MAMMALIAN SPECIES No. 732, pp. 1–3, 3 figs.

Sorex arizonae.

By Lee H. Simons and Donald F. Hoffmeister

Published 18 December 2003 by the American Society of Mammalogists

Sorex arizonae

Diersing and Hoffmeister, 1977

Arizona Shrew

Sorex arizonae Diersing and Hoffmeister, 1977:329. Type locality "upper end of Miller Canyon, 15 mi S [=10 mi S, 4¾ mi E] Fort Huachuca [near spring at lower edge of Douglas fir zone, Huachuca Mts.], Cochise County, Arizona."

CONTEXT AND CONTENT. Order Insectivora, family Soricidae, subfamily Soricinae, genus *Sorex*, group *saussurei* (Diersing and Hoffmeister 1977; George 1988; Ivanitskaya 1994; Junge and Hoffmann 1981). *Sorex arizonae* is monotypic (Diersing and Hoffmeister 1977).

DIAGNOSIS. *Sorex arizonae* (Fig. 1) is distinguished from other shrews by the presence of a well-defined post-mandibular foramen (Fig. 2), lack of pigmentation on lingual face of upper unicuspids, presence of medial accessory tines on I1, third unicuspid larger than or subequal to fourth unicuspid, condylobasal length ≤16.6 mm, and narrow palate (Diersing and Hoffmeister 1977; Junge and Hoffman 1981).

GENERAL CHARACTERS. *Sorex arizonae* is a small shrew with a gray to brown dorsum and slightly lighter venter (Diersing and Hoffmeister 1977; Hoffmeister and Goodpaster 1954). Means (range in parentheses) of external measurements (in mm) of 10 individuals (Diersing and Hoffmeister 1977) are: total length, 104 (93–114); length of tail, 42 (37–46); length of body, 61 (50–73); and length of hindfoot, 12 (11–13). Selected cranial and dental measurements (in mm, range) for these specimens (Diersing and Hoffmeister 1977) are: length of skull, 16.00 (15.70–16.53); breadth of braincase, 8.25 (8.10–8.40); maxillary breadth, 5.07 (4.87–5.32); and length of toothrow, 6.25 (6.00–6.41). Average external measurements (in mm, range) of 21 specimens from southern Arizona (L. Simons, unpublished data) are: total length, 101 (92–109); length of tail, 43 (38–49); and length of hindfoot, 12 (11–13). Tails of these specimens are 39–45% of total length (mean, 43%). Mean mass of 19 of these specimens is 3.5 g (2.6–5.2).

DISTRIBUTION. *Sorex arizonae* has a disjunct montane distribution (Fig. 3). Specimens have been collected from the Chiricahua, Huachuca, and Santa Rita mountains of southern Arizona (Diersing and Hoffmeister 1977), the Animas mountains of southern New Mexico (Conway and Schmitt 1978), and the Sierra Madre Occidental of Chihuahua, Mexico (Caire et al. 1978). Occurrence in Mexico is based on 1 specimen (Caire et al. 1978). Many areas where *S. arizonae* may occur in southern Arizona, southern New Mexico, and northern Mexico remain unsurveyed (Caire 1997; Simons and Van Pelt 1999). *S. arizonae* occurs between 1,575 and 2,590 m (Diersing and Hoffmeister 1977; Simons et al. 1990). No fossils of *S. arizonae* are known (George 1988).

FORM AND FUNCTION. Dental formula is i 3/1, c 1/1, p 3/1, m 3/3, total 32. Two of 5 *S. arizonae* from the Huachuca Mountains were reported to have abnormal dentition (Hoffmeister and Goodpaster 1954; referred to as *Sorex vagrans monticola*). Reported abnormalities included fused, misaligned, and missing unicuspids, although tooth loss and wear are normal in older soricids (Hoffmeister 1986; Rudd 1955).

ECOLOGY. *Sorex arizonae* occupies at least 2 vegetative communities (Cook 1986; Hoffmeister 1986): montane conifer forest and encinal and Mexican oak-pine woodland (Lowe and Brown 1973). Within these communities, *S. arizonae* occupies relatively mature forest with substantial understory vegetation and debris (Hoffmeister 1986; Simons and Van Pelt 1999). For 19 Arizona specimens (Simons and Van Pelt 1999), canopy closure ranged from 20 to 100% and was skewed low (mean, 86%). Plants occurring near *S. arizonae* capture sites (Caire et al. 1978; Conway and Schmitt 1978; Hoffmeister 1986; Simons and Van Pelt 1999) include Arizona cypress (*Cupressus arizonica*), Arizona madrone (*Arbutus arizonica*), Arizona sycamore (*Platanus wrightii*), Arizona walnut (*Juglans major*), columbine (*Aguilegia*), Douglas-fir (*Pseudotsuga menziesii*), horsetail (*Equisetum*), Mexican locust (*Robinia neomexicana*), quaking aspen (*Populus tremuloides*), and several species of juniper (*Juniperus*), grass, maple (*Acer*), oak (*Quercus*), pine (*Pinus*), and sumac (*Rhus*). All but 1 of 26 *S. arizonae* captured in southern Arizona in 1992 and 1993 were taken near logs or stumps, although most of the associated survey effort occurred near cover (Simons and Van Pelt 1999).

Sorex arizonae tends to inhabit well-vegetated mesic canyons (Hoffmeister 1986), but is apparently not tied to surface water (Simons and Van Pelt 1999). Twenty-one specimens were trapped 2–50 m from surface water and showed either no or negative association with water at the survey scale involved (Simons and Van Pelt 1999). Relative to sample effort, captures of *S. arizonae* increased with amount of rainfall, although captures were also frequent during some periods with no rainfall (Simons and Van Pelt 1999). Capture rates of *S. arizonae* and mean distance of successful trap sites from surface water did not vary systematically with elevation (Simons and Van Pelt 1999).

ONTOGENY AND REPRODUCTION. *Sorex arizonae* displayed evidence of reproductive activity from late July through October (Simons and Van Pelt 1999). Two specimens trapped in early October (L. H. Simons, in litt.) held embryos that were near term at ca. 9 mm crown-rump length (Foresman 1994). Data from winter and spring are lacking.

GENETICS. Four *S. arizonae* (3 from Arizona, 1 from New Mexico) displayed polymorphism at 5 of 26 loci (George 1988). Esterase (Est), glucosephosphate isomerase (GPI), glutamate dehydrogenase (GDH), lactate dehydrogenase (LDH-1), and malate dehydrogenase (MDH-1) were polymorphic. Estimated mean heterozygosity in *S. arizonae* was 0.01 (George 1988).

CONSERVATION STATUS. In 1982 *Sorex arizonae* was listed by the United States government as a category 2 candidate

FIG. 1. Adult Arizona shrew (*Sorex arizonae*) from McClure Canyon on the Fort Huachuca Military Reservation, Huachuca Mountains, Cochise County, Arizona. Catalogue number MSB 88910, Museum of Southwestern Biology, University of New Mexico, Albuquerque.

FIG. 2. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Sorex arizonae* from Pine Canyon, Chiricahua Mountains, Cochise County, Arizona (sex not known, MSB 88948). Greatest length of skull is 16.37 mm.

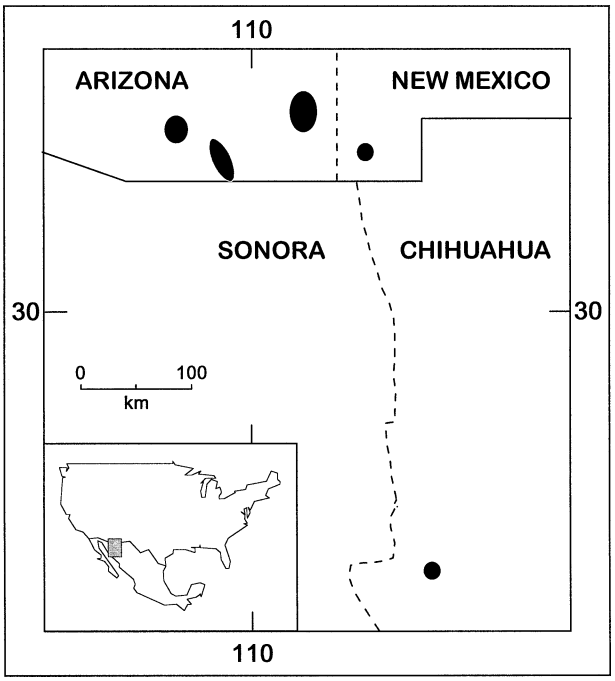

FIG. 3. Reported distribution of *Sorex arizonae* in southern Arizona, southern New Mexico, and northern Mexico. Arizona localities depict approximate size and shape of occupied mountain ranges.

species (Van Pelt et al. 1994). Currently it is listed as a species of special concern by the state of Arizona and as endangered by both the state of New Mexico (Jones and Schmitt 1997) and the country of Mexico (Arizona Game & Fish Department, in litt.). A site yielding the only specimen of *S. arizonae* reported from Mexico (Caire et al. 1978) was subsequently resurveyed but the area had been "clear-cut" and no additional specimens were obtained (W. Caire, in litt.). *S. arizonae* occurred widely in 2 mountain ranges in Arizona and was reasonably abundant at several sites (Simons and Van Pelt 1999). *S. arizonae* occupies a narrow range of habitat types (Cook 1986; Hoffmeister 1986), and thus may be sensitive to environment flux and the risk of extinction (Simons and Van Pelt 1999).

REMARKS. *Sorex arizonae* and *S. merriami* may have diverged in isolation during the late Pleistocene or Holocene (George 1988). The generic name *Sorex* is a Latin based term for shrew. The specific name *arizonae* refers to the state where most specimens including the type have been found.

Gordon L. Kirkland, Jr. and an anonymous reviewer commented on a draft of this manuscript. We thank W. L. Gannon and G. R. Racz (Division of Mammals, Museum of Southwestern Biology, University of New Mexico) for providing skull photographs and W. Caire, W. L. Gannon, W. Haberl (the shrew site), S. Stone, and W. Van Pelt for other assistance.

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Associate editors of this account were LESLIE N. CARRAWAY and LUI MARINELLI. Editor was Virginia Hayssen.

L. H. SIMONS, SHASTA NATURAL HISTORY FOUNDATION, YREKA, CA, 96097-2871, UNITED STATES. D. F. HOFFMEISTER, 20 FIELDS EAST, CHAMPAIGN, IL 61821, UNITED STATES.