

NEW RECORDS FOR SEVERAL FLEA (SIPHONAPTERA) SPECIES IN
THE UNITED STATES, WITH OBSERVATIONS ON SPECIES
PARASITIZING CARNIVORES IN THE
ROCKY MOUNTAIN REGION

R. B. EADS, E. G. CAMPOS, AND A. M. BARNES

Vector-Borne Diseases Division, Center for Disease Control, Public Health Service, U.S. Department of Health, Education, and Welfare, P. O. Box 2087, Fort Collins, Colorado 80522.

Abstract.—New flea distribution data are discussed, and the fleas parasitizing certain carnivorous animals infrequently examined for ectoparasites are listed. *Ceratophyllus scopulorum* Holland is reported from the U.S. for the first time. *Stenoponia americana* (Baker), *Nearctopsylla princei* Holland and Jameson, *Amphipsylla sibirica washingtona* Hubbard, *Ctenophthalmus pseudagyrtis* Baker, *Chaetopsylla floridensis* (I. Fox) and *Eptescoposylla vancouverensis* (Wagner) are reported from Colorado for the first time.

The bird flea, *Ceratophyllus scopulorum* Holland, can be added to the species of fleas known to be present in the United States. Thirty specimens were recovered from nests of the cliff swallow, *Petrochelidon pyrrhonota*, near Drayton, Pembina County, North Dakota, 16 August 1975 by G. C. Smith. The same collector took two females and a male of the species from a cliff swallow nest near Hallock, Kittson County, Minnesota, 16 August 1975. *Ceratophyllus scopulorum* has been previously reported only from Yukon Territory and New Brunswick in Canada, also from cliff swallow nests.

The flea, *Stenoponia americana* (Baker), is common on a variety of small rodents (chiefly *Peromyscus* and *Microtus*) in the eastern United States. To our knowledge, it has not been previously reported from Colorado. Our collections indicate it is present on the eastern slope of the Rockies. Records include: 1 female ex dog, Larimer County, Colorado, 26 February 1975, G. C. Smith; 13 females, 8 males ex *Peromyscus maniculatus*, Custer County, Colorado, 4 October 1975, A. M. Barnes, E. G. Campos and G. O. Maupin.

Two female *Nearctopsylla princei* Holland and Jameson were removed from a *Mustella frenata*, 17 December 1974, in the Rocky Mountain National Park, Larimer County, Colorado, W. S. Archibald and G. O. Maupin. Fleas of this genus parasitize shrews and moles and the carnivores which

Table 1. Fleas recovered from marten, *Martes americana*, Larimer County, Colorado.

| No. Fleas | Species | F | M | Usual Hosts |
|---|------------------------------------|----|----|--------------------------|
| <u>Three marten, October–November, 1976</u> | | | | |
| 2 | <i>Pulex</i> sp. | 2 | 0 | Wide Host Range |
| 2 | <i>Foxella ignota</i> | 1 | 1 | Pocket Gophers |
| 7 | <i>Orchopeas sexdentatus</i> | 6 | 1 | <i>Neotoma</i> |
| 2 | <i>Orchopeas caedens</i> | 2 | 0 | <i>Tamiasciurus</i> |
| 1 | <i>Monopsyllus wagneri</i> | 1 | 0 | <i>Peromyscus</i> |
| 5 | <i>Monopsyllus vison</i> | 3 | 2 | <i>Tamiasciurus</i> |
| 3 | <i>Ctenophyllus armatus</i> | 1 | 2 | <i>Ochotona princeps</i> |
| 1 | <i>Oropsylla idahoensis</i> | 0 | 1 | <i>Spermophilus</i> |
| 1 | <i>Opisocrostis labis</i> | 0 | 1 | <i>Spermophilus</i> |
| 1 | <i>Megarhroglossus</i> sp. | 1 | 0 | Cricetine Rodents |
| 21 | <i>Chaetopsylla floridensis</i> | 8 | 13 | <i>Martes americana</i> |
| <u>Two marten, October, 1977</u> | | | | |
| 22 | <i>Chaetopsylla floridensis</i> | 15 | 7 | <i>Martes americana</i> |
| 2 | <i>Thrassis stanfordi</i> | 1 | 1 | <i>Marmota</i> |
| 2 | <i>Tarsopsylla octodecimentata</i> | | | |
| | <i>coloradensis</i> | 2 | 0 | <i>Tamiasciurus</i> |
| 1 | <i>Megarhroglossus</i> sp. | 1 | 0 | Cricetine Rodents |
| 1 | <i>Amphipsylla sibirica</i> | 1 | 0 | <i>Microtus</i> |

prey on them. *Nearctopsylla princei* has been known only from California, its usual host being the shrew, *Sorex trowbridgei*.

Two subspecies of the largely Palaearctic genus *Amphipsylla* have been reported from North America. *Amphipsylla sibirica washingtona* Hubbard has been known only from Washington and Idaho, to our knowledge. *Amphipsylla sibirica pollionis* (Rothschild) has been taken in Alaska, the Yukon, Alberta and Labrador. We have taken the following specimens of *A. s. washingtona* from the Rocky Mountain National Park, Larimer County, Colorado: 1 male ex *Peromyscus maniculatus*, 21 December 1975, R. G. McLean; 1 male ex *Microtus montanus*, 21 December 1975, R. G. McLean; 1 male ex *Clethrionomys gapperi*, 5 March 1975, E. G. Campos; and 2 females ex *M. montanus*, 27 February 1975, E. G. Campos. A single female *A. sibirica* was taken from a marten, *Martes americana*, in October 1977, in Larimer County, Colorado, by George Stewart.

Ctenophthalmus pseudagyrtis Baker is commonly found in the eastern United States but is rare in the West. We know of no reports of this flea from Colorado previous to the following: 1 male ex *Microtus* sp., 24 April 1970, Spring Creek Dam, Larimer County, Colorado, E. G. Campos; and 1 female ex *Rattus norvegicus*, Fort Collins, Larimer County, Colorado, 3 August 1976, City-County Health Department.

Table 2. Fleas recovered from 7 bobcat, *Lynx rufus*, Larimer County, Colorado, December 1975–March 1976.

| No. Fleas | Species | F | M | Usual Hosts |
|-----------|-------------------------------|----|----|-------------|
| 99 | <i>Cediopsylla inaequalis</i> | 62 | 37 | Rabbits |
| 11 | <i>Hoplopsyllus glacialis</i> | 7 | 4 | Rabbits |
| 21 | <i>Odontopsyllus dentatus</i> | 4 | 17 | Rabbits |
| 1 | <i>Pulex irritans</i> | 0 | 1 | Carnivores |

The range of the flea, *Eptescopysylla vancouverensis* (Wagner), which parasitizes several species of bats has been extended eastward from the west coast of the United States and Canada by the recovery of specimens in Colorado: 1 male, 1 female ex *Plecotus pallescens*, Boulder County, Colorado, 19 January 1977, C. J. Mitchell; and 1 male ex *P. pallescens*, Boulder County, Colorado, 6 January 1978, C. J. Mitchell. We have also seen a male taken from *Euderma maculatum* in Nevada, but the slide has been mislaid and more specific collection data are not available.

The Nevada and Colorado specimens differ somewhat from the west coast *E. vancouverensis*. For example, the former have a reduced number of frontal spiniforms on the head, no mid-dorsal hump on the movable process of the male clasper and reduced setation on the male sternum VIII. The differences are believed to be no more than subspecific in nature.

We have had an opportunity to study fleas from five *Martes americana* trapped in Larimer County, Colorado, in October and November of 1976–77. One marten was taken November 5, 1976 in the Rocky Mountain National Park by Dr. R. G. McLean; the others were secured by Mr. George Stewart, professional trapper, elsewhere in Larimer County. The 14 species taken from martens are listed in Table 1. Of these, only *Chaetopsylla floridensis* (I. Fox) can be characterized as a true marten flea.

Chaetopsylla floridensis, previously unreported from Colorado, bears an unfortunate specific name. It was described from material in the U.S. National Museum purported to be "from garden truck leaf mold" taken in Gainesville, Florida. In light of its present known distribution from Alaska (Hopla, 1964) to Colorado, one is tempted to speculate that the type-material was mislabeled. We have observed that the flea is well-adapted to cold weather and remains active at below 0°F on trapped martens which have been frozen for hours.

Two specimens of a rare flea were recovered from a marten. *Tarsopsylla octodecimentata coloradensis* (Baker) was described from Colorado on *Tamiasciurus hudsonicus*. We know of but two additional records of the species in the state. We have not seen it in recent years, even though numerous *T. hudsonicus* and their nests have been examined in connection with

Table 3. Fleas recovered from 4 ringtailed cat, *Bassaricus astutus*, Bernalillo County, New Mexico, November–December 1977.

| No. Fleas | Species | F | M | Usual Hosts |
|-----------|--------------------------------------|----|----|-----------------------------|
| 30 | <i>Megarthroglossus bisetis</i> | 21 | 9 | <i>Neotoma</i> |
| 24 | <i>Anomopsyllus novomexicanensis</i> | 12 | 12 | <i>Neotoma</i> |
| 2 | <i>Stenistomera alpina</i> | 2 | 0 | <i>Neotoma</i> |
| 6 | <i>Atyphloceras echis</i> | 5 | 1 | <i>Neotoma</i> |
| 4 | <i>Epitedia stanfordi</i> | 1 | 3 | <i>Peromyscus</i> |
| 1 | <i>Micropsylla sectilis goodi</i> | 1 | 0 | <i>Neotoma</i> |
| 1 | <i>Meringis arachis</i> | 1 | 0 | <i>Dipodomys</i> |
| 2 | <i>Diamanus montanus</i> | 1 | 1 | <i>Spermophilus</i> |
| 2 | <i>Malaraeus sinomus</i> | 0 | 2 | Cricetine Rodents |
| 2 | <i>Thrassis aridis</i> | 1 | 1 | <i>Spermophilus</i> |
| 1 | <i>Monopsyllus wagneri</i> | 0 | 1 | <i>Peromyscus</i> |
| 1 | <i>Orchopeas neotomae</i> | 1 | 0 | <i>Neotoma</i> |
| 3 | <i>Pulex simulans</i> | 1 | 2 | <i>Cynomys</i> , Carnivores |
| 4 | <i>Echidnophaga gallinacea</i> | 2 | 2 | Wide Host Range |

Colorado tick fever studies in the Rocky Mountain National Park. Hopla (1964) reports taking the species in Alaska from *T. hudsonicus*, *Mustela erminea*, *Glaucomys sabrinus* and *Clethrionomys rutilus*. We consider *T. O. coloradensis* to be truly a rare flea in Colorado. Due to its scarcity on *Tamiasciurus hudsonicus*, it has been considered a nest flea.

It is apparent from the plethora of flea species found on certain carnivores that they may play an important role in the natural history of bubonic plague, primarily by transferring infected fleas from an infected rodent aggregate to uninfected rodents of the same or different species. With comparatively large home ranges, carnivores should be capable of rapidly spreading plague in rodents.

The Mustelidae are much more likely to have a large variety of flea species on them than other common carnivores in the Colorado Rocky Mountain area. Fox and coyote are frequently heavily infested with *Pulex irritans*, with only occasional rabbit or rodent fleas seen on them. As shown in Table 2, seven bobcat recently examined were infested exclusively with rabbit fleas, with the exception of a single *Pulex irritans*.

The number and diversity of rodent fleas found on the marten is a reflection of the wide host range of these animals and the energetic manner in which they investigate nests of both burrowing and arboreal rodents. The relatively small size of the Mustelidae enables them to actually enter many rodent burrows and pick up predominantly nest fleas.

Noticeable by their absence from the extensive list of fleas from marten are rabbit fleas. Even if they do not feed on rabbits, rabbit fleas are so common

in the Rocky Mountain area that we have picked them up from the ground with flannel drags used for collecting ticks.

An impressive number of flea species have recently been seen off four animals representing another carnivore family, the Procyonidae. A total of 83 fleas, representing 14 species, were removed from two ringtailed cat, *Bassariscus astutus*, trapped November 18, 1977 and two taken December 5, 1977, by U. S. Air Force preventive medicine personnel in Bernalillo County, New Mexico (Table 3). As with the marten, this extensive list of flea species from ringtailed cat does not include rabbit fleas.

We appreciate the assistance given by Dr. George W. Holland, Research Branch, Agriculture Canada, Ottawa, Canada, and Dr. Robert Traub, Department of Microbiology, University of Maryland, Baltimore, Maryland, in the specific determination of certain of the fleas treated in this paper.

LITERATURE CITED

- Hopla, E. C. 1964. Alaskan hematophagous insects, their feeding habits and potential as vectors of pathogenic organisms. Part I. Univ. Oklahoma Research Institute, Norman, Oklahoma. 346 pp.