

Scientific Note

New records of sucking lice (Phthiraptera: Anoplura) from the western United States

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Despite the most recent synopsis of the North American sucking louse fauna by Kim et al. (1986), large gaps still exist in the documented geographic range for many of the species. It is important to document the geographical distributions of sucking lice because some species are known to be enzootic vectors of zoonotic pathogens and it is suspected that additional sucking lice are vectors of other pathogenic agents to wild mammals (Durden 2001). More collecting, emphasizing under-collected geographic regions and mammal species, should yield the discovery of new louse species and host associations (Kim et al. 1990). For example, one new species of sucking louse has recently been described from the western United States: *Haemodipsus brachylagi* Durden and Rausch from the pygmy rabbit, *Brachylagus idahoensis* in Nevada (Durden and Rausch 2007).

Presented here are new collection records resulting mainly from flea survey fieldwork by one of us (JK), which significantly add to our knowledge of the geographic distribution of several species, plus two new host associations. Unattributed collections were made by JK; a few are attributed to other collectors. With two exceptions, host-lice relationships are as previously documented by Kim et al. (1986) and Durden and Musser (1994a,b) and are not considered further. However, a certain host species population may or may not be found to be parasitized by a louse species in a given geographical area. Voucher louse specimens are in the collections of JK or LAD. Host voucher accession numbers for the University of Utah Museum of Natural History, Salt Lake City (UMNH) vertebrate collection are provided where available.

Antarctophthirus microchir (Trouessart and Neumann 1888)

Specimen examined: CALIFORNIA: Palo Alto County, Stanford, 7 August 1969, coll. T. Poulter; 1♀ ex *Eumetopias jubata*.

Antarctophthirus microchir is stated to be a widespread ectoparasite of sea lions and has been recorded from the Arctic to the Antarctic (Kim et al. 1986), but there are few

previous records from California.

Hoplopleura acanthopus (Burmeister, 1838)

Specimens examined: ARIZONA: Coconino County, Kaibab Plateau, vic. Nankoweap trailhead (end of FR610), 2,707 m elev., 29 August 2003; 1♂, 7♀♀ ex *Microtus longicaudus*. Kaibab Plateau, vic. Big Springs, 2,120 m elev., 23 September 2004; 3♀♀ ex *M. longicaudus*. Idem, 1♀ ex *M. longicaudus*. Idem, 5♀♀, 1N ex *M. longicaudus*. IDAHO: Blaine County, Boulder Mountains, Big Wood River vic. Camp Manapu, 2,048 m elev., 16 July 1992; 13♂♂, 26♀♀ ex *M. longicaudus*. UTAH: Iron County, Markagunt Plateau, upper Sidney Valley, 3,322 m elev., 12 September 1992; 5♀♀ ex *Microtus montanus*. Idem, 2♂♂, 7♀♀, 2N ex *M. montanus*. Salt Lake County, Wasatch Mountains, Big Cottonwood Canyon, vic. Redman campground, 2,560 m elev., 21 October 1990; 1♀ ex *Clethrionomys gapperi*. Idem but 12 May 1992; 1♂, 2N ex *C. gapperi*. Idem; 4♂♂, 11♀♀, 1N ex *C. gapperi*. Idem but 24 May 1992; 4♂♂, 7♀♀ ex *C. gapperi*. Idem; 1♂, 5♀♀ ex *C. gapperi*. Idem; 1♀ ex *C. gapperi*. San Juan County, Abajo Mountains, Dalton Springs campground, 2,560 m elev., 8 September 1991; 4♂♂, 3♀♀ ex *M. longicaudus*. Summit County, Uinta Mountains, ~0.5 km NE of Lost Creek campground, 3,060 m elev., 21 July 1991; 1♂, 1♀ ex *C. gapperi*. Uinta Mountains, S of Bald Mountain, 3,210 m elev., 24 August 1996; 1♂, 1♀ ex *C. gapperi*. Uinta Mountains, S of Bald Mountain, 3,206 m elev., 24 August 1996; 4♂♂, 11♀♀ ex *C. gapperi*.

Hoplopleura acanthopus has been extensively collected throughout the United States and Canada (Kim et al. 1986), but has not been previously documented from Arizona or southern Utah.

Hoplopleura arboricola Kellogg and Ferris, 1915

Specimens examined: IDAHO: Bonneville County, vic. Snake River on FR58, 1,609 m elev., 18 July 1992; 9♂♂, 18♀♀, 47N ex *Tamias minimus*. Fremont County, Island Park, T12N, R3E, S2, 1,920 m elev., 12 August 1992; 1♂, 1N ex *Tamias* sp. UTAH: Cache County, Bear River Range, vic. Willow Spring, 2,341 m elev., 16 August 1992; 2♀♀ ex *Tamias* sp. WYOMING: Sublette County, Wind River

Mountains, vic. Green River Lakes, 2,438 m elev., 24 August 1995; 1♀ ex *T. minimus*.

This widely distributed species has been previously documented in Idaho (Butte County) and Utah (Tooele County) (Kim et al. 1986) but was not known from Wyoming.

Hoplopleura difficilis Kim, 1965

Specimens examined (all ex *Peromyscus crinitus*): **ARIZONA:** Mohave County, vic. Pocket Hill east of Black Rock Gulch, 1,158 m elev., 20 December 2001; 1♂, 3♀ ex 2 hosts. Idem but 21 December 2001; 19♂♂, 35♀♀, 2N ex 4 hosts. Idem but 22 December; 3♂♂, 9♀♀ ex 3 hosts. **UTAH:** Washington County, Virgin River corridor, ~7.7 km east of Virgin (town), 1,109 m elev., 19 March 1998; 1♀. Idem but 20 March 1998; 1♂, 4♀♀. Wayne County, Burr Point, 1,689 m elev., 16 April 1998; 1♂.

Hoplopleura difficilis is previously documented only from Tooele County, Utah (type locality; Kim 1965). The present records extend the known range into Arizona.

Hoplopleura ferrisi Cook and Beer, 1959

Specimens examined (all ex *Peromyscus boylii*): **ARIZONA:** Cochise County, Chiricahua Mountains, hillside across from Herb Martyr campground, 1,779 m elev., 18 March 1992, coll. N. Wilson; 2♀♀ (2 hosts). Chiricahua Mountains, Portal, 4.7 km SW (across road from Sunny Flat campground), 1,590 m elev., 22 March 1992; 1♀. Chiricahua Mountains, Herb Martyr campground (9.7 km WSW of Portal), 1,769 m elev., 15-18 March 1992, coll. G. Haas; 1♂, 1♀. Graham County, Pinaleno Mountains, Heliograph Peak, 10.1 km ENE, 1,622 m elev., 20 November 1989, coll. G. Haas; 1♂, 1♀. **UTAH:** Salt Lake County, Wasatch Mountains, Big Cottonwood Canyon, rockslide vic. Granite Flume N of Ledgemere picnic ground, 1,644 m elev., 26 August 1988; 3♀♀. Big Cottonwood Canyon, vic. Dogwood picnic ground, 1,585 m elev., 12 November 1988; 3♂♂, 6♀♀. Idem, 2♀♀. Big Cottonwood Canyon, slope N of Oakridge picnic ground, 1,585 m elev., 2 November 1989; 5♂♂, 18♀♀. Idem, 5♀♀. Big Cottonwood Canyon, vic. Granite Flume, 1,658 m elev., 24 November 1990; 1♀. Wasatch Mountains, mouth of Little Cottonwood Canyon, 1,671 m elev., 18 November 1990; 1♀.

In the United States, *Hoplopleura ferrisi* has been previously documented from Cochise County, Arizona (Portal; type locality) and adjacent Grant County, New Mexico (Kim 1965). The present records extend the known range into Utah.

Hoplopleura hesperomydis (Osborn, 1891)

Specimens examined: **ARIZONA:** Mohave County, vic. Wolf Hole Pass, 1,545 m elev., 11 November 1999; 1♂, 2♀♀ ex *Peromyscus maniculatus* (2 hosts). Vic. Wolf Hole, 1,548 m elev., 12 November 1999; 1♂, 7♀♀ ex *Peromyscus truei* (4 hosts). **NEVADA:** Clark County, Spring Mountains, Willow Creek campground, 1,803 m elev., 3 April 1992; 1♀, 1N ex *P. truei* (2 hosts). Idem but 4 April 1992; 4♀♀ ex *P. truei*. Idem, 1♂, 1♀ ex *P. maniculatus*. Elko County,

Ruby Mountains, Lamoille Canyon, 2,170 m elev., 1 June 1995; 2♀♀ ex *P. maniculatus*. Ruby Mountains, vic. Harrison Pass Creek, 2,036 m elev., 2 June 1995; 1♀ ex *P. maniculatus*. **TEXAS:** San Saba County, Colorado Bend State Park, 11 February 1996, coll. A. Santos III; 2♀♀ ex *Peromyscus pectoralis*. **UTAH:** Emery County, San Rafael Swell, vic. Temple Mountain, 1,682 m elev., 26 October 2000; 1♂, 3♀♀ ex *P. truei*. Grand County, LaSal Mountains, meadow at Oowah Lake, 2,682 m elev., 14 June 1991; 1♂, 2♀♀ ex *P. maniculatus*. LaSal Mountains, Oowah Lake campground, 2,680 m elev., 15 June 1991, coll. G. Haas; 1♂ ex *P. maniculatus*. W side of The Knoll (vic. Dead Horse Point State Park), 1,890 m elev., 13 May 2000; 2♂♂, 11♀♀ ex *P. truei*. Kane County, ~9.7 km S of Cannonville, vic. Kodachrome Basin, T38S R2W S16, 1,713 m elev., 30 March 1991; 1♀ ex *P. truei*. Salt Lake County, Wasatch Mountains, Ferguson Canyon, 1,634 m elev., 22 November 1989; 2♂♂, 1♀ ex *P. maniculatus*. Wasatch Mountains, mouth of Little Cottonwood Canyon, 1,658 m elev., 21 March 1989; 1♀ ex *P. maniculatus*. Idem but 13 November 1988; 3♀♀. Mouth of Little Cottonwood Canyon, 1,671 m elev., 18 November 1990; 1♀ ex *P. maniculatus*. Mouth of Little Cottonwood Canyon, 1,603 m elev., 3 May 1992; 1♀ ex *Microtus* sp. Uintah County, Snake John Reef S of US 40, 1,710 m elev., 11 October 2001; 1♀ ex *P. truei*. Washington County, vic. Baker Dam Reservoir, T39 R16 S22, 1,463 m elev., 12 May 1991, coll. G. Haas; 1♀ ex *Peromyscus* sp. Idem, coll. G. Haas; 1♂, 4♀♀ ex *Peromyscus* sp. Pine Valley Mountains, Pines campground, 2,079 m elev., 12 June 1991, coll. G. Haas; 1♂, 3♀♀ ex *Peromyscus* sp. Vic. Fort Pearce, 890 m elev., 8 October 1994; 5♂♂, 13♀♀ ex *Peromyscus* sp.

Hoplopleura hesperomydis has not previously been reported from *P. pectoralis*. Among other states, *H. hesperomydis* has been previously documented from central Nevada (Douglas County), northern Utah (Cache, Davis, Salt Lake & Tooele Counties) and northern Arizona (Coconino County) (Kim 1965, Kim et al. 1986). However, the species has not previously been documented from the southern parts of Utah and Nevada.

Hoplopleura hirsuta Ferris, 1916

Specimens examined: **ARIZONA:** Pinal County, March 1947, coll. not stated; 4♂♂, 8♀♀ ex *Sigmodon* sp. **KANSAS:** Butler County, 23 November 1958, coll. J. Poorbaugh; 3♂♂, 4♀♀ ex *Sigmodon hispidus*.

Hoplopleura hirsuta is widely distributed in the southern United States and in Central and South America as an ectoparasite of cotton rats, *Sigmodon* spp. (Durden and Musser 1994a). However, the above records are the first ones reported for Arizona and Kansas, respectively.

Hoplopleura reithrodontomydis Ferris, 1951

Specimens examined: **CALIFORNIA:** Orange County, San Joaquin Wildlife Sanctuary, November 1994, coll. J. P. Webb; 2♂♂, 1♀ ex *Reithrodontomys megalotis* (2 hosts). **UTAH:** Washington County, vic. Baker Dam Reservoir, T39, R16, S22, 1,463 m elev., 11 May 1991, coll. G. Haas; 3♀♀ ex *R. megalotis*.

Sporadic collections of *H. reithrodontomydis* have been made from Central America (as far south as Panama) into Tooele (Kim 1965) and Utah counties, Utah (Elzinga 1964, Elzinga and Rees 1964). These are apparently the third and fourth localities documented for the United States.

Hoplopleura sciuricola Ferris, 1921

Specimens examined: **ARIZONA**: Coconino County, Kaibab Plateau, ~1/2 km down FR487, 2,338 m elev., 8 October 1993; 5♂♂, 1♀, 5N ex *Sciurus aberti*. **UTAH**: Cache County, Bear River Range, vic. Willow Spring, 2,341 m elev., 15 August 1992; 4♂♂, 7♀♀ ex *Tamiasciurus hudsonicus*. Summit County, Uinta Mountains, W portal of Duchesne Tunnel on UT150, 2,475 m elev., 14 October 1990; 1♂, 1♀ ex *T. hudsonicus*. **WYOMING**: Teton County, Gros Ventre Range, vic. Granite Creek campground, 2,097 m elev., 22 September 1994; 4♂♂, 5♀♀, 2N ex *T. hudsonicus*.

Hoplopleura sciuricola has been previously documented from Arizona (Kim et al. 1986) but not from the states of Utah and Wyoming.

Hoplopleura trispinosa Kellogg and Ferris, 1915

Specimens examined: **IDAHO**: Bear Lake County, Georgetown Canyon, Church Hollow, 2,012 m elev., 25 September 1994; 6♂♂, 4♀♀ ex *Glaucomyx sabrinus*.

Hoplopleura trispinosa has not been previously documented from Idaho.

Fahrenholzia pinnata Kellogg and Ferris, 1915

Specimen examined: **UTAH**: San Juan County: N end Cajon Mesa, vic. Kahone Lake, 1,670 m elev., 6 April 1996; 1♀ ex *Dipodomys ordii longipes* (UMNH#29516).

Fahrenholzia reducta Ferris, 1951

Specimens examined: **UTAH**: Washington County: west slope Beaver Dam Mountains, vic. mouth of Bulldog Canyon, 1,049 m elev., 25 March 1993; 2♂♂, 14♀♀, 11N ex *Chaetodipus formosus*.

Fahrenholzia pinnata has been collected in Arizona, California, Kansas, Oklahoma, Nevada, New Mexico, Oregon, Texas, Utah, and in several Mexican states (Emerson et al. 1984, Kim et al. 1986, Light and Hafner 2007). In the state of Utah, *F. pinnata* is documented from Utah County (Elzinga 1964), and both *F. pinnata* and *F. reducta* are known from "the southern part of the Great Salt Lake Desert" (Tooele and/or Juab counties: Ignoffo 1956). Collections of *F. reducta* are sparse – the only other known published occurrences in the United States are from California and New Mexico (Ferris 1951, Light and Hafner 2007).

Haemodipsus setoni Ewing, 1924

Specimens examined: **UTAH**: Sevier County, 0.5 km N of N Fork Last Chance Creek on UT 72, 2,280 m elev., T25S R4E S1, 31 March 1991; 4♂♂, 6♀♀, 1N ex *Lepus californicus*.

In the state of Utah, this species has been previously documented from Logan (Cache County) and Tooele County (Kim et al. 1986).

Linognathoides cynomyis Kim, 1986

Specimens examined: **NEBRASKA**: Thomas County, Nebraska National Forest, 8 mi. S and 7 mi. W of Halsey, 863 m elev., 28 May 1985, coll. not stated; 4♂♂, 13♀♀ ex *Cynomys ludovicianus*.

Linognathoides cynomyis parasitizes the black-tailed prairie dog and was previously reported only from the type series from South Dakota (Kim 1986, Kim et al. 1986). The above collections are therefore the first ones for Nebraska.

Linognathoides laeviusculus (Grube, 1851)

Specimens examined: (all ex *Spermophilus armatus* unless noted otherwise): **UTAH**: Salt Lake County, Wasatch Mountains, Big Cottonwood Canyon, 1,573 m elev., 25 September 1987; 1♀ ex *Spermophilus variegatus*. Mouth of Big Cottonwood Canyon, 1,521 m elev., 27 July 1988; 7N ex *S. variegatus*. Big Cottonwood Canyon, vic. Brighton, 2,621 m elev., 1 May 1989; 6♂♂, 8♀♀, 1N. Wasatch Mountains, Little Cottonwood Canyon, Albion Basin road, 2,719 m elev., 30 July 1992; 1♂, 5♀♀. **WYOMING**: Lincoln County, Wyoming Range, vic. confluence of Labarge & South Labarge Creeks, 2,411 m elev., 10 July 1996; 1♂, 2♀♀, 22N. Idem but 11 July; 2♂♂, 3♀♀, 1N. Idem, 4♂♂, 5♀♀, 41N. Wyoming Range, vic. confluence of Greys River & Spring Creek, 2,350 m elev., 12 July 1996; 4♂♂, 10♀♀, 30N. Sublette County, along FR 30530 (Cliff Creek corridor), 1,969 m elev., 23 July 1998; 1♂, 2♀♀, 5N. Idem, 5♂♂, 1♀, 4N.

Linognathoides laeviusculus is known from most of the contiguous United States west of and including those states bordering the Continental Divide (Kim et al. 1986) but was previously undocumented in Wyoming.

Neohaematopinus citellinus Ferris, 1942

Specimens examined: **UTAH**: Uintah County, Uintah Basin, N of US40, 4466200mN / 613356mE (UTM), 1,585 m elev., 12 October 2003; 2♂♂, 2♀♀, 1N ex *Ammospermophilus leucurus* (2 hosts examined).

In Utah, *N. citellinus* has previously been documented in Sanpete and Tooele Counties (Kim et al. 1986).

Neohaematopinus neotomae Ferris, 1942

Specimens examined: **ARIZONA**: Mohave County, Quail Canyon (N of Wolf Hole), vic. Hayrocks, 1,332 m elev., 13 November 1999; 1♀ ex *Neotoma lepida*. **KANSAS**: Meade County, July 1940, coll. "Crowe"; 1♀ ex *Neotoma micropus*. **UTAH**: Washington County, Beaver Dam Mts., road to Welcome Spring, 1,220 m elev., 20 February 1988; 1♀ ex *N. lepida*.

The Kansas record is the first one documented from that state. In the state of Utah, this species (as "*Neohaematopinus* sp.", presumably *N. neotomae* on the basis of host association) has been documented from "the southern part of the Great Salt Lake Desert" (Tooele and/or Juab Counties: Ignoffo 1956). *Neohaematopinus neotomae* has been documented from southern Arizona (Kim et al. 1986) but not previously from northern Arizona.

Neohaematopinus pacificus Kellogg and Ferris, 1915

Specimens examined: ARIZONA: Coconino County, Kaibab Plateau, Cooper Ridge, head of LeFevre Canyon, 2,377 m elev., 24 October 1994; 1N ex *Tamias umbrinus*.

Neohaematopinus pacificus was previously known from California and New Mexico (Kim et al. 1986) and southeastern Arizona (Beer et al. 1959) but has not been documented from northern Arizona.

Neohaematopinus sciuropteri (Osborn, 1891)

Specimens examined: IDAHO: Bear Lake County, Georgetown Canyon, Church Hollow, 2,012 m elev., 25 September 1994; 2♂♂, 6♀♀, 32N ex *Glaucomyssabrinus*. MONTANA: Ravalli County, Blodgett Canyon, 6 December 1976, coll. M. Foster; 1♀ ex *G. sabrinus*.

Among the western United States, *N. sciuropteri* was previously known only from California and Oregon (Kim et al. 1986). The species is documented here for the first time from both Idaho and Montana.

Polyplax alaskensis Ewing, 1927

Specimens examined: ARIZONA: Coconino County, Kaibab Plateau, VT Lake, 2,685 m elev., 26 September 1992; 1♀ ex *Microtus longicaudus*. Idem but 10 August 1996; 2♀♀ ex *M. longicaudus*. UTAH: Iron County, Markagunt Plateau, upper Sidney Valley, 3,322 m elev., 12 September 1992; 3♂♂, 3♀♀ ex *M. montanus*.

Polyplax alaskensis is broadly distributed throughout much of North America, but in the western contiguous United States it was previously known only from California, Oregon, Nevada, and Utah (Salt Lake County) (Kim et al. 1986). The species is here documented from southern Utah and the state of Arizona for the first time.

Polyplax auricularis Kellogg and Ferris, 1915

Specimens examined: ARIZONA: Cochise County, Chiricahua Mountains, Portal, Herb Martyr campground, 1,769 m elev., 15-18 March 1992, coll. G. Haas; 1♀ ex *Peromyscus boylii*. Graham County, Pinaleno Mountains, Heliograph Peak, 1.1 km NW (Shannon Park), 2,774 m elev., 19 November 1989, coll. G. Haas; 1♀ ex *Peromyscus maniculatus*. Mohave County, vic. Pocket Hill east of Black Rock Gulch, 1,158 m elev., 21 December 2001; 5♀♀ ex *Peromyscus crinitus* (2 hosts). Idem but 22 December 2001; 2♂♂, 3♀♀, 1N (2 hosts). Quail Canyon (N of Wolf Hole), vic. Hayrocks, 1,332 m elev., 13 November 1999; 1♀ ex *P. crinitus*. Virgin River corridor, vic. Cedar Pockets Wash, 853 m elev., 21 January 1999; 2♂♂, 5♀♀ ex *P. crinitus stephensi* (2 hosts: UMNH#30139, 30141). Idem, but 22 January 1999; 2♂♂, 3♀♀ ex *P. crinitus stephensi* (UMNH#30140). Big Valley, adjacent to Atkinville Wash, 902 m elev., 10 March 2005; 1♀ ex *Peromyscus eremicus* (UMNH#31516). NEVADA: Clark County, Spring Mountains, Willow Creek campground, 1,820 m elev., 3 April 1992; 1♀ ex *Peromyscus truei*. Spring Mountains, Willow Creek campground, 1,803 m elev., 4 April 1992; 1♀ ex *P. truei*. Washoe County, Reno (Horizon Hills), 21 December 1994, coll. S.I. Tiranti; 7♀♀ ex *P. maniculatus*. UTAH: Emery County, San Rafael Swell,

vic. Temple Mountain, 1,682 m elev., 26 October 2000; 3♂♂, 9♀♀ ex *P. truei* (2 hosts). Grand County, vic. road fork to Dead Horse Point & Canyonlands NP, 1,878 m elev., 21 April 1991; 1♂ ex *P. truei*. LaSal Mountains, Oowah Lake campground, 2,690 m elev., 15 June 1991, coll. G. Haas; 3♀♀ ex *P. maniculatus* (2 hosts). Kane County, ~9.7 km S of Cannonville, vic. Kodachrome Basin, T38S R2W S16, 1,713 m elev., 30 March 1991; 1♂, 1♀ ex *P. truei*. Salt Lake County, Wasatch Mountains, foothills N mouth Little Cottonwood Canyon, 1,609 m elev., 13 November 1988; 1♀ ex *P. maniculatus*. Little Cottonwood Canyon, White Pine slide area, 16 June 1990; 1N ex *P. maniculatus*. Big Cottonwood Canyon, vic. Redman campground, 2,560 m elev., 28 October 1990; 1♀ ex *P. maniculatus*. San Juan County, W side Rone Bailey Mesa, 1,890 m elev., 14 March 1992; 2♂♂, 7♀♀, 1N ex *P. truei* (3 hosts). Washington County, vic. Baker Dam Reservoir, T39 R16 S22, 1,463 m elev., 12 May 1991, coll. G. Haas; 1♂, 3♀♀ ex *P. truei*. Beaver Dam Mountains, vic. mouth of Bulldog Canyon, 1,049 m elev., 25 March 1993; 7♀♀ ex *Onychomys* sp. WYOMING: Lincoln County, Wyoming Range, vic. confluence of Labarge & South Labarge Creeks, 2,411 m elev., 11 July 1996; 2♀♀ ex *P. maniculatus*. Idem but 12 July 1996; 1♂, 2♀♀ ex *P. maniculatus*.

Polyplax auricularis is broadly distributed throughout North America (Ferris 1951, Kim et al. 1986). It is known from southern Arizona (Cochise County), northern Utah (Salt Lake and Tooele Counties) and northern Nevada (Elko County). Here, *P. auricularis* is documented from Wyoming for the first time and also in the huge range gap of southern Utah, southern Nevada, and northern Arizona. The species parasitizes various species of *Peromyscus*, *Onychomys*, and *Reithrodontomys* (Durden and Musser 1994a,b) but was not previously known from *Peromyscus eremicus*.

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