

Catalogue of American Amphibians and Reptiles.

PLATZ, JAMES E. AND JOHN S. MECHAM. 1984. *Rana chiricahuensis*.***Rana chiricahuensis* Platz and Mecham
Wrights' leopard frog**

Rana chiricahuensis, Platz and Mecham 1979:383. Type-locality, "Herb Martyr Lake (elev. 1768 m), 6 km west of Portal, Coronado National Forest, Cochise County, Arizona." Holotype, Am. Mus. Natur. Hist. 100372, an adult alcoholic male collected on 10 September 1971, by James E. Platz (examined by authors).

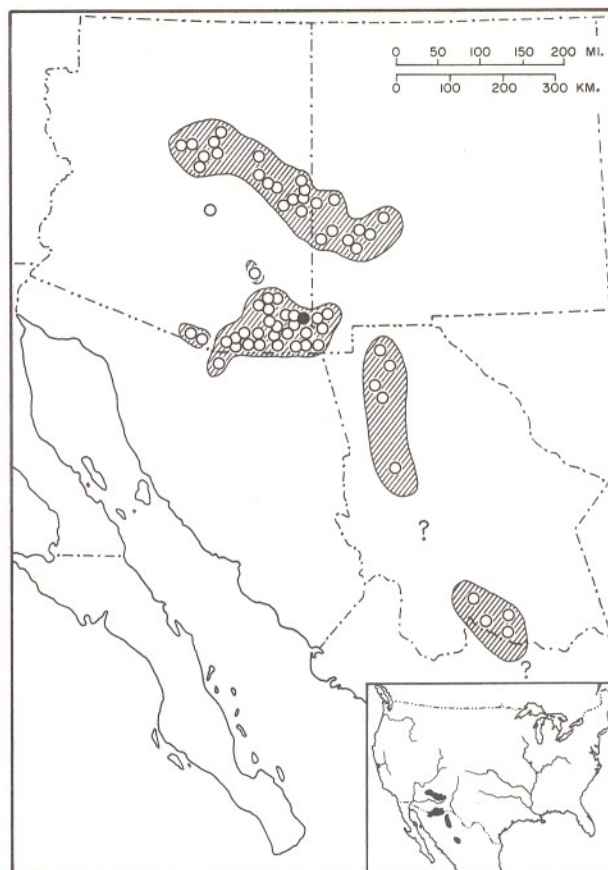
• CONTENT. No subspecies have been proposed.

• DEFINITION. A species of the *Rana pipiens* complex with a snout-vent length of 57-95 mm in adults. Body proportions relatively stocky; skin on back and sides generally more rugose than other leopard frog species. Dorsolateral folds present, and interrupted posteriorly and deflected medially in the region of the base of the urostyle. Vocal sacs small and external. Supralabial stripe incomplete (diffuse anterior to eye) except in juveniles where it may appear well defined to the tip of the snout. The venter is variably melanistic; gray mottling on throat may extend onto the chest, with dusky pigment often evident on lower belly and thighs. Yellowish pigmentation in the groin region often extends onto the posterior venter and adjacent upper thighs. The area surrounding the cloaca and posterior region of the thigh is covered with small tubercles, each associated with a small cream colored spot.

The mating call is a long snore-like trill with an unusually high pulse repetition rate (approximately 34 pulses/sec at 22°C) and pulse number (28-68 per call). Pulse duration and pulse rise time are both unusually short. The call is typically offered as a single note lasting between 1 and 2 seconds depending upon temperature and is repeated intermittently.

• DESCRIPTIONS. Prior to formal description by Platz and Mecham (1979), Wright and Wright (1949:516-519) described the external morphology and coloration from specimens collected at Lakeside, Arizona. Mecham (1968) also provides a good description of morphology and coloration under his heading as the "southern" form. Platz (1976) discusses geographic variation of mensural characters utilizing multivariate analyses. The morphology of natural hybrids is included. Pace (1974) provides information on the morphology of the vocal sacs.

• ILLUSTRATIONS. Wright and Wright (1949:518) include (as unidentified members of the *R. pipiens* complex) 5 photographs of single individuals, one photograph in which an adult is compared with *R. pipiens* from the same locality, and a photograph of a



MAP. Solid circle marks the type-locality; open circles indicate other localities.

tadpole that may pertain to this species. Photographs of three adults, together with a photograph of a juvenile compared with a juvenile *R. pipiens*, are found in Mecham (1968). Mecham (1971) provides an audiospectrogram of the mating call, together with oscillograms of the mating call, mating call pulse, and low trill pulse, all from recordings made near Nuevo Casas Grandes, Chihuahua.

• DISTRIBUTION. This species occurs in Arizona, New Mexico, and Sonora and Chihuahua, Mexico. The distribution is discontin-

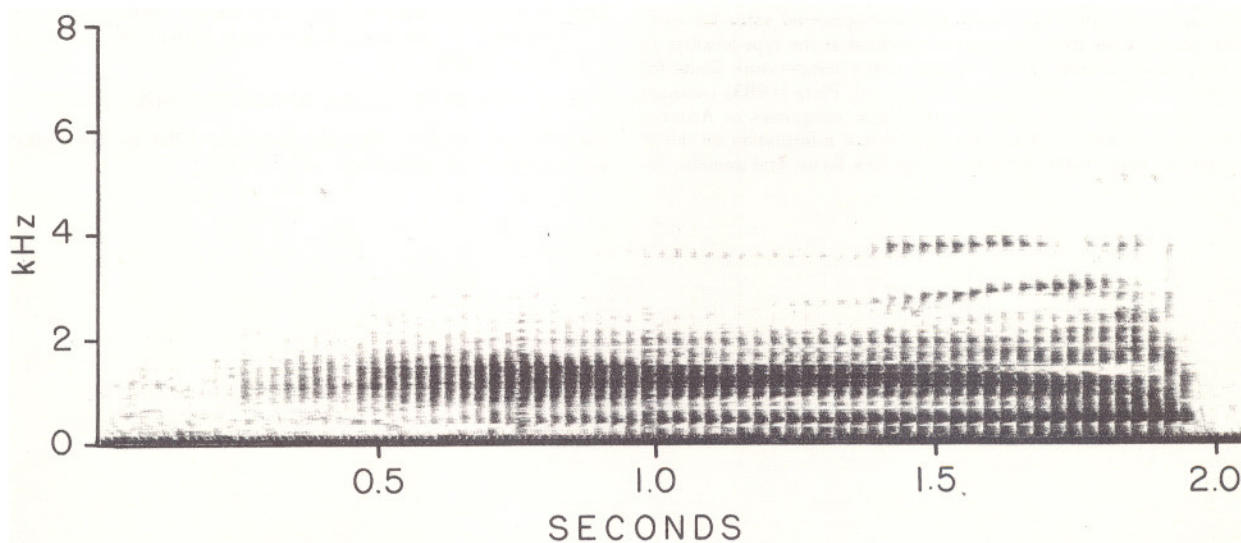


FIGURE 1. Audiospectrogram of mating call of *Rana chiricahuensis*: 19 mi N Buenaventura, Chihuahua, Mexico, 27 June 1969; air 22.2°, water 24.6°C; recorded by J. Mecham.



FIGURE 2. *Rana chiricahuensis*, adult female topotype. Photograph by J. Mecham.

uous. Populations in the northern part of the range are essentially confined to montane habitats of the Mogollon Rim country of central and eastern Arizona, and montane areas of adjacent western New Mexico. This part of the range is separated from populations along the southern borders of Arizona and southwestern New Mexico by an intervening expanse of scrub desert with elevations below 1000 m. Another series of populations are distributed southward in Chihuahua along the eastern base of the Sierra Madre Occidental. The species occurs over a wide range of altitudes (1000–2600 m) and in a variety of permanent aquatic habitats where adequate depth provides escape from predators. These include montane streams, ponds, lakes, and marshes, and, at intermediate elevations, stock-ponds and plunge pools of canyon streams.

• Fossil Record. None.

• PERTINENT LITERATURE. Platz (1976) provides the most comprehensive survey of geographic variation in morphology, as well as an electrophoretic analysis of protein variation. Also included are estimates of rates of natural hybridization and backcrossing with two other members of the *Rana pipiens* complex in Arizona. Platz and Platz (1973) compare the hemoglobins of this species with those of two other forms in Arizona. Frost and Bagnara (1977) give information on the species in sympatry with *R. blairi* in southeastern Arizona. They also compare hemoglobins of the two forms, and present results of experimental crosses between the two species. Mecham (1968) includes results of laboratory crosses with *R. pipiens*, as well as comparative life history observations. Purcell (1968) presents information on rates of embryonic development at different temperatures, as well as results of experimental crosses with *R. blairi* and *R. berlandieri*. Zweifel (1968) provides information regarding temperature tolerances and developmental rates for early embryonic stages from egg masses collected at the type-locality. In a later paper Zweifel (1977) reports upper temperature limits for embryos from this same locality. Frost and Platz (1983) compare life history data of this species and three congeners in Arizona. They also compare mating calls, and review information on developmental compatibility between the various forms and genetic po-

tential of F_1 hybrids. An analysis of pre-mating isolating mechanisms that act to limit hybridization with each of the other species is included. Hillis et al. (1983) provide a phylogenetic scheme of relationships among members of the *R. pipiens* complex including all currently recognized species in the Central United States and Mexico.

• ETYMOLOGY. The name *chiricahuensis* (Latinized from Chiricahua) refers to a tribe of Apache Indians. The holotype and paratypes were collected in the Chiricahua Mountains, and the geographic range of the Chiricahua Indians was at one time largely coincident with the distribution of this anuran. The common name, Wright's leopard frog, credits Albert and Anna Wright (1949) for their original discovery at Lakeside, Arizona in 1942.

LITERATURE CITED

- Frost, John S., and Joseph T. Bagnara. 1977. Sympatry between *Rana blairi* and the southern form of leopard frog in southeastern Arizona (Anura: Ranidae). *Southwest. Natur.* 22(4): 443–453.
- , and James E. Platz. 1983. Comparative assessment of modes of reproductive isolation among four species of leopard frogs (*Rana pipiens* complex). *Evolution* 37(1):66–78.
- Hillis, David M., John S. Frost, and David A. Wright. 1983. Phylogeny and biogeography of the *Rana pipiens* complex: a biochemical evaluation. *Syst. Zool.* 32(2):132–143.
- Mecham, John S. 1968. Evidence of reproductive isolation between two populations of the frog, *Rana pipiens*, in Arizona. *Southwest. Natur.* 13(1):35–44.
- 1971. Vocalizations of the leopard frog, *Rana pipiens*, and three related Mexican species. *Copeia* 1971(3):505–516.
- Pace, Ann E. 1974. Systematic and biological studies of the leopard frogs (*Rana pipiens* complex) of the United States. *Misc. Publ. Mus. Zool. Univ. Michigan* (148):1–140.
- Platz, James E. 1976. Biochemical and morphological variation of leopard frogs in Arizona. *Copeia* 1976(4):660–672.
- , and John S. Mecham. 1979. *Rana chiricahuensis*, a new species of leopard frog (*Rana pipiens* complex) from Arizona. *Copeia* 1979(3):383–390.
- , and Anna L. Platz. 1973. *Rana pipiens* complex: hemoglobin phenotypes of sympatric and allopatric populations in Arizona. *Science* 179:1334–1336.
- Purcell, Jerry W. 1968. Embryonic temperature adaptations of southwestern populations of *Rana pipiens*. M. S. Thesis, Texas Tech Univ. v + 46 p.
- Wright, Albert A., and Anna H. Wright. 1949. Handbook of frogs and toads of the United States and Canada. Third edition. Comstock Publ. Co., Ithaca, New York. xii + 640 p.
- Zweifel, Richard G. 1968. Reproductive biology of anurans of the arid southwest, with emphasis on adaptation of embryos to temperature. *Bull. Amer. Mus. Natur. Hist.* 140(1):1–64.
- 1977. Upper thermal tolerances of anuran embryos in relation to stage of development and breeding habits. *Amer. Mus. Novitates* (2617):1–21.
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