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Notes on the Herpetofauna of Two Mountain Ranges in México (Sierra Fría, Aguascalientes, and Sierra Morones, Zacatecas)

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ABSTRACT—A total of 25 species of reptiles and amphibians is reported from pine-oak woodland on two southern outlier ranges of the Sierra Madre Occidental, the Sierra Fría in Aguascalientes and the Sierra Morones in Zacatecas. Of those 25 species, 20 are known from the Sierra Fría and 17 from the Sierra Morones. Seven species are reported as new records for Aguascalientes or Zacatecas. A discussion of the biogeography of these ranges is included. Comparison is made to the herpetofaunas of the southern Sierra Madre Occidental and the Cordillera Volcánica in Michoacán.

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INTRODUCTION

During field work on the taxonomy and ecology of the Rock Rattlesnake, *Crotalus lepidus,* we made collections in two poorly known mountain ranges, the Sierra Fría and the Sierra Morones, in the Mexican states of Aguascalientes and Zacatecas, respectively. These mountain ranges are southern outliers of the Sierra Madre Occidental. Previous collections from these areas are limited to those made by Nelson and Goldman in the Sierra Morones in 1897 (in the collection of the National Museum of Natural History), by Hooper, Garlich, and Cantrell in the Sierra Fría in 1953 (in the collections of the University of Michigan Museum of Zoology), both of which we have examined, and by Lidicker in the Sierra Fría in 1959 (Anderson and Lidicker, 1963).

We spent the periods of 27-30 June 1977 in the Sierra Fría and 1-3 July 1977 in the Sierra Morones. During these periods we collected 16 species of reptiles and amphibians in the Sierra Fría and 13 species in the Sierra Morones. These species are discussed in the accounts below.

Our collections (deposited in LSUMZ) were made at elevations ranging from 2380-3000 m in forest consisting of various species of pines and oaks, manzanillo, and juniper, commonly referred to as pine-oak woodland (Marshall, 1957; Leopold, 1972). Areas relatively undisturbed by man that we studied are characterized by open stands of pine and/or oak with scattered junipers and manzanillo (Figs. 1 and 3). The canyon slopes are covered by a growth of bunch grass or *zacatón* (Figs. 2 and 4). In areas disturbed by man, where logging has taken place, manzanillo tends to predominate and grow in almost impenetrable thickets. This situation is perpetuated by continual chopping of manzanillo for use as firewood. We encountered this condition at the highest elevations (2900-3000 m) in the Sierra Fría.

The species collected by us and others are discussed below. The known herpetofauna of the Sierra Fría (including the material reported by Anderson and Lidicker, 1963, and the Hooper, Garlich, and Cantrell collection) and the Sierra Morones (including the material in the Nelson and Goldman collection reported by various authors) is listed in Table 1.

GAZETTEER. Neither of the mountain ranges we studied is heavily populated. Maps other than topographic maps do not show most of the localities at which we collected. Therefore, we provide the following gazetteer of those localities.

Congoya (AGUASCALIENTES)—village located in the Sierra Fría, ca.2500 m (22° 10′ N, 102° 33′ W).

Mesa la Virgin (ZACATECAS)—mesa located in the Sierra Morones, ca. 2500 m (21° 51′ N, 103° 08′ W).

FIGURE 1. Pine-oak woodland 10.2 km WNW Congoya, 2700 meters elevation, Aguascalientes, México.

FIGURE 3. Pine-oak woodland 12.3 km SW El Plateado, 2670 meters elevation, Zacatecas, México.

FIGURE 2. Canyon slope in pine-oak woodland with an understory of bunch-grass (*zacatón*) 10.2 km WNW Congoya, ca. 2700 meters elevation, Aguascalientes, México.

FIGURE 4. Rocky canyon slope in pine-oak woodland with scattered bunch-grass (*zacatón*) 0.8 km N Mesa la Virgin, 2440 meters elevation, Zacatecas, México.

El Pateado (= Joaquin Amaro) (ZACATECAS)—town located at base of Sierra Morones, 2380 m (21° 56′ N, 103° 06′ W).

Portrerillo (AGUASCALIENTES)—village at base of the Sierra Fría, ca. 2200 m (22° 14′ N, 102° 27′ W).

Temescal (ZACATECAS)—abandoned ranch headquarters in the Sierra Morones, 2660 m (21° 54′ N, 103° 10′ W).

SPECIES ACCOUNTS

Pseudoeurycea belli.—ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2500 m (LSUMZ 35074). This specimen represents the first record of this species from Zacatecas. The specimen came from beneath a log in the pine-oak forest.

Hyla arenicolor.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35012-17). ZACATECAS: El Plateado, 2438 m (USNM 46824). This species was previously reported from the Sierra Fría by Anderson and Lidicker (1963) and from the Sierra Morones by Duellman (1970).

Hyla eximia.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2700 m (LSUMZ 35011); Sierra Fría, 10.8 km WNW Congoya, 2710 m (LSUMZ 35022). ZACATECAS: Sierra Morones, 10.8 km SW El Plateado, 2650 m (LSUMZ 35045-46); Sierra Morones, Temescal, 13.2 km SW El Plateado, 2660 m (LSUMZ 35054-55). Our records represent first records of the

occurrence of this frog in both the Sierra Fría and the Sierra Morones, but it was previously known from lower areas on the Mexican Plateau in both states (Duellman, 1970).

Bufo occidentalis.—ZACATECAS: Sierra Morones, 12.3 km SW El Plateado, 2670 m (LSUMZ 35049); Sierra Morones, 0.8 km N Mesa la Virgin, 2450-2470 m (LSUMZ 35111). Our specimens of this toad represent the first record from the Sierra Morones.

Scaphiopus multiplicatus.—AGUASCALIENTES: Sierra Fría 10.2 km WNW Congoya, 2690-2700 m (LSUMZ 35018, 35020). ZACATECAS: Sierra Morones, El Plateado, 2380 m (LSUMZ 35038-43); Sierra Morones, 2.4 km N Mesa la Virgin, 2570 m (LSUMZ 35072-73). We are following Brown (1976) in the use of the name *Scaphiopus multiplicatus.*

Hylactophryne augusti.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35010, 35019). This frog has been reported from the Sierra Fría by Anderson and Lidicker (1963). One of our specimens was found dead floating in water at the bottom of a natural well alongside a stream. Another was found underneath a rock on a slope above the same stream. Specimens from this population have been allocated to *H. a. cactorum* (Zweifel, 1967).

Rana berlandieri.—AGUASCALIENTES: Sierra Fría, 4.8 km N Cerro del Jagüey, ca. 2500 m (MVZ 68933-34). According to Zweifel (1954), these frogs key out to *Rana "pipiens."* They were also identified as this species by Anderson and Lidicker (1963). Hobart M. Smith (pers. comm.) has suggested the

TABLE 1. Herpetofaunal composition of the pine-oak forests of the Sierra Fría in Aguascalientes, Sierra Morones in Zacatecas, southern Sierra Madre Occidental in Sinaloa, Durango, and Zacatecas, and the Cordillera Volcánica in Michoacán.

Species	Sierra Fría	Sierra Morones	Southern Sierra Madre Occidental	Cordillera Volcánica in Michoacán
Ambystoma amblycephalum				x
Ambystoma dumerili				x
Ambystoma ordinarium				x
Ambystoma rosaceum			x	
Ambystoma tigrinum				x
Pseudoeurycea belli		x		x
Bufo compactilis			x	
Bufo microscaphus			x	
Bufo occidentalis		x	x	x
Bufo punctatus			x	
Eleutherodactylus hobartsmithi				x
Hyla arenicolor	x	x	x	x
Hyla bistincta			x	x
Hyla eximia	x	x	x	x
Hyla plicata				x
Hylactophryne augusti	x			x
Hylactophryne tarahumaraensis			x	
Rana berlandieri	x		x	x
Rana dunni				x
Rana montezumai	x			x
Rana pustulosa			x	x
Scaphiopus multiplicatus	x	x	x	x
Tomodactylus angustidigitorum				x
Tomodactylus fuscus				x
Tomodactylus nitidus			x	x
Tomodactylus rufescens				x
Kinosternon integrum			x	x
Anolis nebulosus		x	x	x
Barisia imbricata	x	x	x	x
Cnemidophorus costatus			x	
Eumeces brevirostris			x	x
Eumeces copei				x
Eumeces dugesi				x
Eumeces lynxe	x	x	x	
Gerrhonotus liocephalus			x	
Phrynosoma orbiculare	x	x	x	
Sceloporus aeneus				x
Sceloporus bulleri			x	
Sceloporus dugesi		x		x
Sceloporus grammicus	x	x	x	x
Sceloporus heterolepis			x	x
Sceloporus jarrovi	x		x	
Sceloporus nelsoni			x	
Sceloporus poinsetti			x	
Sceloporus scalaris	x	x	x	x
Sceloporus torquatus	x	x		x
Adelophis foxi			x	
Conopsis biserialis				x
Conopsis nasus	x	x	x	x
Crotalus intermedius				x
Crotalus lepidus	x	x	x	
Crotalus molossus	x	x	x	x

TABLE 1. Continued.

Species	Sierra Fría	Sierra Morones	Southern Sierra Madre Occidental	Cordillera Volcánica in Michoacán
Crotalus polystictus		x		x
Crotalus pricei			x	
Crotalus pusillus				x
Crotalus triseriatus				x
Crotalus willardi			x	
Crotalus sp.	x			
Diadophis punctatus			x	x
Dryadophis cliftoni			x	
Geophis dugesi			x	x
Geophis petersi				x
Lampropeltis mexicana			x	
Lampropeltis triangulum				x
Leptophis diplotropis			x	
Masticophis mentovarius			x	
Pituophis deppei	x		x	
Pituophis lineaticollis				x
Rhadinaea hesperia			x	
Rhadinaea laureata			x	x
Rhadinaea taeniata				x
Salvadora bairdi			x	x
Storeria storerioides			x	x
Tantilla bocourti			x	x
Thamnophis cyrtopsis	x		x	x
Thamnophis elegans			x	
Thamnophis eques	x		x	x
Thamnophis melanogaster			x	
Thamnophis nigronuchalis			x	
Thamnophis rufipunctatus			x	
Thamnophis scalaris				x
Toluca lineata				x
TOTALS	20	17	52	53

use of the name *berlandieri* for these frogs. Frogs of the *Rana pipiens* complex were seen by us in the Sierra Morones but could not be identified to species. The locality Cerro del Jagüey was described by Anderson and Lidicker (1963).

Rana montezumai.—AGUASCALIENTES: Sierra Fría, 4.8 km N Cerro del Jagüey, ca. 2500 m (MVZ 68926, 68936); Sierra Fría, 21.0 km WNW Congoya, 2600 m (LSUMZ 35021);Sierra Fría, 10.8 km WNW Congoya, Ca. 2700 m (LSUMZ 35025); Congoya, ca. 2500 m (UMMZ 110920 - 10 spec.). Two of the specimens (MVZ 68926, 68936) reported by Anderson and Lidicker (1963) as *Rana pipiens* have been reidentified by us as *R. montezumai,* using the key in Zweifel (1954). All specimens of the *Rana pipiens* complex collected by us in the Sierra Fría are also allocated to *R. montezumai.*

Eumeces lynxe.—AGUASCALIENTES: Sierra Fría, 18.5 km WNW Portrerillo, 2500 m (LSUMZ 35056); Sierra Fría, 11.1 km WNW Congoya, ca. 2700 m (LSUMZ 35058-59); Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35093-95). ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2500 m (LSUMZ 35082-83, 35109-10). Our specimens of this skink represent the first record for Aguascalientes and for southern Zacatecas and also help to fill in the gap in the range between *E. l. belli* and *E. l. lynxe* (Webb, 1968). Our specimens all key out to *E. l. belli* on the basis of color pattern and number of middorsal scales. Middorsal scale rows in the Sierra Fría material range from 59-62 ($\bar{x}$ = 60.5) and 60-64 ($\bar{x}$ = 61.6) in the Sierra Morones material. Most specimens were collected from underneath rocks, but a juvenile specimen was found in the open crawling among rocks.

Barisia imbricata.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35068). ZACATECAS: Sierra Morones, Temescal, 13.2 km SW El Plateado, 2660 m (LSUMZ 35070-71). This lizard was reported from the Sierra Fría by Anderson and Lidicker (1963) as *Gerrhonotus imbricatus ciliaris.*

Anolis nebulosus.—ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2500 m (LSUMZ 35079-81, 35112-13). Our specimens of this anole represent the first record for the state of Zacatecas. They were found moving about on the ground. Our specimens were allocated to *A. nebulosus* on the basis of characters used by Duellman (1961).

Phrynosoma orbiculare.—AGUASCALIENTES: Sierra Fría, 11.1 km WNW Congoya, 2710 m (LSUMZ 35057); Sierra Fría, 10.2 km WNW Congoya, 2700 m (LSUMZ 35107). ZACATECAS: El Plateado, 2317 m (USNM 46927, 47874-82). This horned lizard has been reported from the Sierra

Fría by Anderson and Lidicker (1963) and from the Sierra Morones by Reeve (1952) and Horowitz (1955). The material from El Plateado has been identified as *P. o. cortezi* by Horowitz (1955). Our material from the Sierra Fría appears to be intergradient between *P. o. cortezi* and *P. o. orientale,* in agreement with the determination of Anderson and Lidicker (1963). They have lateral fringe counts of 27-32 ($\bar{x}$ = 30.0) and femoral pore counts of 27.

Sceloporus dugesi.—ZACATECAS: 5.0 km N El Plateado, 2270 M (LSUMZ 35037); Sierra Morones, 5.8 km SW El Plateado, 2450 m (LSUMZ 35044); Sierra Morones, 0.8 km N Mesa la Virgin, ca. 2500 m (LSUMZ 35076, 35114-15). These specimens represent the first record of this species for Zacatecas. This *Sceloporus,* which appears to be the ecological counterpart of *S. jarrovi* found in the Sierra Fría, is found principally in rocky areas, especially along rock fences. Our specimens wer identified by H. M. Smith as *S. d. dugesi.*

Sceloporus grammicus.—AGUASCALIENTES: Sierra Fría, 25.8 km WNW Portrerillo, 2950 m (LSUMZ 35029-30); Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35065-66, 35097-98, 35104-05); Sierra Fría, 8.9 km WNW Congoya, 2640 m (LSUMZ 35091-92). ZACATECAS: Sierra Morones, 11.0 km SW El Plateado, 2650 m (LSUMZ 35047-48); Sierra Morones, 12.3 km SW El Plateado, 2670 m (LSUMZ 35050); Sierra Morones, Temescal, 13.2 km SW El Plateado, 2660 m (LSUMZ 35051); El Plateado, 2438 m (USNM 46627, 46631-33). This *Sceloporus* was reported from the Sierra Fría by Anderson and Lidicker (1963) and from the Sierra Morones by Smith (1939). Our specimens from these mountain ranges were identified as *S. g. disparilis* by H. M. Smith.

Sceloporus jarrovi.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35009, 35024, 35067, 35096, 35103); Sierra Fría, 25.8 km WNW Portrerillo, 2900-3000 m (LSUMZ 35031-32). Our specimens from the Sierra Fría represent the first record for the state of Aguascalientes. Our specimens were identified by H. M. Smith as *S. j. jarrovi.* This species is encountered on rocks on hillsides. In the Sierra Morones, the ecological position of *S. jarrovi* is occupied by the closely-related *S. dugesi.* Inasmuch as both *S. jarrovi* and *S. torquatus* are now known from the Sierra Fría, the suggestion made by Anderson and Lidicker (1963) that *S. torquatus* may be the ecological replacement of *S. jarrovi* is not warranted.

Sceloporus scalaris.—AGUASCALIENTES: Sierra Fría, 25.8 km WNW Portrerillo, 2700 m (LSUMZ 35027-28); Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35099). ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2500-2510 m (LSUMZ 35078, 35108). Our specimens of the Bunch Grass Lizard are the first from both the Sierra Fría and the Sierra Morones, although it is known from both the states of Aguascalientes and Zacatecas (Thomas and Dixon, 1976). As its name suggests, this lizard is commonly encountered among clumps of bunch grass (*zacatón*). *S. scalaris* was considered a monotypic species by Thomas and Dixon (1976).

Sceloporus torquatus.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35008, 35100). ZACATECAS: Sierra Morones, Temescal, 13.2 km SW El Plateado, 2660 m (LSUMZ 35052, 35069); Sierra Morones, 0.8 km N Mesa la Virgin, 2500 m (LSUMZ 35075, 35077). This species of *Sceloporus* was reported from the Sierra Fría by Anderson and Lidicker (1963). Our specimens from the Sierra Morones represent the first from that mountain range, however, the species is widely distributed in Zacatecas. One specimen from the Sierra Fría was extracted from a stump and some of the ones from the Sierra Morones were collected on the rock walls of the abandoned buildings at Temescal. These specimens were identified by H. M. Smith as *S. t. melanogaster.*

Conopsis nasus.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, ca. 2700 m (LSUMZ 35084, 35158-60). ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2450 m (LSUMZ 35134); El Plateado, 2438 m (USNM 46418). Our material of this snake from the Sierra Fría represents the first record for Aguascalientes. It was recorded from the Sierra Morones by Taylor and Smith (1942). All specimens we collected came from underneath rocks. They key out to *C. n. nasus* (Tanner, 1961).

Pituophis deppei.—AGUASCALIENTES: Congoya, 45.2 km SW Rincón de Romos, ca. 2500 m (UMMZ 110881). This represents the first record of this snake from the Sierra Fría. We collected another specimen (LSUMZ 35026) from 2140 m at the base of the foothills of the Sierra Fría.

Thamnophis cyrtopsis.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35064). This specimen of the Blacknecked Garter Snake represents the first record for the state of Aguascalientes. It was found moving among bunch grass and rocks on a slope above a stream. We use the name *cyrtopsis* instead of *dorsalis* for this garter snake following the reasoning of Webb (1966). According to Webb (1966), the subspecies found in the pine-oak forest is *T. c. pulchrilatus.*

Thamnophis eques.—AGUASCALIENTES: Sierra Fría, 10.2 km WNW Congoya, 2660-2710 m (LSUMZ 35166, 35168). Our specimens represent the first record from the Sierra Fría. This garter snake was found alongside a stream. Anderson and Lidicker (1963) identified material from lower elevations in Aguascalientes as *T. e. megalops.*

Crotalus lepidus.—ZACATECAS: Sierra Morones, 0.8 km N Mesa la Virgin, 2440 m (LSUMZ 35256); El Plateado (USNM 46470-71). This rattlesnake was reported from the Sierra Fría by Anderson and Lidicker (1963) and from the Sierra Morones by Gloyd (1940). Both the Sierra Fría and Sierra Morones lie within the range of *C. l. klauberi,* as presently envisioned.

Crotalus molossus.—ZACATECAS: El Plateado, 2438 m (USNM 46469). This rattlesnake was recorded from the foothills (2287 m) of the Sierra Fría by Anderson and Lidicker (1963). The El Plateado specimen was mapped by Gloyd (1940).

Crotalus polystictus.—ZACATECAS: El Plateado, 2317 m (USNM 46330-31). This rattlesnake was recorded from the Sierra Morones by Gloyd (1940). The inhabitants of Mesa la Virgin in the Sierra Morones seem to be familiar with this snake. The species probably occurs in the Sierra Fría, as what appeared to be suitable habitat was seen 21.0 km WNW Congoya.

Crotalus sp.—AGUASCALIENTES: Sierra Fría, W of Rincón de Romos, 2500 m (UMMZ 110878). This specimen was tentatively assigned to *Crotalus pricei miquihuanaus* by Klauber (1972). Although the specimen shares some important characteristics with *Crotalus pricei,* it also shares other characters with *C. intermedius.* We believe it represents an undescribed species of *Crotalus.* The resolution of this question will have to await the collection of additional material.

DISCUSSION

Our collections from the Sierra Fría in Aguascalientes and the Sierra Morones in Zacatecas were all made in pine-oak forest or woodland. Although our stay in these mountains was relatively brief, we feel our collections are fairly complete and allow for a comparison of the herpetofaunas of these two southern outlier ranges with those of the pine-oak forest of the main mass of the Sierra Madre Occidental to the north in Sinaloa, Durango, and Zacatecas and the Cordillera Volcánica in Michoacán to the south. Data on the herpetofaunal composition of the pine-oak woodland of the Sierra Madre Occidental of Sinaloa, Durango, and Zacatecas are from a variety of sources, including Conant (1963), Drake (1958), Hardy and McDiarmid (1969), Webb and Baker (1962), Webb (in litt.), and pers. observ. Data on the composition of the herpetofauna of the western portion of the Cordillera Volcánica are from Duellman (1961, 1965).

Even granting that the available material from the sierras Fría and Morones are somewhat incomplete (see comments below), it is evident that the pine-oak herpetofauna of these two ranges is a depauperate reflection of the pine-oak herpetofauna of both the southern portion of the Sierra Madre Occidental and Cordillera Volcánica in Michoacán. Available data indicate a total herpetofaunal composition of 52 species for the southern Sierra Madre Occidental, 53 species for the Cordillera Volcánica in Michoacán, 20 species for the Sierra Fría, and 17 species for the Sierra Morones (Table 1).

We have used the formula $SC = \frac{100c}{n_1}$, also used by Meyer (1969) in his biogeographic study of the herpetofauna of Honduras, where

SC = similarity coefficient
c = species in common to the two areas
n_1 = number of species in smaller of the two faunas

TABLE 2. Similarity coefficient values for the herpetofauna of the Sierra Fría, Sierra Morones, southern Sierra Madre Occidental, and Cordillera Volcánica of Michoacán (italicized numbers on the diagonal represent the total fauna for each area; numbers above the diagonal indicate shared species and those below are the SC values)

	Sierra Fría	Sierra Morones	Southern Sierra Madre Occidental	Cordillera Volcánica in Michoacán
Sierra Fría	*20*	12	16	13
Sierra Morones	71	*17*	13	14
Southern Sierra Madre Occidental	80	76	*52*	25
Cordillera Volcánica in Michoacán	65	82	48	*53*

as a gauge of faunal resemblance (see Table 2). These data indicate that, whereas about the same number of species (12-16) are shared between all two-area comparisons, except for the Sierra Madre Occidental-Cordillera Volcanica comparison, the SC values vary more widely. The Sierra Fría shows a greater similarity in its herpetofaunal composition to that of the Sierra Madre Occidental than it does to the intermediate Sierra Morones. We suspect that this will prove to be less the case with additional collecting in both of the sierras we studied. In like fashion, the Sierra Morones shows more resemblance to the other source area, the Cordillera Volcanica, than it does to the intermediate Sierra Fría. Interestingly enough, even though the number of shared species (25) between the Sierra Madre Occidental and the Cordillera Volcánica is by far the highest, the SC value is the lowest because of the relatively high species composition in those areas. The relatively high number of shared species between the two source areas as compared to the two outlier ranges is also apparently due to two other factors: (1) incomplete sampling of the outlier ranges (see comments below); (2) occurrence of species in both the source areas whose distribution skirts to the west of the outlier ranges (e.g., *Rana pustulosa, Tomodactylus nitidus, Eumeces brevirostris, Sceloporus heterolepis,* and *Geophis dugesi*).

The number of species common to all four areas is eight (*Hyla arenicolor, H. eximia, Scaphiopus multiplicatus, Barisia imbricata, Sceloporus grammicus, S. scalaris, Conopsis nasus,* and *Crotalus molossus*), all of which are wide-ranging species in México and five of which also occur in the southwestern United States.

As a source area, the Cordillera Volcánica is equally as potent as is the Sierra Madre Occidental. Species in the outlier ranges that appear to have been derived from the north in the Sierra Madre Occidental include *Eumeces lynxe, Phrynosoma orbiculare, Sceloporus jarrovi* (in the Sierra Fría only), and *Crotalus lepidus.* Species derived from the south in the Cordillera Volcánica are *Pseudoeurycea belli* (in the Sierra Morones only), *Rana montezumai, Sceloporus dugesi* (in the Sierra Morones only), and *Crotalus polystictus* (in the Sierra Morones only).

There are no species endemic to either the Sierra Fría or the Sierra Morones, with the possible exception of the *Crotalus* sp. from the Sierra Fría.

As stated previously, we feel our collections from the outlier ranges are relatively complete, however, there are some species which, on the basis of known distribution, we feel will be shown to occur in one or the other or both of the ranges with additional collecting. Those species are:

SIERRA FRÍA	*SIERRA MORONES*
Bufo occidentalis	*Rana berlandieri*
Kinosternon integrum	*Rana montezumai*
Anolis nebulosus	*Kinosternon integrum*
Crotalus polystictus	*Diadophis punctatus*
Diadophis punctatus	*Pitouphis deppei*
Rhadinaea laureata	*Rhadinaea laureata*
Salvadora bairdi	*Salvadora bairdi*
Tantilla bocourti	*Tantilla bocourti*
	Thamnophis cyrtopsis
	Thamnophis eques

Thus, the total herpetofauna of the pine-oak forests of the Sierra Fría may be as high as 28 species and that of the Sierra Morones as high as 27 species.

In summary, the herpetofauna of the Sierra Fría and Sierra Morones appears to have been derived from the following components: (1) a wide-ranging component; (2) a northern component

derived from the Sierra Madre Occidental; (3) a southern component derived from the Cordillera Volcánica; (4) a possible endemic component of one species (*Crotalus* sp.–Sierra Fría only).

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