

Catalogue of American Amphibians and Reptiles.

POUGH, F. HARVEY. 1977. *Uma notata*.*Uma notata* Baird
Colorado Desert fringe-toed lizard

Uma notata Baird, 1859:253. Type-locality, "Mojave Desert," in error, corrected to "Colorado Desert, California" by Heifetz (1941:101). Holotype, U. S. Nat. Mus. 4124, collected by Lt. Williamson and Dr. A. L. Heerman (holotype not seen by author).

Callisaurus notatus: Cope, 1896:1049.

• CONTENT. Two subspecies are recognized: *U. n. notata* and *U. n. rufopunctata*.

• DEFINITION AND DIAGNOSIS. A medium-sized species of *Uma* (maximum snout-vent length 121 mm in males, 94 mm in females) with a dorsal pattern of ocelli that form lines over the shoulders. The single ventrolateral bar may extend onto the dorsum as a thin line. The gular chevrons are faint or broken medially. There are usually 3, sometimes 4 internasals.

• DESCRIPTIONS. For the best descriptions, see Cope (1900), Heifetz (1941), Smith (1946), and Norris (1958). See COMMENT.

• ILLUSTRATIONS. Heifetz (1941), Smith (1946), Norris (1958) provide photographs. Line drawings of scutellation are in Cope (1900), Heifetz (1941), and Smith (1946). Color illustrations are in Schmidt and Inger (1957), and Cochran and Goin (1970). Stebbins (1954, 1966) gave diagrams of the venter.

• DISTRIBUTION. *Uma notata* occurs in areas of wind-blown sand in the Colorado Desert of California and northeastern Baja California, eastward through the Gran Desierto to southwestern Arizona, and southward along the Gulf of California in northwestern Sonora, Mexico. The southern limits of the species' range in Sonora are not known (Norris, 1958; Smith and Hensley, 1958). Photographs of habitat are in Stebbins (1944), Norris (1958), and Mayhew (1966).

• FOSSIL RECORD. None.

• PERTINENT LITERATURE. The most comprehensive account of the species is that of Norris (1958). See also Cope (1900), Van Denburgh (1922), Smith (1946), and Mayhew (1966, 1968).

Cook (1949) and Licht (1964a, 1964b, 1965) studied metabolism and heart rate. Chew and Damman (1961) and Deavers (1972) studied water relationships. Pough (1969a, 1969b, 1976) found no physiological differences between *U. n. notata* and *U. inornata*. Cowles (1939), Cowles and Bogert (1944), Mayhew (1964b), and Brattstrom (1965) provided temperature data. Regal (1967) reported voluntary hypothermia in *U. notata*.

Mayhew (1961, 1964a, 1966, 1967) and Mayhew and Wright (1970) studied reproduction. Shaw (1952) described the eggs of both subspecies. For background color-matching, see Klauber (1939), Stebbins (1944), Norris (1958, 1967), and Norris and Lowe (1964). Lynn, et al. (1966) described the thyroid gland. Maderson et al. (1970), and Stewart and Daniel (1975) studied the epidermis. Presch (1970), Earle (1962), Wever and Peterson (1963), and Peterson (1966) studied the ear and hearing. Gorman et al. (1967) found $2n = 12$ metacentric macrochromosomes and 22 microchromosomes. Guttman (1970) compared the hemoglobin with that of other sand lizard genera.

Shaw (1950) described the diet of captive individuals. Funk (1965) recorded *U. n. rufopunctata* in the diet of *Crotalus cerastes*. Carpenter (1963) described display patterns.

• ETYMOLOGY. *Notata* (Latin) means known; *rufopunctata* (Latin, *rufus* "red" or "reddish" and *punctus* "pricked in") refers to the reddish color of the dorsal ocelli.

1. *Uma notata notata* Baird

Uma notata Baird, 1859:253. See species synonymy.
Uma notata notata: Heifetz, 1941:101. First use of trinomial. See REMARKS.

• DIAGNOSIS. This subspecies is characterized by retention of lateroventral orange markings throughout the year, and by wide ventrolateral black bars.

• REMARKS. Heifetz (1941) included part of the Arizona-

Sonora population in this subspecies. Norris (1958) restricted *U. n. notata* to populations west of the Colorado River. Thus, Smith and Taylor's (1950:355) restriction of the type-locality to "Yuma, Yuma County, Arizona" is unacceptable.

2. *Uma notata rufopunctata* Cope

Uma rufopunctata Cope, 1895:938. Type-locality, "Arizona," = Monument 200, Yuma Desert [Yuma County], Arizona (fide Cochran, 1961:152). Syntypes, U. S. Nat. Mus. 21846-28147, 21849-21852, Univ. Illinois Mus. Nat. Hist. 40750, collected 15-16 May 1894 by E. A. Mearns (not examined by author).

Callisaurus rufopunctatus: Cope, 1896:1049.

Uma notata cowlesi Heifetz, 1941:104. Type-locality, "Tepoca Bay, Sonora, Mexico." Holotype, California Acad. Sci. 53370, collected 25 April 1921 by J. R. Slevin (not examined by author).

Uma notata rufopunctata: Norris, 1958:290. First use of combination.

• DIAGNOSIS. This subspecies is characterized by the absence of orange ventral markings except in the breeding season, and by narrow ventrolateral black bars.

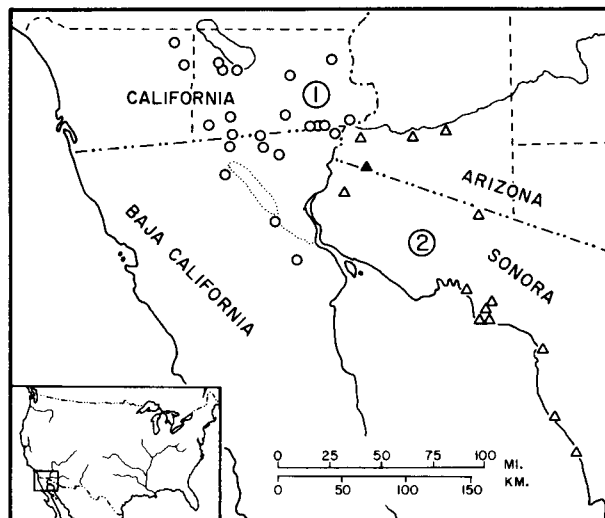
• REMARKS. Heifetz (1941) based the subspecies *U. n. cowlesi* on specimens from Tepoca Bay, Sonora with very narrow ventrolateral blotches. I agree with Norris (1958) that more information on variation in the *Uma notata* populations of Baja California is needed before this character can be evaluated. Smith and Hensley (1958) reported a specimen of *U. n. rufopunctata* from 11.5 mi NE Puerto Peñasco, Sonora with the orange ventrolateral stripe characteristic of *U. n. notata*. This character may be more variable than current reports indicate.

COMMENT

Uma was long considered monotypic. References to "*Uma notata*" especially before 1941, when *U. inornata* and *U. scoparia* were resurrected (Heifetz, 1941), can be correctly attributed to species only if detailed locality data, descriptions, or photographs are given.

LITERATURE CITED

- Baird, S. F. 1859. Description of new genera and species of North American lizards in the museum of the Smithsonian Institution. Proc. Acad. Natur. Sci. Philadelphia 10:253-256.
- Brattstrom, Bayard H. 1965. Body temperatures of reptiles. Amer. Midland Natur. 73(2):376-422.
- Burt, Charles E. 1931. On the occurrence of a throat-fan in the sand lizard, *Uma notata* Baird, with notes on the adaptive specializations of the form. Copeia 1931(1):15-16.



MAP. Circles mark localities for *U. n. notata*, triangles for *U. n. rufopunctata*; solid triangle marks type-locality (that of *notata* is too indefinite to locate). The species is restricted to wind-blown sand dunes, so the distribution is discontinuous.

- Camp, Charles L. 1916. Notes on the local distribution and habits of the amphibians and reptiles of southeastern California in the vicinity of the Turtle Mountains. Univ. California Publ. Zool. 12(17):503-544.
- Carpenter, Charles C. 1963. Patterns of behavior in three forms of the fringe-toed lizards (*Uma*, Iguanidae). Copeia 1963(2):406-412.
- Chew, R. M., and A. E. Damman. 1961. Evaporative water loss of small vertebrates as measured with an infrared analyzer. Science 133:384-385.
- Cochran, Doris M. 1961. Type specimens of reptiles and amphibians in the U. S. National Museum. U. S. Natl. Mus. Bull. (220):xv + 291 p.
- , and Coleman J. Goin. 1970. The new field book of reptiles and amphibians. G. P. Putnam's Sons, New York. xxii + 359 p.
- Cook, S. F. 1949. Respiratory metabolism of certain reptiles and Amphibia. Univ. California Publ. Zool. 53(10):367-376.
- Cope, Edward D. 1895. On the species of *Uma* and *Xantusia*. Amer. Natur. 29:938-939.
- 1896. On the genus *Callisaurus*. *Ibid.* 30:1049-1050.
- 1900. The crocodylians, lizards and snakes of North America. Ann. Rept. U. S. Nat. Mus. for 1898:153-1270.
- Cowles, Raymond B. 1939. Possible implications of reptilian thermal tolerance. Science 90:465-466.
- , and Charles M. Bogert. 1944. A preliminary study of the thermal requirements of desert reptiles. Bull. Amer. Mus. Natur. Hist. 83(5):261-296.
- Deavers, Daniel R. 1972. Water and electrolyte metabolism in the arenicolous lizard *Uma notata notata*. Copeia 1972(1):109-122.
- Earle, Alvin M. 1962. The middle ear of the genus *Uma* compared to those of the other sand lizards. Copeia 1962(1):185-188.
- Funk, Richard S. 1965. Food of *Crotalus cerastes laterorepens* in Yuma County, Arizona. Herpetologica 21(1):15-17.
- Gorman, G. C., L. Atkins, and T. Holzinger. 1967. New karyotypic data on 15 genera of lizards in the family Iguanidae with a discussion of taxonomic and cytological implications. Cytogenetics 6:286-299.
- Guttman, Sheldon I. 1970. An electrophoretic study of the hemoglobins of the sand lizards, *Callisaurus*, *Cophosaurus*, *Holbrookia*, and *Uma*. Comp. Biochem. Physiol. 34(3):569-574.
- Heifetz, William. 1941. A review of the lizards of the genus *Uma*. Copeia 1941(2):99-111.
- Hunsaker, Don, and C. Johnson. 1959. Internal pigmentation and ultraviolet transmission of the integument in amphibians and reptiles. Copeia 1959(4):311-315.
- Klauber, Laurence M. 1939. Studies of reptile life in the arid southwest. Bull. Zool. Soc. San Diego (14):1-100.
- Licht, Paul. 1964a. The temperature dependence of myosin adenosinetriphosphatase and alkaline phosphatase in lizards. Comp. Biochem. Physiol. 12(1):331-340.
- 1964b. A comparative study of the thermal dependence of contractility in saurian skeletal muscle. *Ibid.* 13(1):27-34.
- 1965. Effects of temperature on heart rates of lizards during rest and activity. Physiol. Zool. 38(2):129-137.
- Lynn, W. G., M. C. O'Brien, and P. Herhenreader. 1966. Thyroid morphology in lizards of the families Iguanidae and Agamidae. Herpetologica 22(2):90-93.
- Maderson, P. F. A., W. W. Mayhew, and G. Sprague. 1970. Observations of the epidermis of desert-living iguanids. J. Morph. 130(1):25-36.
- Mayhew, W. W. 1961. Photoperiodic response of female fringe-toed lizards. Science 134:2104-2105.
- 1964a. Photoperiodic responses in three species of the lizard genus *Uma*. Herpetologica 20(2):95-113.
- 1964b. Taxonomic status of California populations of the lizard genus *Uma*. *Ibid.* 20(3):170-183.
- 1966. Reproduction in the arenicolous lizard *Uma notata*. Ecology 47(1):9-18.
- 1967. Comparative reproduction in three species of the genus *Uma*, p. 45-61. In Milstead, W. W., ed., Lizard ecology: A symposium. Univ. Missouri Press, Columbia. xii + 300 p.
- 1968. The biology of desert amphibians and reptiles, p. 195-356. In Brown, G. W., Jr., ed., Desert biology, Vol. 1. Academic Press, New York. xvii + 635 p.
- , and S. J. Wright. 1970. Seasonal changes in testicular histology of three species of the lizard genus *Uma*. J. Morph. 130(2):163-186.
- Norris, Kenneth S. 1958. The evolution and systematics of the iguanid genus *Uma* and its relation to the evolution of other North American desert reptiles. Bull. Amer. Mus. Natur. Hist. 114(3):251-326.
- 1967. Color adaptation in desert reptiles and its thermal relationships, p. 162-229. In Milstead, W. W., ed., Lizard ecology: A symposium. Univ. Missouri Press, Columbia. xii + 300 p.
- , and Charles H. Lowe. 1964. An analysis of background color-matching in amphibians and reptiles. Ecology 45(3):565-580.
- Peterson, E. A. 1966. Hearing in the lizard: some comments on the auditory capacity of a nonmammalian ear. Herpetologica 22(3):161-171.
- Pough, F. Harvey. 1969a. Physiological aspects of the burrowing of sand lizards (*Uma*, Iguanidae) and other lizards. Comp. Biochem. Physiol. 31(6):869-884.
- 1969b. Environmental adaptations in the blood of lizards. *Ibid.* 31(6):886-901.
- 1976. The effect of temperature on oxygen capacity of reptile blood. Physiol. Zool. 49(2):141-151.
- Presch, William. 1970. Scleral ossicles in the sceloporine lizards, family Iguanidae. Herpetologica 26(4):446-450.
- Regal, Philip J. 1967. Voluntary hypothermia in reptiles. Science 155(3769):1551-1553.
- Schmidt, Karl P., and Robert F. Inger. 1957. Living reptiles of the world. Doubleday and Co., New York. 287 p.
- Shaw, Charles E. 1950. Lizards in the diet of captive *Uma*. Herpetologica 6(1):36-37.
- 1952. Notes on the eggs and young of some United States and Mexican lizards, I. *Ibid.* 8(3):71-79.
- Smith, Hobart M. 1946. Handbook of lizards: lizards of the United States and of Canada. Comstock Publ. Co., Ithaca, New York. xxi + 557 p.
- , and E. H. Taylor. 1950. Type localities of Mexican reptiles and amphibians. Univ. Kansas Sci. Bull. 33(8):313-380.
- Smith, Philip W., and Max Hensley. 1958. Notes on a small collection of amphibians and reptiles from the vicinity of the Pinacate Lava Cap in northwestern Sonora, Mexico. Trans. Kansas Acad. Sci. 61(1):64-76.
- Stebbins, Robert C. 1944. Some aspects of the ecology of the iguanid genus *Uma*. Ecol. Monogr. 14(3):311-322.
- 1954. Amphibians and reptiles of western North America. McGraw-Hill Co., New York. xxiv + 528 p.
- 1966. A field guide to western reptiles and amphibians. Houghton Mifflin Co., Boston. xiv + 279 p.
- Stewart, Glenn R., and Ronald S. Daniel. 1975. Microornamentation of lizard scales: some variations and taxonomic correlations. Herpetologica 31(1):117-130.
- Van Denburgh, John. 1922. The reptiles of western North America. Vol. 1. Occas. Papers California Acad. Sci. (10):1-611.
- Wever, E. G., and E. A. Peterson. 1963. Auditory sensitivity in three iguanid lizards. J. Audit. Res. 3:205-212.

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