

## Catalogue of American Amphibians and Reptiles.

GAUDIN, ANTHONY J. 1979. *Hyla cadaverina*.*Hyla cadaverina* Cope  
California treefrog

*Hyla nebulosa* Hallowell, 1854:96 (not *Hyla nebulosa* Spix, 1824, from Brazil). Type-locality, "Tejon Pass," Los Angeles County, California. Syntypes, Acad. Natur. Sci. Philadelphia, 1987, 1988, two females, collected by A. L. Heermann (not examined by author).

*Hyla cadaverina* Cope, 1866:84. Replacement name for *Hyla nebulosa* Hallowell, preoccupied by *Hyla nebulosa* Spix.

*Hyla californiae* Bogert, 1958:11. Nomen nudum.

*Hyla californiae* Gorman, 1960:214. Type-locality, "Canyon de Llanos, 9 mi. (14.5 km.) SSW of 'Alaska' [La Rumorosa], Partido del Norte, Baja California, Mexico." Holotype, Museum of Vertebrate Zoology (Univ. of California, Berkeley) 31773, collected 10 June 1939 by R. R. Miller and J. Davis (not examined by author).

- CONTENT. No subspecies have been described.

• DEFINITION AND DIAGNOSIS. A moderately small treefrog (males to 36 mm and females to 45 mm snout-vent length) possessing these characteristics: snout rounded; canthus rostralis rounded; diameter of tympanum less than half that of eye; arms short and slender; fingers slender, lacking webbing; digital discs small, about  $\frac{2}{3}$  diameter of tympanum; subarticular tubercles large; hind limbs short and slender; heel of adpressed hind limb reaching anterior border of eye; inner metatarsal tubercle small; outer metatarsal tubercle minute or absent; toes long and slender, about  $\frac{3}{4}$  webbed; penultimate phalanx of most toes free of web; skin tuberculate on dorsum, granular to smooth on venter.

Dorsal coloration is grayish to brown, with several to many darker brown to green spots and/or blotches; ventral surfaces of throat and belly dull gray to white; groin, anterior and posterior surfaces of thigh, ventral surface of shank, and inner surface of tarsus dull yellow; white line on upper lip.

This treefrog can be readily separated from *Hyla regilla*, the only other hylid in its range, by noting that *H. cadaverina* lacks the prominent, dark "eye-mask" that extends from the tip of the snout through the eye and posteriorly to the shoulder in *H. regilla*. The dorsum is tuberculate in *cadaverina* and smooth to very weakly pustulate in *regilla*. Webbing reaches the base of the penultimate phalanx of the fourth toe in *cadaverina*, but only to the base of the antepenultimate phalanx of the fourth toe in *regilla*. The only other treefrog in western North America with which it could easily be confused is *Hyla arenicolor*, which has a larger tympanum ( $\frac{2}{3}$  the diameter of the eye), larger digital discs, and less webbing (toes only  $\frac{1}{2}$  webbed).

• DESCRIPTIONS. The most nearly complete and readily available descriptions of adults appear in Duellman (1970), Ball and Jameson (1970), Wright and Wright (1949), and Storer (1925). Storer (1925) and Gaudin (1965) describe the eggs. See Gaudin (1964) and Duellman (1970) for descriptions of larvae, and Gaudin (1965) for a diagnostic comparison of larvae of *H. cadaverina* and

*H. regilla* at several developmental stages. The mating call has been described by Ball and Jameson (1966), Littlejohn (1971), and Duellman (1970), and consists of a series of short, single-note "quacks." The following average measurements were reported from a population in southern California by Littlejohn (1971): dominant frequency 1950–2200 ( $\bar{x}$  = 2080) Hz; pulse repetition rate 134.9–148.2 ( $\bar{x}$  = 142.4) pulses/sec; call duration 127–172 ( $\bar{x}$  = 148.4) msec (wet bulb air temperature 9.0°C, water temperature 15.7°C).

• ILLUSTRATIONS. Color illustrations of adults appear in Stebbins (1966) and Duellman (1970). Eggs are illustrated in Gaudin (1965). Larvae are illustrated in Gaudin (1964, 1965) and Duellman (1970). Gaudin (1969) illustrates the skull. Audiospectrograms of the mating call appear in Ball and Jameson (1966) and Duellman (1970); and Littlejohn (1971) presents an oscillogram of the mating calls of both *cadaverina* and *H. regilla*.

• DISTRIBUTION. *Hyla cadaverina* occurs in the mountains and canyons of southern California and northern Baja California, Mexico; from San Luis Obispo, California south to near Bahia de los Angeles, Baja California, and from coastal canyons eastward to the western fringes of the Mojave and Colorado deserts; from near sea level to 1700 m. For specific localities, see Storer (1925), Linsdale (1932), Salt and Stebbins (1948), Stebbins (1951), Duellman (1970), Glaser (1970), Ball and Jameson (1970), and Schoenherr (1976).

- FOSSIL RECORD. None.

• PERTINENT LITERATURE. Storer (1925) provides much information on life history, breeding behavior, and general ecology. Brattstrom (1963) discusses the thermal requirements of the species in relation to its use of its habitat. Dole (1974) reports on home range and seasonal movements in a stream-dwelling population in the San Gabriel Mountains. Harris (1975) reports on the seasonal use of the streamside habitat and the use of deep crevices away from the stream for winter hibernation. Lillywhite and Licht (1975) report on the adaptive significance of the discharge of large amounts of mucus from integumentary glands. Cunningham (1964) reports on food habits, moisture relations, and thermal ecology. Gorman (1960) discusses ecology and natural history of *H. cadaverina*, and compares its behavior to that of *H. arenicolor*. Miller and Stebbins (1964) report on general

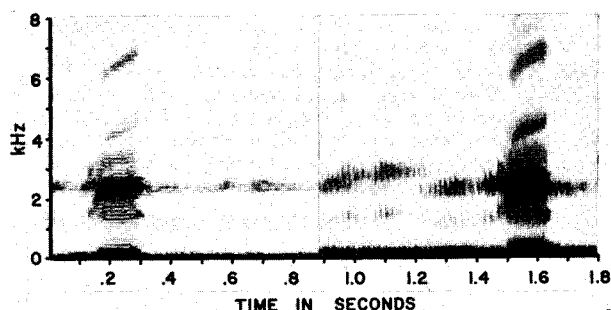
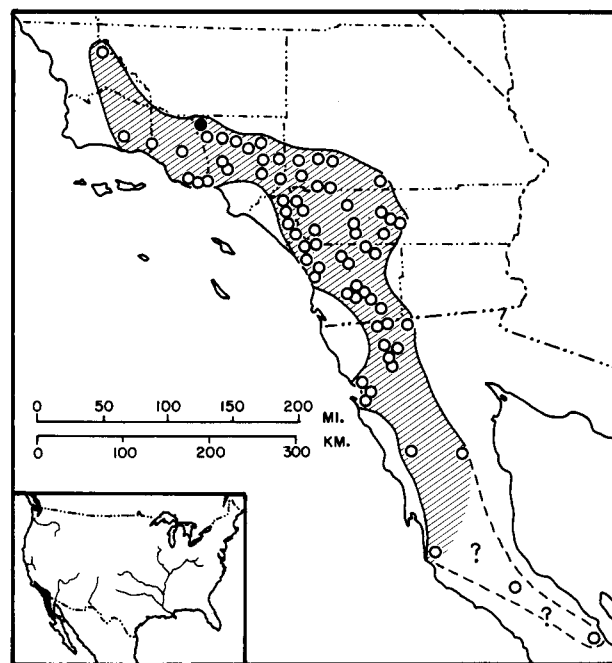


FIGURE. Audiospectrogram of call of *Hyla cadaverina*: Sentenac Canyon, San Diego County, California, 24 March 1956, water 13°C, air 15.5°C; narrow band (45 Hz) filter on right, wide band (300 Hz) filter on left; Amer. Mus. Natur. Hist. tape no. 7.



MAP. The solid circle marks the type-locality; open circles indicate other records. Distributional boundaries in the southern part of the range in Baja California are uncertain.

ecology and behavior of populations living at permanent springs in the Mojave Desert, and Schoenherr (1976) discusses the association of these frogs with boulders in riparian habitats in the San Gabriel Mountains. Stebbins (1951) presents information on ecology and life history. Ball and Jameson (1966) present a multivariate analysis of mating call and morphology in a comparison of *H. cadaverina* and *H. regilla*; and Littlejohn (1971), and Straughan (1975) analyze components (especially pulse repetition rate) in their mating calls that allow discrimination by females of the species. The call may be heard on a phonograph record (Bogert, 1958). Ball and Jameson (1970) present a multivariate statistical analysis of morphological differentiation in 22 populations of *H. cadaverina*, and discuss the ecological factors involved in this differentiation. Gaudin (1965) describes larval development in both *cadaverina* and *H. regilla*. Maxson and Jameson (1968) present a karyotype and karyogram, and compare the chromosomes of *cadaverina* and *regilla*. Ralin (1972) crossed *H. cadaverina* with several other species of treefrogs and used the results of the matings to relate *cadaverina* to the "eximia" group of North American hylids (consists of *H. eximia*, *H. regilla*, *H. cadaverina*, *H. squirella*, *H. euphorbiceae*, *H. plicata*, and *H. walkeri*). Maxson and Wilson (1974, 1975) studied serum albumins in *cadaverina* and used the data to analyze the phylogenetic relationships of the species. Wallace, Maxson, and Wilson (1971) used a similar technique to analyze the rate of evolution within frogs in general. Savage (1960), and Ball and Jameson (1970), studied the biogeography of *H. cadaverina*.

• **NOMENCLATURE HISTORY.** For years, *H. cadaverina* was considered a disjunct, western segment of *Hyla arenicolor* Cope 1866, the canyon tree frog found east of the Colorado River and in Mexico. Gorman (1960) recognized the specific distinctness of the western form, naming it *H. californiae*, but he overlooked the earlier names *nebulosa* Hallowell 1854 and *cadaverina* Cope 1866 based on this species. Jameson et al. (1966) identified *cadaverina* as a senior synonym of *californiae*, and Duellman (1968) added supporting information.

• **ETYMOLOGY.** The specific name *cadaverina* has two Latin roots: "*cadaver*," which means "corpse;" and "*ina*," a suffix used either as a diminutive (in which case *cadaverina* would mean "little corpse"), or to mean "likeness" or "belonging to" (in which case *cadaverina* means "resembling a corpse"). Both translations accurately describe the pale, corpse-like appearance of this small treefrog in life.

#### COMMENT

Brattstrom and Warren (1955), and Gorman (1960), report the existence of probable natural adult hybrids between *H. cadaverina* and *H. regilla* in southern California; however, attempts to hybridize these species in the laboratory by the author and by Maxson and Jameson (1968) have resulted only in the production of tadpoles that fail to survive metamorphosis.

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