

*Eleutherodactylus muricatus* appears to have a spotty distribution, somewhat analogous to that seen in other anurans in this region (Lynch 1977). *E. muricatus* has not been collected at the Río Orito, a locality very close to the type locality, despite several visits by field parties from the University of Kansas. More field work is needed to confirm the spottiness of the distribution.

*Eleutherodactylus tenebrionis*

**Holotype:** MCZ 90326, an adult male collected at the Hotel Tinalandia, 16 km E Santo Domingo de los Colorados by road, Provincia Pichincha, Ecuador, 800 m, on 6 August 1975 by Ken Miyata.

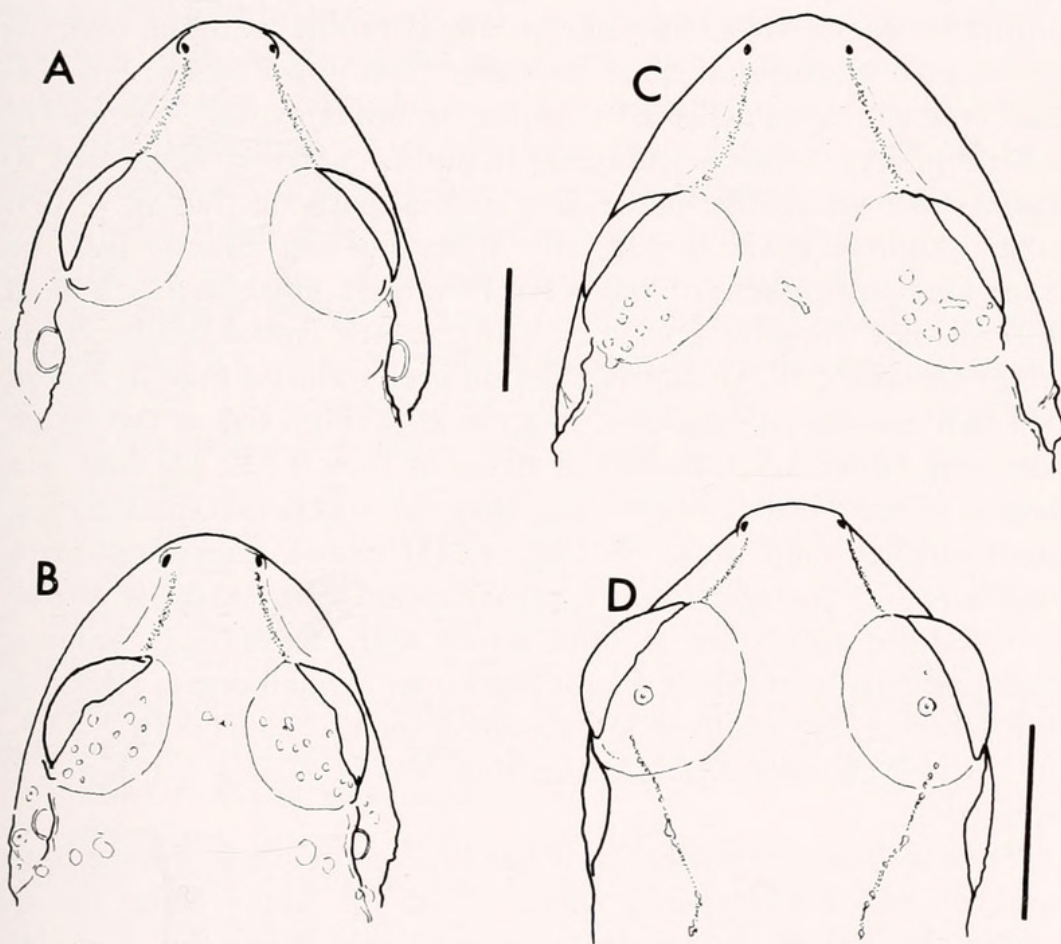


Figure 2. Outlines of heads of western Ecuador *Eleutherodactylus*. (A) *E. crenunguis*, MCZ 92099; (B) *E. muricatus*, MCZ 92095; (C) *E. latidiscus*, cotype, BM 98.4.28.109; (D) *E. tenebrionis*, MCZ 92081. Scale for A-C is between figs. A and C; that for D is to its right. Scales equal 5 mm.



*Paratypes:* MCZ 88890, 90325, 90327–29, 92079–81, 94712, topotypes; KU 179224–27, Santo Domingo de los Colorados, Provincia Pichincha, 580 m; KU 179228–30, 2 km E, 1 km S Santo Domingo de los Colorados, Provincia Pichincha, 600 m; MCZ 97596–97, USNM 211176, Centinela, 14.1 km SE Patricia Pilar by road, Provincia Pichincha, 570–600 m; KU 146171, 165874–77, MCZ 94864–65, 94867, 98164–66, USNM 211175, Centro Científico Río Palenque, 47 km S Santo Domingo de los Colorados by road, Provincia Pichincha, 170–220 m.

*Diagnosis.* 1) Skin of dorsum smooth with occasional tubercles, that of venter areolate; no dorsolateral folds; no anal sheath; 2) tympanum distinct, round, its length  $1/4$ – $2/5$  eye length; 3) snout round in dorsal view, truncate in lateral profile; canthus rostralis distinct; 4) interorbital space narrower than upper eyelid; low cranial crests in females; small tubercle on upper eyelid; 5) vomerine odontophores elevated, triangular in outline, narrowly separated; 6) males with vocal slits; males lack nuptial pads on thumb; 7) first finger shorter than second; all digits bearing broad discs on expanded pads, pads of fingers III–IV largest, emarginate, those of I–II smaller, rounded apically; 8) fingers lack lateral fringes; 9) no ulnar tubercles; 10) small tubercles on heel, none on knee or tarsus; 11) two metatarsal tubercles, inner oval, 4 times size of flat outer; low supernumerary tubercles at bases of toes II–IV; 12) toes lack lateral fringes; discs broader than long on weakly emarginate pads, pads smaller than those on fingers; 13) brown above with little indication of pattern (Fig. 1); venter cream with extensive brown reticulation; undersides of limbs brown with cream flecks; anterior and posterior surfaces of thighs brown with small cream flecks; in life, iris blue; 14) adults moderate-sized, males  $20.8$ – $26.8$  ( $\bar{x} = 23.8 \pm 0.9$ ,  $n = 16$ ) mm SVL, females  $30.6$ – $36.9$  ( $\bar{x} = 33.8 \pm 1.6$ ,  $n = 7$ ) mm SVL.

*Eleutherodactylus tenebrionis* has no close relatives known to us except for an undescribed species from the upper cloud forests (2000–2700 m) in Provincias Imbabura and Pichincha, Ecuador (Lynch and Trueb, in press) which differs from *E. tenebrionis* in having prominent conical tubercles on the forearm, tarsus, and upper eyelid and a calcar on the heel.

*Description.* Head as wide as or wider than body, wider than



long; HW 37.0–41.4 per cent ( $\bar{x} = 39.3$ ,  $n = 23$ ) SVL; snout round in dorsal view, truncate in lateral profile; E-N in males 72.0–84.8 per cent ( $\bar{x} = 77.9$ ,  $n = 16$ ) eye length, in females 75.9–87.0 ( $\bar{x} = 82.9$ ,  $n = 7$ ); nostrils protuberant, directed laterally; canthus rostralis distinct, weakly concave; loreal region concave, sloping abruptly in males and gradually in females to lips; lips not flared (Fig. 2); upper eyelid 110.3–165.7 per cent ( $\bar{x} = 125.8$ ,  $n = 23$ ) IOD, bearing 1–2 small conical tubercles; adult females have low cranial crests (not evident in smaller frogs); lower  $3/4$  of tympanum distinct, upper edge hidden by diffuse supratympanic fold; tympanum separated from eye by almost its length; tympanum length in males 25.0–35.0 per cent ( $\bar{x} = 29.4$ ,  $n = 16$ ) eye length, in females 29.6–38.5 ( $\bar{x} = 32.9$ ,  $n = 7$ ); small postrectal tubercles present; skin on rest of head smooth; choanae longer than wide, not concealed by palatal shelf of maxillary arch; vomerine odontophores median and posterior to choanae, pungent, triangular in outline, bearing 5–7 teeth in a transverse row, separated on midline by a space equal to  $1/3$ – $1/2$  of odontophore width; odontophores nearly as large as a choana; tongue longer than wide, its posterior border notched, posterior  $1/5$  not adherent to floor of mouth; male with vocal slits.

Skin of dorsum essentially smooth but some small, low, flat warts on lower back (in a few examples these warts are pungent) and a few tiny warts scattered on back; no dorsolateral folds; flanks become areolate, areolation continuing onto venter; throat smooth; discoidal folds present; no anal sheath; no ulnar tubercles; palmar tubercles bifid (outer lobe the smaller), as large as or smaller than oval thenar tubercle; if present, supernumerary palmar tubercles flat, indistinct; subarticular tubercles relatively low, round; fingers lacking lateral fringe or keel; all fingers bearing broader than long discs; pad smallest on I, intermediate on II, largest on III and IV; pad of III as large as tympanum; pads on III and IV feebly emarginate; II longer than I; males lack nuptial pads.

No tubercles on knee or tarsus; 1–2 small tubercles on heel; inner metatarsal tubercle twice as long as wide, outer  $1/4$  (or less) size of inner, flat; supernumerary plantar tubercles low, at bases of toes II–IV; subarticular tubercles longer than wide, not conical; toes lack lateral fringes, bearing broad discs on expanded, feebly emarginate pads (toe pads smaller than those on outer fingers); heels of flexed hind legs overlap; shank of males 52.8–62.5 ( $\bar{x} = 57.9$ ,  $n = 16$ ) per cent SVL, of females 52.2–59.7 ( $\bar{x} = 56.1$ ,  $n = 7$ ).



Brown above with diffuse dark brown or black scapular "W", supratympanic stripe, interorbital bar, and indefinite sacral chevron; canthal stripe, labial bars, anal triangle brown, not distinct; limb bars brown, nearly transverse on shanks, about as wide as interspaces; flanks pale brown (cream invasion of brown); venter cream with dense fine brown reticulation; some cream flecks on limbs, fewest on underside of shank; throat and breast heavily stippled with brown (relative to venter); anterior and posterior surfaces of thighs (and groin) brown with small cream flecks.

In life, *E. tenebrionis* is burnt umber with black and dull golden flecks above; the venter is gray with gray-brown mottling. The iris is gray-blue. At night they tend to be a much paler yellowish-tan dorsally with prominent black spots in the shoulder region.

*Measurements of Holotype* (in mm). SVL 26.4; shank 15.0; HW 10.8; head length 10.4; upper eyelid 3.0; IOD 2.6; tympanum length 1.4; eye length 4.4; E-N 3.3.

*Etymology.* The specific epithet is derived from the Latin, meaning a lover of darkness, in reference to the restriction of *E. tenebrionis* to primary forest.

*Natural History.* *Eleutherodactylus tenebrionis* is restricted to primary forest, where it is most frequently found at night on low vegetation along stream courses. The lowland rain forests in western Ecuador which this species inhabits are characterized by full canopies and relatively sparse understories. Epiphytes are especially prominent in these wet forests, and some of the lowland forests appear superficially like cloud forest. Much of this region is covered with clouds during the dry season which encourages this lush growth even though annual rainfall is only moderately heavy (Dodson and Gentry 1978).

The preference of *E. tenebrionis* for streamside vegetation appears to be real and not a sampling bias. One of us (KM) has spent considerable time working study plots in primary forest at Rio Palenque located on top of a plateau and lacking any streams and has never encountered *E. tenebrionis* there. Along the small creeks elsewhere in the Rio Palenque forest they are encountered regularly, if not commonly. The specimens from Centinela likewise all came from along a small forest stream rather than from the primary ridgetop forest or the recently cleared hillside forest. At Tinalandia



occasional individuals were found perched on low vegetation within 2 m of the ground along a hillside about 30 m above stream level, but this area at 800 m elevation is more mesic than the lower localities.

### DISCUSSION

The flared lips and long snouts of *E. crenunguis*, *E. latidiscus*, *E. muricatus*, and *E. rubicundus* are in marked contrast to the condition seen in *E. tenebrionis* (Fig. 2). All of these species share the narrow IOD, a relatively uncommon trait among *Eleutherodactylus* (Fig. 2). Low cranial crests are present in most of these species (except *E. muricatus*) but are generally evident only in adult females. These traits are also exhibited by *E. cruentus* (Peters), a species sometimes confused with *E. latidiscus* which may be allied to *E. crenunguis* and *E. latidiscus* (Lynch 1976). As noted by Lynch (in press) only *E. crenunguis*, *E. latidiscus*, and *E. rubicundus* of the *rubicundus* assembly have emarginate digital pads. We can now add *E. muricatus* to this list but we are not convinced that these four species are more closely related to one another than any is to the other two known species of the assembly. The weakly emarginate digital pads of *E. tenebrionis* are not convincing evidence of its relationship with the *rubicundus* assembly; its snout physiognomy suggests that it is allied elsewhere.

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**A NEW SPECIES OF *ATELOPUS*  
(ANURA: BUFONIDAE)  
FROM THE CLOUD FORESTS  
OF NORTHWESTERN ECUADOR**

KENNETH MIYATA<sup>1</sup>

**ABSTRACT:** *Atelopus coynei* is described from the Río Faisanes in Pichincha Province, Ecuador. It appears to have an extremely restricted distribution and may be in danger of extinction as its habitat is altered by man. The new species is most closely to *Atelopus mindoensis*.

INTRODUCTION

The western slope of the Andes in northern Ecuador has a rich anuran fauna, much of which has been described only within the past decade. Until recently access to this area has been difficult due to its precipitous terrain and dense blanket of montane forest. Many species appear to have restricted distributions and it is not surprising that they were missed by early collectors. Within this forested zone, which extends up to at least 3000 m elevation, there are several distinct assemblages of frogs. Maximum species diversity apparently occurs between 1000 and 1600 m. Many of these species are very restricted in distribution; few are known from outside Ecuador. My field work in this region revealed the presence of an apparently new species of frog of the genus *Atelopus* that seems to exhibit an exceptionally restricted distribution even in comparison with other elements of this fauna. Despite extensive collecting efforts in the cloud forests of western Ecuador by myself and field parties from the Museum of Natural History of the University of Kansas, this new species remains known from only two localities within a few kilome-

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ters of each other. Given the rather precarious status of these habitats as human development encroaches, I take the opportunity here to describe this species before the populations become extinct.

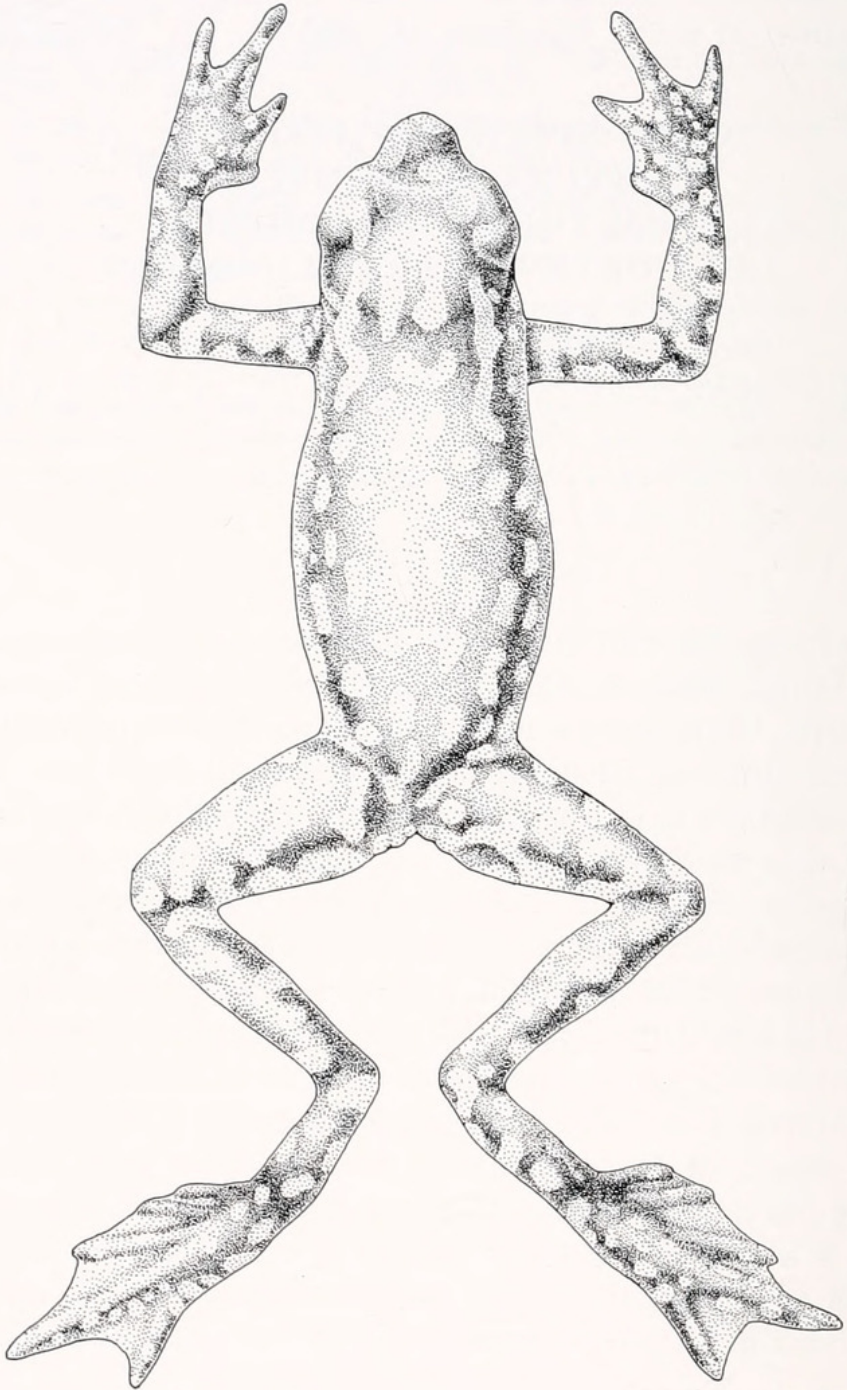


Figure 1. Dorsal view of holotype of *Atelopus coynei* (MCZ 91444).



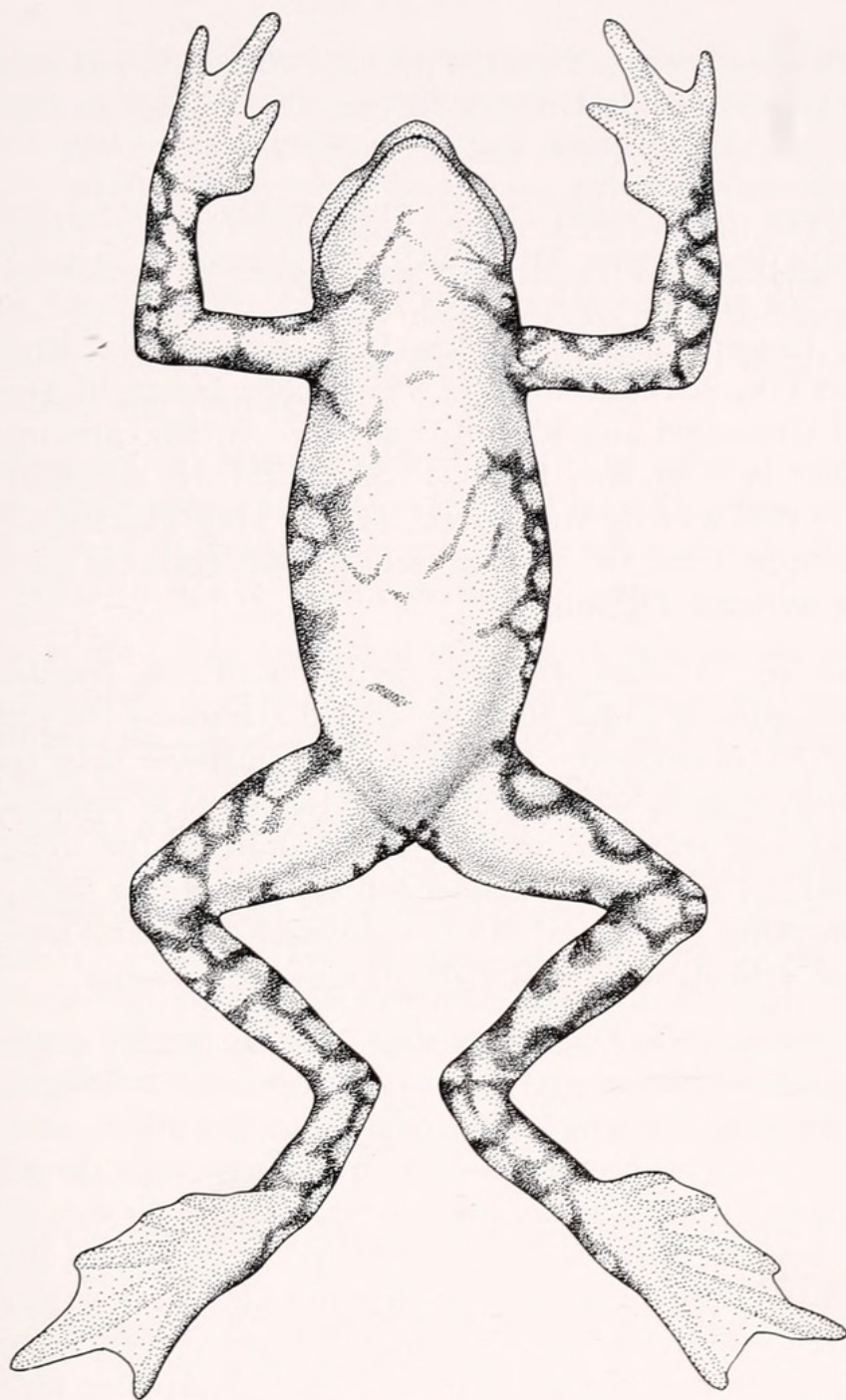


Figure 2. Ventral view of holotype of *Atelopus coynei* (MCZ 91444).

*Atelopus coynei* sp. nov.

*Holotype:* MCZ 91444, an adult male, one of a series collected on the banks of the Río Faisanes where it crosses Ecuador Highway 28 (the road from La Palma to Quito via Chiriboga), 14.4 km from the junction with Highway 30 (the Aloag to Santo Domingo de los



Colorados road) at La Palma, Pichincha Province, Ecuador, 1380 m, on 11 July 1976 by Godfrey Guynn, Kay Harker, Steven Kaal, Ken Miyata, David Paul, and Harrison Weed.

*Paratypes.* Topotypes: MCZ 91445-91449, 96775-96756, collected with the holotype; MCZ 91450, collected on 7 August 1976 by Jerry Coyne and Ken Miyata; MCZ 95411, collected on 8 January 1978 by Lauren Cardullo, Andrea Dion, Ken Miyata, Hugh Torbert, and Lisa Schwadron; MCZ 95676, collected on 30 April 1978 by Paul Greenfield and Ken Miyata; MCZ 96754, collected on 12 November 1977 by Ken Miyata; USNM 211171, collected on 17 February 1979 by Roy McDiarmid. From 4 km E Dos Rios, Pichincha Province, Ecuador, 1140 m: KU 164744, collected on 2 April 1975 by William Duellman.

*Diagnosis.* A small *Atelopus* (males to 23 mm, females to 32 mm) distinguished from all other known species by the following combination of characters: 1.) Hind limbs relatively long, the heels overlapping slightly when held parallel to femora at right angles to the body and reaching or just falling short of the orbit when adpressed. 2.) First finger almost entirely buried in a thick, rather fleshy webbing. 3.) Ventral pattern consisting of a sparse network of fine dark reticulations on a light opaque background.

*Description.* Head narrower than body, somewhat longer than wide. Snout projecting past tip of lower jaw, rounded from above. Projecting snout forming fairly sharp right angle above and in front of nostril in lateral profile. Nostrils opening laterally about 2/3 of way from anterior margin of orbit to tip of snout, directly above or slightly behind tip of lower jaw. From above, canthi diverging slightly from behind nostrils to a point just anterior of orbits where they diverge outward more abruptly. Canthus rostralis rounded with slight depression in loreal region. Interorbital space wider than upper eyelid. Tympanum hidden. Skin on head generally smooth with some very sparse and fine granulation.

Dorsum finely shagreened, dorsolateral folds absent. Venter and sides with numerous plate-like folds, smallest and most distinct on throat and neck, becoming larger and less distinct on sides and towards cloaca. Pair of narrow low ridges on dorsum in parotoid region.

Forearm slightly thicker than upper arm. Forefeet fleshy with thick webbing. First finger almost buried in fleshy webbing with only the tip free. Other fingers basally webbed with lateral fringes





Miyata, Kenneth. 1980. "A new species of *Atelopus* (Anura: Bufonidae) from the cloud forests of northwestern Ecuador." *Breviora* 458, 1–10.

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