

FIGURE 56. Dorsal views of striped (left, FMNH 128831) and unstriped (right, UPR 2641) *Leptodactylus longirostris*.

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FIGURE 57. Lateral view of the heads of *Leptodactylus amazonicus* (left, lip stripe very distinct), *longirostris* (center, lip stripe moderately distinct), *poecilochilus* (right, no lip stripe, lip bar present).

SVL ratio $.545 \pm .026$, female $.553 \pm .031$) than *laurae* (male foot/SVL ratio $.649 \pm .039$, female $.628 \pm .028$); *longirostris* occurs in northern South America, *laurae* in mid-east and southern South America. Most individuals of *mystaceus* have distinct white tubercles on the sole of the foot; *mystaceus* occurs along coastal Brasil. Many individuals of *notoaktites* have white tubercles on the sole of the foot; *notoaktites* occurs in SE Brasil. *Leptodactylus longirostris* often has a distinct light lip stripe and lacks a dark suborbital bar, *poecilochilus* lacks a distinct light lip stripe and often has a dark suborbital bar (fig. 57).

Adult Characteristics ($N = 70$).—Dorsum uniform or spotted, spots sometimes elongate, fused (fig. 1, A, B, C, E, J); light mid-dorsal stripe present in 17% of individuals, presence not sexually dimorphic ($X^2 = .09$, $P = .76$); light lip stripe usually indistinct (60%), often distinct (40%), distinctiveness not sexually dimorphic ($X^2 = 2.94$, $P = .09$); dark suborbital bar absent; light stripe on posterior face of thigh usually distinct (80%), sometimes indistinct (20%), more females (100%) have distinct light stripes than males ($X^2 = 6.80$, $P = .009$); tibia barred; usually 4 well defined dorsal folds, 6 dorsolateral folds present when light mid-dorsal stripe present; dorsal surface of tibia lacking white tubercles; pos-

terior surface of tarsus almost always (99%) lacking white tubercles, presence not sexually dimorphic ($X^2 = .14$, $P = .71$); sole of foot lacking white tubercles (100%); male SVL 38.2 ± 1.8 mm, female 41.8 ± 2.4 mm, females larger than males ($F_{1, 68} = 49.7$, $P < .001$); male head length/SVL ratio $.394 \pm .012$, female $.387 \pm .014$, male head longer than female ($F_{1, 68} = 5.28$, $P = .025$); male head width/SVL ratio $.338 \pm .015$, female $.334 \pm .013$, not sexually dimorphic ($F_{1, 68} = 1.12$, $P > .05$); male femur/SVL ratio $.446 \pm .041$, female $.457 \pm .033$, not sexually dimorphic ($F_{1, 68} = 1.31$, $P > .05$); male tibia/SVL ratio $.512 \pm .024$, female $.527 \pm .031$, female tibia longer than male ($F_{1, 68} = 5.28$, $P = .025$); male foot/SVL ratio $.545 \pm .026$, female $.553 \pm .031$, not sexually dimorphic ($F_{1, 68} = 1.21$, $P > .05$).

Larval Characteristics.—Unknown.

Mating Call.—Dominant frequency modulated between 1500–3600 hz; note duration about 0.8 s; note repetition rate 1.4 per second (from Rivero, 1971, fig. 58 reproduced here from same sonagram described by Rivero).

Karyotype.—Unknown.

Distribution.—Centered upon the Guiana Shield (fig. 55).

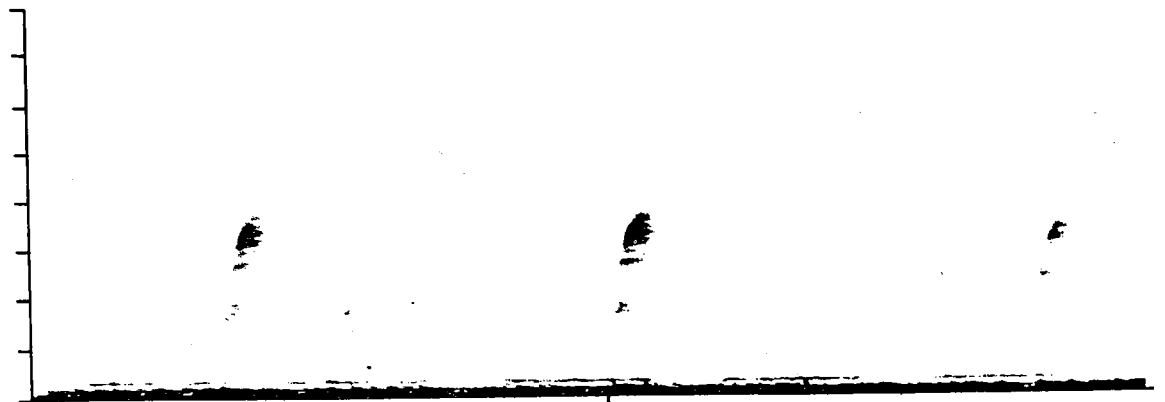


FIGURE 58. Sonagram of the mating call of *Leptodactylus longirostris*. Vertical scale marks at 1000 hz intervals. Horizontal scale mark at 1 s. Specimen from Venezuela, La Escalera (sonagram courtesy of Juan A. Rivero).

FIGURE 56. Dorsal views of striped (left, FMNH 128831) and unstriped (right, UPR 2641) *Leptodactylus longirostris*.

BRASIL. AMAZONAS: Ponta Negra, Negro River, MZUSP 24880; Tapera, Rio Negro, MZUSP 37518.

PARÁ: Igarapé Jaramacaru, Campos do Ariramba, MZUSP 28401-04; Rio Mapuera, at equator, AMNH 46189-190 (3); Rio Mapuera, R. Trombetas, AMNH 46187-88.

GUYANA. Kartabo, USNM 118065-66; Kuyuwini Landing, AMNH 49349-351, 49353-54 (4); upper Rupununi River, AMNH 81355-56.

SURINAM. Brownsberg Nature Park, Brokopondo Dist., MCZ 89648; Brownsweg, RMNH 17531, 17535; Christian Kondre, MZUSP 24758, 24761, 24765, 24767-772; Kaiserberg Airstrip, Zuid River, FMNH 128827-832, 128913-18, 128920-23, RMNH 17527 (4), 17530, 17549 (5); Krakka, RMNH 17540 (2); road between Krakka and Phedra, RMNH 17537, 17539 (2); Powakka, CM 49482, 49484, 44265, 44272, 44274; Matta, RMNH 17558; Sabakoe Creek, between Berlijn and Zanderij, RMNH 15106; Sipaliwini, RMNH 15176, 15178 (2), 17524-26, 17528-29, 17532-33, 17547, 17569; Tibiti, RMNH 17555, 17563; Troeli Cr., 6 km S Matta, RMNH 15115 (2), 15133 (4); Zanderij, MCZ 35642, MZUSP 15869-870, USNM 159066-67.

VENEZUELA. BOLÍVAR: km 104-151 on El Dorado-Santa Elena de Uairén Road, KU-WED 40072, 40078, 40080, 40085, 40151, 40181-82, 40208-09, 40263, 40281-87, 40381; La Escalera, Serrania de Lema, MCZ 79907, UPR 2641, 2643-45, 2647.

LEPTODACTYLUS MARAMBAIAE IZECKSOHN 1976

Leptodactylus marambaiae Izecksohn 1976:527-530, fig. 1. (Type locality, Brasil: Rio de Janeiro; Restinga da Marambaia. Holotype personal collection of Izecksohn 4123, adult male.)

Diagnosis.—The species with light longitudinal stripes on skin-folds on the dorsal surface of the tibia (fig. 48) (if light stripes indistinct, folds are present where stripes occur in other individuals) are *geminus*, *gracilis*, and *marambaiae*. *Leptodactylus marambaiae* has a shorter leg (e.g. tibia 50% SVL) than *gracilis* (e.g. tibia average 58% SVL in males, 57% SVL in females). At present, *marambaiae* cannot be morphologically distinguished from *geminus*. The note repetition rate of the mating call is slower for *marambaiae* (6 per second) than for *geminus* (22 per second).

Adult Characteristics.—Dorsum striped; mid-dorsal light stripe always present; light upper lip stripe distinct; no dark suborbital bar; light stripe on posterior face of thigh usually distinct, sometimes indistinct; tibia partially barred with light longitudinal pin stripes present; 6 well defined dorsolateral folds; upper surface of tibia lacking white tubercles; posterior surface of tarsus lacking white tubercles; sole of foot lacking white tubercles; male SVL 36.8 mm, female 40.2 mm; male head length/SVL ratio .40, female .36; male head width/SVL ratio .34, female .34; male femur/SVL ratio .44, female .44; male tibia/SVL ratio .50, female .50; male foot/SVL ratio .56, female .54.

Larval Characteristics.—Unknown.

Mating Call.—Dominant frequency modulates between 3000-3700 hz (fig. 59); call without harmonic structure; call not pulsed (fig. 60); note duration about 0.02 s; note repetition rate about 6 per second.

Karyotype.—Unknown.

Distribution.—Known only from the type locality (fig. 55).

BRASIL. RIO DE JANEIRO: Restinga da Marambaia.

LEPTODACTYLUS MYSTACEUS (SPIX) 1824

Rana mystacea Spix 1824:27, plate 3, fig. 3. (Type locality, Brasil: Bahia [Salvador as designated by Bokermann 1966]. Types lost.)

Diagnosis.—Most individual *mystaceus* have a combination of a distinct light stripe on the posterior surface of the thigh and distinct white tubercles on the surfaces of the posterior tarsus and sole of foot; these states are shared with *albilabris*, *elenae*, *fragilis*, and *latinasus*. *Leptodactylus mystaceus* have distinct dorsolateral folds (at least indicated by color pattern), *fragilis* and *latinasus* lack distinct dorsolateral folds. *Leptodactylus mystaceus* has white tubercles on the dorsal surface of the tibia, the tibia is smooth in *elenae*. *Leptodactylus mystaceus* is found in east coastal Brasil, *albilabris* occurs in the West Indies.

Some individuals of *mystaceus* lack the white tubercles on the tarsus and sole of foot (light thigh stripe present), these states are shared with at least some individuals of *fuscus*, *geminus*, *gracilis*, *laurae*, *longirostris*, *notoaktites*, and *poecilochilus*. The tubercles on the dorsal surface of the tibia distinguishes *mystaceus* from all these species.

Adult Characteristics ($N = 38$).—Dorsum spotted or rarely uniform (fig. 1, A, C, 0); light mid-dorsal stripe usually absent (97%), presence not sexually dimorphic ($X^2 = .08$, $P = .78$); light lip stripe usually distinct (79%), distinctiveness not sexually dimorphic ($X^2 = .14$, $P = .71$); dark suborbital bar absent; light stripe on posterior face of thigh distinct (100%); tibia barred; usually 4 or 2 well defined dorsolateral folds, 6 dorsolateral folds present when light mid-dorsal stripe present; dorsal surface of tibia usually with many distinct white tubercles; posterior surface of tarsus usually with many distinct white tubercles (87%), tubercles sometimes lacking (13%), presence not sexually dimorphic ($X^2 = .43$, $P = .51$); sole of foot usually with many distinct tubercles (87%), tubercles sometimes lacking (13%), presence not sexually dimorphic ($X^2 = .43$, $P = .51$); male SVL 42.7 ± 2.3 mm, female 43.6 ± 3.0 mm, not sexually dimorphic ($F_{1, 36} = 1.18$, $P > .05$); male head length/SVL ratio $.379 \pm .015$, female $.375 \pm .022$, not sexually dimorphic ($F_{1, 36} = .40$, $P > .05$); male head width/SVL ratio $.344 \pm .018$, female $.342 \pm .029$, not sexually dimorphic ($F_{1, 36} = .15$, $P > .05$); male femur/SVL ratio $.434 \pm .032$, female $.461 \pm .037$, female femur longer than male ($F_{1, 36} = 5.61$, $.025 < P < .01$); male tibia/SVL ratio $.509 \pm .015$, female $.517 \pm .029$, not sexually dimorphic ($F_{1, 36} = 1.42$, $P > .05$); male foot/SVL ratio $.554 \pm .022$, female $.548 \pm .034$, not sexually dimorphic ($F_{1, 36} = .42$, $P > .05$).

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40, $P > .05$);
female .342
15, $P > .05$);
male $.461 \pm$
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female .548
42, $P > .05$).

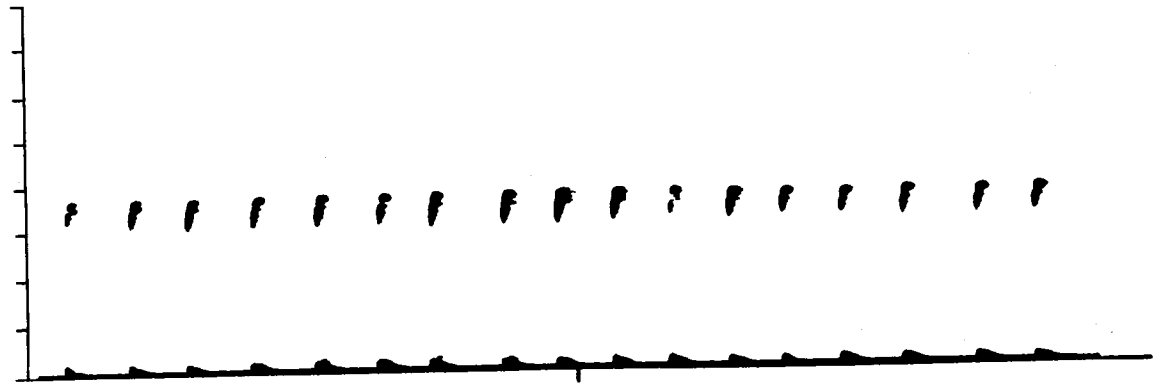


FIGURE 59. Sonagram of the mating call of *Leptodactylus marambaiae*. Vertical scale marks at 1000 hz intervals. Horizontal scale mark at 1 s. Specimen from Brasil, Restinga da Marambaia (tape courtesy of W. C. A. Bokermann).



FIGURE 60. Strip chart record of the mating call of *Leptodactylus marambaiae*. Line equals 0.01 s. See legend of Figure 59 for specimen data.

Larval Characteristics.—Unknown.

Mating Call.—Unknown.

Karyotype.—Unknown.

Distribution.—East coast of Brasil (fig. 61).

BRASIL. BAHIA: Copec. Ilhéus, MNRio 1724 (4), WCAB 45899–5919, 46570–6601, 47066–69; Itapetinga, WCAB 44885.

ESPÍRITO SANTO: Santa Teresa, CAS-SU 11787–88; São Mateus, MCZ 1298 (5).

RIO DE JANEIRO: Caxias, MNRio 1809 (5), 2374, 2861; Cidade dos Meninos, MNRio 1656 (3); Meriti, USNM 96222; Niteroi, Saco de São Francisco, USNM 96407–411, 99120; road to São Paulo, km 40, D. F., 97572; Serra de Friburgo, USNM 96467; Teresópolis, KU 92927–931, MNRio 397 (4), WCAB 12252.

LEPTODACTYLUS MYSTACINUS BURMEISTER 1861

Cystignathus mystacinus Burmeister 1861:532. (Type locality, Argentina. Holotype Martin-Luther-Universität, Halle (Saale), no number, male.)

Cystignathus labialis Cope 1878:90. (Type locality unknown. Presumed holotype USNM 31302, juvenile.)

Diagnosis.—The species having a combination of no light stripe on the posterior surface of the thigh and distinct white tubercles on the posterior surface of the tarsus are *bufonius*, *labrosus*, *mystacinus*, *troglydites*, and

ventrimaculatus. *Leptodactylus mystacinus* has distinct dorsolateral folds (at least indicated by color pattern), dorsolateral folds are indistinct or lacking in *bufonius* and *troglydites*. *Leptodactylus mystacinus* occurs east of the Andes, *labrosus* and *ventrimaculatus* occur west of the Andes.

Adult Characteristics ($N = 87$).—Dorsum uniform, striped, or slightly spotted (fig. 1, A, C, J, K); no light mid-dorsal stripe; light lip stripe usually distinct (86%), sometimes indistinct (14%), more females (100%) with distinct lip stripes than males ($\chi^2 = 4.10, P = .04$); dark suborbital bar absent; light stripe on posterior face of thigh usually absent (94%), rarely indistinct (6%), presence not sexually dimorphic ($\chi^2 = 1.17, P = .28$); tibia barred; usually 2 or 4 well defined dorsolateral folds; dorsal surface of tibia with many or scattered distinct white tubercles; posterior surface of tarsus almost always (94%) with many or scattered distinct white tubercles, absence not sexually dimorphic ($\chi^2 = .004, P = .95$); sole of foot usually with distinct scattered or many white tubercles (75%), sometimes absent (25%), presence not sexually dimorphic ($\chi^2 = .41, P = .52$); male SVL 53.0 ± 4.6 mm, female 56.5 ± 2.7 mm, females larger than males ($F_{1, 85} = 12.59, P < .001$); male head length/SVL ratio $.371 \pm .013$, female $.358 \pm .013$, male head

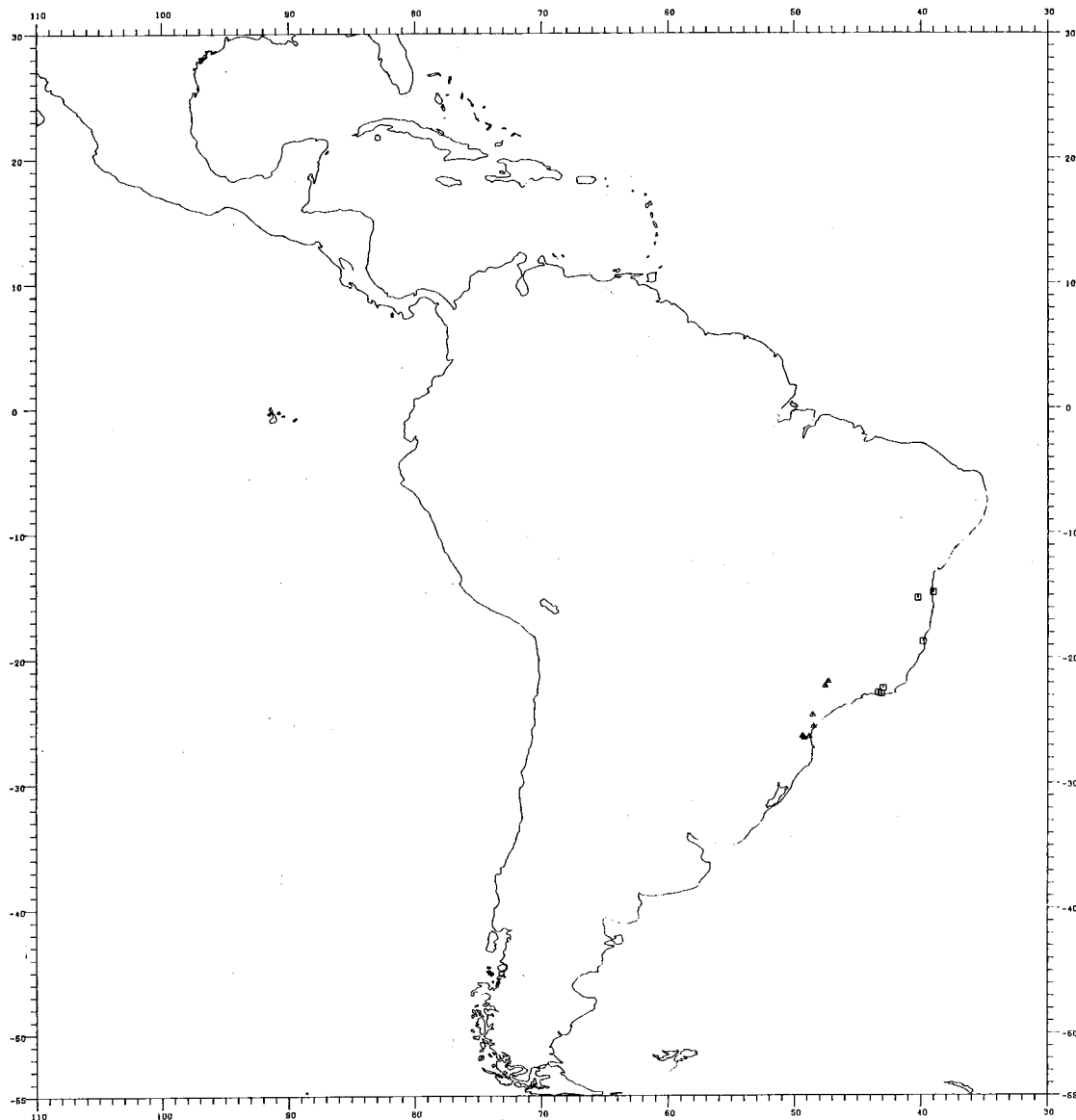


FIGURE 61. Distribution map of *Leptodactylus mystaceus* (squares) and *notoaktites* (triangles).

longer than female ($F_{1, 85} = 18.17, P < .001$); male head width/SVL ratio $.351 \pm .015$, female $.348 \pm .013$, not sexually dimorphic ($F_{1, 85} = .88, P = .94$); male femur/SVL ratio $.388 \pm .023$, female $.389 \pm .024$, not sexually dimorphic ($F_{1, 85} = 1.52, P > .05$); male tibia/SVL ratio $.421 \pm .013$, female $.416 \pm .018$, not sexually dimorphic ($F_{1, 85} = 2.34, P > .05$); male foot/SVL ratio $.428 \pm .021$, female $.423 \pm .022$, not sexually dimorphic ($F_{1, 85} = 1.06, P > .05$).

Larval Characteristics.—Sazima (1975) described and figured the larvae.

Mating Call.—Dominant frequency modulates between 2200–2500 hz; note duration 0.1 s; note repetition rate 5–6.5 per second (Barrio 1965).

Karyotype.—Diploid number 22; 7 pair median, 3 pair submedian, 1 pair subterminal; secondary constriction on chromosome pair 11 (Bogart 1974).

Distribution.—Interior Brasil to and including the Gran Chaco, coastal southeast Brasil and Argentina (fig. 62).

ARGENTINA. BUENOS AIRES: Buenos Aires, MACN 4150.

CHACO: Ciervo Petizo, IML 243.

ENTRE RÍOS: Concepción del Uruguay, MACN 4530.

JUJUY: Sobre ruta entre Río San Francisco y La Realidad (5 km from Yuto), IML 1272; Ruta Yuto-Ledesma, IML 1273.

LA PAMPA: Conelo, MACN 1166; General Pico, MACN 4479, 4505, 4513.

MISIONES: Dos de Mayo, IML 2356; Puerto Piray, km 18,

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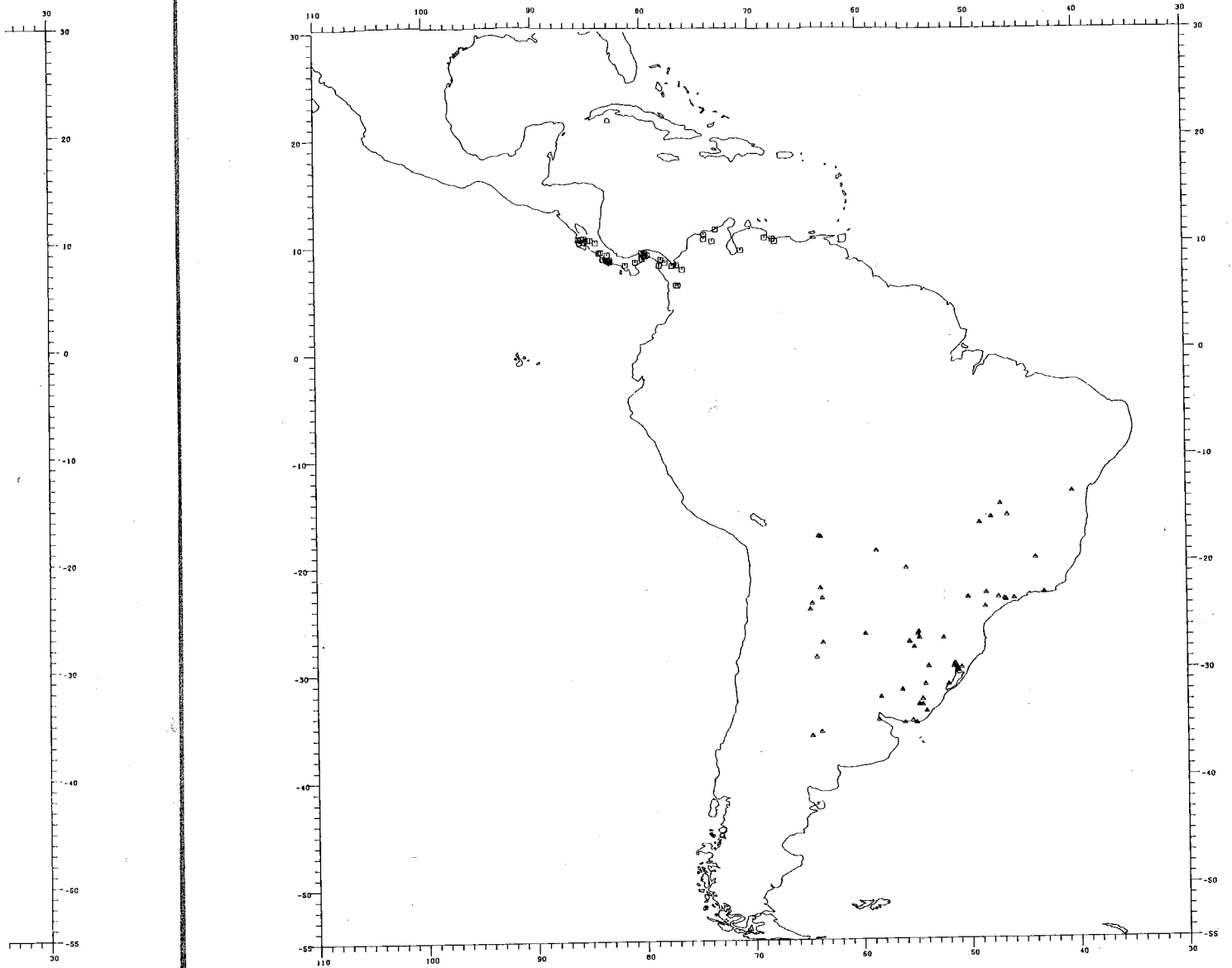


FIGURE 62. Distribution map of *Leptodactylus mystacinus* (triangles) and *poecilochilus* (squares).

MACN 2956; Río Paranay, FMNH 9462-66; 10870; San Javier, Puerto Londero, MACN 2072; Santa Ana, MACN 5548.
 SALTA: Campo Aguaray, IML 1473; near Hickmann, IML 148, 433.
 SANTIAGO DEL ESTERO: Caspi Corral, 96 km, IML 2188; Pajares, Simbol, Chichi Huaracunay y Guanaco, Depto. Atamisqui, IML 2230.
 TUCUMÁN: Río Uruña, near border of Salta, IML 1428.
BOLIVIA. SANTA CRUZ: Buenavista, MCZ 12897, UMMZ 66479 (2), 66480, 66488; El Carmen, CM 36097, MCZ 29986; Río Surutú, CM 3811.
BRASIL. BAHIA: Maracás, WCAB 31825-28.
 DISTRITO FEDERAL: Brasília, USNM 121292.
 GOIÁS: Anápolis, AMNH 43847; Flôres, USNM 121270.
 MATO GROSSO: Aquidauana, MZUSP 15800.
 MINAS GERAIS: Lapa Vermelha, Lagoa Santa, MZUSP 15877; Urucua Riv., first waterfall, Buritís, MZUSP 25069.

PARANÁ: St. Antonio da Platina, MZUSP 24155.
 RIO DE JANEIRO: Niteroi, Saco de São Francisco, AMNH 20308 USNM 99121.
 RIO GRANDE DO SUL: Albardão, WCAB 16843; Bagé, WCAB 3878; 18 km S Farroupilha, FMNH 80374; Montenegro, MZUSP 16050; Pôrto Alegre, FMNH 80360-371, KU 92921-23, MZUSP 16048-49, 21688-89, WCAB 3876; 39 km N Rio Pardo, FMNH 80372-73; Sta. Maria, MZUSP 24153-54, USNM 121272, WCAB 5259; São Leopoldo, MZUSP 25478; São Lourenço, MZUSP 91, 1970; Viamão, MCZ 32695-96, WCAB 7137-178; Vila Nova, São Sepé, MZUSP 23707-08.
 SANTA CATARINA: Nova Teutônia, MZUSP 8694-98.
 SÃO PAULO: Botacatú, WCAB 4351; Ermelindo Matrazzo, MZUSP 8106; Faveiro, MZUSP 25423-26; Guapiara, WCAB 6119; Itu, FMNH 83235, KU 92923-24, WCAB 4306, 4311, 4314, 6223, 8230; Nova Itaperuna, WCAB 13660; Pe-

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