

**A collection of eleutherodactyline frogs
from Northeastern Amazonian Perú
with the descriptions of two new species
(Amphibia, Salientia, Leptodactylidae)**

by John D. LYNCH and Jean LESCURE *

Abstract. — Twelve species of eleutherodactyline frogs are reported from Colonia, Depto. Loreto, Perú, including *Eleutherodactylus aaptus* sp. nov. and *E. lythrodes* sp. nov. Additional records are provided for the other ten species. Both of the new species are members of the *unistrigatus* group.

Résumé. — Douze espèces d'Eleutherodactylini sont signalées de Colonia (Département de Loreto, Pérou) dont *Eleutherodactylus aaptus* sp. nov. et *E. lythrodes* sp. nov.

Les deux nouvelles espèces appartiennent au groupe *unistrigatus*. Des localités nouvelles supplémentaires sont données pour les dix autres espèces d'*Eleutherodactylus*.

INTRODUCTION

The eleutherodactyline frog fauna of the Amazon Basin is markedly depauperate in comparison with the Amazonian hylid frog fauna or with the rich eleutherodactyline faunas more closely associated with the Andes. LYNCH (1979) reported only 28 species of *Eleutherodactylus* for the entire Amazon Basin with the most diverse local faunas being from those areas at the immediate base of the Andes in Ecuador (estimates of 20 to 21 sympatric species). Most collections of eleutherodactyline frogs from the Amazon Basin proper have been made by persons interested in collections of things other than frogs ; between January and May 1978, a party from the Muséum national d'Histoire naturelle collected at Colonia and Yuvinetto, Departamento Loreto, Perú. These collections in conjunction with those by Borys MALKIN (at the American Museum of Natural History, New York) and by Robert BLEIWEISS (Museum of Comparative Zoology, Cambridge) document the rapid decline in species richness as one proceeds east from Andean Ecuador into Amazonia but also reveal some endemism along the western edge of the Basin.

The junior author and his colleagues collected eleven species of *Eleutherodactylus* as well as *Ischnocnema quixensis* at Colonia, a village at the mouth of the Río Zumun which

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is a tributary of the Río Yahuasyacu. The Río Yahuasyacu is a tributary of the Río Ampiyacu. The site lies at approximately 3° S, 72° 30' W. Collections were also made at Yuvineto (approximately 1° 02' S, 74° 13' W), along the Río Putumayo. Both localities are in northern Depto. Loreto, Perú. We also report some material collected in Depto. Amazonas, Colombia. That material was collected from localities along the Río Amaca-Yacu by Robert BLEIWEISS (Harvard University).

MATERIALS AND METHODS

Specimens reported here include material from the American Museum of Natural History (AMNH), Museum of Comparative Zoology (MCZ), and Muséum national d'Histoire naturelle (MNHN). For methods of measurement, see LYNCH and DUELLMAN (1979). The following abbreviations are employed: SVL, snout-vent length; HW, head width; IOD, interorbital distance; E-N, eye to nostril distance.

ACCOUNTS OF SPECIES

***Eleutherodactylus aaptus* sp. nov.**

HOLOTYPE : MNHN 1978. 2816, an adult male, taken at Colonia, Departamento Loreto, Perú, June 1978 by LESCURE.

PARATYPES : MCZ 93635, 96771, 96773-74, Puerto Nariño; MCZ 96772, Río Amaca-yacu; MCZ 95796, Ríos Amaca-Yacu and Caiwima, 40 km NNE Puerto Nariño; MCZ (uncatalogued, field number 90068), headwaters of Río Caiwima, ca. 70 km NNE Puerto Nariño; all Depto. Amazonas, Colombia, collected between July 1977 and January 1978 by Robert BLEIWEISS. MNHN 1978.2815, Colonia, June 1978 by J. LESCURE.

DIAGNOSIS : (1) skin of dorsum finely shagreened, that of venter areolate; no dorso-lateral folds; (2) tympanum prominent, round, its length $1/3$ - $1/2$ eye length; (3) snout long, subacuminate in dorsal view, rounded in profile; canthus distinct in males, lips flared in females; (4) upper eyelid lacking tubercles, narrower than IOD; no cranial crests; (5) vomerine odontophores prominent, oblique; (6) males with vocal sac and slits, non-spinous nuptial pad; (7) first finger shorter than second; pads on fingers II-IV large; (8) fingers bear lateral fringes; (9) ulnar tubercles in males; (10) small tubercles on heel; tubercle on inner edge of tarsus in males; (11) two metatarsal tubercles, inner elongate, much larger than round outer; supernumerary plantar tubercles in rows; (12) toes bear lateral fringes, no webbing, toe pads smaller than those of fingers, (13) gray-brown above with no pattern, venter cream with sparse reticulation or spotting; posterior surfaces of thighs dark brown or black; (14) adults moderate-sized, one male 22.9 mm, four females 29.9-34.8 mm SVL.

Eleutherodactylus aaptus differs from most species of the *unistrigatus* group in that the head is longer than wide and the snout is markedly longer than the eye. Other species with long snouts (*E. prolatus*, *E. trachyblepharis*, and *E. variabilis*) are markedly smaller frogs (females less than 25.0 mm SVL). The most distinctive feature of *E. aaptus* is the flaring of the lips in females (fig. 1). This attribute is characteristic of many frogs of the *rubicundus* assembly but seen in both sexes (LYNCH and MIYATA, 1980) and is there associated with narrow IOD and often low cranial crests.

DESCRIPTION

Head narrower than body, about as long as wide; HW 35.4-40.5 ($\bar{x}$ = 37.8, N = 8) per cent SVL; snout subacuminate in dorsal view, round in lateral profile; snout long, E-N 103.2-131.6 ($\bar{x}$ = 118.0, N = 8) per cent eye length; nostrils slightly protuberant, directed dorsolaterally; canthus rostralis moderately distinct, straight or sinuous; loreal region concave, sloping to lips and lips flared in females; in males lips not flared; interorbital space flat (no cranial crests); upper eyelid lacking tubercles, its width 73.7-108.7 ($\bar{x}$ = 86.3, N = 7) per cent IOD; eyes small; tympanum round, its length 34.7-48.6 ($\bar{x}$ = 44.4, N = 8) per cent eye length, upper edge concealed by supratympanic fold (fold reaching to above arm), separated from eye by its diameter; postrectal tubercles small, no other tubercles on head; choanae large, longer than wide, not concealed by palatal shelf of maxillary arch; vomerine odontophores pungent, median to choanae, lying just posterior to choanae; odontophores strongly slanted (in some individuals teeth in a longitudinal row), longer than wide, separated on midline by a distance about equal to odontophore length; tongue longer than wide, its posterior border notched, posterior 2/5 not adherent to floor of mouth; males with vocal slits, subgular vocal sac.

Skin of dorsum very finely shagreened, becoming areolate on flanks, that of throat smooth, of venter areolate, of undersides of thighs coarsely areolate; no dorsolateral or discoidal folds; no anal sheath; one small antebrachial is the only ulnar tubercle in females but males have 3 small ulnar tubercles; palmar tubercle bifid, lobes equal in size; thenar tubercle oval, smaller than palmar tubercle; several pungent supernumerary palmar tubercles; subarticular tubercles round, proximal tubercles subconical, more distal ones not conical; fingers bearing lateral fringes; fringe evident one-half way down outside of palm; fingers bearing discs, discs broader than long, on large pads; pad of thumb smallest, those of fingers II-IV about size of tympanum; all pads round apically; first finger shorter than second; males have white, non-spinous nuptial pad on thumb.

Several small, non-conical tubercles on heel; no tubercles on outer edge of tarsus; in females, one small indefinite tubercle (or short fold) on inner edge of tarsus just proximal to inner metatarsal tubercle; in males a distinct conical tubercle about mid-way along inner edge of tarsus and lesser tubercles proximal and distal; inner metatarsal tubercle 3 times as long as wide and 6 times size of round outer metatarsal tubercle; as few as 3 supernumerary plantar tubercles (at bases of toes II-IV), up to 4 rows of tubercles; subarticular tubercles longer than wide, conical; fringes evident on lateral margins of toes; toes bearing broad discs on expanded pads, toe pads smaller than those of fingers; heels of flexed hind legs overlap; shank 49.7-58.2 ($\bar{x}$ = 54.4, N = 8) per cent SVL.

Dorsal surfaces of body and shanks gray-brown; tops of thighs gray; posterior surfaces of thighs and undersides of shanks black; groin black; color on adjacent anterior surfaces of thighs and on flanks grading into gray-brown; vague network of reticulations on flanks; dark brown canthal-supratympanic stripe; two brown labial bars; ventral surfaces white to cream, some gray reticulation on chest and belly.

MEASUREMENTS OF HOLOTYPE (in mm): SVL 22.9; shank 12.5; HW 8.2; head length 9.0; upper eyelid width ca. 2.2; IOD 2.9; tympanum length 1.5; eye length 3.1; E-N 3.2.

ETYMOLOGY: Greek, *aaptos*, unapproachable; in allusion to the delay in its discovery.

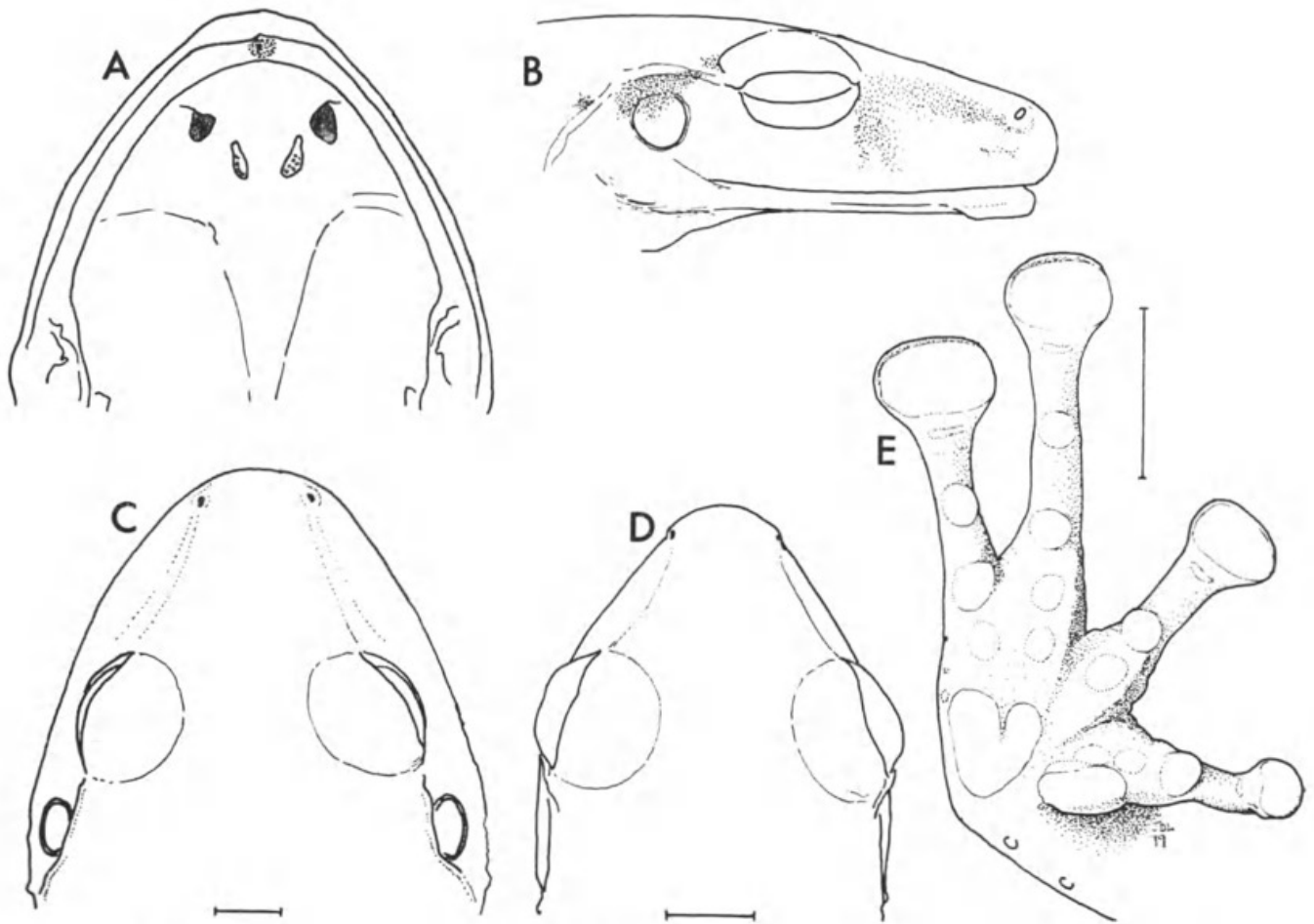


FIG. 1. — *Eleutherodactylus aaptus* sp. nov. A, palate, female, MCZ 96774 ; B, top of head, female, MCZ 96772 ; C, side of head, female, MCZ 96772 ; D, top of head of male holotype, MNHN 1978.2816 ; E, palm of MNHN 1978-2816. (Scale for A-C, beneath B ; all scales equal 2 mm.)

REMARKS : Sexual dimorphism is pronounced (fig. 1). Males have ulnar and tarsal tubercles (absent in females), sharp canthi (obtuse in females), and do not exhibit flaring of the lips (flared in females). The head shape of females alone would have led us to propose that *E. aaptus* is a small Amazonian ally of *E. latidiscus* (and its allies).

Only three males are available : MNHN 1978.2815-16 and MCZ 96773 that is a juvenile (no vocal slits, no nuptial pad) 21.2 mm SVL. Our data are meager, but *E. aaptus* appears to exhibit the normal sexual dimorphism in size seen in most *Eleutherodactylus*.

***Eleutherodactylus acuminatus* Shreve**

Eleutherodactylus acuminatus Shreve, 1935 : 217 ; CRUMP, 1974 : 24 ff ; DUELLMAN, 1978 : 86-87 ; LYNCH, 1980a : 3.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : Río Caiwima (MCZ 96792) ; 50 km NW Puerto Nariño (MCZ 93776). Perú, Depto. Loreto : Colonia (MNHN 1979.47-49) ; Yuvinetó (1979-7900).

These records partially bridge the geographic hiatus evident previously (LYNCH, 1980a) for this food-specialist (DUELLMAN, 1978).

Eleutherodactylus altamazonicus Barbour and Dunn

Eleutherodactylus altamazonicus : LYNCH, 1974 : 14.

MATERIAL EXAMINED : Perú, Depto. Loreto : Colonia (MNHN 1979.52); Yuvinetto (Walter Hödl 6308).

Eleutherodactylus carvalhoi Lutz

Eleutherodactylus carvalhoi Lutz in LUTZ and KLOSS, 1952 : 642; DUELLMAN and TOFT, 1979 : 61; LYNCH, 1980a : 4.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : Puerto Nariño (MCZ 93634, 94521, 96793-97); Ríos Amaca-Yacu and Caiwima, ca. 40 km NNE Puerto Nariño (MCZ 95797). Ecuador, Pastaza River, Canelos to Marañon (MCZ 19627). Perú Depto. Loreto : Colonia (MNHN 1978. 2832-33, 1979. 56-69); Iparia (MCZ 75049-50); Mishana, Río Nanay (MCZ 89081); Yuvinetto (MNHN 1979.70-71).

MNHN 1978. 2833 is a gravid female 18.4 mm SVL with essentially smooth skin on the dorsum, concealed tympana, a pale spot in the groin, 2-3 pale spots on the anterior surfaces of the thighs, and a brown venter with small white spots. In spite of the unusual pattern, the smooth skin on the dorsum, and its small size we refer it to *E. carvalhoi*.

The distributional records reported here tend to support LYNCH's (1980a) view that *E. carvalhoi* occurs essentially east of the distributions of its relatives, *E. croceoinguinis* and *E. martiae*. The specimens from Colonia were obtained in both primary forest and in secondary forest (ca. 40 yr. old). The pale spot in the groin is either yellow or orange in life. LYNCH (1980a) noted that DUELLMAN and TOFT's (1979) specimens from Depto. Huánuco in south-central Perú were smaller than his samples from western Brasil and adjacent Perú. Specimens from the localities reported here are intermediate in size : two males 13.3-13.4 mm SVL, 16 females 17.7-21.1 mm SVL ($\bar{x} = 19.4 \pm 0.5$ [2 standard errors]). Proportions for females are as follows (expressed in percents) : Tibia/SVL 47.4-55.1 ($\bar{x} = 51.6$), HW/SVL 33.8-39.8 ($\bar{x} = 36.2$), eyelid/IOD 80.0-135.1 ($\bar{x} = 105.0$), E-N/eye length 82.7-108.5 ($\bar{x} = 95.5$). Males lack vocal sac and slits and also lack nuptial pads.

Eleutherodactylus conspicillatus (Günther)

Hylodes conspicillatus Günther, 1859 : 92.

Eleutherodactylus conspicillatus : LYNCH, 1975a : 3-9; 1980a : 4.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : 8-10 km inland from tierra firme, across from Isla de Santa Sophia (MCZ 85811-12); Puerto Nariño (MCZ 93641, 93638-39, 96798, 96802); 50 km NW Puerto Nariño (MCZ 96799-801); Río Amaca-Yacu (MCZ 96803-04); Ríos Amaca-Yacu and Caiwima, ca. 40 km NNE Puerto Nariño (MCZ 95803); headwaters of Río Caiwima (MCZ 96805-06). Perú, Depto. Loreto : Colonia (MNHN 1979.1-16, 7892-95); Iparia (MCZ 75041-46, 75048); Moropan (MCZ 91254); Yuvinetto (MNHN 1979.17-28).

LYNCH (1975a) combined *E. conspicillatus* (Günther) and *E. peruvianus* (Melin) but following study of collections by Harvey BASSLER and Borys MALKIN advocated species recognition for each (LYNCH, 1980a). The two frogs are very similar and differ only in color patterns. LYNCH (1980a) considered the distributions essentially parapatric and reported *E. peruvianus* from Igarapé Belém, Estado Amazonas, Brasil, as well as from Estirón (Río Ampiyacu) and the headwaters of the Río Loretoyacu, Depto. Loreto, Perú.

The frogs from Colombia and those from Colonia represent *E. conspicillatus* rather than *E. peruvianus* as might have been expected. The frogs have minute white spots (red in life) on the posterior surfaces of the thighs and have mottling of gray and cream (or uniform gray) on the underside of the shank. Some examples have labial bars evident on the dark face and most have moderate brown stippling on the throat. They are thus intermediate in coloration between *E. conspicillatus* and *E. peruvianus*. The intermediacy of these specimens is discordant and thus we do not advocate treating *E. conspicillatus* and *E. peruvianus* as synonyms although we consider them only tenuously separable.

***Eleutherodactylus lythroides* sp. nov.**

HOLOTYPE : MNHN 1978.2825, an adult male taken at Colonia, Departamento Loreto, Perú on 31 May 1978 by J. LESCURE.

PARATYPES : MNHN 1978.2819-24, 2826-28, 2830-31, collected at the type-locality on 27-31 May 1978 by J. LESCURE and on January by P. RAZON.

DIAGNOSIS : (1) skin or dorsum roughened, no dorsolateral folds, that of venter areolate; anal opening extended in sheath; (2) tympanum prominent, its length $1/3-2/5$ eye length; (3) snout subacuminate in dorsal view, round in lateral profile; canthus rostralis sharp; (4) interorbital space broader than upper eyelid; no cranial crests; no tubercles on eyelid; (5) vomerine odontophores small, pungent, median and slightly posterior to choanae; (6) males with vocal slits; thumb bearing white non-spinous nuptial pad; (7) first finger shorter than second; all digits bearing broad discs on expanded pads, pads of fingers III-IV largest; pads round apically; (8) fingers with narrow lateral keels; (9) small antebrachial tubercle present; (10) no tubercles on heel or outer edge of tarsus; inner tarsal ridge present; (11) two metatarsal tubercles, inner oval, 8 times size of round outer; small supernumerary plantar tubercles at bases of toes II-IV; (12) toes bearing lateral keels; toe pads bearing broad discs, slightly smaller than those of fingers; (13) black above with brown limb bars; anterior and posterior surfaces of thighs, groin, much of venter, and ventral surfaces of hind limb cream (or black with cream spots); anterior venter and throat black, latter with transverse cream bar; pale areas red in life; (14) adults small, males 16.4-18.2 ($\bar{x}$ = 17.3, N = 6) mm, females 23.6-25.8 ($\bar{x}$ 25.0, N = 4) mm SVL.

Eleutherodactylus lythroides is most similar to *E. variabilis* Lynch from which it differs in having larger digital pads, a tarsal ridge (instead of a tubercle), subacuminate (rather than acuminate) snout, and in coloration (*E. variabilis* has a spotted or reticulated venter with a pale area edged with black across the groin and lower venter which is yellow in life). Occasional examples of *E. altamazonicus* Barbour and Dunn are similar to the darkest *E. lythroides* in color pattern but are readily distinguished in having the tympana concealed, more tuberculate skin, larger digital pads, and in being larger frogs.

DESCRIPTION

Head as broad as or broader than body, longer than wide; HW 34.1-36.4 ($\bar{x}$ = 34.8, N = 10) per cent SVL; snout subacuminate to nearly acuminate in dorsal view, round in lateral profile; nostrils protuberant, directed dorsolaterally; snout moderately long, E-N in males 78.6-91.7 ($\bar{x}$ = 85.0, N = 6) per cent eye length, in females 98.5-107.9 ($\bar{x}$ = 103.2, N = 4) per cent; canthus rostralis sharp, straight; loreal region weakly concave, sloping abruptly to lips; lips not flared; upper eyelid lacking tubercles, its width in males 64.3-85.0 ($\bar{x}$ = 75.2, N = 6) per cent IOD, in females 72.4-92.3 ($\bar{x}$ = 85.0, N = 4) per cent; no cranial crests; tympana small, distinct, round, tympanum length 32.1-41.7 ($\bar{x}$ = 36.9, N = 10) per cent eye length; tympanum separated from eye by distance almost equal to its diameter; postrictal tubercles very small; choanae large, subtriangular in outline, not concealed by palatal shelf of maxillary arch when roof of mouth is viewed from directly above; vomerine odontophores median to choanae; anterior border of odontophore lying at about same level as posterior margin of choanae; odontophores small, elevated, bearing a transverse row of 3-4 teeth, separated on midline by distance equal to 1 1/2-2 odontophore widths; tongue large, twice as long as wide, its posterior border not notched, posterior 1/6 not adherent to floor of mouth; males with vocal slits posterolateral to tongue; vocal sac is internal; lining of mouth blotched with melanophores.

Skin of dorsum roughened (an admixture of shagreening and fine corrugation), becoming smooth on lower flanks; skin of throat and undersides of limbs smooth, of venter finely

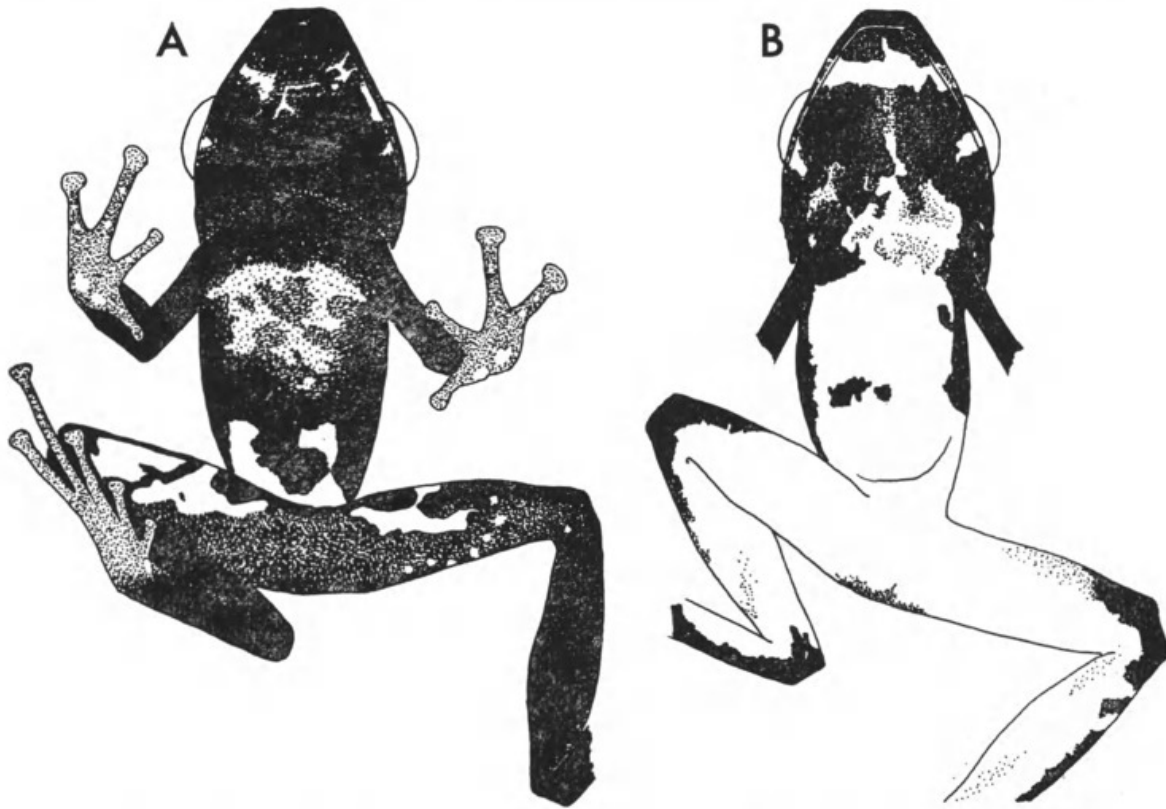


FIG. 2. — Patterns on venter of *Eleutherodactylus lythroides* sp. nov.
A, MNHN 1978-2825, 16.8 mm SVL; B, MNHN 1978-2826, 17.8 mm SVL.

areolate ; skin of dorsal surfaces of limbs like that of dorsum only more smooth ; no dorso-lateral or paravertebral folds (thin sagittal ridge evident on head) ; discoidal folds distinct, well anterior to groin ; anal opening enclosed in short sheath ; small antebrachial tubercle present, no other ulnar tubercles ; palmar tubercle bifid, larger than oval thenar tubercle ; several low, flat, large supernumerary palmar tubercles ; subarticular tubercles round, pungent ; fingers bear lateral keels ; discs broader than long, on expanded pads ; pads of III and IV largest (nearly as large as tympanum) ; pads rounded apically ; first finger shorter than second ; male with swollen thumbs and white, non-spinous nuptial pads.

Heel and outer edge of tarsus lacking tubercles ; inner edge of tarsus bearing an elongate tubercle (a low, unattached tarsal ridge) ; inner metatarsal tubercle $2\frac{1}{2}$ times as long as wide, outer minute ($\frac{1}{8}$ size of inner), round ; supernumerary plantar tubercles at bases of toes II-IV ; subarticular tubercles round or slightly longer than wide, pungent ; toes bearing lateral keels, expanded pads (slightly smaller than those of fingers), broad discs ; heels of flexed hind legs overlap ; heel of adpressed hind leg reaches anterior edge of eye ; shank of males 48.9-54.8 ($\bar{x}$ = 52.1, N = 6) per cent SVL, of females 47.5-51.8 ($\bar{x}$ = 49.5, N = 3) per cent.

Black above without markings ; pale lines on face (below eye and on snout suggesting presence of labial bars ; forelimb with pale bands on upper arm, faint banding on lower arm ; hind legs with black transverse bands, slightly broader than (or equal to) brown interspaces ; anterior and posterior surfaces of thighs, groin, ventral surface of shank, anterior edge of tarsus, lower venter, and underside of thighs cream with occasional black spots (the pale areas are occasionally much more restricted, c.f. fig. 2A) ; black speckling on posterior surfaces of thigh ; rest of venter and throat black except for moderately pigmented areas on breast, pale band across throat and pale spots on throat below eyes (fig. 2).

In life, *E. lythroides* is black or brownish black with white to slate spots on the face and white markings on the throat. The pale areas on the venter and hind limbs are vermillion red.

MEASUREMENTS OF HOLOTYPE (in mm) : SVL 16.8, shank 9.2 ; HW 5.9 ; head length 6.4 ; upper eyelid width 1.7 ; IOD 2.0 ; tympanum length 0.9 ; eye length 2.8 ; E-N 2.2. The holotype is one of the most darkly pigmented specimens available (fig. 2A).

ETYMOLOGY : Greek, meaning gory, in reference to the blood red pigment on the venter and hind limbs.

Eleutherodactylus lythroides will key out as *E. variabilis* in LYNCH's (1980a) key to the identification of Amazonian species of the *unistrigatus* group.

***Eleutherodactylus malkini* Lynch**

Eleutherodactylus malkini Lynch, 1980a : 9.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : Puerto Nariño (MCZ 93640, 96808, 96810-23, 96826-27) ; 50 km NW Puerto Nariño (MCZ 96809, 96824-25) ; Ríos Amaca-Yacu and Caiwima (MCZ 95801-02) ; Río Caiwima, ca. 70 km NNE Puerto Nariño (MCZ 96524-28, 96828-31). Perú, Depto. Loreto : Colonia (MNH 1978.2791-2814, 2817-2818, 1979-45-46, 7897) ; Yuvinetto (Walter Hödl 6210, 6249).

LYNCH (1980a) reported specimens from western Brasil, south eastern Colombia, eastern Ecuador, and eastern Perú. Our records do not increase the known distribution of *E. malkini* but LYNCH's (1980a) material consisted entirely of specimens lacking notes on colors in life and microhabitat data. At Colonia, *E. malkini* was found in primary forests near small streams. The microhabitat was very moist (even at the end of the rainy season) and the forest floor was heavily littered with wet dead leaves.

In life, *E. malkini* is brown to dark reddish brown above, the flanks and groin are brown with white flecks, the throat white, the venter yellowish, and the undersides of the legs greenish-yellow. The canthal-supratympanic stripe is black and the labial bars are dark brown. The posterior surfaces of the thighs are black with slate white, clear brown, or greenish brown flecks. The iris is gold with a horizontal copper streak.

In the original description, LYNCH (1980a) recorded vocal slits as present. Vocal slits are present in only three of the 22 adult males now available.

***Eleutherodactylus nigrovittatus* Andersson**

Eleutherodactylus nigrovittatus Andersson, 1945 : 33 ; LYNCH, 1980a : 11 ; 1980b : 299. LYNCH and DUELLMAN, 1980 (*in press*).

Phyzelaphryne miriamae Heyer, 1977 : 152-54.

MATERIAL EXAMINED. — Colombia, Depto. Amazonas : Puerto Nariño (MCZ 96832-36, 96841-46) ; ca. 50 km NW Puerto Nariño (MCZ 96837-40) ; Río Caiwima, ca. 70 km NNE Puerto Nariño (MCZ 96847-48). Perú, Depto. Loreto : Colonia (MNHN 1978. 2837-46) ; Iparia (MCZ 75031).

This species is more widely distributed than indicated by LYNCH (1980a). With the recognition that HEYER's (1977) *Phyzelaphryne miriamae* is conspecific (LYNCH, 1980b), *E. nigrovittatus*' distribution area extends well into the Amazon Basin. Specimens from Colonia were found in wet primary forest in leaf litter by day. In life, the throat is brown with white speckles. A prominent black spot occurs above the groin. The dorsum is brown with a pattern consisting of an occipital W and a sacral chevron. Dark brown dorsolateral stripes reach to the suprainguinal spots ; the anal triangle is black. Adult males have a fleshy keel along the lips anterior to the eyes (LYNCH, 1980b).

***Eleutherodactylus ockendeni* (Boulenger)**

Hylodes ockendeni Boulenger, 1912 : 187.

Eleutherodactylus ockendeni : LYNCH, 1974a : 16-20, 1980a : 12.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : Puerto Nariño (MCZ 93636-37, 94519-20, 95798, 96849-53) ; ca 50 km NW Puerto Nariño (MCZ 94517-18) ; Ríos Amaca-Yacu and Caiwima (MCZ 95504) ; Río Caiwima, ca 70 km NNE Puerto Nariño (MCZ 96854). Perú, Depto. Loreto : Colonia (MNHN 1978.2834, 2836, 1979.50-51, 53) ; Yuvinetto (MNHN 1979.54-55).

Eleutherodactylus ockendeni is distributed south of the Río Putumayo (as far east as the Leticia region in Colombia) to extreme southern Perú (LYNCH, 1974a, 1980a).

Eleutherodactylus sulcatus (Cope)

Hylodes sulcatus Cope, 1874 : 126.

Eleutherodactylus sulcatus : LYNCH, 1975b : 33-35.

MATERIAL EXAMINED : Colombia, Depto. Amazonas : Puerto Nariño (MCZ 93642, 96856). Perú, Depto. Loreto : Colonia (MNHN 1979.38-44) ; Yuvinetto (Walter HÖDL 6169).

Eleutherodactylus sulcatus was found during the day in leaf litter in wet primary forest associated with *Adenomera andreae*, *Bufo typhonius*, *Eleutherodactylus conspicillatus*, *E. lythrodes*, *E. malkini*, and *E. nigrovittatus*.

Eleutherodactylus variabilis Lynch

Eleutherodactylus variabilis Lynch, 1968 : 129.

MATERIAL EXAMINED : Perú, Depto. Loreto : Colonia (MNHN 1978.2835) ; Yuvinetto (Walter HÖDL 6184, 6246, MNHN 1978.2851-52).

LYNCH (1979) reported *E. variabilis* from Puerto Nariño. Our material helps fill the geographic gap evident from previous records. Males of this species have a white, non-spinous nuptial pad.

Ischnocnema quixensis (Jiménez de la Espada)

Oreobates quixensis Jiménez de la Espada, 1872 : 87.

Ischnocnema quixensis : LYNCH and SCHWARTZ, 1972 : 109 ; LYNCH, 1974b : 87.

MATERIAL EXAMINED : Brasil, Estado Amazonas : Igarapé Belém (AMNH, uncatalogued). Colombia, Depto. Putumayo : Santa Rosa de Sucumbios, 400 m (AMNH, uncatalogued). Perú, Depto. Amazonas : Río Santiago (AMNH 42445, 42743, 42745, 42778, 42974, 43480, 43485). Depto. Huánuco : Monte Alegre, Río Pachitea (AMNH 43023, 43031, 43035). Depto. Loreto : Andoaz, Río Pastaza (AMNH 52857-58) ; Barranca, Río Marañon (AMNH 42653) ; Cashiboya (AMNH 42120, 42302-03, 43086, 43208, 43450) ; Colonia (MNHN 1979.29-33) ; Colonia Antigua (MNHN 1979.34-37) ; Iquitos (AMNH 55172-73) ; Perú-Brasil frontier, Ríos Tapiche-Utoquinia (AMNH 43223) ; Pungo, Río Tapechi (AMNH 42926) ; headwaters Río Loretoyacu (AMNH, uncatalogued) ; Río Pisqui, lower camp (AMNH 43535, 43540, 43544, 43547, 43558) ; upper Río Sepahu, Urubamba (AMNH 43309) ; middle Río Utoquinia (AMNH 42650) ; Roaboya (AMNH 43529) ; Santa Rosa (AMNH 20142) ; Yuvinetto (Walter HÖDL 6189). Depto. San Martín : Pachisa (AMNH 42330, 43401).

LYNCH (1974b) provided many records for *I. quixensis* but we have found many more out of Ecuador establishing a distribution area over most of eastern Ecuador and Perú (fig. 3).

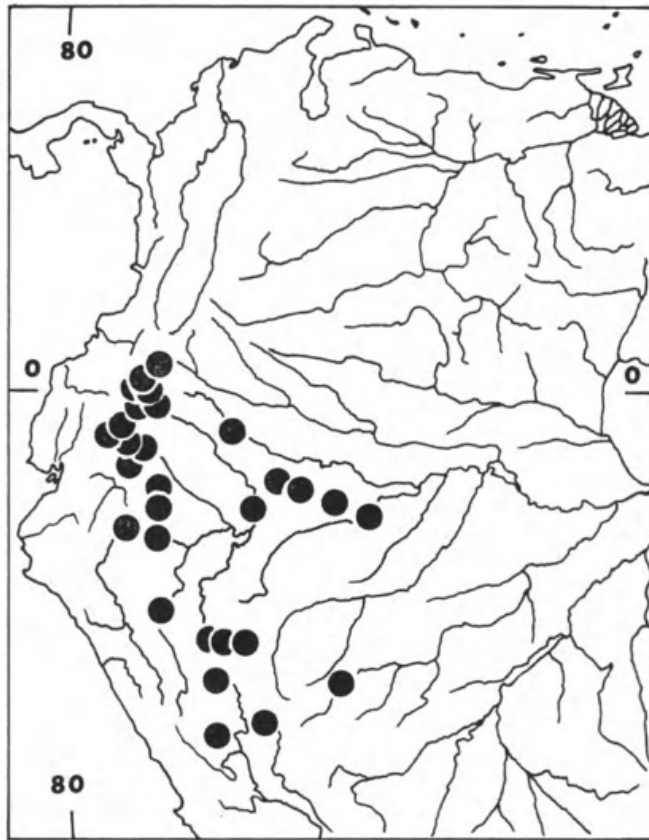


FIG. 3. — Distribution of *Ischnocnema quixensis* in the upper Amazon Basin.

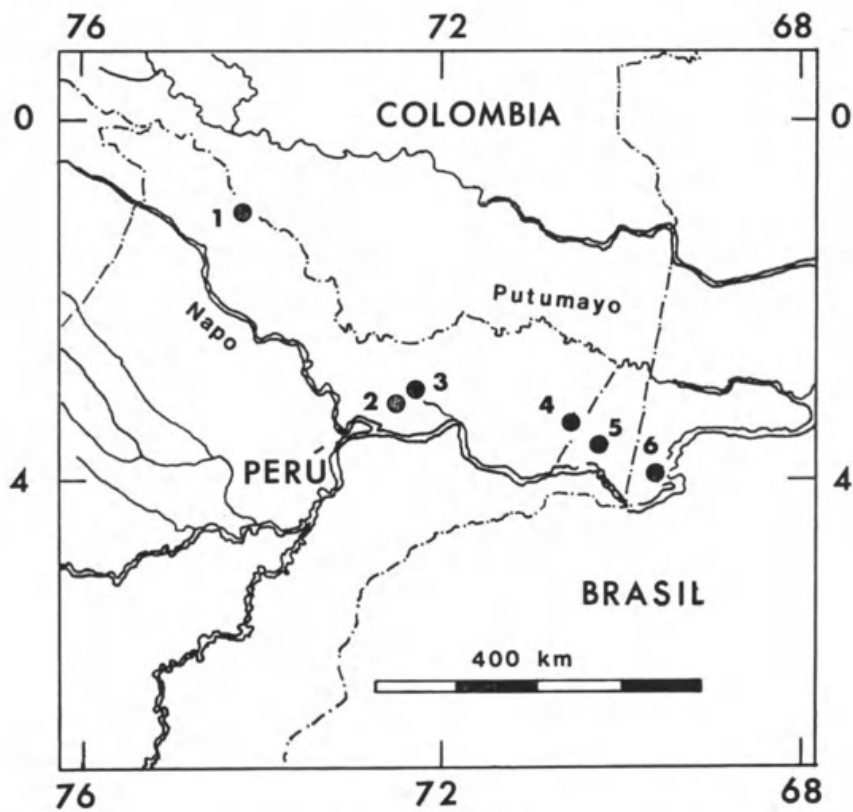


FIG. 4. — Localities for six collections between the Río Putumayo and Río Amazonas-Río Napo.

DISCUSSION

Within a corridor between the Río Putumayo and Río Solimões-Amazonas-Napo (between approximately 69° W and 74° W) six primary collection sites are available (fig. 4) and a total of 15 species of eleutherodactyline frogs have been obtained from the six sites. In addition to these, three other species (*E. lacrimosus*, *E. marmoratus*, and *E. ventrimarmoratus*) probably occur in the corridor (LYNCH, 1980a). Of the 15 species, only *E. malkini* and *E. sulcatus* were found at each of the six sites (table I).

The presence of 11 species of *Eleutherodactylus* at Colonia (locality 2, fig. 4) and the anticipation of at least two others (*E. lacrimosus* and *E. ventrimarmoratus*) being found

TABLE I. — Species representations at six sites in the upper Amazon Basin.

	Yuvincto (1)	Colonia (2)	Estirón (3)	Loretoyacu (4)	Puerto Nariño Area (5)	Igarapé Belém (6)
<i>E. aaptus</i>		×			×	
<i>E. acuminatus</i>	×	×			×	
<i>E. altamazonicus</i>	×	×	×	×	×	
<i>E. carvalhoi</i>	×	×		×	×	×
<i>E. conspicillatus</i>	×	×			×	
<i>E. lanthanites</i>				×		×
<i>E. lythrodes</i>		×				
<i>E. malkini</i>	×	×	×	×	×	×
<i>E. nigrovittatus</i>		×	×	×	×	
<i>E. ockendeni</i>	×	×		×	×	
<i>E. peruvianus</i>			×	×		×
<i>E. sulcatus</i>	×	×	×	×	×	×
<i>E. variabilis</i>	×	×			×	
<i>E. vilarsi</i>				×		
<i>I. quixensis</i>	×	×		×		×
TOTAL	9	12	5	10	10	6

there in the future requires only minor modification of LYNCH's (1980a) recorded impoverishment of the Amazon Basin. Four of the species at Colonia (*E. aaptus*, *E. carvalhoi*, *E. lythroides*, and *E. malkini*) are Amazonian species compensating for the eastward decline of species found only at the eastern base of the Andes.

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