

A NEW SPECIES OF FROG FROM NORTHEASTERN COLOMBIA (GENUS *ELEUTHERODACTYLUS*: LEPTODACTYLIDAE)

por

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Resumen

Lynch, J. D.: A new species of frog from northeastern Colombia (genus *Eleutherodactylus*: Leptodactylidae). Rev. Acad. Colomb. Cienc. **27** (103): 287-289, 2003. ISSN 0370-3908.

Se describe una especie nueva de rana del grupo *Eleutherodactylus nigrovittatus* de los bosques de niebla de Santander. La especie nueva se parece a *E. nigrovittatus* de la cuenca Amazónica, pero igualmente esta relacionada con las especies andinas *E. latens* y *E. mantipus* de las cordilleras Central y Occidental. Con base en un análisis filogenético, se señala que el hábitat primitivo para las ranas de este grupo es el páramo, desde donde se han desplazado progresivamente hacia menores altitudes.

Palabras clave: Cladística, *Eleutherodactylus*, taxonomía.

Abstract

A new species of frog of the *Eleutherodactylus nigrovittatus* group is described from cloudforests in northern Santander. The new species is most similar to *E. nigrovittatus* of the Amazon basin but is equally closely related to the Andean *E. latens* and *E. mantipus* found on the Central and Western cordilleras. Based on a phylogenetic analysis, the primitive habitat for frogs of this species group is paramo with subsequent downward movement.

Key words: Cladistics, *Eleutherodactylus*, taxonomy.

Introduction

The *Eleutherodactylus nigrovittatus* group was treated by **Lynch** (1989) who recognized four species. The group

is of some biogeographic interest because while three species are Andean (in Colombia and Ecuador), the fourth also occurs in the lowlands of the Amazon Basin in Brazil, Colombia, Ecuador, and northern Peru. Subsequently, **Duellman & Pramuk** (1999) added an additional Andean species from northern Peru. I recently had occasion to examine a collection of frogs made in Santander and was

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surprised to discover an additional species of the *E. nigrovittatus* group, also Andean. Although the species is represented by a single male specimen, given the group's importance in understanding the role of the Andes in the evolution of the group (Lynch, 1999) and my recognition that I could place it in my earlier cladogram, I decided to describe it.

***Eleutherodactylus adercus* sp. nov.**

Holotype: ICN 47772 (original field number JMD 799), a male obtained by Juan Manuel Daza and Eliana M. Muñoz on 6 of October 2001.

Type-locality: COLOMBIA, Departamento de Santander, municipio de Betulia, vereda El Centro, 2280 m.

Diagnosis: (1) Skin of dorsum and venter smooth, no dorsolateral folds; discoidal folds present; (2) tympanum round, 37.5% length of eye; (3) snout short, subacuminate in dorsal view, sloping toward lips; (4) upper eyelid width less than interorbital distance; no cranial crests; (5) vomerine odontophores prominent, triangular in outline; (6) vocal slits present; no nuptial excrescences; (7) first finger longer than second; fingers lack discs and ventral pads, (8) fingers lack lateral fringes or keels; (9) ulnar tubercles absent; (10) heel and tarsus lacking tubercles or folds; (11) inner metatarsal tubercle oval, 2-3 times size of outer metatarsal tubercle; no supernumary plantar tubercles; (12) toes lacking lateral fringes and webbing; Toe V shorter than Toe III; toes bearing expanded disks, pointed at tip; (13) dorsum brown, flanks darker, throat brown, venter cream with brown reticulum; posterior surfaces of thighs brown with cream flecks and large cream spot behind knee; (14) one adult male 18.8 mm SVL.

Eleutherodactylus adercus is most similar to *E. nigrovittatus* but differs in lacking tubercles along the outer edge of the tarsus, in having vocal slits, and in having smooth, not shagreened skin on the dorsum.

Description: Head broader than body; snout subacuminate, sloping in lateral view; nostrils weakly protruding, directed dorsolaterally; canthus rostralis straight; loreal region concave, sloping abruptly to lips; lips not flared; upper lip bearing fleshy fold; upper eyelid bearing a few low tubercles; interorbital space flat, broader than upper eyelid; supratympanic fold obvious, obscuring upper edge of tympanum; tympanum round, separated from eye by its own diameter; two non-conical postrictal tubercles; choanae small, not concealed by palatal shelf of maxillary arch; vomerine odontophores median and posterior to choanae, triangular in outline, bearing a row of 6–7 teeth, slanting posteriorly; tongue longer than wide, not notched

posteriorly, posterior 1/5 not adherent to floor of mouth; short vocal slits posterolateral to tongue.

Skin of head and dorsum smooth, that on flanks granular, of venter smooth; occipital folds present but no dorsolateral folds; no anal sheath; discoidal fold just anterior to groin; no ulnar folds or tubercles; thenar tubercle oval, smaller than bifid palmar tubercle; supernumerary tubercles few, flattened; subarticular tubercles of fingers round, non-pungent; fingers lacking lateral fringes; fingers lacking discs, finger III pointed, others rounded at tips, digits lacking circumferential grooves, first finger slightly longer than second.

Heel and tarsus lacking tubercles or folds; inner metatarsal tubercle oval, length 2 ½ times width; outer metatarsal tubercle 1/3 to ½ size of inner metatarsal tubercle; sole lacking plantar supernumary tubercles; subarticular tubercles of toes round, non-conical; toes lacking lateral fringes or keels; toes bearing prominent discs, those on toes II–IV 1 ½ times width of digit below disc, those of Toes I and V scarcely wider than digit; pads defined by circumferential grooves; discs pointed, except on Toe V (rounded); Toe V almost reaches penultimate subarticular tubercle of Toe IV, Toe III reaches ½ way between penultimate and distal subarticular tubercles of Toe IV; when flexed hindlimbs held perpendicular to sagittal plane, heels barely overlapping.

Coloration in alcohol: Dorsum brown with pale brown snout and pale spot on lower back; fleshy protuberance on snout cream; flanks darker brown; throat brown with cream flecks; venter cream with brown reticulation; dark brown anal triangle; posterior surface of thighs brown with cream flecks and large cream spot behind knee.

Coloration in life: Dorsum dark brown; throat and abdomen dark gray; undersides of feet dirty yellow; iris dark with some metallic golden flecks; pale brown line along canthus rostralis to tip of snout.

Measurements of holotype in mm: SVL 18.8; shank 8.3; head width 7.0; head length 7.6; chord of head length 7.8; upper eyelid width 1.4; interorbital diameter 1.9; tympanum length 0.9; eye length 2.4; eye to nostril distance 1.5.

Etymology: Greek, *aderkes*, meaning unseen or unexpected.

Natural history: The holotype is an adult male and like most other species has a pale fleshy fold on the snout (except *E. elassodiscus*; males are unknown for *E. araidactylus* but, given its placement in the cladogram, I

predict that they will lack the fleshy fold on the snout) . In other species, this structure is seen only in males and is probably involved either in courtship or in excavating a burrow for eggs. The holotype was found in leaf litter in mature forest during the day.

Remarks: Lynch (1989) proposed a cladogram, based on three osteological and three non-osteological characters, for the four species then-known: *E. elassodiscus*, *E. latens*, *E. mantipus*, and *E. nigrovittatus* wherein the species were related as follows—(*elassodiscus* (*nigrovittatus* (*latens* *mantipus*))). Subsequently Duellman & Pramuk (1999) named *E. araiodactylus* from the Andes of northern Peru. My interest in this group stemmed from my observation of what I then-thought, and still think, to be a peculiar distribution. Of the five species, four are Andean, whereas *E. nigrovittatus* is distributed primarily in the western Amazonian lowlands but also on the Amazonian slopes of the Ecuadorian Andes (to 1935 m). With the addition of *E. adercus*, the Andean dominance is further evidenced. No osteological data are available for *E. araiodactylus* and the only osteological characters that I can score for the unique holotype of *E. adercus* are character 1 (large sphenethmoid extending anteriorly—the derived condition) and character 6 (quadratojugal not enlarged—primitive condition and uninformative).

In spite of not being able to score four characters for *E. araiodactylus* and one for *E. adercus*, the least refuted hypothesis of relationships (Fig. 1) for the six species is largely resolved (a trichotomy at the base). In my evolving effort to understand what is happening in the evolution of the genus *Eleutherodactylus*, I (Lynch, 1999) mapped habitat onto the topologies of several cladograms in order to discover which was the ancestral habitat and to specify all habitat changes, where habitat was assumed to be congruent with the altitudinal ranges of the species involved. Lynch's (1999) simple classification of habitat was thus: A (0-900 m), B (901-1800 m), C (1801-2700 m), D (2701-3200 m), and E (> 3201 m). Thus, *E. araiodactylus* and *E. elassodiscus* are scored E, *E. latens* is scored D, *E. adercus* is scored C, *E. mantipus* is scored B, and *E. nigrovittatus* is scored AB. Using this classification, and assuming that *E. araiodactylus* does not have the derived condition for character 1, the primitive habitat for the group is páramo (E) and the remaining four species emerged from an ancestor who descended the Andean slopes. Further resolution of primitive states is not possible but the conclusion that there were subsequent movements up and downslope is inescapable. This species group thus presents the most complex scenario of the ten cases analyzed.

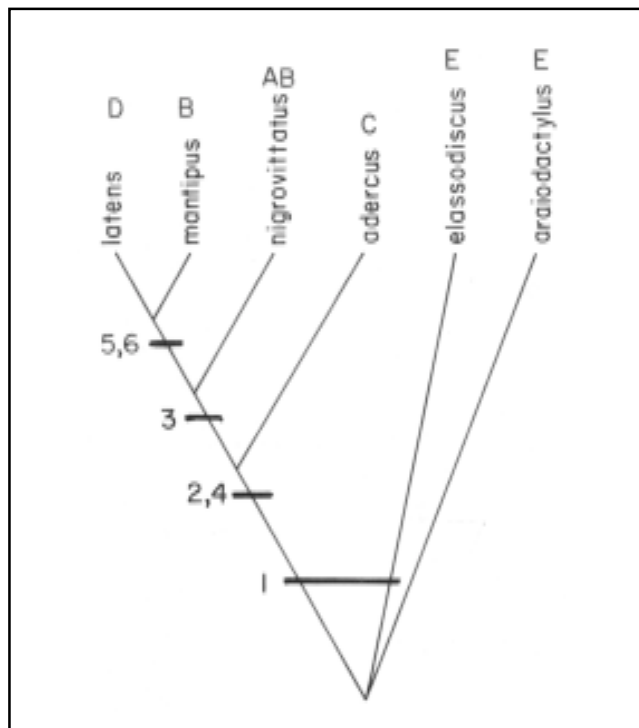


Figure 1. Cladogram of the six species of the *Eleutherodactylus nigrovittatus* group. Characters are those identified by Lynch (1989), some of which are mentioned in the text. The habitat (following Lynch, 1999) is indicated above the species name in upper case letters (see text).

Acknowledgments

I am grateful to Vivian Páez, Universidad de Antioquia, and Martha Patricia Ramírez, Universidad Industrial de Santander, for making available laboratory space and for their encouragement to describe this frog. Juan Manuel Daza shared his fieldnotes. Vivian Páez donated the unique holotype to the Amphibian collection of the Instituto de Ciencias Naturales.

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