

Catalogue of American Amphibians and Reptiles.

POUGH, F. HARVEY. 1974. *Uma scoparia*.

Uma scoparia Cope
Mojave fringe-toed lizard

Uma notata (part): Cope, 1866:310. See Remarks.

Uma scoparia Cope, 1894:435. Type-locality "Fort Buchanan (near Tucson), Arizona," in error, corrected to "Mojave Desert, California" by Schmidt (1953:119). Holotype, U. S. Natl. Mus. 6063 (cited incorrectly by Cope as "6065"), collected by Dr. B. J. D. Irwin; date of collection unknown (holotype not examined by author).

Uma scopifera: Cope, 1894:435. This spelling appears to be a misprint (Stejneger and Barbour, 1917:48).

Callisaurus scoparius: Cope, 1896:1049.

Callisaurus notatus (part): Burt, 1935:272.

Uma notata scoparia: Schmidt, 1953:119. First use of combination. See Remarks.

- CONTENT. The species is monotypic.

- DEFINITION AND DIAGNOSIS. A medium-sized species of *Uma* (maximum snout-vent length 104 mm; maximum total length 215 mm) with a dorsal pattern of scattered ocelli that do not coalesce to form longitudinal lines over the shoulders. There is a single ventrolateral blotch, and the mean ratio of snout-vent length to blotch width is 17.9 ± 0.2 . The gular crescents are complete, and usually widest medially. There are usually 5 internasals, rarely 3, 4, or 6. Femoral pores number 25 to 35, mean 29.6 (Norris, 1958). The ephemeral breeding color consists of a yellow-green ventral wash, becoming pink along the lateral abdominal folds (Norris, 1958:284). *Uma scoparia* is closely color-matched to the sands on which it occurs. There appears to be no phylogenetic significance in this character, but Norris (1958:285) found three characters that correlate with the probable evolutionary history of the species: posterior occlusion of the post-mental scale, the presence or absence of precloacal spots, and separation of the post-parietal and inter-parietal scales.

- DESCRIPTIONS. The best descriptions are those of Cope (1900), Heifetz (1941), Smith (1946), and Norris (1958). Many authors between 1922 and 1941 described *U. scoparia* as part of a composite "*Uma notata*."

- ILLUSTRATIONS. Cope (1894) illustrated the digital fringes and later (1900) provided line drawings of the holotype. Norris (1958) illustrated variation in posterior occlusion of the post-mental scale and the dorsal head scutellation. Black and white photographs are in Van Denburgh (1922:plates 10 and 11, as "*Uma notata*"), Heifetz (1941), Smith (1946), Miller and Stebbins (1964), and Dixon (1967). Stebbins (1954, 1966) gave diagrammatic drawings of dorsal and ventral aspects.

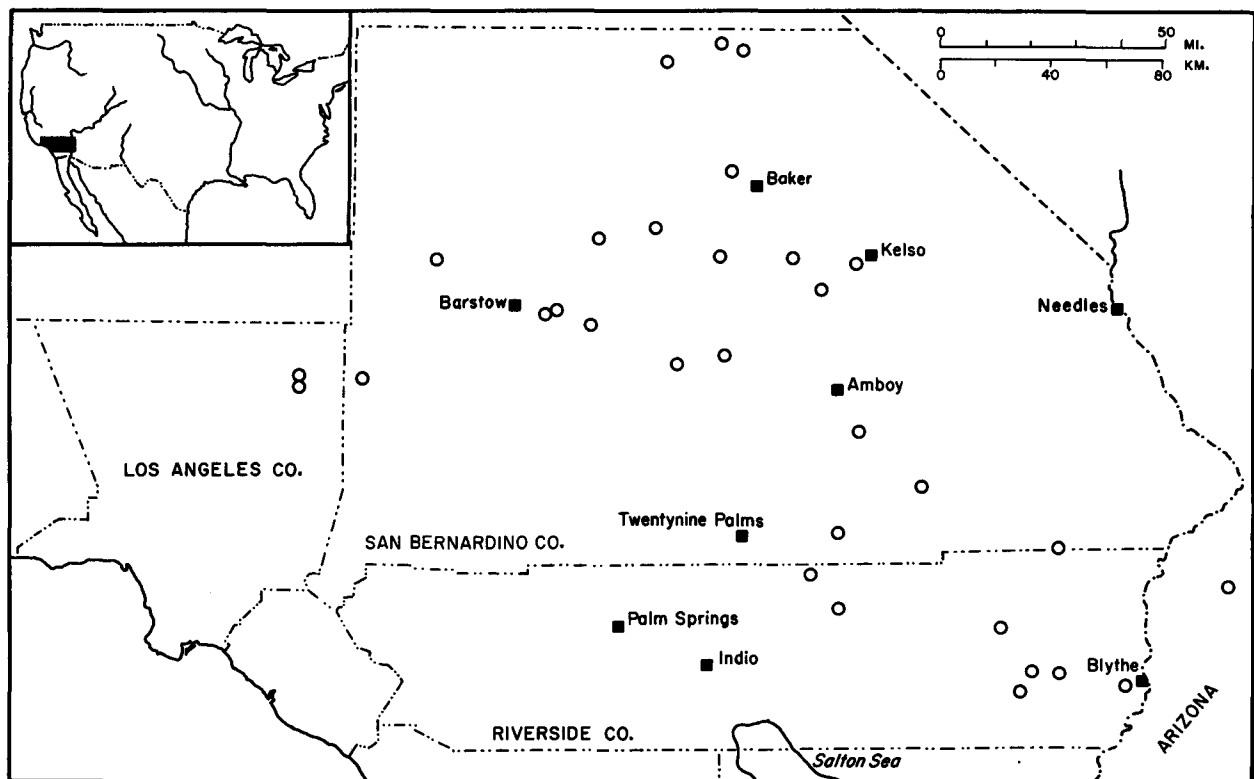
- DISTRIBUTION. *Uma scoparia* occurs on wind-blown sand dunes of the Mojave Desert, in Los Angeles, Riverside, and San Bernardino counties, California. Norris (1958:284, figs. 6-7) outlined the distribution of *U. scoparia* in detail, and showed the probable dispersal paths of the species (fig. 17). Stebbins (1944) and Miller and Stebbins (1964) described characteristic habitats. Mayhew (1966:115) published a photograph of typical habitat near Dale Dry Lake, San Bernardino County, California.

A specimen collected 15 miles southeast of Parker, Yuma County, Arizona (California Acad. Sci. 81478) is the only record of the species east of the Colorado River (Elvin, 1960).

- PERTINENT LITERATURE. Camp (1916) remarked upon background color matching of individuals from near Blythe Junction, Riverside County, California, and recorded stomach contents consisting of ants, beetles, grasshoppers, and plant material. Norris (1958, 1967) discussed background matching in greater detail, and presented reflectance curves.

Mosauer (1936) performed experiments on the critical thermal maximum in *Uma scoparia* (as "*Uma notata*") and reported temperatures at death averaging a fraction over 45° C (range 44.2-45.7). Mayhew (1964b) reported the following temperature observations from 411 *Uma scoparia*: maximum 44.2° C, minimum 25.8, mean 37.5, median 38.0, mode 38.0.

Mayhew (1964b) measured testis volumes of *Uma scoparia*, and discussed the length of the potential breeding season. In a more detailed report Mayhew (1966) noted that re-



MAP. Hollow symbols mark known localities for *Uma scoparia*. Because the species is restricted to wind-blown sand dunes, the distribution is discontinuous.

production is dependent on winter rainfall. The lizard's main food source is insects that feed on low-growing annual plants. Following dry winters there is little growth of annuals, hence a limited supply of food for the lizards. Under these conditions testes (and presumably ovaries) do not become active. In years of adequate rainfall testes begin to enlarge in March and reach maximum size in May. Motile sperm were found in the *vas deferens* from mid-April to July. Females had eggs in the oviducts from mid-May to mid-July, and probably lay more than once each year. *Uma scoparia* is active for shorter daily periods in March and April than *U. inornata* and *U. notata*, and reproductive changes were not strongly stimulated by long photoperiods in the laboratory (Mayhew, 1964a). *Uma scoparia* has a larger mean testis volume than *U. notata* or *U. inornata* (Mayhew, 1967), and a shorter reproductive season (Mayhew, 1967; Mayhew and Wright, 1970). *Uma scoparia* testes *in vitro* do best at 37° C, but are viable at temperatures as high as 44° C (Licht and Basu, 1967). Mayhew (1967, 1968) has summarized information on reproduction in *Uma*.

Mayhew (1966) reported that *U. scoparia* is most common in areas with abundant low-growing vegetation. Sand grain size may also affect distribution. Norris (*in Pough*, 1970: 154) noted that *U. scoparia* is absent from the lower part of the Pisgah Lava Flow, San Bernardino County, California, where dune sands contain large proportions of silt. In contrast, *U. scoparia* is the most abundant lizard at the foot of the nearby Sleeping Beauty Mountains, where the sand is silt-free. An account of the ecology and natural history of *U. scoparia* in Joshua Tree National Monument, including data on habitat, behavior, seasonal occurrence, temperature relationships, and reproduction, was presented by Miller and Stebbins (1964).

Uma scoparia is similar to *U. inornata* in the physiological parameters studied by Pough (1969a, 1969b). Minnich and Shoemaker (1972) studied water and electrolyte turnover in *U. scoparia* in relation to rainfall cycles and food. Miller (1966) described the morphology of the cochlear duct, and Etheridge (1964) described xiphisternal morphology.

Carpenter (1963) described the display pattern of *U. scoparia*. The challenge display posture is the same as for *U. notata* (see generic account), but the display action pattern is markedly different from other species of *Uma*. Two push-ups occur in rapid succession (0.6 seconds), followed by a pause (0.75 second), another push-up (0.55 second), a pause (0.6 second), culminated by a rise to half height (0.3 second). The entire sequence takes an average of 2.7 seconds. A rare variation of this pattern started with three initial push-ups and required 2.9 seconds to complete. In Carpenter's experimental enclosures *U. scoparia*, *U. notata* and *U. inornata* interacted extensively with little evidence of species discrimination. Dominance hierarchies included all three species.

Morphologically (Norris, 1958) and behaviorally (Carpenter, 1963) *U. scoparia* is the most divergent of the western group of *Uma*. Norris (1958:315) suggested that *U. scoparia*, probably originally derived from "proto-*Uma notata rufopunctata*" populations in the Gran Desierto, "became restricted to the old southern dunes of the Mojave Desert during the later Pluvial periods." Later it reinvaded the Mojave Desert along river-edge dunes of the Mojave and Amargosa rivers.

• **ETYMOLOGY.** *Scoparia* (Latin, "a sweeper") presumably refers to the brush-like toe fringes.

• **REMARKS.** Although adequately diagnosed by Cope (1894, 1900) *Uma scoparia* was for many years considered a synonym of *Uma notata*, probably as a result of the influential works of Camp (1916) and Van Denburgh (1922). References to "*Uma notata*" published between 1922 and 1941, when *U. scoparia* was resurrected (Heifetz, 1941), can be correctly attributed to species only if detailed locality data or photographs are given. Schmidt (1953:119) considered *U. scoparia* a subspecies of *Uma notata*, but this arrangement has been rejected by recent students of the genus (Stebbins, 1954; Norris, 1958; Mayhew, 1964).

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- F. HARVEY POUCH, SECTION OF ECOLOGY AND SYSTEMATICS, CORNELL UNIVERSITY, ITHACA, NEW YORK 14850.
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