

AMPHIBIA: ANURA: LEPTODACTYLIDAE

LEPTODACTYLUS ELENAE

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Leptodactylus elenae Heyer

Leptodactylus elenae Heyer 1978:45. Type locality, "Argentina; Salta, Embarcación." Holotype, Los Angeles County Museum (LACM) 92096, adult female, collected by K.A. Berven, L.M. Heyer, M.H. Heyer, and W.R. Heyer on 4 January 1972 (examined by WRH).

Leptodactylus helena: Cei 1982:215, 224, 226. *Lapsus*.

• **CONTENT.** The species is monotypic.

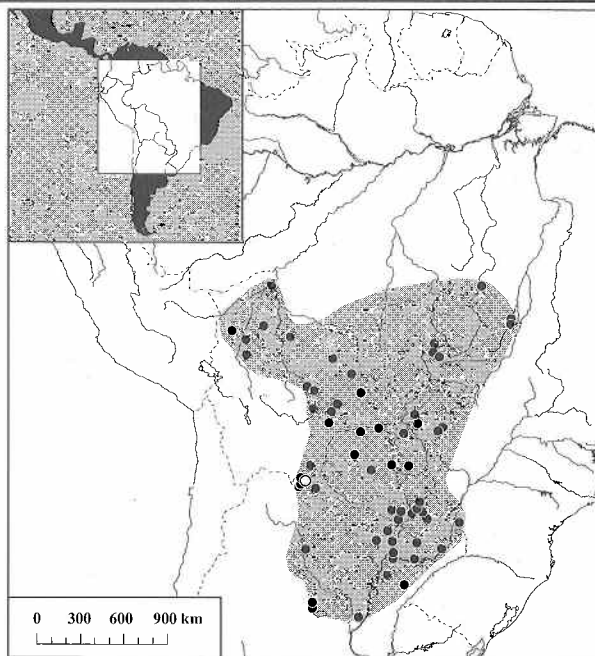
• **DEFINITION.** Adult *Leptodactylus elenae* males are of moderate size, females are moderately small, the head is not as wide as long, and the hind limbs are moderate in length (see **Table**; Heyer and Thompson 2000 provided definitions of adult size and leg length categories for *Leptodactylus*). Male vocal sacs are modestly expanded laterally and are usually at least moderately darkly pigmented. Male forearms are not hypertrophied. Males lack asperities on the thumbs and chest. Two distinct pairs of dorsolateral folds (indicated by dark/light outlining in indifferently preserved specimens) are present: one pair extends from behind the eye at the level above the posterior edge of the tympanum to the upper groin, and a second pair extends from the top of the tympanum level, posterior to the parotoid gland, to the groin along the flanks. The toe tips are rounded or very slightly swollen. The toes generally lack fringes or lateral fleshy ridges; some individuals have vestigial basal lateral ridges and toe webbing between toes I, II, and III. The upper shank is usually smooth, rarely with weak longitudinal folds. The outer tarsus usually has at least one or two to many white tubercles, but is smooth in some individuals. The sole of the foot has many or scattered white fleshy tubercles.

The upper lip has a distinct (77%) or indistinct (23%) light stripe. No dark suborbital bar is present. An interorbital bar is irregularly shaped. The dorsum ranges from almost uniform tan/brown to a pattern of parallel series of small darker spots, which may be coalesced longitudinally in some individuals, or to one or two small chevrons in the mid-scapular and mid-sacral regions. The dorsolateral folds are usually highlighted by a distinct light pin-stripe, more so posteriorly than anteriorly. The upper pair of dorsolateral folds is usually bordered below by a noticeably darker stripe, which is sometimes quite broad. The species lacks light middorsal stripes. The belly is immaculate or with a few indistinct dark spots or mottling on its lateralmost extent. The posterior thigh surfaces have distinct light horizontal stripes on their lower aspects. The dorsal surface of the shank has irregularly shaped crossbands.

Larvae have not been described.

TABLE. Summary measurement data for *Leptodactylus elenae* (means are in parentheses). Heyer and Thompson (2000) provided definitions of adult size and leg length categories for *Leptodactylus*.

Measurement	Males	Females
SVL (mm)	38–46 (43.1)	39–49 (43.5)
Head length/SVL (%)	35–40 (38)	36–39 (38)
Head width/SVL (%)	31–37 (34)	30–37 (34)
Thigh length/SVL (%)	36–47 (41)	33–46 (41)
Shank length/SVL (%)	44–53 (48)	42–52 (48)
Foot length/SVL (%)	45–57 (50)	45–54 (49)



MAP. Distribution of *Leptodactylus elenae*. The type locality is indicated by a circle. Dots mark other localities. Published locality data used to generate the map should be considered as secondary sources of information, as we did not confirm all specimen identities.



FIGURE 1. *Leptodactylus elenae*. Mucuñaçu, Santa Cruz, Bolivia, field number JK 0612 (photograph courtesy of Jörn Köhler).

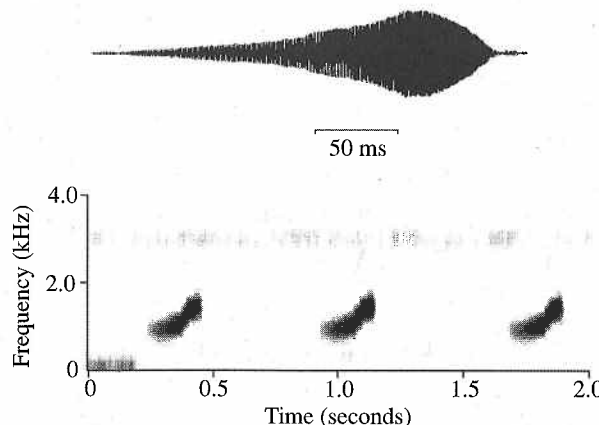


FIGURE 2. Wave form and audiospectrogram displays of the advertisement call of *Leptodactylus elenae* (USNM recording 180, cut 7) from El Tirol, near Encarnación, Itapua, Paraguay.

The advertisement call consists of a single note per call, given at a rate of 64–120/min. Call duration ranges from 0.2–0.3 s. The call is either unpulsed or with very weak pulses in mid-call. The call is frequency modulated, rising very slowly in the first 1/3–1/2 of the call, then rising rapidly, and finally reaching a plateau at the end of the call. The call is intensity modulated, reaching the loudest intensity about 3/4–4/5 of the call duration, then decreasing rapidly for the rest of the call. The dominant frequency is the fundamental frequency. The dominant frequency ranges from 700–870 Hz at the beginning of the call and from 1370–1500 Hz at the end of the call. Harmonics are either absent (calls analyzed for this account) or present (Barrio 1965).

• **DIAGNOSIS.** Adult *Leptodactylus elenae* have the toes free of webbing or lateral fringes, one or two pair of distinct dorso-lateral folds, a light stripe on the lower portion of the posterior face of the thigh, and the sole of the foot covered with obvious light tubercles. These features are shared with (at least some individuals of) *L. albilabris*, *L. didymus*, *L. fragilis*, *L. latinasus*, *L. mystaceus*, *L. notoakites*, and *L. spixi*. *Leptodactylus elenae* lacks white tubercles on the dorsal surface of the shank, differing from *L. albilabris*, *L. fragilis*, *L. latinasus*, and *L. spixi*. *Leptodactylus elenae* usually has white tubercles on the posterior tarsus; the tarsus is smooth in *L. didymus*, *L. mystaceus*, and *L. notoakites*.

• **DESCRIPTIONS.** Heyer (1978) provided morphological characteristics of the species and of the holotype. Detailed character descriptions of adults including color patterns are in Ceï (1987), De la Riva (1993), and Gallardo (1987). Morphology and color were described by Ceï (1980, as *L. mystaceus*), Gallardo (1964, as *L. mystaceus*), Méhelý (1904, as *L. mystaceus*), and Proctor (1921, as *L. longirostris*). Mercolli et al. (1995) discussed sexually dimorphic color. Descriptions of advertisement calls are in Gallardo (1987), Gallardo and Valera de Olmedo (1992), Heyer et al. (1996), and Marquez et al. (1995), and as *L. mystaceus* in Barrio (1965, reiterated by Straughan and Heyer 1976). A cassette recording was provided by Straneck et al. (1993). An incomplete description of the karyotype is in Heyer (1978).

• **ILLUSTRATIONS.** Color photographs of adults are in De La Riva et al. (2000), Couturier (1985, as *L. mystaceus*), and Moravec and Aparicio (2000). Other photographs are in Ceï (1987), Gallardo (1964, as *L. mystaceus*), and Heyer (1978). Figure drawings of adult specimens are in Ceï (1980, as *L. mystaceus*), Di Tada et al. (1976, as *L. mystaceus*), Gallardo (1987), and Straneck et al. (1993). Limeses (1969, as *L. mystaceus*) and Limeses et al. (1972, as *L. mystaceus*) provided drawings of anatomical features. Audiospectrograms of the advertisement call are in Barrio (1965, as *L. mystaceus*), Heyer et al. (1996), Marquez et al. (1995), and Straneck et al. (1993). A wave form of the advertisement call is figured in Heyer et al. (1996).

• **DISTRIBUTION.** *Leptodactylus elenae* is a wide-ranging species that inhabits semi-arid Chaco, cerrado, caatinga, and dry forest regions from the eastern slopes of Bolivia to Mato Grosso, Brazil and south through Paraguay to north-central Argentina. Mercolli et al. (1995) and Strüssman et al. (2000a) found the species in forested formations and De La Riva (1993), Harvey (1998), Heyer and Maxson (1982), and Köhler (2000) noted that it preferred open habitats. Duellman (1999) tabled its distribution as Southwest Amazon Basin-Guiana lowlands and Caatinga-Cerrado-Chaco. Harding (1983) listed its distribution by countries in the New World. The Peruvian locality

for *L. elenae* of Tocache Nuevo, Río Huallaga, San Martín reported by Heyer (1978) and mentioned by Henle (1992) and Morales (1995) was questioned by Rodríguez et al. (1993). The juvenile specimens (USNM 195998–195999) are not *L. elenae* but probably an undescribed species of the *L. mystaceus* complex (W.R. Heyer, pers. obs.). A distributional map was provided by Heyer (1978).

Additional references to distribution and localities are listed by country: **Argentina** (Alvarez et al. 1996; Barrio 1965, as *L. mystaceus*; Berg 1896, as *L. mystaceus*; Boulenger 1889, as *L. poecilochilus*; Blair 1976, as *L. mystaceus*; Blair et al. 1976, as *L. mystaceus*; Bosso and Céspedes 1995; Ceï 1955, 1980, as *L. mystaceus*, and 1987; Céspedes et al. 1995; Di Tada et al. 1976, as *L. mystaceus*; Duellman and Veloso 1977, as *L. mystaceus*; Freiberg 1942, as *L. mystaceus*; Gallardo 1964, 1966, 1974, as *L. mystaceus*, and 1987; Heyer 1978; Lajmanovich 1991; Laurent 1973, as *L. mystaceus*; Lavilla and Scrocchi 1991, 1999; Lavilla et al. 1992, 2000b; Mares et al. 1977, as *L. mystaceus*; Martori and Aun 1995; Mercolli et al. 1995; Montanelli and Acosta 1991; Straneck et al. 1993; Vaira 2001a; Vellard 1948, as *L. mystaceus*); **Bolivia** (Aparicio 1992; De la Riva 1990, 1993, 1995; De la Riva et al. 2000; Fugler 1983, 1984, 1988; Gallardo 1964, as *L. mystaceus*; Gans 1960, as *L. mystaceus*; Gonzáles A. 1998; Harvey 1998; Harvey et al. 1998; Heyer 1978; Köhler 2000; Köhler and Lötters 1999; Middendorf and Reynolds 2000; Moravec and Aparicio 2000; Padial et al. 2000; Parker 1928, as *L. mystaceus*; Peracca 1897, as *L. poecilochilus*); **Brazil** (Baumann 1912, as *L. poecilochilus* in part; Carvalho 1939, as *L. mystaceus*; Gallardo 1964, as *L. mystaceus*; Gans 1960, as *L. mystaceus*; Heyer 1978; Strüssman et al. 2000c); and **Paraguay** (Aquino 1986; Aquino et al. 1996; Bertoni, 1914, 1939, as *L. poecilochilus*; Heyer et al. 1996; Méhelý, 1904 as *L. mystaceus*; Peracca 1895, as *L. poecilochilus*; Scott and Lovett 1975).

• **FOSSIL RECORD.** None.

• **PERTINENT LITERATURE.** The most comprehensive works on the species are those of Gallardo (1964, as *L. mystaceus*) and Heyer (1978). Additional literature is listed by topic: **bibliographic information and lists** (Lavilla and Ceï 2001, Liner 1992, Walley 2000); **call and call parameters** (Barrio 1965, as *L. mystaceus*; De la Riva 1993; Heyer et al. 1996; Marquez et al. 1995; Straughan and Heyer 1976, as *L. mystaceus*); **checklists** (Contreras and Contreras 1982, as *L. mystaceus*; De la Riva et al. 2000); **conservation** (Anonymous 1997; Lavilla 2001; Lavilla et al. 2000a); **ecology, natural history, reproduction** (De la Riva 1993, 1995; Fugler 1986, 1988; Mercolli et al. 1995; Moravec and Aparicio 2000; Perotti 1994; Strüssman et al. 2000b; Vaira 2001b); **evolution** (Heyer 1978); **habitat** (De la Riva 1993; Gonzáles A. 1998; Köhler 2000; Mercolli et al. 1995; Moravec and Aparicio 2000); **lists of specimens in individual collections** (Aquino et al. 1996; Avila and Martori 1991; Elter 1981, as *L. mystaceus*; Gavetti and Andreone 1993, as *L. mystaceus*; Quijada B. 1914, as *L. poecilochilus*; Tedesco et al. 1993; Yanosky et al. 1993, as *L. mystaceus*); **morphology** (Ceï 1980, as *L. mystaceus*; Fabrezi 1993; Gallardo 1964, as *L. mystaceus*; Heyer et al. 1996; Limeses 1969, as *L. mystaceus*; Limeses et al. 1972, as *L. mystaceus*; Perotti 1994; Ponssa 1999; Strüssman et al. 2000b); **parasite host** (Baker and Vaucher 1984, 1985, 1986, 1988); **relationships** (Heyer 1978, Heyer and Maxson 1982, Maxson and Heyer 1988); **species accounts and systematics** (Berg 1896, as *L. poecilochilus*; Ceï 1956, 1980, as *L. mystaceus*, and 1987; Di Tada et al. 1976, as *L. mystaceus*; Freiberg 1942, as *L. mystaceus*; Gallardo and Valera de Olmedo 1992; Heyer 1983; Heyer et al. 1996); **species or taxonomic lists** (Frost 1985; Glaw et al. 2000; Gorham 1966, as *L. mystaceus* in part; Lavilla 1992; Lavilla and Ceï

2001; Nieden 1923, as *L. mystaceus* in part); and **zoogeography** (De la Riva 1993; Duellman and Thomas 1996; Gallardo 1966, as *L. mystaceus*; Harvey 1998; Heyer 1978, 1988; Heyer and Maxson 1982).

• **NOMENCLATURE HISTORY.** *Leptodactylus elenae* was identified as *L. longirostris*, *L. mystaceus*, and *L. poecilochilus* prior to its recognition as a distinct species in 1978.

• **REMARKS.** The common name for *Leptodactylus elenae*, Rana Marmolada (Straneck et al. 1993), was translated to Marbled Frog by Frank and Ramus (1995).

• **ETYMOLOGY.** Heyer (1978) named the species for his daughter, Elena.

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