



11-4-2014

New flea (Siphonaptera) record for Heermann's kangaroo rat (*Dipodomys heermanni*), San Luis Obispo County, California

Howard O. Clark Jr.

Garcia & Associates, Clovis, CA, hclark@garciaandassociates.com

Helen K. Pigage

University of Colorado, Colorado Springs, CO, hpigage@uccs.edu

Follow this and additional works at: <https://scholarsarchive.byu.edu/wnan>



Part of the [Anatomy Commons](#), [Botany Commons](#), [Physiology Commons](#), and the [Zoology Commons](#)

Recommended Citation

Clark, Howard O. Jr. and Pigage, Helen K. (2014) "New flea (Siphonaptera) record for Heermann's kangaroo rat (*Dipodomys heermanni*), San Luis Obispo County, California," *Western North American Naturalist*. Vol. 74 : No. 3 , Article 11.

Available at: <https://scholarsarchive.byu.edu/wnan/vol74/iss3/11>

This Note is brought to you for free and open access by the Western North American Naturalist Publications at BYU ScholarsArchive. It has been accepted for inclusion in Western North American Naturalist by an authorized editor of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.

NEW FLEA (SIPHONAPTERA) RECORD FOR HEERMANN'S KANGAROO RAT (*DIPDOMYS HEERMANNI*), SAN LUIS OBISPO COUNTY, CALIFORNIA

Howard O. Clark Jr.¹ and Helen K. Pigage²

ABSTRACT.—Three Heermann's kangaroo rats (*Dipodomys heermanni* LeConte 1853) from San Luis Obispo County, California, were examined for ectoparasites. Two species of fleas were found, *Meringis cummingsi* (C. Fox 1926) and *Hoplopsyllus anomalus* (Baker 1904). While *M. cummingsi* has been reported frequently from this host (Dorman 1969, Eads et al. 1987), occurrence of *H. anomalus* on *D. heermanni* has not been reported before and represents a new host record.

RESUMEN.—Las ratas del canguro de tres Heermann (*Dipodomys heermanni* LeConte 1853), de San Luis Obispo County, California, fueron examinados por ectoparásitos. Se encontraron dos especies de pulgas, *Meringis cummingsi* (C. Fox 1926) y *Hoplopsyllus anomalus* (Baker 1904). Mientras que *M. cummingsi* ha informado con frecuencia de esta acogida (Dorman 1969, Eads et al. 1987), la aparición de *H. anomalus* en *D. heermanni* no se ha informado antes, y representa un nuevo registro de host.

Heermann's kangaroo rat (*Dipodomys heermanni* LeConte 1853) is endemic to California and typically occurs in arid and semiarid habitats within the central portion of the state (Kelt 1988). *Dipodomys heermanni* includes 8 recognized subspecies, one of which, *D. h. morroensis*, is listed as state and federally endangered (California Department of Fish and Game 2011).

Previous studies have identified 6 species of fleas occurring on *D. heermanni*: *Aetheca wagneri* (Baker 1904), *Malaraeus telchinus* (Rothschild 1905), *Thrassis aridus* (Prince 1944), *Meringis cummingsi* (C. Fox 1926), and *Meringis parkeri* (Jordan 1937) (Coultrip et al. 1973, Hardy et al. 1974, Eads et al. 1987). In addition, Stark (1957) reported *Thrassis arcuatus* from *D. h. jolonensis*, Monterey County, California. Here we report a new flea record from *D. heermanni*.

On 1 April 2013, one trapping grid was established on private land within the Carrizo Plain National Monument, San Luis Obispo County, California (Township 11 North, Range 25 West, Section 20; elevation 787 m). Thirty Sherman live traps (7.5 × 9.5 × 30.5 cm; H.B. Sherman Traps, Tallahassee, FL) were deployed, baited with white proso millet, and provisioned with an unbleached paper towel. Traps were set shortly before sunset and closed 3–4 hours later when captured animals

were processed. Fleas collected from kangaroo rats were preserved in 70% isopropyl alcohol. Following data and flea collection, captured rodents were released at the trap site. The fleas were dehydrated using standard methods, mounted on slides in Canada balsam, identified to species using published keys (Hubbard 1947, Eads et al. 1987), and deposited at the Denver Museum of Nature & Science (2001 Colorado Boulevard, Denver, CO 80205).

Three adult Heermann's kangaroo rats (subspecies *D. h. swarthi*; Kelt 1988) were captured (1 female and 2 males) from which 4 fleas were collected. Three of the fleas were identified as *Hoplopsyllus anomalus* (Baker 1904) (2 males, accession numbers ZE.45283 and ZE.45284; 1 female, ZE.45286) and one flea, a male, was identified as *Meringis cummingsi* (C. Fox 1926; accession number ZE.45282). The *H. anomalus* represents a new record for the Heermann's kangaroo rat. *Meringis cummingsi* is commonly associated with *Dipodomys heermanni*; however, *H. anomalus* is commonly associated with sciurids. On the Carrizo Plain, kangaroo rats have largely filled the sciurid niche, usually filled by *Otospermophilus beecheyi* (Richardson 1859) (Tabor et al. 1993). No *O. beecheyi* were captured in work done at the Carrizo Plain National Monument trap site (H.O. Clark Jr. unpublished data). We know, however, that both *D. ingens* (Merriam

¹Garcia and Associates, 993 Ezie Avenue, Clovis, CA 93611. E-mail: hclark@garciaandassociates.com

²University of Colorado, Colorado Springs, 1420 Austin Bluffs Parkway, Colorado Springs, CO 80918.

1904) and *D. h. swarthi* (Kelt 1988) share ectoparasites, as we have reported *H. anomalus* from both species. The single specimen of *Meringis* sp. collected previously by us (Clark et al. 2014) was a female whose identity to species could not be determined (Eads et al. 1987). Based on the collection of a male from the same site, we think that it was most likely *M. cummingsi*. The observed flea intensity was 1.33, however, this low value was not surprising, as other authors (Kelt 1988) have reported relatively low flea intensities (0.04–0.86) on *D. heermanni*. Hubbard (1961) reported *M. cummingsi* taken from *D. heermanni* at flea intensities of 2.0–8.0, depending on collection site and time of year. Tabor et al. (1993) reported the mean number of fleas on 67 *D. ingens* as 4.34.

Fleas and other parasites can potentially adversely affect their hosts (Clark et al. 2006); however, our examination of kangaroo rats with fleas during this study revealed no unhealthy or weakened individuals. Further research is needed to determine how kangaroo rats manage flea loads (e.g., by dust-bathing) and what effects fleas have on kangaroo rat populations, if any.

We thank SunPower® Corporation, Inc., for providing support for this study. We thank S.I. Hagen and 2 anonymous reviewers for improving the manuscript. We thank J. Stephenson, collections manager at the Denver Museum of Nature & Science, for specimen accession and O.R. Larson at the University of North Dakota for verification of flea identification. Kangaroo rats were handled and processed under the authority of federal permit TE-797267-16, a memorandum of understanding by and between H.T. Harvey & Associates and the California Department of Fish and Wildlife (CDFW), and a CDFW-issued scientific collecting permit (SCP 003366).

LITERATURE CITED

- CALIFORNIA DEPARTMENT OF FISH AND GAME. 2011. Special animals (898 taxa). California Department of Fish and Game, Biogeographic Data Branch, California Natural Diversity Database, Sacramento, CA.
- CLARK, H.O., JR., H.K. PIGAGE, C.A. WILKINSON, AND R.K. BURTON. 2014. Ectoparasites on the giant kangaroo rat, Carrizo Plain National Monument, San Luis Obispo County, California. *Western Wildlife* 1:8–11.
- CLARK, H.O., JR., H.S. SHELLHAMMER, AND S.D. GAIMARI. 2006. Ectoparasites found on salt marsh harvest mice in the northern salt marshes of Grizzly Bay, California. *California Fish and Game* 92:52–54.
- COULTRIE, R.L., R.W. EMMONS, L.J. LECTERS, J.D. MARSHALL JR., AND K.F. MURRAY. 1973. Survey for the arthropod vectors and mammalian hosts of Rocky Mountain spotted fever and plague at Fort Ord, California. *Journal of Medical Entomology* 3:303–309.
- DORMAN, D.E. 1969. New host and distribution records for species of *Meringis* (Siphonaptera, Hystrichopsyllidae). *Journal of Parasitology* 55:1233.
- EADS, R.B., E.O. CAMPOS, AND G.O. MAUPIN. 1987. A review of the genus *Meringis* (Siphonaptera: Hystrichopsyllidae). *Journal of Medical Entomology* 24:467–476.
- HARDY, J.L., W.C. REEVES, R.P. SCRIVANI, AND D.R. ROBERTS. 1974. Wild mammals as hosts of Group A and Group B arboviruses in Kern County, California. *American Journal of Tropical Medicine and Hygiene* 23:1165–1177.
- HUBBARD, C.A. 1947. Fleas of western North America: their relation to the public health. Iowa State College Press, Ames, IA. 533 pp.
- _____. 1961. Fleas from the kangaroo rats of northern California. *Entomological News* 72:133–139.
- KELT, D.A. 1988. *Dipodomys heermanni*. *Mammalian Species* 323:1–7.
- MERRIAM, C.H. 1904. New and little known kangaroo rats of the genus *Perodipus*. *Proceedings of the Biological Society of Washington* 17:139–145.
- STARK, H.E. 1957. Five new fleas of the genus *Thrassis* Jordan, 1929 (Ceratophyllidae: Siphonaptera), a genus of known importance in plague transmission. *Journal of Parasitology* 43:332–346.
- TABOR, S.P., D.F. WILLIAMS, D.J. GERMANO, AND R.E. THOMAS. 1993. Fleas (Siphonaptera) infesting giant kangaroo rats (*Dipodomys ingens*) on the Elkhorn and Carrizo Plains, San Luis Obispo County, California. *Journal of Medical Entomology* 30:291–294.

Received 6 February 2014

Accepted 29 September 2014