

MITES (ACARI : LAELAPIDAE) PARASITIC ON THE MEADOW VOLE,
MICROTUS PENNSYLVANICUS

BY

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ABSTRACT.

Three species of parasitic mites of the family Laelapidae were found to be present in great numbers on the meadow vole, *Microtus pennsylvanicus*. Two hundred and two individuals were identified from 15 host animals. *Hyperlaelaps microti* (Ewing), the most abundant parasite, made up 97 % of the individuals found. *Androlaelaps fahrenheitzi* (Berlese) and *Hirstionyssus isabellinus* (Oudemans) constituted the remaining 3 % of the individuals found.

Several articles have been published describing ectoparasitic mites and their mammalian host distribution, 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 *M. richardsoni*, in Wyoming. In Nebraska, Rapp (1962) listed seven species of Laelapidae as being found on birds and small mammals of the state. With the limited amount of acarological work done in this area, I felt a more comprehensive study of the mites parasitic on *Microtus pennsylvanicus* (Ord) was needed.

During this period of 18 October 1969-20 April 1970, collections were made to determine the external parasitic mites on the meadow vole, *Microtus pennsylvanicus*. The study site was located two miles south of Kearney in Kearney County, Nebraska. It was chosen because it possessed a small, relatively isolated population of *M. pennsylvanicus*. This area was a riparian habitat with thick underbrush. The purpose of this research was : (1) to determine what species of mites were present as ectoparasites of *M. pennsylvanicus* and, (2) the relative abundance of each species, sex and stage.

All voles were caught in Sherman live traps using rolled oats for bait. Each animal was placed in a separate bag, killed, tagged, and frozen until parasites could be removed. Preliminary ectoparasite removal attempts employed washing the host with non-sudsing detergent, rinsing, and filtering (Elzinga 1967) and dissolving the skin in KOH (Cook 1954) but I felt incomplete removal resulted.

A triangular file was used to scrape the skins of 13 of the 15 voles in this study. This method appeared to get more complete removal of external parasites than the previous methods utilized. Mites of Utah Mammals (Allred and Beck 1966) was the main key used to identify mites. All three species were placed in the family Laelapidae, following Krantz (1970).

Two of the mites found, *Hyperlaelaps microti* and *Hirstionyssus isabellinus* are considered important vectors of tularemia in nature (Baker et al. 1956).

HYPERLAELAPS MICROTI

Hyperlaelaps microti (Ewing), *Laelaps kochi* (Oudemans), *Laelaps microti* (Ewing), and *Laelaps pachypus* (Koch) are all names found in literature for this species, but *Hyperlaelaps microti* is the current correct name. Allred and Beck (1966) reported (Ewing) *Microtus* spp. to be the preferred host. *H. microti* was abundant on *M. pennsylvanicus* during the entire study period. A maximum of 61 *H. microti* and 15 lice (Hoplopleuridae : *Hoplopleura acanthopus*) were obtained from one host on February 1970, with no apparent damage having been done to the host. One hundred and eighteen adult females, 31 adult males, and 47 deutonymphs were collected during this investigation from 15 *M. pennsylvanicus*. The adult sex ratio was approximately four females to one male. These mites appeared to have no site preference, as they were collected from the host's entire body. *H. microti* was reported to have been found on *Microtus ochrogaster* near Chadron, Nebraska, in 1956 (Rapp 1962).

ANDROLAELAPS FAHRENHOLZI

Androlaelaps fahrenheitzi (Berlese), *Haemolaelaps gasgowi* (Ewing), and *Androlaelaps gasgowi* are names which have been used for this species, but *Androlaelaps fahrenheitzi* (Berlese) has priority over the others. This is a cosmopolitan mite found on a variety of hosts (Baker et al. 1956). *Peromyscus* is the most common host. Four *A. fahrenheitzi* were found during this study : one female, one male and two deutonymphs. All specimens were found on one vole, 16 December 1969. Insufficient numbers of this mite were collected to obtain seasonal data and sex ratios. Baker et al. (1956) cited a study in Georgia where no appreciable seasonal change in abundance of this mite was found. Allred (1958) found a seasonal fluctuation with peak populations from April through August. Rapp (1962) reported that *A. fahrenheitzi* was taken from *Microtus ochrogaster* near Crete, Nebraska, in 1955.

HIRSTIONYSSUS ISABELLINUS (Oudemans)

Two adult males were recovered from two separate hosts during October, and one adult female was recovered from one host in December. This species is commonly found associated with *Laelaps* spp. on voles (Allred and Beck 1966). Herrin (1970) reports *H. isabellinus* as being found on *Microtus pennsylvanicus* in Michigan, New York, Ohio, and in Utah. There were no published records of this mite found for Nebraska.

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LITERATURE CITED

- ALLRED (D. M.), 1958. — Mites found on mice of the genus *Peromyscus* in Utah. IV. Families Laelaptidae and Phytoseiidae (Acarina). — *The Pan-Pacific Entomologist*, **34** (1) : 17-32.
- ALLRED (D. M.) and D. E. BECK, 1966. — Mites of Utah Mammals. — *Brigham Young Univ. Sci. Bull.*, **8** (1). 123 p.
- BAKER (E. W.), T. M. EVANS, D. J. GOULD, W. B. HULL, and H. L. KEEGAN, 1956. — *A Manual of Parasitic Mites of Economic Importance*. — Henry Tripp, New York. 170 p.
- COOK (E. F.), 1954. — A modification of Hopkin's technique for collecting ectoparasites from mammalian skins. — *Ent. News.*, **65** (2) : 35-37.
- ELZINGA (R. J.), 1967. — *A Laboratory Manual for Arachnology*. — Kansas State Univ. (mimeo.) 151 p.
- GRANT (C. D.), 000.0 — North American mites of the genus *Laelaps* (Arachnida : Acarina : Parasitidae). — *Stanford Univ. Contrib. No. 52*. 22 p.
- HERRIN (C. S.), 1970. — A systematic revision of the genus *Hirstionyssus* (Acari : Mesostigmata) of the nearctic region. — *J. Med. Entomol.*, **7** (4) : 391-437.
- KINSELLA (J. M.) and D. L. PATTIE, 1967. — Ectoparasites of small mammals of the Alpine Beartooth Plateau, Wyoming. — *Can. J. Zool.*, **45** : 233-235.
- KRANTZ (G. W.), 1970. — *A Manual of Acarology*. — O. S. U. Book Stores, Inc., Oregon. 335 p.
- RAPP (W. F., Jr) 1962. — Distributional notes on parasitic mites. — *Acarologia*. **4** (1) : 31-33.
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