

# Natural History and Population Status of the Slate Milliped, *Comanchelus chihuanus* (Diplopoda: Spirobolida: Atopetholidae)

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## Abstract

The atopetholid milliped *Comanchelus chihuanus* (Chamberlin, 1947) inhabits deserts in the southwestern United States (U.S.) and northern Mexico and has been designated a Species of Concern by the U.S. Fish and Wildlife Service. Preliminary examination of museum specimens and observations of two populations at the northern periphery of its range indicate that this designation is not warranted. Its distribution reflects thermal factors more than moisture, as is typical for desert millipeds.

*Key words:* *Comanchelus*, conservation, ecology, milliped, natural history.

Diplopoda typically inhabit moist, forested environments (Blower 1985). Those species occurring in deserts, however, have adapted to harsh conditions involving extreme heat and aridity in summer and frigid, even dryer winters. To survive, desert species must locate the rare biotopes where conditions are suitable for survival. The Atopetholidae (Spirobolida), addressed taxonomically by Hoffman and Orcutt (1960), is one of three families that successfully occupies deserts in the southwestern United States (U.S.) and adjacent northwestern Mexico, the others being Spirostreptidae (Spirostreptida) and Schizopetalidae (Callipodida), which were studied by Causey (1975) and Shelley (1996), respectively. One atopetholid, *Comanchelus chihuanus* (Chamberlin, 1947), is the only milliped in New Mexico to be designated a Species of Concern (SOC) by the U.S. Fish and Wildlife Service (N.M. Species of Concern List, 2003). The Species of Concern designation is an informal category assigned to species with undetermined conservation status whose listing as a threatened or endangered species may be warranted but for which there is insufficient research to support listing. Species of Concern receive no legal protection. The SOC designation was assigned to *C. chihuanus* in the 1990s when only two populations were known – one on the western side of Albuquerque, Bernalillo County, New Mexico, USA, and the type locality near Ciudad Chihuahua, Chihuahua, Mexico (Chamberlin, 1947). Subsequent investigations revealed the milliped is more widespread and comprises nine allopatric populations that

extend into western Texas and eastern Arizona. Data for the newly reported samples are included in Appendix 1. The ensuing discussion is based on preliminary analyses of museum specimens and observations of populations of *C. chihuanus* at the northern periphery of its range.

To my knowledge, the literature on *C. chihuanus* consists of only five publications. The species was originally assigned to *Toltecolus* by Chamberlin (1947) and retained in this genus by Chamberlin and Hoffman (1958). Hoffman and Orcutt (1960) transferred it to their new genus, *Comanchelus*, where it was subsequently reported by Hoffman (1999) and Shelley et al. (2000). In a comparison of its gut flora with that of the sympatric spirostreptid, *Orthoporus ornatus* (Girard, 1853), Taylor (1982) listed it as “*Comanchelus sp.*,” but the specimens were obtained on the western side of Albuquerque where *C. chihuanus* is the only atopetholid. I have also discovered a third population at Tomé Hill, Valencia County, approximately 40 km south of the Albuquerque population.

Material for a complete revision of the Atopetholidae has been borrowed from museums in the U.S. and Europe. A cursory search for samples from New Mexico, Arizona, and western Texas revealed six additional populations, which when combined with the two known populations from New Mexico plus the type locality, brings the total number of known populations to nine (Fig. 1). There is the potential for additional populations to exist in southern Texas, eastern Arizona, and northern Mexico as this region contains suitable habitats which have not

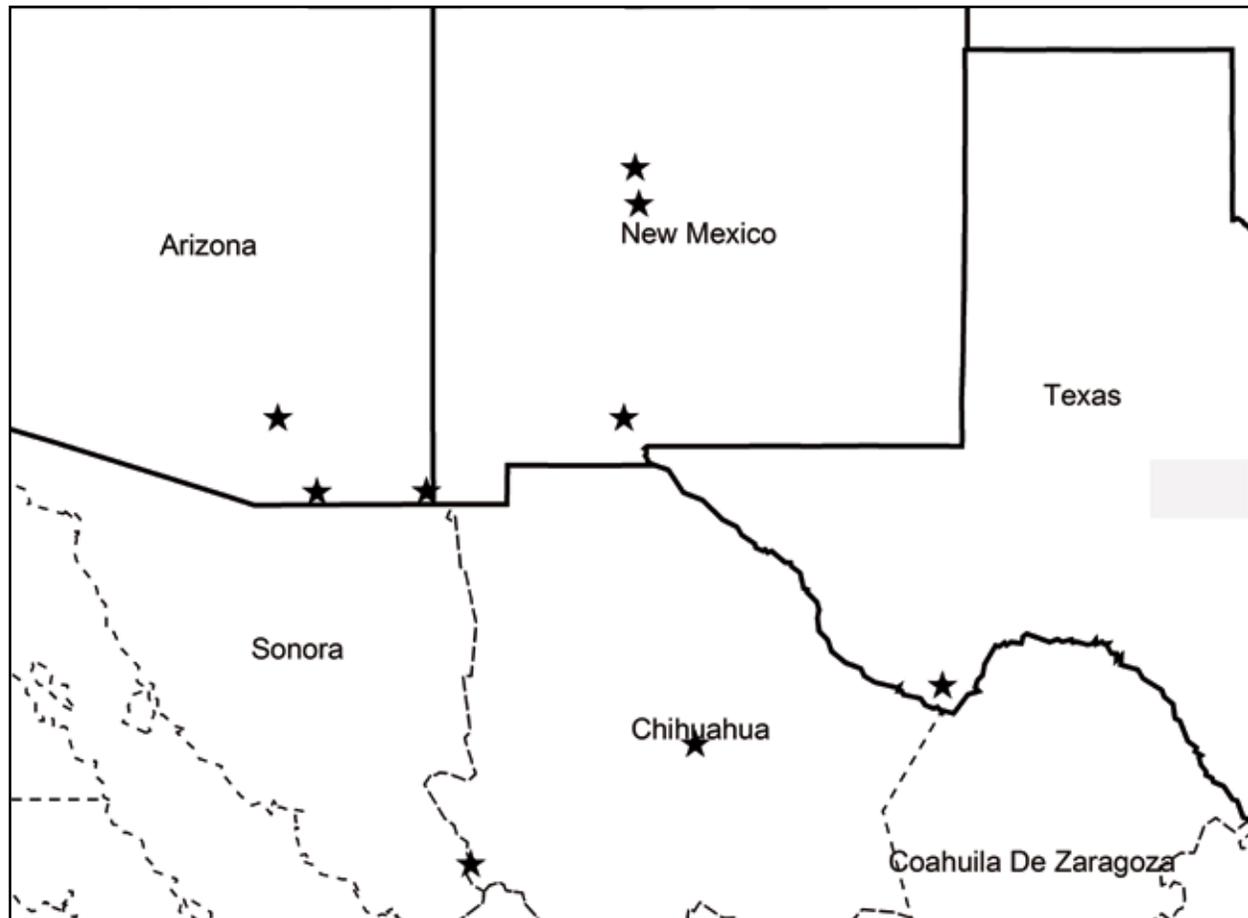


Fig. 1. Known distribution of *Comanchelus chihuanus* in the southwestern United States and northern Mexico.

been fully evaluated. The finding that *C. chihuanus* is more widespread and that more populations exist than previously known is alone sufficient to conclude that SOC status is not justified.

Populations of *C. chihuanus* occupy a wider variety of habitats than has been realized. Those at Albuquerque and Tomé Hill inhabit volcanic escarpment and clearly are successful because hundreds of individuals are surface active after late summer thunderstorms, apparently foraging for food (pers. obs.). The success of these populations can be attributed to the thermal properties of the volcanic outcrops; the large black boulders in these “thermal islands” (Crawford 1987) concentrate heat because of their dark color. The properties of these “thermal islands” allow *C. chihuanus* and *O. ornatus* to congregate and thrive in them.

The distribution of *C. chihuanus* on the volcanic outcrops is informative. Individuals occur only along the base of south-facing slopes, which are considerably warmer and drier than the cooler, moister, north-facing slopes. This habitat partitioning suggests that temperature is more important to survival, particularly in winter, than moisture. These observations suggest that the stringent

habitat requirements of northern populations will become less critical in the south as one approaches the type locality, and that populations will be more evenly distributed on the landscape. Fieldwork is planned in southern New Mexico, western Texas, and Chihuahua to confirm or disprove this hypothesis.

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## Appendix 1

Collection data for the allopatric populations of *Comanchelus chihuanus*. Museum abbreviations: AMNH, American Museum of Natural History; MSB, Museum of Southwestern Biology; NCSM, North Carolina State Museum of Natural Sciences; NMNH, National Museum of Natural History, Smithsonian Institution.

**NEW MEXICO:** Bernalillo Co., Albuquerque West Mesa, 15 August 2001, M.F. Medrano, 1♂, MSB. Dona Ana Co., Picacho Peak, 6.4 km NW Las Cruces, 1 August 1989, W.D. Sissom, 1♂, NCSM. Valencia Co., Tome Hill, 6.4 km SE Los Lunas, 12 July 1998, M.F. Medrano, 1♂, MSB. **ARIZONA:** Cochise Co., Huachuca Mountains, Garden Canyon, 31 July 1949, W.J. & J.W. Gertsch, 1♂, AMNH. Cochise Co., 19-26 km S Apache, 17 July 1963, V. Roth, 1♂, NCSM. Pima Co., Sabino Canyon, Tucson, 5 June 1952, M. Cazier, W. Gertsch, R. Schrammel, 1♂, 2♀, AMNH. **TEXAS:** Brewster Co., Basin Chisos Mountains, 28 May 1952, M. Cazier, W. Gertsch, R. Schrammel, 2♂, AMNH. **MEXICO: CHIHUAHUA:** North of Milpillas, Sonora, 3.2 mi NE Las Chinacas, 9 – 11 July 1989, 4♂, 6♀, 3 juveniles, NCSM. City of Chihuahua, 23 July 1944, C.E. Shelford, 1♂ (holotype), NMNH.

