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## A New *Atelopus* from Ecuador and Colombia

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**ABSTRACT**—A new species of *Atelopus* from the lower Pacific slopes of northern Ecuador and southern Colombia is distinguished from its congeners by the shape of the snout, skin texture, coloration, and lack of a distinct pattern. Some specimens of the new species previously have been confused with *Atelopus longirostris*.

\* \* \*

### INTRODUCTION

Peters (1973) reviewed the bufonid genus *Atelopus* in Ecuador and included four species from the Pacific versant: *Atelopus balios* Peters, *A. elegans* (Boulenger), *A. longirostris* Cope, and *A. mindoensis* Peters. Miyata (1980) added *A. coynei* to this list of species. Of these five species, *A. elegans* and *A. longirostris* have been reported from Colombia by Rivero (1963, 1968) and Cochran and Goin (1970). Peters (1973) commented that the *A. longirostris* from Colombia probably represented a taxon distinct from Ecuadorian *A. longirostris*. Fresh material of this unnamed species has been collected recently on the Colombia-Ecuador border at Maldonado, Ecuador.

This new harlequin frog differs from its often colorful congeners by its dull brown coloration. Part of the type-series was collected by John D. Lynch, and in recognition of his efforts I associate his name with this rather nondescript brown frog.

*Atelopus lynchi* sp. nov.

Fig. 1

*Atelopus longirostris*—Rivero, 1963:112, 1968:22; Cochran and Goin, 1970:141.

**Holotype**.—University of Kansas Museum of Natural History (KU) 178412, adult male (snout-vent length 34.5 mm), collected 28 May 1977, at Maldonado, Provincia Carchi, Ecuador, 1410 m, 01°00'N, 78°11'W, by John D. Lynch.

**Paratypes**.—KU 178413-416, collected 28–30 May 1977 at the type-locality by John D. Lynch, Thomas J. Berger, and David C. Cannatella.

**Diagnosis**.—(1) Body and limbs elongate; tibia length/SD equals 47.7–52.1%;  $\bar{x}$  = 50.3%, (2) snout long and protruding; (3) fingers slender, basally webbed; toes fully webbed; (4) skin relatively smooth, lacking warts or pustules; (5) tympanum, tympanic ring, columella, and middle ear absent; (6) in life, dorsum brown and patternless; apex and canthus of snout, upper lip, postorbital ridge, and dorsal markings indistinct dull yellow-gray; throat cream, venter dull blue-gray.

*Atelopus lynchi* is referable to the *longirostris* group of *Atelopus* (Peters, 1973) on the basis of the elongate snout, body and limbs. This group is a loose cluster of species generally occurring at elevations below 2000 m. Peters (1973) introduced this group name in reference to Ecuadorian species, but its utility extends to members of the genus throughout its range.

The coloration and absence of pattern distinguish *A. lynchi* from all members of the *longirostris* group (*sensu lato*), except *A. carauta* Ruiz-Carranza and Hernández-Camacho. The color in life of *A. carauta* is not known; its color in preservative is brown (Ruiz-Carranza and Hernández-Camacho, 1978), thus resembling that of *A. lynchi*. *Atelopus carauta* differs from *lynchi* in having a

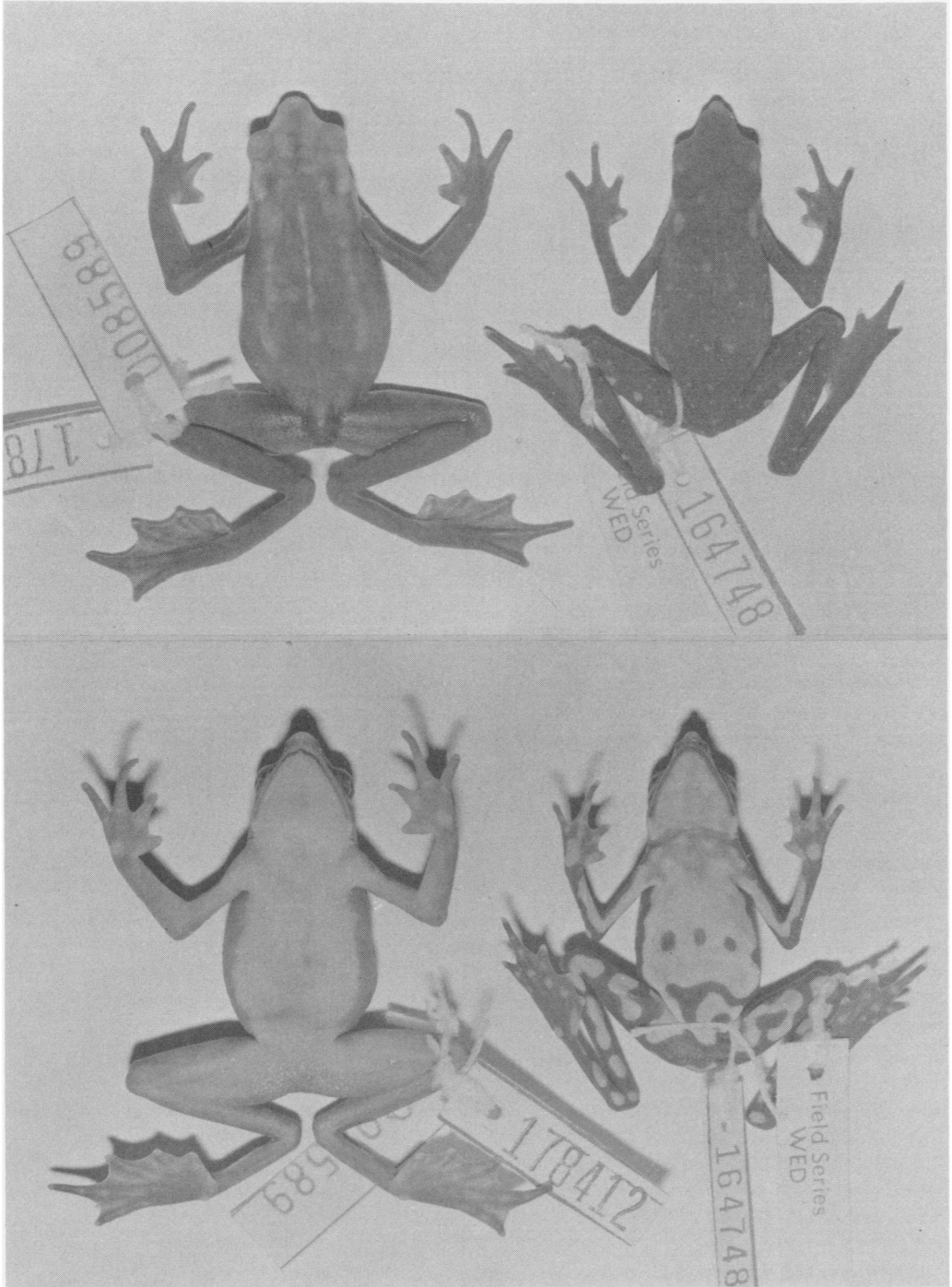


FIGURE 1. Dorsal and ventral views of *Atelopus lynchi* holotype (left), KU 178412, male, and *A. longirostris* (right), KU 164748, male.

more elongate head with a narrower and more protruding snout. In addition, Ruiz-Carranza and Hernández-Camacho (1978) reported that the sacro-coccygeal articulation of *A. carauta* is monocondylar; the articulation is bicondylar in the single dry skeleton of *A. lynchi* that I have examined.

*Measurements.*—I have used standard distance (SD, the distance from the tip of the snout to the end of the coccyx) in addition to the snout-vent length (SVL) in order to facilitate comparisons with the data of Peters (1973). The following measurements (in mm) are based only on the type-series (five males); the mean is followed by one standard deviation and the range.

SVL:  $37.2 \pm 2.29$ , 34.5–40.8; SD:  $35.5 \pm 2.11$ ; 33.2–38.6; tibia length:  $17.8 \pm 1.23$ , 17.0–20.0; head length:  $10.7 \pm 0.45$ , 10.2–11.4; head width:  $9.6 \pm 0.47$ , 9.0–10.3; interorbital distance:  $4.1 \pm 0.32$ , 3.7–4.4; anterior corner of eye to nostril:  $3.5 \pm 0.23$ , 3.3–3.9; tibia length/SD:  $0.503 \pm 0.018$ , 0.477–0.521.

*Description.*—Head narrower than body; head longer than wide; snout acuminate, protruding beyond lower jaw in dorsal and lateral views; nostrils slightly protruding, directed laterally, situated at level of apex of lower jaw; canthus rostralis distinct, uncurved from eye to nostril, convex from nostril to tip of snout; loreal region barely concave; lips not flared; interorbital region and top of snout flat; postorbital crest (posterior ramus of squamosal) conspicuous; tympanum absent; head lacking tubercles; choanae small, round, widely separated; premaxilla, maxilla, and prevomer edentate; tongue 2.5 times as long as wide, narrowing anteriorly, free for one-third of its length posteriorly; vocal slits present in three of the five males of the type series; ostia pharyngea present in only one specimen.

Skin on dorsal surfaces and flanks finely granular, lacking warts or pustules; skin on belly slightly granular, with a few creases; other ventral surfaces finely granular; anal opening an inconspicuous short tube, lacking tubercles, directed posteriorly at midlevel of thighs.

Fingers basally webbed, lacking fringes (Fig. 2); thenar and subarticular tubercles weak; palmar tubercle large, indistinct; thin horny nuptial excrescence on thumbs of males; general aspect of palm smooth; digital pads distinct, round; forearm and arm lacking tubercles or folds.

Thigh, shank, and tarsus lacking folds or tubercles; inner metatarsal tubercle barely discernible; outer metatarsal tubercle distinct, round; subarticular tubercles round, indistinct; digital pads distinct, round; webbing extending to digital pads of all toes except fourth, here reaching only to antepenultimate phalanx and continuing distally as a narrow fringe; general aspect of plantar surface of feet smooth (Fig. 2).

Skin partially adherent to postorbital crests and neural arches of vertebrae; skin irregularly textured owing to protruding neural arches, ends of transverse and sacral processes, and urostyle.

*Coloration.*—In preservative, flanks, dorsum, and dorsal and concealed surfaces of limbs brown; canthus rostralis, tip of snout, postorbital crests, upper lip, skin over neural arches and ends of transverse processes pale brown to cream; chin and belly off-white, deepening to gray on ventral surfaces of limbs; tubercles of hand and foot gray. In life, brown above with dull yellow facial and dorsal markings; chin yellow-cream, venter dull blue-gray; iris black with pale green area surrounding pupil.

## DISCUSSION

*Variation.*—None of the paratypes exhibits noticeable variation in color from the holotype. A series of specimens referred to this species from La Costa, Colombia (KU 145050-54, 145056-57) exhibits noteworthy differences. The specimens are moderate to dark brown dorsally, with tan areas on the head and along the dorsolateral ridge formed by the underlying tips of the transverse processes. Most of the specimens have dark brown markings under the chin, in the pectoral region, as a midventral line on the abdomen, or as an anal patch. Two of the specimens have the typical unmarked venter of the type-series. The limbs of the specimens from La Costa are slightly tubercular; those of the type-series are smooth. Three specimens from the Río Michenque (KU 145058-60), Colombia, are similar to those from La Costa. Rivero (1963) and Cochran and Goin

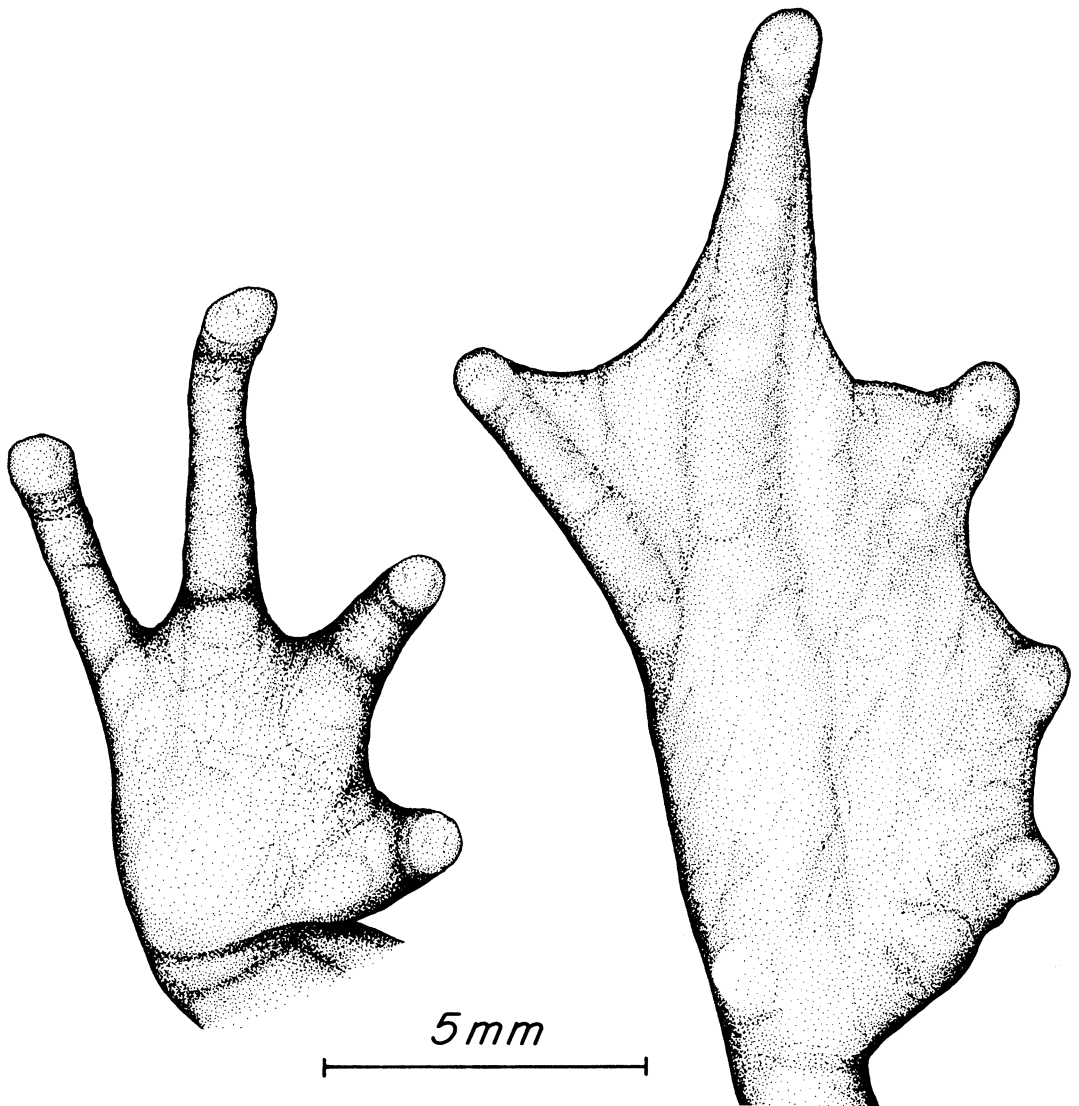


FIGURE 2. Hand and foot of *Atelopus lynchi*, KU 178415, male paratype.

(1970) described two specimens (Field Museum of Natural History, FMNH 43850–51) from Cisneros and referred them to *A. longirostris*. Peters (1973) maintained that these specimens probably represented an undescribed species. I have examined these specimens (in fair condition) and I refer them to *A. lynchi*; they definitely are not *A. longirostris*.

*Atelopus longirostris* is distinguished easily from *A. lynchi* and *A. carauta* by the discrete yellow spots on the dorsal surfaces, and an elongate blotch invariably present behind each eye. The snout of *A. longirostris* is narrower and longer than in *A. lynchi* (Figs. 1 and 3); the snout is long and narrow in *A. longirostris* and *A. carauta*; however, the tip of the snout is curved ventrad in *A. carauta*, slightly reminiscent of some *Rhamphophryne* (Compare Fig. 1 in Ruiz-Carranza and Hernández-Camacho, 1978, with Trueb, 1971). The tip of the snout is not curved in *A. longirostris*.

Also, the region of the canthus between the nares and the tip of the snout is distinctly concave in *A. longirostris* and straight in *A. carauta* and *A. lynchi*.

The only three females of *A. lynchi* are from Colombia and bear a few scattered white spicules along the flanks and hind limbs. All males, including the type-series, lack such spicules. White spicules are present sporadically in other species of *Atelopus*, but their significance as a possible sexually dimorphic character has not been studied.

Ostia pharyngea are clearly present in only one specimen. Vocal slits are present in males, although only on one side in some individuals; they are not present in females. McDiarmid (1971) reported that such intraspecific variation in these vocal structures is common in some *Atelopus*.

**Distribution and Ecology.**—*Atelopus lynchi* is known only from the Pacific slopes of northern Ecuador (Maldonado) and southern Colombia, as far north as Cisneros (Fig. 4) at altitudes of 800–1410 m.

The type-locality, Maldonado, lies at the end of the road over the slopes of Volcán Chiles west from Tulcán. This small village is situated in lower montane rainforest on the Río San Juan, which forms the Ecuador-Colombia border in this area. The type specimens were collected at night on vegetation along the Quebrada Huaygambi and Q. Naranjo; these two streams at opposite ends of the village flow into the Río San Juan. The frogs were sitting adpressed to leaves.

*Atelopus longirostris* is about the same size as *A. lynchi* and occurs in the same type of habitat, along lower montane streams. *Atelopus longirostris* occurs from Tandapi northward to Alto Tambo (Fig. 4). Maldonado, about 40 km NE of Alto Tambo, is the southernmost and only Ecuadorian record of *A. lynchi*.

*Atelopus longirostris* and the smaller *A. mindoensis* are sympatric over several localities in Ecuador; neither has been collected with *A. lynchi*. In Colombia *A. lynchi* has been found in the Departamento Cauca at localities near, but not sympatric with *A. longibrachius*. A series of *A. lynchi* (KU 145058-60) is from the "Río Michenque" 800 m, Depto. Cauca. This is probably a misspelling for the Río Mechengue in the same region (2°40'N, 77°13'W, Cochran and Goin, 1970).

**Remarks.**—Peters (1973) tentatively referred a series of small Ecuadorian *Atelopus* from Carolina, Provincia Imbabura, and Concepcion, Provincia Carchi, to *A. longirostris*. Peters had

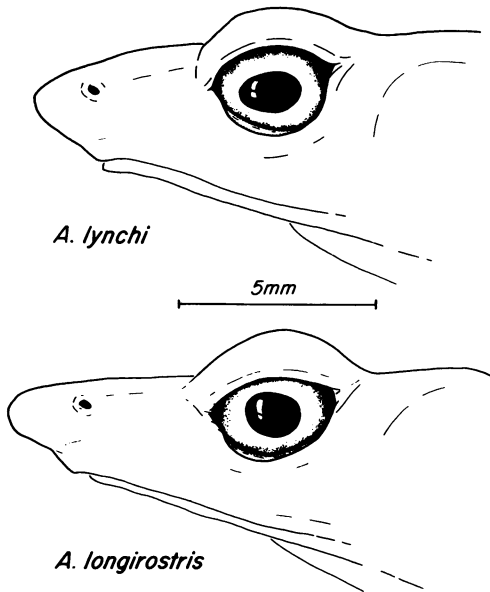


FIGURE 3. Lateral view of heads of *Atelopus lynchi* holotype, KU 178412, and *A. longirostris*, KU 178390, male.

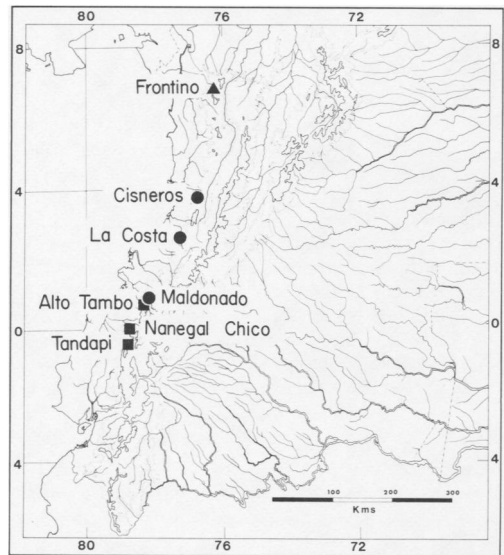


FIGURE 4. Distribution of *Atelopus lynchi* (dots), *A. longirostris* (squares), and *A. carauta* (triangle) in Colombia and Ecuador.

excellent material on which to base his redescription of *A. longirostris*, and his hesitation in assignment of these specimens is well-founded. I have examined the specimens (University of Michigan Museum of Zoology, UMMZ 83656, 83658-60); they are not *A. longirostris* nor *A. lynchi*. The specimens (adult males, mean SVL = 22.4 mm) are referable to *A. coynei* (Ken Miyata, pers. comm.).

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#### SPECIMENS EXAMINED

*Atelopus coynei*—ECUADOR: *Carchi*: Concepción, UMMZ 83656; *Imbabura*: Carolina, UMMZ 83658-60; *Pichincha*: 4 km NE Dos Ríos, 1140 m, KU 164744 (paratype).  
*Atelopus longibrachius*—COLOMBIA: *Cauca*: El Tambo, Gúisitó (= Huisitó), 800 m, FMNH 54283 (holotype), 54276-82 and 54284-304 (paratypes); El Tambo, La Costa, 800 m, KU 145042-45; El Tambo, Río Munchique, 1000 m, KU 145046-49.  
*Atelopus longirostris*—ECUADOR: *Pichincha*: 4 km NE Dos Ríos, 1140 m, KU 164745-53; La Palma, 920 m, KU 178391-93; Nanegal Chico, KU 108942-43; Tandapi, 1460 m, KU 178390.  
*Atelopus lynchi*—COLOMBIA: *Cauca*: El Tambo, La Costa, 1000 m, KU 145050-54 (145054, skeleton), 145056-57; Río Michenque, 800 m, KU 145058-60; *Valle*: Cisneros, 1100 m, FMNH 43850-51. ECUADOR: *Carchi*: Maldonado, 1410 m, KU 178412 (holotype), 178413-16 (paratypes).

#### LITERATURE CITED

- Cochran, D. M. and C. J. Goin. 1970. Frogs of Colombia. Bull. U.S. Nat. Mus. 288:1-655.  
Miyata, K. 1980. A new species of *Atelopus* (Anura: Bufonidae) from the cloud forests of northwestern Ecuador. Mus. Comp. Zool. Breviora 458:1-10.  
McDiarmid, R. W. 1971. Comparative morphology and evolution of frogs of the Neotropical genera *Atelopus*, *Dendrophryniscus*, *Melanophryniscus*, and *Oreophrynella*. Bull. L. A. Co. Mus. Nat. Hist. 12:1-66.  
Peters, J. A. 1973. The frog genus *Atelopus* in Ecuador (Anura: Bufonidae). Smith. Cont. Zool. 145:1-49.  
Rivero, J. A. 1963. Five new species of *Atelopus* from Colombia, with notes on other forms from Colombia and Ecuador. Carib. J. Sci. 3:103-124.  
———. 1968. More on the *Atelopus* (Amphibia, Salientia) from western South America. Carib. J. Sci. 8:19-29.  
Ruiz-Carranza, Pedro M. and J. I. Hernández-Camacho. 1978. Una nueva especie colombiana de *Atelopus* (Amphibia; Bufonidae). Caldasia 12:181-197.  
Trueb, L. 1971. Phylogenetic relationships of certain Neotropical toads with the description of a new genus (Anura: Bufonidae). Cont. Sci. L. A. Co. Mus. 216:1-40.

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