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Mites and lice of the National Reactor Testing Station

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MITES AND LICE OF THE NATIONAL REACTOR TESTING STATION

by

Dorald M. Allred

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BIOLOGICAL SERIES—VOLUME XII, NUMBER 1
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MITES AND LICE OF THE
NATIONAL REACTOR TESTING STATION

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INTRODUCTION

This is the fourth in a series of reports on arthropods of the National Reactor Testing Station in Idaho (Allred, 1968 a & b, 1969). A fifth paper by Atwood (1970) deals with the plants of the sites where the arthropods were studied. The initial publication of the series (Allred, 1968a) discusses the location and physical characteristics of the NRTS, the study areas and procedures, and lists the kinds of vertebrates examined. The reader is referred to that report for details not included herein.

The National Reactor Testing Station is situated approximately 30 miles west of Idaho Falls in southeastern Idaho. The central and southern parts are typified by basalt flows which are exposed in some areas. The northern section is primarily lake and eolian deposits, and exposed basalt flows are less evident. Annual precipitation averages less than 10 inches, and the vegetation is characteristic of the cool, northern desert, shrub-type biome. Twelve principal study sites established on the basis of their predominant vegetation were studied periodically: (1) Chrysothammus-Artemisia-grasses; (2) Artemisia-Chrysothammus-grasses; (3) Elymus; (4) Oryzopsis-Stripa; (5) Juniperus; (6) Chrysothammus-Tetradymia-Artemisia; (7) Chrysothammus-Artemisia-Eurotia; (8) Artemisia-Arriplex; (9) Chenopodium-Eurotia; (10) Artemisia-Opuntia; (11) Chrysothammus-grasses-Tetradymia; (12) Juniperus-Chrysothammus-Eurotia-Artemisia. Twenty-eight other sites similar to the major ones but with minor variations of plant associations occupying smaller geographic areas were studied less frequently.

Most of the mammals were captured with live-catch or break-back traps. Rabbits, carnivores, and birds were shot, and reptiles were captured by hand or in can pit-traps. Ectoparasites were retrieved from their hosts by the cooling and warming method described by Allred (1968a).

Financial support for these studies was provided by U.S. Atomic Energy Commission Contract AT(11-1)-1559 with Brigham Young University. Logistics (in part) were provided through the AEC Operations Office at Idaho Falls, Idaho. The chigger mites and many of the mesostigmatids were identified by Mr. Morris Goates, and the lice by Dr. W. L. Jellison.

PARASITE-HOST ASSOCIATIONS

Entries in the listings below may be interpreted by using the first two lines of the listing of mite-host associations as an example (each specific entry is indicated in boldface type):

Androlaelaps leviculus (Mar-Aug) 13 dny 1 ♂ 17 ♀:

Androlaelaps leviculus = the species of parasite collected.

(Mar-Aug) = the inclusive period of time when the parasites were found.

13 dny 1 ♂ 17 ♀ = the total number of parasites of each developmental stage and sex that were collected (la = larva, pny = protonymph, dny = deutonymph, im = immature, ♂ = adult male, ♀ = adult female).

Dipodomys ordii 2 (808) 1.5 - ♀: Jun Jul:

Dipodomys ordii = a specific host on which parasites of the species listed above it were found.

2 = number of hosts infested with parasites of that particular species.

(808) = total number of hosts examined.

1.5 = the parasite-host index (total number of parasites of that

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1BYU-AEC Report No. C00-1559-5.
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species found on that particular host, divided by the number of hosts of the species infested with those parasites).

♀ = the specific stage of development and/or sex of parasite found on that host.

Jun Jul = the specific months when these parasites were found on that host.

Asterisks preceding the names of the hosts indicate that all of those listed, they are the ones most commonly infested. Except where indicated otherwise, the hosts are mammals.

Mite-Host Associations

**Androlaelaps leviculis** (Mar-Aug) 13 dny 1 d 17♀
- **Dipodomys ordii** 2 (808) 1.5 - ♀: Jun Jul
- **Eutamias minimus** 1 (398) 1.0 - ♀: Aug
  * **Onychomys leucogaster** 2 (63) 4.5 - dny ♀: Mar Aug
  * **Peromyscus maniculatus** 7 (1866) 2.6 - dny ♀: Mar June-Aug

**Androlaelaps** sp. (Jul-Sep) 3 dny 1 d 7♀
- **Dipodomys ordii** 3 (808) 1.0 - ♀: Jul-Aug
- **Onychomys leucogaster** 1 (63) 4.0 - dny ♀: Aug
- **Perognathus parvus** 1 (434) 1.0 - ♀: Aug
  * **Peromyscus maniculatus** 2 (1866) 1.5 - ♀: Aug

**Bernia marita** (Aug-Nov) 2 la
- **Eremophil a alpestris** (bird) 1 (84) 1.0 - ♀: Nov
  * **Peromyscus maniculatus** 1 (1866) 1.0 - ♀: Aug

**Brevisterna** sp. (Aug) 2 dny
- **Neotoma cinerea** 1 (14) 2.0

**Chatia ochotona** (Aug-Oct) 21 la
- **Neotoma cinerea** 1 (14) 7.0: Aug
  * **Plectus townsendii** 1 (78) 14.0: Oct

**Dermatogenus gallinae** (Feb-Jun) 1 d 14♀
- **Asyndesmus lewis** (bird) 1 (2) 1.0 - ♀: May
- **Dendrocoptes villosus** (bird) 1 (1) 4.0 - ♀: Jun
  * **Eremophil a alpestris** (bird) 5 (84) 1.6 - ♀: Feb
  * **Turdus migratorius** (bird) 1 (11) 1.0 - ♀: Jun

**Dermatogenus** sp. (Apr-Jun) 2 pny 2 ♀ 1♂
- **Eremophil a alpestris** (bird) 3 (84) 1.0 - pny ♀: Apr
  * **Piranga ludoviciana** (bird) 1 (16) 1.0 - ♀: Jun
  * **Dipodomys ordii** 1 (808) 1.0 - ♀: Apr

**Eubrachyelaaps circularis** (Mar-Jun) 4♀
- **Peromyscus maniculatus** 3 (1866) 1.3: Mar Jun

**Eubrachyelaaps crowei** (Mar-Oct) 202♀
- **Dipodomys ordii** 2 (808) .5 ♀: Sep
  * **Onychomys leucogaster** 22 (63) 8.8: Mar Jun-Aug Oct
  * **Peromyscus maniculatus** 5 (1866) 1.6: Mar Aug Oct

**Eubrachyelaaps debilis** (Jan-Dec) 1 pny 12 dny 1 ♀ 998♀
- **Crotalus viridis** (snake) 1 (95) 1.0 - ♀: Jun
- **Centrocerces urophasianus** (bird) 1 (18) 1.0 - ♀: Feb
  * **Dipodomys ordii** 1 (808) 5.0 - ♀: Mar Jul Aug
  * **Onychomys leucogaster** 3 (63) 5.3 - ♀: Mar
  * **Perognathus parvus** 5 (474) 1.2 - ♀: May Jun Sep

  * **Peromyscus maniculatus** 222 (1866) 4.6 - pny
  * ♀: Jan-Sep Nov Dec

**Eubrachyelaaps** sp. (Feb-Nov) 1 pny 10 dny
- **Dipodomys ordii** 1 (808) 1.0 - dny: Apr
  * **Peromyscus maniculatus** 1 (1866) 9.0 - dny: Feb May Jun Nov ♀ host - pny: Jul

**Euschoengastia cordiremis** (Jul-Oct) 19 la
- **Dipodomys ordii** 1 (808) 7.0: Jul Aug
  * **Peromyscus maniculatus** 2 (1866) 6.0: Oct

**Euschoengastia criceticola** (Oct) 1 la
- **Peromyscus maniculatus** 1 (1866) 1.0

**Euschoengastia decipiens** (Mar-Dec) 488 la
- **Zoonotrichia leucophrys** (bird) 1 (33) 3.0: Sep
  * **Dipodomys ordii** 13 (808) 7.0: Mar-May Jul Aug Oct
  * **Eutamias minimus** 4 (398) 2.8: Oct
  * **Lepus californicus** 2 (125) 11.0: Dec
  * **Neotoma cinerea** 1 (14) 3.0: Sep
  * **Perognathus parvus** 12 (474) 13.6: May Aug-Oct
  * **Peromyscus maniculatus** 14 (1866) 5.9: Apr
  * **Peromyscus maniculatus** 15 (1866) 10.0: May Jul-Nov
  * **Sylvilagus idahoensis** 1 (13) 56.0: Nov
  * **Sylvilagus nuttalli** 3 (28) 14.0: Oct-Dec
  * **Thomomys talpoides** 1 (8) 15.0: Sep

**Euschoengastia fasolla** (Oct) 8 la
- **Eutamias minimus** 2 (398) 4.0

**Euschoengastia luteodema** (Dec) 5 la
- **Peromyscus maniculatus** 1 (1866) 8.0

**Euschoengastia luteodema** (Dec) 5 la
- **Lepus californicus** 1 (125) 5.0
Euschoengastia oregonensis (Jul) 11 1a
Salpinetes obsoletus (bird) 1 (17) 11.0

Euschoengastia pomerantzi (Oct) 1 1a
Eutamias minimus 1 (398) 1.0

Euschoengastia radfordi (Apr-Dec) 80 1a
* Amphipiza belli (bird) 4 (38) 2.3: Apr
Centrocerus urophasianus (bird) 1 (18) 4.0; Nov
Chordeiles minor (bird) 1 (5) 2.0: Aug
Erempnphila alpestris (bird) 2 (84) 2.5: Apr Nov
Junco oreganus (bird) 1 (30) 11.0: Oct
Lanius ludocicius (bird) 1 (20) 1.0: Apr
Leucosticte tephrocotis (bird) 1 (25) 3.0: Nov
Dipodomys ordii 1 (808) 5.0: Oct
* Lepus californicus 1 (125) 4.0: Dec
Perognathus parvus 1 (474) 1.0: May
Peromyscus maniculatus 1 (1866) 6.0: Aug
Sylvilagus nuttalli 2 (28) 3.0: Oct

Euschoengastia scatircola (May-Oct) 7 1a
Eutamias minimus 2 (398) 2.0: Oct
Marmota flaviventris 1 (6) 3.0: May

Euschoengastia sp. (Aug-Oct) 19 1a
Dipodomys ordii 3 (808) 1.0: Aug Oct
Microtus montanus 1 (25) 8.0: Aug
Perognathus parvus 2 (474) 2.5: Aug
Peromyscus maniculatus 2 (1866) 1.5: Sep Oct

Haemogamiasus ambulans (Mar-Oct) 8 dny 1 d 80 ?
* Dipodomys ordii 10 (808) 1.4: ?; Jun Jul
Eutamias minimus 1 (398) 1.0: dny Mar
* Onychomys leucogaster 6 (63) 5.7: dny ?; Jun-Aug Oct
Perognathus parvus 2 (474) 1.0: ?; Jun Aug
* Peromyscus maniculatus 31 (1866) 1.2: ?; Mar Jun-Aug Oct
Reithrodontomys megalotis 1 (39) 1.0: ?; Aug
Thomomys talpoides 1 (8) 1.0: dny ?

Haemogamiasus longitarus (Jun) 7 ?
* Onychomys leucogaster 3 (63) 1.0
Peromyscus maniculatus 4 (1866) 1.0

Haemolaelaps casalis (Jun-Oct) 1 ? 1 ?
Perognathus parvus 1 (474) 1.0: Oct
Peromyscus maniculatus 1 (1866) 1.0: Jun

Haemolaelaps glasowi (Jan-Nov) 26 pny 64 dny 57 d 1062 ?
Erempnphila alpestris (bird) 1 (84) 1.0: ?; Mar
* Dipodomys ordii 72 (808) 2.1: pny dny ?; Mar-Aug Oct
Eutamias minimus 24 (398) 4.9: pny ?; Mar-Jun-Oct

Microtus montanus 7 (25) 1 - d ?; Jan Jun-Aug Nov
* Onychomys leucogaster 36 (63) 5.4: pny dny d ?; Mar Apr-Jun-Oct
* Perognathus parvus 33 (474) 2.8: pny dny d ?; Apr-Oct
* Peromyscus maniculatus 281 (1866) 2.1: pny dny ?; Jan-Nov
Plectotus townsendii 1 (78) 5.0: ?; Apr
Reithrodontomys megalotis 1 (39) 1.0: ?; Aug
Spermophilus townsendii 9 (60) 3.0: ?; Apr-Jul
Thomomys talpoides 1 (8) 1.0: ?; Jun

Haemolaelaps sp. (Mar-Jun) 1 pny 1 d
Dipodomys ordii 1 (808) 1.0: d; Mar
Peromyscus maniculatus 1 (1866) 1.0: pny; Jul

Hirstionyssus bisetosus (Sep) 2 ?
Neotoma cinerea 1 (14) 2.0

Hirstionyssus hillii (Mar-Aug) 17 ?
Eutamias minimus 1 (398) 1.0: Jul
Onychomys leucogaster 1 (63) 1.0: Mar Jun
* Perognathus parvus 5 (474) 2.6: May Jul Aug
Peromyscus maniculatus 2 (1866) 1.0: Jul Aug

Hirstionyssus incomptus (Mar-Nov) 91 ?
* Dipodomys ordii 37 (808) 21.0: Mar Jun-Oct
Eutamias minimus 1 (398) 1.0: Jun
Perognathus parvus 2 (474) 2.0: Jun Jul
Peromyscus maniculatus 6 (1866) 1.2: Jun-Aug Nov

Hirstionyssus isabellinus (Nov) 1 ?
Microtus montanus 1 (25) 1.0

Hirstionyssus longiclave (Jun-Oct) 6 ?
Dipodomys ordii 1 (808) 1.0: Jun
Peromyscus maniculatus 1 (1866) 1.0: Jun
* Thomomys talpoides 2 (8) 2.0: Jun Oct

Hirstionyssus neotoma (Sep-Oct) 48 ?
Eutamias minimus 1 (398) 4.0: Oct
Neotoma cinerea 1 (14) 44.0: Sep

Hirstionyssus thomomys (Mar-Oct) 7 ?
Onychomys leucogaster 1 (63) 1.0: Jul
Peromyscus maniculatus 1 (1866) 1.0: Sep
* Thomomys talpoides 3 (8) 1.7: Mar Jun Oct

Hirstionyssus tricantus (Apr-Oct) 185 ?
Sceloporus gracius (lizard) 1 (314) 1.0: Sep
Chordeiles minor (bird) 2 (5) 1.5: Aug
Dipodomys ordii 111 (808) 2.4: Apr-Oct
Eutamias minimus 5 (398) 1.0: Jul Oct
Neotoma cinerea 1 (14) 1.0: Sep
Perognathus parvus 2 (474) 2.0: Jun Jul
Peromyscus maniculatus 5 (1866) 8: Jun-Aug
Spermophilus townsendii 2 (60) 1.0: Jun
Eutamias (1866) pny
Perognathus dny: Feb-Mar
Sceloporus dny:
Peromyscus d:
Dipodomys 25 (163)
1 pny d:
Jun-Sep
Spermophilus townsendii 1 (78) 1.0: Jul
Perognathus parvus 5 (474) 1.0: Jun-Jul
* Peromyscus maniculatus 74 (1866) .3: Mar
Jun-Sep Nov
Spermophilus townsendii 1 (78) 1.0: Jul

Hirstionyssus sp. (Mar-Oct) 71 dny 36 δ 14 ?
Dendrocoptes viillosus (bird) 1 (1) 1.0 - δ: ?
Dipodomys ordii 18 (808) 2.9 - dny δ: Jun-Oct
Eutamias minimus 5 (389) 1.4 - dny δ: Jun-Jul
Microtus montanus 1 (25) 1.0 - dny: ?
Neotoma cinerea 2 (14) 4.0 - dny δ: ?
Onychomys leucogaster 1 (63) 1.0 - dny δ: ?
* Perognathus parvus 6 (474) .7 - dny δ: May-Aug
Peromyscus maniculatus 23 (1866) .8 - dny δ: ?
Jun-Aug
Thomomys talpoides 3 (8) 4.0 - dny δ: ?

Hypoaspis lubbac (Aug) 1 ?
Perognathus parvus 1 (474) 1.0

Ischyropoda armatus (May-Oct) 3 dny 25 δ 186 ?
Crotalus viridis (snake) 1 (95) 1.0 - δ: Sep
* Dipodomys ordii 33 (808) 1.1 - δ: ?
Leptus californicus 1 (125) 1.0 - dny: Oct
Microtus montanus 3 (25) .7 - δ: Jul-Aug
* Onychomys leucogaster 23 (63) 3.0 - dny δ: ?
Jun-Oct
* Perognathus parvus 14 (474) 1.0 - δ: ?
Peromyscus maniculatus 61 (1866) 1.3 - dny δ: ?
May-Oct
Sorex merriami 1 (9) 7.0 - δ: Aug
Thomomys talpoides 1 (8) 1.0 - δ: Oct

Ischyropoda armani (Jan-Aug) 3 δ 25 ?
* Dipodomys ordii 9 (808) 1.2 - δ: ?
Onychomys leucogaster 2 (63) 1.0 - δ: Aug
Perognathus parvus 5 (474) 2.6 - pny dny δ: ?
Jun-Aug
Peromyscus maniculatus 9 (1866) 1.0 - δ: ?
Jan-Jun-Aug

Ischyropoda sp. (Apr-May) 5 pny 55 dny 14 δ 23 ?
Dipodomys ordii 7 (808) 2.3 - pny dny δ: ?
Jun-Sep
Eutamias minimus 3 (398) 1.0 - dny δ: ?
Neotoma cinerea 1 (14) 2.0 - dny δ: ?
Onychomys leucogaster 7 (63) 5.6 - dny δ: ?
Jun-Aug
Perognathus parvus 5 (474) 2.6 - pny dny δ: ?
Jun-Aug

Peromyscus maniculatus 15 (1866) 1.4 - pny dny δ: ?
Jan-Jun-Aug
Sorex merriami 1 (9) 3.0 - dny: Aug
Spermophilus townsendii 1 (60) 1.0 - dny: Apr

Kleemania sp. (Apr-Sep) 154 ?
Chordeiles minor (bird) 1 (5) 1.0: Aug
* Dipodomys ordii 8 (808) 6.5: Jun-Sep
Eutamias minimus 1 (398) 1.0: Jul
Microtus montanus 1 (25) 1.0: Aug
Neotoma cinerea 1 (14) 1.0: Sep
* Onychomys leucogaster 5 (63) 3.8: Jun-Aug
* Perognathus parvus 7 (474) 4.3: Apr-Jun-Sep
* Peromyscus maniculatus 32 (1866) 1.2: Jun-Sep
Sorex merriami 1 (9) 1.0: Aug

Leeuwienhoekia americana (Jul) 6 la
Dipodomys ordii 1 (808) 6.0

Listrophorus sp. (Mar-Nov) 960
Chordeiles minor (bird) 1 (5) 1.0: Aug
* Dipodomys ordii 53 (808) 18.1: Mar-May Aug-Nov
Peromyscus maniculatus 1 (1866) 2.0: Jun

Macropyssus unidens (Feb-Mar) 1 la 1 pny 1 dny 1 δ + others
Plecotus townsendii 35 (78) ?

Odontocaurus lunulae (Jul) 6 la
Dipodomys ordii 1 (808) 6.0

Odontocaurus melinieri (Jul) 10 la
Dipodomys ordii 1 (808) 10.0

Ornithonyssus bacoti (Oct) 1 ?
Dipodomys ordii 1 (808) 1.0

Ornithonyssus sylvarum (Jul-Sep) 16 ?
Amphiphiiza bella (bird) 2 (38) 2.0: Jul
Oreoscoptes montanus (bird) 1 (13) 2.0: Jul
* Poecetes grammicus (bird) 3 (13) 1.3: Jul
Zonotrichia leucophrys (bird) 1 (33) 4.0: Sep

Radfordia bachai (Aug) 1 la
Dipodomys ordii 1 (808) 1.0

Trombicula arenicola (Jul-Oct) 325 la
Dipodomys ordii 26 (808) 12.5

Trombicula bakeri (Jul-Aug) 21 la
Dipodomys ordii 1 (808) 21.0

Trombicula belkii (Jul-Aug) 167 la
Phrynosoma douglasi (lizard) 1 (19) 7.0: Aug
* Sceloporus graciosus (lizard) 19 (314) 8.4: Jul-Aug
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Trombicula doremi (Jul-Aug) 98 1a
* Dipodomys ordii 24 (808) 3.6: Jul Aug
Onychomys leucogaster 1 (63) 1.0: Aug
Perognathus parvus 5 (474) 2.0: Aug

Trombicula sp. (Aug-Oct) 12 1a
Sceiroporus gracius (lizard) 1 (314) 1.0: Aug
Dipodomys ordii 3 (808) 3.0: Aug Oct
Onychomys leucogaster 1 (63) 1.0: Aug
Peromyscus maniculatus 1 (1866) 1.0: Aug

Louse-Host Associations

Enderleinellus sp. (prob. sputuralis) (Apr-Oct) 1 δ 3 ♀
Perognathus parvus 1 (434) 1.0 - ♀: Oct
Peromyscus maniculatus 1 (1866) 1.0 - ♀: Aug
* Spermophilus Townsendii 2 (60) 1.0 - ♀: Apr Jul

Fahrenholzia pinnata (Mar-Nov) 63 δ 137 ♀
Sceiroporus gracius (lizard) 1 (314) 1.0 - ♀: Aug
* Dipodomys ordii 86 (808) 1.8 - ♀: Mar Apr

Eutamias minimus 4 (398) 1.5 - ♀: Jun Jul
* Perognathus parvus 15 (474) 1.6 - ♀: May-Aug Oct
Peromyscus maniculatus 11 (1866) 1.4 - ♀: Apr Jun-Sep
Sylvilagus idahoensis 1 (13) 1.0 - ♀: Nov

Fahrenholzia sp. (prob. pinnata) (Jun-Oct) 1 δ 4 ♀ 47 im 1 ♀
* Dipodomys ordii 27 (808) 1.0 - ♀ im: Jun-Aug
Eutamias minimus 1 (398) 1.0 - ♀ im: Jul
Onychomys leucogaster 1 (63) 1.0 - ♀ im: Jun
Perognathus parvus 6 (474) 2.2 - ♀: im: May-Aug Oct
Peromyscus maniculatus 2 (1866) 2.0 - ♀: im:

Jun-Jul Oct

Geomydoecus sp. (Oct) 4 δ ♀ 2 im
Thomasomys talpoides 1 (8) 15.0

Haemodipus setoni (Feb-Jul) 21 δ 28 ♀ 18 im
Lepus californicus 2 (125) 12.0 - ♀ im: May Jul
Peromyscus maniculatus 1 (1866) 1.0 - ♀: Mar
* Sylvilagus nuttalli 2 (28) 21.0 - ♀ im: Feb

Hoplopleura acaenthopus (Mar-Aug) 8 δ 20 ♀
Microtus montanus 6 (25) 4.7

Hoplopleura arboricola (Mar-Oct) 136 δ 257 ♀ 1 im
Sceiroporus gracius (lizard) 1 (314) 2.0 - ♀:
Sep
Ereunetes mauri (bird) 1 (6) 1.0 - ♀: Aug
Dipodomys ordii 2 (808) 3.5 - ♀: Mar Jul

* Eutamias minimus 83 (398) 4.0 - ♀: Mar May-Aug Oct
Marmota flaviventris 2 (6) 1.0 - ♀: Jun
Peromyscus parvus 1 (474) 5.0 - ♀: Aug
Peromyscus maniculatus 16 (1866) 2.1 - ♀:
Mar Jun-Aug
Spermophilus Townsendii 2 (60) 4.0 - ♀ im: Jul-Jul

Hoplopleura erraticula (Jul-Oct) 1 δ 4 ♀
* Eutamias minimus 4 (398) 1.0 - ♀: Jul-Aug
* Perognathus parvus 1 (474) 1.0 - ♀: Jul

Hoplopleura hesperomydis (Jan-Dec) 16 δ 440 ♀
Ereunetes mauri (bird) 1 (6) 8.0 - ♀: Mar Jun-Aug
Dipodomys ordii 7 (808) 1.3 - ♀: Jun Aug
Eutamias minimus 7 (398) 1.1 - ♀: Mar Jun-Aug
Microtus montanus 2 (25) 1.0 - ♀: Jun Aug
Onychomys leucogaster 1 (63) 1.0 - ♀: Jul
Perognathus parvus 3 (474) 2.0 - ♀: Aug
* Peromyscus maniculatus 167 (1866) 3.4 - ♀:
Jan-Dec
Reithrodontomyss megalotis 1 (39) 2.0 - ♀: May

Neohaematopinus inornatus (Aug) 2 δ 2 ♀
Neotoma cinerea 2 (14) 2.0

Neohaematopinus laeviusculus (Apr-Aug) 68 δ 107 ♀ 60 im
Eutamias minimus 2 (398) 1.0 - ♀ im: Jul-Aug
Marmota flaviventris 2 (6) 1.0 - ♀ im: May
Peromyscus parvus 1 (474) 2.0 - ♀ im: Jul
Peromyscus maniculatus 5 (1866) 2.8 - ♀ im: May-Jun Aug
* Spermophilus Townsendii 26 (60) 8.5 - ♀ im: Apr-Jul

Neohaematopinus marmota (Apr-Aug) 25 δ 26 ♀ 13 im
* Marmota flaviventris 4 (6) 14.0 - ♀ im: May-Jun
Peromyscus maniculatus 4 (1866) 2.3 - ♀ im: Apr-Aug

Neohaematopinus pacificus (May-Nov) 21 δ 46 ♀
* Eutamias minimus 27 (398) 2.1 - ♀ im: May-Aug
Peromyscus parvus 2 (474) 1.5 - ♀: May-Aug
Peromyscus maniculatus 4 (1866) 1.8 - ♀ im: Feb Mar Aug
Reithrodontomyss megalotis 1 (39) 1.0 - ♀: Aug
Spermophilus Townsendii 1 (60) 2.0 - ♀: Jul

Neohaematopinus sp. (Aug) 1 ♀
Dipodomys ordii 1 (808) 1.0

*
Neotrichodectes interruptofasciatus (Apr-Nov) 19 ♀ ♂ 15 ♂ 23 im
Taxidea taxus 2 (5) 28.5
Polyplax auricularis (Jan-Dec) 331 ♀ 669 ♂
Sceloporus graciosus (reptile) 2 (314) 1.0 - ♀ ♂: Sep
Ereunetes mauri (bird) 1 (6) 1.0 - ♂: Aug
Dipodomys ordii 4 (808) 1.0 - ♂ ♂: Jul-Aug Nov
Eutamias minimus 7 (398) 1.0 - ♀: Mar-Jun-Aug
Neotoma cinerea 1 (14) 1.0 - ♀: Jun
Perognathus parvus 2 (474) 1.0 - ♀: Jun Aug
* Peromyscus maniculatus 224 (1866) 4.3 - ♀: Jan-Dec
* Spermophilus townsendii 5 (60) 1.0 - ♀: Apr-Jun-Jul
Sylvilagus nuttallii 1 (28) 1.0 - ♂: Aug
Polyplax spinulosa (Jul) 1 ♀
Microtus montanus 1 (25) 1.0
Polyplax sp. (Jun-Jul) 2 ♀
Microtus montanus 2 (25) 1.0
Mallophaga (Jan-Oct) 35 ♀ 70 ♀ 68 im 6 ♂
Buteo regalis (bird) 1 (4) 24.0 - ♀ ♀ im: Aug
Centrocercus urophasianus (bird) 2 (18) 2.5 - ♀ im: Jul

Mallophaga (Jan-Oct) 35 ♀ 70 ♀ 68 im 6 ♂
Buteo regalis (bird) 1 (4) 24.0 - ♀ ♀ im: Aug
Centrocercus urophasianus (bird) 2 (18) 2.5 - ♀ im: Jul

HOST-PARASITE RELATIONSHIPS

(* = the mite and/or louse which occurred most commonly on that host; H = new host record based on replications—other associations listed may represent new records, but are not so indicated because of infrequent occurrence considered accidental infestations or contaminations).

Reptiles
Crotaulus viridis
Eubrachylaelaps deblis
Ischyrhopoda armatus
Pherinosaoma douglasi
Trombicula belkini
Scepolorus gracilus
Hirstionyssus triacanthus
* Trombicula belkini
Fulcrholiza pinnata
Hoplopleura arboricola
Polyplax auricularis
Mallophaga

Birds
Amphispiza belli
* Euschoengastia radfordi
Ornithonyssus sylviarum
Asyndesmus lewis
Dermanyssus gallinae

Circus cyaneus (bird) 1 (1) 1.0 - im: Apr
Didodonmys ordii 3 (808) 1.0 - ♀: Apr Sep-Oct
Eremophila alpestris (bird) 1 (84) 4.0 - ♀ ♂: Jul
Ereunetes mauri (bird) 4 (6) 2.5 - ♂ im: Mar-Jun-Aug
Eutamias minimus 6 (398) 3.2 - ♀ im: Mar-Jun-Aug
Falco sparrowius (bird) 1 (6) 1.0 - ♀: Jun
Junco oreagnus (bird) 1 (30) 1.0 - im: Apr
Lepus californicus 1 (125) 9.0 - ♀: Apr
Lynx rufus 1 (8) 2.0 - im: Jan
Oreoscopes montanus (bird) 1 (13) 1.0 - ♀: Jul
Perognathus parvus 5 (474) 3.4 - ♀ ♀ im: ♀: Apr-May Jul-Aug
Peromyscus maniculatus 9 (1866) 1.9 - ♀ ♀ im: May-Aug
Pica pica (bird) 1 (8) 1.0 - ♀: Feb
Pleocrotus townsendii 1 (78) 4.0 - im: Apr
Reithrodontomyss megalotis 1 (39) 15.0 - ♀ ♀ im: Apr
Sceloporus graciosus (lizard) 1 (314) 3.0 - ♀ im: Jun
Spermophilus townsendii 5 (60) 7.6 - ♀ ♀ im: Apr-Jun
Spinus pinus (bird) 1 (23) 1.0 - ♀: Jun
Steriella neglecta (bird) 1 (7) 1.0 - im: Jul
Zenaithura macroura (bird) 1 (23) 2.0 - ♀ ♀ im: Jul

Buteo regalis
Mallophaga
Centrocercus urophasianus
Eubrachylaelaps deblis
* Euschoengastia radfordi
Mallophaga
Circus cyaneus
Mallophaga
Chordeiles minor
Euschoengastia radfordi
Hirstionyssus triacanthus
Kleemaunia sp.
Listrophorus sp.
Dendrocoops villosus
* Dermanyssus gallinae
Hirstionyssus sp.
Eremophila alpestris
Bernia marita
* Dermanyssus gallinae
Euschoengastia radfordi
Haemolaelaps glasgowi
Mallophaga
Ereunetes mauri
Hoplopleura arboricola
H. hesperomydis
Polyplax auricularis
Mallophaga
Falco sparverius
Mallophaga

Junco oreganus
Euschoengastia radfordi
Mallophaga

Lanius ludovicianus
Euschoengastia radfordi
Mallophaga

Leucosticte tephrocotis
Euschoengastia radfordi
Mallophaga

Oreoscoptes muntamis
Ornithonyssus sylvianum
Mallophaga

Pica pica
Mallophaga

Piranga ludovician a
Dermennyssus sp.

Pooecetes gramineus
Ornithonyssus sylvianum
Mallophaga

Spinus pinus
Mallophaga

Sturnella neglecta
Mallophaga

Turdus migratorius
Dermennyssus gallinace

Zenaida macroura
Mallophaga

Zonotrichia leucophrys
Euschoengastia decipiens
Euschoengastia oregonensis
* Ornithonyssus sylvianum

Spinus pinus
Mallophaga

Mammals

Dipodomys ordii
Androlaelaps leviculus
Dermennyssus sp.
Eubrachylaelaps crowei
E. debilis
Euschoengastia cordiretnus
* E. decipiens
E. radfordi
Haemognasus ambulans
* Haemolaelaps glasgowi
* Hirstionyssus incomptus
H. longichelae
H. triacanthus
H. utahensis
* Ischyropoda armatus
I. furmani
* Kleemania sp.
Leautwenhoekia americana
* Listrophorus sp.
Odontacarus linsdalei
O. micheneri
Ornithonyssus bacoti
Radfordia bachai
* Trombicula arenicola

T. bakeri
* T. doremi
* Fahrenholzia pinnata
Fahrenholzia sp.
Hoplopleura arboricola
H. hesperomydis - H
Neohaemotopinus sp.
Polyplax auricularis
Mallophaga

Eutamias minimus
Androlaelaps leviculus
Euschoengastia decipiens - H
E. fasolla
E. pomerantzi
E. schuricola
Haemognasus ambulans
* Haemolaelaps glasgowi
Hirstionyssus hillii
H. incomptus
H. neotoma e
H. triacanthus - H
H. utahensis
Ischyropoda sp. - H
Kleemania sp.
Fahrenholzia pinnata
Fahrenholzia sp.
* Hoplopleura arboricola
H. erratic a
H. hesperomydis - H
Neohaemotopinus laeviusculus
* N. pacificus
Polyplax auricularis - H
Mallophaga

Lepus californicus
Euschoengastia decipiens
E. luteodema
* E. radfordi
Ischyropoda armatus
Haemodipsus setoni
Mallophaga

Lynx rufus
Mallophaga

Marmota flaviventris
Euschoengastia sciuricola
Hoplopleura arboricola
Neohaemotopinus laeviusculus
* N. marmotae

Microtus montanus
Euschoengastia sp.
* Haemolaelaps glasgowi
Hirstionyssus isabellinus
Ischyropoda armatus - H
Kleemania sp.
* Hoplopleura acanthopus - H
H. hesperomydis
Polyplax spinulosa
Polyplax sp.

Neotoma cinerea
Brevisterna sp.  
Chatia ochotona  
Euschschengastia decipiens  
Hirstionyssus bisetosus  
* H. neotomae  
H. triacanthus  
Ischyropoda sp.  
Kleemania sp.  
* Neohaematopinus inornatus - H  
Polyplax auricularis  
Onychonyss us leucogaster  
Androlaelaps leviculus  
* Eubrachyelaels crowei  
E. debilis - H  
Haemogamasus ambulans  
H. longicantus - H  
* Haemolaelaps glasgowi  
Hirstionyssus hilli  
H. thomomys  
H. utahensis  
* Ischyropoda armatus  
I. furmani  
Kleemania sp.  
Trombicula doremi  
Fahrenholzia sp.  
Hoplopleura hesperomydis  
Perognathus parvus  
Androlaelaps sp.  
Dermenyssus gallinae  
Eubrachyelaels debilis - H  
* Euschengastia decipiens  
E. radfordi  
Haemogamasus ambulans  
Haemolaelaps casalis  
* H. glasgowi  
* Hirstionyssus hilli  
H. incomptus  
H. triacanthus  
H. utahensis - H  
Hypoaspis lubrica  
* Ischyropoda armatus  
I. furmani - H  
* Kleemania sp.  
Trombicula doremi - H  
Enderleinellus sp.  
* Fahrenholzia pinnata  
Fahrenholzia sp.  
Hoplopleura arboricola  
H. erraticus  
H. hesperomydis  
Neohaematopinus laeviusculus  
N. pacificus  
Polyplax auricularis  
Mallophaga  
Peromyscus maniculatus  
Androlaelaps leviculisus  
Bemix marita  
Eubrachyelaels circularis  
E. crowei  
* E. debilis  
Euschengastia cordiremus  
E. cricetica  
* E. decipens  
E. lanei  
E. radfordi  
* Haemogamasus ambulans  
H. longicantus  
Haemolaelaps casalis  
* H. glasgowi  
Hirstionyssus hilli  
H. incomptus  
H. longicantus  
H. thomomys  
H. triacanthus  
* H. utahensis  
* Ischyropoda armatus  
I. furmani - H  
Kleemania sp.  
Listrophorus sp.  
Trombicula sp.  
Enderleinellus sp.  
Fahrenholzia pinnata - H  
Fahrenholzia sp.  
Haemogamasus ambulans  
H. incomptus  
H. longicantus  
* H. utahensis  
* Ischyropoda armatus  
I. furmani - H  
Kleemania sp.  
Listrophorus sp.  
Trombicula sp.  
Enderleinellus sp.  
Fahrenholzia pinnata - H  
Fahrenholzia sp.  
Fahrenholzia pinnata  
Haemogamasus ambulans  
H. incomptus  
H. longicantus  
* H. utahensis  
* Ischyropoda armatus  
I. furmani  
Fahrenholzia pinnata - H  
Fahrenholzia sp.  
* Mallophaga  
Pleocitus townsendii  
Chattia ochotona  
Haemolaelaps glasgowi  
* Macronyssus unidens  
Mallophaga  
Reithrodontomys megalotis  
Haemogamasus ambulans  
Haemogamasus glasgowi  
Hoplopleura hesperomydis  
Neohaematopinus pacificus  
Mallophaga  
Sorex merriami  
Ischyropoda armatus  
Kleemania sp.  
Spermophilus townsendii  
* * Haemolaelaps glasgowi  
Hirstionyssus triacanthus  
H. utahensis  
Ischyropoda sp.  
Enderleinellus sp.  
Hoplopleura arboricola  
* Neohaematopinus laeviusculus  
N. pacificus  
Polyplax auricularis  
Mallophaga
ECOLOGICAL CONSIDERATIONS

Degree of Host Infestation

The degree of infestation of mammals differed relative to their geographic distribution (Table 1).

A greater percentage of *Peromyscus maniculatus* was infested with mites in Area 12 than in other areas, with the lowest percentages in Areas 6, 10 and 11. *Perognathus parvus* in Areas 1 and 5 were the most heavily infested, whereas those in Area 7 were the least. In Area 5 *Eutamias minimus* were heavily infested, whereas in Area 3 none were infested. The greatest infestation rate for *Dipodomys ordii* was in Area 8 and the lowest in Area 4. Except in Area 5, no two species of mammals in the same area had a high rate of infestation with mites. The same was true for the lowest rates of infestation.

A greater percentage of *Dipodomys ordii* was infested with lice in Areas 6 and 8, and fewer animals in Areas 5 and 10 were infested than in other areas. The greatest percentage of infested *Eutamias minimus* was in Areas 2 and 10, and fewest in Area 7. No significant differences were noted for *Perognathus parvus* except in Areas 7, 9 and 10, where no infested animals were found even though 108 were examined. A greater percentage of *Peromyscus maniculatus* was infested in Area 4, and fewer infested animals were found in Area 11 than in other areas. On the basis of frequency and degree of infestation, the areas where louse infestation was optimum for *Dipodomys ordii*

Table 1. Percentage of hosts\(^1\) infested with mites and lice in each of 12 major study areas.

<table>
<thead>
<tr>
<th>Host</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MITES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dipodomys ordii</em></td>
<td>71</td>
<td>50</td>
<td>45</td>
<td>58</td>
<td>87</td>
<td>97</td>
<td>77</td>
<td>71</td>
<td>89</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td>10</td>
<td>6</td>
<td>0</td>
<td>24</td>
<td>6</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>35</td>
<td>16</td>
<td>21</td>
<td>38</td>
<td>15</td>
<td>24</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>42</td>
<td>32</td>
<td>60</td>
<td>45</td>
<td>14</td>
<td>50</td>
<td>45</td>
<td>18</td>
<td>18</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LICE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dipodomys ordii</em></td>
<td>17</td>
<td>17</td>
<td>12</td>
<td>6</td>
<td>21</td>
<td>23</td>
<td>8</td>
<td>6</td>
<td>16</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td>20</td>
<td>32</td>
<td>24</td>
<td>24</td>
<td>6</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>8</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>27</td>
<td>29</td>
<td>23</td>
<td>30</td>
<td>12</td>
<td>18</td>
<td>22</td>
<td>11</td>
<td>12</td>
<td>8</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\)Only those hosts that were widely distributed geographically are included.

\(^2\)To nearest whole percent.

\(^3\)Data not included when less than 10 hosts from the area were examined.
are 6, 8 and 11, for *Eutamias minutus* 2 and 3, and for *Peromyscus maniculatus* 2 and 5. Considering lice of all species, hosts in Area 2, 5 and 9 were more heavily infested than those in other areas.

In each of the 12 study areas, a greater percentage of the hosts belonging to *Dipodomys ordii*, *Perognathus parvus*, and *Peromyscus maniculatus* were infested with lice than with mite. The reverse situation occurred with *Eutamias minutus*. Four exceptions to these conditions wherein about equal percentages of hosts were infested with mites and lice were *Eutamias minutus* in Areas 5 and 7, and *Peromyscus maniculatus* in Areas 2 and 6.

Host Abundance and Species Variety

The number of species of parasites which occurred on a particular kind of host generally was in direct proportion to the number of hosts examined (Table 2).

Table 2. Number of mammals examined and number of species of mites and lice found on each kind.

<table>
<thead>
<tr>
<th>Species</th>
<th>No. examined</th>
<th>Mites</th>
<th>Lice</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1866</td>
<td>25</td>
<td>9</td>
</tr>
<tr>
<td><em>Dipodomys ordii</em></td>
<td>808</td>
<td>25</td>
<td>5</td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>474</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td><em>Eutamias minutus</em></td>
<td>398</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td><em>Leps californicus</em></td>
<td>125</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><em>Plectus townsendii</em></td>
<td>78</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td><em>Onychomys leucogaster</em></td>
<td>63</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td><em>Spermophilus townsendii</em></td>
<td>60</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><em>Reithrodontomyx megalotis</em></td>
<td>39</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><em>Sylvilagus nuttalii</em></td>
<td>28</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td><em>Microtus montanus</em></td>
<td>25</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td><em>Neotoma cinerea</em></td>
<td>14</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td><em>Sylvilagus idahoensis</em></td>
<td>13</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><em>Sorex merriami</em></td>
<td>9</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><em>Thomomys talpoides</em></td>
<td>8</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td><em>Marmota flaviventris</em></td>
<td>6</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Mammals of three species did not fit the expected ratio of direct proportion with reference to mites—*Peromyscus maniculatus* and *Sylvilagus idahoensis* had fewer species of mites than would be expected, and *Onychomys leucogaster* more species than expected. I assume that the numbers of *Peromyscus* examined approached the upper end of the “numbers examined—species present” ratio, whereas the unexpected ratios for *Sylvilagus* and *Onychomys* may be related to their behavior patterns and/or habitat.

Lice are more host specific than mites, fleas or ticks. Consequently the sucking lice in this study were more restricted in host distribution than fleas or mites, but followed the similar trend of number of species found in direct proportion to number of hosts examined. Exceptions were *Plector townsendii* on which no lice were found, and *Spermophilus townsendii*, *Microtus montanus* and *Marmota flaviventris*, which possessed more species of lice than expected.

Degree of Infestation by Sex of Host

Some significant differences in the rate of infestation on mammals of different sexes were noted for parasites of some species (Table 3).

Table 3. Comparative rates of infestation by mites and lice on the different sexes of mammals of some species.

<table>
<thead>
<tr>
<th>Parasite and host</th>
<th>Parasite-host index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\delta$ hosts</td>
</tr>
<tr>
<td><strong>Mites</strong></td>
<td></td>
</tr>
<tr>
<td><em>Eubrachyelaeps crowei</em></td>
<td><em>Onychomys leucogaster</em></td>
</tr>
<tr>
<td><em>Eubrachyelaeps debilis</em></td>
<td><em>Peromyscus maniculatus</em></td>
</tr>
<tr>
<td><em>Eucyrtodiplosis decipiens</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Dipodomys ordii</em></td>
<td>19.9</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>6.0</td>
</tr>
<tr>
<td><em>Haemogamasus ambulans</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Onychomys leucogaster</em></td>
<td>3.5</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1.2</td>
</tr>
<tr>
<td><em>Haemolaelaps glasgowi</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Eutamias minutus</em></td>
<td>1.8</td>
</tr>
<tr>
<td><em>Microtus montanus</em></td>
<td>1.6</td>
</tr>
<tr>
<td><em>Onychomys leucogaster</em></td>
<td>6.0</td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>1.8</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1.8</td>
</tr>
<tr>
<td><em>Spermophilus townsendii</em></td>
<td>2.8</td>
</tr>
<tr>
<td><em>Hirstionyssus incomptus</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Hirstionyssus triacanthus</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Hirstionyssus utahensis</em></td>
<td><em>Eutamias minutus</em></td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>2.0</td>
</tr>
<tr>
<td><em>Ischyropoda armatus</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
<tr>
<td><em>Onychomys leucogaster</em></td>
<td>2.6</td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>1.0</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1.4</td>
</tr>
<tr>
<td><em>Ischyropoda furmani</em></td>
<td><em>Dipodomys ordii</em></td>
</tr>
</tbody>
</table>
Table 3. (Continued)

<table>
<thead>
<tr>
<th>Parasite and host</th>
<th>Parasite-host index</th>
<th>( \delta ) hosts</th>
<th>( \varphi ) hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1.0</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td><em>Kleemania sp.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dipodomyus ordii</em></td>
<td>2.1</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>1.6</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td><em>Listrophorus sp.</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Dipodomyus ordii</em></td>
<td>20.0</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td><em>Trombicula arenicola</em></td>
<td>9.0</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td><em>Trombicula belkini</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Sceloporus graciosus</em></td>
<td>6.7</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td><em>Trombicula doreni</em></td>
<td>3.0</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td><em>Dipodomyus ordii</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Lice

<table>
<thead>
<tr>
<th>Lice</th>
<th>( \delta ) hosts</th>
<th>( \varphi ) hosts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fahrenholzia pinnata</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td><em>Dipodomyus ordii</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hoplopleura arboricola</em></td>
<td>4.7</td>
<td>4.0</td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Hoplopleura hesperomydis</em></td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Neohaematopinus laeviusculus</em></td>
<td>12.6</td>
<td>5.1</td>
</tr>
<tr>
<td><em>Spermophilus townsendii</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Neohaematopinus pacificus</em></td>
<td>2.4</td>
<td>1.4</td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Polyplax auricularis</em></td>
<td>3.6</td>
<td>2.4</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Seasonal Occurrence

Complete seasonal occurrences of the mites and lice are given in the listings in the sections "Mite-Host Associations" and "Louse-Host Associations." Their occurrence on commonly collected hosts is summarized in Tables 4 and 5.

I assume that a direct correlation exists between the number and kinds of hosts examined and the number of kinds of parasites found. This was true except for October when proportionately more species of mites and lice were found than would be expected from the number of hosts examined. The number of species of parasites taken during July and August were equal, although more hosts were examined in August than in July. The number of kinds of parasites in relationship to the number of kinds of hosts examined was in direct correlation for other months except for April, July and November when fewer kinds of mites, and in June when fewer lice were found than expected from the number of kinds of hosts examined. In February more kinds of lice were found than expected.

The absence of Mallophaga on so many birds was unusual, particularly on *Anoplus bellii*, *Lantus ludovicianus*, *Lentococie tephotroctis*, and *Zonotrichia leucophrys*.

For the sucking lice an unusual situation was the apparent absence of these parasites during specific months. Lice were found on *Peromyscus maniculatus* every month, yet were absent on other of their common hosts at times when one would expect them to be present. Significant examples of absence are in May for *Dipodomyus ordii*, August and December for *Lepus californicus*, and September for *Perognathus parvus*.

### Males of *Dipodomyus ordii* and *Perognathus parvus*

Males of *Dipodomyus ordii* and *Perognathus parvus* were more heavily infested with mites of *Euchoenastia decipiens* than were females. Relative to mites of *Hemolaelaps glasgowi*, females of *Eutamias minimus* were more heavily infested, whereas the males of *Onychomys leucogaster* were more heavily infested. For *Hirstionysus utahensis*, male *Eutamias minimus* were more heavily infested, whereas female *Peromyscus maniculatus* were more heavily infested. Males of *Dipodomyus ordii* were more heavily infested with mites of *Trombicula arenicola* than were females.

For the most part, a greater percentage of the male hosts were more heavily infested with lice than were the females. This was most evident with *Polyplax auricularis* on *Peromyscus maniculatus*. In every case but one (Hoplopleura hesperomydis on *Peromyscus maniculatus*) the louse-host index was higher for males than for females, although the difference was not significant except for *Neohaematopinus laeviusculus* on *Spermophilus townsendii*.

### Reproduction In Mites

An egg or larva was observed within the idiosoma of mites of seven species. Females of *Euchromylaelaps crowei* were gravid with eggs during June, July, August and October, and with larvae from June to October, inclusive. Females of *E. debilis* contained eggs from February through December (except in September and October), and larvae during the same period except October. Mites of *Hemolaelaps glasgowi* were gravid with eggs from March through October, and with larvae for the same period except in May and September. Mites of *Hirstionysus hilli* contained eggs in August, those of *H. incomptus* in June and July, those of *H. neotomae* in September, and those of *H. thomomys* in October.

The cosmopolitan species *Hemolaelaps glasgowi*, which occurs on such a variety of hosts, was common on mammals of five species at the NRTS, but those taken from *Dipodomyus ordii* contained the greatest
Table 4. Seasonal infestation of some common hosts<sup>1</sup> with mites<sup>2</sup> and lice.<sup>2</sup>

<table>
<thead>
<tr>
<th>Host</th>
<th>No. vertebrates examined and parasites&lt;sup&gt;3&lt;/sup&gt; present</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan</td>
</tr>
<tr>
<td>Reptiles</td>
<td></td>
</tr>
<tr>
<td><em>Crotalus viridis</em></td>
<td></td>
</tr>
<tr>
<td><em>Sceloporus graciosus</em></td>
<td>1</td>
</tr>
<tr>
<td>Birds</td>
<td></td>
</tr>
<tr>
<td><em>Amphispiza belli</em></td>
<td>15</td>
</tr>
<tr>
<td><em>Eremophila alpestris</em></td>
<td>6</td>
</tr>
<tr>
<td><em>Junco oreganus</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Lanius ludovicianus</em></td>
<td>1</td>
</tr>
<tr>
<td><em>Leucisticus tephrocoris</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Spinus pinus</em></td>
<td>3</td>
</tr>
<tr>
<td><em>Zonaihara macroura</em></td>
<td>2</td>
</tr>
<tr>
<td><em>Zonotrichia leucophrys</em></td>
<td>6</td>
</tr>
<tr>
<td>Mammals</td>
<td></td>
</tr>
<tr>
<td><em>Dipodomys ordii</em></td>
<td>50</td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td>51</td>
</tr>
<tr>
<td><em>Lepus californicus</em></td>
<td>6</td>
</tr>
<tr>
<td><em>Micrus montanus</em></td>
<td>8</td>
</tr>
<tr>
<td><em>Onychomys leucogaster</em></td>
<td>7</td>
</tr>
<tr>
<td><em>Perognathus parvus</em></td>
<td>14</td>
</tr>
<tr>
<td><em>Peromyscus maniculatus</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Reithrodontomys megalotis</em></td>
<td>6</td>
</tr>
<tr>
<td><em>Spermophilus townsendii</em></td>
<td>5</td>
</tr>
<tr>
<td><em>Sylvilagus nuttalii</em></td>
<td>7</td>
</tr>
</tbody>
</table>

<sup>1</sup>Only those are listed wherein a total of 20 or more animals were examined of those species which are common hosts for mites or lice.

<sup>2</sup>All species.

<sup>3</sup>L = lice, M = mites.

Table 5. Numbers of species of mites and lice collected each month relative to numbers and kinds of mammals.

<table>
<thead>
<tr>
<th>Item</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. hosts examined</td>
<td>19</td>
<td>50</td>
<td>243</td>
<td>98</td>
<td>121</td>
<td>856</td>
<td>1001</td>
<td>1022</td>
<td>173</td>
<td>198</td>
<td>71</td>
<td>64</td>
</tr>
<tr>
<td>Kinds hosts examined</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>10</td>
<td>9</td>
<td>7</td>
<td>9</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Kinds parasites found:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mites</td>
<td>3</td>
<td>4</td>
<td>13</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>25</td>
<td>28</td>
<td>16</td>
<td>21</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Lice</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>11</td>
<td>11</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
percentage of gravid females (13%) when compared with those on *Peromyscus maniculatus* (7%), *Onychomys leucogaster* (5%), *Perognathus parvus* (4%), and *Eutamias minimus* (3%).

**Consortism**

Where sufficient numbers of parasites were found to make comparisons, different degrees of species consortism were noted (Table 6). Mites of *Euschoengastia decipens*, although found on a variety of hosts, were seldom in association with mites of other genera. All of the common species except *Trombicula arenicola* occurred as the only species of mite on their hosts in more than half the collections. *Euschoengastia radfordi*, *E. decipiens* and *Hirstioniussus incomptus* frequently were associated with other species of the same genus.

Consortism between lice of different species was not as common as with other ectoparasites. Lice of the species *Polyplax auricularis* occurred as the only ones on their host a greater percentage of the time than did other lice. All of the commonly collected species except *Neohammatopus pacificus* occurred as the only lice on their hosts in more than half of the collections. A significant correlation occurred with *N. pacificus* which was associated with *Hoplopleura arborigola* in 43 percent of its collections. A similar correlation was noted between *Hoplopleura hesperomydis* and *Polyplax auricularis*. Significant intragenic associations were noted for *Hoplopleura* and *Neohammatopus*.

**Geographic Distribution**

The distribution of parasites of most species was directly correlated with the distribution of the host on which the parasites were most commonly found. Of the mites, *Eubrachyleaelaps debilis*, *Hirstioniussus incomptus*, *Listrophorus* sp. and *Trombicula arenicola* were more widely distributed than expected, and *Euschoengastia radfordi*, *Berenia marita* and *Ornithonyssus sylviarum* were more geographically restricted than were the hosts on which they were found.

Lice of the species *Neohammatopus pacificus*, and especially those of *Hoplopleura erraticia*, were more geographically restricted than the hosts on which they were most commonly found.

The numbers of species of mites and lice found in each study area are shown in Table 7. Although fewer species than expected were found in every area, the greatest deviations from the average numbers of species present were Areas 5 and 7 for the mites and Areas 4 and 8 for the lice.

**Radiation Influence**

Animals differed in their degree of infestation with ectoparasites in an irradiated area when compared with an ecologically similar nonirradiated one (Table 8). Animals of *Eutamias minimus* and *Peromyscus maniculatus* were less frequently infested with mites in the irradiated area than in the nonirradiated one. The mite-host index was about equal for *Eutamias minimus* in the two areas, but was higher for *Peromyscus maniculatus* in the irradiated one.

Fewer species of lice were found, a smaller percentage of mammals were infested, and a lower house-host index for *Eutamias minimus* occurred in the irradiated area. Although the house-host index was lower for *Peromyscus maniculatus*, a higher percentage of the mammals were infested and more species of lice were found in the irradiated area.

**Unusual Host Records**

Routine processing of many animals for ectoparasites creates a potential for error and contamination

---

Table 6. Frequency of intrageneric and species associations for some commonly collected mites and lice.

<table>
<thead>
<tr>
<th>Parasite</th>
<th>% of times found:</th>
<th>% of times found:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As only species²</td>
<td>With species of</td>
</tr>
<tr>
<td></td>
<td>on host</td>
<td>same genus</td>
</tr>
<tr>
<td>Mites</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Trombicula belkini</em></td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td><em>Euschoengastia radfordi</em></td>
<td>94</td>
<td>17</td>
</tr>
<tr>
<td><em>Hirstioniussus incomptus</em></td>
<td>84</td>
<td>11</td>
</tr>
<tr>
<td><em>Kleemania</em> sp.</td>
<td>83</td>
<td>0</td>
</tr>
<tr>
<td><em>Eubrachyleaelaps debilis</em></td>
<td>80</td>
<td>1</td>
</tr>
<tr>
<td><em>Haemogamasus ambulans</em></td>
<td>79</td>
<td>0</td>
</tr>
<tr>
<td><em>Euschoengastia decipiens</em></td>
<td>79</td>
<td>11</td>
</tr>
<tr>
<td><em>Listrophorus</em> sp.</td>
<td>77</td>
<td>0</td>
</tr>
<tr>
<td><em>Hirstioniussus utahensis</em></td>
<td>77</td>
<td>5</td>
</tr>
<tr>
<td><em>Trombicula doremi</em></td>
<td>75</td>
<td>6</td>
</tr>
<tr>
<td><em>Ischyropoda armatus</em></td>
<td>67</td>
<td>2</td>
</tr>
<tr>
<td><em>L. furmani</em></td>
<td>67</td>
<td>8</td>
</tr>
<tr>
<td><em>Hirstioniussus triacanthus</em></td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td><em>Haemolaelaps glasgowi</em></td>
<td>55</td>
<td>1</td>
</tr>
<tr>
<td><em>Trombicula arenicola</em></td>
<td>39</td>
<td>9</td>
</tr>
</tbody>
</table>

| Lice                            |                   |                   |
| *Polyplax auricularis*          | 73                | 0                 |
| *Fahrenholzia pinnata*          | 67                | 0                 |
| *Hoplopleura arborigola*        | 64                | 9                 |
| *Hoplopleura hesperomydis*      | 60                | 18                |
| *Neohammatopus laevisculatus*   | 53                | 6                 |
| *Neohammatopus pacificus*       | 34                | 6                 |

¹Nearest whole percent.
²Of mites or of lice, respectively.
even though the greatest care is exercised. Consequently, many of the host records in the list of host-parasite relationships must be considered as tentative, especially when they represent only one or two collections. On the other hand, some of the records represent sufficient replications to be valid, and consequently must be considered as new. These are *Euschoengastia decipiens*, *Hirstionyssus triacanthus* and *Ischyropoda* sp. on *Eutamias minimus*; *Ischyropoda armatus* on *Microtus montanus*; *Eubrachylaelaps* debilis and *Haemogamasus longitarsus* on *Onychomys leucogaster*; and *E. debilis*, *Hirstionyssus utahensis*, *Ischyropoda furmani* and *Trombicula doremi* on *Perognathus parvus*.

Table 7. Numbers of species of mites and lice found in the major study areas in proportion to the kinds and numbers of hosts examined.

<table>
<thead>
<tr>
<th>Study Area</th>
<th>No. hosts examined</th>
<th>No. species mites</th>
<th>No. species lice</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individuals</td>
<td>Species</td>
<td>Expected</td>
</tr>
<tr>
<td>1</td>
<td>169</td>
<td>6</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>155</td>
<td>4</td>
<td>29</td>
</tr>
<tr>
<td>3</td>
<td>311</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>117</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>6</td>
<td>51</td>
<td>3</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>57</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>148</td>
<td>5</td>
<td>41</td>
</tr>
<tr>
<td>9</td>
<td>93</td>
<td>3</td>
<td>41</td>
</tr>
<tr>
<td>10</td>
<td>39</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>11</td>
<td>39</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>12</td>
<td>49</td>
<td>3</td>
<td>41</td>
</tr>
</tbody>
</table>

1 Only those are included that are known to be common hosts of mites or lice.

2 Based on number and kinds of hosts examined in relationship to parasites found on these hosts in at least one other study area.

Table 8. Differences in degree of infestation by mites and lice on mammals of two species in irradiated and nonirradiated areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>No. hosts examined</th>
<th>% hosts infested with:</th>
<th>No. species present</th>
<th>Parasite-host index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mites</td>
<td>Lice</td>
<td>Mites</td>
</tr>
<tr>
<td><em>Eutamias minimus</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>38 (control)</td>
<td>18</td>
<td>67</td>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td>13 (irradiated)</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>4</td>
</tr>
</tbody>
</table>

*Peromyscus maniculatus* |

| 37 (control) | 22                 | 95    | 14   | 5     | 2    | .6    | 11.0 |
| 13 (irradiated) | 80                | 50    | 26   | 9     | 4    | 26.0  | 4.3  |
New records for lice, which likely are not contaminations, are *Fahrenholzia pinnata* on *Peromyscus maniculatus*, *Hoplopleura acanthopus* on *Microtus montanus*, *H. arboricola* on *P. maniculatus*, *H. hesperomydis* on *Dipodomys ordii* and Eutamias minimus, and *Polyplax auricularis* on *E. minimus.*

**Taxonomic Considerations of the Lice**

I have taken the liberty to include some applicable comments made by Dr. William T. Jellison relative to his identifications of the lice.

*Enderleinella* sp.—These probably were of ground squirrel origin, and likely are *E. satursalis.*

*Fahrenholzia pinnata.*—This is a characteristic parasite of *Dipodomys.* The specimens from *Perognathus* were only tentatively relegated to this species by Jellison. On the Idaho specimens the upper left-hand pleural plate is consistently longer than on typical *F. pinnata.*

*Haemodipsus setoni.*—Lice relegated to this species were taken from *Lepus* and *Sylvilagus*. A different species likely occurs on each of these hosts, but so far no distinction has been recognized.

*Hoplopleura erraticia.*—Western chipmunks have two louse parasites—*H. erratica arboricola* and *Neohematopinus pacificus*. The Idaho specimens are closer to the subspecies *H. e. erratica*, typical of *Tamias*, than to the western *H. e. arboricola*.

*Polyplax auricularis.*—This typically infests *Peromyscus* and mice of several other genera, and Jellison seriously questions the records from *Dipodomys, Perognathus* and *Spermophilus*.

**DISCUSSION**

**Community Relationships**

In the 12 major study areas where collections were made during all seasons, the degrees of infestation of each species of hosts were not consistent between different areas. However, in Areas 7 and 10 the degree of infestation was lower for more species than for the other areas. The same predominant plants were present in Areas 7 and 10 and in some of the other areas, but total composition and edaphic differences likely exist which affect parasite infestation of the host as well as its nest.

**Species Variety**

For those ectoparasites that are not considered host specific, the number of species of ectoparasites found on a particular species of host was proportionate to the number of hosts examined. The fewer kinds of mites than expected to be found on *Peromyscus maniculatus* is unusual in consideration of the abundance, distribution and habits of these rodents. The greater number of species of mites than expected on *Onychomys leucogaster* is not unusual in light of its carnivorous habits. The unusual number of species of lice on *Spermophilus, Microtus* and *Marmota* is unexpected because of the apparent host specificity of these ectoparasites and the habitat and behavior of their hosts.

**Sexual Differences**

Where degree of infestation according to sex of host differed for a given species, the males were more often and more heavily infested than the females, although this varied somewhat with the species of parasite. This may be related to the reproductive, nesting and food-getting activities of the different hosts. The greater degree of infestation of males is contrary to an assumption that females are potentially apt to be more heavily infested because they spend more time associated with the nest because of their reproductive activities. The nest is assumed to be the principle reservoir of many ectoparasites of the nest-building rodents. On the other hand, the wandering activities of the males may provide for greater potential contact with ectoparasites seeking a host. Furthermore, the nest itself may contain plant materials and dusts which act as pesticides against the ectoparasites.

**Seasonal Occurrence**

The summer months (July and August) are expected to represent the optimum period for the greatest number of species of ectoparasites on the hosts inasmuch as this is the time when populations of hosts are attaining their peak, and environmental conditions should be optimum for ectoparasite reproduction. The decline in September and subsequent increase in October is related to the maturation of immatures produced by the mid-summer adults. The expected decline in winter months occurred for the mites, but populations of lice in February were higher than expected. This latter situation may be due to the optimum environmental conditions of the nest as a result of animal hibernation, or decreased amounts of activity outside of the nest.

**Consortism**

Whether the degree of consortism is directly related to the species of ectoparasite involved or to edaphic or other environmental factors is not known. For the lice, considered as being more host specific than the mites, individual species seldom occurred with other lice, especially with those of the same genus. Although mites of different species frequently
were associated together, those of two species represented the extremes of consortism. Chigger mites of *Euschoengastia decipiens* seldom were found in association with other mites, whereas the mesostigmatid *Eubrachylaelaps crowei* was almost always found in association with other species. The occurrence of mites of two species of the same genus on the same host was not considered common in proportion to the number of times each species was found, but was much more common in the mites than with the lice.

**Geographic Distribution**

One may assume that the distribution of an ectoparasite should be in direct relationship to the distribution of its common hosts, especially with the lice where host specificity is more evident than with the mites. Such was the case with most of those mites and lice studied. Based on host relationships, however, mites of three species were more widely distributed than expected, whereas those of three other species were more restricted than expected. Undoubtedly environmental factors other than the host are influential on these mites. No correlation with a predominant type of vegetation was evident, and highest and lowest populations were found in two communities which contained the same species of predominant plants. On the other hand, other species which occurred in greatest numbers were associated with plant associations wherein greater cover and organic debris were present.

**Radiation Effects**

The effects of radiation, *per se*, on the rate of ectoparasite infestation are not known. However, in one disturbed area fewer ectoparasites occurred than in an ecologically similar undisturbed area. This situation occurred for lice and mites on *Eutamias minimus*, but was different for ectoparasites on *Peromyscus maniculatus*. Although fewer mice were infested with mites in the irradiated area than in the undisturbed area, the mite-host index was higher. Exactly the reverse situation occurred with lice on *P. maniculatus*. I believe that the differences in rates of infestation are not due to the effects of radionuclides, but rather to the physical disturbance of the habitat, i.e., destruction of plants and soil manipulation.

**SUMMARY**

Mites of 47 species and lice of 16 species were taken from reptiles of 3 species, birds of 23 species, and mammals of 18 species at the National Reactor Testing Station between June, 1966, and September, 1967. Mammals differed in degree of infestation relative to their geographic distribution at the station. The number of species of ectoparasites which occurred on a particular kind of host generally was in direct proportion to the number of hosts examined, but exceptions occurred in some instances. In some cases the rate of infestation differed relative to the sex of the host. The greatest numbers of species of mites and lice were found during July and August, fewest species of mites from December through February, and fewest kinds of lice during December and January. Host preferences for mites of some species were evident during their reproductive and nonreproductive periods. Consortism among the ectoparasites differed in degree by species. Except for mites of seven species and lice of two species, the geographic distribution of the ectoparasites was in direct proportion to the distribution of the host on which they were commonly found. Mammals of two species differed in their frequency of infestation with ectoparasites in an irradiated area when compared to an ecologically similar nonirradiated control area. Ten new host records for mites and six for lice were established.
REFERENCES


Ferris, G. F. 1919-1935. Contributions Toward a Monograph of the Sucking Lice. 2(1-8), Stanford Univ. Press; Stanford, Calif.


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