

AMERICAN MUSEUM NOVITATES

PUBLISHED BY THE AMERICAN MUSEUM OF NATURAL HISTORY
CITY OF NEW YORK MAY 9, 1949 NUMBER 1419

NOTES ON SOUTH AMERICAN FROGS OF THE FAMILY MICROHYLIDAE

BY EMMETT REID DUNN

This paper is a report on the South American frogs of the family Microhylidae in the American Museum of Natural History. For the privilege of examining this material I am indebted to the kindness of the curator, Mr. C. M. Bogert. As a report on the specimens necessarily involves certain additions to and modifications of Parker's 1934 monograph of this family, it seems sensible to include comments on the pertinent literature from 1934 on, and on some material in other museums. Thus the paper may be of greater service to students of South American herpetology, as Parker's monograph is not readily available to all of them.

The student of a local or a continental fauna should follow as closely as possible those workers whose scope has been wider. It is his duty and his privilege to alter the details of the picture, but he should not make major alterations on the basis of even the best local or continental information. Parker monographed the frog family Microhylidae in 1934. His arrangement of subfamilies and genera was on a world-wide basis, and therefore his criteria for subfamilies and for genera are, for me, the criteria to be accepted until a new monograph of the family appears.

Parker divided the family into seven subfamilies. Of these only one, the Microhylinae, occurs in the Western Hemisphere. He allocated the species of this subfamily to 16 genera. One of these (*Microhyla*) is present in both Asia and America. Nine are confined to southeastern Asia and the adjacent islands, and six to the Americas. A brief analysis of Parker's system follows:

1. A number of American species have the clavicle participating in the glenoid and reaching close to its opposite fellow ven-

trally (the normal tetrapod arrangement and theoretically primitive). These are not congeneric with Asiatic species with similar clavicles, as the American species have simple terminal phalanges and those of the Asiatic forms are T-shaped. Parker recognized three American genera in this group: *Otophryne*, *Hypopachus*, and *Ribeirina*.

2. Some American species have reduced clavicles, not participating in the glenoid. Asiatic forms with similar shoulder girdles differ in having T-shaped terminal phalanges. The American species are divided by Parker into two genera: *Chiasmocleis*, with better developed clavicles and procoracoids; *Ela-chistocleis*, with these skeletal elements less well developed.

3. Some American species have no trace of either clavicles or procoracoids. No character and no combination of characters separates them, as a group, from Asiatic species with similar shoulder girdles. In this group of American species Parker recognized two genera: *Microhyla*, with a well-developed tongue, both American and Asiatic; *Ctenophryne*, with a poorly developed tongue, monotypic American.

OTOPHRYNE BOULENGER, 1900

This genus is based on *Otophryne robusta* Boulenger and is monotypic. The generic distinction of the species from other American forms with fully developed clavicle (*Hypopachus* and *Ribeirina*) is based on: omosternum present; clavicles straight; well-developed tympanum; no metatarsal tubercles. The first three of these characters are markedly primitive, and the three in combination are met with elsewhere in the Microhylinae only in the genus *Kalophrynus* (southeast Asia, Borneo, and the Philippines). The species was based on a single male specimen from Mt. Roraima, British Guiana. The survival of a very primitive frog on a "lost world" plateau would be an interesting and satisfactory phenomenon, but the fact is that the specimen came from an altitude of 3500 feet, the general level of the lower country from which Roraima and the other high sandstone mesas rise—a terrain of considerable extent.

As the type specimen is the only one so far reported, the American Museum specimen (No. 1325) is worth recording. It has no data, except that it was from the Georgetown Museum. Its physical characters add little to the description of the type. It is

slightly bigger (55 mm.), and I consider the toes less than "1/3 webbed." It has been somewhat dissected, but I judge that it was a male.

HYPOPACHUS KEFERSTEIN, 1867

This genus is based on *H. seebachii* Keferstein, 1867, which is generally held to be a synonym of *Engystoma variolosum* Cope, 1866; both names are based on Costa Rican specimens. The clavicles are straight or only slightly curved; there is no bony ridge behind the choanae; omosternum and tympanum are lacking.

The genera *Stereocyclops* Cope, 1871 (type *S. incrassatus* Cope, 1871), and *Dermatonotus* M  hely, 1904 (type *Engystoma m  lleri* Boettger, 1885) are included by Parker in *Hypopachus*.

THE *variolosus* GROUP

Characterized by two metatarsal tubercles, both compressed.

- H. cuneus* Cope, 1889. Southern Texas and Tamaulipas
- H. oxyrhinus* Boulenger, 1883. Sinaloa, Jalisco, and Michoac  n
- H. ovis* Taylor, 1940. Nayarit
- H. caprimimus* Taylor, 1940. Guerrero
- H. alboventer* Taylor, 1940. Morelos
- H. maculatus* Taylor, 1940. Chiapas
- H. cuneus nigroreticulatus* Taylor, 1940. Campeche and Yucatan
- H. championi* Stuart, 1940. Baja Vera Paz, Guatemala
- H. variolosus* Cope, 1866. Costa Rica

It is quite possible that all of these forms are races of a single species.

THE *inguinalis* GROUP

Characterized by two metatarsal tubercles, neither compressed.

- H. barberi* Schmidt, 1939. Tecpan, Solol  , Guatemala
- H. inguinalis* Cope, 1869. Coban, Vera Paz, Guatemala
- H. simus* Stuart, 1941. Nebaj Valley, El Quich  , Guatemala
- H. globulosus* Schmidt, 1939. Lake Ticamaya, Honduras

Here again it is probable that these are races of a single species.

SOUTH AMERICAN FORMS

Parker recognizes one South American species, with only a single metatarsal tubercle. Wettstein has since described a second, with two metatarsal tubercles, the inner "projecting," the outer indistinct.

***Hypopachus incrassatus* (Cope)**

Stereocyclops incrassatus COPE, 1870, Proc. Amer. Phil. Soc., vol. 11, p. 165; São Matheos, south of Ríó de Janeiro, Brazil. Type M.C.Z. No. 1525.

Engystoma mülleri BOETTGER, 1885, Zeitschr. Naturwiss., Halle, vol. 58, p. 241; Paraguay.

American Museum material consists of an apparently adult male (No. 50664) and a very young individual (No. 50665), both from Colonia Nueva Italia, Villeta, Paraguay. The webbing between the toes is rudimentary, there is only a single uncompressed metatarsal tubercle, and the snout is rather blunt compared to that of *H. variolosus*. The adult has prominent spicules on the chin and on the upper surface of the hand. The pharyngeal ridges seem to me to be of approximately equal length, and the posterior one is distinctly denticulated rather than "Smooth . . . the anterior much shorter" as Parker (1934, p. 111) states for *Hypopachus* as a genus. The clavicles are nearly straight.

Dr. George Myers, after a study of these forms in Brazil, writes me that he considers that the two names cited above represent two valid species. The original descriptions would seem to bear out Myers' contention. The type of Cope's species from Ríó de Janeiro was said to be flat with head and body as in *Pipa pipa*, while the Paraguayan specimens, presumably *mülleri*, are certainly robust.

If, as Myers suggests, Parker was wrong in merging Boettger's species with Cope's, it may well be that he saw no actual specimen of Cope's species, and that most of the description and all the localities under his "*Hypopachus incrassatus*" appertain to Boettger's form. Parker's Brazilian specimens came from Ríó das Velhas, in the San Francisco drainage of Minas Gerais, and from Natal in Ríó Grande do Norte. Both of these are in the dry belt which extends into Paraguay and Bolivia and which is very dissimilar climatically, botanically, and faunistically from the southern coastal forest belt whence came the type of Cope's species. If this be true, the allocation of *Stereocyclops* to *Hypopachus* may need reëxamination.

***Hypopachus parkeri* Wettstein**

Hypopachus parkeri WETTSTEIN, 1934, Zool. Anz., vol. 105, p. 270; Kol. Santa Cruz, Dist. Fed., Ríó de Janeiro, Brazil.

RIBEIRINA PARKER, 1934

This genus is based on *Emydops hypomelas* Miranda Ribeiro, 1920. It is said to differ from *Hypopachus* in the very great curvature of the clavicles, in the presence of a body ridge behind the choanae, and in having only a single dermal pharyngeal ridge.

Ribeirina hypomelas (Miranda Ribeiro)

Emydops hypomelas MIRANDA RIBEIRO, 1920, Rev. Mus. Paulista, vol. 12, p. 287, pl. 2, figs. 4-6; Puerto Cachoeira, Espirito Santo, Brazil.

This species is said to lack toe webbing and to have an inner uncompressed metatarsal tubercle.

CHIASMOCLEIS MÉHELY, 1904

This genus is based on *Engystoma albopunctatum* Boettger. Parker (1934) recognized five species. The present review necessitates the recognition of 10 species and extends the range of the group northward into North America. Parker himself has added a species, my own investigations add three, and it is so very likely that Andersson has described another (as an *Engystoma*) that I include it in the following key. The characters given in the key are the diagnostic characters of the new forms and are not necessarily repeated in the individual descriptions.

KEY TO SPECIES OF *Chiasmocleis*

- A. Epicoracoids long; maxilla and jugal separated; fingers with more or less distinct fleshy webbing or fringes.
 - B. Toes two-thirds webbed; Santa Catarina, Brazil.....*spinulosa*
 - BB. Toes at most one-third webbed.
 - C. Canthus rostralis well marked, angular; São Paulo, Brazil
.....*bicegoi*
 - CC. Canthus rostralis rounded, not well marked.
 - D. Toes with a distinct web; (*leucosticta* group).
 - E. Uniform dark brown above; yellowish beneath, more or less heavily blotched with brown; eye a little longer than its distance from the nostril; Santa Catarina, Brazil....*leucosticta*
 - EE. Dark gray above, with fine light flecking; a narrow light midvertebral line; an irregular black inguinal spot; throat gray with narrow white median line; belly and under legs with black spotting and marbling; eye a little shorter than its distance from the nostril; southern British Guiana.....*shudikarensis*

- EEE. Above uniform chocolate brown; all lower surfaces (except the feet) pale yellowish white with large, irregular, chocolate brown spots; Rio Pastaza, Ecuador.....*ventrimaculata*
- DD. Toes free; (*albopunctata* group).
- E. Nostril much nearer tip of snout than eye (1 to 1.75); first finger and first toe normal; fingers and toes not dilated at tips; dark above, with small light spots or flecks which may form a streak on side of head; dark below, regularly spotted with light; Paraguay; Matto Grosso, Brazil.....*albopunctata*
- EE. Nostril only slightly nearer tip of snout than eye (1 to 1.2); first finger and first toe rudimentary; toes II to V with disk and groove between upper and lower surface; purple brown above, with some fine lighter stippings which may form a light lateral zone anteriorly; lower surfaces white, with brown stippling on the gular region and a brown reticulum on the limbs; southern British Guiana.....*hudsoni*
- AA. Epicoracoids long; maxilla and jugal separated; fingers without webbing or fringes; toes free.
- B. First finger and first toe normal; a middorsal color pattern; Panama.....*panamensis*
- BB. First finger and first toe rudimentary; no dorsal color pattern; eastern Peru.....*bassleri*
- AAA. Epicoracoids short; maxilla and jugal in sutural contact; fingers without webbing or fringes; a middorsal color pattern; toes free; Bolivia to British Guiana.....*boliviana*

The foregoing key is adapted from that of Parker (1934) and does not deviate from his arrangement except when necessary. Comments on the correctness of this arrangement are not appropriate from me, as I have seen specimens of only four species (*shudikarensis*, *panamensis*, *bassleri*, and *boliviana*).

LIST OF SPECIES OF *Chiasmocleis*

***Chiasmocleis spinulosa* (Miranda Ribeiro)**

Nectodactylus spinulosus MIRANDA RIBEIRO, 1924, Bol. Mus. Nac. Río de Janeiro, vol. 4, p. 256; near Humboldt, Santa Catarina, Brazil.

***Chiasmocleis bicegoi* Miranda Ribeiro**

Chiasmocleis bicegoi MIRANDA RIBEIRO, 1920, Rev. Mus. Paulista, vol. 12, p. 286; Os Perús, São Paulo, Brazil.

***Chiasmocleis leucosticta* (Boulenger)**

Engystoma leucostictum BOULENGER, 1888, Ann. Mag. Nat. Hist., ser. 6, vol. 1, p. 416; Sierra do Catarina, Santa Catarina, Brazil.

***Chiasmocleis shudikarensis*, new species**

TYPE: A.M.N.H. No. 43674, collected by Snedigar and Hassler, June 22, 1938.

TYPE LOCALITY: Shudikar-wau, upper Essequibo River, British Guiana (not far from Brazilian border).

RANGE: Known only from the type locality.

DIAGNOSIS: See key.



FIG. 1. Dorsal view of *Chiasmocleis shudikarensis*, type, A.M.N.H. No. 43674, from Shudikar-wau, British Guiana. Twice natural size.

DESCRIPTION: Snout prominent, one and one-fourth times diameter of eye; nostril much nearer tip of snout than to eye (1 to 4); canthus rounded, loreal region sloping; interorbital space much wider than upper eyelid; fingers fringed, tips without grooved or developed disks, second equals fourth in length, finger 1 well developed; two carpal tubercles; subarticular

tubercles moderately developed; toes fringed, webbed at base, a fringe on outside of toe V; disks (without grooves) on all but toe I, toe I well developed; subarticular tubercles moderately developed; a small oval inner metatarsal tubercle; above gray with fine light flecking and a narrow, light, middorsal line; throat gray with a narrow light median line; belly and under surface of limbs cream with black spotting or mottling, increasing in amount posteriorly; a black inguinal spot, rather vague and irregular; length from snout to butt 25 mm.

REMARKS: This species is, in all external characters, very close to that described by Andersson as *Engystoma ventrimaculata* from Ecuador, differing only slightly in coloration. Andersson does not state the length of the eye in relation to its distance from the nostril. Likewise, *shudikarensis* differs only slightly in coloration and in relative length of eye from *leucosticta* of Santa Catarina, Brazil. It differs drastically from *hudsoni* and from *boliviana*, the other two British Guianan species of the genus.

Chiasmocleis ventrimaculata (Andersson)

Engystoma ventrimaculata ANDERSSON, 1945, Arkiv. Zool., Stockholm, vol. 37A, p. 2, fig. 1; Rio Pastaza, Ecuador.

This species is referred to *Chiasmocleis* with the appropriate amount of doubt. The description indicates an animal very similar to *shudikarensis* and to *leucosticta*, and very different from any American *Microhyla* ("*Engystoma*").

Chiasmocleis albopunctata (Boettger)

Engystoma albopunctatum BOETTGER, 1885, Zeitschr. Naturwiss., Halle, vol. 58, p. 240; Paraguay. Also occurs in Matto Grosso, Brazil.

Chiasmocleis hudsoni Parker

Chiasmocleis hudsoni PARKER, 1940, Ann. Mag. Nat. Hist., ser. 11, vol. 5, p. 260; New River, southern British Guiana, 750 feet altitude.

Chiasmocleis panamensis Dunn, Trapido, and Evans

Chiasmocleis panamensis DUNN, TRAPIDO, AND EVANS, 1948, Amer. Mus. Novitates, no. 1376, p. 1, Old Panama, Republic of Panama.

***Chiasmocleis bassleri*, new species**

TYPE: A.M.N.H. No. 42699, collected by Dr. Harvey Bassler.

TYPE LOCALITY: Rio Utoquinia to Rio Tapiche, Peru (near the Brazilian border).

RANGE: Known only from the type locality.

DIAGNOSIS: See key.

DESCRIPTION: Snout moderate, one and one-half times as long as the diameter of the eye; nostril much nearer tip of snout than to eye (1 to 4); canthus rostralis rounded; fingers without web or fringes, slight disk at tip of all but the first, second subequal to the fourth, first very short ($1/4$ length of fourth); heel to eye; toes without web or fringes, slight disk at tip of all but first; first toe excessively short; a small inner metatarsal tubercle and a trace of a tarsal fold extending from it; a groove

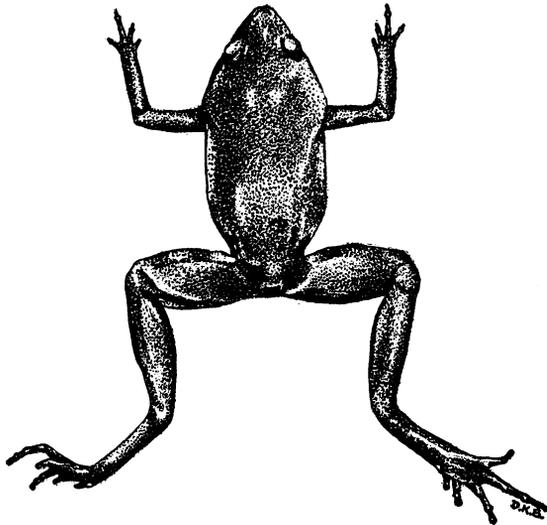


FIG. 2. Dorsal view of *Chiasmocleis bassleri*, type, A.M.N.H. No. 42699, from Rio Utoquinia to Rio Tapiche, Peru. Twice natural size.

from eye to arm; a trace of a groove from eye to eye; brown above, a large irregular inguinal black spot which extends to the dorsum and forward to the appressed elbow; belly white with five large circular black spots; black stripe on hind side of thigh, tibia, and hind side of metatarsus; black spots on front of thigh,

under side of tibia, upper surface of foot, inner side of upper arm, and on under side of forearm; length 19.5 mm.

REMARKS: This species occurs with *C. boliviana* (q.v.) but is amply distinct from it. It may be an ally of *C. albopunctata* (the genotype) from Matto Grosso and Paraguay, of *C. hudsoni* (recently described from British Guiana), and of *C. panamensis* from Panama. The four mentioned species have no webs on the toes.



FIG. 3. Dorsal view of *Chiasmocleis boliviana*, A.M.N.H. No. 43417, from Suhuaya, Peru. Twice natural size.

Chiasmocleis boliviana Parker

Chiasmocleis boliviana PARKER, 1927, Occas. Papers Mus. Zool. Michigan, no. 187, p. 3, fig. 5; Buenavista, Sara, Bolivia.

Chiasmocleis sp. PARKER, 1934, *op. cit.*, p. 120; upper Cuyuni River, north-western British Guiana.

Elachistocleis ovalis MYERS (*nec* Schneider, 1799), 1942, Proc. Biol. Soc. Washington, vol. 55, p. 155; Pevas, Loreta, Peru.

Six specimens in the collection made by Dr. Harvey Bassler in Peru are fully adult and agree minutely with both the external and internal characters given by Parker for this species. They thus serve to bridge the gap between British Guiana and Bolivia, as they come from almost halfway between the two. They are

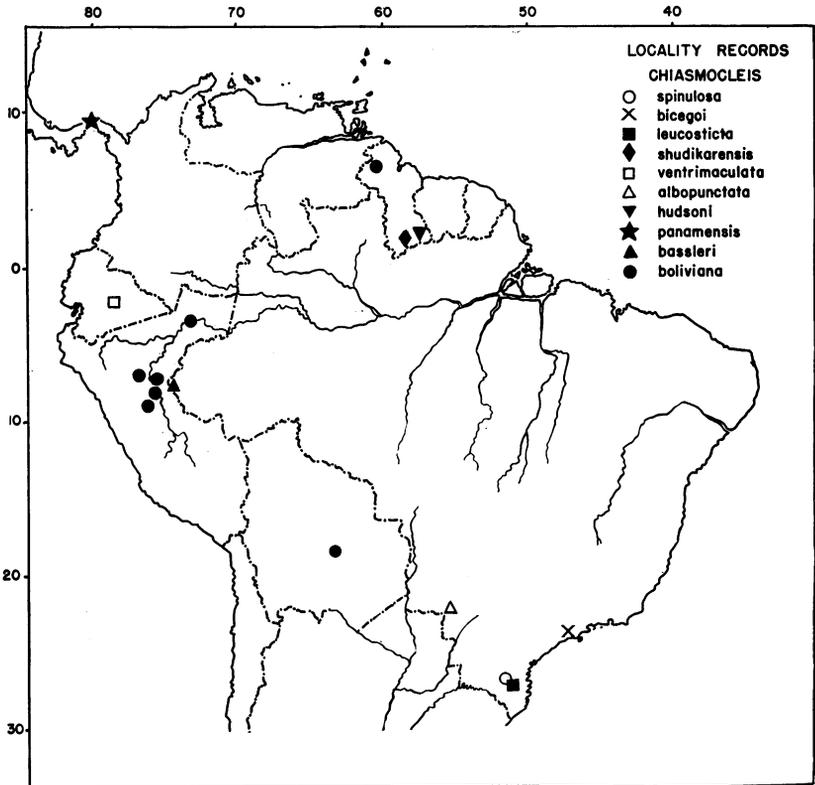


FIG. 4. Map of northern South America showing the localities where *Chiasmocleis* has been taken.

all from the basin of the Ucayali. The localities are arranged from north to south, and the numbers are those of the American Museum catalogue:

Pampa Hermosa, 42352, 42357
Suhuaya, 43417
Cashiboya, 43384
Roaboya, 42614
Headwaters of Rio Utoquinia, 43312

As the headwaters of the Utoquinia reach the Peru-Brazil border, it is highly likely that this species occurs in Brazilian territory.

The locality Pevas, Loreta, Peru, would further bridge the gap in the range of this species. The markings described by Myers for his "*Elachistocleis ovalis*" are exactly like those of *C. boliviana*, and utterly unlike those of any *Elachistocleis*. Pevas is close to the mouth of the Ucayali, and *boliviana* should occur there.

ELACHISTOCLEIS PARKER, 1927

This genus is based on *Rana ovalis* Schneider. When Parker originally described it he recognized it as monotypic with two races, but added that as both occurred together in Bolivia they might be distinct species. In his monograph, however, he did not subdivide the species.

My own tentative conclusions are nearer to Parker's original ideas, and I suggest that there is (1) a small southern species with an immaculate belly (white in preservative), with a narrow light stripe on the thigh and without inguinal light spots, for which the name *bicolor* is available; (2) a small species with a dark belly with light dots, with a broad stripe on the thigh and with inguinal spots, which ranges from Bolivia to São Paulo and north to the Guianas and northeast Colombia, and for which the name *ovalis* is available; (3) a large species with a coarsely marbled belly, a marbled thigh, inguinal and axillary spots, which is confined to Colombia and Panama, and for which the name *pearsei* is available. It is a pity that Parker's monograph gives no information about the color patterns of the individual specimens that were available to him.

The form *bicolor* and the form *ovalis* appear to me quite distinct and apparently overlap. I have seen both *ovalis* and *pearsei* in

the field, and I would take them for vicarious races save for the statement of Ruthven that the two occur together at Fundación, Colombia.

LIST OF SPECIES OF *Elachistocleis*

***Elachistocleis bicolor* (Valenciennes)**

Oxyrhynchus bicolor VALENCIENNES, 1838, in Guérin-Méneville, Inconographie du regne animal de G. Cuvier, vol. 1, reptiles, pl. 27, fig. 2; 1844, *op. cit.*, vol. 3, reptiles, p. 17; South America. [It is permissible to infer, from remarks elsewhere in the literature, that the original specimens of this form came from Buenos Aires, Argentina.]

The nine American Museum specimens are from Paraguay. No other data accompany A.M.N.H. Nos. 19888–19891; Nos. 50658–50662 are from Colonia Nueva Italia, Villeta. According to Parker (1927), it occurs in Bolivia. The Philadelphia Academy has three specimens (Nos. 14157–14159) from São João, Rio Grande do Sul, Brazil, and in the literature cited by Parker (1934) I find unequivocal references to this form as occurring at Porto Alegre and at Itaquí, also in Rio Grande do Sul. These localities are all at the southern end of the generic range.

***Elachistocleis ovalis* (Schneider)**

Rana ovalis SCHNEIDER, 1799, *Historiae amphiborum*, p. 131; no type locality given.

The 12 American Museum specimens, all from the Guianas, are as follows:

Dutch Guiana

Paramaribo, Nos. 5099–5100

British Guiana (near Brazilian border; Terry-Holden Expedition)

Essequibo River, No. 43679 (2)

Manari Creek, Nos. 49345–49346

Upper Rupununi River, Nos. 44545 (4), 46482 (2)

I have taken it breeding at Villavicencio, at the edge of the Colombian llanos, and Ruthven records it from Fundación, at the northern base of the Santa Martas. To the south, according to Parker, it occurs in Bolivia in company with *bicolor*. Both the Philadelphia Academy and the United States National Museum have it from Matto Grosso, Brazil (A.N.S.P. Nos. 14156, 14161, Chapada; U.S.N.M. No. 52826, Miranda). In the literature cited by Parker there are unmistakable references to this

form (i.e., not *bicolor*) in southern Brazil from several localities in São Paulo. There were no specimens of *Elachistocleis* in the enormous Bassler collection of frogs from eastern Peru, and although Myers (1942) has recorded it from Pevas, his own remarks indicate he had a specimen of *Chiasmocleis boliviana*.

***Elachistocleis pearsei* (Ruthven)**

Hypopachus pearsei RUTHVEN, 1914, Proc. Biol. Soc. Washington, vol. 27, p. 77; Fundación, Colombia.

The American Museum has a single 40-mm. adult female (No. 13539) from Medellín, Antioquia. The altitude of Medellín (1538 meters) may mean that this locality is erroneous. Certainly the Bogotá (2640 meters) record given by Parker is incorrect. More likely records refer to Cafetal Buenavista (near Viota, Cundinamarca), 1040 meters, and Purnio, Caldas, 200 meters. I took specimens at Mariquita, Tolima, at 535 meters. The known Panamanian range is given by Parker's record for Aguadulce in Coclé, to which I can add Sitio Conte, in the same province, from a Philadelphia Academy specimen (No. 23211) and Agua Caliente (perhaps the place of that name in Los Santos Province) from a specimen in Vienna.

MICROHYLA TSCHUDI, 1838

This genus is based on the Javanese species *Microhyla achatina* Tschudi, 1838. According to Parker, some of the 15 Asiatic species are more primitive than any of the American forms. The primitive characters (presence of a palatine bone, extensive webbing of the toes, and digital disks) are diversely scattered among the American species.

The genera *Gastrophryne* Fitzinger, 1843 (type *Engystoma carolinense* Holbrook, 1836), *Glossostoma* Günther, 1900 (type *G. aterrimum* Günther, 1900), and *Dasypops* Miranda Ribeiro, 1924 (type *D. schirchi* Miranda Ribeiro, 1924) were based on American species and are included by Parker in *Microhyla*. Students of the North American fauna have altered Parker's arrangement by dropping out *M. areolata* (Strecker) and adding *M. mazatlanensis* Taylor.

THE *carolinensis* GROUP

Toe web absent or rudimentary; no palatine bone; an inner, uncompressed, metatarsal tubercle, but no outer one. The forms are listed from north to south:

M. carolinensis carolinensis (Holbrook), 1836. Maryland and Indiana to Florida and Texas

M. carolinensis olivacea (Hallowell), 1857. Kansas to Texas; Chihuahua, Coahuila, and Durango

M. carolinensis mazatlanensis Taylor 1943. Arizona and Sonora

M. elegans (Boulenger), 1882. Vera Cruz to Guatemala



FIG. 5. Dorsal view of *Microhyla aequatorialis*, A.M.N.H. No. 17555, from Sincay, Ecuador. Twice natural size.

M. pictiventris (Cope), 1886. Nicaragua and Costa Rica
M. aequatorialis (Peracca), 1904. Ecuadorian Andes

Parker was not able to examine any specimens of the last two forms of this list, nor have I seen any *M. elegans*, but I have examined the three known specimens of *M. pictiventris* and a series of 28 *M. aequatorialis*. The first three forms in the list have no webs; the last three have slight webbing on the toes. There is some gap in the distribution in northeast Mexico, and a great gap between the Atlantic lowlands of Costa Rica and the high inter-Andean valleys of Ecuador, but the frogs of this group differ so little that they all could be races of a single species. The South American form is:

***Microhyla aequatorialis* (Peracca)**

Engistoma aequatoriale PERACCA, 1904, Bol. Mus. Torino, vol. 19, p. 23; Cuenca, Ecuador; type presumably in Turin.

Cuenca is in the province of Azuay, at an altitude of 8467 feet. The 28 American Museum specimens were collected by G. H. H. Tate in 1922, at Sinincay, a short distance northwest of Cuenca, altitude 8300 feet. They bear the numbers 17553–17561, 17563–17566, 17568–17575, 17612–17618. This seems to be the second known locality for the species.

THE *usta* GROUP

No toe webbing; no palatine bone; two compressed metatarsal tubercles.

M. usta usta (Cope), 1866. Jalisco, Puebla, and ? Vera Cruz
M. usta gadovii (Boulenger), 1903. Oaxaca

THE *aterrima* GROUP

Toes about half webbed; a palatine bone; an inner uncompressed metatarsal tubercle, but no outer one.

***Microhyla aterrima* (Günther)**

Glossostoma aterrimum GÜNTHER, 1902, Biologia Centrali Americana, Reptilia and Batrachia, p. 210, pl. 64, fig. A; Costa Rica; type in the British Museum.

This species is known from the locality Carillo in the Atlantic lowlands of Costa Rica. In South America it has been taken, as Parker reports, in the low wet forests of the west coast at Peña Lisa, Colombia, and Rio Durango, northwest Ecuador. I can

add Muzo, at 840 meters elevation, in the middle Magdalena forest of the Department of Boyacá, Colombia. I have examined all the known specimens.

Should anyone consider the genus *Ctenophryne* not distinct from *Microhyla*, *C. geayi* (*q.v.*) might be considered as belonging in this group and replacing *M. aterrima* east of the Andes.

THE *microps* GROUP

The remaining three South American species agree in having very long snouts; toe web absent or rudimentary; no palatine bone; a small inner, but no outer, metatarsal tubercle. *M. schirchi* has rudimentary toe webs, and the skin of the head is rugose and adherent to the skull. *M. subnigra* is said to differ from *M. c. carolinensis* chiefly in the excessively long snout. *M. microps* has quite definite disks on the four outer toes, a structural character that is present in some Asiatic species but not in any other American form. Parker examined no specimens of *M. schirchi*, and I have been able to examine only *M. microps*.

Microhyla schirchi (Miranda Ribeiro)

Dasytops schirchi MIRANDA RIBEIRO, Bol. Mus. Nac. Rio de Janeiro, vol. 1, p. 225; Rio Mutum, Espirito Santo, Brazil.

Microhyla subnigra (Miranda Ribeiro)

Engystoma subnigrum MIRANDA RIBEIRO, 1920, Rev. Mus. Paulista, vol. 12, p. 285; Serra de Macahé, Rio de Janeiro, Brazil.

Microhyla microps (Duméril and Bibron)

Engystoma microps DUMÉRIL AND BIBRON, 1841, Erpétologie générale, vol. 8, p. 744; Brazil.

Melin (1941, p. 67, fig. 38) has recorded this species from Taracua, Rio Uapés, Brazil. The American Museum material affords some definite localities in British Guiana. Beebe collected two specimens at Kartabo (Nos. 13526, 23118), and the Terry-Holden Expedition took seven in the extreme upper Essequibo drainage (No. 46386, three specimens from Onora; No. 46265 from Shudikar-wau; No. 53204, three specimens from "headwaters").

CTENOPHRYNE MOCQUARD, 1904

This genus is based on *Ctenophryne geayi* Mocquard. Parker recognized it but was apparently unable to examine the unique specimen of the type species. Ahl has since described a second species of *Ctenophryne*.

***Ctenophryne geayi* Mocquard**

Ctenophryne geayi MOCQUARD, 1904, Bull. Mus. Hist. Nat., Paris, p. 308; Sarare River, Colombia.

The Sarare rises on the southeast slope of the paramo of Tamá in Norte de Santander. It flows for about 8 miles in Colombian territory, crosses into Venezuela at an altitude (at the border) of 640 meters, and thence flows east to join the Apure. Most maps show the Sarare as entirely a Venezuelan stream, and this is the only mention of the river in Colombian herpetology, whether pub-

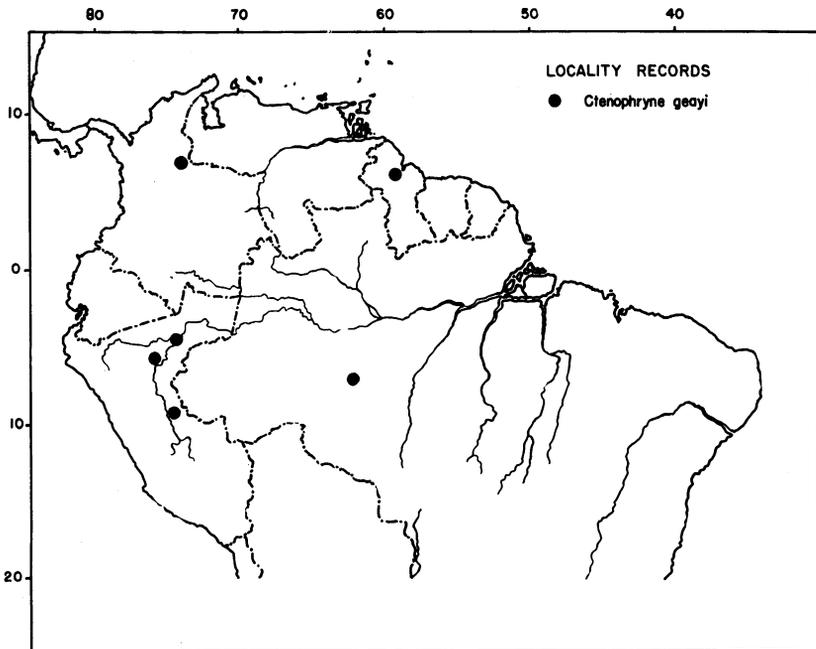


FIG. 6. Map of northern South America showing the localities where *Ctenophryne geayi* has been taken.

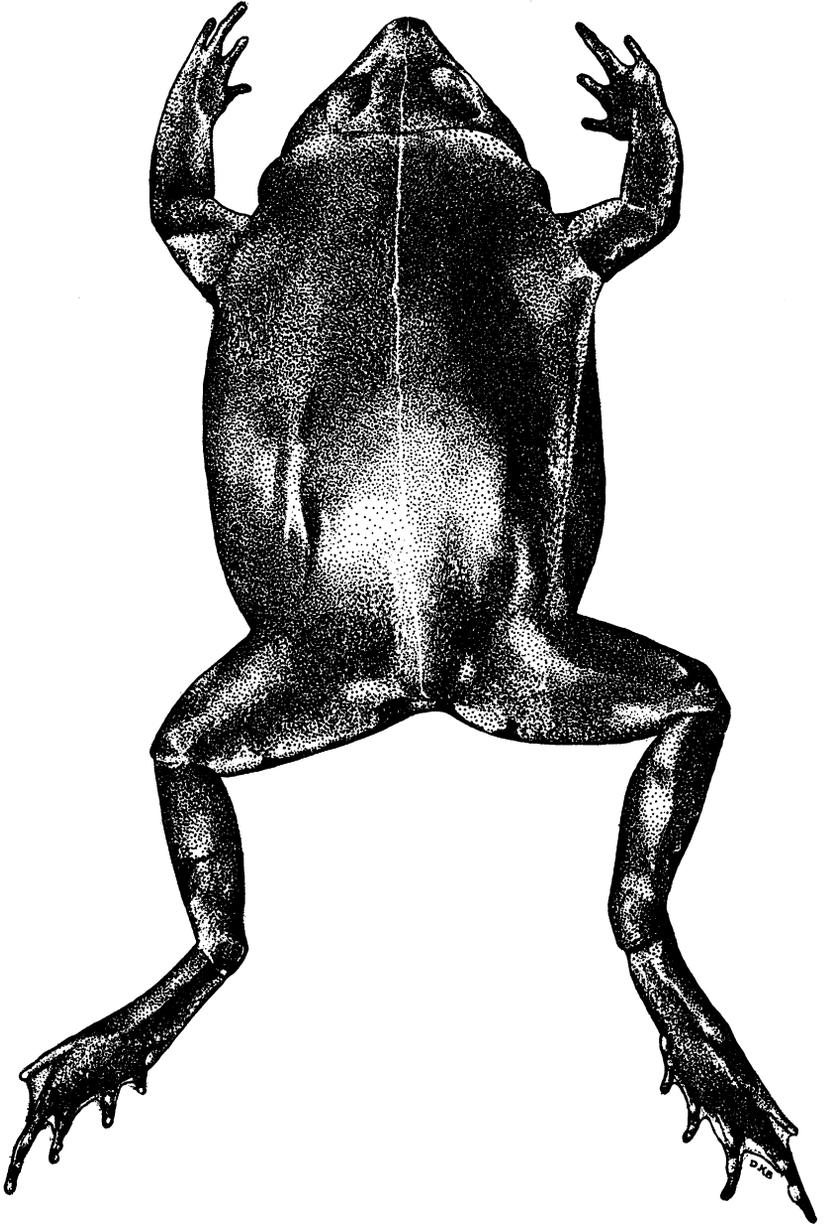


FIG. 7. Dorsal view of *Ctenophryne geayi*, A.M.N.H. No. 42663, from Pampa Hermosa (Cushabatay), Peru. Twice natural size.

lished or as labels on specimens. It is certain that a boundary commission visited the spot where the river crosses the border and there established an altitude. It is permissible to suppose that it was an international commission and might have included a French member. I can think of no other plausible solution of the problem presented by the appearance in Paris of a frog from a Colombian locality that is virtually unknown to Colombians.

Thus it is quite likely that *C. geayi* is an authentic Colombian species. It also inhabits British Guiana, Brazil, and Peru, as the American Museum has five specimens from these countries:

British Guiana

Kartabo, No. 23119, Beebe, 1920. A second Kartabo specimen in the Beebe collection has been examined

Brazil

Rio Livranents, Amazonas, latitude 7° 17' S., longitude 62° 22' W. [about 80 miles northeast of Porto Velho], No. 44787, B. Krakoff, 1935

Peru (Bassler collection)

Iquitos, No. 42887

Pampa Hermosa, Rio Cushabatay (Ucayali Valley), No. 42663

Peru-Brazil frontier (Ucayali Valley), No. 42685

The species is thus much more widespread than has been thought. It is also very surprising that it was first described by Mocquard, as the Philadelphia Academy has a specimen (No. 14735) which was formerly in the hands of E. D. Cope, and was partially dissected by him. A paper label attached has the data "Upper Purus R., Steer, type of *Lithodytes cinereus* Cope," but as the specimen does not in any way agree with the type description of the *Lithodytes* or, indeed, with any of the frogs mentioned by Cope as having been in the Steere collection, the label must have been erroneously attached to it. I have, naturally, searched the writings of Cope, especially the reports on the collections made by Steere, Orton, Hauxwell, and Heath, all of whom were in the range of *Ctenophryne*, but have failed to find any reference to any frog that could conceivably have been this specimen. It would seem that for once in his life, at least, Cope had a striking novelty in his hands and did not describe it.

I cannot make out the pupil shape in any of the seven available specimens, so that the character of "vertical pupil" wherein *Ctenophryne* is said to differ from *Microhyla* can be neither confirmed nor denied. The other external characters of the specimens fit the original description very well, including the three-fourths webbed toes. This extensive webbing exceeds that of

any other American microhylid and is only approached by *Microhyla aterrima*, which has the toes half webbed.

The tongue seems to me a narrow oval, adherent behind but not on the sides, and with a median furrow. It does not impress me as affording a necessary separation of *C. geayi* from *Microhyla*, to which it seems closely allied. Among the known American *Microhyla* its closest relative seems to be *aterrima*, from which it is separated by the eastern Andes.

To the original description I can add that the vertebral column is diplasiocoelous, as in *Microhyla*, and that the prevomer is in a condition that Parker called "divided, the post-choanal portion lost," as in *Microhyla*. I find no palatine, a bone that is absent in American *Microhyla* with the exception of *aterrima*.

Ctenophryne marmorata Ahl

Ctenophryne marmorata AHL, 1935, Zool. Anz., vol. 112, p. 254; no locality.

This is a very dubious form. No data accompanied the two specimens, and no osteological facts are given. The frog may have come from anywhere in the range of the family. The toes are only one-third webbed, and the heel reaches only to the axilla, instead of to the eye as in *C. geayi*. It might well be a form of *Glyphoglossus* or of *Uperodon* of southeast Asia.

LITERATURE CITED

MELIN, DOUGLAS

1941. Contributions to the knowledge of the Amphibia of South America. Göteborgs K. Vetensk. Vitterh. Samh. Handl., ser. 6, ser. B, vol. 1, no. 4, pp. 1-71.

PARKER, H. W.

1934. A monograph of the frogs of the family Microhylidae. London.

