

Catalogue of American Amphibians and Reptiles.

McCranie, J. R. 2017. *Craugastor chrysozetetes*.

***Craugastor chrysozetetes* (McCranie,
Savage, and Wilson)
Cerro Búfalo Streamside Frog**

Eleutherodactylus chrysozetetes McCranie, Savage, and Wilson 1989:483. Type locality, "Quebrada de Oro (15°38'N, 86°47'W), elevation 880 m, tributary of Río Viejo, south slope of Cerro Búfalo, Cordillera de Nombre de Dios, Departamento de Atlántida, Honduras." Holotype, Museum of Natural History, University of Kansas, KU 209035, an adult male, collected by J. R. McCranie, K. L. Williams, and L. D. Wilson, 17 August 1984 (examined by author).

Eleutherodactylus chrysozetetes: Duellman 1993:139. *Lapsus*.

Eleutherodactylus (Craugastor) chrysozetetes: Lynch and Duellman 1997:222. By implication.

Craugastor chrysozetetes: Crawford and Smith 2005:539. By implication.

Craugastor chrysozetetes: Frost et al. 2006: 360. First use of combination in print.

Craugastor (Campbellius) chrysozetetes: Hedges et al. 2008:34.

CONTENT. No subspecies are recognized.

DESCRIPTION. *Craugastor chrysozetetes* is a moderately small eleutherodactyline (in five adult males, snout-vent length [SVL] range = 33.5–41.3 mm, mean [standard deviation] = 37.3 mm [\pm 3.3 mm]; in ten adult females, SVL range = 37.3–45.6 mm, mean [standard deviation] = 42.2 mm [\pm 3.2 mm]) with a moderately long, broad head (head length/SVL in adult males = 0.373–0.419, in adult females = 0.367–0.424; head width/SVL in adult males = 0.376–0.421, in adult females = 0.387–0.443). The snout is nearly rounded in dorsal aspect and rounded to nearly vertical



FIGURE 1. Adult female (USNM 497056; SVL 44.8 mm) of *Craugastor chrysozetetes* from Quebrada de Oro, Atlántida, Honduras. Photographed by the author on 23 May 1988.

in lateral profile. The top of the head is flat. The canthal ridges are angular and the loreal regions are concave. The upper lips are slightly flared in large females, but otherwise not flared. The nostrils are directed posterolaterally and are situated at a point slightly over two-thirds the distance between the anterior borders of the eyes (interorbital distance/eye length in males = 0.750–0.914, in females = 0.648–0.778) and the tip of the snout. Cranial crests are absent. The upper eyelids are prominent (eyelid width/interorbital distance in males = 1.000–1.171, in females = 1.000–1.250). Tympana are absent in both sexes. A well-developed supratympanic fold is present on each side.

The upper arms are slightly more slender than the moderately robust forearms. A weak transverse dermal fold is present on the upper surfaces of the wrists. No vertical dermal folds are present along the elbows. Tubercles arranged in a linear row are present along the posterior ventrolateral edges of the forearms, but tubercles not developed into a dermal ridge. The finger discs are broadly expanded (disc on Finger III about 2.0–2.9 times with of digit just proximal to disc). The disc cover on



MAP. Distribution of *Craugastor chrysozetetes*. Circle marks the type and only known locality.

each Finger I is rounded, but is ovoid apically, those on Fingers II–IV are rounded (even; see Savage 1987). The disc pads on the fingers are broadened. The subarticular tubercles on the fingers are round to ovoid and globular. Supernumerary tubercles are absent on the fingers. The palmar tubercle on each hand is elevated and ovoid (occasionally bifid), and are about as large as, or slightly larger than the thenar tubercles. A few small accessory palmar tubercles are present. The thenar tubercle on each hand is elongate, elevated, visible from above. Each prepollex is not enlarged, but nuptial thumb pads bearing tiny, colorless nuptial excrescences are present in adult males. Relative length of the fingers is $I < II < IV < III$. The fingers are not webbed, but bear lateral keels.

The hind limbs are relatively long (shank length/SVL 0.530–0.614 in males, 0.520–0.609 in females; foot length/SVL 0.524–0.558 in males, 0.498–0.571 in females). The heels are not overlapping to slightly overlap-

ping when the hind limbs are held together towards the cloacal opening at right angles to the body. A weak vertical dermal fold is present on the outer lateral edge of each heel. Each heel varies from nearly smooth with numerous tiny tubercles to each heel covered with about 15–30 moderate-sized tubercles. Tubercles or dermal ridges are absent along the posterior ventrolateral edge of each tarsus. An inner tarsal fold is absent. The subarticular tubercles on the toes are round to ovoid and globular. Supernumerary and plantar tubercles are absent on the toes. Each inner metatarsal tubercle is elongate, elevated, and visible from above. The outer metatarsal tubercles are small, round, and elevated. Relative toe length is $I < II < V < III < IV$. Each toe disc is definite and broadly expanded (*sensu* Savage 1987), with disc on Toe IV about 1.9–2.5 times the width of the digit just proximal to the disc. Disc covers on the toes are rounded (even; see Savage 1987) and the disc pads on the toes are broadened. The webbing formula

of the feet is I $1\frac{1}{3}$ –2 II $1\frac{1}{3}$ – $2\frac{1}{2}$ III 2– $3\frac{1}{3}$ IV $3\frac{1}{3}$ –2 V. Lateral fleshy fringes are well-developed on the unwebbed portions of the toes, with the fringes folding ventrally. An inguinal gland is visible or not.

The vent opening is directed posteroventrally near the upper level of the thighs with the skin around the vent strongly tuberculate. The skin of the dorsal surface of the head (except the upper eyelids) and the anterior portion of the body varies from slightly wrinkled, with numerous tiny tubercles, to strongly wrinkled with numerous tiny tubercles plus scattered small tubercles, or to weakly granular with numerous tiny tubercles plus some small tubercles. The tubercles on the flanks and posterior portion of the body are larger than those on the remainder of the dorsum. The skin of the upper eyelids is strongly wrinkled, with numerous tiny tubercles, or many small to large tubercles. A row of raised skin, with or without tubercles, forms discontinuous postocular ridges that extend to level of scapular region. Dorsolateral ridges are absent on the body. The skin on the chin, throat, and chest is smooth. The skin of the belly varies from slightly wrinkled (almost smooth) to noticeably wrinkled. The skin of the ventral surfaces of the thighs is slightly wrinkled, almost smooth. The ventral disc is absent to indistinct in both sexes. The pupil is horizontally elliptical. The palpebral membrane is translucent and unpatterned. The tongue is ovoid, not or slightly notched posteriorly, and is free posteriorly for about one-half of its length. The vomerine tooth patches are on elevated, ovoid to nearly triangular-shaped ridges located posteromedially to round, tear-shaped, or ovoid choanae. Each tooth patch is separated by a distance less than the width of either patch. Maxillary teeth are present. Males have paired vocal slits and a single, median, subgular vocal sac, but that sac is not evident externally. All of the above data were taken by the author and published by McCranie et al. (1989), McCranie and Wilson (2002), and McCranie and Castañeda (2007).

Color in life of an adult female (USNM 497056) follows. The dorsal surfaces of the head, body, and limbs were mottled olive-green and dark olive-green. Scattered irregular pale olive-green blotches were also present on the body. The ventral surfaces and the groin region were purplish brown with dull white flecking also present on the chin, and pale blue flecking present on the chest. The posterior surfaces of the thighs were chocolate brown with olive-yellow blotching. Each iris was silvery bronze with a wine-red mark at the anterior and posterior ends. Each iris was also reticulated with black. In life, the male holotype (KU 209035) had the dorsal surfaces of the head, body, and forelimbs dark olive brown and blotched with pale olive brown. The posterior surfaces of the thigh were uniformly purplish-brown with a pale paraclacal bar. The ventral surfaces of the body and throat were pale purple. The soles and palms were purple. The underside of the tibia was suffused with pale purple. The iris was steel gray with a rust-red horizontal bar.

DIAGNOSIS. The following combination of characters will distinguish *Craugastor chrysozetetes* from all other Honduran *Craugastor* species. The dorsal surfaces are usually tuberculate. A tympanum and an inner tarsal fold are absent. The toe webbing is relatively well developed with the modal webbing formula I $1\frac{1}{3}$ –2 II $1\frac{1}{3}$ – $2\frac{1}{2}$ III 2– $3\frac{1}{3}$ IV $3\frac{1}{3}$ –2 V. Finger II is longer than Finger I, and Toe V is shorter than Toe III. Well-developed lateral fleshy fringes are present on the unwebbed portions of Toes II–V, with those fringes folding ventrally. *Craugastor cruzi* and *Craugastor stadelmani* share most of these features with *Craugastor chrysozetetes*, but *Craugastor chrysozetetes* has more toe webbing (webbing formula in *Craugastor cruzi* is I 2– $2\frac{3}{4}$ II 2– $3\frac{1}{2}$ III 3–4 IV 4– $2\frac{1}{2}$ V and in *Craugastor stadelmani* it is I 2– $2\frac{3}{4}$ II 2– $3\frac{1}{2}$ III 3–4 IV 4– $2\frac{1}{2}$ V). In addition, the maximum SVL reported for males of *Craugastor chrysozetetes* is 41.3 mm; maximum SVL for males of *Craugastor cruzi*

is 33.2 mm SVL, maximum SVL for males of *Craugastor stadelmani* is 33.1 mm SVL. Additionally, *Craugastor chrysozetetes* lacks a pale middorsal stripe, whereas *Craugastor cruzi* has a complete middorsal pale stripe.

PUBLISHED DESCRIPTIONS. Detailed descriptions of the external morphology of the adult were done by the author and published by McCranie and Castañeda (2007), McCranie and Wilson (2002), and McCranie et al. (1989). A descriptive table comparing diagnostic characters of *Craugastor chrysozetetes* to related *Craugastor* species from Honduras was published by McCranie and Wilson (2002).

ILLUSTRATIONS. Color photographs of an adult were presented by Köhler (2011), McCranie and Castañeda (2007), McCranie and Wilson (2002), Stuart et al. (2008), and Wilson and McCranie (2004). A color photograph of an apparent hybrid between *Craugastor chrysozetetes* and *Craugastor fecundus* was published by McCranie and Wilson (2002). A **black-and-white photograph** of the holotype was published by McCranie et al. (1989).

DISTRIBUTION. *Craugastor chrysozetetes* is known to occur from 880 to 1130 m elevation in the Premontane Wet Forest formation (see Holdridge 1967) in the central portion of the Cordillera Nombre de Dios, Honduras. The species is known only from the vicinity of its type locality along the Quebrada de Oro, Atlántida.

FOSSIL RECORD. None.

PERTINENT LITERATURE. Relevant citations are listed by topic: **checklists and faunal lists** (Anonymous 1989, 2016; Campbell 1999; Duellman 1993; Glaw et al. 1998, 2000a, 2000b; Heinicke et al. 2007; Hutchins et al. 2003; Köhler 2011; Lynch and Duellman 1997; McCranie 2006, 2007, 2009, 2015; McCranie

and Castañeda 2005, 2007; McCranie and Solís 2013; McCranie and Wilson 2002; McCranie et al. 2006; Solís et al. 2014; Townsend and Wilson 2010, 2016; Wilson and Johnson 2010; Wilson and McCranie 1994; Wilson and Townsend 2006, 2010; Wilson et al. 2001), **comparisons to new species** (McCranie and Wilson 1997; Savage 2001), **conservation status** (Johnson et al. 2015; McCranie and Castañeda 2005; McCranie and Wilson 2004; Stuart et al. 2008; Townsend et al. 2012; Vial and Saylor 1993; Whitfield et al. 2016; Wilson and McCranie 1998, 2003, 2004; Wilson and Townsend 2006, 2010; Young et al. 2004a, 2004b), **identification keys** (Campbell 1994; McCranie and Wilson 1997, 2002), **taxonomy, systematics, and phylogenetics** (Frost 2017; Frost et al. 2006; Lynch 2000; Padiá et al. 2014).

REMARKS. Six trips to the Quebrada de Oro region, the type and only known locality of *Craugastor chrysozetetes*, were made between 1980 and 1989, the last year *Craugastor chrysozetetes* was seen alive. *Craugastor chrysozetetes* was found on four of those six trips. After the trip in August 1989, the author did not return to Quebrada de Oro until February 1995 and despite efforts targeting streamside *Craugastor*, not a single streamside *Craugastor* was seen. Subsequent trips were made to the Quebrada de Oro during 1996, 2003, and 2005, all without seeing a single streamside *Craugastor*. Thus, sometime between August 1989 and February 1995 the population of *Craugastor chrysozetetes* at the Quebrada de Oro completely crashed. Thus, *Craugastor chrysozetetes* is feared to be extinct, the same conclusion reached by McCranie and Castañeda (2005, 2007).

The habitat destruction that occurred at the type and only known locality of *Craugastor chrysozetetes* along the Quebrada de Oro, Atlántida was discussed by McCranie and Castañeda (2005, 2007), McCranie and Wilson (2002), and Wilson and McCranie (1998). Human destruction of the forest played a

significant role in facilitating landslides that destroyed the portions of the Quebrada de Oro in which *Craugastor chrysozetetes* lived. Further complicating that habitat destruction is that the chytrid fungus *Batrachochytrium dendrobatidis* was recorded in two of the four anuran species collected along the Quebrada de Oro during 2003 (Puschendorf et al. 2006). This chytrid fungus has been linked to anuran declines in other neotropical regions (Puschendorf et al. 2006) and likely played a role in the extinction of this species.

During October 1998, torrential rains from Hurricane Mitch, aided by previous habitat destruction by humans, caused much larger landslides, some of which devastated parts of the Quebrada de Oro. As a result of all of those stream-altering landslides, much of the Quebrada de Oro is no longer fit for this species. The slight hope for a remaining population of *Craugastor chrysozetetes* would most likely be on the north slopes of the Cordillera Nombre de Dios that are still forested and thus were not damaged by landslides. Unfortunately, the majority of those slopes are so steep that few permanent streams exist above about 900 m elevation.

Two specimens from Quebrada de Oro (USNM 497113–14) appear to represent hybrids between *Craugastor chrysozetetes* and *Craugastor fecundus*. Those two specimens were collected on 1 and 6 August 1989 (see discussion and a photograph of one of those specimens provided by McCranie and Wilson 2002:373, 376).

ADDITIONAL VERNACULAR NAMES.

The vernacular name “McCranie’s Robber Frog” used by Frank and Ramus (1995) and Wrobel (2004) should be rejected in favor of a name associated with the type locality instead of a name tied to one of the three authors who named this species.

ETYMOLOGY. The name *chrysozetetes* is derived from the Greek words *chrysos* (gold) and *zetetes* (searcher). The reference is to the

occurrence of *Craugastor chrysozetetes* along the stream Quebrada de Oro, its type and only known locality.

COMMENTS. Campbell (1994), in footnote 5 to his Table 1, confused the holotype and referred specimen of *Craugastor chrysozetetes* with the holotype and paratype of *Craugastor cruzi*.

Craugastor chrysozetetes was listed as both extinct (p. 138) and as a rapidly declining species (p. 696) by Stuart et al. (2008).

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Primary editors for this account, Christopher J. Bell and Travis J. LaDuc.

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