

Comments on Ectoparasites of Two Species of *Microtus* in Nebraska

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Abstract

The ectoparasitic fauna of Nebraskan *Microtus pennsylvanicus* and *Microtus ochrogaster* was examined to determine what species were present, the relative abundance of each species, sex, and developmental stage. Four species of mites of the family Laelapidae were found. *Hyperlaelaps microti*, the most abundant ectoparasite collected, and *Androlaelaps fahrenheitzi* were obtained from both species of voles. *Hirstionyssus isabellinus* is reported from Nebraska for the first time on the basis of three specimens taken from *M. pennsylvanicus*. One adult female *Hirstionyssus utahensis* was collected from *M. ochrogaster* and constitutes the first record of this mite for Nebraska and on *M. ochrogaster*.

Dermacentor variabilis, the American dog tick, was the only tick taken during the study. Two species of fleas, *Epididia wennmani* and *Monopsyllus wagneri*, were found on *M. pennsylvanicus*. The single species of louse obtained, *Hoplopleura acanthopus*, was collected only from *M. pennsylvanicus* and is herein initially reported from Nebraska. *Trans. Kans. Acad. Sci.*, 75 (1), 1972.

Introduction

Several articles have been published describing ectoparasites and their distribution on mammals, but little of this work has been done in the Great Plains region. Allred (1958) described mites on five species of *Peromyscus* in Utah. Kinsella and Pattie (1967) studied ectoparasites of small mammals, including *Microtus montanus* and *Arvicola richardsoni*, from the Beartooth Plateau in Wyoming. Populations of lice on *Peromyscus maniculatus*, *Microtus pennsylvanicus*, and *Clethrionomys gapperi* in Minnesota were studied by Cook and Beer (1955; 1958). In a review of the natural history of the prairie vole, Jameson (1947) included a list of the ectoparasites collected from *Microtus ochrogaster* in Kansas. Rapp (1962) listed seven species of mites found on birds and mammals in Nebraska and Rapp and Gates (1957) published distributional notes for fleas obtained from Nebraskan *Peromyscus* and *Blarina*.

Considering the paucity of information on mammalian host-ectoparasite relationships, I felt that a more comprehensive study of the ectoparasitic fauna associated with *Microtus pennsylvanicus* (Ord) would

be elucidative. The purposes of this research were to determine what species of ectoparasites occur on *M. pennsylvanicus* and to estimate the relative abundance of each sex and developmental stage for each ectoparasitic species.

Materials and Methods

Collections of specimens were made during the period of 18 October 1969–20 April 1970. The study site was a riparian habitat with a dense growth of mixed grasses located two miles south of Kearney, in Kearney County, Nebraska. Additionally, some ectoparasites were collected from specimens of *M. ochrogaster* collected incidentally at one mile east of Wilber, Saline County. All voles were caught in Sherman live traps using rolled oats for bait. Each vole was placed in a separate plastic bag, killed, tagged, and frozen until parasites could be removed. Preliminary attempts to remove ectoparasites included washing the host with non-sudsing detergent, rinsing the host, filtering the solution (Elzinga, 1967), and dissolving the skin in KOH (Cook, 1954), but the number of parasites retrieved was markedly less than was observed using the following technique. A triangular file was used to scrape and brush the skins (see Ellis, 1955) of 15 of the 17 voles studied. In addition, the voles were inspected thoroughly under a .7–3X dissecting microscope and parasites removed individually. This method appeared to result in a more complete removal of external parasites than did the previous methods.

Accounts of Ectoparasites

(ACARI: LAELAPIDAE)

Hyperlaelaps microti (Ewing)

Hyperlaelaps microti was abundant on *Microtus pennsylvanicus* during the entire study period. One hundred and eighteen adult females, 31 adult males, and 47 deutonymphs of this species were collected from 15 *M. pennsylvanicus* during the investigation. These mites appeared to have no site preference, as they were collected from many locations on the hosts (Timm, 1972). A maximum of 61 *H. microti* and 15 lice (Hoplopleuridae: *Hoplopleura acanthopus*) was obtained from one host on 7 February 1970, with no apparent damage having been done to the host. Allred and Beck (1966) reported *Microtus* sp. to be the preferred host. Jameson (1947) found this mite on *M. ochrogaster* and *Sigmodon hispidus* in Kansas and on *M. pennsylvanicus* in New York. Lawrence *et al.* (1965) found *H. microti* on *M. pennsylvanicus* in Michigan. *H. microti* was reported to have been found on *M. ochrogaster* near Chadron, Dawes County, Nebraska, in 1956 (Rapp, 1962) and I have taken in from

M. ochrogaster in Saline County, Nebraska. *Hyperlaelaps microti* is considered an important vector of tularemia (Baker *et al.*, 1956). *Laelaps kochi* Oudemans is a name commonly used in literature for this species.

Androlaelaps fabrenholzi (Berlese)

This cosmopolitan mite has been found on a variety of hosts (Baker *et al.*, 1956), especially on mice of the genus *Peromyscus*. Four *Androlaelaps fabrenholzi*, one adult female, one adult male, and two deutonymphs, were obtained from a *M. pennsylvanicus* captured on 16 December 1969 and are the only members of the species collected during this study (Timm, 1972). Numbers were insufficient to determine seasonal abundance and sex ratios. Baker *et al.* (1956) cited a study in Georgia where no appreciable seasonal change in abundance of this mite was found, but Allred (1958) noted a seasonal fluctuation with population peaks from April through August. Lawrence *et al.* (1965) found this mite on *M. pennsylvanicus* in Michigan. Rapp (1962) reported that *A. fabrenholzi* was taken on *Peromyscus* from several locations in Nebraska. He also found it on *Spermophilus tridecemlineatus* and *M. ochrogaster* in Dawes County and on *Blarina brevicauda* in Knox County. I have obtained it from *M. ochrogaster* in Saline County.

Hirstionyssus isabellinus (Oudemans)

Two adult males were recovered from separate hosts during October, and one adult female was recovered in December (Timm, 1972). *Hirstionyssus isabellinus* is commonly associated with *Hyperlaelaps* sp. on voles (Allred and Beck, 1966). Herrin (1970) reported mites of this species on *Microtus pennsylvanicus* in Michigan, New York, Ohio, and Utah. Kinsella and Pattie (1967) found it on *M. montanus* and *Arvicola richardsoni* in Wyoming. There are no earlier published records for this mite from Nebraska. *H. isabellinus* is considered an important vector of tularemia (Baker *et al.*, 1956).

Hirstionyssus utabensis Allred and Beck

One adult female *Hirstionyssus utabensis* was recovered from *Microtus ochrogaster* in Saline County on 9 November 1969. Specimens of *Hyperlaelaps microti* and *Androlaelaps fabrenholzi* were taken from the same host. Herrin (1970) reported this species as being found on *Peromyscus* in California, Colorado, Iowa, Michigan, and Ohio. This is the first record of this mite in Nebraska and on *M. ochrogaster*. It was not taken from the *M. pennsylvanicus* obtained on the primary study area.

(ACARI: IXODIDAE)

Dermacentor variabilis (Say)

The American dog tick, *Dermacentor variabilis*, was found on only two *M. pennsylvanicus*, one obtained on 19 April and the other on 20 April 1970. Three nymphs and 24 larvae were taken from just behind the ears of one host and 18 larvae were removed from the same area of the other. Morlan (1952) found *D. variabilis* on a variety of mammals throughout the year in Georgia. This tick has been reported on *M. pennsylvanicus* in Michigan (Lawrence *et al.*, 1965) and West Virginia (Wilson, 1943). Jameson (1947) found only one nymph "attached to the scapular region of a prairie vole" in Kansas. *D. variabilis* is the principal vector of Rocky Mountain spotted fever in the central and eastern portion of the United States (Herms and James, 1961).

(SIPHONAPTERA: HYSTRICHOPSYLLIDAE)

Eptedia wennmani (Rothschild)

Three specimens of *Eptedia wennmani*, a common flea found on microtine and cricetine rodents, were obtained from *M. pennsylvanicus* during the study. One was taken on 8 November and two were taken from separate hosts on 16 December 1969. Rapp and Gates (1957) collected this flea on *Peromyscus leucopus*, *P. maniculatus*, and *Blarina brevicauda* from various locations throughout Nebraska. Holland and Benton (1968) found it on *M. pennsylvanicus* in Pennsylvania and Jameson (1947) reported it to be common on *P. leucopus* but rare on *M. ochrogaster* in Kansas. Stark (1959) reported finding this flea on *M. pennsylvanicus* in Utah, where he considered it a possible vector of plague.

(SIPHONAPTERA: CERATOPHYLLIDAE)

Monopsyllus wagneri (Baker)

Monopsyllus wagneri was found on two *M. pennsylvanicus* during the study, one taken on 18 October 1969 and one on 19 April 1970. Rapp and Gates (1957) reported it on *Peromyscus leucopus* and *P. maniculatus* from several locations in Nebraska. Kinsella and Pattie (1967) found this flea on *P. maniculatus* and *Spermophilus lateralis* from the Beartooth Plateau in Wyoming and it was found on *Peromyscus maniculatus*, *P. boylii*, and *Microtus longicaudus* in California (Jameson and Brennan, 1957). Stark (1959) considered this flea a possible vector of plague in Utah.

(ANOPLURA: HOPLOPLEURIDAE)

Hoplopleura acanthopus (Burmeister)

Seventy six specimens of *Hoplopleura acanthopus* were found on seven *M. pennsylvanicus* during the period from 7 November to 20 April. Numbers of lice per vole ranged from one to 38. Seventy-one second and third instars were collected during the study, three first instars were found during the period from February to April, and one adult female and one adult male were taken in November. *H. acanthopus* is considered a ubiquitous parasite on microtine rodents. Ferris (1921) obtained it from *Microtus* in England and continental Europe. Cook and Beer (1955; 1958) have done extensive population studies of *H. acanthopus* on *M. pennsylvanicus* in Minnesota. This is the first published record of the species from Nebraska.

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