

Catalogue of American Amphibians and Reptiles.

Díaz-Lameiro, A.M., H. Kaiser, and R. Powell. 2008.
Pristimantis shrevei.

***Pristimantis shrevei* (Schwartz)
St. Vincent Frog**

Eleutherodactylus urichi: Barbour 1935:93 (part).
Eleutherodactylus urichi shrevei Schwartz 1967:13.
Type-locality, "Lowrt, 1000 ft. (305 meters), St. Andrew Parish, St. Vincent." Holotype, Museum of Comparative Zoology (MCZ) 43230 (original number ASFS V11243), an adult female collected by D.C. Leber and A. Schwartz on 7 March 1961 (examined by HK).

Eleutherodactylus shrevei: Kaiser et al. 1994b:791.
Eleutherodactylus (Eleutherodactylus) shrevei: Lynch and Duellman 1997:232.

Pristimantis shrevei: Heinicke et al. 2007: supporting information (www.pnas.org/cgi/content/full/0611051104/DC1, table 2).

• **CONTENT.** *Pristimantis shrevei* is monotypic.

• **DEFINITION.** *Pristimantis shrevei* is a moderately sized member of the "South American clade" of eleutherodactylines (Heinicke et al. 2007). Maximum known female SVL = 40.1 mm (Kaiser et al. 1994b), male SVL = 29.0 mm (Díaz-Lameiro et al. 2007). The species is characterized by (Kaiser et al. 1994b): (1) skin on dorsum smooth, with a few minute tubercles on the posterior third; dorsolateral folds absent, venter with few minute colorless areolae between pectoral and pelvic areas; (2) tympanum round, distinct, one-quarter of diameter of eye, partly obscured posterodorsally by pronounced supratympanic fold; (3) snout rounded in dorsal view and in profile, eye-to-naris distance less than length of eye; nares protruding slightly; canthus rostralis sharply angled, canthal ridge straight with a slight lateral inflection and a dark line along its length; (4) supraocular tubercles present; interorbital distance equal to the width of upper eyelid; upper eyelid darkly pigmented; cranial crests absent; (5) dentigerous process of vomer triangular and straight; choanae triangular; (6) males with vocal slits and single median subgular vocal sac; (7) size of fingers I = II < IV < III, III about one-third longer than I; finger disks III and IV wider than fingers, disks I and II only slightly so, all oval in shape; finger disk size I < II < III < IV, with I not reduced; ventral surface of finger discs darkly pigmented; number of subarticular tubercles 2–2–3–2 for fingers I–IV, respectively; two large subarticular tubercles side by side on finger I; all subarticular tubercles oval; two confluent but distinct palmar tubercles covering palm; one large basal thenar tubercle; (8) fingers lacking lateral fringes; (9) ulnar tubercles indistinct, with several small tubercles on elbows; (10) several small, flat heel tubercles present; inner tarsal fold indistinct; (11) two large ovoid metatarsal tubercles, equal in size; several supernumerary plantar tubercles present; (12) number of subarticular tubercles 1–2–3–3–2 for toes I–V,



Figure 1. Adult female *Pristimantis shrevei* from along the Vermont Nature Trail (St. Patrick Parish), St. Vincent (photograph by R. Powell).

respectively; subarticular tubercle on I enlarged, most proximal tubercle on III reduced; lateral fringes and webbing absent.

Color and pattern are exceedingly variable (Barbour 1937, Díaz-Lameiro et al. 2007, Schwartz and Henderson 1991). Díaz-Lameiro et al. (2007) found no traits exclusively in males or females. Characteristics common to most frogs sampled include predominately yellow venters and a greenish throat with a distinct yellowish cast; some individuals have white, gray, or yellow throats, but always with a yellowish tinge. Varying degrees of brown stippling on the throat are universally present, albeit sometimes reduced to margins and few scattered specks. The ground color of the iris above and below a dark horizontal line running through the pupil ranges from near white through ivory to pale brown, often with a slight golden tinge (and may vary with elevation). Areas above and below the line are essentially similar in color. The horizontal line itself is dark brown, frequently with a reddish cast.

Pattern elements that are almost universally present, albeit less well defined in some individuals, include: (1) a dark brown to black canthal line continuous with the line through the orbit and continuing as a comparably dark supratympanic line set off by a lighter line passing through the tympanum; (2) interorbital bars (complete or broken); (3) post-anal triangles; (4) middorsal lines absent; (5) strong to indistinct vertical bars on the upper lips, sometimes reduced to varying numbers and sizes of brown specks; and (6) two dark dorsal chevrons (occasionally four or none).

The ground color of the dorsal and lateral fields, the top of the snout in front of the interorbital bar, and limbs range from gray and light brown to very dark brown, often with a yellowish, orange, or reddish cast. Dorsal ground color is usually the same as the lateral color, but is occasionally darker or lighter. Red color on the thighs often extends onto the sides and sides of the venter. The top of the snout is usually lighter, but infrequently the same color as the dorsum. Dorsolateral lines are in most cases absent, but when present, they are usually lighter than the dorsum. Toe pads vary in color from very light brown through dark

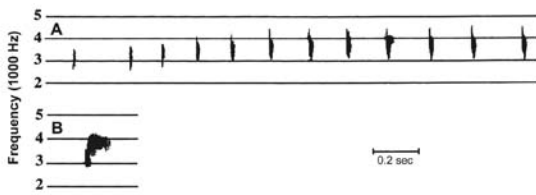
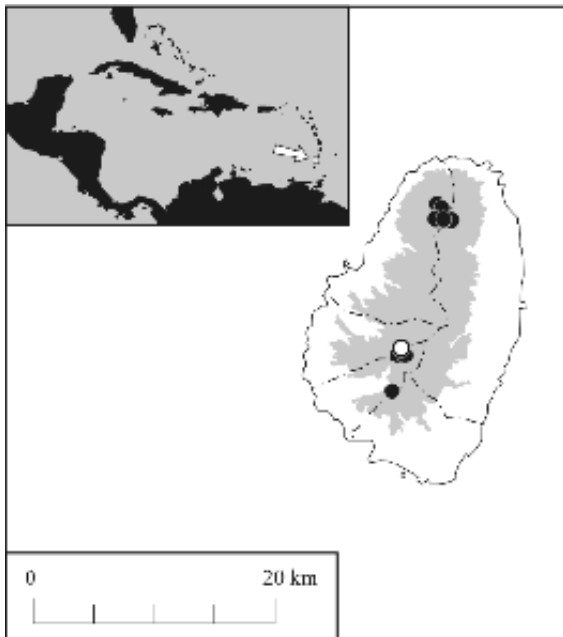


Figure 2. Calls of *Pristimantis shrevei*; “clicks” (A) are the dominant component, but a second, extended call at higher frequency (B) may be issued (from Kaiser et al. 1994b). Calls of frogs from very high elevations on La Soufrière (1180 m) seem to be slightly lower in pitch, possibly due to cooler body temperatures associated with local conditions.

brown, sometimes with a distinct grayish cast, almost always darker than the toe itself. A few individuals have a light bar on the snout, with bars ranging from wide and complete to narrow and broken; one individual was found to have a light spot on the snout.

• **DIAGNOSIS.** *Pristimantis shrevei* can be distinguished from the only sympatric eleutherodactyline (*Eleutherodactylus johnstonei*) and its closest relative (*P. euphronides* from Grenada) by the presence of reddish coloration on the venter and hindlimbs. From *P. urichi*, with which it was subspecifically allied until elevated to full species status by Kaiser et al. (1994b), it can be distinguished by size (*P. shrevei* is larger) and lack of a pair of dorsal spots (present in *P. urichi*; Schwartz 1967).

• **DESCRIPTIONS.** In addition to the original description by Schwartz (1967), the only other detailed



Map. Distribution of *Pristimantis shrevei*; the circle marks the type-locality and dots indicate other records (modified from Schwartz and Henderson 1991).

description is in Kaiser et al. (1994b). Many other descriptions (e.g., Schwartz and Henderson 1991) apply to all species in the *P. urichi* complex.

• **ILLUSTRATIONS.** Color photographs of individuals are in Malhotra and Thorpe (1999) and Díaz-Lameiro et al. (2007); the latter also illustrated a series of frogs showing dorsal and ventral variation in color and pattern. Color photographs also are available on-line at <<http://www.kingsnake.com/westindian/metazoa9.html>> and <http://www.morley-read.com/frogs_on_line/antilles.html>. Black-and-white photographs are in Kaiser et al. (1994b), Kaiser and Henderson (1994), and Treglia (2006). Schwartz (1967) included a line drawing.

• **DISTRIBUTION.** *Pristimantis shrevei* is endemic to St. Vincent (Schwartz 1967), where it remains abundant at higher (> ~250 m) elevations (Díaz-Lameiro et al. 2007, Mallery et al. 2007). *Pristimantis shrevei* is largely confined to forests when introduced *Eleutherodactylus johnstonei* is present in disturbed habitats along forest fringes (Kaiser et al. 1994b, Kaiser and Henderson 1994). Díaz-Lameiro et al. (2007) suggested that the species may once have occurred at lower elevations, from which it might have been displaced by introduced *E. johnstonei*.

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** The broadest overview of *Pristimantis shrevei* is in Kaiser (1993). Additional references to the species are arranged by topic: **biogeography** (Kaiser 1996), **chromosomes** (Schmid et al. 2002), **conservation status** (Hedges and Powell 2004; Kaiser and Henderson 1994; Lescure (1978) 1979; Powell and Henderson 2007), **natural history** (Kaiser et al. 1994b; Schwartz 1967; Schwartz and Henderson 1991), **polymorphism** (Díaz-Lameiro et al. 2007), and **systematics** (Hedges 1989, Hedges et al. 2008, Heinicke et al. 2007, Joglar 1989, Kaiser et al. 1994b, Lynch and Duellman 1997, Schwartz 1967, 1969).

This species, as *Eleutherodactylus urichi*, *E. urichi shrevei*, or *E. shrevei*, is included in guides, checklists (some annotated), notes, or is mentioned in longer works by Barbour (1935, 1937), Censky and Kaiser (1999), Frank and Ramus (1995), Frost (1985, 2006), Glaw et al. (1998), Hedges (1999), Kaiser et al. (1994a), Lescure (1987, 2001), MacLean et al. (1977), Murphy (1996), Powell et al. (1996), Schwartz (1969), Schwartz and Henderson (1985, 1988), and Schwartz and Thomas (1975).

• **REMARKS.** Barbour (1935) was the first to note the presence of what was then known as *Eleutherodactylus urichi* on St. Vincent. He indicated that Benjamin Shreve had suggested that the St. Vincent and Grenada populations might differ and be worthy of taxonomic distinction.

• **ETYMOLOGY.** The specific name is a patronym

honoring Benjamin Shreve, who had completed an unpublished manuscript describing a new subspecies of *Eleutherodactylus urichi* from the Lesser Antilles before relinquishing his interest in those frogs to A. Schwartz (Schwartz 1967).

LITERATURE CITED

- Barbour, T. 1935. A second list of Antillean reptiles and amphibians. *Zoologica* 19:77–141.
- . 1937. Third list of Antillean reptiles and amphibians. *Bull. Mus. Comp. Zool.* 82:77–166.
- Censky, E.J. and H. Kaiser. 1999. The Lesser Antillean Fauna, p. 181–221. *In* B.I. Crother (ed.), *Caribbean Amphibians and Reptiles*. Academic Press, San Diego.
- Díaz-Lameiro, A.M., R. Powell, and C.S. Berg. 2007. Colour and pattern polymorphism in *Pristimantis shrevei* and *Eleutherodactylus johnstonei* (Leptodactylidae) on St. Vincent, West Indies. *Herpetological Bull.* (101):18–25.
- Frank, N. and E. Ramus. 1995. A complete guide to scientific and common names of reptiles and amphibians of the world. N G Publ., Inc., Pottsville, Pennsylvania.
- Frost, D.R. 1985. *Amphibian Species of the World*. Allen Press Inc. and Association of Systematic Collections, Lawrence, Kansas.
- . 2006. *Amphibian Species of the World: An Online Reference*. Version 4 (17 August 2006). <<http://research.amnh.org/herpetology/amphibia/index.php>>. American Museum of Natural History, New York.
- Glaw, F., J. Köhler, R. Hofrichter, and A. Dubois. 1998. Systematik der Amphibien: Liste der rezenten Familien, Gattungen und Arten, p. 252–258. *In* R. Hofrichter (ed.), *Amphibien*. Naturbuch Verlag, Augsburg, Germany.
- Hedges, S.B. 1989. Evolution and biogeography of West Indian frogs of the genus *Eleutherodactylus*: Slow-evolving loci and the major groups, p. 305–370. *In* C.A. Woods (ed.), *Biogeography of the West Indies: Past, Present, & Future*. Sandhill Crane Press, Gainesville, Florida.
- . 1999. Distribution patterns of amphibians in the West Indies, p. 211–254. *In* W.E. Duellman (ed.), *Patterns of Distribution of Amphibians: A Global Perspective*. Johns Hopkins Univ. Press, Baltimore, Maryland.
- , W.E. Duellman, and M.P. Heinicke. 2008. New World direct-developing frogs (Anura: Terrarana): molecular phylogeny, classification, biogeography, and conservation. *Zootaxa* (1737):1–182.
- and R. Powell. 2004. *Eleutherodactylus shrevei*. *In* IUCN 2004. 2004 IUCN Red List of Threatened Species. <www.iucnredlist.org>.
- Heinicke, M.P., W.E. Duellman, and S.B. Hedges. 2007. Major Caribbean and Central American frog faunas originated by ancient oceanic dispersal. *Proc. Natl. Acad. Sci. USA* 104:10092–10097.
- Joglar, R. 1989. Phylogenetic relationships of the West Indian frogs of the genus *Eleutherodactylus*: A morphological analysis, p. 371–408. *In* C.A. Woods (ed.), *Biogeography of the West Indies: Past, Present, & Future*. Sandhill Crane Press, Gainesville, Florida.
- Kaiser, H. 1993. Systematics and biogeography of eastern Caribbean frogs. Ph.D. Diss., McGill University, Montreal, Quebec, Canada.
- . 1996. Systematics and biogeography of eastern Caribbean *Eleutherodactylus* (Anura: Leptodactylidae): Consensus from a multidisciplinary approach, p. 129–140. *In* R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol., vol. 12, Ithaca, New York.
- , D.M. Green, and M. Schmid. 1994a. Systematics and biogeography of eastern Caribbean frogs (Leptodactylidae: *Eleutherodactylus*), with the description of a new species from Dominica. *Canadian J. Zool.* 72:2217–2237.
- , J.D. Hardy, and D.M. Green. 1994b. Taxonomic status of Caribbean and South American frogs currently ascribed to *Eleutherodactylus urichi* (Anura: Leptodactylidae). *Copeia* 1994:780–796.
- and R.W. Henderson. 1994. The conservation status of Lesser Antillean frogs. *Herpetol. Nat. Hist.* 2(2):41–56.
- Lescure, J. (1978) 1979. Singularité et fragilité de la fauna en vertébrés des Petites Antilles. *C R. Soc. Biogéogr.* 482:93–109.
- . 1987. Le peuplement en reptiles et amphibiens des Petites Antilles. *Bull. Soc. Zool. France* 112:327–342.
- . 2001. Caractéristiques biogéographiques des Petites Antilles et herpétofaune, p. 97–106. *In* C.T.H.S. (ed.), *L'exploration naturaliste des Antilles et de la Guyane*. 123e Congrès national des sociétés historiques et scientifiques, Antilles-Guyane, 1998. Histoire Naturelle, Paris, France.
- Lynch, J.D. and W.E. Duellman. 1997. Frogs of the genus *Eleutherodactylus* in western Ecuador. *Univ. Kansas Mus. Nat. Hist., Spec. Publ.* (23):1–236.
- MacLean, W.P., R. Kellner, and H. Dennis. 1977. Island lists of West Indian amphibians and reptiles. *Smithson. Herpetol. Info. Serv.* (40):1–47.
- Malhotra, A. and R.S. Thorpe. 1999. *Reptiles and Amphibians of the Eastern Caribbean*. Macmillan Education Ltd., London, United Kingdom.
- Mallery, C.S., Jr., M.A. Marcum, R. Powell, J.S. Parmelee, Jr., and R.W. Henderson. 2007. Herpetofaunal communities of the leeward slopes and coasts of St. Vincent: a comparison of sites variously altered by human activity. *Appl. Herpetol.* 4:313–325.
- Murphy, J.C. 1996. Crossing Bond's Line: The herpetofaunal exchange between the eastern Caribbean and mainland South America, p. 207–216. *In* R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol., vol. 12, Ithaca, New York.
- Powell, R. and R.W. Henderson. 2007. The St. Vincent (Lesser Antilles) herpetofauna: Conservation concerns. *Appl. Herpetol.* 4:295–312.

- , –, K. Adler, and H.A. Dundee. 1996. An annotated checklist of West Indian amphibians and reptiles, p. 51–93 + 8 pl. *In* R. Powell and R.W. Henderson (eds.), *Contributions to West Indian Herpetology: A Tribute to Albert Schwartz*. SSAR Contrib. Herpetol., vol. 12, Ithaca, New York.
- Schmid, M., W. Feichtinger, C. Steinlein, A. Rupprecht, T. Haaf, and H. Kaiser. 2002. Chromosome banding in Amphibia. XXIII. Giant W sex chromosomes and extremely small genomes in *Eleutherodactylus euphronides* and *Eleutherodactylus shrevei* (Anura, Leptodactylidae). *Cyto. Chromosome Res.* 97:81–94.
- Schwartz, A. 1967. Frogs of the genus *Eleutherodactylus* in the Lesser Antilles. *Stud. Fauna Curaçao Carib. Isl.* (91):1–62.
- . 1969. The Antillean *Eleutherodactylus* of the *auriculatus* group. *Stud. Fauna Curaçao Carib. Isl.* 30:99–115.
- and R.W. Henderson. 1985. A guide to the identification of the amphibians and reptiles of the West Indies exclusive of Hispaniola. Milwaukee Public Museum, Milwaukee, Wisconsin.
- and –. 1988. West Indian Amphibians and Reptiles: a check-list. Milwaukee Pub. Mus. Contrib. Biol. Geol. (74):1–264.
- and –. 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. Univ. Florida Press, Gainesville.
- and R. Thomas. 1975. A check-list of West Indian amphibians and reptiles. *Carnegie Mus. Nat. Hist., Spec. Publ.* (1):1–216.
- Treglia, M.L. 2006. An annotated checklist of the amphibians and reptiles of St. Vincent, West Indies. *Iguana* 13:251–262.

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