Q
11
U563
CRLSSI

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
BULLETIN 194

AN ANNOTATED CHECKLIST AND KEY TO THE AMPHIBIA OF MEXICO

By
HOBART M. SMITH AND EDWARD H. TAYLOR

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
Price 50 cents

ADVERTISEMENT

The scientific publications of the National Museum include two series, known, respectively, as *Proceedings* and *Bulletin*.

The *Proceedings* series, begun in 1878, is intended primarily as a medium for the publication of original papers, based on the collections of the National Museum, that set forth newly acquired facts in biology, anthropology, and geology, with descriptions of new forms and revisions of limited groups. Copies of each paper, in pamphlet form, are distributed as published to libraries and scientific organizations and to specialists and others interested in the different subjects. The dates at which these separate papers are published are recorded in the table of contents of each of the volumes.

The series of *Bulletins*, the first of which was issued in 1875, contains separate publications comprising monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, catalogs of type specimens, special collections, and other material of similar nature. The majority of the volumes are octavo in size, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable. In the *Bulletin* series appear volumes under the heading *Contributions from the United States National Herbarium*, in octavo form, published by the National Museum since 1902, which contain papers relating to the botanical collections of the Museum.

The present work forms No. 194 of the *Bulletin* series.

ALEXANDER WETMORE,
Secretary, Smithsonian Institution.

CONTENTS

	Page
Introduction	1
Class Amphibia	3
Key to Mexican orders of Amphibia	3
Order Gymnophiona	3
Family Caeciliidae	3
Key to Mexican genera of Caeciliidae	4
Genus *Dermophis*	4
Genus *Gymnopis*	5
Order Caudata	5
Key to Mexican suborders of Caudata	5
Suborder Meantes	5
Family Sirenidae	5
Genus *Siren*	6
Suborder Ambystomoidea	6
Family Ambystomidae	6
Key to Mexican genera of Ambystomidae	6
Genus *Bathysiredon*	7
Genus *Siredon*	7
Genus *Rhyacosiredon*	8
Genus *Ambystoma*	10
Suborder Salamandroidea	14
Family Salamandridae	14
Key to Mexican genera of Salamandridae	14
Genus *Taricha*	14
Genus *Diemictylus*	15
Suborder Plethodontoidea	16
Family Plethodontidae	16
Key to Mexican subfamilies of Plethodontidae	16
Subfamily Thoriinae	16
Genus *Thorius*	16
Subfamily Plethodontinae	18
Key to Mexican genera of Plethodontinae	18
Genus *Ensatina*	19
Genus *Batrachoseps*	19
Genus *Aneides*	20
Genus *Parvimolge*	20
Genus *Oedipina*	21
Genus *Magnadigita*	21
Genus *Bolitoglossa*	22
Genus *Pseudoeurycea*	25
Genus *Chiropterotriton*	30
Order Salientia	33

Class Amphibia—Continued
Key to Mexican suborders of Salientia ... 33
Suborder Opisthocoela ... 34
Family Rhinophrynidae ... 34
Genus *Rhinophrynus* ... 34
Suborder Anomocoela ... 34
Family Pelobatidae ... 34
Genus *Scaphiopus* ... 35
Suborder Procoela ... 36
Key to Mexican families of Procoela ... 36
Family Bufonidae ... 37
Genus *Bufo* ... 37
Family Leptodactylidae ... 46
Key to Mexican genera of Leptodactylidae ... 46
Genus *Engystomops* ... 47
Genus *Tomodactylus* ... 47
Genus *Syrrhophus* ... 49
Genus *Microbatrachylus* ... 53
Genus *Leptodactylus* ... 55
Genus *Eleutherodactylus* ... 57
Family Hylidae ... 67
Key to Mexican genera of Hylidae ... 67
Genus *Centrolenella* ... 68
Genus *Diaglena* ... 69
Genus *Triprion* ... 70
Genus *Anotheca* ... 70
Genus *Pternohyla* ... 70
Genus *Agalychnis* ... 71
Genus *Plectrohyla* ... 73
Genus *Acrodytes* ... 74
Genus *Smilisca* ... 75
Genus *Hylella* ... 76
Genus *Acris* ... 77
Genus *Hyla* ... 77
Genus *Ptychohyla* ... 91
Suborder Diplasiocoela ... 91
Key to Mexican families of Diplasiocoela ... 91
Family Microhylidae ... 91
Subfamily Microhylinae ... 92
Key to Mexican genera of Microhylinae ... 92
Genus *Microhyla* ... 92
Genus *Hypopachus* ... 94
Family Ranidae ... 96
Subfamily Raninae ... 96
Genus *Rana* ... 96
State lists ... 100
Index ... 109

AN ANNOTATED CHECKLIST AND KEY TO THE AMPHIBIA OF MEXICO

By Hobart M. Smith and Edward H. Taylor

INTRODUCTION

A new era in the study of Mexican herpetology was initiated in 1932, a year marked first by the appearance of Dr. Remington Kellogg's "Mexican Tailless Amphibians in the United States National Museum," [1] a work of fundamental importance; and second, by the renaissance of intensive field exploration in Mexico.

Since 1932 the number of amphibians in collections from Mexico has increased about a thousand percent, and the number of recognizable forms more than a hundred percent. For example, Kellogg recognized 65 species of anurans, basing his study upon some 2,200 specimens. We recognize 161, represented by collections totaling about 25,000 specimens.

The salamanders of Mexico have never been treated fully, although Dr. E. R. Dunn's "The Salamanders of the Family Plethodontidae," which appeared in 1926, summarized over half the salamander fauna, 67 percent of which (by number of forms) is comprised by members of the family Plethodontidae (as of today). Dunn recognized 15 forms in 291 Mexican specimens; we list 43 forms, represented by some 9,000 specimens, and of all salamander groups combined 64 forms and 15,000 specimens. We are acutely aware that much revisionary work is still to be done in Mexico and in adjacent areas. Several genera and species obviously are polyphyletic assemblages; the study of some, like *Rana pipiens*, is beset with the difficulties of tremendous variability, wide range, and larger quantities of material than can easily be handled. Satisfactory solutions to many problems await collections from critical areas, and no doubt numerous species and subspecies remain to be discovered and defined. Probably many of the forms we regard as species will ultimately be regarded justifiably as subspecies. However, assumption of subspecific status for geographically separated species (as we consider them) should be undertaken with temerity, as witness the implications of Moore's recent work by which some widely

[1] U. S. Nat. Mus. Bull. 160, 1932.

differentiated species are shown to interbreed freely while other populations inadequately differentiated taxonomically are shown to be incapable of interbreeding. Furthermore, determination of the actual status of some forms which we here regard as species must undoubtedly await experimental investigation; we refer to extraordinary complexes like that of a certain group of closely related but morphologically very distinct species of *Eleutherodactylus* in central Veracruz (*vide* Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 572). Beyond question, *en fin*, much juggling of arrangement remains to be endured. This fact is a reflection of (1) the peculiar character of amphibians, which are provided with fewer well-defined obvious and interracially variable features than almost any other group of vertebrates, and (2) the difficulties attending their collection. The difficulties of amphibian taxonomy are obvious to anyone who actually tries to identify preserved specimens without the benefit of field experience. Knowledge of the animals in life is practically indispensable even—or perhaps especially—to the expert. This fact has not always been appreciated by critics who may have felt that we have recognized, in some cases, more forms than exist.

That thorough collection of amphibians is not easily attained, especially in tropical areas, is well known. Some specimens emerge from their quarters into the open for breeding, where they are more easily collected, for extremely brief periods—perhaps one night a year. Except in breeding congresses many species are rarely if ever found; thus one must be on hand at just the right time and at just the right place to secure the species. Salamanders are collected in abundance usually by special techniques not widely applied, such as seining or use of dipnets (for ambystomids) and search during the dry season in bromelias, stump holes, etc. (for most plethodontids). We have continually been surprised by repeated discovery of novelties at favorite collecting sites that we had considered completely surveyed. In view of these considerations, we feel that our view of the relative incompleteness of our present knowledge and the considerable length of time that will be required to approach completeness is not unwarranted.

Nevertheless we feel the time is ripe for a summary of the amphibian fauna of Mexico, the complexity of which has become steadily more apparent in recent years. Students in this field have accomplished reviewal of most available collections at least only in a preliminary fashion, partly because of dwindling accessions during war years. The coming years will undoubtedly be a period of review, during which the activities of the recent past and the problems revealed by them

will be subjected to individual attention at leisure. The present list takes a step toward such general review by providing a brief survey of the present status of Mexican forms and a concise analysis of recent advances, to which additions and emendations may be made readily.

In preparing this summary we have followed, with some exceptions, the style of our "Annotated Checklist and Key to the Snakes of Mexico." [2] The present account differs chiefly in the natural arrangement of the species and in the distribution of the keys, which instead of being united are scattered through the list in appropriate places. The keys are to transformed specimens, except where otherwise indicated, since the larvae are too incompletely known to permit the construction of useful keys. Likewise the eggs of relatively few forms are known. Juvenile transformed specimens will not be identifiable in all cases, since important characters may not be evident in them.

For the sake of brevity we have indicated the E. H. Taylor–H. M. Smith collection by the abbreviation EHT–HMS.

Class AMPHIBIA Linnaeus

Amphibia Linnaeus, Systema naturae, ed. 10, vol. 1, 1758, p. 194.

KEY TO MEXICAN ORDERS OF AMPHIBIA [3]

1. One or two pairs of limbs present; no scales 2
   No limbs present; animals with slender, elongate, annulated, wormlike bodies; scales hidden in skin ..... Gymnophiona (p. 3)
2. Animals with elongate bodies; hind legs not or slightly larger than fore; a tail present in larvae and adults; neotenic forms sometimes occurring; 2 or 4 limbs ..... Caudata (p. 5)
   Animals with greatly shortened bodies; hind legs much stouter than forelegs; tail absent in adult; no neotenic forms; always 4 limbs. Salientia (p. 33)

Order GYMNOPHIONA Müller

Gymnophiona Müller, Zeitschr. Physiol., vol. 4, 1832, p. 24.

Family CAECILIIDAE Gray [4]

Caeciliadae [5] Gray, Ann. Philos., ser. 2, vol. 10, 1825, p. 217.

[2] U. S. Nat. Mus. Bull. 187, 1945.

[3] Characters used in all cases apply to Mexican forms. These may not apply universally.

[4] Despite rather remarkable skull differences, all living forms of the order Gymnophiona have been recognized under a single family.

[5] Cited as Coeciliidae by Gray in 1850, Catalogue of the Batrachia Gradientia of the British Museum, p. 56; first use of present orthography, Caeciliidae, by Cope, Amer. Nat., vol. 23, 1889, p. 862.

KEY TO MEXICAN GENERA OF CAECILIIDAE

1. Eye visible; tentacle only slightly nearer eye than nostril; primary (97–110) and secondary (51–80) rings reduced in number; stout; total length/diameter ratio 14–26 ..... **Dermophis** (p. 4)
   Eye invisible or not, completely or partially encased under bone; tentacle very close to eye; primaries (119–137) and secondaries (98–122) more numerous; generally more slender; total length/diameter ratio 24–40 ..... **Gymnopis** (p. 5)

Genus DERMOPHIS Peters [6]

Dermophis Peters, Monatsb. Akad. Wiss. Berlin, 1879, p. 937.—Dunn, Bull. Mus. Comp. Zool., vol. 91, 1942, pp. 461–479 (part).

Genotype.—*Dermophis mexicanus* Duméril and Bibron (by subsequent designation, Noble, Bull. Amer. Mus. Nat. Hist., vol. 49, 1924, p. 305).

Range.—Veracruz and Guerrero, Mexico, to Ecuador.

Species.—Five forms are recorded, three of which are races of *D. mexicana;* one enters Mexico.

DERMOPHIS MEXICANUS MEXICANUS (Duméril and Bibron)

Siphonops mexicanus Duméril and Bibron, Erpétologie générale, vol. 8, 1841, pp. 284–5.
Dermophis mexicanus Peters, Monatsb. Akad. Wiss. Berlin, 1879, p. 937, fig. 6.
Dermophis mexicanus mexicanus Dunn, Proc. New England Zool. Club, vol. 10, 1928, pp. 74–75, pl. 5.
Gymnopis mexicanus mexicanus Dunn, Bull. Mus. Comp. Zool., vol. 91, 1942, pp. 473–476.

Type.—Mus. Hist. Nat. Paris No. 5c (*fide* Dunn).

Type locality.—Mexico.

Range.—The Atlantic coast from central Veracruz southeastward to the Isthmus of Tehuantepec and perhaps to Yucatán; and on the Pacific coast from the Isthmus southeastward to western Nicaragua. In Mexico known from *Veracruz:* Cuatotolapam, Veracruz; *Oaxaca:* Tehuantepec, Barrio; *Tabasco:* Teapa; *Chiapas:* La Zacualpa, Soconusco, Escuintla; *Yucatán:* loc.? (Dugès).

[6] In his revision of American caecilians, Dunn (Bull. Mus. Comp. Zool., vol. 91, 1942, pp. 437–540) unites *Dermophis* and *Gymnopis* (under the latter name) because of the existence of apparently annectant forms. The eye, visible and in an open orbit, is invariable in the three species of *Dermophis* but variable in visibility and presumably in extent of enclosure by bone in the four species of *Gymnopis.* However, the position of the tentacle (very near eye in *Gymnopis,* halfway between eye and nostril in *Dermophis*) does not overlap, the extent of closure of the orbit probably does not overlap (not known for all forms), and finally there is no indication that the present groupings of species under these two names are unnatural. For these reasons we retain *Dermophis.*

Genus GYMNOPIS Peters

Gymnopis Peters, Monatsb. Akad. Wiss. Berlin, 1874, p. 616.—Dunn, Bull. Mus. Comp. Zool., vol. 91, 1942, pp. 461–479 (part).

Genotype.—*Gymnopis multiplicata* Peters (by monotypy).

Range.—Guerrero, Mexico, and Alta Verapaz, Guatemala, to Brazil.

Species.—Eight forms are known, of which three are races of *G. multiplicata*. Two (*G. pricei, G. braziliensis*) have been described by Dunn since the appearance of his monograph in 1942. Only one form enters Mexico.

GYMNOPIS MULTIPLICATA OAXACAE Mertens

Gymnopis multiplicata oaxacae Mertens, Abh. Ber. Mus. Magdeburg, vol. 6, 1930, pp. 153–155, fig. 14.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 299–300.—Dunn, Bull. Mus. Comp. Zool., vol. 91, 1942, pp. 466–469.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 523–524.

Type.—Senckenberg Museum, Frankfurt, No. 22120.

Type locality.—Cafetal Concordia, 600 meters, between Puerto Angel and Salina Cruz, Oaxaca, Mexico.

Range.—Pacific slopes from central Guerrero to southern Chiapas. Specimens are known from *Guerrero:* El Limoncito (near La Venta), Xaltianguis; *Oaxaca:* Cafetal Concordia, Mirador; *Chiapas:* Tonalá, La Esperanza (near Escuintla).

Order CAUDATA Oppel

Caudata Oppel, Ordnung, Familien und Gattungen der Reptilien . . ., 1811, p. 72.

KEY TO MEXICAN SUBORDERS OF CAUDATA

1. No teeth in upper or lower jaw [1]; body greatly elongated; hind limbs absent; permanent larvae, with gills throughout life..... Meantes (p. 5)
   Teeth in upper and/or lower jaws [1]; fore and hind limbs present..... 2
2. "Parasphenoid" teeth present..... 3
   "Parasphenoid" teeth absent..... Ambystomoidea (p. 6)
3. No nasolabial groove..... Salamandroidea (p. 14)
   A nasolabial groove..... Plethodontoidea (p. 16)

Suborder Meantes Linnaeus

Meantes Linnaeus, Systema naturae, ed. 12, vol. 1, pt. 2, 1766 (unpaged).

Family SIRENIDAE Gray

Sirenidae (part) Gray, Ann. Philos., ser. 2, vol. 10, 1825, p. 216; Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 68.

[1] Excluding palate.

Genus SIREN Linnaeus

Siren Linnaeus, Systema naturae, ed. 12, vol. 1, pt. 2, 1766, addenda (unpaged).

Genotype.—*Siren lacertina* Linnaeus.

Range.—District of Columbia southward through Florida and westward along the Gulf coast to Matamoros, Tamaulipas; northward in the valley of the Mississippi River to Lake Michigan.

Species.—Three forms, two of them subspecies of *S. intermedia*, comprise this genus; one enters Mexico.

SIREN INTERMEDIA NETTINGI Goin

Siren intermedia nettingi Goin, Ann. Carnegie Mus., vol. 29, 1942, pp. 211–217.

Type.—Carnegie Mus. No. 7580.

Type locality.—Imboden, Lawrence County, Ark.

Range.—"Southern Louisiana northward to southern Illinois and Indiana, west and south to Maverick Co., Texas, and northern Tamaulipas, Mexico." Known in Mexico only from Matamoros, Tamaulipas.

Suborder Ambystomoidea Noble

Ambystomoidea Noble, The biology of the Amphibia, 1931, p. 471.

Family AMBYSTOMIDAE Hallowell

Ambystomidae Hallowell, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 3, 1858, p. 338.

KEY TO MEXICAN GENERA OF AMBYSTOMIDAE [8]

1. Permanent larva (neotenic) in nature 2
   Normal transformation to adult form (possible exception of *Rhyacosiredon zempoalaensis*, *Ambystoma fluvinatum*, and *Ambystoma rosaceum*) 3
2. Three phalanges in fourth toe; digits short; the proximal phalanges, at least, included in a web; gill branches with filaments to near base; 8 to 10 gill rakers on anterior face of third arch; presumably incapable of transformation ..... **Bathysiredon** (p. 7)
   Four phalanges in fourth toe; digits elongate and unwebbed; 12 gill rakers on the anterior face of third arch; capable of artificial transformation, or in case of *lermaensis* at least occasionally transformation may take place ..... **Siredon** (p. 7)
3. Adults retaining vomerine teeth in a modified larval form; premaxillary teeth lost [9] ..... **Rhyacosiredon** (p. 8)
   Vomerine teeth arranged with the pterygopalatine teeth to form a transverse or slightly arched series near level of choanae; premaxillary teeth retained ..... **Ambystoma** (p. 10)

[8] The preparation of usable keys to the genera and species of the Ambystomidae is especially difficult owing to the fact that one genus is known only from neotenic larvae, while other genera contain some species known only from adults and others known only from larvae.

[9] There is a slight deposition of keratin within the mouth but no horny beak is present, as described by Dunn in the generic description, at any age.

Genus BATHYSIREDON Dunn

Bathysiredon Dunn, Not. Nat., No. 36, 1939, p. 1.

Genotype.—*Siredon dumerilii* Dugès.

Range.—Known only from Lake Pátzcuaro, Michoacán, Mexico.

Species.—One.

BATHYSIREDON DUMERILII (Dugès)

Siredon Dumerilii Dugès,[10] La Naturaleza, vol. 1, 1870, pp. 241–244, pl. 5a, figs. 1–13.—Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 426–427.
Bathysiredon dumerilii Dunn, Not. Nat., No. 36, 1939, p. 1.

Type.—U.S.N.M. Nos. 16201–16202 (?) (cotypes).

Type locality.—Lake Pátzcuaro, Michoacán, Mexico.

Range.—Known only from the type locality, Lake Pátzcuaro, 2,055 m. elevation.

Genus SIREDON Wagler

Siredon Wagler, Natürliches System der Amphibien, 1830, pp. 209–210; Descriptiones et icones amphibiorum, 1830, pl. 20.
Axolotes Owen, Ann. Mag. Nat. Hist., vol. 14, 1844, p. 23 (genotype *Axolotes guttata* Owen=*Gyrinus mexicanus* Shaw).

Genotype.—*Siredon axolotl* Cuvier=*Gyrinus mexicanus* Shaw.

Range.—The ancient lakes of the southern Mexican plateau: Lakes Lerma, Xochimilco, and Chalco.

Species.—Two.

KEY TO SPECIES OF SIREDON

1. Larvae dark gray with numerous dark or black spots; artificially transformed adults blackish with large yellow spots..... mexicanum (p. 7)
   Larvae uniformly dark blackish or grayish black, lighter below; normally transformed adults grayish or olive-black, lighter below..... lermaensis (p. 8)

SIREDON MEXICANUM (Shaw) [11]

Gyrinus mexicanus Shaw, Nat. Misc., vol. 9, 1789, pls. 343, 344.
Siredon mexicanum Baird, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 1, 1849, p. 292.—Smith, Publ. Field Mus. Nat. Hist., zool. ser., vol. 24, 1939, pp. 16–17.—Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 424–425, pl. 45, fig. 3.
Siren pisciformis Shaw, Gen. Zool., vol. 3, pt. 2, 1802, p. 612, pl. 140.
Siredon axolotl Wagler, Natürliches System der Amphibien, 1830, p. 209.
Axolotes guttata Owen, Ann. Mag. Nat. Hist., vol. 14, 1844, p. 23 (lake near Mexico City; types unknown).

[10] It is presumed that this species has become extinct owing to the introduction of exotic game and food fishes.

[11] *Sir. [edon] lich. [enoides] alba* Dugès (La Naturaleza, vol. 1, 1869, p. 145) is a *nomen nudum* whose identity should not be guessed.

Siredon humboldtii Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, pp. 177–181 (lake near Mexico City; types probably in Mus. Hist. Nat. Paris).

Gyrinus edulis Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 178 (types and type locality same as preceding).

Lusus aquarum Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 178 (types and type locality as preceding).

Piscis ludricus Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 178 (type and type locality as preceding).

Type.—Brit. Mus. Nat. Hist.

Type locality.—México, Mexico.

Range.—Valley of Mexico. Recorded from Lakes Xochimilco and Chalco.

SIREDON LERMAENSIS Taylor

Siredon lermaensis Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 427–430, pl. 48.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 525–526.

Type.—EHT–HMS No. 22578.

Type locality.—Lake Lerma, east of Toluca, México, Mexico.

Range.—Known only from the type locality.

Genus RHYACOSIREDON Dunn

Rhyacosiredon Dunn, Proc. New England Zool. Club, vol. 10, 1928, pp. 85–86.

Genotype.—Amblystoma altamirani Dugès.

Range.—The high mountains at the southern edge of the main Mexican plateau.

Species.—Four.

KEY TO SPECIES OF RHYACOSIREDON

Adults

1. Tail about as long as body (less than 5 percent longer); elevation of tail in tail length 3.8 to 5 times; pterygopalatine-vomerine series average about 18 teeth on each side; maxillary-premaxillary teeth about 31 on each side; when limbs are adpressed, toes touch elbow ..... **rivularis** (p. 9)

   Tail longer than head and body by more than 5 percent; elevation of tail in tail length from 6 to 9 times 2

2. Mouth strongly papillate; toes not reaching elbow of adpressed limb. **leorae** (p. 9)

   Mouth not obviously papillate; toes of adpressed limbs reaching elbows or beyond ..... **altamirani** (p. 9)

Larvae

1. Lips and tips of toes whitish or cream; body nearly uniformly colored (known only from larvae) ..... **zempoalaensis** (p. 9)

   Lips and tips of toes not whitish; body dark, strongly mottled with cream ..... **rivularis, leorae, altamirani** (p. 9)

RHYACOSIREDON RIVULARIS Taylor

Rhyacosiredon rivularis TAYLOR, Herpetologica, vol. 1, 1940, pp. 171–176, pl. 17, fig. 1.

Type.—EHT-HMS No. 16388.

Type locality.—13 kilometers west of Villa Victoria, México, Mexico.

Range.—Known only from the type locality.

RHYACOSIREDON LEORAE Taylor

Rhyacosiredon leorae TAYLOR, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 345–347, pl. 26, fig. 3.

Type.—EHT-HMS No. 22560.

Type locality.—Near Río Frío, México.

Range.—Known only from the type locality, a small stream, Río Frío, which passes through a village of the same name in the state of México, at a point only a few hundred meters from the México-Puebla border, then flows into the state of Puebla after about a kilometer. The species occurs certainly in both states.

RHYACOSIREDON ALTAMIRANI (Dugès)

Amblystoma altamirani DUGÈS, Description d'un axolotl des Montagues de las Cruces (*Amblystoma altamirani*, A. Dugès), 1895, pp. 1–6, 1 pl., figs. 1–8.—SMITH and NECKER, Anal. Esc. Nac. Cienc. Biol., vol. 3, 1943, pp. 183–185, pl. 1, figs. 2–3.

Rhyacosiredon altamirani DUNN, Proc. New England Zool. Club, vol. 10, 1928, pp. 85, 86.—TAYLOR, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 262–263, pl. 24, fig. 2; Herpetologica, vol. 1, 1940, p. 176, pl. 17, fig. 2.

Type.—Museo Alfredo Dugès, Guanajuato, México (6 cotypes).

Type locality.—Manantial de los Axolotes, Serranía de las Cruces, Valle de México, Distrito Federal, Mexico.

Range.—High mountains of central Mexico, southern Distrito Federal, and northern Morelos. Known or recorded from numerous localities in the Ajusco Mountains. Known from *Distrito Federal:* Manantial de los Axolotes, Desierto de los Leones, Cañada de Contreras; *Morelos* and *México:*[12] Lagunas de Zempoala.

RHYACOSIREDON ZEMPOALAENSIS Taylor and Smith

Rhyacosiredon zempoalaensis TAYLOR and SMITH, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 527–529.

Type.—U.S.N.M. No. 116617.

Type locality.—One of the nearly dry lake beds of the Zempoala lakes, Morelos, Mexico.

Range.—Known only from type locality.

[12] The "Lakes of Zempoala" are at the México-Morelos border; undoubtedly the species occurs on both sides of the boundary.

Genus AMBYSTOMA Tschudi

Ambystoma Tschudi, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, 1838, p. 92.
Sirenodon Desor, Bull. Soc. Sci. Nat. Neuchâtel, vol. 8, 1870, p. 269 (genotype, *Sirenodon lichenoides* Desor=*Siredon lichenoides* Baird=*Ambystoma tigrinum mavortium* Baird).

Genotype.—*Ambystoma subviolacea* Tschudi=*Ambystoma maculatum* Shaw.

Range.—Extreme southeastern Alaska, James Bay, and Labrador southward to the edge of the central plateau in Mexico; apparently not in Baja California.

Species.—Twenty-eight forms are recognized, 6 of which are subspecies of *A. tigrinum;* 11 occur in Mexico.

KEY TO MEXICAN SPECIES OF AMBYSTOMA

Known as transformed adults

1. Small species (maximum known snout-to-vent measurement 62 mm.); adpressed limbs separated by three costal folds; vomeropalatine teeth 16–16; maxillary-premaxillary teeth in more than a single series, the outer containing about 40 teeth on each side; tail about 70 percent of head-body length ..... **schmidti** (p. 13)
   Larger species; snout-to-vent measurement exceeding 60 mm 2
2. Body of adults uniformly colored on dorsal and lateral surfaces 3
   Body not uniformly colored on sides and dorsum 4
3. Grayish black or plumbeous above and on sides; larvae with three rows of small cream spots marking lateral-line system; caudal fin present, in adults, nearly as wide as fleshy part of tail; skin not especially smooth ..... **ordinarium** (p. 13)
   Body of adults uniform grayish brown or lavender-brown, a little lighter below; toes reaching wrist when limbs are adpressed; tail without distinct dorsal fin, about 75 percent snout-to-vent length; maxillary-premaxillary teeth about 55–55; vomerine teeth 15–17; palatine teeth 10–12, the two series separate; skin especially smooth and shining; larvae unknown ..... **bombypellum** (p. 13)
4. Body uniform blackish above with an irregular row of cream spots or an irregular cream stripe low on sides; caudal fin reduced to a fine ridge; adpressed limbs overlap the length of hand; vomeropalatine teeth almost continuous, 31–37 on each side; maxillary-premaxillary series 70–80 on each side; tail about 72 percent of snout-to-vent length ..... **amblycephalum** (p. 13)
   Body not uniformly dark above 5

5. Body black with more or less symmetrical rounded cream marks on head and body and a median series on compressed tail; tail short, about 62 percent snout to vent; maxillary-premaxillary teeth 56 on each side; a total of 55 vomeropalatine teeth in a continuous series; larvae large, golden yellow with numerous black spots; fleshy part of tail attenuated ..... **subsalsum** (p. 11)
   Body not marked as described 6
6. Olive-gray, with numerous, vertical, blackish dark bars on sides of body and tail ..... **tigrinum proserpine** (p. 14)
   Not olive-gray or with numerous vertical, blackish dark bars on sides of body and tail 7
7. Caudal fin low 8
   Caudal fin high, thick, cream to olive-tan with numerous small dark spots; toes of adpressed limbs reach little beyond wrist; tail 80–82 percent of snout-to-vent length; maxillary-premaxillary teeth 48–50 on each side; vomeropalatine teeth total about 42, more or less continuous; larvae light flesh with little or no pigment except on ventral part of caudal fin ..... **granulosum** (p. 12)
8. Olive to dark olive, with scattered black spots ..... **lacustris** (p. 12)
   Brown to blackish with numerous small cream-white spots .. **velasci** (p. 11)

Known only in larval state

1. Body pinkish or reddish with numerous dark spots which may form two irregular lines on each side; caudal fin arising a little posterior to level of arm insertion ..... **rosaceum** (p. 13)
   Body with brownish or blackish pigment on a greenish-yellow ground color; caudal fin low, arising at tail base[13] ..... **fluvinatum** (p. 14)

AMBYSTOMA SUBSALSUM Taylor

Ambystoma subsalsum Taylor, Copeia, Oct. 15, 1943, pp. 151–156, figs. 1–3.

Type.—EHT–HMS No. 22139.
Type locality.—Lake Alchichica, Puebla.
Range.—Type locality.

AMBYSTOMA VELASCI Dugès

Siredon Tigrina Velasco, La Naturaleza, vol. 4, 1879, pp. 212–236, pls. 7–9 (preoccupied by *Salamandra tigrina* Green, 1825=*Ambystoma tigrinum*).
Amblystoma velasci Dugès, La Naturaleza, ser. 2, vol. 1, 1888, p. 142 (substitute name for *Siredon Tigrina* Velasco).
Ambystoma tigrinum velasci Dunn, Copeia, 1940, p. 157 (part).
Ambystoma velasci Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 531–532, pl. 18, figs. 3, 4.

[13] It is not certain whether the known specimens of *rosaceum* are relatively as old as those of *fluvinatum*.

Ambystoma tigrinum velascoi LAFRENTZ,[14] Abh. Ber. Mus. Magdeburg, vol. 6, 1930, pp. 105–114, pl. 2, figs. 2–3, pl. 3, fig. 3 (Lakes Texcoco and Zumpango; type locality restricted here to Lake Texcoco; apparently no types designated.

Type.—Probably none preserved.

Type locality.—Laguna Santa Isabel, near Guadalupe Hidalgo, Distrito Federal, Mexico.

Range.—High plateau region in Puebla and México. Known or recorded from *Puebla*: La Virgin (Kilometer 224) between Puebla and Tehuacán; *México:* San Diego, Santa Magdalena; *Distrito Federal:* Atzacualco.

AMBYSTOMA GRANULOSUM Taylor

Ambystoma granulosum TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 57–61, pl. 8, figs. 1–3.

Type.—EHT–HMS No. 29805.

Type locality.—Kilometer 74, about 12 miles northwest of Toluca, México, Mexico.

Range.—Known only from immediate region about type locality.

AMBYSTOMA LACUSTRIS Taylor and Smith

Ambystoma lacustris TAYLOR and SMITH, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 532–534, pl. 18, figs. 1–2.

Type.—U.S.N.M. No. 117410.

Type locality.—Lake Zumpango, México, Mexico.

Range.—Lake Zumpango.

---

[14] Determination of the author of this name is perhaps an academic matter. Heretofore Wolterstorff has generally been considered as the author, since he on page 132 of the same publication, in a separate article "Zur Systematik und Biologie der Urodelen Mexikos" names and describes an "*Ambystoma tigrinum* subsp. *velascoi* Wolt." However, in an article ("Untersuchungen über die Lebensgeschichte mexikanischer Ambystoma-Arten") which precedes Wolterstorff's Lafrentz (p. 105) cites the name "*Ambystoma tigrinum velascoi* subsp. n." and proceeds to describe the race well enough to permit at least recognition and retention of the name. Neither author, it may be noted, cites a type. Technically, for that reason, neither description need be accepted, although we hesitate to follow the rules so closely.

However, on page 145 a "Richtigstellung" states that "*Ambystoma tigrinum velascoi* subsp. n." should read "*Ambystoma tigrinum velascoi* Wolt."

There can be no question that the original proposal of *A. t. velascoi* is in Lafrentz's article. We believe, moreover, that he, not Wolterstorff, should be regarded as the author—the correction on page 145 notwithstanding—for the following reason. The description was, obviously, written by Lafrentz; the treatment is much different from that which Wolterstorff gives, and there is no indication whatever that it is a quotation from any ms. of Wolterstorff. Although it may be "clear from the contents of the publication that some other person . . ." (i. e., in this case, Wolterstorff) ". . is responsible for said name . . ", definitely it is quite apparent that he is *not* responsible for ". . . its indication, definition, or description." (All quotes from art. 21, Intern. Rules Zool. Nomen.)

AMBYSTOMA SCHMIDTI Taylor

Ambystoma schmidti Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 263–264, pl. 26, fig. 1.

Type.—EHT–HMS No. 3999.

Type locality.—10 miles east of San Martín (Asunción) at Rancho Guadalupe, México, Mexico.

Range.—Known only from the type locality.

AMBYSTOMA AMBLYCEPHALUM Taylor

Ambystoma amblycephala Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 420–421, pl. 45, fig. 2.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 530–531.

Type.—EHT–HMS No. 16443.

Type locality.—15 kilometers west of Morelia, Michoacán, Mexico.

Range.—Known only from the type locality.

AMBYSTOMA ORDINARIUM Taylor

Ambystoma ordinaria Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 422–424, pl. 46, figs. 1, 2, 3.

Type.—EHT–HMS No. 16367.

Type locality.—4 miles west of El Mirador, near Puerto Hondo, Michoacán, Mexico, elevation about 9,000 feet.

Range.—Known only from type locality.

AMBYSTOMA BOMBYPELLUM Taylor

Ambystoma sp. Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pl. 24, fig. 1.

Ambystoma bombypella Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 418–420, pl. 45, fig. 1.

Type.—EHT–HMS No. 3997.

Type locality.—Near Rancho Guadalupe, 14 kilometers east of San Martín (Asunción), México, Mexico.

Range.—Known only from the type locality.

AMBYSTOMA ROSACEUM Taylor

Axolotes maculata Owen, Ann. Mag. Nat. Hist., vol. 14, 1844, p. 23, 1 fig. (*non Lacerta maculata* Shaw, General zoology, vol. 3, 1802, p. 304; type, Brit. Mus. Nat. Hist., No. 41–6–13, 35, from Sierra Madre, Chihuahua, lat. 26°6′ N., long. 106°50′ W.).

Siredon Harlanii Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, pp. 181–182, pl. 95, figs. 1, 1A (part: only the synonymic reference to *Axolotes maculata* Owen; restricted by Bishop (in press) to the specimens from the vicinity of Spring Lake, N. Mex. [=*Ambystoma tigrinum mavortium*]).

Ambystoma rosaceum Taylor, Copeia, Sept. 30, 1941, pp. 143–144, figs. 1A, 1B.

Type.—EHT–HMS No. 23054.

Type locality.—Mojárachic, Chihuahua, Mexico.

Range.—Known only from type locality.

757435—48——2

AMBYSTOMA FLUVINATUM Taylor

Ambystoma fluvinatum Taylor, Copeia, Sept. 30, 1941, pp. 144–146, figs. 2A, 2B.

Type.—EHT-HMS No. 25383.

Type locality.—Mojárachic, Chihuahua, Mexico.

Range.—Known only from the type locality.

AMBYSTOMA TIGRINUM PROSERPINE Baird and Girard

Ambystoma proserpine Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 173.

Amblystoma proserpina Baird, Report on the United States and Mexican Boundary Survey, vol. 2, Reptiles, 1859, p. 29, pl. 35, figs. 7–14.

Type.—U.S.N.M. No. 4082 (6 cotypes).

Type locality.—Salado [River], 4 miles east of San Antonio, Texas; and enroute "from Montgomery, Mexico."

Range.—Southern Texas and adjoining northern Mexico. Recorded from Mexico only, possibly, "on the route from Montgomery, Mexico." [15]

Suborder Salamandroidea Noble

Salamandroidea Noble, The biology of the Amphibia, 1931, p. 473.

Family SALAMANDRIDAE Gray

Salamandridae Gray, Ann. Philos., new ser., vol. 10, 1825, p. 215.

KEY TO MEXICAN GENERA OF SALAMANDRIDAE [16]

1. Head flat, lacking dorsal keels; body unspotted, with numerous well-defined tubercles; fingers and toes relatively short..... **Taricha** (p. 14)
   Head with two dorsal crests; middle fingers elongate... **Diemictylus** (p. 15)

Genus TARICHA Gray

Taricha Gray, Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 25.

Genotype.—*Triton torosus* Eschscholtz.

Range.—Pacific North America, British Columbia, and possibly southeastern Alaska to northwestern Baja California.

Species.—Seven forms are recognized, of which three are considered as subspecies of *T. granulosus;* only one enters Mexico.

[15] At least some of the several records of *Ambystoma tigrinum* from northern and northwestern Mexico probably are referable to this race. Since, however, we have been unable to determine with desirable accuracy the range of this or any other race of *Ambystoma tigrinum* reported or expected from northern Mexico we do not allocate the uncertain locality records.

[16] We follow the work of various European taxonomists, including Wolterstorff and Herre, in segregating American genera of this family. Evidence supporting such an arrangement has been gathered by the exhaustive researches of Barbara Leonard at the University of Rochester and is in preparation for publication.

TARICHA KLAUBERI Wolterstorff

Taricha torosa klauberi Wolterstorff, Blätt. Aquar. Terrarienk., vol. 46, 1935, pp. 179–184, figs. a, b.
Triturus torosus klauberi Stejneger and Barbour, Checklist of North American amphibians and reptiles, ed. 5, 1943, p. 7.
Triturus klauberi Bishop, Handbook of salamanders, 1943, pp. 80–82, fig. 20, map 6.

Type.—Magdeburg Mus.?

Type locality.—Boulder Creek, San Diego County, Calif.

Range.—Extreme southwestern California and northwestern Baja California. Recorded from San Andreas and Keller, in Baja California.

Genus DIEMICTYLUS Rafinesque

Diemictylus Rafinesque, Ann. Nature, No. 22, 1820, p. 5.

Genotype.—Diemictylus viridescens Rafinesque.

Range.—The Gaspé Peninsula of Ontario westward to Minnesota and southward through Florida and the Atlantic Coast of Mexico to southeastern San Luis Potosí.

Species.—Six forms are recognized, three of which are subspecies of *D. viridescens;* two occur in Mexico.

KEY TO MEXICAN SPECIES OF DIEMICTYLUS

1. Olive above and yellow below; all surfaces with relatively large, round, black spots ..... **meridionalis** (p. 15)
   Above gray-brown with small black dots and numerous citron-yellow spots ..... **kallerti** (p. 15)

DIEMICTYLUS MERIDIONALIS Cope

Diemictylus miniatus meridionalis Cope, U. S. Nat. Mus. Bull. 17, 1880, p. 30.
Triturus meridionalis Dunn, Bull. Mus. Comp. Zool., vol. 62, 1918, p. 452.—Bishop, Handbook of salamanders, 1943, pp. 82–86, frontis., fig. 21, map 5.

Type.—U.S.N.M. (*fide* Cope, *loc. cit.*).[17]

Type locality.—Matamoros, Tamaulipas, and "tributaries of the Medina River and southward." Type locality here restricted to Matamoros, Tamaulipas.

Range.—Southern Texas, in the United States; northeastern Tamaulipas in Mexico. Recorded from Matamoros in *Tamaulipas.*

DIEMICTYLUS KALLERTI Wolterstorff

Diemyctylus kallerti Wolterstorff, Abh. Ber. Mus. Magdeburg, vol. 6, 1930, pp. 147–149, pl. 3, fig. 1, and text figs. 12, 13.
T(riturus) kallerti Smith, Amer. Midl. Nat., vol. 15, 1934, p. 407.

[17] "The first specimen of this form which I met with was sent to the Smithsonian Institution from Matamoras, Mexico." Cope (U. S. Nat. Mus. Bull. 34, 1889, p. 213) cites *two* specimens, uncataloged, from Matamoros, and three from "San Diego." None are cited from the "tributaries of the Medina River." We herewith restrict the type locality to Matamoros, Tamaulipas. Dr. Doris Cochran reports (January 1947) that the type or types cannot now be found in the U. S. National Museum.

Type.—Museum Magdeburg, NV, 44/29, Ex. Nr. 1.

Type locality.—Tampico, Veracruz, Mexico.

Range.—Northern Veracruz and eastern San Luis Potosí. Recorded from the type locality and Villa Juárez, San Luis Potosí.

PLETHODONTOIDEA, new suborder

This group consists of the families Desmognathidae and Plethodontidae.

Family PLETHODONTIDAE Gray

Plethodontidae GRAY, Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 31 (part).

KEY TO MEXICAN SUBFAMILIES OF PLETHODONTIDAE

1. Tarsals and carpals well ossified; a strong groove from eye to lip. **Thoriinae** (p. 16)

   Tarsals and carpals normally cartilage [18]; no groove from eye to lip. **Plethodontinae** (p. 18)

Subfamily THORIINAE Cope

Thoriidae COPE, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, pp. 110–111.
Thoriinae COPE, Proc. Amer. Philos. Soc., vol. 31, 1893, p. 334 (part).

Genus THORIUS Cope

Thorius COPE, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, p. 111.—TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 228–229.

Genotype.—*Thorius pennatulus* Cope.

Range.—Mountains at the extreme southeastern edge of the main Mexican plateau, in Veracruz and Puebla; the high mountains of central Oaxaca.

Species.—Five.

KEY TO MEXICAN SPECIES OF THORIUS

1. Nostril large, oval, greatly elongated, nearly twice as long as wide; foot and hand broadened, the digital tips more or less pointed; premaxillary teeth apparently never piercing upper lip in males ..... **pulmonaris** (p. 17)

   Nostril large, round or oval, never greatly elongated 2

2. Nostril very large, circular; digits pointed; usually a single premaxillary tooth piercing lip; subnarial swelling pendant; submental gland very distinct ..... **pennatulus** (p. 17)

   Nostrils large, oval; digits rounded at tips; one or two premaxillary teeth piercing lip; subnarial swelling not pendant 3

[18] Dunn, in "The Salamanders of the Family Plethodontidae," 1926, p. 45, mentions a cleared and stained *Plethodon glutinosus* that shows ossified carpals and tarsals. I have examined numerous specimens of the genus and find the carpals and tarsals to be cartilage, which disintegrates in rotting out the skeletons of preserved specimens. *P. glutinosus* may be an exception. I have not examined very old specimens of this form.—E. H. T.

3. Skin of head smooth or with only a faint trace of pitting; the upper extension of hyoid (epibranchial) reaches level of arm insertion; usually a single tooth piercing lip; body and tail more or less compressed_dubitus (p.17)
   Skin of head usually more or less pitted; upper extension of hyoid (epibranchial) usually extending to at least posterior level of arm or farther; body not compressed, but rounded or somewhat flattened; tail more or less cylindrical at base 4
4. Larger; maximum snout-to-vent length 32 mm.; head and body strongly pitted; three premaxillary teeth pierce lip; nostril larger; about 35 caudal grooves in full-grown specimen; found above ground under bark of rotting logs ..... narisovalis (p. 18)
   Smaller; maximum snout-to-vent length about 26 mm.; head and body usually dimly (rarely distinctly) pitted; usually one, rarely two, premaxillary teeth pierce lip; nostril proportionally smaller; about 40 caudal grooves; dorsum lighter; found under rocks or in cavities in clay, animal burrows, etc ..... troglodytes (p.18)

THORIUS PULMONARIS Taylor

Thorius pulmonaris Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 411–414, text figs. 3, 4.

Type.—EHT–HMS No. 16684.

Type locality.—Cerro San Felipe, about 12 kilometers northeast of Oaxaca, Oaxaca, Mexico.

Range.—Known only from the vicinity of the type locality; Cerro San Luis.

THORIUS PENNATULUS Cope

Thorius pennatribus [Cope], Amer. Nat., 1869, p. 222 (typographical error for *T. pennatulus* [*nomen nudum*], see Cope, type description).

Thorius pennatulus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, pp. 111–112.—Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 105–107, pl. 3, fig. 5.

Spelerpes minimus Wiedersheim (Spengel?), Morph. Jahrb., vol. 3, 1877, p. 544 ("Vera Cruz"; probably no types in existence).

Type.—Originally U. S. N. M. No. 6341, now lost. Neotype, U. S. N. M. No. 111017, Cuautlapan (near Orizaba),Veracruz.

Type locality.—"Orizava," Veracruz, Mexico.

Range.—Known from low mountains (3,000 feet more or less) in the region about and below Orizaba in Veracruz. Recorded from Orizaba and Cuautlapan, Veracruz.

THORIUS DUBITUS Taylor

Thorius pennatulus Taylor (*nec* Cope), Univ. Kansas Sci. Bull., vol. 26, 1940, pp. 414–416 (part), pl. 47, fig. B.

Thorius dubitus Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 108–110, pl. 3, fig. 3.

Type.—EHT–HMS No. 17751.

Type locality.—Two miles south of Acultzingo, Veracruz, Mexico.

Range.—High mountain crests (—7,000 feet) in eastern central Veracruz. Specimens recorded from the type locality, and from nearby localities in Puebla.

THORIUS NARISOVALIS Taylor

Thorius narisovalis Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 416–418, pl. 47, fig. 3.

Type.—EHT–HMS No. 17859.

Type locality.—Cerro San Felipe, 15 kilometers northeast of Oaxaca, Oaxaca, Mexico, elevation 2,600 to 3,000 meters.

Range.—Known from the vicinity of the type locality (including Cerro San Luis) and Reyes, Oaxaca.

THORIUS TROGLODYTES Taylor

Thorius pennatulus Taylor (nec Cope), Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 293–294; vol. 26, 1939 (1940, pp. 414–416 (part), pl. 47, fig. A.

Thorius troglodytes Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 110–112, pl. 3, fig. 4.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 535, pl. 19.

Type.—EHT–HMS No. 17791.

Type locality.—Two miles south of Acultzingo, Veracruz, Mexico.

Range.—Known from the type locality and immediately adjacent areas in the state of Puebla, at an elevation of about 7,000 feet.

Subfamily Plethodontinae Boulenger

Plethodontinae Boulenger, Catalogue of the Batrachia Gradientia of the British Museum, ed. 2, 1882, p. 51.

KEY TO MEXICAN GENERA OF PLETHODONTINAE

1. Tongue attached in front; septomaxillae present 2
   Tongue boletoid, free; one premaxilla; bony septomaxilla usually if not invariably absent 4
2. Two premaxillae present ..... **Ensatina** (p. 19)
   One premaxilla present 3
3. Digits 4–4; some if not all forms with several rows of maxillary teeth. **Batrachoseps** (p. 19)
   Digits 4–5, distinct, unwebbed ..... **Aneides** (p. 20)
4. No sublingual fold present; vertebrae amphicoelous 5
   A sublingual fold present; vertebrae never typically amphicoelous (anterior part of centrum partly or wholly filled with bony deposit) 6
5. Digits completely or almost completely webbed or palmate, the tips, if free, not widened; no distinct subterminal pads present; maxillary teeth not typically pleurodont ..... **Bolitoglossa** (p. 22)
   Digits with at least the outer series of phalanges free on outer toes; toes widened, truncate ..... **Magnadigita** (p. 21)
6. A double series of enlarged dorsal glandules; skull well ossified; diminutive; 12 costal folds; nostril large ..... **Parvimolge** (p. 20)
   No double series of glandules along middorsal line 7

7. Body elongated; 13 or more costal folds; skull well ossified--- **Oedipina** (p. 21)
   Body normal, less than 13 costal folds---------- 8
8. Digits free beyond metatarsals and metacarpals (or only slightly webbed beyond) (*cephalica* group); skull well developed; vertebrae not completely opisthocoelous; larger---------- **Pseudoeurycea** (p. 25)
   Digits webbed to end of proximal phalanx; the hand and foot widespread with well-developed terminal pads; vertebrae opisthocoelous but without a rounded articular condyle; smaller-------- **Chiropterotriton** (p. 30)

Genus ENSATINA Gray

Ensatina Gray, Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 48.

Genotype.—*Ensatina eschscholtzii* Gray.

Range.—Pacific North America from British Columbia to northwestern Baja California.

Species.—Four, two of which are races of *E. eschscholtzii;* one occurs in Mexico.

ENSATINA CROCEATER (Cope)

Plethodon croceater Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 19, 1867, p. 210.
Ensatina croceater Stejneger and Barbour, A checklist of North American amphibians and reptiles, ed. 2, 1923, p. 12.—Bishop, Handbook of salamanders, 1943, pp. 295–297, fig. 83, map 36.

Type.—U.S.N.M. No. 4701 (now lost).

Type locality.—"Fort Tejon," Calif.

Range.—Southern California and northern Baja California, above elevations of about 4,000 feet. Recorded from Cape San Lucas (doubtful occurrence), "75 mi. southeast San Diego, California," and San Pedro Mártir Mountains.

Genus BATRACHOSEPS Bonaparte

Batrachoseps Bonaparte, Iconografia della fauna Italica, vol. 2, fasc. 26, 1839, fol. 131, not paged.

Genotype.—*Salamandrina attenuata* Eschscholtz.

Range.—Pacific North America from southern Alaska to northern Baja California; possibly Colima.

Species.—Six forms are described, all but one of which are subspecies of *B. attenuatus;* one occurs in Mexico.

BATRACHOSEPS ATTENUATUS LEUCOPUS Dunn

Batrachoseps leucopus Dunn, Copeia, No. 109, 1922, pp. 61–62.
Batrachoseps attenuatus leucopus Dunn, The salamanders of the family Plethodontidae, 1926, pp. 241–243.—Bishop, Handbook of salamanders, 1943, pp. 317–320, fig. 91, map 38.

Type.—U.S.N.M. No. 64319.

Type locality.—Los Coronados, North Island, Baja California.

Range.—Southwestern California and northwestern Baja California. In Mexico, recorded from La Paz, San Pedro Mártir Mountains, East Coronado Island, North Coronado Island. (The report of *Batrachoseps attenuatus* from Nevado de Colima [Jalisco or Colima][19] may be authentic or may represent the presence of an undescribed species.)

Genus ANEIDES Baird

Aneides Baird, Iconographic encyclopaedia of science, literature and arts, vol. 2, zool., 1849, p. 257.

Genotype.—*Salamandra lugubris* Hallowell.

Range.—Southwestern British Columbia to northwestern Baja California; central eastern United States from northeastern Alabama to northern West Virginia.

Species.—Five forms, two of which are subspecies of *A. lugubris;* one occurs in Mexico.

ANEIDES LUGUBRIS LUGUBRIS (Hallowell)

Salamandra lugubris Hallowell, Proc. Acad. Nat. Sci. Philadelphia, vol. 4, 1849, p. 126.

Aneides lugubris Baird, Iconographic encyclopaedia of science, literature and arts, vol. 2, zool., 1849, p. 257.

Aneides lugubris lugubris Grinnell and Camp, Univ. California Publ. Zool., vol. 17, 1917, p. 134.—Slevin, Occ. Pap. California Acad. Sci., No. 16, 1928, pp. 71–74, pl. 10, fig. 1.—Bishop, Handbook of salamanders, 1943, pp. 340–343, figs. 95c, 99, map 41.

Type.—Acad. Nat. Sci. Philadelphia No. 1257.

Type locality.—Monterey, Calif.

Range.—Western California from Humboldt County to near the border of Baja California; Los Coronados Islands, Baja California.

Genus PARVIMOLGE Taylor

Parvimolge Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 223, 226.

Genotype.—*Oedipus townsendi* Dunn.

Range.—Foothills of central Veracruz.

Species.—One.

PARVIMOLGE TOWNSENDI (Dunn)

Oedipus townsendi Dunn, Proc. Biol. Soc. Washington, vol. 35, 1922, pp. 5–6 (part).
Bolitoglossa townsendi Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 107.
Parvimolge townsendi Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 223.

[19] Gadow, Proc. Zool. Soc. London, 1905, p. 204.

Type.—Mus. Comp. Zool. No. 8017.

Type locality.—Cerro de los Estropajos, near Jalapa, Veracruz, Mexico.

Range.—Known from the type locality, and Cuautlapan, Veracruz.

Genus OEDIPINA Keferstein

Oedipina Keferstein, Nachr. Ges. Göttingen, vol. 15, 1868, p. 331.—Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 226–228.

Genotype.—*Oedipina uniformis* Keferstein.

Range.—Central Veracruz to Colombia.

Species.—Seven, one occurring in Mexico.

OEDIPINA LINEOLA (Cope)

Spelerpes lineolus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 197.

Opheobatrachus lineolus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, pp. 101–102.

Oedipina lineolus Cope, U. S. Nat. Mus. Bull. 32, 1887, p. 8; Amer. Nat., 1896, p. 1022.

Oedipus lineolus Dunn, Publ. Field Mus. Nat. Hist., zool. ser., vol. 12, 1924, pp. 99–100.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 294–295, pl. 29, fig. 3.

Spelerpes (*Oedipus*) *infuscatus*? Peters, Monatsb. Akad. Wiss. Berlin, 1879, p. 778 ("Haiti," in error; Berlin Mus. No. 6556).

Type.—Acad. Nat. Sci. Philadelphia No. 735.

Type locality.—"Mexican Tableland." Probably eastern central Veracruz, below 4,000 feet.

Range.—Eastern central Veracruz, between 2,000 and 4,000 feet above sea level. Recorded or known from Jalapa, Cuautlapan, San Lorenzo, Metlac, and San Juan de Gracia in Veracruz.

Genus MAGNADIGITA Taylor

Magnadigita Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 218.

Genotype.—*Bolitoglossa nigroflavescens* Taylor.

Range.—Central Veracruz to Colombia and Venezuela.

Species.—Fourteen are recorded, three of which occur in Mexico.

KEY TO MEXICAN SPECIES OF MAGNADIGITA

1. An irregular, dorsolateral light line on each side ..... **sulcata** (p. 22)
   No such line on each side 2
2. Gray to purplish black above, the tail darker than body; lower sides and venter lighter, cream or yellowish cream, usually with large, irregular, yellow-green to yellowish spots ..... **nigroflavescens** (p. 22)
   Black above, making a gradual transition to the lighter underside of belly and neck; a few silver-gray flecks on sides, back, and first third of tail ..... **macrinii** (p. 22)

MAGNADIGITA SULCATA (Brocchi)[20]

Spelerpes sulcatum Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, p. 112, pl. 20, fig. 2.

Type.—Mus. Hist. Nat. Paris.
Type locality.—Mexico.
Range.—Unknown.

MAGNADIGITA NIGROFLAVESCENS (Taylor)

Bolitoglossa nigroflavescens Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 150–152, pl. 8, pl. 9, figs. 9–10.
Magnadigita nigroflavescens Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 218.

Type.—U.S.N.M. No. 111169.
Type locality.—Cerro Ovando, Chiapas, Mexico, elevation between 5,000 and 6,000 feet.
Range.—Known only from type locality.

MAGNADIGITA MACRINII (Lafrentz)

Oedipus macrinii Lafrentz, Abh. Ber. Mus. Magdeburg, vol. 6, 1930, pp. 150–152.[21]
Bolitoglossa macrinii Taylor, Herpetologica, vol. 2, 1941, p. 65.
Magnadigita macrinii Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 218.

Type.—Museum Madgeburg N. V. 52/29.
Type locality.—Cerro Espino, 1,000 meters, near Concordia, Oaxaca, Mexico.
Range.—Known from the type locality.

Genus BOLITOGLOSSA Duméril, Bibron, and Duméril

Bolitoglossa (part) Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 88.

Genotype.—*Bolitoglossa mexicana* Duméril, Bibron, and Duméril (=*Salamandra platydactylus* Gray).
Range.—Eastern San Luis Potosí to Pará, Brazil, and northern Bolivia.
Species.—Twenty are recorded, of which six are known from Mexico.

KEY TO MEXICAN SPECIES OF BOLITOGLOSSA

1. Teeth absent on maxilla; diminutive form; tail much shorter than head and body ..... **rufescens** (p. 23)
   Teeth present on maxilla, arising from a flat surface, not from edge of jaw. 2
2. Diminutive species; tail much shorter than head and body. **occidentalis** (p. 23)

[20] Generic allocation uncertain, since the type (the only known specimen) has not been examined.
[21] Also described as a new species in Lafrentz, Blätter für Aquar.-Terr., vol. 32, Feb. 28, 1931, pp. 55–56, 1 fig. This actually may have antedated the publication referred to here.

Large species, the tail in adults as long as, nearly as long as, or a little longer than head and body 3
3. Sides and belly blackish 4
Belly cream, immaculate (or rarely with slight pigmentation). flaviventris (p. 24)
4. Vomerine teeth in a single series usually 5
Vomerine teeth in several short series ("patch") ..... yucatana (p. 25)
5. Dorsum orange to orange-brown with usually a dark triangular occipital spot and often a few irregular or rounded, small, dorsal, black marks ..... platydactyla [22] (p. 23)
Dorsum yellowish or cream with numerous dark spots occasionally forming continuous lines, or rows of black spots; belly and sides with small cream flecks ..... moreleti (p. 24)

BOLITOGLOSSA RUFESCENS (Cope)

Oedipus rufescens Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, p. 104.
Bolitoglossa rufescens Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 145.

Type.—Apparently lost.

Type locality.—Orizaba, Veracruz, Mexico.

Range.—San Luis Potosí to Guatemala, Atlantic drainage. Known or reported from *San Luis Potosí:* 3 miles north of Huichihuayán; *Veracruz:* Córdoba, El Potrero, Mata de Caña, Potrero Viejo, Cuautlapan, Peñuela, Presidio, Tezonapa; *Oaxaca:* Santa Efigenia; *Tabasco:* no specific locality; *Chiapas:* Palenque; *Petén:* Piedras Negras.

BOLITOGLOSSA OCCIDENTALIS Taylor

Bolitoglossa occidentalis Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 145–147, text fig. 1, C, pl. 9, figs. 1–4.

Type.—U. S. N. M. No. 111085.

Type locality.—La Esperanza, near Escuintla, Chiapas, Mexico.

Range.—Pacific drainage areas of Chiapas, Guatemala, and probably of Oaxaca. Known from the type locality and Finca Juárez, Chiapas, in Mexico.

BOLITOGLOSSA PLATYDACTYLA (Gray)

Salamandra variegata Gray, Supplement, *in* Griffith and Pidgeon's "Animal Kingdom . . .," vol. 9, 1831, p. 107 (not of Bory de St. Vincent, 1829, Dict. Class Hist. Nat., vol. 15, p. 68; Mexico, types in Brit. Mus. Nat. Hist.).
Oedipus variegatus Gray, Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 48.
Spelerpes variegatus Strauch, Mém. Acad. Sci. St. Pétersbourg, ser. 7, vol. 16, 1870, p. 84.
Geotriton variegata Garman, Bull. Essex Inst., vol. 16, 1884, p. 39.
Salamandra platydactylus Gray, Supplement, *in* Griffith and Pidgeon's "Animal Kingdom . . .," vol. 9, 1831, p. 107.

[22] Some specimens from the Potrero Viejo region of Veracruz have the vomerine teeth in a "patch," whereas others taken at the same time and place, and presumably of the same age, have only a single continuous series.

Oedipus platydactylus Tschudi, Mem. Soc. Sci. Nat. Neuchâtel, vol. 2, 1838, p. 58.—Dunn, The salamanders of the family Plethodontidae, 1926, pp. 400–403.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 297–299, pl. 28, fig. 1.—Stuart, Misc. Publ. Mus. Zool. Univ. Michigan, No. 56, 1943, pl. 2, fig. 1.

Bolitoglossa platydactyla Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 219.

Bolitoglossa mexicana Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, pp. 93–97, pl. 104, fig. 1 (part only, cotypes in Mus. Hist. Nat. Paris, from Veracruz, Oaxaca, México, and (?) Dolores in Petén).

Spelerpes mexicanum Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, pp. 113–114 (part), pl. 28 bis, figs. 1–4 (restricts the name to a cotype from Veracruz).

Salamandra togata Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 94 (type that of *B. mexicana*).

Geotriton carbonarius Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 12, 1860, p. 373 (Jalapa, Veracruz, Acad. Nat. Sci. Phila. Nos. 503–504).

?*Spelerpes punctatum* Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, p. 115 (Mexico, types presumably in Mus. Hist. Nat. Paris).

Type.—Brit. Mus. Nat. Hist., those of *S. variegata* Gray.

Type locality.—Mexico.

Range.—From San Luis Potosí south to southern Veracruz and Oaxaca, below elevations of about 3,500 feet. Aside from the type locality it is known or reported from *San Luis Potosí:* 15 miles south of Valles, Tamazunchale, Huichihuayán; *Hidalgo:* Chapulhuacán; *Veracruz:* Jalapa, Orizaba, Motzorongo, Achotal, Cuautlapan, Potrero Viejo, Cerro Gordo, Mata de Caña, Tezonapa, Cuatotolapam, San Juan de la Punta, Presidio, 5 miles east of Córdoba, near San Lorenzo; *Oaxaca:* San Cristóbal.

BOLITOGLOSSA FLAVIVENTRIS (Schmidt)

Oedipus flaviventris Schmidt, Publ. Field Mus. Nat. Hist., zool. ser., vol. 20, 1936, pp. 148–150.

Bolitoglossa flaviventris Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 219.

Spelerpes salvinii Brocchi (*nec* Gray), Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, p. 117, pl. 18, figs. 3, 4.

Oedipus salvinii Taylor (*nec* Gray), Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 296–297, pl. 28, fig. 2.

Type.—U. S. N. M. No. 46922.

Type locality.—Chicharras, Chiapas, Mexico.

Range.—Pacific coast of Chiapas. Recorded from the type locality and La Esperanza, Chiapas. Specimens in the U. S. National Museum are from "Tehuantepec."

BOLITOGLOSSA MORELETI Smith

Bolitoglossa mexicana Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, pp. 96–97 (part).—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 545–547, fig. 58.

Oedipus mexicanus SCHMIDT, Publ. Field Mus. Nat. Hist., zool. ser., vol. 20, 1936, pp. 146–147 (part).—STUART, Misc. Publ. Mus. Zool. Univ. Michigan, No. 56, 1943, pl. 2, fig. 2 (part).
Bolitoglossa moreleti SMITH, Herpetologica, vol. 3, 1945, pp. 14–19.

Type.—U. S. N. M. No. 116079.
Type locality.—Palenque, Chiapas.
Range.—Atlantic slopes of Chiapas and Petén, Guatemala. Recorded in Mexico only from the type locality.

BOLITOGLOSSA YUCATANA (Peters)

Spelerpes (Oedipus) yucatanus PETERS, Sitzb. Ges. Nat. Freunde Berlin, 1882, pp. 137–138.
Spelerpes yucatanicus BOULENGER, Catalogue of the Batrachia Gradientia of the British Museum, ed. 2, 1882, p. 72 (Yucatán, Mexico; type Brit. Mus.).
Bolitoglossa yucatana TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 219.

Type.—Mus. Nat. Berlin No. 10231.
Type locality.—Yucatán, Mexico.
Range.—Yucatán, Mexico; northern Guatemala.

Genus PSEUDOEURYCEA Taylor

Pseudoeurycea TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 209, 212.

Genotype.—Spelerpes leprosus Cope.
Range.—Zacatecas and Nuevo León southward to Guatemala.
Species.—Eighteen forms are recorded, three of which are subspecies of *P. cephalica*; all but three occur in Mexico.

KEY TO MEXICAN SPECIES OF PSEUDOEURYCEA

1. Body black or lead color in life, with paired series of red or orange markings; very large forms 2
   Body without dorsal red or red-orange markings 3
2. A pair of large red marks on occiput; adpressed limbs in males separated by three costal folds; teeth less numerous ..... **bellii** (p. 26)
   No pair of red or orange spots on head; adpressed limbs of males touch or are separated by a single costal fold; teeth more numerous ..... **gigantea** (p. 27)
3. Premaxillary teeth of males large, bifid, the outer section elongate, curved, clawlike 4
   Premaxillary teeth of males lacking an elongate clawlike terminal part 7
4. Paired series of small yellow spots on back and one lateral series, more or less distinct 5
   No series of dorsal or lateral light spots 6
5. Lavender above, yellow cream below; limbs proportionally shorter, teeth fewer in all series ..... **gadovii** (p. 27)
   Black above, gray-black below, limbs proportionally longer; teeth more numerous ..... **melanomolga** (p. 27)
6. Usually uniform olive or gray-olive above; limbs longer, touching or overlapping somewhat in adults; hands and feet larger ..... **unguidentis** (p. 27)
   Olive to gray or brownish with some dark-brown or reddish-brown flecks, the costal grooves usually with a dark line; limbs shorter, the adpressed limbs separated by two or more costal folds ..... **smithi** (p. 28)

7. Web including none to about half of proximal phalanx of middle digits-- 8
   Web between middle toes including entire phalanx; toes broad, narrowing toward tip---------- 12
8. Maxillary-premaxillary teeth less than 30 on each side---------- 9
   Maxillary-premaxillary teeth 40 or more on each side---------- 11
9. Tail short, about 70 percent of head-body length; adpressed limbs separated by two costal folds; body dark or blackish brown with numerous small, irregular dark spots---------- **cochranae** (p. 28)
   Tail longer, about 90 to 100 percent of head-body length; adpressed limbs separated by one costal fold or touch, in adults---------- 10
10. Teeth less numerous (22–24); body brownish to brownish gray with cream flecks (rarely darker flecks)---------- **altamontana** (p. 28)
    Teeth 19–20; a red-brown, fawn, or orange dorsal stripe--- **robertsi** (p. 28)
11. Teeth small with reddish-brown tips; toes not widened terminally; maxillary-premaxillary teeth about 40 on each side---------- **leprosa** (p. 28)
    Teeth not tipped with red-brown; teeth large, about 50 in maxillary-premaxillary series; toes widened at tips---------- **nigromaculata** (p. 29)
12. Large (70 mm. snout to vent); maxillary-premaxillary teeth 59 on one side; vomerine teeth 18–20; tail, rarely body, spotted white; terminal pads under digit tips well developed---------- **galeanae** (p. 29)
    Smaller, not exceeding 60 mm. snout to vent---------- 13
13. Body dark, limbs red; tip of tail red or lighter colored than body. **cephalica rubrimembris** (p. 30)
    Limbs not red, tail usually colored like body---------- 14
14. Body in life lead-colored, flecked and clouded with cream-white, especially on venter; central western plateau--------**cephalica manni** (p. 30)
    Body uniformly colored, lacking light flecks; eastern plateau. **cephalica cephalica** (p. 29)

PSEUDOEURYCEA BELLII (Gray)

Oedipus platydactylus Baird, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 1, 1849, p. 286 (*nec Salamandra platydactylus* Cuvier).

Spelerpes belli Gray, Catalogue of the Batrachia Gradientia of the British Museum, 1850, p. 46.

Oedipus bellii Dunn, Bull. Mus. Comp. Zool., vol. 62, 1918, p. 471.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 264–266, pl. 27, figs. 1, 2.

Bolitoglossa bellii Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, p. 77.

Pseudoeurycea bellii Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Bolitoglossa mexicana Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 93 (part), pl. 104, fig. 2.

Type.—Brit. Mus. Nat. Hist.

Type locality.—Mexico.

Range.—High elevations, Nayarit southeastward to Querétaro and western Puebla; also in the Sierra Madre del Sur of Guerrero and the central mountains of Oaxaca. Known or reported from *Jalisco:* Belén, Cumbre de los Arrastrados, Talpa, Mascota, Guadalajara; *Nayarit:* Sierra de Nayarit, Tepic; *Michoacán:* Pátzcuaro, Tangancícuaro, Carapa; *Oaxaca:* Putla, Cerro San Felipe near Oaxaca, Mount Zempoaltepec; *Guanajuato:* Guanajuato; *Querétaro:* San Juan del Río; *Hidalgo:* Guerrero; *México:* 10 miles west of Villa Victoria,

Nevado de Toluca; *Guerrero:* Omilteme; *Tlaxcala:* no specific locality; *Morelos:* Lakes of Zempoala; *Puebla:* 2 miles east of Río Frío, México.

PSEUDOEURYCEA GIGANTEA (Taylor)

Oedipus giganteus Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 266–269, pl. 27, figs. 3, 4.
Bolitoglossa gigantea Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 112.
Pseudoeurycea gigantea Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—Mus. Comp. Zool. No. 8435.

Type locality.—Jalapa, Veracruz.

Range.—Known from eastern Hidalgo, northern Puebla and highlands of northern Veracruz. Besides the type locality, specimens are known from *Hidalgo:* near Santa Anita; *Puebla:* near Tezuitlán; *Veracruz:* Cofre de Perote.

PSEUDOEURYCEA GADOVII (Dunn)

Oedipus gadovii Dunn, The salamanders of the family Plethodontidae, 1926, pp. 437–438.
B. (*olitoglossa*) *gadovii* Taylor, Herpetologica, vol. 2, 1941, p. 58.
Pseudoeurycea gadovii Taylor, Univ. of Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—Brit. Mus. Nat. Hist. No. 1903.9.30.312.

Type locality.—Xometla, 8,500 feet elevation, Mount Orizaba, Veracruz, Mexico.

Range.—Mount Orizaba, in Puebla and Veracruz; known also from Mount Malintzín (Malinche), Puebla.

PSEUDOEURYCEA MELANOMOLGA (Taylor)

Bolitoglossa melanomolga Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp. 81–83.
Pseudoeurycea melanomolge Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 24626.

Type locality.—20 kilometers north of San Antonio Limón (Totalco), Veracruz, Mexico.

Range.—Known only from the type locality, and from Tezuitlán, Puebla.

PSEUDOEURYCEA UNGUIDENTIS (Taylor)

Bolitoglossa unguidentis Taylor, Herpetologica, vol. 2, 1941, pp. 57–62, figs. 1 A–C, C–D, 3 A–B.
Pseudoeurycea unguidentis Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 17102.

Type locality.—Cerro San Felipe, 15 kilometers northeast of Oaxaca, Mexico, elevation 2,200 meters.

Range.—Known only from the type locality.

PSEUDOEURYCEA SMITHI (Taylor)

Oedipus sulcatus DUNN (*nec* Brocchi), The salamanders of the family Plethodontidae, 1926, pp. 364–366, fig. 60 (map).
Oedipus smithi TAYLOR, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 269–272, pl. 25, figs. 5–6.
Bolitoglossa smithi TAYLOR, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), p. 418.
Pseudoeurycea smithi TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 3966.

Type locality.—Cerro de San Luis, 15 miles northeast (not northwest) of Oaxaca, Oaxaca, Mexico.

Range.—Known only from Cerro San Felipe and Cerro San Luis, Oaxaca.

PSEUDOEURYCEA COCHRANAE (Taylor)

Bolitoglossa cochranae TAYLOR, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 343–345.
Pseudoeurycea cochranae TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 24594.

Type locality.—Cerro San Felipe, Oaxaca, Mexico.

Range.—Known only from the type locality.

PSEUDOEURYCEA ALTAMONTANA (Taylor)

Oedipus altamontanus TAYLOR, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 272–274, pl. 25, figs. 3–4.
Bolitoglossa altamontana TAYLOR, Herpetologica, vol. 2, 1941, p. 57.
Pseudoeurycea altamontana TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 12245.

Type locality.—Lake Zempoala (Cempoala), Morelos, Mexico, elevation 10,500 feet.

Range.—Known from type locality and from the west slope of Mount Popocatépetl.

PSEUDOEURYCEA ROBERTSI (Taylor)

Oedipus robertsi TAYLOR, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 287–289, pl. 26, fig. 2.
Pseudoeurycea robertsi TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS No. 12503.

Type locality.—Nevado de Toluca, México, elevation 10,000 to 11,000 feet.

Range.—Known only from the type locality.

PSEUDOEURYCEA LEPROSA (Cope)

Spelerpes leprosus COPE (part), Proc. Acad. Nat. Sci. Philadelphia, vol. 21, 1869, pp. 105–106.
Oedipus leprosus DUNN, Bull. Mus. Comp. Zool., vol. 62, 1918, p. 470.—TAYLOR, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 274–276, pl. 29, fig. 2.
Bolitoglossa leprosa TAYLOR, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 143.
Pseudoeurycea leprosa TAYLOR, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

?*Spelerpes laticeps* Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, p. 110, pl. 18, fig. 1 (Veracruz, Mexico; Mus. Hist. Nat. Paris).

Spelerpes orizabensis Blatchley, Proc. U. S. Nat. Mus., vol. 16, 1893, p. 37 (Mount Orizaba, Veracruz; U. S. N. M. Nos. 19266–19267).

Oedipus orizabensis Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 280–283, pl. 25, figs. 1, 2.

Spelerpes gibbicaudus Blatchley, Proc. U. S. Nat. Mus., vol. 16, 1893, pp. 38–39 (same type specimen as *Spelerpes leprosus*).

Oedipus cephalicus Dunn (part), The salamanders of the family Plethodontidae, 1926, pp. 380–384, fig. 67 (map).

Type.—Originally U.S.N.M. No. 6340; now U.S.N.M. No. 19255.

Type locality.—Orizaba, Veracruz, Mexico.

Range.—High mountains of Puebla, Veracruz, Morelos, México, and Distrito Federal. Known or reported from *Distrito Federal:* mountains near El Guardia, Valle Alegre (Ajusco), Kilometer 35 on road between Mexico City and Tres Cumbres, Morelos, Desierto de los Leones; *México:* West slopes of Mount Popocatépetl, Llano Grande; *Morelos:* near Tres Cumbres, Lakes of Zempoala; *Puebla:* region about Río Frío, México, west slope of Cerro Negro, near Tezuitlán; *Veracruz:* near Las Vigas, Cruz Blanca, 17 kilometers northeast of Totalco.

PSEUDOEURYCEA NIGROMACULATA (Taylor)

Bolitoglossa nigromaculata Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 141–145, text figs. 1A, 1B, pl. 9, figs. 5–6.

Pseudoeurycea nigromaculata Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—U.S.N.M. No. 110635.

Type locality.—Cuautlapan, Veracruz, Mexico.

Range.—Known only from type locality.

PSEUDOEURYCEA GALEANAE (Taylor)

Bolitoglossa galaenae (sic, error typ.) Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp. 83–85.

Pseudoeurycea galeanae Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—EHT–HMS. No. 17146.

Type locality.—Near Galeana, Nuevo León, Mexico, 7,000 feet elevation.

Range.—Known only from the type locality.

PSEUDOEURYCEA CEPHALICA CEPHALICA (Cope)

Spelerpes cephalicus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 196.

Oedipus cephalicus Dunn, Publ. Field Mus. Nat. Hist., zool. ser., vol. 12, 1924, p. 99.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 283–287, pl. 26, figs. 3, 4.

Pseudoeurycea cephalica cephalica Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

757435—48——3

?*Spelerpes laticeps* Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 3, 1883, p. 110, pl. 18, fig. 1 (Mus. Hist. Nat. Paris, Veracruz).

Type.—Lost (*fide* Dunn); neotype EHT–HMS No. 4372, Cruz Blanca, Veracruz.

Type locality.—"Mexican Tableland," Mexico.

Range.—Veracruz, Puebla, México, and Morelos. Known or reported from *Veracruz:* Cruz Blanca, north slope of Cofre de Perote up to 10,500 feet, Pan de Olla, 17 kilometers north of Totalco, Tequeyutepec, 2 kilometers west of Acultzingo; *Puebla:* between Río Frío and Puebla; 2 miles east of Río Frío; *Morelos:* Tres Cumbres, Lakes of Zempoala; *México:* Río Frío, Llano Grande, 10 miles west of Villa Victoria, Mount Popocatépetl.

PSEUDOEURYCEA CEPHALICA RUBRIMEMBRIS (Taylor and Smith)

Bolitoglossa cephalica rubrimembris Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 539–541.

Type.—U. S. N. M. No. 110661.

Type locality.—Six kilometers south of Santa Anita, Hidalgo, Mexico.

Range.—Northern Hidalgo, at high elevations (about 4,500 feet).

PSEUDOEURYCEA CEPHALICA MANNI (Taylor)

Oedipus manni Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 277–280.
Pseudoeurycea cephalica manni Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 209.

Type.—Mus. Comp. Zool. No. 3915.

Type locality.—Guerrero, Hidalgo, Mexico.

Range.—High mountains of southern Hidalgo.

Genus CHIROPTEROTRITON Taylor

Chiropterotriton Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 213–218.

Genotype.—Oedipus multidentatus Taylor.

Range.—Hidalgo to Honduras and possibly Costa Rica.

Species.—Ten, possibly eleven;[23] nine occur in Mexico.

KEY TO MEXICAN SPECIES OF CHIROPTEROTRITON

1. Nostrils large in adults; limbs separated by 4 to 5 costal folds; parasphenoid tooth groups close together; diminutive species, maximum size 28 mm. snout to vent; terrestrial ..... **dimidiata** (p. 31)
   Nostrils small in adults 2
2. Skull poorly ossified in adults; adpressed limbs separated by two costal folds; maxillary-premaxillary teeth about 20 on each side in females, 16 to 18 in males on each side; tail longer than head and body; parasphenoid teeth closely approximated; terrestrial ..... **chondrostega** (p. 31)

[23] By tentative allocation here of *Chiropterotriton picadoi* (Stejneger).

Skull normally well ossified in adults 3

3. Maxillary-premaxillary series of teeth not greatly reduced in males (more than half); tails distinctly longer than head and body 4
Maxillary-premaxillary teeth greatly reduced in adult males, usually less than half number of teeth in females 6

4. Teeth larger, curved; arms touch or overlap when adpressed; digits more dilated at tips; maxillary-premaxillary series about 21 on each side; females darker on venter than males; arboreal ..... **arborea** (p. 32)
Teeth not especially large or curved 5

5. Digits less dilated at tips; maxillary-premaxillary tooth series about 34 in females, 25 in males; teeth not elongate or noticeably curved; males and females white below; terrestrial or arboreal ..... **multidentata** (p. 32)
Maxillary-premaxillary tooth series 25 to 31; vomerine teeth 8 to 13; limbs overlap width of 2 costal folds; second finger longer than fourth; terrestrial ..... **mosaueri** (p. 32)

6. Adpressed limbs touch or overlap in both sexes; maxillary-premaxillary teeth 25 in adult females, 5 to 8 in adult males; vomerine teeth about 6; arboreal ..... **lavae** (p. 32)
Adpressed limbs separated usually in both sexes (may touch in *xolocalcae* males) 7

7. Surface of head not roughened, not flattened especially; terrestrial 8
Head flattened, the surface somewhat roughened; adpressed limbs separated by about one costal fold in females, may touch in males; vomerine teeth 13 on each side; maxillary-premaxillary teeth 36 on each side in females; arboreal ..... **xolocalcae** (p. 33)

8. Adpressed limbs separated by from 2 to 4 costal folds; females about 24 maxillary-premaxillary teeth on each side, males 6 to 8; vomerine teeth 6 or 7; larger ..... **chiroptera** (p. 32)
Adpressed limbs separated by from 1½ to 3 costal folds; females 25 to 27 maxillary-premaxillary teeth, males 13 or 14; vomerine teeth 4 or 5; smaller ..... **terrestris** (p. 33)

CHIROPTEROTRITON DIMIDIATA (Taylor)

Bolitoglossa dimidiata Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 408–411, figs. 1–2.

Chiropterotriton dimidiata Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—EHT–HMS No. 17677.

Type locality.—Guerrero, near Mineral del Monte, southern Hidalgo, Mexico.

Range.—Hidalgo. Known only from the type locality and the nearby El Chico National Park.

CHIROPTEROTRITON CHONDROSTEGA (Taylor)

Bolitoglossa chondrostega Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 113–115.

Chiropterotriton chondrostega Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—EHT–HMS No. 17304.

Type locality.—Durango, Hidalgo, Mexico, elevation 5,000 to 6,000 feet.

Range.—Northern Hidalgo. Known only from the type locality.

CHIROPTEROTRITON ARBOREA (Taylor)

Bolitoglossa arborea Taylor, Herpetologica, vol. 2, 1941, pp. 62–65, figs. 4 a–c, 5 a–c.

Chiropterotriton arborea Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—EHT–HMS No. 16743.

Type locality.—Near Tianguistengo, Hidalgo, Mexico.

Range.—Known only from the type locality and vicinity.

CHIROPTEROTRITON MULTIDENTATA (Taylor)

Oedipus multidentata Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 289–291, pl. 29, fig. 1.

Bolitoglossa multidentata Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), p. 407.

Chiropterotriton multidentata Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—Mus. Comp. Zool. No. 14812.

Type locality.—Alvarez (Kilometer 53, on Potosí y Río Verde Railroad), San Luis Potosí, Mexico.

Range.—San Luis Potosí and Hidalgo. Reported from El Chico National Park in Hidalgo.

CHIROPTEROTRITON MOSAUERI (Woodall)

Oedipus mosaueri Woodall, Occ. Pap. Mus. Zool. Univ. Michigan, No. 444, 1941, pp. 1–4.

Chiropterotriton mosaueri Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—Univ. Mich. Mus. Zool. No. 88839.

Type locality.—Durango, Hidalgo, Mexico, 7,200 feet elevation.

Range.—Known only from the type locality.

CHIROPTEROTRITON LAVAE (Taylor)

Bolitoglossa lavae Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 295–298, pl. 27, figs. 5–6.

Chiropterotriton lavae Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—EHT–HMS No. 28937.

Type locality.—2 miles west of La Joya, Veracruz, Mexico.

Range.—Known from Toxtlacuaya and La Joya, *Veracruz.*

CHIROPTEROTRITON CHIROPTERA (Cope)

Spelerpes chiropterus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 15, 1863, p 54.

Oedipus chiropterus Dunn, Publ. Field Mus. Nat. Hist., zool. ser., vol. 12, 1924, pp. 99–100.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 291–293.

Bolitoglossa chiroptera Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 410–411.

Chiropterotriton chiroptera Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Spelerpes orculus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, pp. 196–197 ("Mexican Table Land"; types lost).

Type.—Unknown.

Type locality.—Mirador, Veracruz, Mexico.

Range.—Puebla, Veracruz, México, Morelos. Recorded or known from *Puebla:* near Río Frío, Mount Popocatépetl; *México:* Llano Grande, Río Frío, northwestern slope Mount Popocatépetl; *Veracruz:* Cruz Blanca, Cofre de Perote up to 11,000 feet, near Vigas, 17–20 kilometers north of Totalco (San Antonio Limón), Toxtlacuaya; *Distrito Federal:* Desierto de los Leones; *Morelos:* Tres Cumbres, Lakes of Zempoala, Mount Ajusco.

CHIROPTEROTRITON TERRESTRIS (Taylor)

Bolitoglossa terrestris Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 115–117.
Chiropterotriton terrestris Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—EHT–HMS No. 23354.

Type locality.—Six miles south of Tianguistengo, Hidalgo, Mexico, elevation about 5,000 feet.

Range.—Hidalgo. Recorded from the regions about Tianguistengo and Zacualtipán, *Hidalgo.*

CHIROPTEROTRITON XOLOCALCAE (Taylor)

Bolitoglossa xolocalcae Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 148–150, pl. 7, pl. 9, figs. 7, 8.
Chiropterotriton xolocalcae Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 216.

Type.—U.S.N.M. No. 111371.

Type locality.—Cerro Ovando, Chiapas, Mexico.

Range.—Known only from type locality.

Order SALIENTIA Laurenti

Salientia Laurenti, Synopsin reptilium, 1768, p. 24.

KEY TO MEXICAN SUBORDERS OF SALIENTIA

1. Sacral vertebra procoelous, fused to the coccyx, 8 presacral vertebrae uniformly procoelous or amphicoelous (with free intervertebral balls) (spadefoot toads)---------- **Anomocoela** (p. 91)
   Sacral vertebra not fused to coccyx; a double, posterior condyle, for articulation of coccyx---------- 2
2. Centrum of sacral vertebra concave anteriorly---------- 3
   Centrum of sacral vertebra convex anteriorly; eighth vertebra biconcave; 7 preceding vertebrae procoelous, rarely the first two, and rarely eighth and sacral, fused (true frogs and narrow-mouthed toads)---------- **Diplasiocoela** (p. 91)
3. Sacral vertebra and eight presacral vertebrae uniformly procoelous (true toads, tree toads, etc.)---------- **Procoela** (p. 36)
   Presacral vertebrae opisthocoelous, the intervertebral disks partly or wholly fused with anterior faces of centra (*Rhinophrynus*).
   Opisthocoela (p. 34)

Suborder OPISTHOCOELA Nicholls

Opisthocoela NICHOLLS, Proc. Linn. Soc. London, vol. 128, 1915–1916 (1916), p. 86.

Family RHINOPHRYNIDAE Günther [24]

Rhinophrynidae GÜNTHER, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 127.

Genus RHINOPHRYNUS Duméril and Bibron

Rhinophrynus DUMÉRIL and BIBRON, Erpétologie générale, vol. 8, 1841, p. 757–758.—KELLOGG, U. S. Nat. Mus. Bull. 160, 1932, pp. 17, 24–25.—WALKER, Occ. Pap. Mus. Zool. Univ. Michigan, No. 372, 1938, pp. 1–11, figs. 1–3.

Genotype.—*Rhinophrynus dorsalis* Duméril and Bibron.

Range.—Tamaulipas to Guatemala.

Species.—One.

RHINOPHRYNUS DORSALIS Duméril and Bibron

Rhinophrynus dorsalis DUMÉRIL and BIBRON, Erpétologie générale, vol. 8, 1841, pp. 758–760, Atlas, 1854, pl. 91, figs. 2, 2a.—ORTON, Occ. Pap. Mus. Zool. Univ. Michigan, No. 472, 1943, pp. 1–7, pl. 1 (tadpole).—TAYLOR and SMITH, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 550–551, pl. 2, fig. 2.

Rhinophryne dorsalis GADOW, Proc. Zool. Soc. London, 1905, vol. 2, pp. 193–205.

Rhinophrynus rostratus BROCCHI, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877. p. 196 (Tehuantepec, Oaxaca, Mexico; types in Mus. Hist. Nat. Paris).

Type.—Mus. Hist. Nat. Paris No. 693 (No. 743).

Type locality.—Veracruz, Veracruz, Mexico.

Range.—Atlantic lowlands from Tamaulipas and Pacific lowlands from the Isthmus of Tehuantepec southward to Guatemala, including Yucatán. The species has been reported from *Tamaulipas:* Hacienda la Clementina; *Veracruz:* Potrero Viejo, Veracruz, Córdoba, Hacienda Cerro del Gallo, Tuxpam, Cuatotolapam; *Oaxaca:* Tehuantepec, borders of the Gulf of Tehuantepec, Tuxtepec; *Chiapas:* La Esperanza, Cruz de Piedra, Colonia Soconusco; *Campeche:* Tuxpeña Camp, Champotón, Encarnación; *Tabasco:* Montecristo; *Yucatán:* Chichen Itzá; *Quintana Roo:* Xcopen.

Suborder ANOMOCOELA Nicholls

Anomocoela NICHOLLS, Proc. Linn. Soc. London, vol. 128, 1915–1916 (1916), p. 86.

Family PELOBATIDAE Lataste

Pelobatidae LATASTE, Compte Rendu Assoc. Franç. Avan. Sci., 1878 (1879), pp. 761–762.

[24] Formerly placed in the suborder Procoela. Its true relationships have been shown by Walker (Occ. Papers Mus. Zool. Univ. Michigan, No. 372, 1938, pp. 1–11) on the basis of adult anatomy and by Orton (*ibid.*, No. 472, 1943, pp. 1–7) on the basis of larval anatomy.

Genus SCAPHIOPUS Holbrook

Scaphiopus Holbrook, North American herpetology, ed. 1, vol. 1, 1836, p. 85.
Spea Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 6, 1866, p. 81 (genotype, *Scaphiopus bombifrons* Cope).

Genotype.—*Scaphiopus solitarius* Holbrook=*Scaphiopus holbrookii* (Harlan).

Range.—New England and British Columbia southward through Mexico as far as Cape San Lucas and the southern edge of the plateau in Oaxaca.

Species.—Eight forms are recorded, two of which are subspecies of *S. holbrookii;* three occur in Mexico.

KEY TO MEXICAN SPECIES OF SCAPHIOPUS

1. Width of an eyelid equal to or very slightly less than the interorbital space; eye as long as the snout or a little shorter; skin of head somewhat involved in the cranial ossification in fully adult specimens; dorsal markings a broad reticulum of dark brown or black on a cream or light tan background; 74 mm ..... **couchii** (p. 35)

   Width of an eyelid 1½ to 1⅓ of the interorbital distance; length of eye 1½ to nearly twice the length of snout; skin of head not involved in the cranial ossification; dorsal pattern not a dark reticulation on a lighter background 2

2. Hand small and all digits slender; heel not reaching tympanum; dorsal tubercles small, irregular, often arising from a black base; 61 mm. **hammondii** (p. 36)

   Hand and foot larger, the individual digits thicker; heel usually to tympanum or as far as anterior edge of eye; dorsal tubercles larger, rounded, and much more numerous; parotoids often very distinct; 65 mm. (composite) ..... **multiplicatus** (p. 36)

SCAPHIOPUS COUCHII Baird

Scaphiopus couchii Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 62.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 20–21.—Taylor, Univ. Kansas Sci. Bull., vol. 24, 1936 (1938), p. 508, pl. 44.
?*Scaphiopus varians* Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 15, 1863, pp. 52–53 (Cape San Lucas, Baja California; type U.S.N.M. No. 5893).
S[caphiopus] rectifrenis Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 15, 1863, p. 53 (Tamaulipas; Río Nazas, Coahuila; type U.S.N.M. Nos. 3715 [destroyed] and 3714).

Type.—Two cotypes, originally U.S.N.M. Nos. 3713 and 3714, the latter number referred to *rectifrenis* by Cope.

Type locality.—Río Nazas, Coahuila, and Matamoros, Tamaulipas, Mexico.

Range.—Northern Mexico southward through San Luis Potosí, Nayarit, and Baja California. Recorded from the states of Tamaulipas, Nuevo León, Coahuila, San Luis Potosí, Chihuahua, Zacatecas, Sonora, Baja California, Nayarit, and Sinaloa.

SCAPHIOPUS HAMMONDII Baird

Scaphiopus hammondii Baird, Explorations and surveys for a railroad route from the Mississippi River to the Pacific Ocean, vol. 10, Williamson's route, pt. 4, No. 4, 1857 (1859), p. 12, pl. 28, fig. 2.

Spea hammondii Cope, U. S. Nat. Mus. Bull. 34, 1889, pp. 303–304, fig. 77.

Type.—U.S.N.M. No. 3695.

Type locality.—Fort Reading, Calif.

Range.—British Columbia southward to northern Baja California, and eastward in the north to extreme western Nevada, in the south to central Texas, passing through northern Mexico, central Arizona, and New Mexico. Reported from Baja California, Chihuahua, Coahuila, Nuevo León, Tamaulipas, Sonora. (Other mainland records are probably not of this species.)

SCAPHIOPUS MULTIPLICATUS Cope

S(caphiopus) multiplicatus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 15, 1863, p. 52.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 42–44, pl. 2, fig. 3, pl. 3, fig. 3.

Scaphiopus hammondii multiplicatus Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 19, 22–24.

Scaphiopus dugesii Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 3, 1879, p. 23 (Mexico; Mus. Hist. Nat. Paris, No. 281a, two cotypes).

Type.—U.S.N.M. No. 3694.

Type locality.—"Valley of Mexico"; Mexico.

Range.—The plateau of central Mexico from Durango and Zacatecas southward to Guerrero and Oaxaca. Recorded from the states of San Luis Potosí, Guanajuato, Jalisco, México, Distrito Federal, Puebla, Veracruz (western), Zacatecas, Durango, Aguascalientes, Guerrero, and Oaxaca.

Suborder Procoela Nicholls

Procoela Nicholls, Proc. Linn. Soc. London, vol. 128, 1915–1916 (1916), p. 87.

KEY TO MEXICAN FAMILIES OF PROCOELA

1. Maxillary and vomerine teeth absent; generally a distinctly visible parotoid gland 2
   Maxillary teeth present; parotoid glands invisible; vomerine teeth present in most genera 3
2. A conical tubercle on middle of inner edge of tarsus, marking end of tarsal fold; terminal phalanges with nodular extremities. **Leptodactylidae** [25] (p. 46)
   No tubercle as described; terminal phalanges with T-shaped or simple extremities ..... **Bufonidae** (p. 37)
3. No intercalary cartilage or bone between ultimate and penultimate phalanges of each digit, supporting the claw-shaped or T-shaped terminal joint; sacral diapophyses cylindrical or dilated. **Leptodactylidae** (p. 46)
   An intercalary cartilage or bone supporting terminal phalanges, which are generally claw-shaped; sacral diapophyses dilated ..... **Hylidae** (p. 67)

[25] *Engystomops* only.

Family BUFONIDAE Hogg

Bufonidae Hogg, Ann. Mag. Nat. Hist., ser. 2, vol. 7, 1841, p. 361.

Genus BUFO Laurenti

Bufo Laurenti, Synopsin reptilium, 1768, p. 25.

Docidophryne Fitzinger, Systema reptilium, fasc. 1, 1843, p. 32 (genotype *Bufo Agua* Daudin=(*Rana*) *marina* Linnaeus).

Anaxyrus Tschudi, Untersuchungen über die Fauna Peruana, Herp., 1845, p. 78 (genotype *Anaxyrus melancholicus* Tschudi=*Bufo compactilis* Wiegmann).

Dromoplectrus Camerano, Atti Accad. Sci. Torino, vol. 14, 1879, p. 882 (genotype *Dromoplectrus anomalus* Camerano=*Bufo compactilis* Wiegmann).

Genotype.—*Bufo vulgaris* Laurenti=(*Rana*) *bufo* Linnaeus, 1758.

Range.—World-wide except in sub-Arctic and Arctic regions and excluding New Guinea, Polynesia, Australia, and Madagascar. In the Americas, Hudson Bay, Labrador, Aleutian Islands, and Prince William Sound (southern coast of central Alaska) southward through South America.

Species.—About 250 forms are known, and of these some 65 or 70 occur in the Americas; 22 occur in Mexico.

KEY TO MEXICAN SPECIES OF BUFO

1. An enlarged gland present on arm; two or more glands on leg; large, 147 mm ..... **alvarius** (p. 39)
   No well-defined enlarged gland present on arms, none on legs (glands on legs only on *Bufo boreas halophilus*) 2
2. The inner metatarsal tubercle horn covered, black 3
   Inner metatarsal tubercle not shovellike, lacking a horny, cutting edge, not covered with black horn 6
3. Inner metatarsal tubercle a large, well-defined shovel with a rather sharp, horny, cutting edge 4
   Inner metatarsal tubercle small, rather sharp-pointed, not shovel-shaped; 64 mm ..... **californicus** (p. 41)
4. Tarsal fold very indistinct or absent; postorbital crest forming right angle with the interorbital crest; 120 mm ..... **woodhousii woodhousii** (p. 40)
   Tarsal fold present, distinct, but narrow 5
5. Cranial crests poorly defined or absent; if present, an occipital crest may be faintly indicated; 88 mm ..... **compactilis** (p. 40)
   A pair of strong supraorbital crests converging anteriorly to a bony boss between the nostrils; angle between postorbital and interorbital crests usually greater than a right angle; no occipital crest; 97 mm. **cognatus** (p. 41)
6. Very large toads; parotoid gland very large, of greater area than side of head; prominent cranial crests; parotoids usually colored different than body 7
   Small and medium to large toads, parotoid usually smaller than side of head (or if larger the species very small, glands colored like body) 8
7. Body more elongate, not strongly tubercular; parotoid not encroaching on tympanum; foot slender; 127 mm ..... **angustipes** (p. 41)
   Body more triangular, strongly tubercular (spiny in males); parotoid encroaching on tympanum; foot less slender; 170 mm ..... **horribilis** (p. 41)

8. Large parotoids present, not in contact with eye, colored like body; small toads 9
   Parotoids smaller than side of head 11
9. Dorsal cranial ridges not or scarcely discernible; if present, represented by very low (or discontinuous) elevations or tubercles; lateral head crests better developed; parotoid not widest anteriorly, much longer than wide; tibiotarsal articulation to about middle of parotoid 10
   Dorsal cranial ridges strongly developed in adults, surmounted by a continuous line of spiny tubercles; parotoid generally triangular, nearly as wide as long, widest anteriorly; tibiotarsal articulation barely reaches parotoid; 44 mm ..... **kelloggi** (p. 42)
10. Toes about one-third webbed; nostril back from tip of snout; preorbital and suborbital crests smooth, without tubercles; parotoid as large as side of head; anterior edge of tympanum not strongly elevated; 52 mm ..... **debilis** (p. 42)
    Toes about one-half webbed; nostril at extreme tip of snout; parotoid larger than side of head; preorbital and suborbital crests with some flat tubercles; anterior edge of tympanum elevated; 59 mm .. **insidior** (p. 42)
11. Parotoids 1⅝ to 1¾ area of eyelid, in contact or narrowly separated from it; tubercles under toes not prominent or numerous; large toads 12
    Parotoid less than eyelid and separated from it; or if larger, very narrow, elongate; tubercles prominent under toes 13
12. Parotoid 1½ to 1¾ area of eyelid, touching eyelid; foot less than one-half webbed; no specialized tibial gland; tympanum often indistinct or covered; straight, heavy supraorbital crests; 95 mm ..... **simus** (p. 42)
    Parotoid 1⅓ to 1½ area of eyelid, very narrowly separated from eyelid; foot two-thirds webbed, larger; one or more specialized glands on tibia; no cranial crests; 110 mm ..... **boreas halophilus** (p. 43)
13. Very small toads with narrow elongate parotoids, twice as long as wide; cranial crest very low; supraorbital and postorbital crests forming a curve; 54 mm ..... **canaliferus** (p. 43)
    Larger toads; parotoids usually smaller than an eyelid, not long and narrow, usually as wide as long (little more or less) 14
14. Cranial crests high, well defined, consisting of a preorbital, supraorbital, postorbital, pretympanic, supratympanic; the occipital crest present or absent 15
    Cranial crests low, inconspicuous (absent in younger specimens) 20
15. Occipital crest absent, or occasionally barely indicated; parotoid smaller than eyelid, its greatest length equal to or less than eye diameter; large, rather elongate-bodied toads with rather long legs; tibiotarsal articulation reaching to tympanum or near it 16
    Occipital crests present 17
16. Distance between summits of supraorbital ridges greater than width of eyelid; pretympanic crest equal to supratympanic; greatest diameter of tympanum not more than two-thirds eyelid; 99 mm .. **gemmifer** (p. 43)
    Distance between summits of supraorbital ridges less than width of eyelid; height of tympanum equals seven-eighths of eye diameter; supratympanic crest shorter than pretympanic; parotoid about one-half eyelid; 86 mm ..... **mazatlanensis** (p. 43)

17. All cranial crests thickened; occipital crest arising from highest point of the supraorbital crest and continuous with it, converging more or less posteriorly; belly sulphur yellow with or without some blackish spots or flecks; parotoids longer than wide, occasionally a little larger than eyelid; postorbital and supraorbital crests present; supratympanic crest heavier than and about as long as pretympanic; 80 mm..... **cristatus** (p. 44)
    Cranial crests narrow, not conspicuously thickened; occipital crest lower, not arising from highest point of supraorbital crest and not continuous with it; supraorbital and postorbital crests forming a continuous curve; bellies not yellow..... 18
18. Parotoids about size of eyelid, nearly transverse, broader than long; supratympanic crest shorter than pretympanic crest; subarticular tubercles normally undivided under digits (rarely the distal on third finger divided); 73 mm..... **nayaritensis** (p. 44)
    Parotoids a little larger than eyelid, robust, diagonal, longer than wide (rarely subcircular)..... 19
19. Parotoid robust, smooth, diagonal, longer than wide, outer edge rounded; no linear series of enlarged warts on sides of body; one or more subarticular tubercles under two outer fingers and tubercles on three outer toes double or bifid; dorsal tubercles all rather larger; 75 mm.. **coccifer** (p. 44)
    Parotoid rather flat, often differently colored than surroundings, yellowish or brownish, outer edge nearly straight; a linear series of enlarged warts on sides of body; dorsal tubercles proportionally smaller; 100 mm..... **valliceps** (p. 44)
20. Supraorbital and postorbital crests together forming a curve; space between supraorbital crests less than width of an eyelid; a small supratympanic crest, less than pretympanic; sexual dimorphism in markings; 78 mm..... **marmoreus** (p. 45)
    Supraorbital and postorbital crest forming angle..... 21
21. Crests form obtuse angle; the supratympanic crest absent, leaving parotoid in contact with the postorbital crest; no divided tubercles on hand or foot; sexual dimorphism in markings; large blotches; interorbital width equal to an eyelid; 66 mm..... **perplexus** (p. 45)
    Supraorbital and postorbital crests form a right angle (or less) if crest is evident (often very low or not discernible); not sexually dimorphic in markings; usually uniform olive or brown-olive with small brick red spots which fade; head flat; interorbital width much greater than an eyelid; 80 mm..... **punctatus** (p. 46)

BUFO ALVARIUS Girard

Bufo alvarius Girard, *in* Baird, Report on the United States and Mexican Boundary Survey, vol. 2, Reptiles, 1859, p. 26, pl. 41, figs. 1–6.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 31, 35–40, fig. 4, and pl. 1.

Type.—Two cotypes, U.S.N.M. Nos. 2571, 2572 (so designated by Kellogg); the first specimen probably lost.

Type locality.—Valley of the Gila and Colorado Rivers.

Range.—Central Arizona southward through Sonora, westward to southeastern California (Imperial County). Reported from *Sonora:* Guadelupe Cañon, Quitovaquito, Cajón Bonito Creek, Santa Ana, Puerto, Hermosillo, Guaymas, La Posa (10 miles northwest of Guaymas), Alamos, Guirocoba.

BUFO WOODHOUSII WOODHOUSII Girard

Bufo dorsalis Hallowell, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 181 (*nec Bufo dorsalis* Spix).

Bufo woodhousii Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 86 (substitute name for *B. dorsalis*, preoccupied).—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 32, 72–74, fig. 16.

Bufo woodhousii woodhousii Smith, Amer. Midl. Nat., vol. 15, 1934, pp. 449–457, pl. 17, figs. 22B, 23B.

Bufo frontosus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, p. 301 (Territory of Arizona, near the parallel of 35°, and along the valley of the Colorado from Fort Mojave to Fort Yuma; type lost).

Type.—U.S.N.M. No. 2531.

Type locality.—"New Mexico"=(San Francisco Mountain, Coconino County, Ariz.).

Range.—Montana and North Dakota southward through Kansas and Nevada to northwestern Mexico. Reported in Mexico from *Baja California:* Colorado River; *Chihuahua:* Río Santa María, Colonia García, Colonia Juárez, Santa Rosalia; *Sonora; Durango:* Santiago Papasquiero.

BUFO COMPACTILIS Wiegmann

Bufo compactilis Wiegmann, Isis von Oken, vol. 26, 1833, pp. 661–662.—Dickerson, The frog book, 1906, pp. 102–104, figs. 93–98.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 32–33, 44–48, fig. 8.

Anaxyrus melancholicus Tschudi, Untersuchungen über die Fauna Peruana, Herp., 1845, p. 78, pl. 11, fig. 5.

Bufo speciosus Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, pp. 85–87 (Valley of the Río Bravo [Río Grande del Norte] and not uncommon in the province of New Leon [Nuevo León]; three cotypes, U. S. N. M. Nos. 2611, 2608, 2610).

Bufo anomalus Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 57 (Mexico; Brit. Mus. No. 58. 9. 6. 12).

Bufo levifrons Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, pp. 187–188 (Mexique; type lost).

Bufo Mexicanus Brocchi, Bull. Soc. Philom., ser. 7, vol. 3, 1879, pp. 23–24 (Mexique; type lost).

Type.—Mus. Nat. Berlin No. 3528.

Type locality.—Mexico.

Range.—Southwestern Utah and Kansas to central Mexico in Jalisco, Distrito Federal, and Veracruz. Recorded from the states of Sonora, Chihuahua, Coahuila, Nuevo León, Tamaulipas, Durango, Zacatecas, Guanajuato, Michoacán, Jalisco, Veracruz, Distrito Federal, México, Puebla, and Oaxaca.

BUFO COGNATUS Say

Bufo cognatus Say, *in* Long, Account of an expedition from Pittsburgh to the Rocky Mountains, vol. 2, 1823, p. 190.—Dickerson, The frog book, 1906, pp. 99–102, figs. 85–92, col. pl. 5, fig. 2.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 32, 41–44, fig. 7.

Bufo dipternus Cope, Amer. Nat., vol. 13, 1879, p. 437 (Montana; types lost).

? *Bufo terrestris* Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 2, 1882, p. 77 (part).

Type.—Apparently lost.

Type locality.—Arkansas River, Prowers County, Colo.

Range.—Montana and North Dakota southward to northern Baja California and southern San Luis Potosí. In Mexico reported from *Chihuahua:* Río Santa María near Progreso, near Villa Ahumada, 3 miles east of Carmen, Colonia Juárez; *Coahuila:* Alamo de Parras, near La Cuchilla, 13 miles west of San Pedro; *Durango:* Villa Lerdo, 10 miles south of Gómez Palacio, Durango; *San Luis Potosí:* Mountains of Alvarez, 9 leagues southeast of San Luis Potosí (city); *Baja California:* Pilot Knob, and 7 miles east of Cerro Prieto.

BUFO CALIFORNICUS Camp

Bufo cognatus californicus Camp, Univ. California Publ. Zool., vol. 12, 1915, pp. 331–334.

Bufo californicus Myers, Proc. Biol. Soc. Washington, vol. 43, 1930, pp. 73–77.

Type.—Mus. Vert. Zool. No. 4364.

Type locality.—Santa Paula, 800 feet elevation, Ventura County, Calif.

Range.—Coastal area of southern California southward in Baja California to northern Sierra San Pedro Mártir.

BUFO ANGUSTIPES Taylor and Smith

Bufo angustipes Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 553–555, fig. 59.

Type.—U.S.N.M. No. 116513.

Type locality.—La Esperanza, Chiapas, Mexico.

Range.—Type locality.

BUFO HORRIBILIS Wiegmann

Bufo horribilis Wiegmann, Isis von Oken, vol. 26, 1833, pp. 654–655.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 551–552.

Bufo marinus Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 31–32, 53–57, fig. 11 (*part*).

Type.—Mus. Nat. Berlin Nos. 3478–81.

Type locality.—Misantla and Veracruz, Mexico.

Range.—Texas; south to eastern Coahuila and on the lowlands of the Atlantic coast, and from Mazatlán, Sinaloa, south on the Pacific coast. Recorded from the states of Campeche, Chiapas, Coahuila, Colima, Durango, Guerrero, Hidalgo, Jalisco, Michoacán, Morelos, Nayarit, Nuevo León, Oaxaca, Puebla, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, and Yucatán.

BUFO DEBILIS Girard [26]

Bufo debilis Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 87.—Taylor, Univ. Kansas Sci. Bull., vol. 24, 1936 (1938), pl. 513, p. 45, figs. 4–6.

Type.—(Cotypes) U.S.N.M. No. 2621 (8 specimens).

Type locality.—Lower part of Río Grande del Norte and in the Province of Tamaulipas, Mexico.

Range.—Central southern Texas and Tamaulipas. Reported from *Tamaulipas:* Matamoros; *Nuevo León.*

BUFO INSIDIOR Girard

Bufo insidior Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 88.—Taylor, Univ. Kansas Sci. Bull., vol. 24, 1936 (1938), pp. 513–514, pl. 45, figs. 7–9.

Type.—U.S.N.M. No. 2622 (2 cotypes).

Type locality.—Chihuahua, Mexico.

Range.—Southwestern Kansas south through western Texas and southern New Mexico to northern central Mexico. In Mexico reported from *Sonora; Chihuahua:* Villa Ahumada, Río Santa María, and near Progreso; *Coahuila:* Músquiz, Sierra de Santa Rosa, Hermanas, La Rosa, and "20 miles east of Torreon"; *Zacatecas:* Majoma, Villa de Cos, La Colorada, Zacatecas; *Durango:* Conejos.

BUFO KELLOGGI Taylor

Bufo kelloggi Taylor, Univ. Kansas Sci. Bull., vol. 24, 1936 (1938), pp. 510–514, pl. 45, figs. 1–3.

Type.—EHT–HMS No. 21.

Type locality.—2 miles east of Mazatlán, Sinaloa, Mexico.

Range.—Southern Sinaloa (Mazatlán) and Nayarit (Acaponeta).

BUFO SIMUS Schmidt

Bufo simus Schmidt, Denkschr. Akad. Wiss. Wien, math.-nat. Classe, vol. 14, 1858, pp. 254–255, pl. 3, fig. 22.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 34, 63–66, figs. 14, a, b (part).

Bufo intermedius Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 140, pl. 9, fig. A (Andes of Ecuador; cotypes, Brit. Mus. Nos. 58. 9. 20. 3–6).

[26] It is possible that this and the following, *insidior*, are subspecies.

Bufo occidentalis Camerano, Atti Accad. Sci. Torino, vol. 14, 1879, p. 887 (Mexico; Turin Mus.).

Bufo monksiae Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, p. 263 (Guanajuato, Mexico; U.S.N.M. No. 9896).

Type.—(Cotypes) Zoological Museum, Krakow, Poland.

Type locality.—Chiriquí River in the vicinity of Bocas del Toro, Panama.

Range.—Discontinuous; Sinaloa and Veracruz southward to the Isthmus of Tehuantepec; Panama and northern South America. In Mexico recorded from the states of Chihuahua, Sinaloa, Colima, Zacatecas, Durango, Nayarit, Jalisco, Guanajuato, Hidalgo, Distrito Federal, Morelos, Tlaxcala, Puebla, Guerrero, Veracruz, and Oaxaca.

BUFO BOREAS HALOPHILUS Baird and Girard

Bufo halophila Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1853, p. 301.

Bufo boreas halophilus Camp, Univ. California Publ. Zool., vol. 17, 1917, p. 116.

Type.—U.S.N.M. No. 2589.

Type locality.—Benicia, Calif.

Range.—California, western Nevada and northern Baja California. Reported from *Baja California:* San Pedro Mártir Mountains, La Grulla, 7,500 feet, Vallecitos, 8,000 feet, north end of Nachogüero Valley and Ensenada.

BUFO CANALIFERUS Cope

Bufo canaliferus Cope, Proc. Amer. Philos. Soc., vol. 17, 1877, pp. 85–86.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 34, 40–41, fig. 5.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 557, pl. 21, fig. 1.

Type.—(Cotypes) U.S.N.M. Nos. 30315–24.

Type locality.—"West Tehuantepec," Oaxaca, Mexico.

Range.—Pacific slopes of Oaxaca and Chiapas, and probably southward in Central America. Reported from *Oaxaca:* Chivela, Santa Efigenia, Tapana, Tehuantepec; *Chiapas:* Cruz de Piedra, Colonia Soconusco, La Esperanza, Rancho Las Gradas, Tonalá, Tapachula.

BUFO GEMMIFER Taylor

Bufo gemmifer Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 490–492, pl. 53, figs. 3, 3a, 3b.

Type.—EHT–HMS No. 18509.

Type locality.—El Limoncito, near La Venta, Guerrero, Mexico.

Range.—Known only from the type locality.

BUFO MAZATLANENSIS Taylor

Bufo mazatlanensis Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 492–494, pl. 53, fig. 1, pl. 54.

Type.—EHT–HMS No. 374.

Type locality.—2 miles east of Mazatlán, Sinaloa, México.

Range.—Southern Sonora through Sinaloa, on Pacific slopes. Recorded from *Sonora:* Alamos, Guirocoba, Navajoa; *Sinaloa:* Mazatlán.

BUFO CRISTATUS Wiegmann

Bufo cristatus Wiegmann, Isis von Oken, vol. 26, 1833, pp. 660–661.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 33, 48–49, fig. 9, a, b.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 559, pl. 23, figs. 5, 6.

Bufo occipitalis Camerano, Atti Accad. Sci. Torono, vol. 14, 1879, pp. 889, 890 (Mexico; type lost).

Type.—Cotypes, Mus. Nat. Berlin Nos. 3523, 3524.

Type locality.—Jalapa, Veracruz, Mexico.

Range.—Known only from central western Veracruz and Pacific slopes of Chiapas. Reported from Cuautlapan, Jalapa, San José de Gracia, and Potrero Viejo, *Veracruz;* Cruz de Piedra, Salto de Agua, and Colonia Soconusco, *Chiapas.*

BUFO NAYARITENSIS Taylor

Bufo nayaritensis Taylor, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 349–351, pl. 26, figs. 1, 1a.

Type.—EHT–HMS No. 397.

Type locality.—Tepic, Nayarit, Mexico.

Range.—Known from the type locality and possibly Acaponeta, Nayarit.

BUFO COCCIFER Cope

Bufo coccifer Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, pp. 130–131.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 35, 41, fig. 6, a–b.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 558, pl. 22.

Type.—U.S.N.M. No. 6490.

Type locality.—Arriba, Costa Rica.

Range.—Pacific slopes, Guerrero to Costa Rica. Reported in Mexico from *Oaxaca:* Juchitán, Tehuantepec, Cacoprieto; *Guerrero:* Agua del Obispo.

BUFO VALLICEPS Wiegmann

Bufo valliceps Wiegmann, Isis von Oken, vol. 26, 1833, pp. 657–659.—Dickerson, The frog book, 1906, pp. 108–110, figs. 112–115, col. pl. 5, fig. 3.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 35, 68–72, fig. 15.—Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pl. 53, fig. 2.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 559–561, pl. 24, figs. 1–6.

Bufo trachypus Wiegmann, Isis von Oken, vol. 26, 1833, pp. 657–658 (same types as for the preceding).

Bufo granulosus Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 173 (*nec Bufo granulosus* Spix; Indianola to San Antonio, Tex.; type, U.S.N.M. No. 2595).

Bufo nebulifer Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 87 (substitute for the preceding).

Bufo sternosignatus (part) Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), pp. 68–69, pl. 5, fig. C (Córdoba, Mexico, and Venezuela; two Mexican cotypes, Brit. Mus. Nos. 56.3.-17.25, 56.9.6.13, name restricted to Venezuela cotype).

Type.—Five cotypes, Mus. Nat. Berlin Nos. 3525–27, 3532.

Type locality.—Mexico.

Range.—Texas, Louisiana, and eastern Coahuila south to Costa Rica, in lowlands of Gulf drainage, and up to 3,000 feet in Hidalgo; not on Pacific coast. Known in Mexico from the states of Campeche, Chiapas, Coahuila, Hidalgo, Nuevo León, Oaxaca, Quintana Roo, San Luis Potosí, Tabasco, Tamaulipas, Veracruz, and Yucatán.

BUFO MARMOREUS Wiegmann

Bufo marmoreus Wiegmann, Isis von Oken, vol. 26, 1833, p. 66.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 34, 58–60, fig. 12.—Taylor, Univ. Kansas Sci. Bull., vol. 29, 1943, pl. 26, figs. 1a, 2.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 555–556, pl. 23, figs. 1, 2.

Bufo argillaceus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 20, 1868 (cotypes, U.S.N.M. Nos. 27768–27764; "Colima, Mex.").

Bufo lateralis Werner, Zool. Anz., vol. 17, 1894, p. 156 (type, Nat. Mus. Vienna No. 115–1929; Tehuantepec, Oaxaca, Mexico).

? *Bufo eiteli* Ahl, Sitzb. Ges. Nat. Freunde, 1927, pp. 111–112 (Berlin Mus.; Puerto México, Veracruz).

Type.—Three cotypes, Mus. Nat. Berlin Nos. 3529–31.

Type locality.—Veracruz, Veracruz, Mexico.

Range.—Mazatlán, Sinaloa, to Chiapas on Pacific slopes, and Veracruz south to the Isthmus of Tehuantepec on Atlantic drainage. Reported from *Colima:* Colima; *Jalisco:* Jamay; *Guerrero:* Acapulco, Tierra Colorada, Papayo, Chilpancingo (other records in Guerrero may apply to *Bufo perplexus* Taylor); *Oaxaca:* Tehuantepec, Chivela, Santo Domingo, Tapana, Escurana (15 kilometers west of Tehuantepec); *Sinaloa:* Mazatlán, Rosario; *Veracruz:* Veracruz, Puerto México, Veracruz.

BUFO PERPLEXUS Taylor

Bufo perplexus Taylor, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 347–349, pl. 27, figs. 1, 2.

Type.—EHT–HMS No. 707.

Type locality.—Balsas River near Mexcala, Guerrero, Mexico.

Range.—Pacific slopes from Guerrero to Chiapas. Reported from *Morelos:* Cuernavaca, near Huajintlán, 5 miles west of Alpuyeca,

Puente de Ixtla; *Guerrero:* El Naranjo, Tonolapam, Mexcala, vicinity of Chilpancingo; *Oaxaca:* Tehuantepec, Escurana (15 kilometers west of Tehuantepec); *Chiapas:* Tonalá.

BUFO PUNCTATUS Baird and Girard

Bufo punctatus Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 173.—Dickerson, The frog book, 1906, pp. 110–112, figs. 116–120, col. pl. 5, fig. 1.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 33, 60–63, fig. 13.

Bufo beldingi Yarrow, U. S. Nat. Mus. Bull. 24, 1883, pp. 23, 163 (La Paz, Baja California; 10 cotypes, U. S. N. M. Nos. 12660, 12670).

? *Bufo coccifer* Mocquard (*nec* Cope), Nouv. Arch. Mus. Hist. Nat. Paris, ser. 4, vol. 1, 1899, pp. 334–337 (Santa Rosalia, Baja California).

Type.—Cotypes, U.S.N.M. No. 2618, 3 specimens, lost.

Type locality.—Rio San Pedro [Devils River], Val Verde County, Tex.

Range.—Utah and Kansas southward to Guanajuato, Baja California, and Tamaulipas. Recorded in Mexico from the states of Tamaulipas, Coahuila, Nuevo León, Chihuahua, San Luis Potosí, Sinaloa, Sonora, Guanajuato, and Baja California.

Family LEPTODACTYLIDAE Berg

Leptodactylidae Berg, Anal. Mus. Nac. Buenos Aires, vol. 5, 1896, p. 161.

KEY TO MEXICAN GENERA OF LEPTODACTYLIDAE

1. Small toadlike animal, lacking maxillary and vomerine teeth. **Engystomops** (p. 47)
   Froglike or toadlike form, maxillary teeth present; vomerine teeth present or absent 2
2. Small to very small frogs; vomerine teeth absent normally (present occasionally in *Syrrhophus latodactylus* and *Microbatrachylus lineatissimus*) 3
   Larger forms, vomerine and maxillary teeth present 5
3. A ventral disk confined to the abdomen, not reaching femora; vocal sac present in males; testes and ovaries unpigmented 4
   Ventral disk terminating posteriorly on the femora; testes and ovaries heavily pigmented; no vocal sac in males; very small species, 13–27 mm. **Microbatrachylus** (p. 53)
4. An elongate, elevated, definitive, lumbar or lumboinguinal gland. **Tomodactylus** (p. 47)
   No elongate, elevated gland; gland when present diffuse, subcircular, often not easily visible externally ..... **Syrrhophus** (p. 49)
5. Mesosternum forming a bony style; vomerine teeth in elongate transverse series ..... **Leptodactylus** (p. 55)
   Mesosternum cartilaginous with a double, arrow-shaped, posterior termination; ventral abdominal disks present, not reaching femora; testes and ovaries unpigmented (*Eleutherodactylus calcitrans* exception); inguinal gland if present indistinct ..... **Eleutherodactylus** (p. 57)

Genus ENGYSTOMOPS Jiménez de la Espada

Engystomops Jiménez de la Espada, Anal. Soc. España Hist. Nat., vol. 1, 1872, p. 86.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 77–78.
Microphryne Peters, Monatsb. Akad. Wiss. Berlin, 1873, p. 616 (genotype *Paludicola pustulosa* Cope).

Genotype.—*Engystomops petersi* Jiménez de la Espada.
Range.—Central Veracruz to Ecuador.
Species.—Three, of which one occurs in Mexico.[27]

ENGYSTOMOPS PUSTULOSUS (Cope)

Paludicola pustulosa Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 16, 1864, p. 180.
Engystomops pustulosus Boulenger, Catalogue of the Batrachia Salientia in the collection of the British Museum, ed. 2, 1882, p. 275.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 76–81, fig. 18.

Type.—U. S. N. M. No. 4339 (now lost).
Type locality.—New Granada on the River Truando, Colombia.
Range.—Both sides of the Isthmus of Tehuantepec and on the Atlantic coast from central Veracruz southward into South America. Occurs in *Veracruz:* Tierra Colorada, near Potrero Viejo, Cañada, 4 miles east of Encero, near San Gerónimo, near Jalapa, San Andrés Tuxtla; *Tabasco:* Tenosique; *Campeche;* Encarnación; *Oaxaca:* Santo Domingo, Tehuantepec, Cosolapa; *Chiapas:* Tonalá.

Genus TOMODACTYLUS Günther

Tomodactylus Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 219.

Genotype.—*Tomodactylus amulae* Günther.
Range.—The southern edge of the main Mexican plateau and the Oaxacan extension.
Species.—Five.

KEY TO MEXICAN SPECIES OF TOMODACTYLUS

1. Tympanum large, its diameter three-fourths to four-fifths of eye diameter; two outer fingers with dilated disks, one and three-fourths to twice narrowest width of digit; lumbar gland rather low; maximum size 31 mm. macrotympanum (p. 48)
   Tympanum less than one-half diameter of eye 2
2. Tips of digits tapering, smaller than width of digit; diameter of tympanum one-fourth (or less) of eye diameter; lumbar gland high, distinct; maximum size 27 mm ..... angustidigitorum (p. 48)
   Tips of digits wider than the digits 3

[27] This genus is sometimes combined with another, *Eupemphix* Steindachner, 1863 (Sitzb. Akad. Wiss. Wien, math.-naturw. Kl., vol. 48, p. 188; type, *E. nattereri* Steindachner, Cuyaba, Brazil), which in its limited sense contains four species.

3. Upper lip with white or silvery line or stripe; tympanum a little less than half eye; a red or orange spot on anterior part of thigh or extending to groin; maximum length 23 mm ..... albolabris (p. 48)
   No white or silvery line on upper lip 4
4. Canthus rostralis rather sharp; tympanum about one-sixth size of orbit. amulae (p. 48)
   Canthus rostralis indistinct or rounding; markings, width of digit tips, ventral granulation, and tympanum, variable (a composite species). nitidus (p. 48)

TOMODACTYLUS MACROTYMPANUM Taylor

Tomodactylus macrotympanum TAYLOR, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 496–499, pl. 55, figs. 2, 2a, 2b.

Type.—EHT-HMS No. 6838.

Type locality.—La Placita, south of Jacala, Hidalgo, Mexico.

Range.—Hidalgo, eastern San Luis Potosí.

TOMODACTYLUS ANGUSTIDIGITORUM Taylor

Tomodactylus angustidigitorum TAYLOR, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 494–496, pl. 55, figs. 1, 1a, 1b.

Type.—EHT-HMS No. 18640.

Type locality.—Quiroga, Michoacán, Mexico, elevation 6,880 feet.

Range.—Michoacán, west México and Distrito Federal. Specimens are known from *Michoacán:* west of Zacapú, 4 miles east of Carapa, Cerro de Tecolote; *México:* San Martín; *Distrito Federal,* near Tlalpam.

TOMODACTYLUS ALBOLABRIS Taylor

Tomodactylus albolabris TAYLOR, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 351–353.

Type.—EHT-HMS No. 29568.

Type locality.—Agua del Obispo, Guerrero (Kilometer 351).

Range.—Guerrero. Recorded from Agua del Obispo, and 9 kilometers south of Mazatlán, in Guerrero.

TOMODACTYLUS AMULAE Günther

Tomodactylus amulae GÜNTHER, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, pp. 219–220, pl. 64, fig. C.

Type.—Brit. Mus. No. 1901.12.19.9–12.

Type locality.—Amula, Guerrero, Mexico.

Range.—Guerrero and Morelos. Known in *Guerrero:* Amula, near Omilteme; ? *Morelos:* near Tres Cumbres.

TOMODACTYLUS NITIDUS (Peters)

Liuperus nitidus PETERS, Monatsb. Akad. Wiss. Berlin, 1869, pp. 878–879.
Tomodactylus nitidus KELLOGG, U. S. Nat. Mus. Bull. 160, 1932, pp. 120–123.

Type.—Mus. Nat. Berlin No. 6669.

Type locality.—State of Puebla (probably near Matamoros), Mexico.

Range.—Highlands of western Veracruz, Puebla, Morelos, Guerrero, and Oaxaca.

Genus SYRRHOPHUS Cope

Syrrhophus Cope, Amer. Nat., vol. 12, 1878, p. 253.

Malachylodes Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, p. 264 (genotype *Malachylodes guttilatus* Cope).

Syrrhopus Boulenger, Proc. Zool. Soc. London, 1888, pt. 2, p. 206 (emendation of *Syrrhophus* Cope).

Syrrhaphus Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 215 (emendation of *Syrrhophus* Cope).

Genotype.—*Syrrhophus marnockii* Cope.

Range.—Southern Texas and Colima southward presumably to Perú.

Species.—Twenty-two are described, of which 12 occur in Mexico.

KEY TO MEXICAN SPECIES OF SYRRHOPHUS

1. Two palmar tubercles, outer absent 2
   Three palmar tubercles, outer present 5
2. None of the digits widened at tips or only minutely so; purplish or brownish with red spots; 22.5 mm ..... **rubrimaculata** (p. 50)
   Outer digits of hand and foot widened at tip 3
3. Digits rather sharply truncate at tip; interorbital width twice width of eyelid; sides as well as dorsum and venter smooth; yellowish brown or brownish gray with a broken dark lateral mark and dark spots on back; 21 mm ..... **modestus** (p. 50)
   Digit tips not sharply truncate but somewhat rounded, the terminal pads better developed; sides areolate; dorsum variable; venter smooth 4
4. Diameter of tympanum (vertical) a little more than half eye; the lower rim distinctly elevated, the upper part of rim hidden; choanae not concealed; skin smooth above; 31 mm ..... **pipilans** (p. 50)
   Diameter of tympanum about one-third eye, the lower rim not noticeably raised; skin of back with flattened pustules; light lavender above with a nebulous pattern; white or cream below; 25 mm ..... **nebulosus** (p. 51)
5. Digits not or but very slightly widened at tip 6
   Digit tips definitely widened (1⅓ to more than 2½ narrowest digital width) 8
6. Venter and dorsum shining smooth; larger forms 7
   Venter more or less roughened, granular or areolate; a vestige of web between toes; smaller form; eyelid width, 1⅔ in interorbital width; heel to posterior part of eye; above vinaceous-drab to brownish drab with sharply defined, blue-black spots; femur barred with rufous; 22 mm ..... **guttilatus** (p. 51)
7. No vestige of web on toes; parotoid apparently absent; tympanum subcircular, more than half eye diameter, width of eyelid four-fifths interorbital width; heel to the tympanum (in adult); sides somewhat areolate; ash gray, with dark flecks above; 33 mm ..... **smithi** (p. 51)

A vestige of web between toes; the diameter of tympanum one-third to two-thirds eye diameter; parotoid present; heel to anterior part of eye; eyelid 1½ in interorbital width; dark lavender or purple with larger light cream or yellow spots or reticulations; femur not barred; 30 mm ..... **leprus** (p. 51)

8. All digits very wide, the widest 2½ times (or more) greatest width of digit; tips sharply truncate; tympanum two-thirds to three-fourths diameter of eye; head wider than body; back pustular or tubercular; vomerine teeth present or absent; yellowish or light lavender above with deep brown spots or reticulations; 38.2 mm. ..... **latodactylus** (p. 51)

None of terminal pads of digits more than twice width of digit; vomerine teeth not present; head not noticeably wider than body 9

9. Abdominal region at least partly granular or areolate; dorsum tubercular or granular 10

Ventral abdominal region shining smooth 11

10. Choanae small; vestige of web between toes; outer metatarsal tubercle almost as large as inner; mulberry or lavender speckled, below yellowish or flesh; 22.5 mm ..... **cystignathoides** (p. 52)

Choanae very large; no web vestige; outer metatarsal tubercle about one third inner; yellow-brown or fawn stippled with brown; 20 mm. **verruculatus** (p. 52)

11. Tympanum diameter about one-half diameter of eye; an abdominal disk more or less distinct; tubercles under forearm; outer metatarsal tubercle nearly as large as inner; dorsal skin granular or tubercular; indefinite grayish olive, with indefinite lighter and darker markings; 25.5 mm ..... **campi** (p. 52)

Tympanum two-thirds diameter of eye; skin of dorsum smooth, the sides areolate; no abdominal fold or disk (?); dark bluish gray marked with black spots, white below; 23.5 mm ..... **verrucipes** (p. 52)

SYRRHOPHUS RUBRIMACULATA Taylor and Smith

Syrrhophus rubrimaculata Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 583–585.

Type.—U.S.N.M. No. 114070.

Type locality.—La Esperanza (near Escuintla), Chiapas, Mexico.

Range.—Chiapas; recorded from La Esperanza (near Escuintla) and Rancho Las Gradas.

SYRRHOPHUS MODESTUS Taylor

Syrrhophus modestus Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 304–306, pl. 29.

Type.—EHT–HMS No. 3756.

Type locality.—Hacienda Paso del Río, Colima, Mexico.

Range.—Known from the type locality.

SYRRHOPHUS PIPILANS Taylor

Syrrhophus pipilans Taylor, Proc. Biol. Soc. Washington, vol. 53, 1940, pp. 95–97, pl. 1.

Type.—EHT–HMS No. 6843.

Type locality.—9 miles south of Mazatlán, Guerrero, Mexico.

Range.—Pacific slopes, Guerrero and Oaxaca. Specimens are known from *Guerrero:* Agua del Obispo, 30 kilometers north of Acapulco; *Oaxaca:* Cerro Arenal (near Tehuantepec).

SYRRHOPHUS NEBULOSUS Taylor

Syrrhophus nebulosus Taylor, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 353–355, pl. 27, figs. 3–5.

Type.—EHT–HMS No. 3774.

Type locality.—Near Tonalá, Chiapas, Mexico.

Range.—Chiapas. Known only from the type locality, Tuxtla Gutiérrez and Tapachula, *Chiapas;* and ? Rodriguez Clara, *Veracruz.*

SYRRHOPHUS SMITHI Taylor

Syrrhophus smithi Taylor, Proc. U. S. Nat. Mus., vol. 89, 1940, pp. 43–45, pl. 1.

Type.—U.S.N.M. No. 108594.

Type locality.—15 miles west of Galeana, Nuevo León, Mexico.

Range.—Known only from the type locality.

SYRRHOPHUS LEPRUS Cope

Syrrhophus leprus Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, pp. 268–269.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 124–125, 128.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 582.

Type.—U.S.N.M. No. 10040.

Type locality.—Santa Efigenia, Oaxaca, Mexico.

Range.—Atlantic slopes, southern Veracruz to Petén, Guatemala. Reported from *Veracruz:* Potrero Viejo; *Oaxaca:* La Gloria, Santa Efigenia; *Guatemala:* Piedras Negras (on Mexican border).

SYRRHOPHUS GUTTILATUS (Cope)

Malachylodes guttilatus Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, pp. 264–265.
Syrrhophus guttilatus Nieden, Das Tierreich, Lief. 46, 1923, pp. 399–400.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 125, 127–128.

Type.—U.S.N.M. No. 9888.

Type locality.—Guanajuato, Guanajuato, Mexico.

Range.—San Luis Potosí and Guanajuato. The record for San Luis Potosí is "9 leagues S San Luis Potosí" (city).

SYRRHOPHUS LATODACTYLUS Taylor

Syrrhophus latodactylus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 397–401, pl. 43, and text fig. 7.

Type.—EHT–HMS No. 6807.

Type locality.—Huasteca Cañon, 15 kilometers west of Monterrey, Nuevo León, Mexico.

Range.—Hidalgo, southern Nuevo León, eastern San Luis Potosí. Reported from *Hidalgo:* near La Placita (6–8 kilometers south of Jacala); *San Luis Potosí:* 10 miles west of Naranjos; *Nuevo León:* 15 kilometers west of Monterrey, Sabinas Hidalgo.

SYRRHOPHUS CYSTIGNATHOIDES (Cope)

Phyllobates cystignathoides Cope, Proc. Amer. Philos. Soc., vol. 17, 1877, pp. 89–90.
Syrrhophus cystignathoides Nieden, Das Tierreich, Lief. 46, 1923, pp. 399, 401.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 126, 127.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 582–583.

Type.—(Cotypes) U.S.N.M. Nos. 32402–32409.

Type locality.—Potrero, near Córdoba, Veracruz, Mexico.

Range.—Veracruz, and ? San Luis Potosí. Reported from *Veracruz:* Potrero, Metlac (near Córdoba), Cuautlapan; *San Luis Potosí:* Huichihuayán (the latter is based upon a young specimen and not impossibly is referable to another species).

SYRRHOPHUS VERRUCULATUS (Peters)

Phyllobates verruculatus Peters, Monatsb. Akad. Wiss. Berlin, 1870, p. 650.
Syrrhophus verruculatus Nieden, Das Tierreich, Lief. 46, 1923, pp. 399, 401.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 125–126, 129.

Type.—Mus. Nat. Berlin, No. 6957.

Type locality.—Huanusco (=probably Huatusco), Veracruz, Mexico.

Range.—Puebla and Veracruz. Recorded from *Puebla:* Necaxa; *Hidalgo:* near Tianguistengo; *Veracruz:* (type locality).

SYRRHOPHUS CAMPI Stejneger

Syrrhophus campi Stejneger, Proc. Biol. Soc. Washington, vol. 28, 1915, pp. 131–132.

Type.—U.S.N.M. No. 52290.

Type locality.—Brownsville, Tex.

Range.—Tamaulipas, Nuevo León, and eastern San Luis Potosí in Mexico; lower Río Grande Valley in Texas in the United States. Reported or examined from *Nuevo León:* Monterrey; *San Luis Potosí:* 10 miles west of Naranjos; *Tamaulipas:* Matamoros.

SYRRHOPHUS VERRUCIPES Cope

Syrrhophus verrucipes Cope, Proc. Amer. Philos. Soc., vol. 22, 1885, p. 383.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 126–127, 128–129.

Type.—Lost (*fide* Kellogg).

Type locality.—Near Zacualtipan, Hidalgo, Mexico (1,800 feet lower in rocky gorge of a stream near its junction with the San Miguel River).

Range.—Known only from the type locality.

Genus MICROBATRACHYLUS Taylor

Microbatrachylus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), p. 499.

Genotype.—Eleutherodactylus hobartsmithi Taylor.

Range.—Central Veracruz and Guerrero through Mexico probably to Guatemala and perhaps to Nicaragua.

Species.—Eight are known at present, all in Mexico.

KEY TO MEXICAN SPECIES OF MICROBATRACHYLUS

1. White stripe, black-edged below, on upper jaw; dark median stripe limited by irregular dorsal ridges; maximum size, ♀, 18 mm.... **albolabris** (p. 54)
   No white stripe on upper jaw, or dark median stripe.... 2
2. Tibiotarsal articulation to tip of snout or beyond; an outer palmar tubercle.... 3
   Tibiotarsal articulation to eye or at most halfway to nostril; an outer palmer tubercle present or absent.... 4
3. Minute vomerine teeth; seven more or less distinct dorsal and dorsolateral ridges; heel to beyond tip of snout; 20 mm.... **lineatissimus** (p. 54)
   No vomerine teeth; dorsal and dorsolateral ridges if present, indistinct, less than 7; heel to tip of snout; 18.1 mm.... **oaxacae** (p. 54)
4. Three palmar tubercles; no parotoid gland evident; outer metatarsal tubercle two-thirds size of inner; large species; 27 mm., ♀.... **montanus** (p. 54)
   Only two palmar tubercles, outer absent.... 5
5. Dorsal ridges absent; well-defined dorsolateral ridges, continuous or broken, arising from corners of eyes, converging on end of rump; area between, uniform light brown, cream-fawn or whitish.... 6
   No well-defined dorsolateral ridges limiting a uniform dorsal coloration.... 7
6. Dorsal skin covered with fine tubercles; no evidence of a parotoid gland; tibiotarsal articulation to middle of eye; color fawn to light brown, uniform, with an indistinct, V-shaped blackish mark on occiput; 15 mm., ♂; 19 mm. ♀.... **minimus** (p. 54)
   Dorsal skin nearly smooth; a strongly defined parotoid; tibiotarsal articulation halfway to nostril; color clay-white on back; no tubercles on outer edge of tarsus; 14.2 mm., ♂; ♀ ?.... **imitator** (p. 55)
7. An inverted V-shaped ridge and mark on shoulders; lip spotted black; a pair of inguinal black spots; no tubercles on outer edge of tarsus; tips of digits widened; no parotoid; 16 mm., ♂; 19 mm., ♀.... **pygmaeus** (p. 55)
   Inverted V-shaped ridge and dark mark sometimes evident in males; no inguinal black spots; tubercles on outer edge of tarsus; tips of digits not or but minutely wider than digits; parotoid gland present; 15.1 mm., ♂; 22.5 mm., ♀.... **hobartsmithi** (p. 55)

MICROBATRACHYLUS ALBOLABRIS Taylor

Microbatrachylus albolabris Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 502–504, pl. 56, figs. A and B.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 563–564.

Type.—EHT–HMS No. 6407.

Type locality.—2 miles west of Córdoba, Veracruz, Mexico.

Range.—Coastal hills of Veracruz, Chiapas, Guerrero, and undoubtedly Oaxaca. Recorded from *Veracruz:* Potrero Viejo, Cuautlapan; *Chiapas:* La Esperanza (near Escuintla), Colonia Hidalgo, Salto de Agua (Mount Ovando); *Guerrero:* Agua del Obispo, and 1½ miles north of Mazatlán. No specimens yet known from Oaxaca.

MICROBATRACHYLUS LINEATISSIMUS Taylor

Microbatrachylus lineatissimus Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp. 87–89.

Type.—EHT–HMS No. 24289.

Type locality.—Cerro San Felipe, Oaxaca, Mexico, elevation 7,000 to 8,000 feet.

Range.—Known only from the type locality.

MICROBATRACHYLUS OAXACAE Taylor

Microbatrachylus oaxacae Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 504–507.

Type.—EHT–HMS No. 18197.

Type locality.—Cerro San Felipe, near Oaxaca, Oaxaca.

Range.—Known only from the type locality, and Lachiguiri, *Oaxaca.*

MICROBATRACHYLUS MONTANUS Taylor

Microbatrachylus montanus Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 67–69, pl. 6, figs. 2, 2a–2c.

Type.—U.S.N.M. No. 115507.

Type locality.—Mount Ovando, Chiapas, Mexico.

Range.—Chiapas in region about Mount Ovando. Reported from La Esperanza (near Escuintla), Las Nubes, and Salto de Agua (Mount Ovando in Chiapas).

MICROBATRACHYLUS MINIMUS Taylor

Microbatrachylus minimus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 507–508, pl. 56, figs. C, D.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 562–563.

Type.—EHT–HMS No. 6416.

Type locality.—Agua del Obispo, Guerrero, Mexico (Kilometer 350).

Range.—Coastal hills of Guerrero, Veracruz, and Chiapas. Reported from *Veracruz:* Potrero Viejo, Cuautlapan; *Chiapas:* Salto de Agua (Mount Ovando); *Guerrero:* Agua del Obispo.

MICROBATRACHYLUS IMITATOR Taylor

Microbatrachylus imitator Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 70–71, pl. 6, figs. 1, 1a, 1b, 1c.

Type.—U.S.N.M. No. 115508.

Type locality.—La Esperanza (near Escuintla), Chiapas, Mexico.

Range.—Known only from the type locality, and Colonia Hidalgo in Chiapas.

MICROBATRACHYLUS PYGMAEUS (Taylor)

Eleutherodactylus pygmaeus Taylor, Trans. Kansas Acad. Sci., vol. 39, 1936 (1937), pp. 352–354, pl. 1, figs. 3, 4.

Microbatrachylus pygmaeus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 500–501.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 565.

Type.—EHT–HMS No. 3691.

Type locality.—One mile north of Rodriguez Clara, Veracruz, Mexico.

Range.—Veracruz, eastern Oaxaca, Chiapas and Guerrero. Reported from *Veracruz:* Potrero Viejo, Cuautlapan; *Oaxaca:* Matías Romero; *Chiapas:* La Esperanza (near Escuintla), Colonia Hidalgo, Colonia Soconusco, Las Nubes, Cerro Ovando, Finca Juárez, La Magnolia, Salto de Agua on Mount Ovando; *Guerrero:* Agua del Obispo and 12 miles south of Chilpancingo.

MICROBATRACHYLUS HOBARTSMITHI (Taylor)

Eleutherodactylus hobartsmithi Taylor, Trans. Kansas Acad. Sci., vol. 39, 1936 (1937), pp. 355–357, pl. 1, figs. 5, 6.

Microbatrachylus hobartsmithi Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 501–502.

Type.—EHT–HMS No. 3688.

Type locality.—Near Uruapan, Michoacán, Mexico.

Range.—Southwestern portion of the central plateau of Mexico. Recorded from *México:* 10 miles west of Villa Victoria; *Jalisco:* 20 miles west of Guadalajara; *Michoacán:* Mirador in Zimba National Forest.

Genus LEPTODACTYLUS Fitzinger

Leptodactylus Fitzinger, Neue Classification der Reptilien, 1826, p. 38.

Genotype.—*Leptodactylus typhonia* Fitzinger=*Rana typhonia* (part) Daudin (*nec Rana typhonius* Linnaeus, 1758).

Range.—Southern Texas and Sonora to Argentina, the Antilles, and the islands of San Andrés and Providence.

Species.—About 60 are known, 3 of which occur in Mexico.

KEY TO MEXICAN SPECIES OF LEPTODACTYLUS

1. A strongly defined ventral dermal disk; toes lacking lateral dermal fringes; males with a prominent shelflike projection on snout; skin smooth without horn-tipped tubercles scattered over body; males lacking black, horny spines on first finger; white below; a white stripe on lip..**labialis** (p. 56)

   No strongly defined ventral dermal disk; toes with strong lateral dermal fringes; males with 2 heavy horny spines on first finger, and without shelf from snout; lip without a white stripe..... 2

2. Posttympanic gland elongate, with a free-rounded posterior; these as well as axillary and postfemoral glands producing a horny excretion at least during a part of the year; digital spines of males closer together; smaller..... **occidentalis** (p. 56)

   Posttympanic gland ill defined; the axillary and postfemoral glands, if present, diffuse, all not forming horny excretions; digital spines more separated; larger species (composite)..... **melanonotus** (p. 57)

LEPTODACTYLUS LABIALIS (Cope)

Cystignathus labialis Cope, Proc. Amer. Philos. Soc., vol. 17, 1877, p. 90.

Leptodactylus labialis Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 1, 1881, p. 20, pl. 5, fig. 1.—Gaige, Carnegie Inst. Washington Publ. No. 457, 1936, p. 281.

Cystignathus fragilis Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, p. 182 (Tehuantepec, Mexico; Mus. Hist. Nat. Paris No. 1952).

[*Cystignathus*] *gracilis* Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, p. 269–270 (*nec Cystignathus gracilis* Duméril and Bibron).

Leptodactylus albilabris Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 213 (*nec L. albilabris* Günther, 1859).—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 82, 83–88 (part).

Type.—(Cotypes) U.S.N.M. Nos. 31300–31305.

Type locality.—"Probably a part of Sumichrast's Mexican Collection."

Range.—Texas south to Nicaragua, Oaxaca, and Guerrero. In Mexico it occurs in Tamaulipas, Nuevo León, Veracruz, Morelos, Guerrero, Oaxaca, Chiapas, Tabasco, Yucatán, and Campeche.

LEPTODACTYLUS OCCIDENTALIS Taylor [28]

Leptodactylus occidentalis Taylor, Trans. Kansas Acad. Sci., vol. 39, 1936 (1937), pp. 347–352, pl. 1, figs. 1, 2, 7.

Type.—EHT-HMS No. 3322.

Type locality.—Tepic, Nayarit, Mexico.

Range.—Sonora to Nayarit. Known from the type locality, Mazatlán, *Sinaloa*, and Alamos, *Sonora*.

[28] Validity questioned by Bogert and Oliver, Bull. Amer. Mus. Nat. Hist., vol. 83, 1945, pp. 342-343, who synonymize it with *L. melanonotus*. The latter species needs careful revision. We are certain of the distinctness of *occidentalis* among Mexican populations and accordingly list it here. The other populations of *melanonotus* appear extremely heterogeneous, and, of course, comparisons of any one population, however distinct, with all others, cannot be very impressive, as Bogert and Oliver have observed.

LEPTODACTYLUS MELANONOTUS (Hallowell)

Cystignathus melanonotus Hallowell, Proc. Acad. Nat. Sci. Philadelphia, vol. 12, 1860, p. 485.

Leptodactylus melanonotus Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 1, 1881, p. 20.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 82–83, 88–89.—Gaige, Carnegie Inst. Washington Publ. No. 457, 1936, p. 291 (tadpole).—Bogert and Oliver, Bull. Amer. Mus. Nat. Hist., vol. 83, 1945, pp. 342–343.

? *Cystignathus microtis* Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, p. 265 (Guanajuato, Mexico; U.S.N.M. No. 9906).

Cystignathus perlaevis Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, pp. 269–270 (Japana [=Tapana=Tapanatepec] Oaxaca; U.S.N.M. No. 10041).

Leptodactylus caliginosus Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 214 (*nec L. caliginosus* Girard).

Type.—U.S.N.M. No. 6264.

Tupe locality.—Nicaragua.

Range.—Southern Sonora and San Luis Potosí southward along both coasts to Costa Rica. Recorded in Mexico from the states of Sonora, Sinaloa, Michoacán, Colima, Guanajuato (erroneously), Nayarit, Guerrero, Veracruz, San Luis Potosí, Campeche, Yucatán, Tabasco, Oaxaca, Chiapas, and Jalisco.

Genus ELEUTHERODACTYLUS Duméril and Bibron

Eleutherodactylus Duméril and Bibron, Erpétologie générale, vol. 8, 1841, p. 620.

Epirhexis Cope, Journ. Acad. Nat. Sci. Philadelphia, new ser., vol. 6, 1866, p. 96 (genotype *Batrachyla longipes* Baird).

Genotype.—*Eleutherodactylus martinicensis* (=*Hylodes martinicensis*) Tschudi.

Range.—Southern Texas and Sonora to Brazil and Peru, the Antilles.

Species.—About 225, of which 28 occur in Mexico.

KEY TO MEXICAN SPECIES OF ELEUTHERODACTYLUS

1. Arboreal forms with tips of digits strongly dilated 2
   Terrestrial forms for the most part, digits not or very moderately dilated; none of digit tips showing an emargination 8
2. Two or more of the outer digital disks with a median terminal notch ... 3
   Outer digital disks without trace of a median terminal notch 7
3. Vocal sac absent in males; tympanum of males about two-thirds diameter of eye; upper part of tympanum not blackish 4
   Vocal sac present in males; tympanum of males less than half length of eye; upper part of tympanum usually blackish 5
4. Tibiotarsal articulation (heel) to much beyond tip of snout; tympanum brownish with a lighter center; a tarsal fold present; vomerine teeth reach forward to a line between middle of choanae; 50 mm.. alfredi (p. 60)
   Tibiotarsal articulation to nostril; no tarsal fold present; vomerine teeth completely behind level of choanae; 42.5 mm..... conspicuus (p. 60)

5. Heel to anterior edge of eye; disks of three outer fingers and toes rather strongly emarginated, usually a distinct inguinal black spot; usually two or more dark diagonal spots or lines on sides, separated by cream lines; 32 mm ..... **spatulatus** (p. 61)

   Heel to snout tip, or beyond 6

6. Heel reaching much beyond tip of snout; dorsum light, sides darker; canthus rostralis distinct; a median elevated area on occiput and interorbital region; toes less dilated at tip; emargination of outer digital disks not pronounced; no diagonal lines on sides; tarsal fold indicated by one or two small tubercles; 25 mm ..... **decoratus** (p. 61)

   Heel reaching tip of snout; gray markings on a lighter background; sides not darker than dorsum; a symmetrical mark indicated on shoulders; elevated area on head absent or faintly indicated; canthus rounded or wanting; tarsal fold indicated by an elongate tubercle; 28.5 mm. **hidalgoensis** (p. 61)

7. Toes short, hylalike, but without a cartilage between last two phalanges; a pair of narrow dorsolateral ridges; no large distinct black spots on back; 29 mm ..... **batrachylus** (p. 61)

   Toes apparently longer, not especially hylalike; the disks less widened; no dorsolateral ridges; a triangular mark on occiput; other dark marks on back; 38 mm ..... **longipes** (p. 61)

8. No trace of an inner tarsal fold; vomerine teeth present but weak (or perhaps occasionally absent in *mexicanus*) 9

   A tarsal fold or tarsal tubercle present (absent or indistinct in *matudai*, in which the edge of the tarsus is thickened but not elevated) 18

9. An inguinal gland present, rather distinct; vocal sacs in males absent (except in *occidentalis*); toes very slightly dilated, disks with transverse groove present or absent, visible if slightly dehydrated; supernumerary tubercles absent on foot (except in *occidentalis*), but present, larger or smaller, on hand 10

   Vocal sacs present, the toes blunt, slightly swollen at tip; large supernumerary tubercles present on soles and palms, 8 or 9 on former, 5 or 6 on latter; no inguinal gland evident; an intertympanic fold usually present 13

10. First finger longer than second; inner metatarsal tubercle compressed, very large, about equal to length of first toe; outer tubercle about one-fifth of inner; some rather indistinct supernumerary tubercles on sole; no outer palmar tubercle; vomerine teeth well developed; male with vocal sac; gonadal membranes white; heel to nostril; heels overlap; 42 mm ..... **occidentalis** (p. 62)

    First finger shorter than (rarely equal to) second; inner metatarsal tubercle not compressed; vocal sac absent 11

11. Heels not touching when legs are folded; heel to eye; inner metatarsal tubercle very large, broad oval-conical, very little shorter than first toe; outer tubercle one-fifth of inner; supernumerary tubercles obsolete on sole, present on palm; small outer palmar tubercle present, touching median; vomerine teeth small, weak; gonadal membranes white; skin above minutely granular; abdomen coarsely granular; ventral disk not reaching femur; no tubercles on outer part of tarsus; 42 mm. **calcitrans** (p. 62)

    Heels overlapping when legs are folded; belly smooth 12

12. Outer metatarsal tubercle one-third or more of inner; a few tubercles on outer edge of tarsus; inner metatarsal tubercle smaller and more elongate-oval than that of preceding species; large, outer palmar tubercle partly fused to median; digits very slightly dilated at tips, without transverse grooves; vomerine teeth reduced or absent; some variable dorsal ridges, the skin usually granular; vomerine teeth reduced (or occasionally absent); testicular membranes white; 40 mm.
mexicanus (p. 62)

No tubercles on tarsus; tips of digits widened into small disks with transverse grooves; heel much beyond tip of snout; heels overlapping much when legs are folded; vomerine teeth small, weak; inner metatarsal tubercle oval, rather small, less than three-fifths length of inner toe; outer palmar tubercle fused to median; ventral disk distinct; gonadal membranes black, inguinal gland yellowish (perhaps referable to *Microbatrachylus*); 44 mm---- **saltator** (p. 63)

13. Heavy toadlike forms with or without a tarsal fold; a strongly defined ventral disk---- 14

Smaller, slender froglike forms, lacking a tarsal fold; the head as wide as body; ventral disk present but not strongly defined; more or less areolate, rough or striated; heel to between eye and nostril---- 17

14. A sharp-edged tarsal fold; a small web between the toes; head very wide; a small outer metatarsal tubercle; a large protuberant inner; 74 mm.
laticeps (p. 63)

No trace of a tarsal fold; no trace of webbing between toes---- 15

15. Limbs short; heel to tympanum; heels widely separated when legs are folded (7 mm.); skin above minutely corrugated, without tubercles; outer metatarsal tubercle three-quarters of inner; tympanum about three-fifths of eye diameter; eyelid greater than interorbital distance; 78 mm---- **cactorum** (p. 63)

Limbs longer; heel to eye; heels touch or overlap a little when limbs are folded; eyelid less than interorbital space---- 16

16. Tympanum two-thirds to four-fifths diameter of eye; dorsal surface smooth; 90 mm---- **latrans** (p. 63)

Tympanum scarcely one-half diameter of eye; dorsal surface rough, granulate; 80 mm---- **augusti** (p. 63)

17. An intratympanic fold; skin smoother, median palmar tubercle narrowed, elongate; limbs strongly barred with double white lines; 44 mm.
bolivari (p. 64)

No intratympanic fold; supernumerary tubercles on hand very large; skin rougher, tubercular; median palmar tubercle not strongly narrowed; hind limbs not barred with double white lines; 43 mm.
tarahumaraensis (p. 64)

18. A distinct tarsal fold---- 19

A tubercle present on tarsus instead of a fold---- 23

19. A mere vestige of a web between toes; edges of canthus rostralis sharp; a pair of sinuous dorsal ridges from eye to rump, nearest together at middle of body; tips of toes scarcely dilated; no distinct tarsal fold; 40 mm---- **matudai** (p. 64)

A small distinct web present between toes; edges of canthus not elevated- 20

20. A vocal sac present in males; tubercles in occipital region tending to form a W-shaped pattern; toe disks rounder, wider than fingers; first and second fingers subequal; toes one-third webbed; a slight, narrow, elongate tarsal fold extends half length of tarsus; 57.5 mm---- **vocalis** (p. 64)

Vocal sac wanting in males---- 21

21. Heel reaches much beyond tip of snout 22
Heel reaches tip of snout; toes about one-fourth webbed; an elevated tarsal fold about two-thirds length of tarsus; first finger longer than second; 72 mm ..... **rugulosus** (p. 65)
22. Very large species; tarsal fold low, runs halfway to heel; first and second fingers about equal; tympanum three-fifths eye in female; canthus rostralis distinct; 93 mm ..... **natator** (p. 65)
Smaller species; tarsal fold greatly elevated, forming a free fringe, four-fifths length of tarsus; first finger longer than second; toes between one-third and one-half webbed; 51 mm ..... **avocalis** (p. 65)
23. A white, black-edged stripe on upper jaw; 37 mm ..... **beatae** (p. 65)
Normally no white, black-edged stripe on upper lip (rarely present in *venustus*) 24
24. A pair of dorsolateral lines from corners of eye converging somewhat on rump, enclosing a uniform fawn-colored area; a pair of black dots on occiput; 39 mm ..... **dorsoconcolor** (p. 66)
Not the above pattern 25
25. A pair of dorsal ridges forming an hourglass pattern, the area between, and somewhat overlapping the ridges, deep purple; or 4 to 6 ridges, a pair reaching tip of snout; 38 mm ..... **venustus** (p. 66)
Pattern not as above 26
26. Dorsolateral lines from corners of eyes cross on the shoulders forming an X-shaped pattern; a pair of black dots in middle of back; almost uniform clay to cream-white above; 27 mm ..... **macdougalli** (p. 66)
Not the above pattern 27
27. Similar to above but the ridges coming closer together where they meet two tubercles, then continue back rather narrowly separated; very variable in color but usually loreal black stripe and an angular spot above tympanum; 34 mm ..... **rhodopis** (p. 66)
Not the above pattern; ridges arising more medially than eye corner and not coming so close together on shoulders, extending back a variable distance; variable color pattern; 38 mm ..... **dunni** (p. 67)

ELEUTHERODACTYLUS ALFREDI (Boulenger)

? *Hylodes conspicillatus* Brocchi, Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 2, 1882, p. 59 (*nec Hylodes conspicillatus* Günther, 1858).

Hylodes alfredi Boulenger, Proc. Zool. Soc. London, 1898, pp. 480–481, pl. 39, fig. 1.

Eleutherodactylus alfredi Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 94–95, 99–100.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 566.

Type.—(Cotypes) Brit. Mus. Nos. 98.2.19.1 and 98.4.7.1.

Type locality.—Atoyac, Veracruz, Mexico.

Range.—Central eastern Veracruz. Reported from Orizaba, Atoyac, and Cuautlapan in Veracruz.

ELEUTHERODACTYLUS CONSPICUUS Taylor and Smith

Eleutherodactylus conspicuus Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 567–569, fig. 60A.

Type.—U.S.N.M. No. 116509.

Type locality.—Piedras Negras, Guatemala, practically on Mexico-Guatemala border.

Range.—Known only from the type locality.

ELEUTHERODACTYLUS SPATULATUS Smith

Eleutherodactylus spatulatus Smith, Proc. Biol. Soc. Washington, vol. 52, 1939, pp. 187–190, pl. 2, figs. 4, 5.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, p. 304, pl. 27, figs. 6, 7, 11.

Type.—U.S.N.M. field No. 3787 of Hobart M. Smith, now U.S. N.M. No. 106027.

Type locality.—Cuautlapan, Veracruz, Mexico.

Range.—Known only from the type locality.

ELEUTHERODACTYLUS DECORATUS Taylor

Eleutherodactylus decoratus Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 301–303, pl. 25, figs. 1–4, pl. 27, fig. 9.

Type.—EHT–HMS No. 28720.

Type locality.—Near Banderilla, 6 miles west of Jalapa, Veracruz, Mexico.

Range.—Known only from La Joya and Banderilla, Veracruz.

ELEUTHERODACTYLUS HIDALGOENSIS Taylor

Eleutherodactylus hidalgoensis Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 299–301, pl. 25, figs. 5–8, pl. 27, fig. 10.

Type.—EHT–HMS No. 24454.

Type locality.—About 4 miles north of Tianguistengo, Hidalgo, Mexico.

Range.—Eastern Hidalgo, and central Veracruz. Known only from the type locality, and Tequeyutepec, *Veracruz.*

ELEUTHERODACTYLUS BATRACHYLUS Taylor

Eleutherodactylus longipes Barbour (*nec* Baird), Proc. New England Zool. Club, vol. 8, 1923, pp. 81–83.

Eleutherodactylus batrachylus Taylor, Proc. New England Zool. Club, vol. 18, 1940, pp. 13–16, pls. 1–2.

Type.—Mus. Comp. Zool. No. 9308.

Type locality.—Miquihuana, Tamaulipas, Mexico.

Range.—Known only from type locality.

ELEUTHERODACTYLUS LONGIPES (Baird)

Batrachyla longipes Baird, Report on the United States and Mexican Boundary Survey, vol. 2, Reptiles, 1859, p. 35, pl. 37, figs. 1–3 (no description).

Eleutherodactylus longipes Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 95, 107 (part).

Type.—Formerly in U. S. National Museum; now lost (*fide* Kellogg).
Type locality.—Mexico, the exact locality doubtful.
Range.—Unknown.

ELEUTHERODACTYLUS OCCIDENTALIS Taylor

Borborocoetes mexicanus Boulenger, Proc. Zool. Soc. London, 1898, pp. 477, 481, pl. 39, fig. 2, 2a [not *Leuiperus mexicanus*=*Eleutherodactylus mexicanus* (Brocchi)].
Eleutherodactylus occidentalis Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp. 91–92.—Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 117, pl. 4, fig. 1.

Type.—(Cotypes) Brit. Mus. No. 92.2.8.66–67.
Type locality.—Hacienda el Florencio, Zacatecas, Mexico.
Range.—Southwestern edge of the central Mexican plateau. Specimens have been examined or have been reported from *Sinaloa:* Plomosas; *Colima:* Quesería, Paso del Río; *Zacatecas:* Hacienda el Florencio; *Jalisco:* "Piedras Negras," Agua Azul, Rosario, 11 miles west of Guadalajara, Nevado de Colima (8,000 feet), Magdalena; *Nayarit:* Cerro San Juan; *Michoacán,* near Uruapan.

ELEUTHERODACTYLUS CALCITRANS (Günther)

Hylodes calcitrans Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 230, pl. 67, fig. B.
Eleutherodactylus calcitrans Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, p. 93.—Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, p. 117, pl. 5, fig. 2.

Type.—Brit. Mus. No. 1901.12.19.25–43.
Type locality.—Omilteme, Guerrero, and Jalisco, Mexico (restricted to Omilteme, Guerrero).
Range.—Guerrero. Probably distributed through the Sierra Madre del Sur (the Jalisco specimen is probably referable to another species).

ELEUTHERODACTYLUS MEXICANUS (Brocchi)

Leuiperus (sic) *mexicanus* Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1879, p. 484.
Eleutherodactylus mexicanus Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 98–99, 108–112 (part).—Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp. 93–94.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, p. 73, pl. 8, figs. 2, 2a–2c.

Type.—Mus. Hist. Nat. Paris?
Type locality.—Mexico.
Range.—Oaxaca and ? Veracruz. Recorded from Cerro San Felipe (10,000 feet elevation), Cosolapa, La Parada (7,800 feet), mountains west of Oaxaca (9,400 feet), ? Tehuantepec, Totontepec, Lachiguiri, Cerro de las Flores, in the state of *Oaxaca*; ? Pan de Olla (near Tezuitlán), *Veracruz.*

ELEUTHERODACTYLUS SALTATOR Taylor

Eleutherodactylus saltator Taylor, Proc. Biol. Soc. Washington, vol. 54, 1941, pp; 89–91; Univ. Kansas Sci. Bull., vol. 27, 1941, p. 117, pl. 4, fig. 2.

Type.—EHT–HMS No. 24301.

Type locality.—Omilteme, Guerrero, Mexico.

Range.—Known only from the type locality. Probably distributed through the higher parts of the Sierra Madre del Sur.

ELEUTHERODACTYLUS LATICEPS (Duméril)

Hylodes laticeps Duméril, Ann. Sci. Nat. Paris, ser. 3, zool., vol. 19, 1853, p. 178.—Duméril, Bibron, and Duméril, Erpétologie générale, vol. 9, 1854, p. 408, Atlas, pl. 99, figs. 1–4.

Eleutherodactylus laticeps Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 93, 106–107.

Type.—Mus. Hist. Nat. Paris No. 509 (No. 1547).

Type locality.—Yucatán, Mexico.

Range.—Known only from type locality.

ELEUTHERODACTYLUS CACTORUM Taylor

Eleutherodactylus cactorum Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 391–394, text fig. 2.

Type.—EHT–HMS No. 6383.

Type locality.—Kilometer 226, 20 miles northwest of Tehuacán, Puebla, Mexico.

Range.—Eastern Puebla (Upper Balsan Province).

ELEUTHERODACTYLUS LATRANS (Cope)

Lithodytes latrans Cope, U. S. Nat. Mus. Bull. 17, 1880, p. 25; U. S. Nat. Mus. Bull. 34, 1889, pp. 316–317, fig. 80.

Eleutherodactylus latrans Stejneger and Barbour, Checklist of North American amphibians and reptiles, ed. 1, 1917, p. 34.

Type—.? (Cotypes) U.S.N.M. Nos. 10058, 10529, 10751–53.

Type locality.—Helotes, Bexar County, Tex.

Range.—Texas; northern Mexico to San Luis Potosí. Known in Mexico from 10 miles west of Naranjos, *San Luis Potosí* (EHT–HMS Collection), and Cuatro Ciénegas, *Coahuila.*

ELEUTHERODACTYLUS AUGUSTI (Dugès)

Hylodes augusti Dugès, *in* Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 3, 1879, pp. 21–22.

Eleutherodactylus augusti Kellogg, U. S. Nat. Mus. Bull. 106, 1932, pp. 93–94, 100–104.—Smith and Necker, Anal. Esc. Nac. Cienc. Biol., vol. 3, 1944, pp. 201–203, pl. 1, fig. 1.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95. 1945, pp. 574–575, pl. 24, figs. 7, 8.

Type.—Alfredo Dugès Museum, Guanajuato, Guanajuato (skeleton).

Type locality.—Guanajuato, Guanajuato, Mexico.

Range.—The western edge and southern part of the central Mexican plateau, and the Sierra Madre del Sur in Guerrero. Specimens are known or have been reported from *Nayarit:* Cerro San Juan; *Durango:* Ventanas ("from a mine 1,000 feet deep!"); *Guanajuato:* Guanajuato, 4 miles west of Acámbaro, Tupátaro; *Zacatecas:* Zacatecas; *Jalisco:* La Laguna (6,900 feet), near Magdalena; *Morelos:* 10 miles northeast of Cuernavaca; *Guerrero:* Agua del Obispo; *Michoacán:* Lake Pátzcuaro (near Quiroga), Uruapan; *Oaxaca:* Mixtequilla Mountains, Cerro Guengola.

ELEUTHERODACTYLUS BOLIVARI Taylor

Eleutherodactylus bolivari Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 298–299, p. 26, figs. 1–4.

Type.—EHT-HMS No. 29564.

Type locality.—Ixtapan del Oro, México, Mexico.

Range.—Known from only the type locality.

ELEUTHERODACTYLUS TARAHUMARAENSIS Taylor

Eleutherodactylus tarahumaraensis Taylor, Copeia, Dec. 27, 1940, pp. 250–253, fig. 1.

? *Eleutherodactylus augusti* Bogert and Oliver (*nec* Dugès), Bull. Amer. Mus. Nat. Hist., vol. 83, 1945, pp. 405–406 (part).[29]

Type.—EHT-HMS No. 23008.

Type locality.—Mojárachic, Chihuahua, Mexico; elevation 6,900 feet.

Range.—Known definitely only from the type locality and (?) 2 miles east of Guirocoba, Sonora; sight records for Nayarit (Ixtlán) and adjacent Jalisco (Magdalena) may possibly belong here.

ELEUTHERODACTYLUS MATUDAI Taylor

Eleutherodactylus matudai Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 154–157, pl. 11.

Type.—U.S.N.M. No. 110626.

Type locality.—Mount Ovando, Chiapas, Mexico.

Range.—Known only from the type locality.

ELEUTHERODACTYLUS VOCALIS Taylor

Eleutherodactylus vocalis Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 401–405, pl. 44, and text fig. 8.

[29] It is impossible to accept the idea expressed by Bogert and Oliver that *tarahumaraensis* and *augusti* are synonymous. These two species are the most widely different of the entire group of *Eleutherodactylus* to which they belong.

Type.—EHT-HMS No. 6390.

Type locality.—Hacienda El Sabino, Uruapan, Michoacán, Mexico.

Range.—Known only from the type locality.

ELEUTHERODACTYLUS NATATOR Taylor

Eleutherodactylus natator Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 394–397, pl. 39, fig. 2, and pl. 40.

Type.—EHT-HMS No. 6373.

Type locality.—Tlilapam (=Cuautlapan), Veracruz, Mexico.

Range.—Western Veracruz, northeastern Oaxaca, and probably northeastern Puebla. Recorded or examined from Cuautlapan, Metlac, and Fortín, *Veracruz*, and Camotlán, *Oaxaca*.

ELEUTHERODACTYLUS AVOCALIS Taylor and Smith

Eleutherodactylus avocalis Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 580–581.

Type.—U.S.N.M. No. 116885.

Type locality.—Tres Cruces, near Tehuantepec, Oaxaca, Mexico.

Range.—Known only from the vicinity of the type locality.

ELEUTHERODACTYLUS RUGULOSUS (Cope)

Liyla rugulosa Cope, Proc. Amer. Philos. Soc., vol. 11, 1869, pp. 160–161.

? *Hylodes berkenbuschii* Peters, Monatsb. Akad. Wiss. Berlin, 1869, pp. 879–880 (probably near Matamoros, Puebla, Mexico; Berlin Mus. No. 6666).

Eleutherodactylus rugulosus Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 95–96, 116–117.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 578–579, pl. 23, figs. 3, 4.

Type.—Cotypes, U.S.N.M. Nos. 29971, 29972.

Type locality.—Pacific region of the Isthmus of Tehuantepec, Mexico.

Range.—Eastern Puebla and Oaxaca southward to El Salvador. Reported in Mexico from *Chiapas:* Colonia Hidalgo, Finca Juárez, La Magnolia, Rancho Las Gradas, Cruz de Piedra, Colonia Soconusco, La Esperanza (near Escuintla), Salto de Agua, San Juanita, Tonalá, Tumbala (4,000 feet); *Guerrero:* Agua del Obispo; *Oaxaca:* Pluma, Tehuantepec; *Puebla*. The published Veracruz references may belong to *Eleutherodactylus natator*.

ELEUTHERODACTYLUS BEATAE (Boulenger)

Hylodes beatae Boulenger, Ann. Mag. Nat. Hist., ser. 7, vol. 12, 1903, pp. 552–553.

Syrrhophus mystaceus Barbour, Proc. Biol. Soc. Washington, vol. 35, 1922, p. 112 (type locality, Cerro de los Estrapajos, Veracruz, Mexico; Mus. Comp. Zool. No. 8241).

Eleutherodactylus beatae Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 92–93, 104–105.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 572–573, figs. 60G, 61A.

Type.—Cotypes, Brit. Mus. Nos. 1903.9.30.236; 1903.9.30.237.

Type locality.—La Perla, near Orizaba, Veracruz, Mexico, 6,000 feet elevation.

Range.—Central eastern Veracruz and Pacific Chiapas. Reported from Cuautlapan, Tequeyutepec, Cerro de los Estrapajos (west of Jalapa), La Perla (near Orizaba), *Veracruz;* La Esperanza, *Chiapas.*

ELEUTHERODACTYLUS DORSOCONCOLOR Taylor

Eleutherodactylus dorsoconcolor Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 152–154, pl. 10.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 574, fig. 61B.

Type.—U.S.N.M. No. 110619.

Type locality.—Tequeyutepec, Veracruz, Mexico.

Range.—Veracruz. Known only from type locality.

ELEUTHERODACTYLUS VENUSTUS (Günther)

Hylodes venustus Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 234, pl. 68, fig. C.

Eleutherodactylus venustus Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 96–97, 117–118.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 573–574, fig. 61C–D.

Type.—Brit. Mus. No. 1901.12.19.37.

Type locality.—Jalapa, Veracruz, Mexico.

Range.—Western Veracruz and Chiapas. Reported from *Veracruz:* Tequeyutepec, Minatitlán, and Jalapa; *Chiapas:* La Esperanza (near Escuintla), Salto de Agua (Mount Ovando), Colonia Soconusco.

ELEUTHERODACTYLUS MACDOUGALLI Taylor

Eleutherodactylus macdougalli Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 71–73, pl. 7, figs. 1, 1a–1c.

Type.—EHT-HMS No. 27482.

Type locality.—La Gloria, Oaxaca, Mexico (Atlantic slopes, north of Niltepec, 4,500 feet elevation).

Range.—Known only from the type locality.

ELEUTHERODACTYLUS RHODOPIS (Cope)

Lithodytes rhodopis Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, p. 323.

Eleutherodactylus rhodopis Noble, Bull. Amer. Mus. Nat. Hist., vol. 38, 1918, p. 327, pl. 16, fig. 1.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 97–98, 112–115.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 576–578.

Hylodes sallaei Günther, Proc. Zool. Soc. London, 1868, p. 487, pl. 38, fig. 3 (Mexico; Brit. Mus. No. 57.7.31.27).

?*Hylodes plicatus* Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 228, pl. 66, fig. B (Jalapa, Veracruz, Mexico; Brit. Mus. No. 1901.12.19.38).

Type.—U.S.N.M. No. 16558 (lectotype).

Type locality.—Orizaba and Córdoba, Veracruz; restricted to vicinity of Orizaba.

Range.—San Luis Potosí through Central America to ?Brazil (*fide* Miranda-Ribeiro). Reported in Mexico from *San Luis Potosí:* Chapulhuacán; *Veracruz:* Potrero Viejo, San Juan de Gracia, Cuautlapan; *Chiapas:* San Juanito (near Palenque), La Esperanza (near Escuintla), Colonia Soconusco, Tonalá, Las Nubes, Chicharras, Salto de Agua, Las Gradas, Cruz de Piedra, Finca Juárez; *Oaxaca:* Matías Romero; *Tabasco:* La Venta.

ELEUTHERODACTYLUS DUNNI Barbour

Eleutherodactylus dunnii Barbour, Proc. Biol. Soc. Washington, vol. 35, 1922, pp. 111–112.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 69, 105–106.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 570, 572, fig. 61 E–H.

Type.—Mus. Comp. Zool. No. 8242.

Type locality.—Cerro de los Estropajos, west of Jalapa, Veracruz, Mexico.

Range.—Western Veracruz and eastern Puebla. Reported from *Veracruz:* Tequeyutepec, Cuautlapan, Xico, and Cerro de los Estropajos; *Puebla:* Huauchinango.

Family HYLIDAE Günther

Hylidae Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 96.

KEY TO MEXICAN GENERA OF HYLIDAE

1. Terminal phalanges more or less T-shaped; very small green frogs, the color quickly fading; transparent on venter so internal organs may be seen; 2 species ..... **Centrolenella** (p. 68)
   Terminal phalanges more or less claw-shaped; not transparent on ventral surface 2
2. Skin of head co-ossified with cranium 3
   Skin on head not co-ossified with cranial bones; head not forming casque 6
3. Head a bony casque with a lateral shelf 4
   Head not in form of a bony casque; no palatine or parasphenoid teeth 5
4. Palatine teeth present forming a curved row behind choanae; parasphenoid teeth present, forming a single median row; lateral shelf wide; 2 species ..... **Diaglena** (p. 69)
   Palatine teeth absent; parasphenoid teeth present, small; lateral shelf narrow; 1 species ..... **Triprion** (p. 70)
5. A series of high, conical, curved, bony spines surrounded by glands border occipital region, and are continued (much shortened) anteriorly along the borders of skull bones; 1 species ..... **Anotheca** (p. 70)
   No spines on skull; head tending to bend sharply forward, especially when preserved; 1 species ..... **Pternohyla** (p. 70)

6. Pupil vertical; first finger opposable to other three; pollex bone forms a lateral projection on first finger, but without an exposed spine; 3 species ---------- **Agalychnis** (p. 71)
   Pupil horizontal ---------- 7
7. First finger with a free rudiment of pollex, and with a free exposed spine; 2 species ---------- **Plectrohyla** (p. 73)
   First finger without a free rudiment of pollex and without spine ---------- 8
8. A pair of external vocal sacs behind angles of jaws; parotoid spread over back; skin thick; 3 species ---------- **Acrodytes** (p. 74)
   No pair of vocal sacs behind jaw angles; parotoids absent or indistinct ---------- 9
9. A pair of subgular vocal sacs in males; 1 species ---------- **Smilisca** (p. 75)
   None or a single subgular vocal sac ---------- 10
10. No large ventrolateral gland present; individual horny nuptial rugosities on first finger of male, small or absent ---------- 11
    A large ventrolateral gland present; nuptial rugosities on male, relatively very large, and reduced in area and numbers; 1 species ---------- **Ptychohyla** (p. 91)
11. Vomerine teeth absent; vocal sac present or absent; a broad fold of skin along side to groin; head wide and flat; 2 species ---------- **Hylella** (p. 76)
    Vomerine teeth present (absent in *H. picta*, in which case there is no lateral fold of skin) ---------- 12
12. Tips of digits not dilated; small terrestrial forms; 1 species ---------- **Acris** (p. 77)
    Tips of digits widened; arboreal and terrestrial forms; 37 species ---------- **Hyla** (p. 77)

Genus CENTROLENELLA Noble

Centrolenella Noble, Bull. Amer. Mus. Nat. Hist., vol. 42, 1920, p. 441.

Genotype.—*Centrolenella antioquiensis* Noble.
Range.—Guerrero to Ecuador.
Species.—Five, of which two occur in Mexico.[30]

KEY TO MEXICAN SPECIES OF CENTROLENELLA

1. Tibiotarsal articulation reaching several millimeters beyond tip of snout; upperparts smooth; head broad; no fleshy folds on thighs near anus; iris of eye, golden; choanae very large; a cream spot on eyelid; heels overlapping when legs are folded at right angles; 24 mm.
   fleischmanni (p. 68)
   Dorsal surface of body and limbs covered with minute rugosities; forearm and toes distinctly broader than preceding, and hand larger; body somewhat shorter and thicker proportionally; iris of eye dark black; heel reaches nostril; no cream spot on eyelid; heels barely touching when legs are folded at right angles to body; maximum size, 23 mm.
   viridissima (p. 69)

CENTROLENELLA FLEISCHMANNI (Boettger)

Hylella fleischmanni Boettger, Bericht. Senck. Nat. Ges., 1893, p. 251.
Centrolenella fleischmanni Noble, Proc. Biol. Soc. Washington, vol. 37, 1925, pp. 66, 69.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, p. 74.

[30] Some authors combine these with *Centrolene* Jiménez de la Espada, 1872 (Anal. Soc. Esp. Hist. Nat. vol. 1, p. 87; type *C. geckoideum* Jiménez de la Espada, Río Napo, Ecuador), comprised of three species with humeral hooks in males and sometimes in females.

Type.—Senckenberg Mus.

Type locality.—San José, Costa Rica.

Range.—Chiapas to Costa Rica. Known in Mexico only from Salto de Agua, Mount Ovando, Chiapas.

CENTROLENELLA VIRIDISSIMA Taylor

Centrolenella viridissima Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 75–77, pl. 9, figs. 2, 2a, 2b.

Type.—EHT–HMS No. 27725.

Type locality.—Agua del Obispo, Guerrero, Mexico.

Range.—Known only from type locality.

Genus DIAGLENA Cope

Diaglena Cope, U. S. Nat. Mus. Bull. 32, 1887, p. 12.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 57–58.

Genotype.—Triprion spatulatus Günther.

Range.—Pacific coast from southern Sinaloa to the Isthmus of Tehuantepec.

Species.—Two.

KEY TO MEXICAN SPECIES OF DIAGLENA

1. Body skin smooth; canthal ridges unite much behind nostrils forming a ridge that continues to tip of snout; head and body rather slender; uniform green above; 86 mm ..... spatulata (p. 69)

   Skin above finely granular; canthal ridges unite far forward, not forming a prominent nasal ridge that extends to tip of snout; head broader and longer proportionally; heavily mottled with brown; 98 mm. ..... reticulata (p. 69)

DIAGLENA RETICULATA Taylor

Diaglena reticulata Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 60–61, pl. 4, figs. 1, 1a–1c; pl. 5, fig. 1.

Type.—U.S.N.M. No. 115500.

Type locality.—Cerro Arenal, Oaxaca, Mexico.

Range.—Tehuantepec region of Oaxaca. Specimens examined or reported from *Oaxaca:* Cerro Arenal, Chivela, San Antonio.

DIAGLENA SPATULATA (Günther)

Triprion spatulatus Günther, Ann. Mag. Nat. Hist., ser. 5, vol. 10, 1882, p. 279.
Diaglena spatulata Cope, U. S. Nat. Mus. Bull. 32, 1887, p. 12.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 131–132, 137–138.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 58–60, pl. 4, figs. 2, 2a–2c; pl. 5, fig. 2.

Type.—(Cotypes) Brit. Mus. Nos. 82.11.13.1; 82.12.5.11–12.

Type locality.—Presidio de Mazatlán, Sinaloa, Mexico.

Range.—Known only from the type locality and vicinity. Recorded from *Sinaloa:* Presidio ("50 mi. from Mazatlán"), and "Venodio" (=? Venadillo).

Genus TRIPRION Cope

Pharyngodon Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 193 (genotype *Pharyngodon petasatus* Cope; preoccupied by *Pharyngodon* Diesing, 1860).

Triprion Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, p. 127.

Genotype.—*Pharyngodon petasatus* Cope.

Range.—Northern Yucatán.

Species.—One.

TRIPRION PETASATUS (Cope)

Pharyngodon petasatus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, pp. 193–194.

Triprion petasatus Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, p. 127.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 132, 138–139.—Gaige, Carnegie Inst. Washington Publ. No. 457, 1936, pp. 291–292.

Type.—U.S.N.M. No. 12287.

Type locality.—Vicinity of Mérida, Yucatán, Mexico.

Range.—Yucatán. Reported from Mérida, Chichen Itzá, Santa Elena Cenote.

Genus ANOTHECA Smith

Anotheca Smith, Proc. Biol. Soc. Washington, vol. 52, 1939, pp. 190–191, pl. 1, figs. 1–3, and pl. 2, fig. 6.

Genotype.—*Anotheca coronata* (Stejneger).

Range.—Central Veracruz, Mexico.

Species.—One.

ANOTHECA CORONATA (Stejneger)

Opisthodelphys ovifera Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 117 (Córdoba, Veracruz, Mexico) (*nec Notodelphys ovifera* Lichtenstein and Weinland).

Gastrotheca coronata Stejneger, Proc. U. S. Nat. Mus., vol. 41, 1911, pp. 287–288.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 131, 133–135.

Anotheca coronata Smith, Proc. Biol. Soc. Washington, vol. 52, 1939, pp. 190–191, pl. 1, figs. 1–3, and pl. 2, fig. 6.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 601–602, figs. 60B–C.

Type.—U.S.N.M. No. 48279.

Type locality.—Palomo, Valle de Orosi, Cartago, Costa Rica.

Range.—Southern Veracruz to Costa Rica. Specimens are known or recorded from Veracruz: Cuautlapan, Córdoba, and San Juan de Gracia.

Genus PTERNOHYLA Boulenger

Pternohyla Boulenger, Ann. Mag. Nat. Hist., ser. 5, vol. 10, 1882, p. 326.

Genotype.—*Pternohyla fodiens* Boulenger.

Range.—Western central Mexico.

Species.—One.

PTERNOHYLA FODIENS Boulenger

Pternohyla fodiens Boulenger, Ann. Mag. Nat. Hist., ser. 5, vol. 10, 1882, pp. 326–327, figs.—Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1901, p. 292, pl. 74, fig. B.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 131, 135–137.

Hyla rudis Mocquard, Bull. Soc. Philom. Paris, ser. 9, vol. 1, 1899, pp. 163–164, pl. 1, fig. 3 (Guadalajara and Jalisco in Mexico; Mus. Hist. Nat. Paris No. 373a).

Type.—Brit. Mus. No. 1882.11.27.8.

Type locality.—Presidio 50 miles from Mazatlán, Sinaloa, Mexico.

Range.—Sonora to Colima. Specimens have been examined or reported from *Sonora:* Noria; *Jalisco:* 3 miles east of Autlán; near Colotitlan, Cerro de Cal, El Fuerte (near Ocotlán), Guadalajara, Hacienda Santa María Magdalena, Jamay, Magdalena, Guadalajara; *Nayarit:* Acaponeta, Tepic; *Sinaloa:* Mazatlán, Presidio de Mazatlán, Rosario (250 feet altitude); *Colima:* Colima, Quesería, Buena Vista.

Genus AGALYCHNIS Cope

Agalychnis Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 16, 1864, p. 181.

Genotype.—Hyla callidryas Cope.

Range.—Central Veracruz and Guerrero to Ecuador.

Species.—Six, three of which occur in Mexico.

KEY TO MEXICAN SPECIES OF AGALYCHNIS

1. Fingers strongly webbed (one-half to two-thirds); toes three-fourths to fully webbed; digital disks much wider than digits; green above (with a few small cream spots present or absent); ventral and concealed surfaces orange; 80 mm ..... moreletii (p. 71)
   Fingers webbed one-half or less, toes two-thirds or less 2
2. Fingers very slightly webbed; toes about one-third webbed; terminal toe pads scarcely wider than digits; green above, white or yellowish cream below and on concealed surfaces; numerous discrete white spots low on sides (occasionally on back); eyes not red; 107 mm ..... dacnicolor (p. 72)
   Fingers about one-third, toes one-third webbed or slightly more; terminal pads distinctly wider than digits; a series of dark (or green) quadrangular marks low on side, separated by diagonal cream lines; eye red; body green above, yellowish or white below; 55 mm ..... callidryas (p. 72)

AGALYCHNIS MORELETII (A. Duméril)

Hyla moreletii A. Duméril, Ann. Sci. Nat. Paris, ser. 3, zool., vol. 19, 1853, p. 169.

Agalychnis moreletii Cope, Nat. Hist. Rev., 1860, p. 110.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 599–601, pl. 31.

Phyllomedusa moreletii Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 142–143, 146–147, figs. 19a, 20a, b.

Hyla holochlora Salvin, Proc. Zool. Soc. London, 1860 (1861), pp. 460–461, pl. 32, fig. 2 (Cobán, Guatemala; Brit. Mus. No. 641.26.142).

Type.—Mus. Hist. Nat. Paris No. 428 (parchment label 767).

Type locality.—Cobán, Verapaz, Guatemala.

Range.—Atlantic slopes from central Veracruz and Pacific slopes from the Isthmus of Tehuantepec southward to Panama. Reported in Mexico from *Veracruz:* Cuautlapan, north of Orizaba, Volcano of Tuxtla, Córdoba, Berta (near Coatzacoalcos); *Chiapas:* Finca Juárez; *Campeche:* Tuxpeña Camp; *Yucatán:* 6½ miles south of Chichen Itzá; *Tabasco:* Tepeaca; *Oaxaca:* Mirador (Hacienda near San Miguel).

AGALYCHNIS DACNICOLOR (Cope)

Phyllomedusa dacnicolor Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 16, 1864, p. 181.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 142, 143–144.

Agalychnis dacnicolor Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 6, 1866, p. 86.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 40–42, pl. 2, fig. 2, pl. 3, fig. 2 (tadpole).—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 599, pl. 28, fig. 1.

Type.—Formerly in U. S. National Museum; now lost (*fide* Kellogg).

Type locality.—Near Colima, Colima, Mexico.

Range.—Pacific slopes from southern Sonora to the Isthmus of Tehuantepec. Specimens examined or reported from *Sonora:* Alamos, Guirocoba; *Sinaloa:* Mazatlán, Presidio ("50 miles from Mazatlán"), San Francisquito, Rosario, San Blas; *Michoacán:* Cicio; *Nayarit:* Acaponeta, Santiago, Rosamorada, Tepic; *Colima:* Colima, 2 miles from Colima, east of Lo de Villa, Paso del Río, Quesería, Manzanillo, Tecomán, Villa Alvarez, Santiago; *Guerrero:* Acapulco, Ometepec (200 feet altitude), near Garrapata, 1 mile north of Organos, Río Balsas, Kilometer 240 (north of Mexcala), Ocotillo, San Luis Allende, Tierra Colorada; *Morelos:* Cuernavaca, near Huajintlán; *Oaxaca:* Tehuantepec.

AGALYCHNIS CALLIDRYAS (Cope)

Hyla callidryas Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, 1862, p. 359.

Agalychnis callidryas Cope, Nat. Hist. Rev., 1865, p. 110.—Gaige, Carnegie Inst. Washington Publ. No. 457, 1936, p. 292.

Phyllomedusa helenae Kellogg (*nec* Cope), U. S. Nat. Mus. Bull. 160, 1932, pp. 142, 145.

Type. Unknown.

?*Type locality.*—Córdoba, Veracruz, México.

Range.—Central Veracruz south to Guatemala. Reported or examined from *Veracruz:* Tierra Colorada, Berta; *Puebla:* Tezuitlán; *Tabasco:* La Venta, Santo Tomás; *Yucatán:* Chichen Itzá.

Genus PLECTROHYLA Brocchi [31]

Plectrohyla Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, p. 93.—Hartweg, Occ. Pap. Mus. Zool., Univ. Michigan, No. 437, 1941, p. 1.

Cauphias Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, p. 129 (type same as for *Plectrohyla*).

Genotype.—*Plectrohyla guatemalensis* Brocchi.

Range.—Chiapas and Guatemala.

Species.—Five, of which two occur in Mexico.

KEY TO MEXICAN SPECIES OF PLECTROHYLA

1. Snout terminating in a sharp point, the canthus with a sharp edge; nostrils not so far forward as lip; skin very pustular, rough, in males; toes webbed to near terminal pads on third and fifth toes, leaving two joints free on fourth; tympanum more or less visible; tarsal fold not a free flap; size 45 mm..... sagorum (p. 73)

   Snout blunt, truncate, the region about nostrils swollen, elevated; nostrils at extreme anterior part of snout, anterior to or as far forward as edge of upper lip; tarsal fold forming a long free flexible flap; toes webbed to terminal disk except on fourth, which has distal joint nearly free; tympanum almost or completely hidden by thick pustulate skin; known maximum size, 45 mm..... matudai (p. 73)

PLECTROHYLA MATUDAI Hartweg

Plectrohyla matudai Hartweg, Occ. Pap. Mus. Zool. Univ. Michigan, No. 437, 1941, pp. 5–10.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 596–597, fig. 60D, pl. 29.

Plectrohyla "Form *a*" Hartweg and Orton, Occ. Pap. Mus. Zool. Univ. Michigan, No. 438, 1941, pp. 2–5, figs. 1–2.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 39–40 (on tadpoles).

Type.—Univ. Michigan Mus. Zool. No. 88863.

Type locality.—Mount Ovando, District of Soconusco, Chiapas, Mexico.

Range.—Known only from the type locality and vicinity.

PLECTROHYLA SAGORUM Hartweg

Plectrohyla sagorum Hartweg, Occ. Pap. Mus. Zool. Univ. Michigan, No. 437, 1941, pp. 2–5, pl. 1, figs. 1, 2, 3.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 597–598, fig. 60E, pl. 30.

Plectrohyla "Form *b*" Hartweg and Orton, Occ. Pap. Mus. Zool. Univ. Michigan, No. 438, 1941, pp. 5–6 (tadpoles).

Type.—Univ. Michigan Mus. Zool. No. 88862.

Type locality.—Mount Ovando, District of Soconusco, Chiapas, Mexico.

Range.—Known only from the type locality and vicinity.

[31] The name *Boana* Gray is apparently the earliest name for Central and South American frogs with a rudimentary pollex. This antedates *Hypsiboas*, which has been used for the group. The name *Plectrohyla* Brocchi is tentatively retained, since there seems to be a possible generic difference in the characters of the spine on the pollex and the vomerine teeth between the northern forms and those in southern Central America and South America, which are referable to *Boana*.

Genus ACRODYTES Fitzinger

Acrodytes Fitzinger, Systema reptilium, 1843, p. 30.—Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 62–63.

Scytopis Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, 1862, p. 355 (genotype *Scytopis hebes* Cope=*Hyla venulosa* Daudin).

Genotype.—*Hyla venulosa* Daudin=*Rana venulosa* Laurenti, 1768, Synopsin reptilium, p. 31 ("Indiis").

Range.—Southern Tamaulipas and Sinaloa to Brazil.

Species.—Three Mexican and at least one and probably other extralimital species.

KEY TO MEXICAN SPECIES OF ACRODYTES

1. Lacking a dorsal pattern of black blotches or dorsolateral stripes; large pustules on back with or without a black tip; eye large, greater than its distance to nostril; Chiapas; 70 mm ..... **modesta** (p. 74)
   A dorsal pattern of a pair of indefinite dorsal stripes and blotches or of blotches alone; eye less than or equal to its distance from nostril 2
2. Anterior blotches separated from posterior by a broad band of ground color; venter immaculate; parotoids not strongly thickened; Guerrero; 98 mm., ♂ ..... **inflata** (p. 74)
   A pair of broad, dark, irregular stripes on back, with a light lateral stripe bordering them; parotoids thickened, making skin thick and leathery; digital disks distinctly smaller than in the preceding; San Luis Potosí to Chiapas ..... **spilomma** (p. 75)

ACRODYTES MODESTA Taylor and Smith

Acrodytes modestus Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 594–596, pl. 27, fig. 2, pl. 28, figs. 2, 3.

Type.—U.S.N.M. No. 115013.

Type locality.—Cruz de Piedra, near Acacoyagua, Chiapas, Mexico.

Range.—Pacific drainage of Chiapas. Reported from Cruz de Piedra, La Esperanza (near Escuintla), and Colonia Soconusco.

ACRODYTES INFLATA Taylor

Acrodytes inflatus Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 64–69, pl. 9.

Type.—EHT–HMS No. 17890.

Type locality.—Near La Venta, Guerrero, Mexico.

Range.—The Pacific coast in Guerrero and possibly north to Mazatlán, Sinaloa (it is possible that the following records of *Hyla venulosa* may refer to this form: *Sinaloa:* Presidio [Boulenger]; *Colima:* Colima [Oliver]; *Nayarit:* Santa Teresa [Kellogg]).

ACRODYTES SPILOMMA (Cope)

Hyla lichenosa Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858, pp. 102–103, pl. 8, fig. C (part only: the cotypes from "Veracruz," "Córdoba," and "Mexico," seven specimens, all in Brit. Mus.; name restricted by Boulenger, Catalogue of the Batrachia Salientia s. Ecaudata in the collection of the British Museum, 1882, p. 364, to the other cotypes, from "South America," "Amazons," and "America" [32]).

Hyla spilomma Cope, Proc. Amer. Phil. Soc., vol. 17, 1877, p. 86.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 593–594, pl. 27, fig. 1.

Hyla nigropunctata Boulenger, Catalogue of the Batrachia Salientia in the collection of the British Museum, ed. 2, 1882, p. 366 (cotypes, Brit. Mus. Nos. 81.10.31.20, 59.9.20.2, Jalapa, Veracruz).

Hyla venulosa Kellogg (*nec* Laurenti), U. S. Nat. Mus. Bull. 160, 1932, pp. 154–155, 176–179, figs. 19c, 20d.

Type.—Lost. (*Fide* Kellogg.)

Type locality.—Cosomaloapam, Veracruz, Mexico.

Range.—From Tamaulipas to Chiapas and perhaps Central America. The species has been reported (as *Hyla venulosa*) from *Tamaulipas:* Tampico; *San Luis Potosí:* Río Coy (near Pujal), Tamuzunchale; *Veracruz:* San Juan de la Punta, Cuautlapan, Tezonapa, Misantla, Jalapa, Veracruz, Córdoba, Panuco, Cerro de Gallo, Tierra Colorada; *Campeche:* Champotón, Tres Brazos, Becán; *Chiapas:* Cruz de Piedra (near Acacoyagua); *Tabasco:* Frontera; *Oaxaca:* Tuxtepec; *Yucatán:* Chichen Itzá.

Genus SMILISCA Cope

Smilisca Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 194.

Genotype.—*Smilisca daulinia* Cope=*Hyla baudinii* Duméril and Bibron.[33]

Range.—Southern Texas and Sonora to Honduras.

Species.—One, with an indefinite number of subspecies.

SMILISCA BAUDINII BAUDINII (Duméril and Bibron)

Hyla baudinii Duméril and Bibron, Erpétologie générale, vol. 8, 1841, pp. 564–565.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 155, 160–163, figs. 1c, 19c, 20c.

[32] Kellogg (*loc. cit.*) mentions and describes the Mexican types and indicates that these were the only ones, following an ambiguity in Boulenger's treatment, which (*op. cit.*, p. 366) clearly designates the Mexican specimens "types" of Günther's *lichenosa*. Boulenger obviously did not imply that these were the only "types" (he did not select a single specimen as "the" type), and in fact indicated that there were others by quoting "*Hyla lichenosa*, part" in the synonymy of both *Hyla venulosa* and *Hyla nigropunctata*, and by allocating Günther's name with *venulosa* while naming certain ones of the cotypes as *nigropunctata*. Unfortunately he failed to designate clearly the types of *lichenosa* which he referred to *venulosa*, although some may be listed. To avoid further ambiguity we hereby designate as lectotype the adult male from the "Amazons," which is listed by Günther as a cotype (*op. cit.*, p. 102) and may be specimen 1 listed by Boulenger (*op. cit.*, p. 365).

[33] Peculiarities in the skull of this species, combined with the paired vocal sacs, cause us to consider this form as a representative of a genus apart from *Hyla*.

Smilisca baudinii Dickerson, The frog book, 1906, pp. 151–152, pl. 57, figs. 178–183.

Hyla baudinii baudinii Stejneger and Barbour, Checklist of North American amphibians and reptiles, ed. 2, 1923, p. 29.

Hyla vanvlietii Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 61 (Brownsville, Tex.; U.S.N.M. No. 3239, lost).

Smilisca daulinia Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 65, footnote (=*Hyla baudinii*).

H.(yla) muricolor Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, 1862, p. 359 (Mirador, Veracruz; U.S.N.M. No. 25097).

Type.—Mus. Hist. Nat. Paris No. 401 (No. 4798).

Type locality.—Mexico.

Range.—Southern Texas and Sonora south along lowlands to Honduras. Reported in Mexico from Distrito Federal and the states of Campeche, Chiapas, Colima, Guerrero, Hidalgo, Jalisco, Nayarit, Nuevo León, Oaxaca, Puebla, Quintana Roo, San Luis Potosí, Sinaloa, Sonora, Tabasco, Tamaulipas, Veracruz, and Yucatán.

Genus HYLELLA Reinhardt and Lütken

Hylella Reinhardt and Lütken, Vid. Medd. Nat. Foren. Kjøbenhavn, 1861, pt. 1, 1862, p. 199.

Exerodonta Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 3, 1879, p. 20 (*Exerodonta sumichrasti* Brocchi).

Genotype.—*Hylella tenera* (herewith designated).

Range.—Morelos and Oaxaca to Paraguay and Brazil.

Species.—Nine, two of which occur in Mexico.

KEY TO MEXICAN SPECIES OF HYLELLA

1. A vocal sac present; chin strongly granular; undersurface of arms with irregular granules; pads on digit tips large ..... azteca (p. 77)
   Vocal sac absent; chin not or but very slightly granular; undersurface of arm smooth; an elevation usually present on vomers (rarely with teeth); digital pads smaller ..... sumichrasti (p. 76)

HYLELLA SUMICHRASTI (Brocchi)

Exerodonta sumichrasti Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 3, 1879, p. 20.

Hylella platycephala Cope, Proc. Amer. Philos. Soc., vol. 18, 1879, pp. 267–268 (Tapana [=Tapanatepec], Oaxaca, Mexico; U.S.N.M. No. 10037, five cotypes).

Hylella sumichrasti Boulenger, Catalogue of the Batrachia Ecaudata in the collection of the British Museum, ed. 2, 1882, p. 366.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 180, 181–182.

Type.—Lost, presumably (*fide* Kellogg).

Type locality.—Santa Efigenia, Oaxaca, Mexico.

Range.—Semi-arid Pacific slopes of Oaxaca at the Isthmus of Tehuantepec. Known from *Oaxaca:* Santa Efigenia, Japana (=Tapa-

natepec), south of Chasumba, between Huamelula, Zapotitlán (1,900 feet elevation) and Llano Ocotol, Cerro Arenal, Tres Cruces, Lachiguiri, Portillo los Nanches (7 leagues northwest of Tehuantepec), "Tehuantepec," La Concepción, Río Grande, 12½ miles north of Niltepec (the report from *Colima:* Cualata, by Kellogg, is based on a rather shriveled specimen which apparently belongs to another species).

HYLELLA AZTECA Taylor

Hylella azteca Taylor, Proc. Biol. Soc. Washington, vol. 56, 1943, pp. 49–52.

Type.—EHT–HMS No. 17525.

Type locality.—Tepoztlan, Morelos, Mexico.

Range.—Known only from type locality; probably occurs in adjacent Puebla.[34]

Genus ACRIS Duméril and Bibron

Acris Duméril and Bibron, Erpétologie générale, vol. 8, 1841, p. 506.

Genotype.—Rana gryllus LeConte.

Range.—Connecticut to Utah and south to the Gulf and to central Coahuila.

Species.—Two, one in Mexico.

ACRIS CREPITANS Baird

Acris crepitans Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 59.—Dunn, Proc. Acad. Nat. Sci. Philadelphia, vol. 90, 1938, pp. 153–154.

Type.—None known.

Type locality.—Northern States generally.

Range.—"Connecticut to the Canadian northwest, and to Georgia, Louisiana and Texas; from sea level to 2000 ft." In Mexico, central Coahuila (Músquiz).

Genus HYLA Laurenti

Hyla Laurenti, Synopsin reptilium, 1768, p. 32.

Hyliola Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, ser. 4, vol. 1, 1899, p. 337 (*Hyliola regilla* Mocquard=*Hyla regilla* Baird and Girard).

Genotype.—Hyla viridis Laurenti.

Range.—World-wide, excluding Arctic and sub-Arctic regions, and most of Africa.

Species.—Approximately 350, about 180 of these American, of which 37 are Mexican.

[34] Sight record, specimen lost, Hobart M. Smith.

757435—48——6

KEY TO MEXICAN SPECIES OF HYLA

1. A dark stripe (absent in *cárdenasi*) from tip of snout to eye, and from eye diagonal to point on side of body, and usually bordered by light color or stripe above or below or both; body usually green in life with or without dark spots on back; terminal toe disks small with never more than a vestige of web between fingers; apparently largely terrestrial (*euphorbiacea*, an exception, is apparently largely arboreal).
eximia group.. 2

No dark stripe from tip of snout to eye and from eye diagonally to a point low on sides of body (sometimes indicated in *phaeota*, a large species, the body not green)..... 8

2. Skin above strongly granular or pustulate; Baja California; 42 mm.
regilla (p. 82)

Skin smooth or minutely corrugated..... 3

3. Posterior and to a lesser extent anterior region of femur and groin with blackish or brownish reticulation enclosing rounded or irregular yellow-cream spots; Veracruz, Puebla, and Oaxaca; 37 mm. **euphorbiacea** (p. 82)

Posterior and anterior region of thigh with equally distributed pigmentation without spots and reticulations..... 4

4. Tibiotarsal articulation to eye or a little beyond, but not to nostril..... 5

Tibiotarsal articulation (heel) to nostril or tip of snout; head less wide; terrestrial forms; disks smaller..... 7

5. Diameter of eye greater than length of snout; eyelid width greater than interorbital width; snout bluntly rounded; uniform green without lateral marks on snout and behind eye; Puebla; 39 mm.. **cárdenasi** (p. 83)

Diameter of eye distinctly less than length of snout..... 6

6. Snout oval; a distinct light-edged dark band on head and side; eyelid less than interorbital width; widespread on the Mexican plateau; 35 mm.
eximia (p. 83)

Snout blunt; head wider; tibiotarsal articulation to between eye and nostril; head wide; eyelid 1½ times interorbital distance; color olive-gray and black, the lateral stripe dim on head and body, not light edged; arboreal; digital disks rather large; Guerrero; 41 mm.
arboricola (p. 83)

7. Larger; green with well-defined, light-edged, dark stripe on side of head and body; dark spots on dorsum edged with silvery white; front side of tibia blackish bordered by a white line, continued on foot; Veracruz to Morelos in high mountains; 50 mm..... **lafrentzi** (p. 84)

Somewhat smaller; with less distinct stripe on body; color green (rarely olive, gray, or brown); dorsal spots not edged with light color; anterior edge of tibia with brown spots; posterior edge of tibia without white line; Chihuahua; 42 mm..... **wrightorum** (p. 84)

8. Entire side of head, and more or less the side of body, darker than, and contrasting more or less with, dorsal coloration; lighter dorsal color terminating at a point near nostril (never extending to lip); pigment forming elaborate star-shaped flecks; whitish part of dorsal coloration appears under lens as extremely minute, closely approximated circles; occasionally (in specimens captured at night) no very strong differentiation between the dorsal and lateral coloration, but under lens, pigment seen to be in larger flecks on sides..... **loquax** group..... 9

Side of head and body not darker than dorsal coloration, usually lighter, with or without light spots or dark spots or both..... 16

9. Femur (thigh) immaculate 10
Femur with at least some pigment 11
10. Dorsum whitish with a triangular brown spot on occiput, connected or not with another blotch or blotches on back; stripe on side of head and from eye more or less continued to groin; distal subarticular tubercle of fourth finger double; fingers one-half or more webbed; vomerine teeth present; 27 mm ..... **ebraccata** (p. 84)
No triangular dark spot on head or back; a pair of brown lines often visible on anterior one-half or two-thirds of back; limbs frequently barred with darker; toes one-third (or slightly less) webbed; the dark stripe from tip of snout to groin, bordered above with a lighter stripe or not; 23 mm ..... **robertmertensi** (p. 84)
11. Dark pigment confined to dorsal side of femur; vomerine teeth present 12
Pigment on dorsal and posterior parts of femur appearing as a sparse peppering 13
12. A larger species, with a conspicuous axillary web; posterior surface of thigh red or orange (which fades, leaving no trace); fingers much more than one-half webbed; distal tubercle of fourth finger single; an indistinct tarsal fold; a vocal sac in males; no canthus rostralis; 42 mm ..... **loquax** (p. 84)
Smaller species with an irregular dark brown or vinaceous pattern on back; sometimes the shoulder spot has an X-shape; fingers one-fourth or less webbed; pigment on femur may extend length of dorsal surface of femur or only part way across ..... **underwoodi** (p. 85)
13. A conspicuous axillary web; hand half or more webbed; outer tubercle of fourth finger single; uniform or indefinitely spotted above; no distinct tarsal fold; canthus distinct; vomerine teeth invariably present; tympanum wider than its distance from eye; vocal sac in male; 38 mm ..... **rickardsi** (p. 85)
Axillary web slight or absent 14
14. Hand with only slight vestige of web; vomerine teeth variable or absent 15
Hand half or more webbed; no vocal sac in male; tympanum narrower than its distance from eye, less than half diameter of eye; heel to between eye and nostril; ventral surface of tarsus and posterior surface of femur pigmented; 43.5 mm ..... **rozellae** (p. 86)
15. A broad dorsolateral pinkish-white stripe from eye to near groin; vomerine teeth absent (rarely present but if so, small, inconspicuous); tympanum a little more than one-third eye; canthus angular; heel to between eye and tip of snout; 25 mm ..... **picta** (p. 85)
No broad dorsolateral stripe; sometimes a very narrow line without pigment between dorsal and lateral coloration; vomerine teeth usually present in adults, often absent in young; tympanum about one-half of eye; canthus absent; heel to anterior part of eye; 30 mm ..... **smithi** (p. 85)
16. Skin leathery, thickly covered with a glandular layer (parotoid?), not confined on back; under lens very numerous, minute, oily-yellow (somewhat whitish) points visible in skin; no web or only a vestige between fingers; a heavy supratympanic fold; nuptial callosities of first finger of males covered with black, horny spines (also present on second and third fingers); anal flap usually elongate, bringing anus to near lower level of femora; medium large to large (*crassa* has not been examined, but very probably all these characters obtain in that form) ..... **bistincta group** 17

Skin not thick and leathery; a few larger forms but mostly small arboreal (some bromeliad) species, the chief exception being the medium-sized *arenicolor*, which is largely a rock-loving form rather than arboreal. The lot contains representatives of several "groups" 21

17. Tympanum concealed; canthus absent or rounded 18
Tympanum visible, the upper edge concealed under the thick supratympanic fold; canthus rostralis distinct 20

18. Toes fully or almost fully webbed to disks 19
Toes three-fourths webbed; spinules of nuptial callosities larger than in other species of this group; some white flecks in anal and posterior femoral region; 49 mm ..... **pachyderma** (p. 86)

19. A vocal sac present in males; no outer metatarsal tubercle; no dorsolateral fold; 55 mm. (nuptial spines present?) ..... **crassa** (p. 86)
Vocal sac absent; a thick dorsolateral fold to middle of body; an outer metatarsal tubercle; 55 mm ..... **robustofemora** (p. 86)

20. Sides with brown reticulation enclosing round white or cream spots; venter yellow, unpigmented; skin generally smooth; tympanum about one-third eye; toes about one-half webbed; 65 mm .. **bistincta** (p. 87)
Sides without reticulations or round light spots; venter cloudy, gray or gray black; toes two-thirds to three-quarters webbed; tympanum about one-half eye diameter; 50 mm ..... **robertsorum** (p. 87)

21. Tympanum hidden; legs distinctly barred; no outer metatarsal tubercle. 22
Tympanum more or less distinct; if covered with skin its outline discernible; outer metatarsal tubercle present 23

22. Snout truncate; choanae very large, four or more times size of vomerine tooth group; no pollex rudiment; eyelid narrower than interorbital distance; subarticular tubercles of feet all single; anal region dark with light spot above; dark spots on back: skin minutely corrugated; heel to tip of snout; 24 mm ..... **pinorum** (p. 87)
Choanae small; an indistinct pollex rudiment; eyelid equals interorbital distance; some subarticular tubercles of feet double; one very large dark area from head to rump narrowed on neck; anal region light; 25 mm ..... **leonard-schultzei** (p. 87)

23. Tympanum large, its diameter equal to distinctly more than half the diameter of eye 24
Tympanum small, diameter one-half (or less) of eye 25

24. Posterior part of thigh strongly reticulated in brown and yellow; tympanum light; a strong fold from eye along sides; mere vestige of web between fingers; tarsal fold present; very elongate inner metatarsal tubercle present; heel to eye; 43 mm ..... **beltrani** (p. 87)
Posterior part of thigh brown or black-brown enclosing very small, lighter, rounded spots; a narrow white line on upper lip; moderately distinct tarsal fold; fingers one-fourth or less webbed; heel to tip of snout; 65 mm ..... **phaeota** (p. 88)

25. Width of eyelid distinctly greater than interorbital distance; an inverted V-shaped fold about anal opening; tympanum small, less than one-third eye; tarsal fold represented by a few flat unconnected tubercles; canthus sharp; heel to eye; foot three-fourths webbed; fingers with a distinct vestige of web (one-fifth or less) ..... **forbesi** (p. 88)
Width of an eyelid less than interorbital distance 26

26. No trace of web between outer fingers 27
Outer finger one-fifth to one-half webbed (or a little more) 29

27. No trace of a tarsal fold, or a ridge, or row of tubercles under forearm; no canthus; tympanum nearly one-half eye diameter; heel to eye; vocal sac present; 30 mm---------- **staufferi** (p. 88)
    A tarsal fold---------- 28
28. No supernumerary tubercles on foot; vomerine teeth at anterior level of choanae; heel to between eye and tip of snout; canthus angular; tongue one-third free; 37 mm---------- **plicata** (p. 88)
    Some supernumerary tubercles on foot; vomerine teeth at posterior level of choanae; skin strongly pustular; canthus absent; tongue one-fourth free behind; toes about half webbed; 45 mm---------- **arenicolor** (p. 89)
29. No trace of tarsal fold; no, or only an indistinct trace of a row of tubercles (or fold) under forearm; eye red in life; heel to a point between eye and nostril; lip with a narrow cream line or elongate white spots; tympanum one-third or less diameter of eye; 26 mm-- **erythromma** (p. 89)
    A distinct tarsal fold---------- 30
30. Very light colored pigment in delicate scattered flecks, not starshaped; bodies flattened; tympani directed rather upward; row of tubercles under forearm more or less distinct (bromeliad frogs)---------- 31
    Darker, heavier pigmentation; brownish, gray, olive, or green, with or without dorsal dark spots---------- 32
31. Heel to eye; toes two-thirds or more webbed; tympanum about one-half eye; fingers one-third webbed; eyelid two-thirds of interorbital width; head as wide as body; 30 mm---------- **melanomma** (p. 89)
    Heel to point between eye and nostril; toes about four-fifths webbed; fingers one-half webbed; tympanum slightly more than one-third eye; head broader than body; 35 mm---------- **dendroscarta** (p. 89)
32. Legs and arms distinctly barred; head wider than body---------- 33
    Legs not barred with darker color; olive or green in life---------- 34
33. Heel to middle of eye; finger disks nearly as large as tympanum; tympanum equal to or slightly more than half of eye; a tarsal fold; canthus rostralis rounded; chin spotted; no dorsal spots; (? no vocal sac); 30 mm---------- **taeniopus** (p. 89)
    No vocal sac; sharp distinct tarsal fold; snout very truncate; canthus distinct; skin relatively smooth, but minutely corrugated; heel to a point in front of eye; finger disks distinctly larger than tympanum; tympanum distinctly less than half eye; distinct dorsal spots; chin spotted; 30 mm---------- **bromeliana** (p. 90)
34. Anal flap elongated; the opening near level of under surface of femur; white stripe above anus; two conspicuous white-topped tubercles, on each side of lower part of anus; row of distinct white tubercles under forearm; a strong tarsal fold, thickest posteriorly; few light flecks on sides; a white line or series of white flecks on posterior edge of tarsus, 35 mm---------- **hazelae** (p. 90)
    Anal flap short; opening near middle or upper level of femora---------- 35
35. Enlarged tubercles at lower level of anus; teeth brownish; more or less of a skinfold in groin; choanae circular; vomerine teeth small; anal tubercles white; a white transverse stripe above anus; deep green to yellow green in life; bromeliad frog; 24 mm---------- **smaragdina** (p. 90)
    No conspicuously enlarged tubercles in anal region---------- 36

36. Tongue not free behind, not distinctly notched; teeth brownish tipped; heel to between eye and nostril; usually green body color bordered by white; a curved white line above black area of the anus; anal tubercles numerous; very considerable sexual dimorphism in size; canthus rounded; male with black horny nuptial spines on first finger only; tympanum about one-fourth to one-third diameter of eye; female 45 mm.; male 35 mm ..... **miotympanum** (p. 90)

Tongue free for about one-fourth length, distinctly notched; teeth not brown tipped; heel to eye; black nuptial spines on first finger only; back of head marked by a lateral depression on each side; female much larger than male; olive-gray or gray-brown; female 46 mm.; male 33 mm ..... **arborescandens** (p. 91)

HYLA REGILLA Baird and Girard

Hyla regilla Baird and Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 174.

?*Hyla curta* Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, pp. 313–314 (Cape San Lucas, Baja California).

Hyla regilla laticeps Cope, U. S. Nat. Mus. Bull. 34, 1889, pp. 356, 359–360 (Cape San Lucas, Baja California; U.S.N.M. No. 5308, eight cotypes).

Hyliola regilla Mocquard, Nouv. Arch. Mus. Hist. Nat. Paris, ser. 4, vol. 1, 1899, pp. 338, 339–341.

Type.—Unknown.

Type locality.—"Sacramento River in Oregon and Puget Sound," United States.

Range.—British Columbia through Baja California. Reported from the following localities in Baja California: Cape San Lucas, "Lapaz," San Francisquito, Sierra Laguna, San Rafael Valley, San Pedro Mártir Mountains, Rancho Santo Domingo, San Ignacio, Miraflores, San José del Cabo, Ensenada, Aguaito Springs, Cedros Island, La Grulla, Tecati (other numerous localities listed by Linsdale, Univ. California Publ. Zool., vol. 38, 1932, p. 353).

HYLA EUPHORBIACEA Günther

Hyla euphorbiacea Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), pp. 109–110, pl. 10, fig. c.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 427–430.

Type.—(Cotypes) Brit. Mus. Nos. 1930.4.10.2; 57.10.28.51; 58.11.22.5; 1858.6.15.4–8 (four specimens and a skeleton, originally).

Type locality.—Córdoba, Veracruz; Cordilleras (of Mexico) and Mexico.

Range.—Central western Veracruz to Oaxaca. Specimens examined or reported from *Veracruz:* above Acultzingo, ? Córdoba; *Puebla:* 8 miles northeast Tehuacán, Pájaro Verde (near Acultzingo); *Oaxaca:* near Oaxaca.

HYLA CÁRDENASI Taylor

Hyla cárdenasi Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 430–432, pl. 47, fig. 2.

Type.—U.S.N.M. No. 84403.

Type locality.—Puebla, Puebla, Mexico.

Range.—Central and western Puebla. A single young specimen has been reported from near Río Frío, México.

HYLA EXIMIA Baird

Hyla eximia Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 61.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 153, 164–168 (part).—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 422–426, pl. 46, figs. 1–10, pl. 47, figs. 3–5.

Hyla gracilipes Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 194 (Mirador, Veracruz; U.S.N.M. Nos. 15318–15321, four cotypes).—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 153–154, 168–170 (part).

Type.—(Cotypes) U.S.N.M. No. 3248 (2 specimens).

Type locality.—"Valley of México," Mexico.

Range.—Central and southern portions of the main Mexican plateau, southward from Durango and Zacatecas. Recorded from *Puebla:* 3 kilometers northeast of Cholula, Los Reyes, Puebla, Santa Catalina, 6 kilometers east of Amozoc, Tepeaca; *Hidalgo:* El Chico, Guerrero, Hacienda de Velasco, Mizquiahuala; *Distrito Federal:* México (city), San Juanico, Tlalpam, Tacubaya, Atzacualco; *Morelos:* Cuernavaca; ? *Veracruz:* Orizaba; *Jalisco:* Tlaquepaque, Jamay, Magdalena, Ocotlán, Tonalá, Agua Azul, Guadalajara; *Michoacán:* Tupátaro, Uruapan, Hacienda El Sabino, Pátzcuaro, Sahuayo; *Nayarit:* Santa Teresa, Tepic; *Guanajuato:* Celaya, Acámbaro, Silao, Guanajuato; *México:* Toluca, Chalco, Lerma, Rancho Guadelupe (42 kilometers northwest of Toluca), 3 kilometers south of Hacienda San Martín (near Zitácuaro), San Juan Teotihuacán, Villa Victoria (20 kilometers west); *Aguascalientes:* 13–15 kilometers east of Aguascalientes; *Zacatecas:* La Colorada; *Durango:* Coyotes, Ciudad, El Salto, between Pueblo Nuevo and Metate; ? *San Luis Potosí:* Mountains of Alvarez, Ebano.

HYLA ARBORICOLA Taylor

Hyla arboricola Taylor, Univ. Kansas Sci. Bull., vol. 27, 1941, pp. 118–119, pl. 5, fig. 1.

Type.—EHT–HMS No. 24556.

Type locality.—6 miles east of Omilteme, Guerrero, Mexico.

Range.—Known only from central Guerrero. Specimens have been examined from 2 miles north of Mazatlán and from Tixtla Lake (east of Chilpancingo).

HYLA LAFRENTZI Mertens and Wolterstorff

Hyla lafrentzi Mertens and Wolterstorff, Zool. Anz., vol. 84, 1929, pp. 235–241.—Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 433–436, pl. 48, figs. 1–2.

Type.—Magdeburg Mus. No. 49/27.

Type locality.—Desierto de los Leones, 3,000 meters elev., Distrito Federal, Mexico.

Range.—Southern tip of the central Mexican plateau. Reported from *Morelos:* Zempoala Lakes; *Hidalgo:* Guerrero; El Chico National Park; *Puebla:* near Río Frío, México (but in Puebla); *México:* Llano Grande (5 miles west of Río Frío); *Veracruz:* Las Vigas; *Distrito Federal:* Desierto de los Leones; *Tlaxcala:* 13 km. northeast of Tlaxcala.

HYLA WRIGHTORUM Taylor

Hyla wrightorum Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 436–439, pl. 47, fig. 1.

Type.—Univ. Mich. Mus. Zool. No. 79141.

Type locality.—Eleven miles south of Springerville, Apache County, Ariz.

Range.—Chihuahua, Arizona, and probably Sonora. Reported from Meadow Valley, Chihuahua.

HYLA EBRACCATA Cope

Hyla ebraccata Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 26, 1874, p. 69.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 587, fig. 60H.

Hyla leucophyllata Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, p. 30 (*nec Hyla leucophyllata* Bereis).

Type.—In Acad. Nat. Sci. Philadelphia?.

Type locality.—Nicaragua.

Range.—Central America and undoubtedly Chiapas. (Found at Piedras Negras, Guatemala, on the Guatemala-Chiapas boundary.)

HYLA ROBERTMERTENSI Taylor

Hyla robertmertensi Taylor, Proc. Biol. Soc. Washington, vol. 50, 1937, pp. 43–45, pl. 2, figs. 3–7.

Type.—EHT-HMS No. 2270.

Type locality.—Near Tapachula, Chiapas, Mexico.

Range.—Chiapas southward into Central America. Known from Tonalá, Asunción, La Esperanza (near Escuintla), Cruz de Piedra (near Acacoyagua) in Chiapas.

HYLA LOQUAX Gaige and Stuart

Hyla loquax Gaige and Stuart, Occ. Pap. Mus. Zool. Univ. Michigan, No. 281, 1934, pp. 1–3.

Type.—Univ. Michigan Mus. Zool. No. 75446.

Type locality.—Ixpuc Aguada, north of La Libertad, El Petén, Guatemala.

Range.—Northern Guatemala and Campeche. Reported from *Campeche:* Tres Brazos and Encarnación; *Guatemala:* Piedras Negras (near the Chiapas border).

HYLA UNDERWOODI Boulenger

Hyla microcephala Boulenger, Proc. Zool. Soc. London, 1898, p. 481, pl. 39, fig. 3 (*non* Cope, 1886).
Hyla underwoodi Boulenger, Ann. Mag. Nat. Hist., ser. 7, vol. 3, 1899, p. 277.
Hyla phlebodes Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 155, 172–173.

Type.—In British Museum.

Type locality.—Bebedero, Costa Rica.

Range.—Costa Rica north to central Veracruz and central Guerrero. Specimens examined or reported from *Guerrero:* El Treinta; *Chiapas:* Palenque; *Veracruz:* Potrero Viejo; *Yucatán:* Chichen Itzá; *Campeche:* Tres Brazos, Encarnación, and Balchacaj.

HYLA RICKARDSI Taylor [35]

Hyla rickardsi Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 385–388, pl. 41, figs. 1–8.

Type.—EHT–HMS No. 5947.

Type locality.—Near Potrero Viejo, Veracruz, Mexico.

Range.—Central western Veracruz. Reported from near Encero, Palma Sola, and Potrero Viejo in Veracruz.

HYLA PICTA Günther [36]

Hylella picta Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1901, pp. 286–287, pl. 73, fig. c.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 180–181.

Type.—Brit. Mus. No. 1901.12.19, 100.

Type locality.—Jalapa, Veracruz, Mexico.

Range.—Eastern San Luis Potosí south to Tabasco. Reported or known from *Veracruz:* Cuautlapan, Orizaba, Jalapa, 2 miles west of Veracruz, Tlalpam, Potrero Viejo, Tierra Colorada; *San Luis Potosí:* Valles; *Tabasco:* Frontera.

HYLA SMITHI Boulenger

Hyla nana Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1901, pp. 263–264, pl. 73, fig. A (*nec Hyla nana* Boulenger 1899; Cuernavaca, Morelos; Brit. Mus. No. 1901.12.19.76–82).

[35] There is a possibility that this is a synonym of *Hyla godmani* Günther; see *Hyla miotympanum.*

[36] This small species formerly associated with *Hylella* is, we believe, a small toothless *Hyla,* closely related to *underwoodi, ebraccata,* and *robertmertensi.*

Hyla smithi Boulenger, Zool. Rec., vol. 38, 1902, Rept. Batr., p. 33.—Taylor, Trans. Kans Acad. Sci., vol. 39, 1936 (1937), pp. 357–359, pl. 2, figs. 1–5.—Oliver, Occ. Pap. Mus. Zool. Univ. Michigan No. 360, 1937, p. 6, pl. 1.

Type.—Brit. Mus. No. 1901.12.19.76–82.

Type locality.—Cuernavaca, Morelos, Mexico.

Range.—Pacific coast from Sinaloa to Guerrero and Morelos. Specimens examined or reported from *Nayarit*: Tepic; *Colima*: Quesería, Tecomán, Paso del Río, Río Armeria; *Morelos:* Puente de Ixtla, Huajintlán, Cuernavaca; *Sinaloa:* 2 miles east of Mazatlán; *Guerrero*: Agua del Obispo, Garrapata, Tierra Colorada, Xochitempa (near Chilapa), Mazatlán; *Michoacán*: Apatzingán, Hacienda El Sabino.

HYLA ROZELLAE Taylor

Hyla rozellae Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 78–79, pl. 9, figs. 1, 1a–1c.

Type.—U.S.N.M. No. 115039.

Type locality.—Salto de Agua, Mount Ovando, Chiapas, Mexico.

Range.—Known only from the type locality and vicinity. Reported from Finca Juárez, Las Nubes, and Salto de Agua in Chiapas.

HYLA CRASSA (Brocchi)

Cauphias crassus Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, p. 130; Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 2, 1882, p. 64, pl. 12, fig. 4.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 118–120 (part).

Hyla crassa Boulenger, Catalogue of the Batrachia Salientia in the collection of the British Museum, ed. 2, 1882, p. 396.

Type.—Mus. Hist. Nat. Paris No. 509 B (6331).

Type locality.—Mexico.

Range.—Unknown.

HYLA ROBUSTOFEMORA Taylor [37]

Hyla robustofemora Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 389–393, figs. 3, 4.

Type.—EHT-HMS No. 16314.

Type locality.—Cerro San Felipe, about 10 miles northeast of Oaxaca, Oaxaca, Mexico, 7,000–8,000 feet elevation.

Range.—Known only from the type locality.

HYLA PACHYDERMA Taylor

Hyla pachyderma Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 308–310, pl. 27, figs. 1–3.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 588, pl. 25.

[37] This form is not *Plectrohyla crassa* Brocchi, as has been suggested by Stuart. Among other differences a vocal sac is present in *crassa*, absent in *robustofemora*.

Type.— U. S. N. M. No. 115029.
Type locality.—Pan de Olla, south of Tezuitlán, Veracruz, Mexico.
Range.—Known only from the type locality.

HYLA BISTINCTA Cope

Hyla bistincta Cope, Proc. Amer. Philos. Soc., vol. 17, July 20, 1877, p. 87.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 151, 163–164.—Taylor, Proc. Biol. Soc. Washington, vol. 50, 1937, pp. 50–54, pl. 3, figs. 1, 2.

Type.—U. S. N. M. No. 32361.
Type locality.—"Most probably Veracruz, Mexico."
Range.—The southern edge of the Mexican plateau. Specimens examined or reported from *Veracruz*: Near Lake San Bernardino, above Acultzingo; *Puebla*: Pájaro Verde (near Acultzingo, Veracruz); *Morelos*: near Cuernavaca; *México*: 12 miles west of Villa Victoria; *Michoacán*: Uruapan; *Oaxaca*: Cerro San Felipe; *Hidalgo*: Zacualtipán.

HYLA ROBERTSORUM Taylor

Hyla robertsorum Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 393–396, figs. 5–6; Univ. Kansas Sci. Bull., vol. 28, 1942, p. 310, pl. 27, fig. 4.

Type.—EHT–HMS No. 16264.
Type locality.—El Chico Parque Nacional, Hidalgo, Mexico.
Range.—Hidalgo. Known from the type locality and near Zacualtipán, Hidalgo.

HYLA PINORUM Taylor

Hyla pinorum Taylor, Proc. Biol. Soc. Washington, vol. 50, 1937, pp. 46–48, pl. 2, fig. 2.

Type.—EHT–HMS No. 5972.
Type locality.—Agua del Obispo (Kilometers 350–351, México-Acapulco highway), Guerrero, Mexico.
Range.—Known only from type locality.

HYLA LEONARD-SCHULTZEI Ahl

Hyla leonard-schultzei Ahl, Zool. Anz., vol. 106, 1934, pp. 185–186.

Type.—Zool. Mus. Univ. Berlin.
Type locality.—Malinaltepec, Guerrero, Mexico.
Range.—Known only from the type locality.

HYLA BELTRANI Taylor

Hyla beltrani Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 306–308, pl. 26, figs. 5–8.

Type.—EHT–HMS No. 29563.
Type locality.—Tapachula, Chiapas, Mexico.
Range.—Known only from type locality.

HYLA PHAEOTA Cope

Hyla phaeota Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 14, 1862, pp. 358–359.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 80–81, pl. 8, figs. 1, 1a–1c.—Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 589, p. 26.

Type.—U.S.N.M. No. 4347.

Type locality.—Turbo, Colombia.

Range.—Guatemala and undoubtedly Chiapas, south to Colombia (found at Piedras Negras, Guatemala, virtually on the Chiapas-Guatemala border).

HYLA FORBESI Taylor

Hyla forbesi Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 513–515, pl. 58, figs. 1, 1a, 1b.

Type.—EHT-HMS No. 22276.

Type locality.—3 miles southwest of Acultzingo, Veracruz, Mexico.

Range.—Known only from the type locality.

HYLA STAUFFERI Cope

Hyla staufferi Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 17, 1865, p. 195.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 152, 173–174.
Hyla culex Gaige, Carnegie Inst. Washington Publ. No. 457, 1936, p. 293.

Type.—U.S.N.M. 15317.

Type locality.—Orizaba, Veracruz, Mexico.

Range.—Tamaulipas, San Luis Potosí, Veracruz, Oaxaca, Guerrero, and Chiapas to Central America. Specimens have been examined or reported as follows: *Veracruz:* Tierra Colorada, 4 miles east of Encero, near Potrero, Orizaba, Motzorongo, Potrero Viejo, San Juan de la Punta, Cuautlapan, Palma Sola, Presidio; *San Luis Potosí:* Tamazunchale, Valles; *Tamaulipas:* near Ciudad Juárez; *Chiapas:* Tonalá, Asunción, San Ricardo, Palenque, Cruz de Piedra (near Acacoyagua); *Guerrero:* 1 mile north of Organos; *Tabasco:* Tenosique; *Oaxaca:* Tehuantepec, Tapana; ? *Jalisco:* Guadalajara (very doubtful); *Campeche:* Tuxpeña Camp, Champotón, Encarnación, Balchacaj.

HYLA PLICATA Brocchi

Hyla plicata Brocchi, Bull. Soc. Philom. Paris, ser. 7, vol. 1, 1877, pp. 126–127; Mission scientifique au Mexique et dans l'Amérique centrale, pt. 3, sect. 2, livr. 1, 1881, pp. 35–36, pl. 12, fig. 1.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 151–152, 173.

Type.—Mus. Hist. Nat. Paris No. 380a (No. 6317).

Type locality.—Mexico.

Range.—Unknown.

HYLA ARENICOLOR Cope

Hyla affinis Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 61 (preoccupied by *Hyla affinis* Spix 1824).

Hyla arenicolor Cope, Journ. Acad. Nat. Sci. Philadelphia, ser. 2, vol. 6, 1866, p. 84 (substitute for the preceding).—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 152–153, 156–159.

Hyla copii Boulenger, Ann. Mag. Nat. Hist., ser. 5, vol. 20, 1887, p. 53 (El Paso, Tex.; Brit. Mus.).

Hyliola digueti Mocquard, Bull. Soc. Philom. Paris, ser. 9, vol. 1, 1899, pp. 165–166, pl. 1, fig. 4 (territory Tepic [=Nayarit], Mexico; Mus. Hist. Nat. Paris).

Type.—U.S.N.M. No. 11410, four cotypes.

Type locality.—Northern Sonora, Mexico.

Range.—Northern Baja California to southern Texas and south to Guerrero. Reported in Mexico from Distrito Federal, and the states of Baja California, Chihuahua, Coahuila, Durango, Guanajuato, Guerrero, Hidalgo, Jalisco, México, Michoacán, Morelos, Nayarit, San Luis Potosí, Sinaloa, Sonora, and Zacatecas.

HYLA ERYTHROMMA Taylor

Hyla erythromma Taylor, Proc. Biol. Soc. Washington, vol. 50, 1937, pp. 48–50, pl. 2, fig. 1; Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 511–512.

Type.—EHT–HMS No. 5976.

Type locality.—Agua del Obispo (Kilometers 350–351), Mexico-Acapulco highway), Guerrero, Mexico.

Range.—Known only from type locality.

HYLA MELANOMMA Taylor

Hyla melanomma Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 508–510, pl. 57, figs. 1, 1a, 1b.

Type.—EHT–HMS No. 21578.

Type locality.—7 miles east of Chilpancingo, Guerrero, Mexico.

Range.—Known only from type locality.

HYLA DENDROSCARTA Taylor

Hyla dendroscarta Taylor, Proc. U. S. Nat. Mus., vol. 89, 1940, pp. 45–47, pls. 2–3.

Type.—U.S.N.M. No. 108679.

Type locality.—Cuautlapan, Veracruz, Mexico.

Range.—Known only from the type locality.

HYLA TAENIOPUS Günther

Hyla taeniopus Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1901, pp. 269–270, pl. 72, fig. f.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 156, 175–176.

Type.—(Cotypes) Brit. Mus. Nat. Hist. Nos. 1901.12.19.86 and 1901.12.19.87.

Type locality.—Jalapa, Veracruz, Mexico.

Range.—Known only from the type locality.[38]

HYLA BROMELIANA Taylor [39]

Hyla bromeliana Taylor, Copeia, July 12, 1939, pp. 98–100, fig. 1.

Type.—EHT–HMS No. 16630.

Type locality.—Near Tianguistengo, Hidalgo, Mexico.

Range.—Known only from type locality.

HYLA HAZELAE Taylor

Hyla hazelae Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 385–389, figs. 1, 2.

Type.—EHT–HMS No. 16263.

Type locality.—Cerro San Felipe, 10 miles northeast of Oaxaca, Oaxaca, Mexico.

Range.—Known from the type locality only.

HYLA SMARAGDINA Taylor

Hyla smaragdina Taylor, Copeia, Mar. 30, 1940, pp. 18–20, fig. 1.

Type.—EHT–HMS No. 17534.

Type locality.—Mountains at eastern end of Lake Chapala, 6 kilometers east of Cojumatlán, Michoacán, Mexico.

Range.—Known only from type locality.

HYLA MIOTYMPANUM Cope

Hyla miotympanum Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 15, 1863, p. 47.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 155–156, 170–172, fig. 19d.

Hyla microtis Peters, Monatsb. Akad. Wiss. Berlin, 1869, pp. 880–881 (probably Matamoros, Puebla; Berl. Mus. No. 6657, two cotypes).

Hyla godmani Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1901, pp. 275–276, pl. 72, fig. e (Misantla and Jalapa, Veracruz; Brit. Mus. Nos. 1901.12.19.88–96).[40]

Type.—Cotypes, U.S.N.M. No. 6311 (now lost).

Type locality.—Near Jalapa and Mirador, Veracruz, Mexico.

Range.—Central Nuevo León to Oaxaca and (?) Chiapas. *Vera-*

[38] A specimen reported from Morelos, Guatemala, by Atkinson, Ohio Nat., vol. 7, 1907, p. 152, doubtlessly belongs to another species.

[39] There is a possibility that this species is the same as *Hyla taeniopus* Cope. Dunn, however, who examined the types of that species, reported that he did not believe they were *Hyla baudinii* but that it was difficult to decide. Since *Hyla bromeliana* shows not the slightest resemblance to *Hyla baudinii*, the probability of its synonymy with *taeniopus* is remote.

[40] Except for the testimony of E. R. Dunn and R. Kellogg (U. S. Nat. Mus. Bull. 160, 1932, pp. 170–171), we would regard *H. godmani* as a good species with *H. rickardsi* a synonym.

cruz: Near Jalapa, Banderilla, Orizaba, San Andrés (8,000 feet), Mirador ? Veracruz, Misantla, Fortín, Cuautlapan, Potrero, Jico, Orizaba, Acultzingo; ? *Guerrero:* Malinaltepec (Ahl); *Hidalgo:* Zacualtipán, Tianguistengo; *Nuevo León:* Pablillo, 20 miles south of Monterrey; *San Luis Potosí:* Tamazunchale, Valles; *Puebla:* Pájaro Verde near Acultzingo, Necaxa, San Diego (near Tehuacán); *Oaxaca:* Tehuantepec, Cerro San Felipe; *Chiapas* (no locality given).

HYLA ARBORESCANDENS Taylor

Hyla arborescandens Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 388–391, text fig. 1; Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), p. 511.

Type.—EHT–HMS No. 3135.

Type locality.—Three miles southwest of Acultzingo, Veracruz, Mexico.

Range.—Tlaxcala and central Veracruz to central Oaxaca. Reported from *Tlaxcala:* Apizaco; *Veracruz:* above Acultzingo, Pan de Olla (near Tezuitlán); *Puebla:* Pájaro Verde (near Acultzingo, Veracruz); *Oaxaca:* Cerro San Felipe.

Genus PTYCHOHYLA Taylor

Ptychohyla Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, p. 41.

Genotype.—Ptychohyla adipoventris Taylor.

Range.—Guerrero.

Species.—One.

PTYCHOHYLA ADIPOVENTRIS Taylor

Ptychohyla adipoventris Taylor, Univ. Kansas Sci. Bull., vol. 30, 1944, pp. 41–45.

Type.—EHT–HMS No. 21592.

Type locality.—Agua del Obispo, Guerrero, Mexico.

Range.—Known only from the type locality.

Suborder Diplasiocoela Nicholls

Diplasiocoela Nicholls, Proc. Linn. Soc. London, vol. 128, 1915–1916 (1916), p. 87.

KEY TO MEXICAN FAMILIES OF DIPLASIOCOELA

1. Head very narrow; mouth small; no vomerine teeth; a transverse skin fold on head, behind eyes; tympanum indistinct or invisible. **Microhylidae** (p. 91)

   Head not narrowed; mouth large; vomerine teeth present; no transverse fold on head; tympanum distinct ..... **Ranidae** (p. 96)

Family MICROHYLIDAE Parker

Microhylidae Parker, Monograph of the frogs of the family Microhylidae, 1934. pp. 9, 19.

Subfamily MICROHYLINAE Noble

Microhylinae NOBLE, The biology of the Amphibia, 1931, p. 537.

KEY TO MEXICAN GENERA OF MICROHYLINAE

1. Toes united by at least a vestigial web; precoracoids present; fingers free, not dilated at tips ..... **Hypopachus** (p. 94)
   Toes free without or with but a trace of a vestigial web at base; finger tips swollen or widened perceptibly; no precoracoids; coracoids united by a simple cartilage ..... **Microhyla** (p. 92)

Genus MICROHYLA Tschudi

Microhyla TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, 1838 (1839), pp. 28, 71.—PARKER, Monograph of the frogs of the family Microhylidae, 1934, pp. 123–151.

Gastrophryne FITZINGER, Systema reptilium, 1843, p. 33 (genotype *Engystoma rugosum* Duméril, Bibron, and Duméril=*Engystoma cardinense* Holbrook).

Genotype.—*"Hylaplesia achatina"* Boie, *nomen nudum* (=*Microhyla achatina* Tschudi.)

Range.—Southwestern Asia, Malayan Islands, and the southeastern quarter of the United States south to Brazil.

Species.—About 13 forms in the Americas, and 15 Old World forms are known; 5 occur in Mexico.

KEY TO MEXICAN SPECIES OF MICROHYLA

1. A single metatarsal tubercle 2
   Two metatarsal tubercles 4
2. Toes swollen at tips but not wider than digit; ventral surface of limbs and abdomen immaculate 3
   Toes flattened at tips, perceptibly wider than the digit; ventral surface of chin and throat, underside of limbs and side of head and body brownish, with lighter flecks; central part of abdomen white with some brown reticulation ..... **elegans** (p. 93)
3. Head narrow; trace of a black stripe or row of black spots from behind eye to a point on side; foot slender, small ..... **mazatlanensis** (p. 92)
   Head wider; no trace of black stripe behind eye; foot wider, the toes a little longer proportionately, larger ..... **olivacea** (p. 93)
4. A hair-fine line from tip of snout to anus; a similar line from anus along posterior surface of leg to foot; smaller ..... **usta gadovii** (p. 94)
   No hair-fine line on back or posterior surface of leg; larger ..... **usta usta** (p. 93)

MICROHYLA MAZATLANENSIS Taylor

Microhyla mazatlanensis TAYLOR, Univ. Kansas Sci. Bull., vol. 29, 1943, pp. 355–357.

Type.—EHT-HMS No. 1236.

Type locality.—2 miles east of Mazatlán, Sinaloa, Mexico.

Range.—Known only from the type locality.

MICROHYLA OLIVACEA (Hallowell)

Engystoma olivaceum Hallowell, Proc. Acad. Nat. Sci. Philadelphia, vol. 8, 1856 (1857), p. 252.
Gastrophryne olivacea Smith, Copeia, Dec. 27, 1933, p. 217.
Microhyla olivacea Parker, Monograph of the frogs of the family Microhylidae, 1934, pp. 126, 144.—Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 529–531 (*part*).

Type.—Not known.

Type locality.—"Kansas and Nebraska," probably Kansas.

Range.—Central United States from Kansas south to Coahuila, Chihuahua, and Durango. Recorded or known from *Coahuila:* 2 to 3 miles east of Torreón, Músquiz; *Chihuahua:* Río Santa María; *Durango:* 5 miles north of Conejos; *Sonora:* Noría.

MICROHYLA ELEGANS (Boulenger)

Engystoma elegans Boulenger, Catalogue of the Batrachia Salientia in the collection of the British Museum, ed. 2, 1882, p. 162.
Gastrophryne elegans Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 183, 187.
Microhyla elegans Papker, Monograph of the frogs of the family Microhylidae, 1934, p. 144.—Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 528–529.

Type.—Brit. Mus. Nat. Hist. No. 56.3.17.27.

Type locality.—Córdoba, Veracruz, Mexico.

Range.—Southern Veracruz to Petén, Guatemala, in lowlands. Known from *Veracruz:* Córdoba, Presidio; *Campeche:* Tres Brazos; also from Piedras Negras, Guatemala, on the Chiapas border.

MICROHYLA USTA USTA (Cope)

Engystoma rugosum (non Duméril and Bibron) Günther, Catalogue of the Batrachia Salientia in the collection of the British Museum, 1858 (1859), p. 52.
Engystoma ustum Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 18, 1866, p. 131.
Gastrophryne usta Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 183, 187–188 (part).
Microhyla usta Parker, Monograph of the frogs of the family Microhylidae, 1934, pp. 148–149 (part).
Microhyla usta usta Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, pp. 602–603, pl. 32, figs. 1–4.
Engystoma mexicanum Peters, Monatsb. Akad. Wiss. Berlin, 1869, p. 181 (state of Puebla, probably Matamoros, Mexico; Berl. Mus. ?).

Type.—U.S.N.M. No. 24965.

Type locality.—Guadalaxara (=Guadalajara), Jalisco, Mexico.

Range.—Sinaloa and central Veracruz southward to near the Isthmus of Tehuantepec. Reported or known from *Veracruz:* Palma Sola, Potrero Viejo, near Cañada, 4 miles east of Encero, Tierra Colorada, Rodríguez Clara, Cuautlapan, Escamilla; *Guerrero:* 1 mile north of Organos, 2 miles north of Xaltinanguis near El Treinta; *Colima:*

Quesería, Paso del Río, Tecomán, Santiago; *Guanajuato:* Buenavista; *Jalisco:* Guadalajara; *Sinaloa:* Venadillo. Probably most of the reports for the state of Oaxaca are referable to *Microhyla usta gadovii;* that for Valles, San Luis Potosí, is based on a young *Hypopachus cuneus cuneus.*

MICROHYLA USTA GADOVII (Boulenger)

Eupemphix gadovii Boulenger, Ann. Mag. Nat. Hist., ser. 7, vol. 12, Nov. 1903, p. 552.

Microhyla usta Parker, Monograph of the frogs of the family Microhylidae, 1934, pp. 148–149 (part).

Microhyla usta gadovii Taylor and Smith, Proc. U. S. Nat. Mus., vol. 95, 1945, p. 603, pl. 32, figs. 5–10.

Type.—(Cotypes) Brit. Mus. Nos. 1903.9.30.259–261.

Type locality.—San Mateo del Mar, Oaxaca, Mexico.

Range.—Oaxaca and Chiapas. Specimens are known from *Oaxaca:* Tehuantepec (city); *Chiapas:* La Esperanza (near Escuintla), Acacoyagua, Colonia Soconusco, Las Gradas, Tonalá, Tapachula.

Genus HYPOPACHUS Keferstein

Hypopachus Keferstein, Nachr. Ges. Göttingen, No. 18, 1867, p. 351.

Genotype.—*Hypopachus seebachii* Keferstein (=*Engystoma variolosum* Cope).

Range.—Southern Texas to Brazil, Paraguay, and Bolivia.

Species.—About 15 species and subspecies, 7 of which occur in Mexico.

KEY TO MEXICAN SPECIES OF HYPOPACHUS

1. Width of head 3 times in snout-to-vent length (slightly more or less); sides of head and body dark brown, contrasting with dorsal color; ventral surface reticulated with brown enclosing cream spots; 50 mm. **caprimimus** (p. 95)

   Width of head in snout-to-vent length 3½ to 4 times 2

2. Venter white or cream without markings 3

   Venter reticulated with brown 4

3. Scattered black spots on sides and groin; spot on femora; a light stripe from eye to jaw angle; foot one-third to two-thirds webbed; 41 mm. **maculatus** (p. 95)

   No distinctive black spots on sides or groin; no light stripe from eye to jaw angle; foot less than one-third webbed; large gland on breast and anterior abdominal region of males usually moderately distinct; 44 mm ..... **alboventer** (p. 95)

4. Venter colored with reticulations of brown and cream, the cream not forming round white spots 5

   Venter reticulated with brown enclosing round cream spots 6

5. Reticulation very light, often scarcely discernible; in some specimens a hair fine median cream line from snout to vent; a series of dark spots on dorsolateral line below which sides are lighter than back; 41 mm. **cuneus cuneus** (p. 95)

Sides of head and body deep black reticulated with cream; groin and lumbar region spotted; venter very strongly reticulated with black and cream; 43 mm..... **cuneus nigroreticulatus** (p. 96)

6. Small, the sides brown with white flecks contrasting with the dorsal coloration; an irregular dark line from occiput to groin; color above grayish to gray-brown; 36 mm..... **ovis** (p. 96)

Large, sides not dark brown in contrast to lighter dorsum but usually lighter; occasionally a few dorsolateral dark spots, and the diagonal lines sometimes indicated by a few dark spots; 50 mm.. **oxyrrhinus** (p. 96)

HYPOPACHUS CAPRIMIMUS Taylor

Hypopachus caprimimus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940) pp. 526–528, pl. 61, 63, fig. 1, 1a; Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 47–48, pl. 2, fig. 1, pl. 3, fig. 7 (tadpole).

Type.—EHT–HMS No. 18149.

Type locality.—Agua del Obispo, Guerrero, Mexico.

Range.—Guerrero. Reported from Balsas River at Mexcala, Garrapatas, Organos, Mazatlán, near Palo Blanco, Buena Vista, El Limoncito.

HYPOPACHUS MACULATUS Taylor

Hypopachus maculatus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 524–526, pl. 62, figs. E, F, pl. 63, figs. 2, 2a.

Type.—EHT–HMS No. 1023.

Type locality.—Near San Ricardo, Chiapas, Mexico.

Range.—Chiapas Plateau. Known only from the type locality and Asunción, Chiapas.

HYPOPACHUS ALBOVENTER Taylor

Hypopachus alboventer Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 522–524, pl. 60, pl. 63, figs. 3, 3a; Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 48–49, pl. 1, fig. 3, pl. 3, fig. 6 (tadpole).

Type.—EHT–HMS No. 19615.

Type locality.—Eight miles east of Cuernavaca, Morelos, Mexico.

Range.—Morelos. Known from the type locality and near Huajintlán, Morelos (Kilometer 133).

HYPOPACHUS CUNEUS CUNEUS Cope

Hypopachus cuneus Cope, U. S. Nat. Mus. Bull. 34, 1889, pp. 388–389, fig. 98.
Hypopachus cuneus cuneus Taylor, Univ. Kansas Sci. Bull., vol. 26, No. 15, 1939 (1940), pp. 516–518, pl. 62, fig. A, pl. 63, figs. 7, 7a.

Type.—U.S.N.M. No. 15676.

Type locality.—San Diego, Nueces County, Texas.

Range.—Southern Texas; Tamaulipas and Veracruz. Specimens reported or known from *Tamaulipas:* Hacienda La Clementina (4 miles west of Forlón); *San Luis Potosí:* Valles; *Veracruz:* Encero.

HYPOPACHUS CUNEUS NIGRORETICULATUS Taylor

Hypopachus cuneus nigroreticulatus Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp. 518–520, pl. 59.

Hypopachus inguinalis Gaige (*nec* Cope), Carnegie Inst. Washington Publ. No. 457, 1936, p. 294 (tadpole).

Type.—EHT–HMS No. 12605.

Type locality.—Encarnación, Campeche, Mexico.

Range.—The Yucatán Peninsula. Recorded in Mexico from the states of *Yucatán:* Mérida, Chichen Itzá; *Campeche:* Encarnación, Tuxpeña Camp, Champotón, Pital, Tres Brazos, Balakbal.

HYPOPACHUS OVIS Taylor

Hypopachus ovis Taylor, Univ. Kansas Sci. Bull., vol. 26, 1939 (1940), pp 520–522, pl. 62, fig. B.

Type.—EHT–HMS No. 1050.

Type locality.—Tepic, Nayarit, Mexico.

Range.—Nayarit to Colima. Known from *Nayarit:* Tepic; *Jalisco:* near Chapala, near Magdalena; *Colima:* near Quesería.

HYPOPACHUS OXYRRHINUS Boulenger

Hypopachus oxyrrhinus Boulenger, Ann. Mag. Nat. Hist., ser. 5, vol. 11, 1883, p. 344.

Hypopachus variolosus Kellogg (*nec* Cope), U. S. Nat. Mus. Bull. 160, 1932, pp. 182–183, 184–185.

Type.—Cotypes, Brit. Mus. Nos. 82.12.5.8; 83.4.5.3.

Type locality.—Presidio, near Mazatlán, Sinaloa, Mexico.

Range.—Sinaloa, south to Jalisco and Michoacán. Reported from *Sinaloa:* Presidio; *Jalisco:* Agua Delgada, Ocotlán, Guadalajara; *Michoacán:* San Salvador, Buena Vista, Cofradía.

Family RANIDAE Bonaparte

Ranidae Bonaparte, Giorn. Accad. Sci. Lett. ed Arti, Roma, vol. 49, 1831, pp. 65, 75.

Subfamily Raninae Noble

Raninae Noble, The biology of the Amphibia, 1931, p. 518.

Genus RANA Linnaeus

Rana Linnaeus, Systema naturae, ed. 10, vol. 1, 1758, p. 210.

Pohlia Steindachner, Reise Novara, vol. 1, Amphibia, 1867, p. 15 (genotype *Pohlia palmipes* Steindachner=*Rana palmipes* Spix).

Genotype.—(*Rana*) *temporaria* Linnaeus.

Range.—Eurasia south to Madagascar and Australia, and Canada to Brazil.

Species.—Approximately 400, about 25 American, of which 9 are Mexican.

KEY TO MEXICAN SPECIES OF RANA

1. A dorsolateral glandular fold 2
   No dorsolateral glandular fold 8
2. Legs long; tibiotarsal articulation (heel) reaching tip or beyond the tip of snout 3
   Legs short, the heel reaching to a point between tympanum and snout tip 5
3. Heels overlap strongly (several millimeters) when legs are folded 4
   Heels touch when legs are folded; a fold behind tympanum; skin without ridges but with small, rounded, pearly-tipped pustules and tubercles of varying sizes, making skin rough to touch; subarticular tubercles moderately large, rather elongate, compressed; toes swollen at tips, fully webbed; 120 mm ..... **pustulosa** (p. 98)
4. Glandular fold narrow; skin without distinct pustules, smooth to touch; toes widened into flattened terminal disks, and fully webbed; no vocal sac; heel far beyond tip of snout; 91 mm .. **sierramadrensis** (p. 98)
   Glandular fold thick, widened; numerous longitudinal ridges or elongate pustules between folds; toes pointed, not dilated at tips, almost completely webbed; two external vocal sacs in males, behind jaw angles; (composite); 115 mm ..... **pipiens** (p. 98)
5. Heel to between eye and tip of snout 6
   Heel not reaching beyond eye 7
6. Heel to between eye and nostril; tympanum large, about ¾ or more of eye diameter; posttympanic fold obsolete; 2 small internal vocal sacs in male, the openings in floor of mouth very small; toes swollen at tips into small disks, almost fully webbed; skin shagreen above, with minute hard pearly-tipped tubercles; canthus distinct, sharp; 125 mm.
   palmipes (p. 98)
   Heel to nostril or between nostril and snout tip; skin fold on upper lip light colored; fore part of head smooth; remainder of dorsum and sides with small rounded papillae; first finger longer than second; canthus indistinct; Baja California; 114 mm ..... **aurora draytoni** (p. 99)
7. Feet and hands rather small or moderate; subarticular tubercles minute; tips of toes minutely swollen; heel to tympanum or between tympanum and eye [41]; first finger longer than second; longitudinal pustules or ridges between dorsolateral glandular folds; sides strongly studded with small equal-sized tubercles; belly unicolor usually; 116 mm.
   montezumae Baird (p. 99)
   Feet and hands large, first and second fingers equal or first shorter; tips of toes perceptibly larger than *montezumae*, the subarticular tubercles small; no conspicuous tubercles between dorsolateral folds; heel to eye; belly reticulated, grayish or grayish black and yellow; 152 mm.
   megapoda (p. 100)
8. Diameter of tympanum two-fifths to one-half diameter of eye; tarsal fold present, distinct or indistinct; toes swollen into small disks; heels to or near to tip of snout; no outer metatarsal tubercle; no vocal sac or external vesicles behind ear; 78 mm ..... **tarahumarae** (p. 100)

[41] In making this measurement the specimen must be straightened. If the back is slightly humped, the heel will reach farther forward and the variation will seem greater than actually obtains.

Diameter of tympanum about equal diameter of eye in females, larger than eye in males; no tarsal fold; heel to tympanum or eye; a vocal sac but no external vesicles; 200 mm..... catesbeiana (p. 100)

RANA SIERRAMADRENSIS Taylor

Rana sierramadrensis Taylor, Univ. Kansas Sci. Bull., vol. 25, 1938 (1939), pp. 397–399, pl. 39, fig. 1.

Type.—EHT-HMS No. 3963 B.

Type locality.—Agua del Obispo, Guerrero, Mexico (Kilometers 350–351 on Mexico-Acapulco Highway).

Range.—Known from type locality and vicinity.

RANA PIPIENS Schreber

Rana pipiens Schreber, Der Naturforscher, Halle, vol. 18, 1872, p. 185, pl. 4.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 192–193, 203–213, figs. 1a, 24.

? *Rana forreri* Boulenger, Ann. Mag. Nat. Hist., ser. 5, vol. 11, 1883, p. 343 (Presidio, Sinaloa, Mexico; Brit. Mus. No. 1882.12.5.7).

Rana trilobata Mocquard, Bull. Soc. Philom. Paris, ser. 9, vol. 1, 1899, pp. 158–159, pl. 1, fig. 1 (Guadalajara, Jalisco, Mexico; Mus. Hist. Nat. Paris No. 169a).

Rana omiltemana Günther, Biologia Centrali-Americana, Reptilia and Batrachia, 1900, p. 200, pl. 61, fig. A (Omilteme, Guerrero, Mexico; Brit. Mus. Nos. 1895.7.15.31–35).

Type.—None.

Type locality.—Raccoon, Gloucester County, N. J.

Range.—North America south to Nicaragua. On plateau and lowlands of Mexico, recorded for every state and territory except Quintana Roo.

RANA PUSTULOSA Boulenger

Rana pustulosa Boulenger, Ann. Mag. Nat. Hist., ser 5, vol. 11, 1883, p. 343.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 193–194, 213–214.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 44–46, pl. 1, fig. 1, pl. 3, fig. 4 (tadpole).

Type.—Brit. Mus. No. 1883.4.16.42.

Type locality.—Ventanas, Durango, Mexico.

Range.—Slope of the plateau, Sonora to Guerrero. Reported from *Sonora*: Guirocoba; *Durango*: Ventanas; *Colima*: Quesería; *Morelos*: 5 miles south of Cuernavaca, near Huajintlán; *Guerrero*: 12 miles south of Chilpancingo, near Palo Blanco.

RANA PALMIPES Spix

Rana palmipes Spix, Animalia nova, sive species novae testudinum et ranarum quas in itinere per Brasiliam . . . , 1824, p. 5, pl. 5, fig. 1.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 194–195, 200–202.

Type.—Not known.

Type locality.—Amazon River, Brazil.

Range.—Southern Veracruz and the Isthmus of Tehuantepec south to South America; Morelos. Reported or known from *Veracruz*: Alvarado, Jalapa, Tlacotalpam, La Laja Creek near Cuatotolapam, Lake Catemaco, Perez, near San Juan de Gracia, Potrero Viejo, San Andrés Tuxtla, Matacabresto; *Morelos*: Cuernavaca; *Campeche*: Tres Brazos; *Oaxaca*: mountains near Santo Domingo (1,000 feet elevation); Tehuantepec (city); *Chiapas*: Palenque, Mount Ovando, Finca Juárez, mountains near Tonalá, Asunción; *Tabasco*: Tenosique.

RANA AURORA DRAYTONI Baird and Girard

Rana draytoni Baird aud Girard, Proc. Acad. Nat. Sci. Philadelphia, vol. 6, 1852, p. 174.

Rana aurora draytoni Camp, Univ. California Publ. Zool., vol. 17, 1917, p. 123.

Type.—U.S.N.M. No. 11497.

Type locality.—San Francisco and the Columbia River.

Range.—Central California to northern Baja California. Reported in Baja California from "San Tomas," Valladares, La Grulla, Rancho San Antonio, San José (2,500 feet), San Ramón, mountains of Baja California up to 4,000 feet elevation.

RANA MONTEZUMAE Baird

Rana montezumae Baird, Proc. Acad. Nat. Sci. Philadelphia, vol. 7, 1854, p. 61; Report on the United States and Mexican Boundary Survey, vol. 2, Reptiles, 1859, p. 27, pl. 36, figs. 1–6.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 191–192, 197–199.—Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 46–47, pl. 3, figs. 1, 5 (tadpole).

Rana adtrita Troschel, *in* Mueller, Reisen in den Vereinigten Staaten, Canada und Mexico, vol. 3, 1865, p. 616 (Mexico; types unknown).

(*Rana montezumae*) *concolor* Cope, U. S. Nat. Mus. Bull. 32, 1887, p. 20 (Guanajuato; lectotype U.S.N.M. No. 81101).

Type.—U. S. N. M. No. 3344 (*fide* Kellogg).

Type locality.—City of México, Distrito Federal, Mexico.

Range.—The southern tip of the central Mexican plateau. Specimens are known or have been reported from *Distrito Federal:* México (city), Xochimilco, Lake Texcoco, north of Guadalupe; *México:* Chalco, Santa Magdalena, Zumpango, 10 miles northwest of Toluca, Lerma; *Aguascalientes:* 8 miles south of Aguascalientes; *Michoacán:* Tupátaro, Sahuayo, 5 miles northwest of Maravatío; *Puebla:* Atlixco, Puebla, Chiguahuapan (Alatristi); *Querétaro:* San Juan del Río; *Jalisco:* Ocotlán, Teocaltiche, near Chapala; *Hidalgo:* Actopán, La Mora; *Guanajuato:* Acámbaro, Lagos, Guanajuato, Santa Rosa (9,500 feet altitude); 3 miles north of León, 7 miles west of Silao, 3 miles east of Santa Rosa. Other records are from *Veracruz:* Mirador, vicinity

of Orizaba; *Oaxaca:* Tehuantepec; and *Tabasco:* no specific locality. For geographic reasons we consider the records from the latter three states unacceptable.

RANA MEGAPODA Taylor

Rana megapoda Taylor, Univ. Kansas Sci. Bull., vol. 28, 1942, pp. 310–313, pl. 28.

Type.—EHT–HMS No. 3280.

Type locality.—Near Chapala, Jalisco, Mexico.

Range.—Jalisco, around Lake Chapala.

RANA TARAHUMARAE Boulenger

Rana tarahumarae Boulenger, Ann. Mag. Nat. Hist., ser. 8, vol. 20, 1917, pp. 416–417.—Kellogg, U. S. Nat. Mus. Bull. 160, 1932, pp. 190–191, 214–215.

Type.—Brit. Mus. Nat. Hist. Nos. 1914.1.28.148–149; 1911.12.12.36–39.

Type locality.—Ioquiro (=Yoquivo) and Barranca del Cobre, Sierra Tarahumara, Chihuahua, Mexico.

Range.—Western Texas to Sonora and southward to Jalisco. In Mexico, known from *Chihuahua:* type localities, and Mojárachic, Chihuahua; *Sonora:* El Tigre Mountain below El Tigre mine; *Jalisco:* Oblatos.

RANA CATESBEIANA Shaw

Rana catesbeiana Shaw, Gen. Zool., vol. 3, pt. 1, 1802, p. 106, pl. 33.—Kellogg, U. S. Nat. Mus. Bull 160, 1932, pp. 191, 195–197, figs. 21–23.

Type.—Probably no preserved type.

Type locality.—North America (restricted to South Carolina).

Range.—In the United States, chiefly east of longitude 98° W., but introduced widely elsewhere; northern Mexico. Reported from *Nuevo León:* San Diego (near Cadereyta); *Tamaulipas:* Altamira. Expected in Sonora and elsewhere (introduced).

STATE LISTS

Compilation of state lists is beset with difficulties arising from incorrect or dubious identifications of material not now available for examination. In most vertebrate classes, casual records and descriptions frequently suffice to allocate correctly erroneously identified specimens, but in amphibians even lengthy descriptions are sometimes insufficient, if the proper comparisons are not made. More than in any other vertebrate class, amphibians are identified, with exceptions of course, on a comparative basis. Thus older workers, whose knowledge of the Mexican fauna was far more incomplete than that of present-day students, frequently could neither evaluate characters properly nor describe them so that the specimens could later be

identified satisfactorily. For this reason we have been unable to allocate some published records, and others only with some or considerable doubt. We have eliminated from these lists records we think preposterous, but have retained some that are possibly correct even though unlikely.

All political areas are represented by three or more records. Arranged according to the number of species known from each, the following sequence results:

Veracruz	71	Sinaloa	21	Distrito Federal	14
Oaxaca	53	Sonora	20	Coahuila	13
Chiapas	47	Nayarit	19	Durango	13
Guerrero	42	Tamaulipas	19	Guanajuato	12
Puebla	33	Tabasco	18	Zacatecas	10
Hidalgo	29	Colima	17	Tlaxcala	5
México	28	Chihuahua	17	Aguascalientes	4
San Luis Potosí	27	Campeche	16	Querétaro	3
Morelos	25	Nuevo León	16	Quintana Roo	3
Jalisco	22	Yucatán	16		
Michoacán	21	Baja California	15		

Veracruz with 71 forms recorded possesses an extremely large proportion of the species of Mexico. This is due perhaps as much to relatively extensive collecting as to favorable environments; important also is the wide variety of niches in the state. Oaxaca with equally varied niches is not so well collected. It is of interest that these two states lead also in number of snake species represented, although the disparity between them is not so great for snakes. Arid or semiarid areas inhabited by many kinds of snakes have relatively few amphibians, as for instance in the case of Baja California. No state has been really well collected, and most have been very poorly investigated. Many additions are to be expected to the list as now constructed.

AGUASCALIENTES

Scaphiopus multiplicatus
Hyla eximia
Rana pipiens
Rana montezumae

BAJA CALIFORNIA

Taricha klauberi
Ensatina croceater
Batrachoseps attenuatus leucopus
Aneides lugubris lugubris
Scaphiopus couchii
Scaphiopus hammondii
Bufo woodhousii woodhousii
Bufo cognatus
Bufo californicus
Bufo boreas halophilus
Bufo punctatus
Hyla regilla
Hyla arenicolor
Rana pipiens
Rana aurora draytoni

CAMPECHE

Rhinophrynus dorsalis
Bufo horribilis
Bufo valliceps
Engystomops pustulosus
Leptodactylus labialis

Leptodactylus melanonotus
Agalychnis moreletii
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla loquax
Hyla underwoodi
Hyla staufferi
Microhyla elegans
Hypopachus cuneus nigroreticulatus
Rana pipiens
Rana palmipes

CHIAPAS

Dermophis mexicanus mexicanus
Gymnopis multiplicata oaxacae
Magnadigita nigroflavescens
Bolitoglossa occidentalis
Bolitoglossa flaviventris
Bolitoglossa moreleti
Bolitoglossa rufescens
Chiropterotriton xolocalcae
Rhinophrynus dorsalis
Bufo angustipes
Bufo horribilis
Bufo canaliferus
Bufo cristatus
Bufo valliceps
Bufo perplexus
Engystomops pustulosus
Syrrhophus rubrimaculatus
Syrrhophus nebulosus
Microbatrachylus albolabris
Microbatrachylus montanus
Microbatrachylus minimus
Microbatrachylus imitator
Microbatrachylus pygmaeus
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus matudai
Eleutherodactylus rugulosus
Eleutherodactylus beatae
Eleutherodactylus venustus
Eleutherodactylus rhodopis
Centrolenella fleischmanni
Agalychnis moreletii
Plectrohyla sagorum
Plectrohyla matudai
Acrodytes modestus
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla robertmertensi
Hyla underwoodi
Hyla rozellae
Hyla beltrani
Hyla staufferi
Hyla miotympanum?
Microhyla usta gadovii
Hypopachus maculatus
Rana pipiens
Rana palmipes

CHIHUAHUA

Ambystoma rosaceum
Ambystoma fluvinatum
Ambystoma tigrinum subsp.
Scaphiopus couchii
Scaphiopus hammondii
Bufo woodhousii woodhousii
Bufo compactilis
Bufo cognatus
Bufo insidior
Bufo simus
Bufo punctatus
Eleutherodactylus tarahumaraensis
Hyla wrightorum
Hyla arenicolor
Microhyla olivacea
Rana pipiens
Rana tarahumarae

COAHUILA

Scaphiopus couchii
Scaphiopus hammondii
Bufo compactilis
Bufo cognatus
Bufo horribilis
Bufo insidior
Bufo valliceps
Bufo punctatus
Eleutherodactylus latrans
Acris crepitans
Hyla arenicolor
Microhyla olivacea
Rana pipiens

COLIMA

Batrachoseps attenuatus ? (Nevado de Colima) (possibly Jalisco)
Bufo horribilis
Bufo simus
Bufo marmoreus
Syrrhophus modestus
Leptodactylus melanonotus
Eleutherodactylus occidentalis
Pternohyla fodiens
Agalychnis dacnicolor

Acrodytes inflatus
Smilisca baudinii baudinii
Hyla smithi
Microhyla usta usta
Hypopachus oxyrrhinus
Hypopachus ovis
Rana pipiens
Rana pustulosa

DISTRITO FEDERAL

Siredon mexicanum
Rhyacosiredon altamirani
Ambystoma velasci
Pseudoeurycea leprosa
Chiropterotriton chiroptera
Scaphiopus multiplicatus
Bufo compactilis
Bufo simus
Tomodactylus angustidigitorum
Smilisca baudinii baudinii
Hyla eximia
Hyla lafrentzi
Hyla arenicolor
Rana montezumae
Rana pipiens

DURANGO

Scaphiopus multiplicatus
Bufo woodhousii woodhousii
Bufo compactilis
Bufo cognatus
Bufo horribilis
Bufo insidior
Bufo simus
Eleutherodactylus augusti
Hyla eximia
Hyla arenicolor
Microhyla olivacea
Rana pipiens
Rana pustulosa

GUANAJUATO

Pseudoeurycea bellii
Scaphiopus multiplicatus
Bufo compactilis
Bufo simus
Bufo punctatus
Syrrhophus guttilatus
Eleutherodactylus augusti
Hyla eximia
Hyla arenicolor
Microhyla usta usta
Rana pipiens
Rana montezumae

GUERRERO

Gymnopis multiplicata oaxacae
Pseudoeurycea bellii
Scaphiopus multiplicatus
Bufo horribilis
Bufo simus
Bufo gemmifer
Bufo coccifer
Bufo marmoreus
Bufo perplexus
Tomodactylus albolabris
Tomodactylus amulae
Tomodactylus nitidus
Syrrhophus pipilans
Microbatrachylus albolabris
Microbatrachylus minimus
Microbatrachylus pygmaeus
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus calcitrans
Eleutherodactylus saltator
Eleutherodactylus augusti
Eleutherodactylus rugulosus
Centrolenella viridissima
Agalychnis dacnicolor
Acrodytes inflatus
Smilisca baudinii baudinii
Hyla arboricola
Hyla underwoodi
Hyla smithi
Hyla pinorum
Hyla leonard-schultzei
Hyla staufferi
Hyla arenicolor
Hyla erythromma
Hyla melanomma
Hyla miotympanum
Ptychohyla adipoventris
Microhyla usta usta
Hypopachus caprimimus
Rana sierramadrensis
Rana pipiens
Rana pustulosa

HIDALGO

Bolitoglossa platydactyla
Pseudoeurycea bellii
Pseudoeurycea gigantea
Pseudoeurycea cephalica rubrimembris
Pseudoeurycea cephalica manni

Chiropterotriton dimidiata
Chiropterotriton chondrostega
Chiropterotriton arborea
Chiropterotriton multidentata
Chiropterotriton mosaueri
Chiropterotriton terrestris
Bufo horribilis
Bufo simus
Bufo valliceps
Tomodactylus macrotympanum
Syrrhophus latodactylus
Syrrhophus verruculatus
Syrrhophus verrucipes
Eleutherodactylus hidalgoensis
Smilisca baudinii baudinii
Hyla eximia
Hyla lafrentzi
Hyla bistincta
Hyla robertsorum
Hyla arenicolor
Hyla bromeliana
Hyla miotympanum
Rana pipiens
Rana montezumae

JALISCO

Pseudoeurycea bellii
Scaphiopus multiplicatus
Bufo compactilis
Bufo horribilis
Bufo simus
Bufo marmoreus
Microbatrachylus hobartsmithi
Leptodactylus melanonotus
Eleutherodactylus occidentalis
Eleutherodactylus augusti
Pternohyla fodiens
Smilisca baudinii baudinii
Hyla eximia
Hyla staufferi
Hyla arenicolor
Microhyla usta usta
Hypopachus ovis
Hypopachus oxyrrhinus
Rana pipiens
Rana montezumae
Rana megapoda
Rana tarahumarae

MÉXICO

Siredon mexicanum
Siredon lermaensis
Rhyacosiredon rivularis
Rhyacosiredon leorae
Rhyacosiredon altamirani
Ambystoma velasci
Ambystoma granulosum
Ambystoma lacustris
Ambystoma schmidti
Ambystoma bombypellum
Pseudoeurycea bellii
Pseudoeurycea altamontana
Pseudoeurycea robertsi
Pseudoeurycea leprosa
Pseudoeurycea cephalica cephalica
Chiropterotriton chiroptera
Scaphiopus multiplicatus
Bufo compactilis
Tomodactylus angustidigitorum
Microbatrachylus hobartsmithi
Eleutherodactylus bolivari
Hyla cárdenasi
Hyla eximia
Hyla lafrentzi
Hyla bistincta
Hyla arenicolor
Rana pipiens
Rana montezumae

MICHOACÁN

Bathysiredon dumerilii
Ambystoma amblycephalum
Ambystoma ordinarium
Pseudoeurycea bellii
Bufo compactilis
Bufo horribilis
Tomodactylus angustidigitorum
Microbatrachylus hobartsmithi
Leptodactylus melanonotus
Eleutherodactylus occidentalis
Eleutherodactylus augusti
Eleutherodactylus vocalis
Agalychnis dacnicolor
Hyla eximia
Hyla smithi
Hyla bistincta
Hyla arenicolor
Hyla smaragdina
Hypopachus oxyrrhinus
Rana pipiens
Rana montezumae

MORELOS

Rhyacosiredon altamirani
Rhyacosiredon zempoalaensis
Pseudoeurycea bellii

Pseudoeurycea altamontana
Pseudoeurycea leprosa
Pseudoeurycea cephalica cephalica
Chiropterotriton chiroptera
Bufo horribilis
Bufo simus
Bufo perplexus
?Tomodactylus amulae
Tomodactylus nitidus
Leptodactylus labialis
Eleutherodactylus augusti
Agalychnis dacnicolor
Hylella azteca
Hyla eximia
Hyla lafrentzi
Hyla smithi
Hyla bistincta
Hyla arenicolor
Hypopachus alboventer
Rana pipiens
Rana pustulosa
Rana palmipes

NAYARIT

Pseudoeurycea bellii
Scaphiopus couchii
Bufo horribilis
Bufo kelloggi
Bufo simus
Bufo nayaritensis
Leptodactylus occidentalis
Leptodactylus melanonotus
Eleutherodactylus occidentalis
Eleutherodactylus augusti
Pternohyla fodiens
Agalychnis dacnicolor
Acrodytes inflatus
Smilisca baudinii baudinii
Hyla eximia
Hyla smithi
Hyla arenicolor
Hypopachus ovis
Rana pipiens

NUEVO LEÓN

Pseudoeurycea galeanae
Scaphiopus couchii
Scaphiopus hammondii
Bufo compactilis
Bufo horribilis
Bufo debilis
Bufo valliceps
Bufo punctatus
Syrrhophus smithi
Syrrhophus latodactylus
Syrrohophus campi
Leptodactylus labialis
Smilisca baudinii baudinii
Hyla miotympanum
Rana pipiens
Rana catesbeiana

OAXACA

Dermophis mexicanus mexicanus
Gymnopis multiplicata oaxacae
Thorius pulmonaris
Thorius narisovalis
Magnadigita macrinii
Bolitoglossa platydactyla
Bolitoglossa rufescens
Pseudoeurycea bellii
Pseudoeurycea unguidentis
Pseudoeurycea smithi
Pseudoeurycea cochranae
Rhinophrynus dorsalis
Scaphiopus multiplicatus
Bufo compactilis
Bufo horribilis
Bufo simus
Bufo canaliferus
Bufo coccifer
Bufo valliceps
Bufo marmoreus
Bufo perplexus
Engystomops pustulosus
Tomodactylus nitidus
Syrrhophus pipilans
Syrrhophus leprus
Microbatrachylus lineatissimus
Microbatrachylus oaxacae
Microbatrachylus pygmaeus
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus mexicanus
Eleutherodactylus augusti
Eleutherodactylus natator
Eleutherodactylus avocalis
Eleutherodactylus rugulosus
Eleutherodactylus macdougalli
Eleutherodactylus rhodopis
Diaglena reticulata
Agalychnis moreletii
Agalychnis dacnicolor
Acrodytes spilomma
Smilisca baudinii baudinii
Hylella sumichrasti

Hyla euphorbiacea
Hyla robustofemora
Hyla bistincta
Hyla staufferi
Hyla hazelae
Hyla miotympanum
Hyla arborescandens
Microhyla usta gadovii
Rana pipiens
Rana palmipes

PUEBLA

Rhyacosiredon leorae
Ambystoma subsalsum
Ambystoma velasci
Thorius dubitus
Thorius troglodytes
Pseudoeurycea bellii
Pseudoeurycea gigantea
Pseudoeurycea gadovii
Pseudoeurycea leprosa
Pseudoeurycea melanomolga
Pseudoeurycea cephalica cephalica
Chiropterotriton chiroptera
Scaphiopus multiplicatus
Bufo compactilis
Bufo horribilis
Bufo simus
Tomodactylus nitidus
Syrrhophus verruculatus
Eleutherodactylus cactorum
Eleutherodactylus rugulosus?
Eleutherodactylus dunni
Agalychnis callidryas
Smilisca baudinii baudinii
Hylella azteca
Hyla euphorbiacea
Hyla cárdenasi
Hyla eximia
Hyla lafrentzi
Hyla bistincta
Hyla miotympanum
Hyla arborescandens
Rana pipiens
Rana montezumae

QUERÉTARO

Pseudoeurycea bellii
Rana montezumae
Rana pipiens

QUINTANA ROO

Rhinophrynus dorsalis
Bufo valliceps
Smilisca baudinii baudinii

SAN LUIS POTOSÍ

Diemictylus kallerti
Bolitoglossa rufescens
Bolitoglossa platydactyla
Chiropterotriton multidentata
Scaphiopus couchii
Scaphiopus multiplicatus
Bufo cognatus
Bufo horribilis
Bufo valliceps
Bufo punctatus
Tomodactylus macrotympanum
Syrrhophus guttilatus
Syrrhophus latodactylus
Syrrhophus cystignathoides?
Syrrhophus campi
Leptodactylus melanonotus
Eleutherodactylus latrans
Eleutherodactylus rhodopis
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla eximia
Hyla picta
Hyla staufferi
Hyla arenicolor
Hyla miotympanum
Hypopachus cuneus cuneus
Rana pipiens

SINALOA

Scaphiopus couchii
Bufo horribilis
Bufo kelloggi
Bufo simus
Bufo mazatlanensis
Bufo marmoreus
Bufo punctatus
Leptodactylus occidentalis
Leptodactylus melanonotus
Eleutherodactylus occidentalis
Diaglena spatulata
Pternohyla fodiens
Agalychnis dacnicolor
Acrodytes inflatus?
Smilisca baudinii baudinii
Hyla smithi
Hyla arenicolor

Microhyla mazatlanensis
Microhyla usta usta
Hypopachus oxyrrhinus
Rana pipiens

SONORA

Scaphiopus couchii
Scaphiopus hammondii
Bufo alvarius
Bufo woodhousii woodhousii
Bufo compactilis
Bufo horribilis
Bufo insidior
Bufo mazatlanensis
Bufo punctatus
Leptodactylus occidentalis
Leptodactylus melanonotus
Eleutherodactylus tarahumaraensis
Pternohyla fodiens
Agalychnis dacnicolor
Smilisca baudinii baudinii
Hyla arenicolor
Microhyla olivacea
Rana pipiens
Rana pustulosa
Rana tarahumarae

TABASCO

Dermophis mexicanus mexicanus
Bolitoglossa platydactyla ?
Bolitoglossa rufescens
Rhinophrynus dorsalis
Bufo horribilis
Bufo valliceps
Engystomops pustulosus
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus rhodopis
Agalychnis moreletii
Agalychnis callidryas
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla picta
Hyla staufferi
Rana pipiens
Rana palmipes

TAMAULIPAS

Siren intermedia nettingi
Diemictylus meridionalis
Rhinophrynus dorsalis
Scaphiopus couchii
Scaphiopus hammondii
Bufo compactilis
Bufo horribilis
Bufo debilis
Bufo valliceps
Bufo punctatus
Syrrhophus campi
Leptodactylus labialis
Eleutherodactylus batrachylus
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla staufferi
Hypopachus cuneus cuneus
Rana pipiens
Rana catesbeiana

TLAXCALA

Pseudoeurycea bellii
Bufo simus
Hyla lafrentzi
Hyla arborescandens
Rana pipiens

VERACRUZ

Dermophis mexicanus mexicanus
Diemictylus kallerti
Thorius pennatulus
Thorius dubitus
Thorius troglodytes
Parvimolge townsendi
Oedipina lineola
Bolitoglossa rufescens
Bolitoglossa platydactyla
Pseudoeurycea gigantea
Pseudoeurycea gadovii
Pseudoeurycea melanomolga
Pseudoeurycea leprosa
Pseudoeurycea nigromaculata
Pseudoeurycea cephalica cephalica
Chiropterotriton lavae
Chiropterotriton chiroptera
Rhinophrynus dorsalis
Scaphiopus multiplicatus
Bufo compactilis
Bufo horribilis
Bufo simus
Bufo cristatus
Bufo valliceps
Bufo marmoreus
Engystomops pustulosus
Tomodactylus nitidus
Syrrhophus nebulosus?
Syrrhophus leprus

Syrrhophus cystignathoides
Syrrhophus verruculatus
Microbatrachylus albolabris
Microbatrachylus minimus
Microbatrachylus pygmaeus
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus alfredi
Eleutherodactylus spatulatus
Eleutherodactylus decoratus
Eleutherodactylus hidalgoensis
Eleutherodactylus mexicanus
Eleutherodactylus natator
Eleutherodactylus beatae
Eleutherodactylus dorsoconcolor
Eleutherodactylus venustus
Eleutherodactylus rhodopis
Eleutherodactylus dunni
Anotheca coronata
Agalychnis moreletii
Agalychnis callidryas
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla euphorbiacea
Hyla eximia
Hyla lafrentzi
Hyla underwoodi
Hyla rickardsi
Hyla picta
Hyla pachyderma
Hyla bistincta
Hyla forbesi
Hyla staufferi
Hyla dendroscarta
Hyla taeniopus
Hyla miotympanum
Hyla arborescandens
Microhyla elegans
Microhyla usta usta
Hypopachus cuneus cuneus
Rana pipiens
Rana palmipes

YUCATÁN

Dermophis mexicanus mexicanus
Bolitoglossa yucatana
Rhinophrynus dorsalis
Bufo horribilis
Bufo valliceps
Leptodactylus labialis
Leptodactylus melanonotus
Eleutherodactylus laticeps
Triprion petasatus
Agalychnis moreletii
Agalychnis callidryas
Acrodytes spilomma
Smilisca baudinii baudinii
Hyla underwoodi
Hypopachus cuneus nigroreticulatus
Rana pipiens

ZACATECAS

Scaphiopus couchii
Scaphiopus multiplicatus
Bufo compactilis
Bufo insidior
Bufo simus
Eleutherodactylus occidentalis
Eleutherodactylus augusti
Hyla eximia
Hyla arenicolor
Rana pipiens

INDEX

achatina, Hylaplesia, 92.
Microhyla, 92.
Acris, 68, 77.
crepitans, 77, 102.
Acrodytes, 68, 74.
inflata, 74.
inflatus, 103, 105.
modesta, 74.
modestus, 74, 102.
spilomma, 74, 75, 102, 105–108.
adipoventris, Ptychohyla, 91, 103.
adtrila, Rana, 99.
affinis, Hyla, 89.
Agalychnis, 68, 71.
callidryas, 71, 72, 106–108.
dacnicolor, 71, 72, 102–107.
moreletii, 71, 102, 105, 107, 108.
agua, Bufo, 37.
alba, Siredon lichenoides, 7.
albilabris, Leptodactylus, 56.
albolabris, Microbatrachylus, 53, 54, 102, 103, 108.
Tomodactylus, 48, 103.
alboventer, Hypopachus, 94, 95, 105.
alfredi, Eleutherodactylus, 57, 60, 108.
Hylodes, 60.
altamirani, Amblystoma, 8, 9.
Rhyacosiredon, 8, 9, 103, 104.
altamontana, Bolitoglossa, 28.
Pseudoeurycea, 26, 28, 104, 105.
altamontanus, Oedipus, 28.
alvarius, Bufo, 37, 39, 107.
amblycephala, Ambystoma, 13.
amblycephalum, Ambystoma, 10, 13, 104.
Amblystoma altamirani, 8, 9.
Ambystoma, 6, 10.
amblycephala, 13.
amblycephalum, 10, 13, 104.
bombypella, 13.
bombypellum, 10, 13, 104.
fluvinatum, 6, 11, 14, 102.
granulosum, 11, 12, 104.
lacustris, 11, 12, 104.
maculatum, 10.
ordinaria, 13.
ordinarium, 10, 13, 104.
proserpina, 14.
proserpine, 14.
rosaceum, 6, 11, 13, 102.
schmidti, 10, 13, 104.
sp., 13.
subsalsum, 11, 106.
Ambystoma subviolacea, 10.
tigrinum, 10, 11, 14.
tigrinum mavortium, 10, 13.
tigrinum proserpine, 11, 14.
tigrinum subsp., 102.
tigrinum velasci, 11, 12.
velasci, 11, 103, 104, 106.
Ambystomidae, 6.
Ambystomoidea, 5, 6.
Amphibia, 3.
amulae, Tomodactylus, 47, 48, 103, 105.
Ameides, 18, 20.
lugubris, 20.
lugubris lugubris, 20, 101.
Anaxyrus, 37.
melancholicus, 37, 40.
angustidigitorum, Tomodactylus, 47, 48, 103, 104.
angustipes, Bufo, 37, 41, 102.
anomalus, Bufo, 40.
Dromoplectrus, 37.
Anomocoela, 33, 34.
Anotheca, 67, 70.
coronata, 70, 108.
antioquiensis, Centrolenella, 68.
aquarum, Lusus, 8.
arborea, Bolitoglossa, 32.
Chiropterotriton, 31, 32, 104.
arborescandens, Hyla, 82, 91, 106–108.
arboricola, Hyla, 78, 83, 103.
arenicolor, Hyla, 81, 89, 101–108.
argillaceus, Bufo, 45.
attenuata, Salamandrina, 19.
attenuatus, Batrachoseps, 19, 20, 102.
augusti, Eleutherodactylus, 59, 63, 64, 103–105, 108.
augusti, Hylodes, 63.
avocalis, Eleutherodactylus, 60, 65, 105.
Axolotes, 7.
guttata, 7.
maculata, 13.
axolotl, Siredon, 7.
azteca, Hylella, 76, 77, 105, 106.

Bathysiredon, 6, 7.
dumerilii, 7, 104.
Batrachoseps, 18, 19.
Batrachoseps attenuatus, 19, 20, 102.
attenuatus leucopus, 19, 101.
leucopus, 19.
Batrachyla longipes, 57, 61.

batrachylus, Eleutherodactylus, 57, 61, 107.
baudinii, Hyla, 75, 76, 90.
Hyla baudinii, 76.
Smilisca, 76.
Smilisca baudinii, 75, 102–108.
beatae, Eleutherodactylus, 60, 65, 102, 108.
Hylodes, 65.
beldingi, Bufo, 46.
belli, Spelerpes, 26.
bellii, Bolitoglossa, 26.
Oedipus, 26.
Pseudoeurycea, 25, 26, 103–107.
beltrani, Hyla, 80, 87, 102.
berkenbuschii, Hylodes, 65.
bistincta, Hyla, 79, 80, 87, 104–106, 108.
Boana, 73.
Bolitoglossa, 18, 22.
altamontana, 28.
arborea, 32.
bellii, 26.
cephalica rubrimembris, 30.
chiroptera, 32.
chondrostega, 31.
cochranae, 28.
dimidiata, 31.
flaviventris, 23, 24, 102.
gadovii, 27.
galaenae, 29.
gigantea, 27.
lavae, 32.
leprosa, 28.
macrinii, 22.
melanomolga, 27.
mexicana, 22, 24, 26.
morelcti, 23, 24, 102.
multidentata, 32.
nigroflavescens, 21, 22.
nigromaculata, 29.
occidentalis, 22, 23, 102.
platydactyla, 23, 103, 105–107.
rufescens, 22, 23, 102, 105–107.
smithi, 28.
terrestris, 33.
townsendi, 20.
unguidentis, 27.
xolocalcae, 33.
yucatana, 23, 25, 108.
bolivari, Eleutherodactylus, 59, 64, 104.
bombifrons, Scaphiopus, 35.
bombypella, Ambystoma, 13.
bombypellum, Ambystoma, 10, 13, 104.
Borborocoetes mexicanus, 62.
braziliensis, Gymnopis, 5.
bromeliana, Hyla, 81, 90, 104.
bufo, Rana, 37.
Bufo, 37.
agua, 37.
alvarius, 37, 39, 107.
angustipes, 37, 41, 102.
anomalus, 40.
argillaceus, 45.
beldingi, 46.
boreas halophilus, 37, 38, 43, 101.
californicus, 37, 41, 101.
Bufo canaliferus, 38, 43, 102, 105.
coccifer, 39, 44, 46, 103, 105.
cognatus, 37, 41, 101–103, 106.
cognatus californicus, 41.
compactilis, 37, 40, 102–108.
cristatus, 39, 44, 102, 107.
debilis, 38, 42, 105, 107.
dipternus, 41.
dorsalis, 40.
eiteli, 45.
frontosus, 40.
gemmifer, 38, 43, 103.
granulosus, 45.
halophila, 43.
horribilis, 37, 41, 101, 102, 103, 104, 105, 106, 107, 108.
insidior, 38, 42, 102, 103, 107, 108.
intermedius, 42.
kelloggi, 38, 42, 105, 106.
lateralis, 45.
levifrons, 40.
marinus, 41.
marmoreus, 39, 45, 102, 103, 104, 105, 106, 107.
mazatlanensis, 38, 43, 106, 107.
mexicanus, 40.
monksiae, 43.
nayaritenis, 39, 44, 105.
nebulifer, 45.
occidentalis, 43.
occipitalis, 44.
perplexus, 39, 45, 102, 103, 105.
punctatus, 39, 46, 102, 103, 105–107.
simus, 38, 42, 102–108.
speciosus, 40.
sternosignatus, 45.
terrestris, 41.
trachypus, 44.
valliceps, 39, 44, 101, 102, 104–108.
vulgaris, 37.
woodhousii, 40.
woodhousii woodhousii, 37, 40, 101–103, 107.
Bufonidae, 36, 37.

cactorum, Eleutherodactylus, 59, 63, 106.
Caeciliidae, 3, 4.
calcitrans, Eleutherodactylus, 46, 58, 62, 103.
Hylodes, 62.
californicus, Bufo, 37, 41, 101.
Bufo cognatus, 41.
caliginosus, Leptodactylus, 57.
callidryas, Agalychnis, 71, 72, 106–108.
Hyla, 71, 72.
campi, Syrrhophus, 50, 52, 106, 107.
canaliferus, Bufo, 38, 43, 102, 105.
caprimimus, Hypopachus, 94, 95, 103.
carbonarius, Geotriton, 24.
cárdenasi, Hyla, 78, 83, 104, 106.
carolinense, Engystoma, 92.
catesbeiana, Rana, 98, 100, 105, 107.
Caudata, 3, 5.

Cauphias, 73.
crassus, 86.
Centrolene, 68.
geckoideum, 68.
Centrolenella, 67, 68.
antioquiensis, 68.
fleischmanni, 68, 102.
viridissima, 68, 69, 103.
cephalica, Pseudoeurycea cephalica, 26, 29, 104–107.
cephalicus, Oedipus, 29.
Spelerpes, 29.
chiroptera, Bolitoglossa, 32.
Chiropterotriton, 31, 32, 103–107.
Chiropterotriton, 19, 30.
arborea, 31, 32, 104.
chiroptera, 31, 32 103–107.
chondrostega, 30, 31, 104.
dimidiata, 30, 31, 104.
lavae, 31, 32, 107.
mosaueri, 31, 32, 104.
multidentata, 31, 32, 104, 106.
terrestris, 31, 33, 104.
xolocalcae, 31, 33, 102.
chiropterus, Oedipus, 32.
Spelerpes, 32.
chondrostega, Bolitoglossa, 31.
Chiropterotriton, 30, 31, 104.
coccifer, Bufo, 39, 44, 46, 103, 105.
cochranae, Bolitoglossa, 28.
Pseudoeurycea, 26, 28, 105.
cognatus, Bufo, 37, 41, 101–103, 106.
compactilis, Bufo, 37, 40, 102–108.
concolor, Rana montezumae, 99.
conspicillatus, Hylodes, 60.
conspicuus, Eleutherodactylus, 57, 60.
copii, Hyla, 89.
coronata, Anotheca, 70, 108.
Gastrotheca, 70.
couchii, Scaphiopus, 35, 101, 102, 105–108.
crassa, Hyla, 80, 86.
Plectrohyla, 86.
crassus, Cauphias, 86.
crepitans, Acris, 77, 102.
cristatus, Bufo, 39, 44, 102, 107.
croceater, Ensatina, 19, 101.
Plethodon, 19.
culex, Hyla, 88.
cuneus, Hypopachus, 95.
Hypopachus cuneus, 94, 95, 106, 107.
curta, Hyla, 82.
cystignathoides, Phyllobates, 52.
Syrrhophus, 50, 52, 106, 108.
Cystignathus fragilis, 56.
gracilis, 56.
labialis, 56.
melanonotus, 57.
microtis, 57.
perlaevis, 57.

dacnicolor, Agalychnis, 71, 72, 102–107.
Phyllomedusa, 71, 72.
daulinia, Smilisca, 75, 76.
debilis, Bufo, 38, 42, 105, 107.
decoratus, Eleutherdactylus, 58, 61, 108.
dendroscarta, Hyla, 81, 89, 108.
Dermophis, 4.
mexicana, 4.
mexicanus, 4.
mexicanus mexicanus, 4, 102, 105, 107.
Desmognathidae, 16.
Diaglena, 67, 69.
reticulata, 69.
spatulata, 69.
Diemictylus, 14, 15.
kallerti, 15, 107.
meridionalis, 15, 107.
miniatus meridionalis, 15.
viridescens, 15.
digueti, Hyliola, 89.
dimidiata, Bolitoglossa, 31.
Chiropterotriton, 30, 31, 104.
Diplasiocoela, 33, 91.
dipternus, Bufo, 41.
Docidophrynae, 37.
dorsalis, Bufo, 40.
Rhinophrynus, 34, 101, 102, 106, 108.
dorsalus, Rhinophryne, 34, 105.
dorsoconcolor, Eleutherodactylus, 60, 66, 108.
draytoni, Rana, 99.
Rana aurora, 97, 99, 101.
Dromoplectrus, 37.
anomalus, 37.
dubitus, Thorius, 17, 106, 107.
dugesii, Scaphiopus, 36.
dumerilii, Bathysiredon, 7, 104.
Siredon, 7.
dunni(i), Eleutherodactylus, 60, 67, 106, 108.

ebraccata, Hyla, 79, 84, 85.
edulis, Gyrinus, 8.
eiteli, Bufo, 45.
elegans, Engystoma, 93.
Gastrophryne, 93.
Microhyla, 92, 93, 102, 108.
Eleutherodactylus, 2, 46, 57, 64.
alfredi, 57, 60, 108.
augusti, 59, 63, 64, 103–105, 108.
avocalis, 60, 65, 105.
batrachylus, 57, 61, 107.
beatae, 60, 65, 102, 108.
bolivari, 59, 64, 104.
cactorum, 59, 63, 106.
calcitrans, 46, 58, 62, 103.
conspicuus, 57, 60.
decoratus, 58, 61, 108.
dorsoconcolor, 60, 66, 108.
dunni(i), 60, 67, 106, 108.
hidalgoensis, 58, 61, 104, 108.
hobartsmithi, 53, 55.
laticeps, 59, 63, 108.
latrans, 59, 63, 102, 106.

Eleutherodactylus longipes, 58, 61.
macdougalli, 60, 66, 105.
martinicensis, 57.
matudai, 58, 59, 64, 102.
mexicanus, 59, 62, 105. 108.
natator, 60, 65, 105, 108.
occidentalis, 58, 62, 102, 104, 105, 108.
rhodopis, 60, 66, 102, 105–108.
rugulosus, 60, 65, 102. 103, 105, 106.
saltator, 59, 63, 103.
spatulatus, 58, 61, 108.
tarahumaraensis, 59, 64, 102, 107.
venustus, 60, 66, 102, 108.
vocalis, 59, 64, 104.
Engystoma carolinense, 92.
elegans, 93.
mexicanum, 93.
olivaceum, 93.
rugosum, 92, 93.
ustum, 93.
variolosum, 94.
Engystomops, 36, 46, 47.
petersi, 47.
pustulosus, 47, 101, 102, 105, 107.
Ensatina, 18, 19.
croceater, 19, 101.
eschscholtzii, 19.
Epirhexis, 57.
erythromma, Hyla, 81, 89, 103.
eschscholtzii, Ensatina, 19.
Eupemphix, 47.
gadovii, 94.
nattereri, 47.
euphorbiacea, Hyla, 78, 82, 106, 108.
Exerodonta, 76.
sumichrasti, 76.
eximia, Hyla, 78, 83, 101, 103–106, 108.

flaviventris, Bolitoglossa, 23, 24, 102.
Oedipus, 24.
fleischmanni, Centrolenella, 68, 102.
Hylella, 68.
fluvinatum, Ambystoma, 6, 11, 14, 102.
fodiens, Pternohyla, 70, 71, 102, 104, 106, 107.
forbesi, Hyla, 80, 88, 108.
forreri, Rana, 98.
fragilis, Cystignathus, 56.
frontosus, Bufo, 40.

gadovii, Bolitoglossa, 27.
Eupemphix, 94.
Microhyla usta, 92, 94, 102, 106.
Oedipus, 27.
Pseudoeurycea, 25, 27, 106, 107.
galaenae, Bolitoglossa, 29.
galeanae, Pseudoeurycea, 26, 29, 105.
Gastrophryne, 92.
elegans, 93.
olivacea, 93.
usta, 93.
Gastrotheca coronata, 70.
geckoideum, Centrolene, 68.
gemmifer, Bufo, 38, 43, 103.
Geotriton carbonarius, 24.
variegata, 23.
gibbicaudus, Spelerpes, 29.
gigantea, Bolitoglossa, 27.
Pseudoeurycea, 25, 27, 103, 106, 107.
giganteus, Oedipus, 27.
glutinosus, Plethodon, 16.
godmani, Hyla, 85, 90.
gracilipes, Hyla, 83.
gracilis, Cystignathus, 56.
granulosum, Ambystoma, 11, 12, 104.
granulosus, Bufo, 45.
Taricha, 14.
gryllus, Rana, 77.
guatemalensis, Plectrohyla, 73.
guttata, Axolotes, 7.
guttilatus, Malachylodes, 49, 51.
Syrrhophus, 49, 51, 103, 106.
Gymnophiona, 3.
Gymnopis, 4, 5.
braziliensis, 5.
mexicanus mexicanus, 4.
multiplicata, 5.
multiplicata oaxacae, 5, 102, 103, 105.
pricei, 5.
Gyrinus edulis, 8.
mexicanus, 7.

halophila, Bufo, 43.
halophilus, Bufo boreas, 37, 38, 43, 101.
hammondii, Scaphiopus, 35, 36, 101, 102, 105, 107.
Spea, 36.
harlanii, Siredon, 13.
hazelae, Hyla, 81, 90, 106.
hebes, Scytopis, 74.
helenae, Phyllomedusa, 72.
hidalgoensis, Eleutherodactylus, 58, 61, 104, 108.
hobartsmithi, Eleutherodactylus, 53, 55.
Microbatrachylus, 53, 55, 104.
holbrookii, Scaphiopus, 35.
holochlora, Hyla, 71.
horribilis, Bufo, 37, 41, 101–108.
humboldtii, Siredon, 8.
Hyla, 68, 75, 77.
affinis, 89.
arborescandens, 82, 91, 106, 107, 108.
arboricola, 78, 83, 103.
arenicolor, 81, 89, 101–108.
baudinii, 75, 76, 90.
baudinii baudinii, 76.
beltrani, 80, 87, 102.
bistincta, 79, 80, 87, 104–106, 108.
bromeliana, 81, 90, 104.
callidryas, 71, 72.
cárdenasi, 78, 83, 104, 106.
copii, 89.
crassa, 80, 86.
culex, 88.
curta, 82.
dendroscarta, 81, 89, 108.

Hyla ebraceata, 79, 84, 85.
erythromma, 81, 89, 103.
euphorbiacea, 78, 82, 106, 108.
eximia, 78, 83, 101, 103–106, 108.
forbesi, 80, 88, 108.
godmani, 85, 90.
gracilipes, 83.
hazelae, 81, 90, 106.
holochlora, 71.
lafrentzi, 78, 84, 103–108.
leonard-schultzei, 80, 87, 103.
leucophyllata, 84.
lichenosa, 75.
loquax, 78, 79, 84, 102.
melanomma, 81, 89, 103.
microcephala, 85.
microtis, 90.
miotympanum, 82, 85, 90, 102–106, 108.
moreletii, 71.
muricolor, 76.
nana, 85.
nigropunctata, 75.
pachyderma, 80, 86, 108.
phaeota, 80, 88.
phlebodes, 85.
picta, 79, 85, 106–108.
pinorum, 80, 87, 103.
plicata, 81, 88.
regilla, 77, 78, 82, 101.
regilla laticeps, 82.
richardsi, 79, 85, 90, 108.
robertmertensi, 79, 84, 85, 102.
robertsorum, 80, 87, 104.
robustofemora, 80, 86, 106.
rozellae, 79, 86, 102.
rudis, 71.
smaragdina, 81, 90, 104.
smithi, 79, 85, 103–106.
spilomma, 75.
staufferi, 81, 88, 102–104, 106–108.
taeniopus, 81, 89, 90, 108.
underwoodi, 79, 85, 102, 103, 108.
vanvlietii, 76.
venulosa, 74, 75.
viridis, 77.
wrightorum, 78, 84, 102.
Hylaplesia achatina, 92.
Hylella, 68, 76, 85.
azteca, 76, 77, 105, 106.
fleischmanni, 68.
picta, 85.
platycephala, 76.
sumichrasti, 76, 105.
tenera, 76.
Hylidae, 36, 67.
Hyliola, 77.
digueti, 89.
regilla, 77.
Hylodes alfredi, 60.
augusti, 63.
beatae, 65.
berkenbuschii, 65.
Hylodes calcitrans, 62.
conspicillatus, 60.
laticeps, 63.
martinicensis, 57.
plicatus, 66.
sallaei, 66.
venustus, 66.
Hypopachus, 92, 94.
alboventer, 94, 95, 105.
caprimimus, 94, 95, 103.
cuneus, 95.
cuneus cuneus, 94, 95, 106, 107.
cuneus nigroreticulatus, 95, 96, 102, 108.
maculatus, 94, 95, 102.
ovis, 95, 96, 103–105.
oxyrrhinus, 95, 96, 103, 104, 107.
seebachii, 94.
Hypsiboas, 73.

imitator, Microbatrachylus, 53, 55, 102.
inflata, Acrodytes, 74.
inflatus, Acrodytes, 103, 105.
infuscatus, Spelerpes (Oedipus), 21.
insidior, Bufo, 38, 42, 102, 103, 107, 108.
intermedia, Siren. 6.
intermedius, Bufo, 42.

kallerti, Diemictylus, 15, 107.
Triturus, 15
kelloggi, Bufo, 38, 42, 105, 106.
klauberi, Taricha, 15, 101.
Taricha torosa, 15.
Triturus, 15.
Triturus torosus, 15.

labialis, Cystignathus, 56.
Leptodactylus, 56, 101–103, 105, 107, 108.
Lacerta maculata, 13.
lacertina, Siren, 6.
lacustris, Ambystoma, 11, 12, 104.
lafrentzi, Hyla, 78, 84, 103–108.
lateralis, Bufo, 45.
laticeps, Eleutherodactylus, 59, 63, 108.
Hyla regilla, 82.
Hylodes, 63.
Spelerpes, 29, 30.
latodactylus, Syrrhophus, 46, 50, 51, 104, 106.
latrans, Eleutherodactylus, 59, 63, 102, 106.
Lithodytes, 63.
lavae, Bolitoglossa, 32.
Chiropterotriton, 31, 32, 107.
leonard-schultzei, Hyla, 80, 87, 103.
leorae, Rhyacosiredon, 8, 9, 104, 106.
leprosa, Bolitoglossa, 28.
Pseudoeurycea, 26, 28, 103–107.
leprosus, Oedipus, 28.
Spelerpes, 28.
leprus, Syrrhophus, 50, 51, 105, 107.

Leptodactylidae, 36, 46.
Leptodactylus, 46, 55.
albilabris, 56.
caliginosus, 57.
labialis, 56, 101–103, 105, 107, 108.
Leptodactylus melanonotus, 56, 57, 102–108.
occidentalis, 56, 106, 107.
typhonia, 55.
lermaensis, Siredon, 7, 8, 104.
leucophyllata, Hyla, 84.
leucopus, Batrachoseps, 19.
Batrachoseps attenuatus, 19, 101.
Leuiperus mexicanus, 62.
levifrons, Bufo, 40.
lichenoides, Siredon, 10.
lichenosa, Hyla, 75.
lineatissimus, Microbatrachylus, 46, 53, 54, 105.
lineola, Oedipina, 21, 107.
lineolus, Oedipina, 21.
Oedipus, 21.
Spelerpes, 21.
Lithodytes latrans, 63.
rhodopis, 66.
Liuperus nitidus, 48.
Liyla rugulosa, 65.
longipes, Batrachila, 57, 61.
Eleutherodactylus, 58, 61.
loquax, Hyla, 78, 79, 84, 102.
ludricus, Piscis, 8.
lugubris, Aneides, 20.
Aneides lugubris, 20, 101.
Salamandra, 20.
Lusus aquarum, 8.

macdougalli, Eleutherodactylus, 60, 66, 105.
macrinii, Bolitoglossa, 22.
Magnadigita, 21, 22, 105.
Oedipus, 22.
macrotympanum, Tomodactylus, 47, 48, 104, 106.
maculata, Axolotes, 13.
Lacerta, 13.
maculatum, Ambystoma, 10.
maculatus, Hypopachus, 94, 95, 102.
Magnadigita, 18, 21.
macrinii, 21, 22, 105.
nigroflavescens, 21, 22, 102.
sulcata, 21, 22.
Malachylodes, 49.
guttilatus, 49, 51.
manni, Oedipus, 30.
Pseudoeurycea cephalica, 26, 30, 103.
marina, Rana, 37.
marinus, Bufo, 41.
marmoreus, Bufo, 39, 45, 102–107.
marnockii, Syrrhophus, 49.
martinicensis, Eleutherodactylus, 57.
Hylodes, 57.
matudai, Eleutherodactylus, 58, 59, 64, 102.
Plectrohyla, 73, 102.
mavortium, Ambystoma tigrinum, 10, 13.
mazatlanensis, Bufo, 38, 43, 106, 107.
Microhyla, 92, 107.
Meantes, 5.
megapoda, Rana, 97, 100, 104.
melancholicus, Anaxyrus, 37, 40.
melanomma, Hyla, 81, 89, 103.
melanomolga, Bolitoglossa, 27.
Pseudoeurycea, 25, 27, 106, 107.
melanomolge, Pseudoeurycea, 27.
melanonotus, Cystignathus, 57.
Leptodactylus, 56, 57, 102–108.
meridionalis, Diemictylus, 15, 107.
Diamictylus miniatus, 15.
Triturus, 15.
mexicana, Bolitoglossa, 22, 24, 26.
Dermophis, 4.
mexicanum, Engystoma, 93.
Siredon, 7, 103, 104.
Spelerpes, 24.
mexicanus, Borborocoetes, 62.
Bufo, 40.
Dermophis, 4.
Dermophis mexicanus, 4, 102, 105, 107.
Eleutherodactylus, 59, 62, 105, 108.
Gymnopis mexicanus, 4.
Gyrinus, 7.
Leuiperus, 62.
Oedipus, 25.
Siphonops, 4.
Microbatrachylus, 46, 53, 59.
albolabris, 53, 54, 102, 103, 108.
hobartsmithi, 53, 55, 104.
imitator, 53, 55, 102.
lineatissimus, 46, 53, 54, 105.
minimus, 53, 54, 102, 103, 108.
montanus, 53, 54, 102.
oaxacae, 53, 54, 105.
pygmaeus, 53, 55, 102, 103, 105, 108.
microcephala, Hyla, 85.
Microhyla, 92.
achatina, 92.
elegans, 92, 93, 102, 108.
mazatlanensis, 92, 107.
olivacea, 92, 93, 103, 107.
usta, 94.
usta gadovii, 92, 94, 102, 106.
usta usta, 92, 93, 103, 104, 107, 108.
Microhylidae, 91.
Microhylinae, 92.
Microphryne, 47.
microtis, Cystignathus, 57.
Hyla, 90.
minimus, Microbatrachylus, 53, 54, 102, 103, 108.
Spelerpes, 17.
miotympanum, Hyla, 82, 85, 90, 102–106, 108.
modesta, Acrodytes, 74.
modestus, Acrodytes, 74, 102.
Syrrhophus, 49, 50, 102.
monksiae, Bufo, 43.

montanus, Microbatrachylus, 53, 54, 102.
montezumae, Rana, 97, 99, 101, 103, 104, 106.
moreleti, Bolitoglossa, 23, 24, 102.
moreletii, Agalychnis, 71, 102, 105, 107, 108.
Hyla, 71.
Phyllomedusa, 71.
mosaueri, Chiropterotriton, 31, 32, 104.
Oedipus, 32.
multidentata, Bolitoglossa, 32.
Chiropterotriton, 31, 32, 104, 106.
Oedipus, 32.
multidentatus, Oedipus, 30.
multiplicata, Gymnopis, 5.
multiplicatus, Scaphiopus, 35, 36, 101, 103–108.
Scaphiopus hammondii, 36.
muricolor, Hyla, 76.
mystaceus, Syrrhophus, 65.

nana, Hyla, 85.
natator, Eleutherodactylus, 60, 65, 105, 108.
nattereri, Eupemphix, 47.
nayaritensis, Bufo, 39, 44, 105.
nebulifer, Bufo, 45.
nebulosus, Syrrhophus, 49, 51, 102, 107.
nettingi, Siren intermedia, 6, 107.
nigroflavescens, Bolitoglossa, 21, 22.
Magnadigita, 21, 22, 102.
nigromaculata, Bolitoglossa, 29.
Pseudoeurycea, 26, 29, 107.
nigropunctata, Hyla, 75.
nigroreticulatus, Hypopachus cuneus, 95, 96, 102, 108.
nitidus, Liuperus, 48.
Tomodactylus, 48, 103, 105–107.
norisovalis, Thorius, 17, 18, 105.

oaxacae, Gymnopis multiplicata, 5, 102, 103, 105.
Microbatrachylus, 53, 54, 105.
occidentalis, Bolitoglossa, 22, 23, 102.
Bufo, 43.
Eleutherodactylus, 58, 62, 102, 104, 105, 108.
Leptodactylus, 56, 106, 107.
occipitalis, Bufo, 44.
Oedipina, 19, 21.
lineola, 21, 107.
lineolus, 21.
uniformis, 21.
Oedipus altamontanus, 28.
bellii, 26.
cephalicus, 29.
chiropterus, 32.
flaviventris, 24.
gadovii, 27.
giganteus, 27.
leprosus, 28.
lineolus, 21.
macrinii, 22.
manni, 30.
mexicanus, 25.
mosaueri, 32.
Oedipus multidentata, 32.
multidentatus, 30.
orizabensis, 29.
platydactylus, 24, 26.
robertsi, 28.
rufescens, 23.
salvinii, 24.
smithi, 28.
sulcatus, 28.
townsendi, 20.
variegatus, 23.
olivacea, Gastrophryne, 93.
Microhyla, 92, 93, 103, 107.
olivaceum, Engystoma, 93.
omiltemana, Rana, 98.
Opisthocoela, 33, 34.
Opisthodelphys ovifera, 70.
orculus, Spelerpes, 32.
ordinaria, Ambystoma, 13.
ordinarium, Ambystoma, 10, 13, 104.
orizabensis, Oedipus, 29.
Spelerpes, 29.
ovifera, Opisthodelphys, 70.
ovis, Hypopachus, 95, 96, 103–105.
oxyrrhinus, Hypopachus, 95, 96, 103 104, 107.

pachyderma, Hyla, 80, 86, 108.
palmipes, Pohlia, 96.
Rana, 96–98, 102, 105–108.
Paludicola pustulosa, 47.
Parvimolge, 18, 20.
townsendi, 20.
Pelobatidae, 34.
pennatribus, Thorius, 17.
pennatulus, Thorius, 16, 17, 18, 107.
perlaevis, Cystignathus, 57.
perplexus, Bufo, 39, 45, 102, 103, 105.
petasatus, Pharyngodon, 70.
Triprion, 70, 108.
petersi, Engystomops, 47.
phaeota, Hyla, 80, 88.
Pharyngodon, 70.
petasatus, 70.
phlebodes, Hyla, 85.
Phyllobates cystignathoides, 52.
verruculatus, 52.
Phyllomedusa dacnicolor, 71, 72.
helenae, 72.
moreletii, 71.
picta, Hyla, 79, 85, 106–108.
Hylella, 85.
pinorum, Hyla, 80, 87, 103.
pipiens, Rana, 1, 97, 98, 101–108.
pipilans, Syrrhophus, 49, 50, 103, 105.
pisciformis, Siren, 7.
Piscis ludricus, 8.
platycephala, Hylella, 76.
platydactyla, Bolitoglossa, 23, 103, 105–107.
platydactylus, Oedipus, 24, 26.
Salamandra, 22, 23, 26.
Plectrohyla, 68, 73.
crassa, 86.
"Form b," 73.

Plectrohyla guatemalensis, 73.
matudai, 73, 102.
sagorum, 73, 102.
Plethodon croceater, 19.
glutinosus, 16.
Plethodontidae, 1, 16.
Plethodontinae, 16, 18.
Plethodontoidea, 5, 16.
plicata, Hyla, 81, 88.
plicatus, Hylodes, 66.
Pohlia, 96.
palmipes, 96.
pricei, Gymnopis, 5.
Procoela, 33, 36.
proserpina, Ambystoma, 14.
proserpine, Ambystoma, 14.
Ambystoma tigrinum, 11, 14.
Pseudoeurycea, 19, 25.
altamontana, 26, 28, 104, 105.
bellii, 25, 26, 103–107.
cephalica cephalica, 26, 29, 104–107.
cephalica manni, 26, 30, 103.
cephalica rubrimembris, 26, 30, 103
cochranae, 26, 28, 105.
gadovii, 25, 27, 106, 107.
galeanae, 26, 29, 105.
gigantea, 25, 27, 103, 106, 107.
leprosa, 26, 28, 103–107.
melanomolga, 25, 27, 106, 107.
melanomolge, 27.
nigromaculata, 26, 29, 107.
robertsi, 26, 28, 104.
smithi, 25, 28, 105.
unguidentis, 25, 27, 105.
Pternohyla, 67, 70.
fodiens, 70, 71, 102, 104, 106, 107.
Ptychohyla, 68, 91.
Ptychohyla adipoventris, 91, 103.
pulmonaris, Thorius, 16, 17, 105.
punctatum, Spelerpes, 24.
punctatus, Bufo, 39, 46, 102, 103, 105–107.
pustulosa, Paludicola, 47.
Rana, 97, 98, 103, 105, 107.
pustulosus, Engystomops, 47, 101, 102, 105, 107.
pygmaeus, Microbatrachylus, 53, 55, 102, 103, 105, 108.

Rana, 96, 97.
adtrila, 99.
aurora draytoni, 97, 99, 101.
bufo, 37.
catesbeiana, 98, 100, 105, 107.
draytoni, 99.
forreri, 98.
gryllus, 77.
marina, 37.
megapoda, 97, 100, 104.
montezumae, 97, 99, 101, 103, 104, 106.
montezumae concolor, 99.
omiltemana, 98.
palmipes, 96–98, 102, 105–108.
pipiens, 1, 97, 98, 101–108.
Rana pustulosa, 97, 98, 103, 105, 107.
sierramadrensis, 97, 98, 103.
tarahumarae, 97, 100, 102, 104, 107.
temporaria, 96.
trilobata, 98.
typhonia, 55.
typhonius, 55.
Rana venulosa, 74.
Ranidae, 91, 196.
Raninae, 96.
rectifrenis, Scaphiopus, 35.
regilla, Hyla, 77, 78, 82, 101.
Hyliola, 77.
reticulata, Diaglena, 69.
Rhinophryne dorsalis, 34, 105.
Rhinophrynidae, 34.
Rhinophrynus, 33, 34.
dorsalis, 34, 101, 102, 106, 108.
rostratus, 34.
rhodopis, Eleutherodactylus, 60, 66, 102, 105–108.
Lithodytes, 66.
Rhyacosiredon, 6, 8.
altamirani, 8, 9, 103, 104.
leorae, 8, 9, 104, 106.
rivularis, 8, 9, 104.
zempoalaensis, 6, 8, 9, 104.
richardsi, Hyla, 79, 85, 90, 108.
rivularis, Rhyacosiredon, 8, 9, 104.
robertmertensi, Hyla, 79, 84, 85, 102.
robertsi, Oedipus, 28.
Pseudoeurycea, 26, 28, 104.
robertsorum, Hyla, 80, 87, 104.
robustofemora, Hyla, 80, 86, 106.
rosaceum, Ambystoma, 6, 11, 13, 102.
rostratus, Rhinophrynus, 34.
rozellae, Hyla, 79, 86, 102.
rubrimaculata, Syrrhophus, 49, 50.
rubrimaculatus, Syrrhophus, 102.
rubrimembris, Bolitoglossa cephalica, 30.
Pseudoeurycea cephalica, 26, 30, 103.
rudis, Hyla, 71.
rufescens, Bolitoglossa, 22, 23, 102, 105–107.
Oedipus, 23.
rugulosa, Liyla, 65.
rugulosus, Eleutherodactylus, 60, 65, 102, 103, 105, 106.
rugosum, Engystoma, 92, 93.

sagorum, Plectrohyla, 73, 102.
Salamandra lugubris, 20.
platydactylus, 22, 23, 26.
tigrina, 11.
togata, 24.
variegata, 23.
Salamandridae, 14.
Salamandrina attenuata, 19.
Salamandroidea, 5, 14.
Salientia, 3, 33.
sallaei, Hylodes, 66.
saltator, Eleutherodactylus, 59, 63, 103.
salvinii, Oedipus, 24.
Spelerpes, 24.

Scaphiopus, 35.
bombifrons, 35.
couchii, 35, 101, 102, 105–108.
dugesii, 36.
hammondii, 35, 36, 101, 102, 105, 107.
hammondii multiplicatus, 36.
holbrookii, 35.
Scaphiopus multiplicatus, 35, 36, 101, 103–108.
rectifrenis, 35.
solitarius, 35.
varians, 35.
schmidti, Ambystoma, 10, 13, 104.
Scytopis, 74.
hebes, 74.
seebachii, Hypopachus, 94.
sierramadrensis, Rana, 97, 98, 103.
simus, Bufo, 38, 42, 102–108.
Siphonops mexicanus, 4.
Siredon, 6, 7.
axolotl, 7.
dumerilii, 7.
harlanii, 13.
humboldtii, 8.
lermaensis, 7, 8, 104.
lichenoides, 10.
lichenoides alba, 7.
mexicanum, 7, 103, 104.
tigrina, 11.
Siren, 6.
intermedia, 6.
intermedia nettingi, 6, 107.
lacertina, 6.
pisciformis, 7.
Sirenidae, 5.
Sirenodon, 10.
lichenoides, 10.
smaragdina, Hyla, 81, 90, 104.
Smilisca, 68, 75.
baudinii, 76.
baudinii baudinii, 75, 102–108.
daulinia, 75, 76.
smithi, Bolitoglossa, 28.
Hyla, 79, 85, 103–106.
Oedipus, 28.
Pseudoeurycea, 25, 28, 105.
smithii, Syrrhophus, 49, 51.
solitarius, Scaphiopus, 35.
spatulata, Diaglena, 69.
spatulatus, Eleutherodactylus, 58, 61, 108.
Triprion, 69.
Spea, 35.
hammondii, 36.
speciosus, Bufo, 40.
Spelerpes belli, 26.
cephalicus, 29.
chiropterus, 32.
gibbicaudus, 29.
(Oedipus) infuscatus, 21.
laticeps, 29, 30.
leprosus, 28.
lineolus, 21.
Spelerpes mexicanum, 24.
minimus, 17.
orculus, 32.
orizabensis, 29.
punctatum, 24.
salvinii, 24.
sulcatum, 22.
variegata, 24.
variegatus, 23.
yucatanicus, 25.
(Oedipus) yucatanus, 25.
spilomma, Acrodytes, 74, 75, 102, 105–108.
Hyla, 75.
staufferi, Hyla, 81, 88, 102–104, 106–108.
sternosignatus, Bufo, 45.
subsalsum, Ambystoma, 11, 106.
subviolacea, Ambystoma, 10.
sulcata, Magnadigita, 21, 22.
sulcatum, Spelerpes, 22.
sulcatus, Oedipus, 28.
sumichrasti, Exerodonta, 76.
Hylella, 76, 105.
Syrrhaphus, 49.
Syrrhophus, 46, 49.
campi, 50, 52, 106, 107.
cystignathoides, 50, 52, 106, 108.
guttilatus, 49, 51, 103, 106.
latodactylus, 46, 50, 51, 104, 106.
leprus, 50, 51, 105, 107.
marnockii, 49.
modestus, 49, 50, 102.
mystaceus, 65.
nebulosus, 49, 51, 102, 107.
pipilans, 49, 50, 103, 105.
rubrimaculata, 49, 50.
rubrimaculatus, 102.
smithi, 49, 51.
verrucipes, 50, 52, 104.
verruculatus, 50, 52, 104, 106, 108.
Syrrhopus, 49.

taeniopus, Hyla, 81, 89, 90, 108.
tarahumarae, Rana, 97, 100, 102, 104, 107.
tarahumaraensis, Eleutherodactylus, 59, 64, 102, 107.
Taricha, 14.
granulosus, 14.
klauberi, 15, 101.
torosa klauberi, 15.
temporaria, Rana, 96.
tenera, Hylella, 76.
terrestris, Bolitoglossa, 33.
Bufo, 41.
Chiropterotriton, 31, 33, 104.
Thoriidae, 16.
Thoriinae, 16.
Thorius, 16.
dubitus, 17, 106, 107.
narisovalis, 17, 18, 105.
pennatribus, 17.

Thorius pennatulus, 16–18, 107.
pulmonaris, 16, 17, 105.
troglodytes, 17, 18, 106, 107.
tigrina, Salamandra, 11.
Siredon, 11.
tigrinum, Ambystoma, 10, 11, 14.
togata, Salamandra, 24.
Tomodactylus, 46, 47.
albolabris, 48, 103.
amulae, 47, 48, 103, 105.
angustidigitorum, 47, 48, 103, 104.
macrotympanum, 47, 48, 104, 106.
nitidus, 48, 103, 105–107.
torosus, Triton, 14.
townsendi, Bolitoglossa, 20.
Oedipus, 20.
Parvimolge, 20.
trachypus, Bufo, 44.
trilobata, Rana, 98.
Triprion, 67, 70.
petasatus, 70, 108.
spatulatus, 69.
Triton torosus, 14.
Triturus kallerti, 15.
klauberi, 15.
torosus klauberi, 15.
meridionalis, 15.
troglodytes, Thorius, 17, 18, 106, 107.
typhonia, Leptodactylus, 55.
Rana, 55.
typhonius, Rana, 55.

underwoodi, Hyla, 79, 85, 102, 103, 108.
unguidentis, Bolitoglossa, 27.
Pseudoeurycea, 25, 27, 105.
uniformis, Oedipina, 21.
usta, Gastrophryne, 93.
Microhyla, 94.
Microhyla usta, 92, 93, 103, 104, 107, 108.
ustum, Engystoma, 93.

valliceps, Bufo, 39, 44, 101, 102, 104–108.
vanvlietii, Hyla, 76.
varians, Scaphiopus, 35.
variegata, Geotriton, 23.
Salamandra, 23.
Spelerpes, 24.
variegatus, Oedipus, 23.
Spelerpes, 23.
variolosum, Engystoma, 94.
velasci, Ambystoma, 11, 103, 104, 106.
Ambystoma tigrinum, 11, 12.
venulosa, Hyla, 74, 75.
Rana, 74.
venustus, Eleutherodactylus, 60, 66, 102, 108.
Hylodes, 66.
verrucipes, Syrrhophus, 50, 52, 104.
verruculatus, Phyllobates, 52.
Syrrhophus, 50, 52, 104, 106, 108.
viridescens, Diemictylus, 15.
viridis, Hyla, 77.
viridissima, Centrolenella, 68, 69, 103.
vocalis, Eleutherodactylus, 59, 64, 104.
vulgaris, Bufo, 37.

woodhousii, Bufo, 40.
Bufo woodhousii, 37, 40, 101–103, 107.
wrightorum, Hyla, 78, 84, 102.

xolocalcae, Bolitoglossa, 33.
Chiropterotriton, 31, 33, 102.

yucatana, Bolitoglossa, 23, 25, 108.
yucatanicus, Spelerpes, 25.
yucatanus, Spelerpes (Oedipus), 25.

zempoalaenisis, Rhyacosiredon, 6, 8, 9, 104.

○

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01421 2799