

LOS  
ANGELES  
COUNTY  
MUSEUM

# CONTRIBUTIONS IN SCIENCE

NUMBER 191

MAY 20, 1970

10

STUDIES ON THE FROGS OF THE GENUS *LEPTODACTYLUS*  
(AMPHIBIA: LEPTODACTYLIDAE). VI.  
BIOSYSTEMATICS OF THE MELANONOTUS GROUP

By W. RONALD HEYER

LOS ANGELES COUNTY MUSEUM OF NATURAL HISTORY • EXPOSITION PARK  
LOS ANGELES, CALIFORNIA 90007

STUDIES ON THE FROGS OF THE GENUS *LEPTODACTYLUS*  
(AMPHIBIA: LEPTODACTYLIDAE). VI.  
BIOSYSTEMATICS OF THE MELANONOTUS GROUP

By W. RONALD HEYER<sup>1</sup>

ABSTRACT: Six species are recognized in the Melanonotus group: *dantasi*, *discodactylus*, *melanonotus*, *podicipinus*, *pustulatus*, and *wagneri*. A synonymy, diagnosis, summary of characteristics, and distributional summary are presented for each species. Series of *Leptodactylus* were analyzed from broad geographic and ecologic areas and situations for standard length, ventral pattern, ventrolateral gland development, posterior thigh pattern, and toe disk development. Correlations are evident between 1) larger size and more mesic habitats in *wagneri*, 2) darker ventral pattern and greater annual rainfall in *melanonotus*, 3) lighter ventral pattern and greater ventrolateral-gland extent in *wagneri*, and 4) greater ventrolateral-gland extent and greater annual rainfall in *wagneri*. The hypothesis is presented that character displacement is involved in the sharp differences in size and pattern between populations of *melanonotus* and *wagneri* as well as *podicipinus* and *wagneri* in sympatry. *Leptodactylus melanonotus* is the most primitive of the species, while *discodactylus* and *pustulatus* are the most advanced.

*Leptodactylus melanonotus*, *podicipinus*, and *wagneri* are associated with old land masses and are species adapted for xeric conditions. *Leptodactylus dantasi* and *discodactylus* are limited to the Tropical Rainforest of the western Amazonian Basin. *Leptodactylus pustulatus* is distributed in the xeric regions of eastern Brazil.

INTRODUCTION

Since the frog genus *Leptodactylus* was proposed by Fitzinger in 1826, it has had an unstable systematic history. No one since Boulenger, in 1882, has treated the group as an entity. The present paper is the first of a projected series attempting to elucidate the biosystematics of each of the species groups within the genus. In the Melanonotus species group, characters of gross morphology and distribution are used to analyze the interspecific relationships, ecological distribution patterns, and geographical distribution patterns of the species.

METHODS

All adult specimens of the Melanonotus species group were examined for size, sex, ventral color pattern, ventrolateral gland development, posterior

<sup>1</sup>Research Associate in Herpetology, Los Angeles County Museum of Natural History; and Biology Department, Pacific Lutheran University, Tacoma, Washington 98447.

thigh pattern, and degree of toe-tip expansion. Analysis of these characters is the basis for the taxonomic conclusions. For convenience, taxonomic conclusions are presented first before discussing the variation of characters analyzed in detail.

All available adult individuals of *L. dantasi*, *discodactylus* and *pustulatus* were studied for variation in 34 characters. The same 34 characters were examined in a series of 15 males and 15 females for each of the other three species. Thirty specimens of *melanotus*, *podicipinus*, and *wagneri* were chosen to represent the extremes in geographic origin and morphological variation. Details of the methods of examining individuals are the same as used previously (Heyer, in press). Percentages of standard length (SL) are presented as follows, 5-6-1-7, where the first number is the minimum, the second the mean, and the third the maximum percentage. The terminology follows Peters (1964) and Elias and Shapiro (1957). A dissecting microscope was used to examine the pattern of melanophore distribution on the ventral surfaces since melanophores in a contracted state are difficult to distinguish with the naked eye.

Prior to this study, five characters appeared adequate to define populations of the *Melanonotus* species group. Male and female sizes were recorded, and standardized forms were drawn which encompassed the range of variation for the ventral pattern, ventrolateral gland development, posterior thigh pattern, and toe-disk development. If a selected character appeared intermediate in any single frog, it was arbitrarily placed in the category it more closely resembled.

One to 100 individuals have been collected from each of 454 localities in Mexico and Middle America. As the status of the frogs in this geographic area was reasonably clear, samples for analysis were selected every 100 km along both coasts and in any inland area. In regions where faunal changes might be expected on the basis of other anuran distribution patterns more samples were analyzed. The samples, usually 10 frogs per locality, from 56 localities from Mexico through Panama and all available South American specimens of the *Melanonotus* species group were analyzed. The frogs were examined to determine how many distinctive morphotypes were present. Examples demonstrating the range of variation for individuals from each population were then recorded. Analyses of only the largest specimens of each distinct morphotype from each locality were recorded. Thus in the following analysis, size refers to the maximum for males and females for a given locality.

A series of mating call recordings were made in western Mexico in July 1967 on an Uher 4000 L portable tape recorder at 7.5 ips. The tapes were analyzed on a Kay Sonagraph 6061 B. Information on number of notes per call group, dominant frequency, harmonics, and frequency shifts was recorded from the sonagrams. The tapes are deposited at the University of Southern California, Department of Biological Sciences. Localities, tapes

(one individual per tape), and specimens on deposit at the Los Angeles County Museum of Natural History, respectively, are: COLIMA, Colima, WRH 67-12, LACM 37037; JALISCO, 5 km W Acatlán, 1400 m, WRH 67-20, LACM 37038, WRH 67-21, WRH 67-22, WRH 67-23, LACM 37039, WRH 67-24, WRH 67-25, LACM 37040; 7.7 km E La Huerta, 340 m, WRH 67-26, LACM 37041; 37.5 km SW Tecalitlan, 910 m, WRH 67-15, WRH 67-16, WRH 67-17; 0.5 km NE Tonila, 1300 m, WRH 67-18, LACM 37428; MICHOACÁN, 2.6 km N Capitío, 300 m, WRH 67-13, LACM 37427; NAYARIT, 13.2 km NE San Blas, WRH 67-31; Santa Cruz, 15 m, WRH 67-30, LACM 37043; Tepic, 950 m, WRH 67-27, LACM 37042, WRH 67-28; SINALOA, 36 km S Los Mochis turnoff on Mexican Highway 15, 10 m, WRH 67-2, LACM 37426, WRH 67-3, LACM 37036; SONORA, 3.1 km E Hermosillo, WRH 67-32.

Certain environmental parameters were chosen to evaluate as possible correlates with SL, gland development, ventral pattern, and posterior thigh pattern.

Total annual rainfall, number of months with less than 100 mm of rain-fall (dry months), and elevation were recorded for each locality. The climatic data were taken from Espinal and Montenegro (1963) for Colombia; Holdridge (1964) for Middle America; Tosi (1960) for Peru; Vivo Escoto (1964) for Mexico; Walter and Lieth (1960-67) for South America and Lesser Antillean Islands. Elevational data were taken from museum catalogues or from the Millionth Map series (American Geographical Society).

The correlation coefficient used to compare categories was the product moment method for ungrouped data, as presented by Arkin and Colton (1966, pp. 80-82). Mary Nafpaktitis wrote a Fortran program for this formula suited to my data. Robert J. Lavenberg wrote a Basic program for a *t*-test, as presented by Fisher (1948, pp. 193-196). The correlation coefficients and *t*-tests were run on a General Electric Time Share Computer terminal, provided by the Los Angeles County Museum of Natural History. The *t* values were located on a table (Fisher, 1948, p. 174) to determine the level of statistical significance (*P* value) of the correlation coefficients. A *P* value of .05 or less was considered statistically significant.

#### ACKNOWLEDGMENTS

This report is a modified section from my doctoral dissertation on file at the University of Southern California. My dissertation committee has been a constant source of encouragement—Jay M. Savage, Chairman, Robert M. Chew, John S. Garth, John L. Mohr, Basil G. Nafpaktitis, and John D. Soule. My fellow graduate students have aided me considerably in helping to define my ideas through stimulating discussions. Of particular help have been John R. Meyer, Roy W. McDiarmid, Norman J. Scott, Jr., Philip A. Silverstone and David B. Wake.

My studies of the genus *Leptodactylus* would have been lessened without the help of the following field companions: James R. Dixon, Miriam Heyer, Roy W. McDiarmid, Marco Tulio Pacheco, Norman J. Scott, Jr., and Charles F. Walker.

The curators of collections with which I worked were particularly gracious in providing information, lending large amounts of material and allowing dissections and skeletal preparations in certain cases (Museum abbreviations as used in the text in parentheses): James E. Böhlke, Academy of Natural Sciences, Philadelphia (ANSP); Werner C. A. Bokermann, São Paulo (WCAB); Antenor Leitao de Carvalho, Museu Nacional, Rio de Janeiro; Javier Castroviejo, Museo Nacional de Ciencias Naturales, Madrid; Doris M. Cochran and James A. Peters, United States National Museum (USNM) and field series GOV and JAP); James R. Dixon, Texas A. & M. University (TCWC); William E. Duellman, Museum of Natural History, University of Kansas (KU); Josef Eiselt, Naturhistorisches Museum, Vienna; Alice G. C. Grandison, British Museum (Natural History) (BMNH); W. Hellmich, Zoologische Sammlung des Bayerischen Staates, Munich; B. Hubendick, Naturhistoriska Museet, Göteborg; Robert F. Inger and Hyman Marx, Field Museum of Natural History (FMNH); Alan E. Leviton, California Academy of Sciences (CAS); Clarence J. McCoy, Carnegie Museum (CM); Günther Peters, Institut für Spezielle Zoologie und Zoologisches Museum, Berlin; Hobart M. Smith, formerly of Museum of Natural History, University of Illinois (UIMNH); Robert C. Stebbins, Museum of Vertebrate Zoology, University of California at Berkeley (MVZ); Paulo E. Vanzolini, Departamento de Zoologia, São Paulo (DZ); Greta Vestergren, Naturhistoriska Riksmuseet, Stockholm; Charles F. Walker, Museum of Zoology, University of Michigan (UMMZ); Ernest E. Williams, Museum of Comparative Zoology, Harvard University (MCZ); John W. Wright, Los Angeles County Museum of Natural History (LACM); Richard G. Zweifel, American Museum of Natural History (AMNH). Field series from the University of Southern California collections are designated CRE (Costa Rica), JRM (Honduras),<sup>2</sup> and PAS (Colombia).<sup>2</sup>

Robert J. Lavenberg and Mary Nafpaktitis facilitated my use of the General Electric Time Share Computer service provided by the Los Angeles County Museum of Natural History.

I acknowledge the support from two National Science Foundation Summer Fellowships for Teaching Assistants (Summers of 1964 and 1965), an NDEA Dissertation Travel Fellowship administered by the University of Southern California for travel in the summer of 1967, and a National Science

<sup>2</sup>To be deposited in the herpetological collection of the Los Angeles County Museum of Natural History.

Foundation Graduate Traineeship for full academic support for the past two years, 1966-1968.

For her constant encouragement and secretarial help, I thank my wife, Miriam.

#### SPECIES ACCOUNTS

Adult members of the *Melanonotus* species group may be confused only with those of the *Ocellatus* species group because members of both groups have extensive toe fringes as adults. The *Ocellatus* group members always have smooth dorsolateral folds, while members of the *Melanonotus* group usually do not have any indication of a dorsolateral fold, or, if such are present, they are weak and warty, never smooth.

Only brief synonymies are presented, including synonyms and generic reallocations of the valid species, as Gorham (1966) has recently published a bibliographic synonymy of the genus *Leptodactylus*.

#### *Leptodactylus dantasi* Bokermann

*Leptodactylus dantasi* Bokermann, 1959: 5-8, figs. 1-5 (Type locality, Brasil: Acre; Feijó. Holotype WCAB 1240, female).

**Diagnostic characters:** The only other species in the *Melanonotus* group with dark bellies with discrete light spots are *podicipinus* and *pustulatus*. *L. dantasi* has large light spots on the belly and lacks a metatarsal fold; *podicipinus* has small light spots on the belly and has a well developed metatarsal fold. *Leptodactylus dantasi* lacks light spots on the posterior face of the thigh, *pustulatus* has large, well defined light spots on the posterior face of the thigh.

**Summary of characteristics:** Snout rounded from above, rounded acute in profile; canthus rostralis indistinct; loreal slightly concave in cross section; tympanum distinct, horizontal diameter 0.5 eye diameter; vomerine teeth in slightly arched series, posterior to choanae; head length greater than width, 43 per cent SL; head width 39 per cent SL; interorbital distance 6 per cent SL; first finger much longer than second, first just shorter than third, second longer than fourth; no distinct ulnar ridge; back warty-pustulose, tibia with many, pronounced warts; supratympanic fold does not reach shoulder; ventrolateral glands present but not distinct; toe tips very slightly expanded, dorsal surfaces not grooved; toes with well developed lateral fringes; subarticular tubercles moderately well developed; metatarsal fold absent; tarsal fold distinct along distal two-thirds of tarsus, weakly continuous with toe fringe; tarsus and foot with many horny spicules, spicules dark on scattered warts; standard length of female holotype 68 mm; femur shorter than tibia, 37 per cent SL; tibia shorter than foot, 39 per cent SL; foot longer than femur, 48 per cent SL; upper lip barred; light outlined dark band from interorbit to sacrum; rest of back uniform; upper surfaces of limbs faintly barred; venter with large light spots on

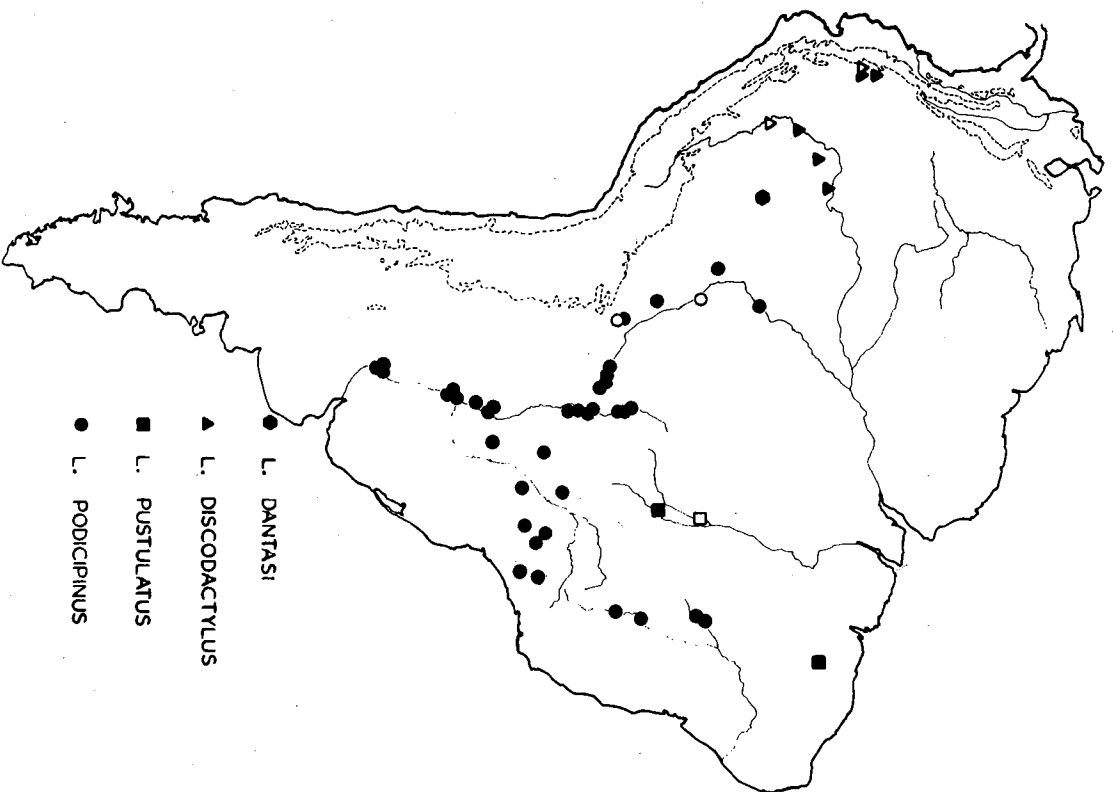


Figure 1. Geographic distribution of *Leptodactylus dantasi*, *discodactylus*, *pustulatus*, and *podicipinus*. Dashed line indicates 2000 meter contour. Open symbols indicate sites of sympatry with *wagneri*.

a dark ground, spots not always regular, spots anastomosing on limbs; posterior thigh uniformly dark.

*Distribution:* Known only from the type locality (Fig. 1), 249 m.

*Remarks:* *L. dantasi* is at present known only from the holotype.

*Leptodactylus discodactylus* Boulenger

*Leptodactylus discodactylus* Boulenger, 1883: 637, pl. 58, fig. 3 (Type locality, Peru: Loreto; Yurimaguas. Holotype BMNH 84.2.18.44, female). Gorham, 1966: 128 (Literature list, synonymy).

*Leptodactylus nigrescens* Andersson, 1945: 57-58 (Type locality, Ecuador: Río Pastaza and Río Napo, Watershed. Type series, Naturhistoriska Riksmuseet, Stockholm, unnumbered. Gorham, 1966: 132 (Literature list, synonymy).

*Diagnostic characters:* The only other species in the *Melanonotus* species group that has disk-like swellings of the toe tips is *wagneri*. The upper disk surfaces of *discodactylus* have longitudinal grooves; if disks are present in *wagneri*, the upper surfaces are never grooved.

*Summary of characteristics:* Snout rounded, subovoid, or subelliptical from above, usually rounded or rounded-ventral in profile; canthus rostralis indistinct; loreal slightly concave in cross section; tympanum distinct, horizontal diameter 0.5-0.66 eye diameter; male vocal slits elongate, arise lateral to posterior 0.25-0.33 tongue and parallel jaw almost to the angle of the jaw; single internal vocal sac in males; vomerine teeth in transverse or very slightly arched series, posterior to choanae; head length greater than width, 37-39.1-43 per cent SL; head width 32-35.2-39 per cent SL; interorbital distance 8-9.5-11 per cent SL; finger tips swollen or not; first finger longer than second, first shorter than third, second longer than or rarely equal to fourth; no spines on thumb of male; arm of male not hypertrophied; no distinct ulnar ridge; back rarely smooth to scattered with conical apicales; tibia especially scattered with conical apicales; supratympanic fold extends to shoulder; gland present at corner of mouth or not; post-tympanic gland present or absent; ventrolateral glands if present, not extensive; glands usually not present on posterior face of thigh; no chest spines on males; toe tips expanded into disks, dorsal disk surfaces grooved; toes with well developed lateral fringes; subarticular tubercles well developed; metatarsal fold present, weakly to strongly developed; tarsal fold distinct along distal 0.5-0.66 tarsus, not continuous with toe fringe; tarsus scattered with conical apicales; foot smooth, or outer sole scattered with conical apicales; standard length of males to 35 mm, females to 35 mm; femur shorter than tibia, 38-43.6-48 per cent SL; tibia shorter than foot, 43-45.8-49 per cent SL; foot longer than femur, 48-52.0-56 per cent SL; upper lip uniform or barred; interorbital region usually with a light stripe bordered behind by a dark

triangle, the dark triangle may extend to the sacral region, or uniformly dark; rest of back usually uniform, may have faint large blotches; upper surfaces of limbs barred to uniform; venter with a profusion of melanophores anteriorly only, to profuse over the entire venter; posterior thigh mottled.

*Distribution*: Known elevational range: 150-1000 m.

Known from a few localities of the upper Amazonian drainage in Ecuador and Peru (Fig. 1).

*Nomenclature*: Boulenger described *L. discodactylus* from Peru in 1883. The subsequent use of the name in the literature has been only a citation of the original description. Dr. James A. Peters allowed me to send one of his specimens, JAP 6197, to the British Museum for comparison with the holotype of *L. discodactylus*. Specimen 6197 is from the upper known elevational range of the species, and its characteristics agree with those of other high elevation populations discussed in the remarks section. Dr. Alice G. C. Grandison of the British Museum (Natural History) compared specimen 6197 with the holotype of *L. discodactylus*. She noted the departures from the holotype characters associated with elevation (see remarks section, below), but concluded that in all other aspects, including the diagnostic toe fringe, toe disks, and upper toe disk surface grooves, the specimens were identical.

Andersson described *Leptodactylus nigrescens* on the basis of three specimens from east Ecuador in 1945. His description is based upon the largest specimen. I was able to examine the largest syntype of *L. nigrescens* at the United States National Museum where Dr. Peters' private collection was available for comparison. Mr. Werner C. A. Bokermann had previously borrowed the two smaller specimens and allowed me to examine them at the National Museum. The type series is composite. The largest syntype of *L. nigrescens* possesses the diagnostic combination of toe fringe and toe disks with grooved upper surfaces of *L. discodactylus*. The other two specimens have well developed toe disks, no finger disks, no toe fringe, no tarsal fold, and two rows (1 pair) of dorsolaterally arranged conical apicalia. I consider the smaller two syntypes of *L. discodactylus* to represent *Eleutherodactylus nigrovittatus* Andersson, described in the same paper as *L. nigrescens*. In a cursory literature review, I was unable to find a senior synonym for this distinct little frog, but one may exist. To avoid future confusion, I hereby designate the largest (35 mm) specimen (the specimen has no museum number) the lectotype of *L. nigrescens*. *Leptodactylus nigrescens* Andersson is a junior synonym of *L. discodactylus* Boulenger.

*Remarks*: The few individuals available have certain differences which correlate with elevation.

Contrasting the highland samples from Ecuador (1000 m) with the lowland samples from Ecuador and Peru (150-300 m), one finds the following consistent differences (lowland population characteristics in parentheses): 1) the finger tips are not swollen (finger tips swollen, forming small disks);

2) the tarsal fold is usually distinct along the distal 0.66 of the tarsus (tarsal fold usually distinct on distal 0.5 of tarsus); and 3) smaller adult size, males to 30 mm, females to 32 mm (both males and females to 35 mm). I assume that the differences noted are responses to different climatic parameters associated with differences in elevation.

*Leptodactylus discodactylus* has been taken in sympatry with *L. wagneri* at two localities, Ecuador: Pasaza; Puyo, 1000 m and Peru: Loreto; Río Tamaya, Sobral, 150 m.

*Leptodactylus melanonotus* (Hallowell)

*Cystignathus melanonotus* Hallowell, 1860: 485 (Type locality, Nicaragua. Type apparently lost).

*Cystignathus echinatus* Brocchi, 1877: 181-2 (Type locality, Guatemala: Río-madre Nieja. Syntypes Paris Museum 6322-3).

*Cystignathus microtis* Cope, 1879: 265 (Type locality, Mexico: Guanajuato; Guanajuato. Syntypes USNM 9906, 9908, 9909).

*Cystignathus perlaevis* Cope, 1879: 269-270 (Type locality, Mexico: Oaxaca; Japana. Holotype USNM 10041, female).

*Leptodactylus melanonotus*, Brocchi, 1881: 20 (Cites Hallowell's record). Gotham, 1966: 131 (Literature list, synonymy).

*Leptodactylus occidentalis* Taylor, 1937: 349-52, pl. 1, figs. 1, 2, 7 (Type locality, Mexico: Nayarit; Tepic. Holotype FMNH 100015, female). Gotham, 1966: 133 (Literature list, synonymy).

*Diagnostic characters*: There is no one character that immediately distinguishes *L. melanonotus* from the other members of the *Melanonotus* species group. The toe disks of *L. discodactylus* distinguish it from *L. melanonotus* (toe tips not expanded into disks). *Leptodactylus dantasi*, *L. podicipinus*, and *L. pustulatus* have dark bellies with discrete light spots; *L. melanonotus* may have a dark belly, but it is mottled and never distinctly spotted. Certain few individuals of *L. melanonotus* are difficult to distinguish consistently from *L. wagneri* (*L. melanonotus* characters in parentheses): *L. wagneri* may have the toe tips expanded into distinct disks (toe tips never disk-like); *L. wagneri* may have a light longitudinal stripe on the posterior face of the thigh (no distinct stripe); *L. wagneri* reaches a larger adult size, standard length of males to 63 mm, females to 81 mm (males to 46 mm, females to 50 mm). The only way to distinguish consistently *L. melanonotus* from *L. wagneri* is by geography. *Leptodactylus melanonotus* is distributed from Mexico through Middle America, and west of the Andes in South America. *Leptodactylus wagneri* is found east of the Andes in South America.

*Summary of characteristics:* Snout rounded-nearly semicircular, rounded, rounded-subelliptical, or rarely subovoid from above, rounded to rounded-vertical in profile; canthus rostralis indistinct; loreal slightly concave in cross section; tympanum distinct, horizontal diameter 0.5 to 0.75 eye diameter; male vocal slits elongate, arise lateral to mid-point of tongue to almost the angle of the jaw, usually parallel to jaw, rarely slightly oblique to the jaw; single internal vocal sac in males; vomerine teeth usually in transverse series, rarely very slightly arched, always posterior to the choanae; head usually longer than wide, rarely equal, or rarely head length shorter than wide, head length 30-36.3-41 per cent SL; head width 30-34.1-38 per cent SL; interorbital distance 5-7.2-9 per cent SL; finger tips not noticeably swollen; first finger just longer than or about equal to second, first shorter than third, second longer than fourth; finger ridges present, especially on second and third fingers; 2 spines on male thumb; male arm not hypertrophied; ulnar ridge not developed; head smooth or scattered with conical apical; upper eyelids warty, glandular or smooth, usually lacking conical apical; rest of back with scattered conical apical; the conical may be on warts or not; upper femur and tibia scattered with conical apical; supratympanic fold extends to shoulder, rarely indications of several warty dorsolateral folds; brown to orange ventrolateral glands poorly to extensively developed, same glandular material may or may not be on jaw angle, post-tympanic region, groin, posterior thigh, or inner tibia and along the tarsal fold; no chest spines on male; toe tips usually not expanded, sometimes slightly expanded, never disk-like, never with dorsal surfaces grooved; toes with well developed lateral fringes; subarticular tubercles well developed; metatarsal fold present, weakly to well developed; tarsal fold distinct along distal 2/3-5/6 tarsus, not continuous with toe fringe; tarsus with scattered conical apical; foot smooth, with scattered conical apical; or conical apical on outer sole only; standard length of males to 46 mm, females to 50 mm; femur longer than equal to, or usually shorter than tibia, 36-40.0-45 per cent SL; tibia shorter than foot, 37-42.7-47 per cent SL; foot longer than femur, 43-49.3-53 per cent SL; upper lip barred to uniform; interorbit with dark, light outlined triangle, a light and dark bar, or a light triangle reaching tip of snout anteriorly, bordered posteriorly by a dark triangle; rest of back brown to gray with darker indistinct spots, blotches, bands, stripes, or without pattern; upper limb surfaces barred to uniform; venter with few melanophores, appearing light to many melanophores profused especially anteriorly to rarely heavily profused over entire venter; posterior thigh mottled.

*Distribution:* Elevational range: sea level—1440 m. The species is known from both coasts of Mexico—Hermosillo, Sonora and the Gómez Farias region, Tamaulipas in the north, extending southward throughout Middle America. The species is known only from the western lowlands of South America to mid-Ecuador. (Figs. 2-4.)

*Nomenclature:* The holotype of *Cystignathus melanonotus* Hallowell is

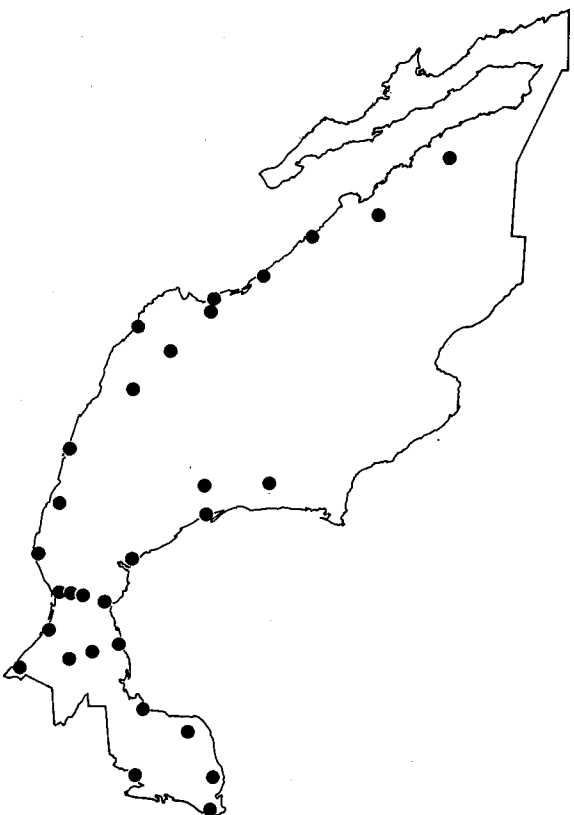


Figure 2. Geographic distribution of *Leptodactylus melanonotus* in Mexico.

apparently lost. The late E. R. Dunn noted (Dr. Dunn's notes presently on deposit in the library of Dr. Jay M. Savage) that the type was originally deposited in the National Museum as specimen number 6264 and that it was missing. The specimen is not listed in the catalog of type specimens of reptiles and amphibians in the U.S. National Museum (Cochran, 1961). In recent visits to the U.S. National Museum, although aided by the late Dr. Cochran and by Dr. Peters, I was unable to locate the type. The evidence indicates that the original holotype is lost.

*Leptodactylus melanonotus* is very closely related to both *L. wagneri* and *L. podicipinus*. *L. melanonotus* is found in Mexico and Middle America, where there is relatively little question as to what the species is. *L. melanonotus* is found west of the Andes and some individuals are very difficult to differentiate consistently from some individuals of *L. wagneri*, an Amazonian species. For nomenclature stability, the name *L. melanonotus* should be applied to a single specimen from the population found in Nicaragua, the type locality of the original, now lost, holotype. I therefore designate specimen number 84848 in the collection at the University of Kansas, an adult male, from Nicaragua, Zelaya, Bonanza, as the neotype of *Cystignathus melanonotus* Hallowell.

I have examined the holotype and two paratypes of *Cystignathus microtis*

