spines in the lateral abdominal fringe," and that *cornutum* has two such rows, the description of *asio* (p. 892) gives "two rows of enlarged soft spines in lateral abdominal fringe," and the diagnosis says "two peripheral rows of abdominal spines." That the key is incorrect and the description correct is shown by the specimen I have examined.

*Sceloporus horridus oligoporus* Cope

Boca de Apiza; Ojos de Agua de San Telmo; La Placita; Coalcomán (33); La Orilla.

This species was collected from the coast, in thorn thickets, to the higher slopes around Coalcomán. It is perhaps the most common species of *Sceloporus* in the highlands, where it is found in trees or rock fences; it is more rarely seen in the lowlands.

*Sceloporus melanorhinus calligaster* Smith

Boca de Apiza (2); La Placita (3); Estopilas de Salitre; Coalcomán (2); Barranca de Herradero.

This species also is present in both low and high regions, but is less commonly seen than the preceding one.

*Sceloporus pyrocephalus* Cope

Ojos de Agua de San Telmo (2); La Placita (9); Ostula (2); Point San Telmo (4).

Although Oliver (1937: 11–12) found this species up to an elevation of 3500 feet, I collected it only on the very low coastal plains of Michoacán, at no place higher than 500 feet. The species is extremely common and is particularly abundant in dry, rocky stream beds. The tail waving mentioned by Oliver (1937: 12) as part of the courtship procedure was observed in most individuals seen, whether courting or not. They run only a few feet when disturbed, then stop and lash the tail from side to side or raise it over the back and hold it motionless.

*Sceloporus siniferus siniferus* Cope

Coahuayana; Ojos de Agua de San Telmo; La Placita (8); Ostula (4); Pómaro (2); Maruata; Puerto de la Higuera; Barranca de Bejuco (2); La Orilla.

This is the second record of the species for Michoacán; Gadow (1930: 50) noted that it was a "tierra caliente" form. Smith (1939a: 313–19) did not include Gadow's record, but I have re-examined the specimen collected at La Orilla and find it typical in all respects. The species was collected only in the lowlands, where it is comparatively abundant.

*Sceloporus utiformis* Cope

Coahuayana (3); Ostula (3); Coalcomán (6); Pómaro.

One of the two cotypes of this species, USNM 42090, was collected by John Xantus "near the Cachan River, Michoacán." The other cotype is from Colima. The 1950–51 field parties found it in both high and low parts of the Sierra and environs.

*Urosaurus bicarinatus tuberculatus* (Schmidt)

Boca de Apiza; La Placita (4); Coalcomán (5); Pómaro (2); La Orilla; San Salvador.

This subspecies has not been previously recorded from Michoacán. The specimens collected by Duellman and myself, at the western end of the region under consideration, are fairly typical of the race. The two specimens in the British Museum, collected by Gadow in localities at the eastern end of the Sierra de Coalcomán, are intermediate between this subspecies and *U. b. bicarinatus*. The enlarged dorsals are low and pavementose, with little keeling. The ventrals are more imbricate than pavementose in both specimens, but, although a few are

keeled, none is mucronate in the one (BMNH 1914.1.28.112) from La Orilla. The blue belly patch is restricted to the sternal area in this specimen, but it extends from axilla to groin in the one (BMNH 1914.1.28.92) from San Salvador, which has mucronate lateral ventrals. The axillar blue patch is not typical of either *b. bicarinatus* or *b. tuberculatus*, but characterizes *b. anonymorphus* of eastern Guerrero and Oaxaca. These specimens, although not *b. bicarinatus*, approach that form and may well represent an intergrading population.

I have not been able to find any specimen in the museums of the United States that would form the basis of the spot record on the Sierra de Coalcomán on the map given by Mittleman (1942: 129) for *b. bicarinatus*. Mittleman has informed me (*in litt.*) that, unfortunately, the data on which the maps were based are no longer available, and the specimen cannot be traced.

*Urosaurus irregularis* (Fischer)

Guayabo.

The use of Fischer's name for this specimen (BMNH 1914.1.28.110) is based upon the complete contact of the enlarged dorsal scale rows across the vertebral line. There are two rows of enlarged dorsals, arranged in pairs, with very low keels and a pavementose appearance. The two rows do not touch the occipital scales; a few isolated, enlarged dorsals are followed by a continuous series beginning at the level of the shoulders. There are 39 scales in this continuous row, counted to a point directly above the posterior edge of the hind legs. Granular scales are found vertebally, except at the point of contact of each pair of enlarged scales. There are five irregular rows of enlarged scales dorsolaterally, one of which forms a distinct ridge over the groin, as shown in Fischer's plate (1882, Pl. 17, Fig. 1). The remaining dorsal scales are not rugose and are quite pavementose. The ventrals are entirely smooth and pavementose except laterally and in the groin, where they are slightly keeled, imbricate, and mucronate. The dorsal pattern is similar to that shown in Fischer's figure, and there are no ventral markings. Fischer's species was described from a specimen labeled "aus dem Hochlande von Mexico," and no specific locality has been known prior to this record.

*Mabuya mabouya alliacea* Cope

La Placita.

Gadow (1930: 50) reported this species from the "tierra caliente" of

Michoacán, as *Mabuia agilis* (Raddi). Smith and Taylor (1950: 156) recorded it as *Mabuya mabouya mabouya* (Lacépède), but Burger (1952: 186) revived Cope's name *alliacea* for all Mexican populations of the species. My single specimen comes from the lowest part of the coastal strip.

*Leiolopisma assatum taylori* Oliver

Ostula.

This is the first record of the subspecies in Michoacán. Notes made on the living animal in the field are as follows: dorsum light, shiny brown; head slightly darker; a thin black line begins at the eye and runs to the axilla. The sides and belly are very clear, with a slight yellowish tinge. The entire tail is a salmon pink.

*Eumeces colimensis* Taylor

Coalcomán; Estopilas de Salitre.

These are the first specimens of *E. colimensis* from Michoacán and the first to be recorded since the type description (Taylor, 1935: 77).

Both of these specimens possess the diagnostic characters of the species, with two exceptions: the frontal is not in contact with the interparietal in either, and the primary temporal is present in both. It seems likely that Taylor's remark that the primary temporal is possibly abnormally fused with the upper secondary is correct. The primary temporal occupies the position of the anterior half of the secondary temporal in the type and prevents any contact between the latter and the last upper labial.

The two specimens differ in several other characters from the description of the type. The prefrontals are in broad contact, separating the supranasals and the frontal. The frontal is in contact with three supraoculars. The frontoparietals do not form a deep notch in the parietals. The interparietal is as broad as long and, as mentioned above, does not come in contact with the frontal. The Coalcomán specimen, UMMZ 104423, has eight superciliaries; No. 104424, the individual from Estopilas, has eight on the right side and nine on the left. (Although Taylor says in the descriptive text that the type has six, there appear to be seven in the figure.) Both specimens have two preoculars, in the same position as shown in the figure of the type. The lower labials are 6/6 in No. 104424, 7/6 in No. 104423. There are only 26 scale rows about the middle of the body in both.



The overlap of the limbs when adpressed is the length of the digits, not of the whole foot. Lamellar formulae are:

	Forefoot	Hind Foot
UMMZ 104423	7-8-11-10-8 7-8-11-11-8	6-8-11-13-10 6-10-12-15-10
UMMZ 104424	6-9-10-12-9 6-9-11-14-8	7-10-13-16-13 8-10-13-17-12

The light dorsolateral lines are much more distinct anteriorly than posteriorly, but are complete. The light brownish streak in the nuchal region is very dim. The "broad band of brown beginning anterior to the eye" is almost black in both specimens. The color of No. 104423 in life was noted as: "back and head shiny, glossy black; dorsolateral lines straw yellow. Light straw colored line on upper lip runs to forearm (not discernible on preserved specimen). Chin a very light orange, venter pale yellow, with each scale faintly outlined in black. Tail entirely blue."

*Eumeces parvulus* Taylor

La Placita; Pómaro (2); San Pedro Damian (3).

This is the first time the species has been collected in Michoacán, but Oliver secured it in Colima. A total of six specimens had been taken before this series was found in Michoacán.

The six new specimens agree well with Taylor's description of the species (1935: 363). Two agree with the type in having 24 scale rows about the middle of the body; four individuals have only 22. In several of the specimens and in UMMZ 104448 (my field number: JAP 1309), particularly, scale row reductions and additions are easily seen along the dorsoventral line, and thus selection of point of counting determines mid-body scale count. One specimen, UMMZ 104447 (JAP 1290), has only two supraocular scales in contact with the frontal; the other specimens all have three. This same specimen has three pairs of nuchals, whereas UMMZ 104448 (JAP 1311) has three nuchals on the right side and two on the left and also three postlabials on the right rather than the usual two. UMMZ 104448 (JAP 1310) has the second loreal on the right divided vertically. All specimens have extremely short legs; they are widely separated when adpressed.

The color and pattern are much as described by Taylor. The younger individuals show more contrast between dorsal and dorso-lateral color, as mentioned by Smith (1943: 250). The adults are almost

entirely unicolor, with indistinct black stippling on each scale. Notes on a living specimen are: "dorsal color olive-brown with blackish speckling. Belly greenish gray. Tail golden brown above, spotted with blue-black, and light blue beneath."

*Ameiva undulata sinistra* Smith and Lafe

Ojos de Agua de San Telmo; La Placita (2); Ostula (2); Estopilas de Salitre; San Pedro Damian; Coalcomán (2); Barranca de Bejuco (2).

This species was much less common in the region than any of the three species of *Cnemidophorus*. One partly swallowed specimen was retrieved from a specimen of *Manolepis putnami*.

*Cnemidophorus deppei lineatissimus* Cope

Boca de Apiza (3); La Placita (3); Estopilas de Salitre; San Pedro Damian (2); Maruata.

This is another form that is apparently confined almost exclusively to the littoral region and the adjoining thorn forest. None was taken more than a few hundred feet above sea level.

*Cnemidophorus guttatus immutabilis* Cope

Boca de Apiza (6); La Placita; Ostula (5); Estopilas de Salitre (2); Motin del Oro; Maruata (6); Pómaro (2); Barranca de Bejuco (3); Cuilala Beach (2).

Also apparently restricted to the coastal region of Michoacán and not found in the higher parts of the Sierra.

*Cnemidophorus sacki copei* Gadow

Coahuayana (3); Ojos de Agua de San Telmo; La Placita; Coalcomán (44); Estopilas de Salitre (2); Pómaro.

Very common in all parts of the region. It is found on the coast with the other two species of *Cnemidophorus*, but it is the only one of the three that is also known from higher areas of the Sierra.

The use of the name for this subspecies is based primarily on availability. In order to use it, the restriction of the type locality of *C. s. communis* Cope (Smith and Taylor, 1950a: 328) must be rejected. It is fairly obvious that the localities represented by Cope's original type

series are not all within the range of a single subspecies, and the name *communis* can be restricted to any subspecies whose range includes one of these localities. The name *communis* has been revived recently by Smith and Taylor (1950: 182), but examination of specimens from all parts of the range shows that it is still a composite as defined. Since *communis* is the only name available in the *sacki* group for the form inhabiting the plateau of Mexico, and since Guadalajara was mentioned as one of the original sources of the type material, the type locality could be legitimately restricted to that city without endangering the availability of any other name. Restriction of the type localities of both *communis* and *copei* to Colima (Smith and Taylor, 1950a: 328) would eliminate one of these names and would require the coining of new names when the composite race is split. The practice of restricting both a valid name and its supposed synonyms to a single locality not only is unsuitable for best taxonomic usage of available names, but also automatically eliminates the consideration of those names for future assignment. If, however, the type locality of *communis* is restricted as suggested, *copei* becomes the valid name for the race on the Pacific slopes of Colima and Michoacán, since its type locality is already restricted to the city of Colima, and it is the only name that can be ascribed to the race. Therefore, I hereby restrict the name *communis* to the high plateau subspecies of *sacki*, with Guadalajara as restricted type locality, and revive the name *copei* Gadow for the coastal form in Colima and Michoacán.

*Heloderma horridum* (Wiegmann)

La Placita; Coalcomán (Cerro de la Piedra Agua).

Gadow (1930: 52) noted that this species "ranges from the coast up to 4000 feet, crossing the Sierra Madre into the Balsas Depression." These specimens, one collected at 75 feet and the other at 3400 feet, verify this statement. The British Museum (Natural History) has no specimens collected by Gadow in the region discussed in this study.

*Typhlops braminus* (Daudin)

Arteaga.

Gadow collected a specimen (BMNH 1914.1.28.120) at Carrizal (=Arteaga) in 1908. There are 20 scales about the body and 313 from the rostral to the tip of the tail. Gadow (1930: 65) recorded this species in the New World in his book on Jorullo, remarking that he had not

expected to find it in Michoacán. Shreve (1939: 144) recorded four specimens from Guerrero, and Taylor (1940a: 444) added 18 more. It is significant, perhaps, that all of the recent records of this species in Mexico to date are confined to the old *camino real* from Acapulco to Mexico City and that they indicate, as suggested by Taylor (1940a: 444), an importation of the species at the time of Spanish trade between Acapulco and the Philippines. The record of the species in Michoacán, in the coastal sierra, either indicates a rapid spreading by this fossorial species or suggests that pack trains from the Pacific Coast occasionally passed through the Sierra de Coalcomán. The latter is perhaps the more likely.

*Leptotyphlops bressoni* Taylor

Smith and Taylor (1945: 21) suggested that a specimen, reported as *Stenostoma macrolepis* Peters by Cope (1887: 63), from Las Aguillillas, Michoacán, might be referable to this species. The specimen, presumably from Cope's personal collection, is not at present in either the United States National Museum or the Academy of Natural Sciences of Philadelphia. E. H. Taylor has suggested (*in litt.*) that the record is based upon a specimen supposedly collected by Dugès. I have been unable to document any activity by either of the Dugès brothers in the Sierra de Coalcomán. The presence of this species in that highland mass is badly in need of verification.

*Leptotyphlops phenops bakewelli* Oliver

La Placita (4); Ostula.

All five specimens were found under rocks, coiled in small holes. They made no attempt to escape, but when I picked them up the tip of the tail was raised, and the sharp point was pressed against my hand. Only pressure could be felt, however; there was no sensation of pricking.

The color of the rostral, as well as that of the tip and posterior half of the ventral side of the tail, described as white by Oliver (1937: 17), is actually a sulphur yellow in living animals. The stripes on the back are black in life, on a light brown ground. The sides and belly are pinkish, with scattered mottling of brownish. The tongue is yellowish white. The head is colored like the dorsum of the body, and the color of the chin is the same as that of the venter.

*Constrictor constrictor imperator* (Daudin)

La Placita; Coalcomán.

This species ranges throughout the region discussed from the coast to the higher parts of the Sierra. My specimen from the vicinity of Coalcomán was taken at about 4000 feet, from beneath a large flat rock near a rapidly flowing mountain stream. The specimen from La Placita, collected by Billy Turner, was found on a tree limb overhanging a mule trail. Xantus collected three specimens on the Cachan River and one on the Nexpa River.

*Loxocemus bicolor* Cope

La Orilla.

This species was not recorded from Michoacán by Smith and Taylor (1945: 27), but Gadow (1930: 50) collected a specimen at La Orilla in 1908 and mentioned it as a "tierra caliente species." I have re-examined the specimen (BMNH 1914.1.28.124) in the light of Taylor's (1940b: 447) revival of *Loxocemus sumichrasti* Bocourt and find that it is *L. bicolor*. The anterior chin shields are considerably longer than the adjoining outer scales; the first pair of lower labials is quite short; the suture between the prefrontals is 2.2 mm.; the supralabials and the ventral surface are identical in color and are in sharp contrast with that of the dorsum; the chin and belly are an immaculate buff-yellow. The specimen, a male, has 235 ventrals, 47 subcaudals, 9 supralabials (with none entering the eye), 1 preocular, 2 suboculars, and 2 postoculars.

*Coniophanes fissidens dispersus* Smith

Arteaga.

I have examined the specimen from Carrizal (=Arteaga) in the British Museum (BMNH 1914.1.28.141) that J. R. Bailey (1939: 23) examined and assigned to *Coniophanes fissidens fissidens* (Günther). The specimen was transferred to *C. f. dispersus* by Smith (1941: 107), although he did not examine it. My check shows that the individual fits Smith's color description in its entirety. The scale counts are as follows: ventrals 119, subcaudals 49+ (tip of tail missing), upper labials 8 (with the fourth and fifth entering the eye), 1 preocular, 2 postoculars, temporals 1+2, infralabials 10/9. The dorsal scale row formula is:

$$19 \frac{8+9(74)}{-V (74)} 17 \frac{7+8(92)}{-8 (90)} 15 (119).$$

*Conophis vittatus vittatus* Peters

Coalcomán (3); Arteaga.

This species has been collected only in the higher parts of the Sierra de Coalcomán. Duellman found a specimen of *Bufo occidentalis* in the stomach of one of these snakes.

*Dryadophis melanolomus stuarti* Smith

Coahuayana; La Placita (3); Point of San Juan de Lima; Point San Telmo.

Not previously recorded from Michoacán, this lowland species was collected only on the coastal strip. It was called *Eudryas boddaertii sleveni* Stuart by Oliver (1937: 19).

*Drymarchon corais rubidus* Smith

La Placita; Ostula; Arteaga.

Although I collected the species only in the lowlands, Gadow's record from Carrizal (=Arteaga) is from the higher part of the Sierra.

*Drymobius margaritiferus fistulosus* Smith

El Tiquiz; Coalcomán (2); Coahuayana.

Present throughout the region studied. Duellman found a specimen in a puddle in which there were also several small individuals of *Rana pipiens*. The snake was under water when first seen. Another individual was observed on three consecutive days along an old channel of the Río Coalcomán that is now choked with water hyacinths; it regularly sought refuge in the water. This subspecies appears to be semiaquatic.

*Enulius unicolor* (Fischer)

Coalcomán.

The single specimen was collected above 3000 feet in the Sierra.

*Geophis nasalis* (Cope)

Coalcomán.

The specimen, taken by Duellman, extends the range of the species considerably westward. It has 142 ventrals and 37 subcaudals. The

first keel appears on the vertebral row at the level of the forty-second ventral, and on the third row of dorsals at the ninety-third. The first and second rows are not keeled; keeling on the other rows is weak. The dorsals are knobbed at the anus. Cope described the species as having eight supralabials, but his figure (1868: 131) shows seven. My specimen has only six, lacking the extremely small first labial which Cope mentioned. It also has two postoculars and six lower labials, as contrasted with the cotypes which have a single postocular and seven lower labials. The dorsal scale rows are irregular in number, varying from 17 to 15; the scale row formula is:

$$17 -V (7) \quad 16 \quad 8+8 (8) \quad 15 \quad V \begin{array}{l} \nearrow 8 \\ \searrow 8 \end{array} (40, 46-47, 50 \rightarrow) \quad 16 \quad \underline{8-7 (52, 54 \rightarrow)} \\ 17 \quad \underline{7+8 (64-65 \text{ only})} \quad 17 (142).$$

These several differences indicate that the relationship between this individual and the Guatemalan segment of the species is on the sub-specific level.

#### *Imantodes gemmistratus oliveri* Smith

##### La Orilla.

Gadow (1930: 50) reported this as a "tierra caliente species," under the name *Himantodes gemmistratus* Cope. I have examined his specimen and find that it belongs to the form described by Smith (1942b: 388) as *Imantodes splendidus oliveri*, as does the specimen from Colima reported by Oliver (1937: 23) and noted by Smith and Taylor (1945: 77) as "probably referable" to this form. Gadow's record of the species in Michoacán was omitted by Smith (1942b: 388) and by Smith and Taylor (1945: 77).

Although Smith (1942b: 386) said, "I conceive that *gemmistratus* and *splendidus* . . . are members of a single morphological group (having similar ventral and caudal scale counts, similar patterns), and accordingly that one does not occur with the other," he maintained *gemmistratus* as a distinct species and restricted usage of the name to the Pacific coast form which ranges from Chiapas to Panamá. The distinction between *gemmistratus* and *splendidus* rests upon the comparative width of the vertebral row of scales. In *gemmistratus* the vertebrae are about twice as broad as the adjacent scales, whereas the subspecies of *splendidus* are said to have vertebrae only slightly, if at all, enlarged. Although this holds true for the subspecies *lucio-*

*dorsus* and *splendidus*, the Colima specimen, the one from Michoacán, and the paratype in the University of Michigan collection from Oaxaca indicate that the subspecies *oliveri* has an intermediate condition. In these specimens the vertebrae vary from only slightly larger than the paravertebrae to almost twice as wide. The ventral and subcaudal counts in *oliveri* (222-234 and 117-137, respectively) are similar to those for *gemmistratus* (220-237 and 114-126). The ventral counts are considerably higher than those of either *luciodorsus* (205-225) or *splendidus* (198-201). The color patterns of *gemmistratus* and *oliveri* are extremely similar. The strong resemblances between *gemmistratus* and *oliveri* on the one hand, and the intermediacy of *oliveri* between *gemmistratus* and the other subspecies of *splendidus* on the other hand, have led me to include all of them in a single species, which must bear the name *gemmistratus*. The forms included in this new arrangement are: *g. gemmistratus* Cope, *g. oliveri* Smith, *g. splendidus* (Günther), *g. luciodorsus* Oliver.

*Lampropeltis doliata blanchardi* Stuart

Coalcomán (2).

Although these specimens show a strong resemblance to *L. d. nelsoni* Blanchard in some characters, the preponderance of evidence indicates that they are *L. d. blanchardi*. In both of the specimens the scales in the red areas are black-tipped, although the blackness is considerably more prominent in the female. The band counts in both are high: in UMMZ 104694 (female) there are 25 white bands on the body, in No. 104695 (male) there are 22. The snout, although not white, is considerably lighter than the rest of the head and is lightly stippled with black. The red areas on the body are never wider than the triads of two black and one white band and are often considerably narrower on the posterior part of the body, where the black bands of neighboring triads are occasionally in contact. Some of the black bands on the ventral surface are incomplete as a result of contact between the red and yellow bands; also neighboring black bands on the belly occasionally meet at the expense of the red band between them. For the most part, however, all bands are complete across the belly. The ventral and subcaudal counts are 221, 53 in the female and 210, 55 in the male.

The principal characteristic employed in the identification of the two subspecies *blanchardi* and *nelsoni* is the presence of black spots in the red rings of the former and their absence in the latter. On this



basis, the specimens from Coalcomán are closer to *blanchardi*. The high number of bands also relates them more closely to *blanchardi* (or even to *polyzona*), for *nelsoni*, with its wider red bands, has a corresponding lower total number of white ones. The mottled snout indicates affinity with *nelsoni* rather than with *blanchardi*, which is said to have a totally black snout.

This intermediacy of characters of these specimens as well as their geographic origin suggests the possibility that they are intergrades. It is of interest to note that USNM 31491, listed by Blanchard (1920: list of specimens, opp. p. 6) as a paratype of *nelsoni* from Colima, was actually collected by Xantus at the Nexpa River in Michoacán, according to the National Museum catalogues.

One specimen, UMMZ 104695, had six baby rodents (*Reithrodontomys*) in its stomach. Both individuals were collected by Duellman.

*Leptodeira bressoni* Taylor

Coalcomán (2).

One of these specimens, badly smashed (UMMZ 104619), was found dead in a street in the city. The other (UMMZ 104620) agrees quite well in most respects with Taylor's original description of the species (1939: 321). It has 37 body spots, many of which do not meet across the vertebral row; 16 tail spots are countable; toward the end of the tail they become very indistinct. This specimen does not have any blotches below the primary ones, but it has lateral spots alternating with the blotches. The lateral spots do not form a band that traverses the body, as was noted in the type material. The ventral count of 164 is slightly lower than that given by Taylor, probably because of different counting methods. The subcaudal count is 85. Keels on the dorsal scales are absent to the level of the one hundred thirteenth ventral, where they appear weakly on the vertebral row. They do not become prominent except in the region of the anus, and there only on the scales of the upper rows, not on those of the first three rows. The complete dorsal scale formula for UMMZ 104620 is:

$$(4) \ 19 \frac{\quad}{3+4(26)} \ 18 \frac{\quad}{+9(33)} \ 19 \frac{+4(36)}{+4(38)} \ 21 \frac{10+9(92)}{3+4(91)} \ 19 \frac{8+9(107)}{8+9(93)} \\ 17 \frac{\quad}{7+8(109)} \ 16 \frac{7+8(163)}{\quad} \ 15 \ (164).$$

*Leptodeira duellmani*, new species

TYPE SPECIMEN.—UMMZ 104490; male; one-fourth mile east of Coalcomán, Michoacán; elevation, 3500 feet. Collected by James A. Peters, July 30, 1950.

DIAGNOSIS.—Distinguished from all other known species of *Lepto-deira* by its almost unicolor body pattern. A row of narrow black spots is confined to the vertebral and paravertebral rows, the spots being separated from one another by a light yellowish area.

DESCRIPTION OF TYPE.—Dorsal head scales normal for the genus; nasal with very shallow grooving which gives the appearance of division; loreal longer than high; two preoculars, upper considerably larger than lower and not touching frontal; one presubocular, separating third labial from eye; two postoculars, upper about twice as large as lower; eight upper labials, fourth and fifth entering eye; one primary and two secondary temporals; tertiary row of scales forms first row of posttemporals. Lower labials ten, five in contact with first pair of chin shields, sixth largest; second pair of chin shields slightly longer than first pair; three rows of scales between chin shields and first ventral.

Ventrals 164; anal divided; subcaudals 26+n. Scale pits paired on all dorsal scales; pits also present on posterior and lateral borders of parietals and secondary temporals and on posterior border of primary temporals; dorsal scales keeled posteriorly, with keels appearing on vertebral row at level of ninety-ninth ventral, on paravertebrals at the one hundredth, on eighth row at the one hundred fourth, seventh row at the one hundred fifth, sixth row at the one hundred thirtieth, fifth row at the one hundred fortieth, fourth row at the one hundred fifty-sixth, third row at the one hundred fifty-seventh, second row at the one hundred fifty-eighth; first row keeled only opposite anus; keel in first four rows little more than a central knob. Dorsal scale row formula:

$$(4) 23 \frac{2+3(8)}{-3(7)} 21 \frac{9+10(96)}{9+10(94)} 19 \frac{V+9(112)}{V+9(114)} 17 \frac{\quad}{V+8(160)} 16 \quad (164).$$

Keeling on dorsocaudal scales disappears at about seventh row of subcaudals; second row last to lose its keeling; first row without keels. Dorsocaudal reduction:

$$(4) 8 \frac{3+4(9)}{3+4(7)} 6 \frac{2+3(18)}{2+3(16)} 4 \quad (26+n).$$

The dorsal ground color is a very light brownish gray, each scale being stippled with dark brown or black. This stippling is most thickly distributed along the posterior and lower edges of each scale in the lateral rows, the remainder of each scale showing irregular streaks or stippling. Occasional lateral spots are formed by greater concentra-

tions of pigment; they are widely separated, and each is confined to a single scale or to the mutual border of two scales. A series of 37 dark spots on the back is confined to the vertebral and paravertebral rows of scales; the anteriormost spot begins at the posterior edge of the parietals and is ten scales long on the nape of the neck (corresponding to the dark nape stripe of other species of *Leptodeira*); the succeeding blotches vary from two to six scales in length, usually two and one-half to three. The vertebral and paravertebral scales between the dorsal blotches have very little, if any, of the dark brown stippling, so that the interblotch areas, which are one to three scale rows long, are light brownish gray and are prominently contrasted with the lateral scales. The dorsal head scales are a slightly darker brownish gray than the dorsal body scales, with similar dark stippling. Two dark streaks, extending posteriorly on the parietals from the frontal-supraocular sutures, appear to be continuing arms of an indefinite U-shaped mark on the prefrontals and frontal. A streak extends from the parietal markings across the secondary temporal and joins a postocular one that runs along the lower edge of the primary temporal and the upper border of the labials. A large lateral spot, immediately behind the quadrate bulge, is separated by a single scale's length from the postocular and temporal stripes. A faint stripe runs along the loreal; the labials are light. The dorsum of the tail lacks vertebral spots; there is a row of dark spots that almost form a streak along the sutures of the sub- and dorsocaudals. Each dorsocaudal is sharply outlined by heavy stippling along its border. The ventral surface from mental to tail tip is a unicolor straw yellow, with very slight stippling on the ends of the ventrals and on the sutures of the subcaudals.

REMARKS.—A possibility exists that this specimen is either an aberrant individual of *Leptodeira bressoni* or an indication of nonsexual dichromatism in that species. Its affinities appear to be directly with that species and were it not for the fact that specimens of *bressoni* were also collected in Coalcomán, it could be treated most satisfactorily as a subspecies of it. The difference in color is striking, but would not be considered as taxonomically important if the difference in scale row formulae did not exist. Although differences in actual number of rows are not impressive in the genus *Leptodeira*, and previously expressed differences between species are primarily a matter of choice of region of the body on which the counts were made, the scale reductions given here for this new species and for *bressoni* are of a magnitude scarcely to be explained by intraspecific variation. On the other hand, the close agreement in all other characters of scutellation indi-

cates a strong relationship between the two species, and their common presence in the Coalcomán region may be evidence of secondary invasion by a parental stock.

The new species is distinguished from others occurring in the general region from which it comes, as follows: from *smithi* and *maculata* in the presence of a dark nape stripe and two preoculars; from *annulata polysticta* in ventral count (198–211 in *polysticta*); and from all, as pointed out above, in color pattern.

*Leptodeira maculata* (Hallowell)

Coahuayana (3); La Placita (3); Estopilas de Salitre; Pómaro.

This snake plays a role in coastal Michoacán similar to that of the ubiquitous garter snake in the United States, being common around houses and gardens. It is often killed in the streets. All of my specimens were taken either in the evening or shortly after dark, and only at coastal localities.

*Leptophis diplotropis* (Günther)

Coalcomán; Rancho el Diezmo; Arteaga.

Gadow collected the specimen from Arteaga; Duellman took the other two, one of which was in a fig tree. One of Duellman's specimens had eaten an *Agalychnis dacnicolor*.

*Manolepis putnami* (Jan)

La Placita (3); Ostula; Maquili.

This species, previously unknown from Michoacán, was found in the lowlands. All those collected were actively abroad during the day, apparently on the hunt for lizards. Two specimens were taken with teiids, one in the process of swallowing an *Ameiva*, the other tightly coiled around a *Cnemidophorus* that had a strong grip on the snake's neck.

*Masticophis flagellum lineatus* (Bocourt)

Boca de Apiza; Coalcomán (3); Arteaga.

The species is moderately common in all parts of the region. Several Xantus specimens from various localities in Michoacán are in the United States National Museum.

*Oxybelis aeneus auratus* (Bell)

Coahuayana; Point San Telmo; Pómaro (3); between Los Pozos and La Cienega; between Las Tecates and Las Higuieritas; Río Tixupan.

This species is one of the most common in the fauna, although according to Oliver (1937: 24) it is rare in Colima. I found some specimens in trees, others on the ground.

*Pseudoficimia frontalis* (Cope)

Coalcomán (4).

The four specimens agree with the redescription of this species given by Taylor and Smith (1942: 243 *et seq.*), except for a few minor details in the scutellation of the head. UMMZ 104687, a juvenile, has two anterior temporals on the left side, and UMMZ 104496 has a small scale inserted between the temporals, the fifth upper labial, and the lower postocular, which does not prevent contact between the upper postocular and the upper temporal. In this specimen the parietal is very deeply sutured above the secondary temporal row; as a result, a third temporal is almost completely formed. The posterior pair of chin shields are separated by an azygous scale in two individuals, but they are in contact in the other two. The paired nuchal bars, beginning on the parietals, are fused on the neck of three individuals; the posterior ends are not in contact on the fourth. The ventral and subcaudal counts are, respectively, 153, 39; 149, 41; 156, 42; and 154, 38. All four specimens are males.

The vertebral blotches are bright brownish red in living specimens and are connected by a fairly broad dark yellow line. The lower sides and the ends of the ventrals are dull orange. The eye is black with a light orange rim on the upper half.

All specimens came from the Sierra region, at an elevation of about 3000 feet. They were under rocks in grassy areas, including pasture land.

*Rhadinaea hesperia hesperioides* Smith

Coalcomán.

This specimen is the first of the subspecies to be recorded for Michoacán. The color pattern conforms well to Smith's description (1942a: 186), although the dorsolateral light stripe enters the seventh scale row, as in *R. h. hesperia*. The presence of secondary stripes on the lateral scale rows is definitive for this form, however. Smith (1942a:

186-87) mentioned a specimen from Hacienda el Sabino, Michoacán, that shows intermediacy between *h. hesperia* and *h. hesperioides*. The locality is intermediate between the Coalcomán area and the known range of *h. hesperia*.

The individual was under a rock on a steep hillside near the town of Coalcomán.

*Salvadora mexicana* (Duméril, Bibron, and Duméril)

La Placita; Ojos de Agua de San Telmo.

Both specimens were collected in the lowlands. One was in a thorn tree, the other in the palm fronds making up the roof of a salt-drying vat, near the beach at La Placita.

*Sibon nebulatus* (Linnaeus)

Aquila.

This first record of the species for Michoacán is also the westernmost and northernmost record for the genus. The species has been reported from the vicinity of Buena Vista, Guerrero. The specimen, a juvenile male, was found coiled in the space formed by the overlapping petioles of *Xanthosoma roseum* Schott, which is also a favorite hiding place for *Hyla smithi* and *Leptodeira maculata*.

The specimen has 180 ventrals, 94 subcaudals, seven upper labials with the fourth and fifth entering the eye, no pre- or suboculars, two postoculars, a single primary and two secondary temporals. Body length is 195 mm., tail length, 69 mm.

*Sonora michoacanensis michoacanensis* (Dugès)

Coalcomán (3).

These three specimens were all taken on one morning, as I worked my way up the side of the Sierra de Camachines. Two were under logs, the third under the bark of a dead stump.

*Tantilla calamarina* Cope

La Placita.

This individual, found in a coconut grove beneath a pile of palm fronds, is 189 mm. long and retains the umbilical scar on the 116-117 ventrals. Some umbilical tissue still remains extruded.

The specimen has six upper labials, with the third and fourth entering the eye; one preocular and one postocular; one primary and

one secondary temporal. The prefrontals are in contact with the labials on both sides. The parietal is in contact with the fifth labial on the left, but is very narrowly separated from it on the right by the primary temporal and the postocular. There are six lower labials, and the mental is in broad contact with the first pair of chin shields. There are 128 ventrals and 32 subcaudals. The ventral surface is unicolor except for a scattering of grayish spots on the second quarter of the body. The first two rows of dorsals are very lightly stippled with brown, giving the appearance of light brown stripes; the lower half of row seven is colorless; the upper half of row seven and all of the vertebral row are dark brown, forming the median stripe. On the head the median band is spatulate; it joins the lateral bands on the posterior half of the parietals. The remainder of the head is dark brown, except for a light spot on the adjacent parts of the prefrontals, supraoculars, and frontal, and also a light area on the rostral, which extends posteriorly on the outer edges of the internasals. The labials are white except for their dorsal edges, which are brown.

This specimen fits very well Cope's incomplete description of the type. He did not give the ventral and subcaudal counts nor the body length. Taylor (1937: 346) described a specimen from Queseria, Colima, which varies from Cope's in that the lateral line is on the fourth and fifth rows, not on the third and fourth, and is "scarcely discernible." Taylor also mentioned a blackish transverse line that unites the three stripes posterior to the parietal, a character not mentioned by Cope and only faintly indicated on my specimen by the discontinuation of the stippling on the fifth and sixth rows. The occurrence of a lateral stripe on the fourth and fifth rows is typical of *Tantilla martindelcampoi* Taylor, which also lacks a preocular and has a low ventral count (114). The other characters mentioned by Taylor as useful in separating *calamarina* and *martindelcampoi* are variable within single individuals of the former (that is, presence or absence of contact between the prefrontals and labials and between the parietals and labials). With the exceptions mentioned above, the color description of *martindelcampoi* is practically identical with that of my specimen of *calamarina*. The relationship between these two snakes seems to be very close, and further investigation may show it to be on the subspecific level. The relationship between the populations from lowland Pacific slopes and those from the Plateau of Mexico (Distrito Federal and Morelos) should also be investigated. In this connection it might be pointed out that the record of "Guadalajara" for the type of *calamarina* is from a specimen collected by I. I.

Major and sent to the Smithsonian Institution and that a large number of the species described from Major's collection are now known to be Pacific coastal forms which have never been retaken at Guadalajara. This suggests that Guadalajara represents not so much a point of collection as a point of shipment and that *calamarina* may well be a strictly lowland species.

*Trimorphodon biscutatus semirutus* Smith

La Placita.

The colors of the living animal are very striking. The ground color is a pinkish brown, becoming almost entirely pink at the edges of the blotches. The blotches are black edged, inside which the scales are golden brown with black mottling. The ventral color is very light pink; the golden brown of the blotches extends onto the ventrals. The head is slightly darker than the ground color of the body and has olive stripes lightly bordered by black. The side of the head is pinkish, fading to clear white on the labials. The chin is white, with the corners of the mouth brownish pink. The eye is yellow-green speckled with brown and black, and has a vertical, black pupil. The tongue is white-tipped, shading into pinkish red.

The specimen was taken at night in one of the houses of La Placita.

*Trimorphodon latifascia* Peters

Coalcomán (2); San Salvador.

Schmidt and Shannon (1947: 83) noted that specimens from Apatzingán were intermediate between *T. fasciolata* Smith and *T. latifascia* Peters and suggested that additional specimens might disprove the validity of the former. The three specimens I have seen from the coastal sierra of Michoacán verify the intermediacy of specimens from that region, and I concur with Davis and Smith (1953: 140) that the two names are synonymous. It appears that the type of *fasciolata* represents the culmination of a tendency in this group of the genus toward broader dorsal bands with parallel sides.

The three specimens from the Sierra have 11–17 vertebral scales and 9–13 ventral scales in the body blotches. Actual counts of vertebral scales in successive blotches are: BMNH 1914.1.28.136–16, 16, 16, 14; UMMZ 104696–16, 14, 14, 13; and UMMZ 104697–17, 14, 12, 11. Ventrals included in the lower ends of blotches (in same order): 6, 10, 11, 9; 10, 11, 12, 9; and 11, 13, 11, 10. Ventrals between lower ends



of adjacent blotches: 9, 9, 9, 8; 6, 8, 6, 5; and 5, 3, 3, 4. In none is the interspace equal to or wider than the blotch end (although in the British Museum specimen the blotch is nearly as wide as the interspace). The ventral counts are 215, 224, 221; the subcaudal counts are 64, 64, 81; the upper labials are 9, 8, 9; the body blotches are 14, 14, 17; and the tail blotches are 4, 5, 7. The two specimens from Coalcomán have the third labial on both sides divided into two equal parts by a horizontal suture; the individual from San Salvador has the posterior loreal divided horizontally. There are two preoculars, with a subocular below them. The primary temporals are 3-3, 3-3, 2-2; the secondary temporals are 4-3, 4-4, 3-3; and the tertiary temporals are 4-4, 5-4, 4-4. Fusion between the several temporal rows is not infrequent, and the rows are highly irregular.

Published notes indicate that *latifascia* often has an even number of scale rows on at least part of the body, and a detailed study of the scale row reductions of the specimens seen verifies the observations. The vertebral row drops out entirely or fuses unilaterally with a paravertebral row; as a result, there are as many even as odd rows. The complete formula for UMMZ 104679 illustrates this well:

$$(7) 23 -V (17) 22 +V (76) 23 \frac{V+11(105)}{V+11(105)} 22 \ 11+11 \ (130) \ 21$$

$$21 \frac{3+4(133)}{3+4(133)} \ 19 \frac{V+9(148)}{V+9(148)} \ 17 \frac{V+8(189)}{V+8(168)} \ 16 \frac{V+8(189)}{V+8(168)} \ 15 \ (221).$$

The statement made by Taylor (1940*b*: 479) that the black bands of the young tend to become brown in the adult of *latifascia* is true in my specimens. UMMZ 104697 is a juvenile male, having jet black blotches which are bisected by lighter lines only from the eleventh blotch posteriorly. The blotches are at least partly joined across the belly from the fourth blotch, and connections between neighboring blotches begin between the fifth and sixth. Lateral black spots in the interblotch area begin beyond the ninth blotch. The venter of the tail is totally black. In No. 104696, an adult male, black pigment is absent, except in the borders of the blotches. Within their borders the blotches are only moderately darker than the interblotch areas. The ventral surface is very light cream with the black blotch border extending a slight distance onto the ends of the ventrals. The venter of the tail is creamy white. The first mid-blotch stripe appears on the ninth blotch, and there is practically no trace of lateral spots on the interblotch areas.

The two specimens from Coalcomán were collected by Duellman, the San Salvador specimen by Gadow.

*Tropidodipsas occidentala* Oliver

Coalcomán.

This individual provides the first record of the species for the state of Michoacán and is the first to be collected since the type was taken. It has been compared with the type, which is in the University of Michigan collections, and is similar in all respects except for some of the normally variable scale characters. An extra preocular on the left side appears to be split from the lower posterior corner of the lower preocular and is wedged into the labial row. The suture between the parietals is incomplete posteriorly. There are 181 ventrals, and the dorsal scales, mostly in rows of 15, are occasionally reduced posteriorly to 14 by fusions between the vertebral and paravertebral rows. There are four complete white rings on the body, three on the neck and one at mid-body, and there are eight incomplete white rings on the left side with only seven on the right, because of alternation at the vertebral row. The tail has five complete white rings, followed by four interrupted bands on the right and five on the left.

The specimen was found coiled under a rock at the mouth of a heavily wooded ravine in a low hill near the town of Coalcomán.

*Natrix valida isabelleae* Conant

Coahuayana; Point of San Juan de Lima.

This species has not been reported previously from Michoacán, and the specimens serve to fill in a wide gap between published locality records. This subspecies has been recently described by Roger Conant (1953: 7), and my specimens are discussed.

*Thamnophis cyrtopsis cyclides* Cope

Coalcomán.

This species has been known previously only from the Plateau of Mexico, the highlands of central Oaxaca, and the Sierra Madre del Sur in Guerrero. Its appearance in the Coalcomán area is a definite indication of a faunal affinity between that region and the plateau. The quite typical specimen is a male, with 159 ventrals, 83+ caudals (tail incomplete), eight upper labials with the fourth and fifth in the

eye, nine lower labials, one preocular, three postoculars on the left side and four on the right, and one primary, two secondary, and three tertiary temporals.

The reasons for the unfortunate change of name for this species, formerly known as *Thamnophis eques eques*, are given by Smith (1951: 138-40).

*Crotalus basiliscus basiliscus* (Cope)

El Tiquiz; Coalcomán (2).

*Crotalus b. basiliscus* is not uncommon in Michoacán. It ranges from the coast through the Sierra. It is very likely that many of the snakes of this species sold by dealers in Colima actually originate in Michoacán.

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*Submitted for publication February 17, 1953.*





