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COMMENTS ON THE HERPETOFAUNA OF THE  
SIERRA DE LOS CUCHUMATANES  
OF GUATEMALA

BY L. C. STUART

INTRODUCTION

IF one travels northwestward on the plateau from Guatemala City along one of the two roads which lead to Huehuetenango or to Sacapulas, one will see from the crest of the Salegua-Negro watershed an almost sheer wall of schists and serpentine rising abruptly from the plain. This wall is the southern boundary of the Sierra de los Cuchumatanes, and it stretches with but a single break due east and west for about ninety miles, from the Mexican border to the looping gorge of the Río Negro. Beyond the wall lies a high, deeply dissected plateau the less eroded crest of which runs north and south to form a great inverted T with the front wall.

Though this mountain mass is readily accessible, it has, nevertheless, remained almost virgin country, biologically speaking. The only serious collecting up to very recently was done by Nelson and Goldman in 1895-96 and by Anthony in 1925 and 1927. None of these collectors, however, secured more than a few herpetological specimens. In 1937-38 Raymond Stadelman, then associated with the Carnegie Institution of Washing-

ton, collected a number of reptiles and amphibians in the western Cuchumatanes, and these were presented to the Museum of Zoology, University of Michigan. Unfortunately, about half of Stadelman's collection was lost in transit. During July and August, 1942, Julian Steyermark of the Field Museum of Natural History secured specimens from several localities in the Cuchumatanes area, and these Mr. Karl P. Schmidt has generously permitted me to study.

In July and August, 1940, I had occasion to visit the eastern Cuchumatanes in an effort to determine the western extent of the fauna of the Alta Verapaz. During that time several hundred specimens were secured, which, when combined with the collections noted above, produced a list of forty-one species from the Cuchumatanes area. In view of the fact that this region seems to constitute a major biotic area the herpetological fauna of which is as yet unknown, it seems desirable to publish an account of the material now extant in museums.

#### ACKNOWLEDGMENTS

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## SOURCES OF THE COLLECTIONS

Barillas.—A village thirty-six miles north and slightly east of Huehuetenango,<sup>1</sup> on the Caribbean slope of the main ridge of the Cuchumatanes. Anthony (in Griscom, 1932: 14) stated that the forest there is largely alder and oak, and Stadelman (*in litt.*) said that rain forest, i.e., cloud forest, crowns the ridges. The rainfall is very heavy (Stadelman, 1940: 98). Elevation, 1420 m. An Anthony locality.

Cerro Chemal.—The peak of the Cuchumatanes above Chemal (see below). Stadelman (*in litt.*) has informed me that this crest of the main ridge of the Cuchumatanes supports grasslands and cypress forest. Altitude, 3800 m. (Steiermark, *in litt.*). Steiermark collected here.

Cerro Chemalito.—Another peak in the Cuchumatanes just west of Santa Eulalia. Altitude and other conditions unknown. A Steiermark locality.

Chemal.—A village sixteen miles north of Huehuetenango. Stadelman (*in litt.*) stated that the vegetation of this region consists of grasslands and temperate forests. Altitude unknown, but probably about 3000 m. A Steiermark station. Not on Map 1.

Chancel.—An hacienda "located at nearly 11,000 feet, near the crest of a high range of mountains, about twenty-five miles (undoubtedly 'trail miles') northeast of Huehuetenango" (Goldman, in Griscom, 1932: 418).

Jacaltenango.—An important village thirty-three miles northwest of Huehuetenango. Stadelman (*in litt.*, and 1940: 98) described the region as brush land with stunted trees and considerable teosinte. Elevation, 1400 m. Stadelman, Nelson, and Goldman collected here.

Nebaj.—The principal village of the eastern Cuchumatanes, twenty-four miles east and slightly north of Huehuetenango. It lies in an enclosed valley which is heavily cultivated, though fine stands of oak and pine still remain. On the mountain crests above the village is typical cloud forest. Elevation,

<sup>1</sup> All distances are measured in a straight line from Huehuetenango, at 15° 20' N., 91° 28' E.



1990 m. Anthony collected at Nebaj, and it served as my base (Pl. I, Fig. 1).

Nentón.—A low hot village at the upper end of the central valley of Chiapas. It lies forty-two miles northwest of Huehuetenango. Stadelman (*in litt.*) said that the region is relatively dry and covered with grasses and stunted oaks. Elevation, 720 m. A Nelson and Goldman locality.

Salquil Grande.—A settlement at the base of the temperate forest nineteen miles northeast of Huehuetenango. The mountain slopes below the village are heavily cultivated, and above it are fine llanos and virgin forest. Elevation, 2450 m. I spent two days here.

Finca San Francisco.—A large coffee finca in the narrow valley of the Río Copoom, forty-one miles east and slightly north of Huehuetenango. Sheltered by a high ridge to the north, it is relatively dry. The region is heavily cultivated, but there are stands of pine and cloud forest in the area. This was an extremely unproductive station, possibly because since 1914 the owner offered a bounty for the destruction of reptiles. Elevation, 1175 m. I spent a week at this station.

San Mateo Ixtantán.—One of the highest villages in the Cuchumatanes. It is thirty-nine miles due north of Huehuetenango. The higher parts contain fine stands of virgin forest (temperate forest), according to Stadelman (*in litt.*). Anthony (in Griscom, 1932: 14) stated there is also much pine and oak. Elevation, 2550 m. Anthony collected at this station.

Finca San Rafael.—A corn and sugar finca about thirty-six miles north and slightly east of Huehuetenango on the Río Amelco (tributary of the Río Ixcán). “A region of great humidity—up to 200 inches of rainfall. Slopes above finca in grass and pine; rain-forest in barrancas” (Steyermark, *in litt.*). Elevation, about 800 m. A Steyermark locality. Not on Map 1.

Santa Eulalia.—A village thirty-one miles due north of Huehuetenango. Stadelman's photographs (1940: Pl. I, Figs. a-b) show the valley bottom in fields and pasture and the mountain slopes in second growth and pine. Altitude, 2590 m. Steyermark collected at this station.

Finca Tesoro.—A small corn finca fifty-three miles east and slightly north of Huehuetenango. It lies in a wet, heavily cultivated valley, but virgin lowland rain forest surrounds it, and on the ridges cloud forest is present. Elevation, 770 m. I spent several days here (Pl. I, Fig. 2).

Todos Santos.—Stadelman's main locality is eighteen miles northwest of Huehuetenango. The region is now intensively cultivated, but virgin forest (temperate forest) is still found on the higher ridges (Stadelman, 1940: 101). Elevation, 2450 m.

#### PHYSICAL GEOGRAPHY

According to Termer (1932) the Cuchumatanes, though a part of the main Central American mountain system, represent a distinct physiographic region. Stratigraphically, they have much in common with the mountains of adjacent Mexico and Alta Verapaz, but orographically in their elevation and topographically in their relief they are very different from the surrounding areas.

These mountains rest upon a base of crystalline rocks which are exposed only very locally. Lying above these are Paleozoic shales and sandstones (Sta. Rosa), and these are capped with the Ixcoy and Todos Santos limestones of Mesozoic age. Above these there occur very local small areas of Tertiary sandstones and marls.

These rocks have been complexly faulted and folded not only on their margin but also within their central mass and are, therefore, divided into a number of separate units, and these faults determine to a great extent the course of the valleys. As a whole, the region has been subjected to considerable uplift within the framework of the entire Central American mountain mass, and in this characteristic it is closely allied to the Sierra Madre of Chiapas.

The faulted structure of the region has produced a complex physiographic pattern that has no generalized trends. Deeply entrenched river valleys have been cut in the soft underlying limestone, so that the country is extremely rugged. The crest of the main mass is a rolling high plateau. Many of the river

valleys open, at their headwaters, into large cirque-like bowls—the result of erosion by thousands of springs. The Nebaj Valley is such a structure. In these valleys residual limestone knobs often dominate the landscape.

Climatically, this mountain mass is divided into two distinct areas, the relatively dry western and the very humid eastern divisions, the boundary of which extends along the crest in an approximate line from Aguacatán to Barillas. The trade winds sweeping in from the northeast across the lowlands of the Petén produce excessively heavy rainfall in the eastern part, and the entire area to the west of the crest lies in the rain shadow. Though statistics are not available, I suggest that the former area may receive as much as 5000 mm. of rainfall per annum, whereas some sections in the west may receive as little as 1000 mm. These are only very generalized conditions, for the complex faulting of the area as a whole has been instrumental in producing rather irregular drainage lines, so that it is not uncommon to find local rain-shadow valleys in the east.

Superimposed upon this wet-dry arrangement of the mountains are three temperature zones. The lower or “tropical” zone lies below about 1500 m. It is extensive in the east and adjoins the plains of Chiapas and the Petén, where it is known as the *zona reina*. In the west it is much less extensive and is represented by an extension of the Grande Valley of Chiapas into Guatemala. Between 1500 and about 300 m. lies the “subtropical” zone, and above that altitude on the very crest of the Cuchumatanes is a fairly extensive area of “temperate” zone. These zones have been previously discussed and defined (Stuart, 1943: 21–22).

The complex physiographic form of these mountains in addition to the often complicated climatic features has produced an extremely varied vegetational pattern. On the Caribbean slopes tropical rain forest or monsoon forest is dominant throughout the tropical zone except for small areas in rain-shadow valleys, where pine indicates drier conditions. The eastern subtropical zone is similarly made up of drier oak-pine

valleys, such as that of Nebaj, and of typical cloud forest on exposed ridges. The more arid western section of the Cuchumatanes, to judge from Stadelman (*in litt.*, and 1940), presents a drier tropical zone dominated by grasses and stunted oaks, and the subtropical zone is largely in pine except for the highest ridges, which seem to receive enough moisture from winds spilling over the main crest to produce cloud forest. The temperate zone on the broad uneroded plateau is largely cypress-pine forest, wet and cold, with open llanos whose origin is obscure.

ZOOGEOGRAPHIC POSITION OF THE SIERRA DE  
LOS CUCHUMATANES<sup>2</sup>

Recent investigations in northern Central America have indicated that the area known geologically as "nuclear Central America" has been a center of dispersal and endemism of major proportions. Though it is still too early to have anything like a clear picture of this region, the distribution of such items as the genera *Plectrohyla* and *Oedipus*, the *godmani* group of *Rhadinaea* (Stuart and Bailey, 1941), and the *inguinalis* group of *Hypopachus* (Stuart, 1941a) permits a rough sketch to take form.

This major region may be broken into a number of smaller units, such as those which I have previously suggested for Guatemala (Stuart, 1943: 24-30). In such a scheme the Cuchumatanes form a kind of crossroads, where the plateau of Guatemala, Chiapas, and the mountains of the Alta Verapaz meet. The faunal assemblage of the Cuchumatanes consists of species from each of these areas, wide-ranging forms, and several forms, which appear to be endemics, of its own. On the lower slopes the mountains have been invaded by a dilute Petén assemblage.

It is questionable whether or not the Cuchumatanes represent a life area the equivalent of the Petén or the Alta Verapaz. Our meager data indicate, rather, that they will prove

<sup>2</sup> The following discussion refers only to the herpetofauna.



to be a subdivision of the plateau. Some examples of forms shared with this area are:

<i>Oedipus rex</i>	<i>Gerrhonotus moreletii fulvus</i>
<i>Oedipus rostratus</i>	<i>Dryadophis dorsalis</i>
<i>Bufo bocourti</i>	<i>Tropidodipsas fischeri</i>
<i>Anolis crassulus</i>	

The relationship to the Alta Verapaz is less marked and seems to be restricted to the humid eastern division. Just where a line between these two areas may be drawn is, at present, unknown. Termer (1932: 241) took the upper course of the Río Copoom as the boundary, but on the basis of the arid interior basin fauna (a Zacapa Desert division) which dominates the gorge of the Río Negro, I am inclined to consider this the boundary. The most obvious elements common to both the Alta Verapaz and the Cuchumatanes are:

<i>Eleutherodactylus anzuetoii</i>	<i>Sceloporus m. taeniocnemis</i>
<i>Plectrohyla</i> sp. (see annotated list)	<i>Adelphicos v. veraepacis</i>

The western Cuchumatanes and adjacent Chiapas are as yet too poorly known to give any true indication of the faunal relations of the two. Nevertheless, such common species as *Sceloporus m. smaragdinus*, *Sceloporus v. variabilis*, and *Ameiva u. stuarti*, though by no means endemic to Chiapas, suggest some faunal continuity between the two.

As for the Petén fauna, it invades the eastern Cuchumatanes only to the base of the subtropical zone, and even then it is represented by few species. Of these, the following may be mentioned:

<i>Sceloporus teapensis</i>	<i>Ameiva f. edwardsii</i>
<i>Anolis uniformis</i>	<i>Tantilla phrenitica</i>

In addition to the above agglomeration there are the usual widespread forms such as *Drymarchon c. melanocercus*, *Drymobius m. margaritiferus*, *Thamnophis sumichrasti fulvus*, *Hyla baudinii*, and *Hyla underwoodi*.

Finally, there appears to be a well-developed endemic fauna. Though the range of most of these recently described forms is

not known, they have not appeared in the relatively well-collected, adjacent areas. They include:

<i>Oedipus cuchumatanus</i>	<i>Hypopachus simus</i>
<i>Oedipus lincolni</i>	<i>Rhadinaea stadelmani</i>
<i>Plectrohyla ixil</i>	<i>Geophis carinosus</i>

The interior basins of Guatemala with their characteristic fauna (Schmidt and Stuart, 1941), though in contact with the Cuchumatanes in the southeast, are completely isolated from them by the great south wall. On the lower slopes near Sacapulas I found *Cnemidophorus sackii motaguae* and *Sceloporus v. olloporus*, both characteristic basin forms, neither of which attains the crest of the south wall.

It is evident, therefore, that the fauna of this area, while having much in common with the fauna of surrounding areas, is, nevertheless, an assemblage quite different from that of any of the adjacent regions. From this, I conclude that the Cuchumatanes must be considered as a separate faunal area or at least a very distinct division of the Guatemalan plateau.

Inasmuch as the species upon which this paper is based are few and poorly distributed, it is almost impossible to consider any of the geographical problems within the area itself. It may be noted, however, that there are humid and subhumid divisions in this region and three vertical life belts. Though some species, such as *Bufo bocourti*, *Sceloporus m. smaragdinus*, *Gerrhonotus m. fulvus*, and *Thamnophis s. fulvus* transcend the humid-arid boundary, others like *Sceloporus v. variabilis* and *Ameiva u. stuarti* are strictly western (subhumid), and *Sceloporus m. taeniocnemis*, *Eleutherodactylus anzuetoi*, and the Petén items are confined to the east (humid).

Data on zonal arrangement are at hand for only the eastern division. Examples possibly indicative of the various belts are as follows:

#### Tropical Zone

<i>Bufo valliceps</i>	<i>Basiliscus vittatus</i>
<i>Hyla baudinii</i>	<i>Sceloporus teapensis</i>
<i>Hyla underwoodi</i>	<i>Ameiva f. edwardsii</i>
<i>Anolis aureolus</i>	<i>Drymobius m. margaritiferus</i>
<i>Anolis uniformis</i>	

## Subtropical Zone

<i>Oedipus cuchumatanus</i>	<i>Sceloporus m. taeniocnemis</i>
<i>Bufo bocourti</i>	<i>Gerrhonotus m. fulvus</i>
<i>Hypopachus simus</i>	<i>Thamnophis s. fulvus</i>
<i>Hyla bromeliacia</i>	<i>Ninia s. sebae</i>
<i>Eleutherodactylus anzuetoi</i>	<i>Tropidodipsas fischeri</i>
<i>Sceloporus m. smaragdinus</i>	

## Temperate Zone

<i>Oedipus rex</i>	<i>Thamnophis s. fulvus</i>
<i>Oedipus rostratus</i>	<i>Tropidodipsas fischeri</i>
<i>Bufo bocourti</i>	<i>Bothrops godmani</i>

Although my data are too few to consider any of the details of ecology, several interesting problems suggest themselves. Among these are the faunal relationships of the drier western section and the dry valleys of the eastern section and the ecological distinctness of the two subspecies of *Sceloporus malachiticus* in the east.

ANNOTATED LIST OF SPECIES<sup>3</sup>*Oedipus cuchumatanus* Stuart

Nebaj: Nos. 89110 (holotype), 89111–13 (paratypes).

As noted in the original description (Stuart, 1943: 14), this species occurs in the dry oak-pine zone of the cloud forest in the eastern Cuchumatanes. It represents the Cuchumatanes counterpart of the Verapaz *O. helmrichi* Schmidt and of *O. engelhardti* Schmidt of the volcanoes.

*Oedipus lincolni* Stuart

Salquil Grande: Nos. 89107 (holotype), 89108–9 (paratypes).

A ground species taken in a cleared area at the upper limits of the cloud forest.

<sup>3</sup> Unless otherwise noted all numbers refer to the Museum of Zoology, University of Michigan. M.C.Z. denotes the Museum of Comparative Zoology, Harvard University; U.S.N.M. the United States National Museum; and F.M.N.H., the Field Museum of Natural History.

*Oedipus rex* Dunn

Salquil Grande: Nos. 89114-15.

Found beneath logs in the temperate forest on the crest of Cerro Salquil. I have previously noted that these specimens are slightly atypical (Stuart, 1943: 19).

*Oedipus rostratus* Brocchi

Salquil Grande: Nos. 89116 (5), 89117 (4), 89118 (4).

Associated with *O. rex* in the temperate forest on Cerro Salquil, but occurs in much greater numbers.

*Bufo bocourti* Brocchi

Cerro Chemalito: F.M.N.H. Nos. 40925-32. Nebaj: Nos. 89174-77. Nebaj-Sacapulas cumbre: No. 90551 (tadpoles). Salquil Grande: Nos. 89171 (13), 89172 (3), 89173 (11). Todos Santos: No. 89219.

This *Bufo* is a typical highland form, occurring at higher altitudes on the Guatemalan plateau and in the Sierra de los Cuchumatanes. I did not find it below about 1900 m., and it increased in abundance above that altitude.

In life it is handsome indeed. Above it is generally a deep, reddish brown mottled with rich chocolate-brown. There is a middorsal stripe of bright yellow and a broader, irregular yellow stripe, dorsolaterally from the upper eyelid across the parotoids to the groin. Beneath it is lemon yellow, heavily mottled with black. Occasional specimens are very pale yellow above, mottled with brown.

In July and August tadpoles in unbelievable numbers were in the ponds at Chihul on the cumbre between Cunén and Nebaj. Since these tadpoles have never been described, I offer the following description and figures:

Body robust, deepest and broadest about three-quarters the distance posterior from the tip of the snout; broader than deep. Eyes dorsolateral. Nostrils directed forward and upward, about middistant between the eye and tip of the snout. Spiracle lateral and sinistral, about two-thirds posteriorly on the body. Anus median. Tail about 30 per cent longer than

the body, slightly less than one-third as deep as long; deepest about two-thirds the distance back from the body. Fins comprising two-thirds of the tail at its mid-point. Musculature of fin terminating almost at the tip of the tail. Dorsal fin not extending on the body (Fig. 1).

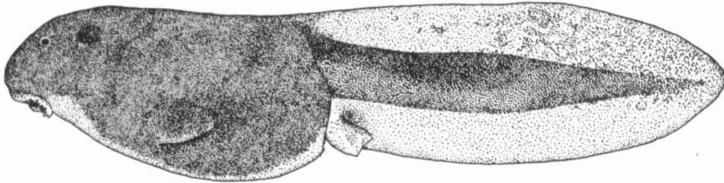


FIG. 1. Lateral view of the tadpole of *Bufo bocourti*.

Mouth directed downward, almost terminal; about one-third as wide as the greatest body width. Laterally, the lips are bordered with a single row of papillae. Beaks well developed, the upper broadly arched, armed with very fine denticulations. Tooth rows 2/3, the inner rows of both broken medially; upper

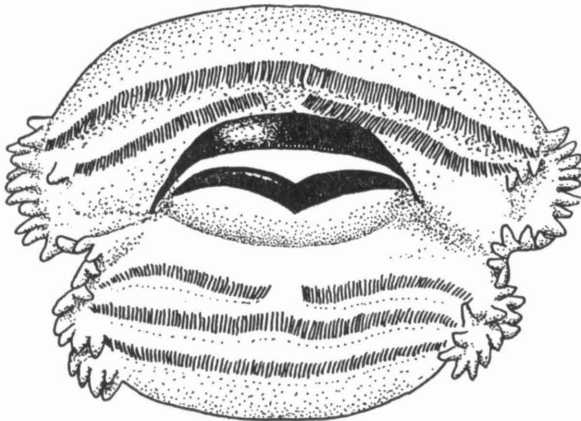


FIG. 2. Mouth parts of the tadpole of *Bufo bocourti*.

rows extending to edge of lips, subequal in length and considerably longer than the lower rows, which are also subequal (Fig. 2).

The body is black above and laterally. Beneath it is gun-

metal blue. The tail musculature is dark brown; the fins are transparent but heavily stippled with a similar color.

*Bufo valliceps* Wiegmann

Finca San Francisco: No. 89170.

I am unable to explain the absence of this species and of *B. marinus* at Finca Tesoro.

*Hyla bromeliacia* Schmidt

Finca San Francisco: Nos. 89167 (2), 90546-47 (tadpoles).

It is somewhat surprising that this relatively common and widespread species remained undiscovered until Schmidt collected it in the Sierra de Merendón of Honduras. In the Alta Verapaz, especially, where its tadpoles may be found beneath almost any banana leaf-sheath or in any bromeliad, it is difficult to understand how it escaped the eyes of Godman and Salvin or their collectors, the great orchid fancier, Skinner, or the emissaries of the Mission Scientifique. This suggests to me that the species is endemic to the cloud forest, a region difficult to reach, and that only since coffee cultivation, with its shading banana, has it invaded lower altitudes (after about 1870).

The above specimens differ slightly from Verapaz material in that they lack an adhesive abdominal disk and have more prominent granulations on the belly. In the type description Schmidt (1933: 19-20) pointed out such variations in the typical series.

The two specimens noted above are females. They were collected July 29 and were filled with mature eggs. In the bromeliad group from which they were taken were several egg clusters. These lay between the leaves and numbered about a dozen to a cluster. They were enclosed in gelatin capsules and were loosely held together (roughly in pairs) by very watery gelatin. In this same group of bromeliads were tadpoles in all stages of development, and not far away in another bromeliad I secured a fully transformed specimen which contained only the rudiment of a tail. The tadpoles will be described and figured in a later paper.

*Hyla baudinii* Duméril and Bibron

Finca San Rafael: F.M.N.H. Nos. 40912-16. Finca Tesoro: Nos. 89166 (3), 90549 (tadpoles).

As was to be expected, this species occurred in abundance in the tropical forest area at Finca Tesoro.

*Hyla underwoodi* Boulenger

Finca San Rafael: F.M.N.H. Nos. 40917-19. Finca Tesoro: No. 89165 (5).

Another common, lowland species which invades the Cuchumatanes to the altitude of Finca Tesoro.

*Plectrohyla ixil* Stuart

Finca San Francisco: Nos. 89092 (holotype), 89093-94 (paratypes).

In the original description (Stuart, 1942a: 4-6) it has been noted that this genus is widely distributed through the mountains of central Guatemala. It is, in fact, the dominant feature of the cloud forest streams. Unfortunately, the great majority of my records of this genus are based upon tadpoles which cannot be allocated specifically. Occurring with the above specimens were tadpoles like those secured in streams supporting *P. quecchi* Stuart in the Alta Verapaz. At Nebaj another tadpole also associated with *P. quecchi* was collected, and in the streams above Finca Tesoro a third plectrohylid tadpole was taken.

The Cuchumatanes, therefore, support three species of *Plectrohyla*, one shared with the Alta Verapaz, another common to the Alta Verapaz, the Cuchumatanes, and the volcanoes (Stuart, 1942a: 13-14), and a third known only from the Cuchumatanes. For the sake of completeness, I list the tadpoles below: Nebaj, No. 90220 (2), form "x" of Stuart (1941: 9); Finca San Francisco, No. 90225 (3), form "z"; Finca Tesoro, No. 90222 (3), form "y."

In addition to the above hylids, at least three others occur in the eastern Cuchumatanes. At both Finca San Francisco and Finca Tesoro the unmistakable "cheep" of *Centrolene*

*fleishmanni* (Boettger) was heard, but the streams over which this species breeds were so swollen that collecting was impossible. The tadpoles of two other hylids were also secured. One is either identical with or very similar to the tadpole of *Hyla spinipollex* Schmidt. This species is widely distributed throughout the mountain streams of the Alta Verapaz, and the tadpoles were taken in similar situations at Nebaj and Finca Tesoro. Another, quite unlike any hylid tadpole I know, was taken from puddles along the trail in the cloud forest on the cumbre between Finca Tesoro and Finca San Francisco.

*Agalychnis moreletii* (Duméril)

Finca San Rafael: F.M.N.H. Nos. 40920-23.

I was apparently too late in the season to find this common, early-breeding, upland species. It was secured by Steyermark in July.

*Eleutherodactylus anzuetoii* Stuart

Nebaj: Nos. 89160 (holotype), 89911 (paratype).

As noted in its description (Stuart, 1941b: 197-98), this species is an inhabitant of the cloud forest zone of both the Cuchumatanes and the Alta Verapaz. It appears to be strictly terrestrial, with no affinity for an aquatic habitat.

*Eleutherodactylus rugulosus* (Cope)

Barillas: M.C.Z. No. 19220. Finca San Francisco: Nos. 89161, 89163-64. Finca Tesoro: No. 89162 (3).

The use of the name *rugulosus* for this population of that vicarious species is purely for the purpose of avoiding further confusion in the already confused literature. Whether many of the described forms represent taxonomic entities or merely slightly variant populations I am not prepared to say, but my collections from the Alta Verapaz are strongly suggestive of the latter condition. The above specimens agree reasonably well with *E. natator* Taylor, which, after comparison with the rather poorly preserved type of *rugulosus*, I am inclined to consider a synonym of this latter.

This species, though not purely aquatic, is always found in



the immediate vicinity of water, especially swift mountain streams.

*Rana pipiens* Schreber

Barillas: M.C.Z. Nos. 15796-98. Nebaj: Nos. 89158 (12), 89159 (8). Finca Tesoro: No. 90548 (tadpoles).

As with *E. rugulosus*, I use the name *pipiens* merely to avoid contributing to synonymic confusion. The tadpoles are not unlike *pipiens* tadpoles from Michigan.

This species is widely distributed throughout the Cuchumatanes, and I saw it in a small pool at 2500 m. at Salquil Grande. It was somewhat surprising not to find what Schmidt and Stuart (1941: 239) have called *R. macroglossa* Brocchi in this area. The latter was extremely abundant in the mountain

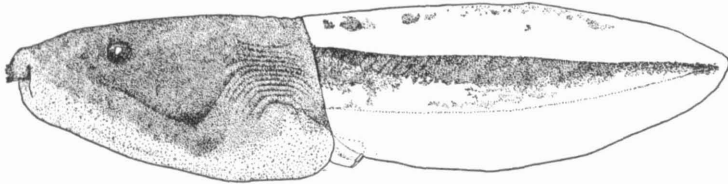


FIG. 3. Lateral view of the tadpole of *Hypopachus simus*.

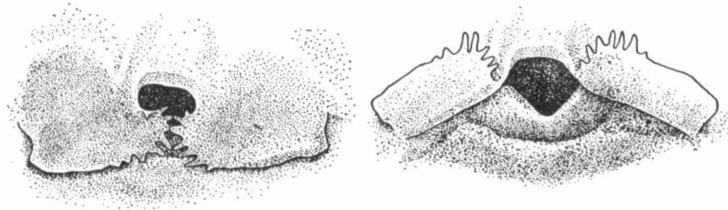


FIG. 4.

FIG. 5.

FIG. 4. Mouth parts of the tadpole of *Hypopachus simus* with the labial aprons in normal position.

FIG. 5. Mouth parts of the tadpole of *Hypopachus simus* with the labial aprons lifted to show the beaks.

brooks of the adjacent Alta Verapaz, but there was no trace of it in similar habitats in the Cuchumatanes.

*Hypopachus simus* Stuart

Nebaj: Nos. 89095 (holotype), 90550 (tadpoles).

This species has been fully discussed in the original descrip-

tion (Stuart, 1941a: 125). At that time the tadpole was also described, but was not figured. Figures 3, 4, and 5 present a lateral view of the complete tadpole and drawings of the mouth parts.

Though specimens were abundant in ponds and small water holes in the Nebaj Valley, I was able to secure only the holotype.

*Anolis aureolus* Cope

Finca San Francisco: No. 89190.

A juvenile specimen obviously not many days old was found in a *cafetal*. Several adults were seen, but all eluded capture.

*Anolis capito* Peters

Finca San Francisco: No. 89192.

Another lowland type which invades the Cuchumatanes proper in the river valleys. The above is a very young specimen, but, fortunately, *A. capito* is so distinctive that even freshly hatched young are readily recognizable.

*Anolis crassulus* Cope

Nebaj: Nos. 89193 (20), 89195. Nebaj, fifteen miles north: M.C.Z. Nos. 27623-25. Salquil Grande: No. 89194 (2). San Mateo Ixtatán: M.C.Z. Nos. 27626-32. Santa Eulalia: F.M.N.H. No. 40911.

I have only recently untangled the confused synonymy of this species (Stuart, 1942b: 1-2). This form is the common anole of the adjacent plateau and is present in the Cuchumatanes only at relatively high altitudes (above 1800 m.). It is a ground species and was particularly abundant among the thistles on the Cunén cumbre above Nebaj. In the valley itself it was uncommon.

*Anolis uniformis* Cope

Finca Tesoro: No. 89191.

This species has been referred to as *A. ruthveni* Stuart in recent literature, but I have allocated it properly (Stuart,

1942b: 1-2). This specimen was taken in the lowland forest area, where it occurred with its ever-present associate, *Ameiva festiva edwardsii* Bocourt.

*Basiliscus vittatus* Wiegmann

Finca Tesoro: No. 89189.

Observed only at this locality, where it was not particularly abundant.

*Sceloporus malachiticus smaragdinus* Bocourt

Chancol: U.S.N.M. Nos. 47514-15. Chemal: F.M.N.H. Nos. 40904-8. Nebaj: Nos. 89181 (2), 89182 (7). San Mateo Ixtatán: M.C.Z. Nos. 28117-18. Todos Santos: No. 89218 (24).

I follow Smith's recent revision of the *formosus* group of *Sceloporus* (1942a: 356). His revised conclusions now break his former *S. formosus smaragdinus* into two races of *malachiticus*: *S. m. smaragdinus* Bocourt and *S. m. taeniocnemis* Cope. The former differs from the latter in possessing a single canthal, small dorsal scales, and a greater number of femoral pores. The range of the two overlaps geographically but not ecologically. *S. m. smaragdinus* occurs on the plateau of Guatemala and throughout the Cuchumatanes, whereas *taeniocnemis* is restricted to the Alta Verapaz and, so far as is known, only the eastern Cuchumatanes. In the latter region *smaragdinus* was not taken below 2400 m. and seemed to be restricted to a rather narrow belt just below the temperate forest, whereas *taeniocnemis* inhabited the cloud forest zone and was never taken above 2100 m. Just where and how intergradation takes place, if it occurs at all, must be answered by more detailed field investigations than those undertaken by me. I am not certain as to the identity of the San Mateo Ixtatán specimens, and their inclusion here, which is purely provisional, is based upon the high altitude of that village.

The above Nebaj specimens were secured from the cleared area on the Cunén-Nabaj cumbre, where they were not uncommon. This is a climbing form and is most frequently found on stones, stumps, and fences.

*Sceloporus malachiticus taeniocnemis* Cope

Barillas: M.C.Z. No. 28119. Izabal (between Nebaj and Salquil Grande): No. 89188. Finca San Francisco: Nos. 89183 (7), 89184 (3), 89186-87. San Francisco-Tesoro cumbre: No. 89185 (3).

This race was extremely abundant at Finca San Francisco, where the pine suggests somewhat dry conditions, but it also was present in considerable numbers on the cloud-enshrouded cumbre above San Francisco. I have no suggestion as to what requirements separate this and the preceding form ecologically. In general habits *taeniocnemis* and *smaragdinus* are very much alike.

*Sceloporus teapensis* Günther

Finca San Francisco: Nos. 89179 (7), 89180 (3).

This typical lowland species was not secured above about 1200 m. It occurred most frequently along streams and was never taken in the *cafetales*, where *S. m. taeniocnemis* was abundant. Its absence from Finca Tesoro is as unaccountable as is that of *Bufo marinus* and *B. valliceps*.

*Sceloporus variabilis variabilis* Wiegmann

Jacaltenango: U.S.N.M. No. 47511. Nentón: U.S.N.M. Nos. 47518-20.

This is one of the species showing the affinities of the Chiapas and western Cuchumatanes faunas.

*Gerrhonotus moreletii fulvus* Bocourt

Cerro Chemalito: F.M.N.H. Nos. 40891-92. Nebaj: No. 90544. Nebaj-Sacapulas trail: No. 90545. San Mateo Ixtatán: M.C.Z. No. 28194. Todos Santos: No. 90543 (2).

K. P. Schmidt, who is working with this difficult genus, has supplied me with the proper name for the Cuchumatanes population. The specimens at Nebaj were collected on the ground in cleared areas in the upper part of the cloud forest at 2600 m. This same race inhabits the plateau to the south, but it is different from the race of the Alta Verapaz.

*Ameiva festiva edwardsii* Bocourt

Finca Tesoro: No. 89197 (4).

As suggested by Dunn (1940: 114), *A. f. festiva* (Lichtenstein) is replaced in northern Central America by a distinct race, to which Bocourt's name *edwardsii* is applicable (type locality, Panzós, Alta Verapaz, Guatemala).

None of the diagnostic characters listed by Bocourt (1873) separate *festiva* and *edwardsii*. They are most readily distinguished by the nature of the posteriormost sublabial. In *festiva* this is a single large shield, and in *edwardsii* it is divided into three smaller shields forming a rough triangle (Figs. 6 and 7).

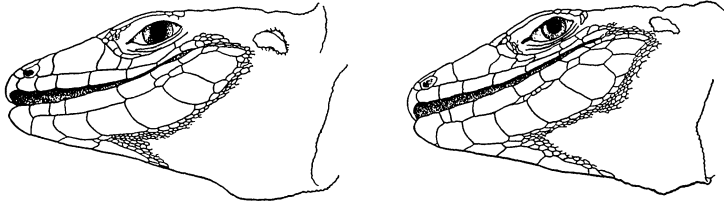


FIG. 6. Side of head of *Ameiva f. festiva* showing the single ultimate sublabial.

FIG. 7. Side of head of *Ameiva f. edwardsii* showing the divided ultimate sublabial.

This species frequented the trails in the dense forest and was never found in the *monte*. On the lowlands of Caribbean Guatemala this and *Anolis uniformis* constitute the index species of the virgin forest.

*Ameiva undulata stuarti* Smith

Nentón: U.S.N.M. No. 47528.

It is somewhat surprising to find this species of the humid Vera Cruz lowlands invading the dry Chiapas Valley as far as Guatemala. The specimen is, nevertheless, typical.

*Thamnophis sumichrasti fulvus* (Bocourt)

Cerro Chermal: F.M.N.H. Nos. 40878-82. Nebaj: Nos. 89203, 89205. Salquil Grande: No. 89204. San Mateo Ixta-

tán: M.C.Z. No. 25212. Todos Santos: Nos. 89206, 89207 (2), 89208-12.

As will be noted in Table I, the number of abdominal scutes is well below that of the specimens listed (as *equus*) by Ruthven (1908: 159) for the entire range and of those reported by Slevin (1939: 397) from the plateau of Guatemala. Recently described species of Central American *Thamnophis* have indicated that a new revision is in order. Feeling, however, that to name these specimens as new would only add to the confusion, I prefer to utilize the name as applied by Smith (1924b: 112) until all the material has been reassembled for further study.

As noted by Slevin (1939) this is an upland species. At Salquil Grande I discovered it in the humid temperate forest at about 3000 m.

TABLE I  
SCUTELLATION OF *Thamnophis s. fulvus*

Number	Sex	Dorsals	Abdominals	Subcaudals
89206 .....	♂	19-17-15	145	.....
89210 .....	♂	17-15	139	67
89211 .....	♂	19-17-15	140	66
89212 .....	♂	19-17-15	139	68
89207 .....	♂	17-19-17-15	135	60
F.M.N.H. 40878 .....	♂	19-17	136	67
F.M.N.H. 40880 .....	♂	19-17	132	67
89207A .....	♀	19-17	136	59
89203 .....	♀	19-17	132	63
89204 .....	♀	19-17	138	57
89205 .....	♀	19-17-15	137	61
89208 .....	♀	19-17-15	133	58
89209 .....	♀	19-17-15	136	60
M.C.Z. 25212 .....	♀	19-17-15	132	53
F.M.N.H. 40879 .....	♀	19-17	134	.....
F.M.N.H. 40881 .....	♀	19-17	133	58
F.M.N.H. 40882 .....	♀	19-17	131	.....

*Drymobius margaritiferus margaritiferus* (Schlegel)

Finca San Francisco: No. 89200. Finca San Rafael: F.M.N.H. No. 40889.

Specimen No. 89200, a female with eggs ready for deposition, was taken on July 30 in a *cafetal*. Its dorsal scale for-

mula is 17-15, and it possesses 150 abdominals and 115 subcaudals. The other, a male, has 146 abdominals and a broken tail. A third specimen was seen at Finca Tesoro.

*Drymarchon corais melanocercus* Smith

Finca San Francisco: No. 89201.

A single specimen of this wide-ranging species was taken in a *cafetal* by an Indian. It is a male with a dorsal scale formula 17-15, 198 abdominals, and 75 subcaudals.

*Dryadophis dorsalis* (Bocourt)

Jacaltenango: No. 89216 (2).

Both specimens of this highland species are juveniles. They are males and are so badly mangled that the only scale count possible is of the subcaudals on one specimen. These number 125.

*Pituophis lineaticollis* (Cope)

Nebaj: No. 89202.

In her recent revision Stull (1940: 47-48, Fig. 26) described and figured *lineaticollis* from Mexico as possessing two continuous black stripes on the anterior part of the dorsum, and Günther (1894: 124, Fig. 47) described and figured a similar pattern in a specimen from Dueñas, Guatemala. Boulenger (1894: 64), however, described the same Dueñas specimen as having the black stripes broken. My Nebaj specimen also possesses broken stripes, so that there is some possibility that a southern race may eventually be brought to light. The above is a female with a dorsal scale formula of 25-27-25-23-21, 241 abdominals, and 59 subcaudals.

*Adelphicos veraepacis veraepacis* Stuart

Guatemala: No. 90239.

A specimen in Stadelman's collection contained no exact data, but since his collection originated from either the plateau or the Cuchumatanes and since the plateau species is quite different there can be little doubt that it was taken in the

Cuchumatanes area. It is a female with 15 dorsals, 135 abdominals, and 27 subcaudals.

*Tantilla phrenitica* Smith

Finca San Francisco: No. 89198.

This female specimen of a recently described species (Smith, 1942c: 39) is slightly atypical in possessing a rather low number of subcaudals. It was secured from beneath decaying rubbish in a *cafetal* and has 15 dorsals, 141 abdominals, and 33 subcaudals.

*Ninia sebae sebae* (Duméril and Bibron)

Finca San Francisco: No. 89199. Finca San Rafael: F.M.N.H. Nos. 40886-88.

This species was much more rare in the Cuchumatanes than in Alta Verapaz to the east, where it was found in great numbers.

TABLE II  
SCUTELLATION OF *Ninia sebae sebae*

Number	Sex	Dorsals	Abdominals	Subcaudals
89199 .....	♂	19	143	57
F.M.N.H. 40886 .....	♂	19	140	55
F.M.N.H. 40887 .....	♀	19-17	133	54
F.M.N.H. 40888 .....	♀	19	143	47

*Rhadinaea stadelmani* Stuart and Bailey

Todos Santos: Nos. 89078 (holotype), 89079 (paratype).

I have no further comments to add to the original description (Stuart and Bailey, 1941: 4).

*Tropidodipsas fischeri* Boulenger

Cerro Chemal: F.M.N.H. No. 40877. Nebaj: M.C.Z. No. 25214. Todos Santos: No. 89213.

There appears to be some confusion regarding the proper name for this species. It was originally described as *Virginia fasciata* by Fischer (1885: 95, Taf. 1, Fig. 2), but the name



*fasciata* was preoccupied by *Tropidodipsas fasciata* Günther, 1858. In 1892 Bocourt redescribed the species as *Tropidoclonium annulatum*. Prior to this, Peters (1870: 643) had published an account of *Geophis annulatus*, which Boulenger (1894: 296) considered a synonym of *T. sartorii* Cope. Boulenger, therefore, was correct in proposing the substitute name *fischeri* for Fischer's original *fasciata*.

Amaral (1929: 193), however, referred back to Bocourt's name *annulatum* and left Peters' *Geophis annulatus* unallocated. Inasmuch as Peters' description and figure certainly bear a strong resemblance to some form of *sartorii*, and since Boulenger is the only author who has definitely considered its allocation, I have followed his conclusions and have retained his name *fischeri* for the common *Tropidodipsas* of the Guatemalan plateau.

TABLE III  
SCUTELLATION OF *Tropidodipsas fischeri*

Number	Sex	Dorsals	Abdominals	Subcaudals
89213 .....	♂	17	178	63
M.C.Z. 25214 .....	♂	17	174	53
F.M.N.H. 40877 .....	♀	17	175	47

*Geophis carinosus* Stuart

Finca San Francisco: No. 89082 (holotype).

No further data has been forthcoming on this recently described species.

*Bothrops godmani* (Günther)

Cerro Chermal: F.M.N.H. No. 40883. Nebaj: M.C.Z. No. 25213. Todos Santos: Nos. 89214 (6), 89215.

A series of this wide-ranging highland species was secured by Stadelman from the vicinity of Todos Santos, where it is apparently abundant.

Of the toxicity of the bite of this species Stadelman wrote:

I treated three cases of bites by this species, two of them in young children. The symptoms were not especially alarming, but consisted of fever and considerable swelling. Apparently, the snake is not very dangerous, although the Indians claim it is.

TABLE IV  
SCUTELLATION OF *Bothrops godmani*

Number	Sex	Dorsals	Abdominals	Subcaudals
89214A .....	♀	21-19-17	136	25
89214B .....	♀	21-19-17-15	134	29
89214C .....	♀	21-19-17	135	27
89214D .....	♂	21-19-17	136	.....
89214E .....	♂	21-19-17	135	32
89214F .....	♂	21-19	143	32
89215 .....	♂	21-19	.....	.....
M.C.Z. 25213 .....	♂	21-19-17	143	.....
F.M.N.H. 40883 .....	♂	21-19-17	131	26

*Bothrops nigroviridis aurifera* (Slevin)

I do not have this species from the Cuchumatanes, but, for the sake of completeness, I include Slevin's (1939: 413) record from Finca El Soché, El Quiché (forty-eight miles east and slightly north of Huehuetenango), in the very eastern extension of the mountains.

*Kinosternon leucostomum* Duméril

Finca Tesoro: Nos. 89220-21.

Two specimens of this common lowland form were taken from a swampy area which occupied a sink hole in the Tesoro Valley.

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## PLATE I

FIG. 1. The Nebaj Valley as seen from the cloud forest. The high, flat peak in the background is Cerro Tzumal; the lower one to the left is Cerro Salquil. Photographed in August, 1940.

FIG. 2. The Tesoro Valley as seen from the base of the cloud forest with monsoon forest in the background. Photographed in August, 1940.

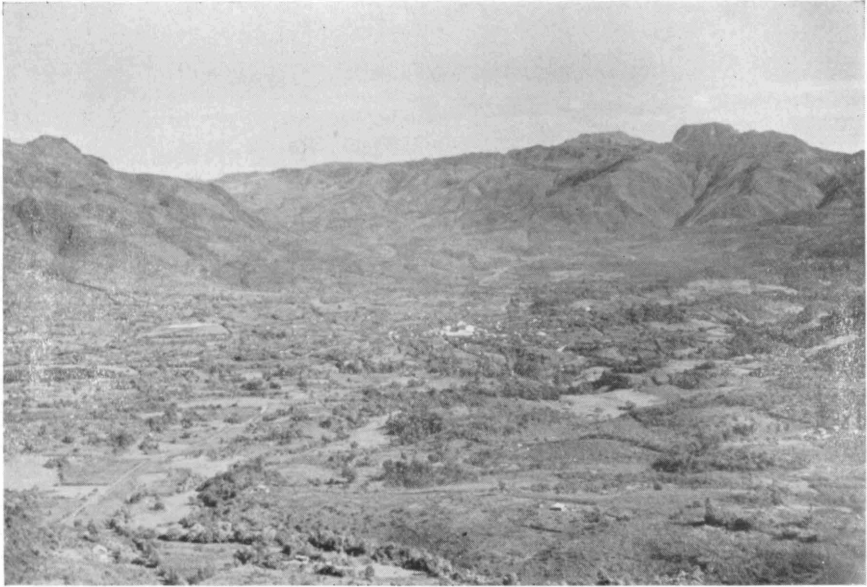


FIG. 1

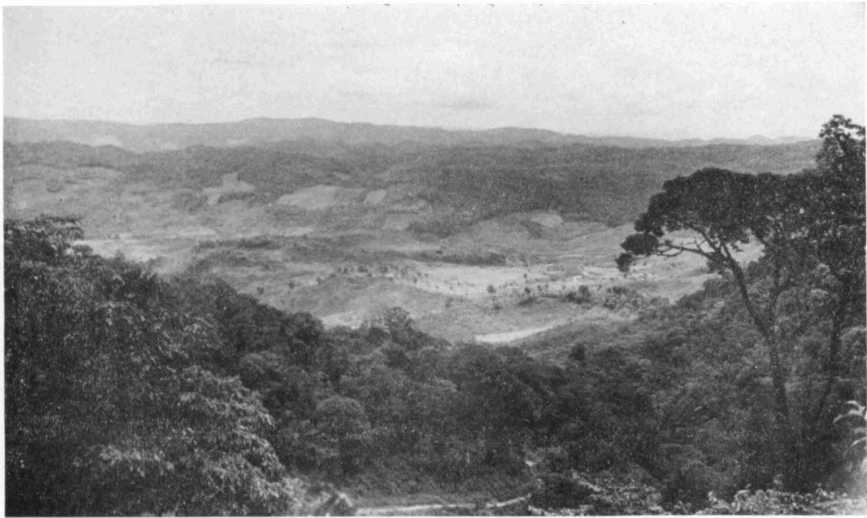


FIG. 2

