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SIPHONAPTERA FROM MAMMALS IN ALASKA. SUPPLEMENT IV. REVISED CHECK LIST FOR SOUTHEASTERN ALASKA

GLENN E. HAAS¹, LOYAL JOHNSON², AND ROBERT E. WOOD³

ABSTRACT

The annotated check list grew to 15 taxa with the addition of *Opisodasys vesperalis* (Jordan) and *Chaetopsylla setosa* Rothschild, both new for Alaska; *Tarsopsylla octodecimdentata coloradensis* (Baker), new for southeastern Alaska; and an *Oropsylla* sp. Nine species of wild mammals and the domestic cat are reported as hosts of fleas in southeastern Alaska for the first time, increasing the total number of mammalian hosts to 25 identified species. Seventy new records for 10 islands and the mainland are combined with published records in a distribution table. Morphological variations in the posterior margin of sternum VII of females of *Monopsyllus ciliatus protinus* (Jordan) and distinguishing characters of three other taxa are illustrated.

INTRODUCTION

The addition of four fleas to our first check list of mammal fleas of southeastern Alaska (Haas *et al.* 1980) raised the total to 15 taxa. Especially noteworthy is a marmot flea of the genus *Oropsylla*. The other three fleas are known from British Columbia (Holland 1949). One of them, *Tarsopsylla octodecimdentata coloradensis* (Baker) is also known from Alaska west of the Yukon Territory (Holland 1963; Hopla 1965; Haas and Wilson 1982), but *Opisodasys vesperalis* (Jordan) and *Chaetopsylla setosa* Rothschild are new to the state of Alaska. New records are presented for all fleas in our first list except for *Myodopsylla gentilis* Jordan and Rothschild and *Chaetopsylla tuberculiceps* (Bezzi).

Mammalian hosts of the fleas are listed (Table 1). The additional ten species resulted in a total of 25 identified hosts plus an unknown species of *Microtus*. These additions are the hoary marmot, northern flying squirrel, southern red-backed vole, meadow vole, long-tailed vole, gray wolf, black bear, ermine, wolverine, and domestic cat. All new and published locality records are tabulated by named islands and the mainland (Table 2).

ANNOTATED LIST

Pulicidae

1. *Ctenocephalides felis felis* (Bouché)

This is the first record of fleas infesting a cat in southeastern Alaska.

Record — Baranof Island, Sitka: two males, six females (one gravid), on cat, I.XII.1979, L. Johnson.

Hystrichopsyllidae

2. *Hystrichopsylla dippiei spinata* Holland (Figs. 1 and 2)

Nine more specimens were collected, all from martens making a total of 16 from this mustelid and one from a mink. The assignment of southeastern Alaskan specimens to this subspecies was facilitated by dissecting male genitalia to expose tubercles near the inner angle of sternum IX (Fig. 1). Not all tubercles are in focus but enough to show more than Holland (1957) illustrated for *H. d. truncata* Holland. He showed that tubercles are absent in *H. d. dippiei* Rothschild.

The aedeagus dissected from our *H. d. spinata* specimen is shown in Fig. 2. Aedeagi of *H. dippiei* (then known as *H. gigas dippiei* Rothschild) and *H. occidentalis* (i.e. *H. o. sylvaticus* Campos and Stark) from south of Canada were illustrated by Traub (1950) and Campos and Stark (1979), respectively. Our specimen appears close to Traub's, although the sclerotized inner tube curves toward its exit (Fig. 2).

¹557 California St., No. 7, Boulder City, NV, U.S.A. 89005.

²State of Alaska Department of Fish and Game, P.O. Box 499, Sitka, AK, U.S.A. 99835.

³State of Alaska Department of Fish and Game, 415 Main St., Rm. 208, Ketchikan, AK, U.S.A. 99901.

Records — All on martens. Baranof Island, Nakwasina Passage: one male (Figs. 1 & 2), 3.XII.1979, L. J.; Sitka, 8.8 km N (Starrigavan Creek): three males, one female, 31.XII.1979, L. J. Boca de Quadra: one female, 27.I.1980, R. Wood. Kruzof Island: one female, 2.XII.1979, L. J.; Sukoi Inlet: one male, 29.XII.1979, L. J. Revillagigedo Island: one male, 15.II.1980, R. W.

3. *Hystriechopsylla occidentalis occidentalis* Holland
Only three more specimens of this flea of shrews, certain rodents, and other small mammals (Holland 1957; Campos and Stark 1979) were collected.

Records — Baranof Island, Sitka, 8.8 km N (Starrigavan Creek): one female, on ermine, 5.XII.1980, L. J. Haines, 13.5 km NW (Chilkoot Lake): one female, on deer mouse, 13.VIII.1980, Juneau, 62 km E (Crescent Lake): one female, on meadow vole, 17.VI.1981, U.S. Forest Service.

4. *Catallagia charlottensis* (Baker)

This species and the next (*D. hollandi*) are the first to be recorded from the southern red-backed vole in Alaska (Table 1). This species is also recorded from four of the larger islands for the first time (Table 2).

Records — Admiralty Island, Hood Bay, South Arm: one female, on deer mouse, 10.VI.1980, L. J. Haines, 13.5 km NW (Chilkoot Lake): two males, on deer mouse, 13. VIII. 1980. Mitkof Island, Petersburg, 25.6 km SE (Ohmer Creek): one female, on deer mouse, 20.XI.1980. Revillagigedo

Island, Ketchikan, 19.6 km NW (Ward Creek): one female, on deer mouse, 26.XI.1980. Skagway, 4 km NE (Skagway River Valley): one female, on deer mouse, 15.VIII.1980; 5 km NW (Taiya River Valley): one female, on long-tailed vole, 16.VIII.1980. Wrangell Island, Wrangell, 28 km S (Pats Creek Wayside): one male, on southern red-backed vole, 22.XI.1980.

5. *Delotelis hollandi* Smit

This rare flea was collected again in southeastern Alaska after a lapse of over 30 years (Smit 1953). New Alaskan host and locality records, shared with *C. charlottensis*, are the southern red-backed vole (Table 1) and Wrangell Island (Table 2).

Record — Wrangell Island, Wrangell, 28 km S (Pats Creek Wayside): one female, in southern red-backed vole, 22.XI.1980.

Ischnopsyllidae

6. *Myodopsylla gentilis* Jordan and Rothschild

We have no new records of this bat flea.

Ceratophyllidae

7. *Megabothris abantis* (Rothschild)

New records of this vole and jumping mouse flea include a specimen from a long-tailed vole, but 11 specimens were from mice and red-backed voles. No collections were on islands.

Records — Haines, 10 km SE (Chilkat Peninsula): one male, one female, on northern red-

TABLE 1. Mammalian hosts of fleas in the annotated list.

<i>Sorex vagrans</i> Baird	Vagrant Shrew*: 3**, 7
<i>Myotis lucifugus</i> (LeConte)	Little Brown Myotis*: 6
<i>Marmota caligata</i> (Eschscholtz)	Hoary Marmot: 12
<i>Tamiasciurus hudsonicus</i> (Erxleben)	Red Squirrel: 8
<i>Glaucomys sabrinus</i> (Shaw)	Northern Flying Squirrel (nest): 10, 11
<i>Peromyscus maniculatus</i> (Wagner)	Deer Mouse: 3, 4, 7, 8, 9
<i>Peromyscus sitkensis</i> Merriam	Sitka Mouse: 9
<i>Clethrionomys rutilus</i> Pallas	Northern Red-backed Vole: 7
<i>Clethrionomys gapperi</i> (Vigors)	Southern Red-backed Vole: 4, 5
<i>Microtus pennsylvanicus</i> (Ord)	Meadow Vole: 3
<i>Microtus oeconomus</i> (Pallas)	Tundra Vole*: 3
<i>Microtus longicaudus</i> (Merriam)	Long-tailed Vole: 4, 7
<i>Microtus</i> sp.	Vole*: 5
<i>Rattus norvegicus</i> (Berkenhout)	Norway Rat*: 3
<i>Zapus hudsonius</i> (Zimmermann)	Meadow Jumping Mouse: 7
<i>Canis familiaris</i> L.	Dog*: 1
<i>Canis lupus</i> L.	Gray Wolf: 14, 15
<i>Ursus americanus</i> Pallas	Black Bear: 14
<i>Ursus arctos</i> L.	Grizzly Bear*: 13
<i>Martes americana</i> (Turton)	Marten: 2, 8, 15
<i>Mustela erminea</i> L.	Ermine: 3, 15
<i>Mustela vison</i> Schreber	Mink: 2, 8, 15
<i>Gulo gulo</i> (L.)	Wolverine: 14
<i>Lutra canadensis</i> (Schreber)	River Otter: 15
<i>Felis catus</i> L.	Cat: 1
<i>Homo sapiens</i> L.	Man*: 1

*No additional records since first check list.

**Species of fleas as numbered in revised list.

backed vole, 12.VIII.1980. Klukwan, 9.5 km NW (Mosquito Lake): three females, on meadow jumping mouse, 11.VIII.1980. Skagway, 5 km NW (Taiya River Valley): one male, one female, on deer mice; two females, on northern red-backed vole; and one male, on long-tailed vole, all on

16.VIII.1980; 16 km NE (Klondike Highway and Moore Creek, 745 m elevation): one male, one female, on northern red-backed voles, 18.VIII.1980.

8. *Monopsyllus ciliatus protinus* (Jordan) (Fig. 3a-h)
In her monograph of the genus *Monopsyllus*,

TABLE 2. Distribution of mammal fleas in southeastern Alaska.

Flea	Island									Mainland	
	Admiralty	Baranof	Chichagof	Krestof	Kruzof	Magoun	Mitkof	Prince of Wales	Revvillagiedo		Wrangell
Pulicidae											
1. <i>Ctenocephalides felis felis</i>		2,11									3
Hystriechopsyllidae											
2. <i>Hystriechopsylla dippiei spinata</i>		2,3,4,11			11	2			5,11		11
3. <i>Hystriechopsylla o. occidentalis</i>		4,11						1,5			1,4,5,11
4. <i>Catallagia charlottensis</i>	11	4					11		11	11	11
5. <i>Delotelis hollandi</i>										11	10
Ichnopsyllidae											
6. <i>Myodopsylla gentilis</i>	4										
Ceratophyllidae											
7. <i>Megabothris abantis</i>											4,11
8. <i>Monopsyllus ciliatus protinus</i>		2,11		11	11				7,11		8,9,11
9. <i>Opisodasys keeni</i>	4,11		11				11	6			11
10. <i>Opisodasys vespertalis</i>											11
11. <i>Tarsopsylla octodecimdentata coloradensis</i>											11 11
12. <i>Oropsylla</i> sp.											
Vermipsyllidae											
13. <i>Chaetopsylla tuberculaticeps</i>	3		3								
14. <i>Chaetopsylla setosa</i>											11
15. <i>Chaetopsylla floridensis</i>	3,11	2,11	11	11	11				7,11		11

¹Campos & Stark (1979).

²Haas et al. (1978).

³Haas et al. (1979).

⁴Haas et al. (1980).

⁵Holland (1957).

⁶Holland (1963).

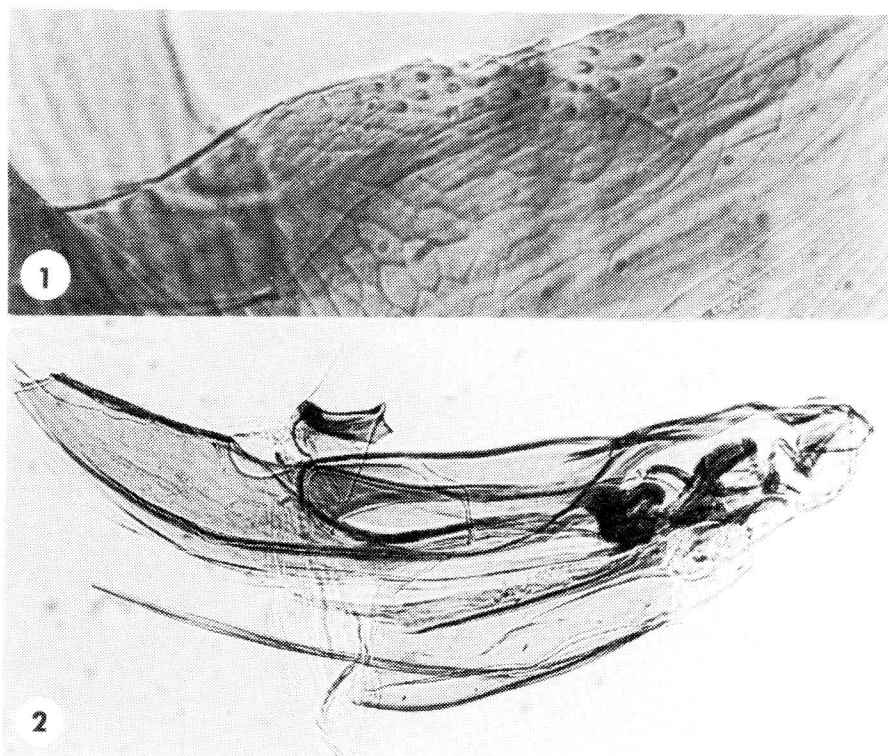
⁷Hopla (1965).

⁸Jellison & Senger (1976).

⁹Johnson (1961).

¹⁰Smit (1952, 1953).

¹¹New data.



Figs. 1, 2. *Hystrichopsylla dippie spinata* Holland, male (Baranof Island): 1, Sternum IX, inner angle, showing many, but not all tubercles; 2, Aedeagus, dissected from same specimen.

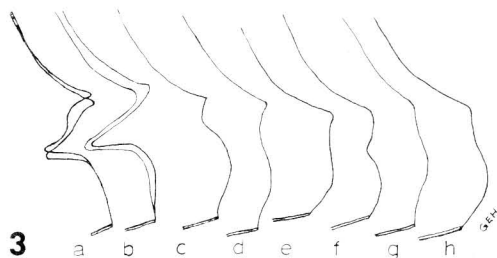


Fig. 3. *Monopsyllus ciliatus protinus* (Jordan), female. Variations in posterior margin of sternum VII (a, d, e, and g, Kruzof Island; b, c, and h, Baranof Island; f, Krestof Island).

Johnson (1961) remarked that the female of *M. c. protinus* differs from females of all other *M. ciliatus* subspecies in that the sinus of sternum VII is large, usually deep, the lower lobe broad and rounded, and the upper lobe usually pointed and not extended far beyond the lower lobe. Most of our specimens are in agreement, e.g. Fig. 3 a, b. They also have the typical darkened area just anterior of the sinus. We have ten specimens (five, Baranof Island, from martens; one, Krestof Island, from a mink; and four, Kruzof Island, from a marten) that are unusual for the species. Each has a sternum VII that

lacks the large sinus (and darkened area) (Fig. 3c-h) so that confusion with *M. vison* (Baker), another species of red squirrel flea, is possible (see illustrations of Johnson 1961). *Monopsyllus vison*, however, occurs in regions of Alaska other than the southeast (Haas and Wilson 1982) and can easily be distinguished from *M. c. protinus* by its longer and less rounded spermathecal bulga (Johnson 1961). The origin of this unusual form of *M. c. protinus* on Krestof and Kruzof Islands can be attributed to the natural spread of red squirrels from Baranof Island.

However, as this rodent was introduced to Baranof Island from the Juneau area (Burriss and McKnight 1973), fleas with sternum VII as in Fig. 3c-h probably also occur on the mainland.

Records — Baranof Island, Fish Bay: one male, on marten, 29.XII.1979, L. J.; Rodman Bay: one female, on marten, 4.II.1980, L. J.; Sitka, 8.8 km N (Starrigavan Creek): two males, three females (Fig. 3c), on marten, 31.XII.1979 and three males, three females (Fig. 3h), on marten, 4.I.1980, L. J. Boca de Quadra: one female, on marten, 27.I.1980, R. W. Klukwan, 11 km W (Haines Highway, Klehini Valley): two males, three females, on red squirrel, 10.VIII.1980. Krestof Island: one female (Fig. 3f), on mink, 2.XII.1979, L. J. Kruzof Island: one male, seven females (Fig. 3a, d, e, g), on martens, 2.XII.1979, L. J.; Sukoi Inlet: one female, on marten, 29.XII.1979, L. J. Revillagiedo Island: one male, on marten, 15.II.1977 and one male, two females, on marten, 15.II.1980, R. W. Skagway, 4 km NE (Skagway River Valley): one female, on deer mouse, 15.VIII.1980.

9. *Opisodasys keeni* (Baker)

New records of this mouse flea include the first for Chichagof and Mitkof Islands and the Skagway River Valley, the northernmost locality on the continent.

Records — Admiralty Island, Hood Bay, South Arm: five males, seven females, 10.VI.1980 and two males, one female, 13.VI.1980, all on deer mice, L. J. Chichagof Island, Lisianski River: one male, on Sitka mouse, 15.VII.1981, U.S.F.S. Juneau, 35.5 km SE (Limestone Inlet): one male, two females, on deer mice, 30.VI.1981, U.S.F.S. Mitkof Island, Petersburg, 25.6 km SE (Ohmer Creek): two males, four females, on deer mice, 20.XI.1980. Skagway, 4 km NE (Skagway River Valley): five males, five females, on deer mice, 15.VIII.1980.

10. *Opisodasys vesperalis* (Jordan)

This flying squirrel nest flea is new for Alaska. A related species, *O. pseudarctomys* (Baker), is known west of the Yukon Territory (Holland 1963; Hopla 1965). The two are sympatric in central British Columbia (Holland 1949), with *O. pseudarctomys* ranging eastward across the continent and *O. vesperalis* ranging west to the Pacific Coast (Holland 1949, 1958, 1963).

Record — Skagway, 3 km NE (Skagway River Valley, 70 m elevation): one male, four females, in nest of northern flying squirrel, 17.VIII.1980.

11. *Tarsopsylla octodecimentata coloradensis* (Baker)

A Holarctic species associated with various tree squirrels. The Nearctic subspecies prefers red squirrels and northern flying squirrels and ranges from lowlands of central and southcentral Alaska southeastward in the northern Great Plains to Manitoba and in the western mountains to New Mexico (Holland 1949, 1958, 1963). In southcentral Alaska 80 specimens were collected from 11 red squirrel nests (Haas and Wilson 1982). The record from a northern flying squirrel nest (also infested

with *O. vesperalis*) near Skagway is the first for this nest flea in southeastern Alaska.

Record — Skagway, 3 km NE (Skagway River Valley, 70 m elevation): six males, three females, nest of northern flying squirrel, 17.VIII.1980.

12. *Oropsylla* sp.

The genus *Oropsylla* Wagner and Ioff is represented in British Columbia by *O. arctomys* (Baker) on woodchucks and *O. idahoensis* (Baker) on ground squirrels, and farther east is the ground squirrel flea *O. rupestris* (Jordan) (Holland 1949). In the Arctic of North America, *O. alaskensis* (Baker) occurs on ground squirrels (Holland 1958). In the Brooks Range of northern Alaska, *O. silantiewi* (Wagner) is found on the Alaska marmot, *Marmota flaviventris* Hall and Gilmore, a probable relict North American species (Rausch and Rausch 1971). Our marmot flea was collected from the wide-ranging hoary marmot, *M. caligata*, and appears close to *O. silantiewi*, better known as a *Marmota* parasite in Asia than in Alaska (Lewis 1975).

Record — Wrangell, 19.2 km E (Groundhog Basin, tributary of Porterfield Creek): one female, on hoary marmot, IX.1980, D. Warner.

Vermipsyllidae

13. *Chaetopsylla tuberculiceps* (Bezzi)

We have no new records of this bear flea.

14. *Chaetopsylla setosa* Rothschild (Figs. 4 and 6)

This setose flea of black bears, wolverines, and some other large carnivores was recorded from British Columbia and Montana (Holland 1949; Hopkins and Rothschild 1956; Jellison and Senger 1973), but not definitely from Alaska until our collections in 1980. Its superficial resemblance to the next species, *C. floridensis*, a flea of the smaller mustelids, probably contributed to the uncertain recording of *C. setosa* from mink, marten, and ermine in an area of interior Alaska (Geary 1953; see Haas *et al.* 1978). As emphasized by Hopkins and Rothschild (1956), the female of *C. setosa* has a long labial palp that extends beyond the fore trochanter (Fig. 4); the female of *C. floridensis* has a labial palp that is much shorter (Fig. 5). The male of *C. setosa* has the acetabulum a little above the middle of the body of the rather setose clasper, the manubrium curves down and narrows suddenly apically, and the aedeagus has lamina about 1.4 times as long as the external portion (Fig. 6); the male of *C. floridensis* has the acetabulum at about the middle of the body of the relatively less setose clasper, the manubrium is straight or nearly so and narrows to a more evenly rounded apex, and the aedeagus has lamina about 1.2 times as long as the external portion (Fig. 7).

All localities are near the southeastern tip of the Alaskan mainland.

Records — Boca de Quadra: one male, on gray wolf and six males (Fig. 6), 15 females (Fig. 4), on wolverine, 9.II.1980, R. W. Rudyerd Bay: five males, 19 females, on black bear, 28.IV.1981, R. W.; nine males, 13 females, on wolverine,

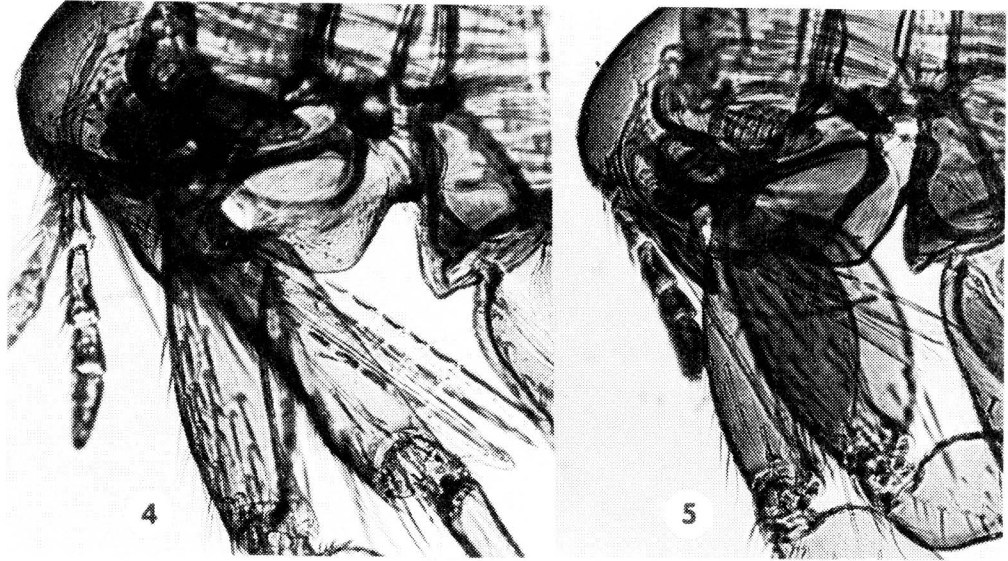


Fig. 4. *Chaetopsylla setosa* Rothschild, female. Long labial palp and adjacent structures (Baranof Island).
 Fig. 5. *Chaetopsylla floridensis* (I. Fox), female. Short labial palp and adjacent structures (Baranof Island).

5.XII.1981, R. W. Smeaton Bay, Cabin Creek: two males, four females, on black bear, 21.V.1980, L. J. 15. *Chaetopsylla floridensis* (I. Fox) (Figs. 5 and 7)

Many new records of this mustelid flea include the first for three islands and the mainland (Table 2). This species probably ranges into British Columbia as it was recently reported on martens in the Rocky Mountains of Colorado (Eads *et al.* 1979).

Records — Admiralty Island, Pybus Bay: two males, one female (gravid), on mink, 20.II.1980, L. J. Baranof Island, Fish Bay: one male, one female, on martens, 29.XII.1979, L. J.; Nakwasina Passage: two females, on marten, 29.XII.1979 and four males, five females, on marten, 2.II.1980, L. J.; Rodman Bay: five males, five females, on martens and one male, seven females, on minks, 4.II.1980, L. J.; and one female, on marten and four males, nine females (Fig. 5), on minks, 6.II.1980, L. J.; Sitka, 8.8 km N (Starrigavan Creek): one male, on ermine, 4.I.1980, L. J. Boca de Quadra: one female, on gray wolf, 9.II.1980 and one male, on marten, 27.I.1980, R. W. Chichagof Island: two males, three females (gravid), on martens and one male, on mink, 22.XII.1979, L. J. Krestof Island: one male, two females, on mink, 2.XII.1979, L. J. Kruzof Island: three males, six females, on marten, 2.XII.1979 and four males, two females (gravid), on mink, 5.I.1980, L. J.; Sukoi Inlet: one female, on marten, 29.XII.1979 and three females (gravid), on mink, 22.XII.1979, L. J. Revillagigedo Island: one male, on marten, 15.II.1980, R. W. Smeaton Bay: five males, eight females, on river otter, 1.XII.1981, R. W.

DISCUSSION

The expectation that additions to the mammal

flea fauna of southeastern Alaska would be species already recorded from British Columbia by Holland (Haas *et al.* 1980) was realized with *O. vesperalis*, *T. octodecimentata*, and *C. setosa*, but we did not expect that any unidentifiable species would be found in the region. The number of undescribed species of mammal fleas in Alaska and Canada must be small. Recently Holland (1979b) described two new species from Canada. He also totaled 180 species in a census of Siphonaptera of Canada, Alaska, and Greenland and estimated that ten Canadian species were still undescribed or unrecorded (including bird fleas) (Holland 1979a).

Although the host list (Table 1) was significantly increased by nine species of wild mammals, we were unable to include one of the most likely hosts of various species of fleas, the bushy-tailed woodrat *Neotoma cinerea* (Ord) (Holland 1952). New locality records included Krestof, Kruzof, Mitkof, and Wrangell Islands (Table 2), but most islands, even some of the larger ones, still lack records. Five fleas (nos. 7, 10, 11, 12, and 14) are known only from the mainland, and two (nos. 6 and 13) are known only from islands. The distribution of mammal fleas in the complex geography of southeastern Alaska is still not well known.

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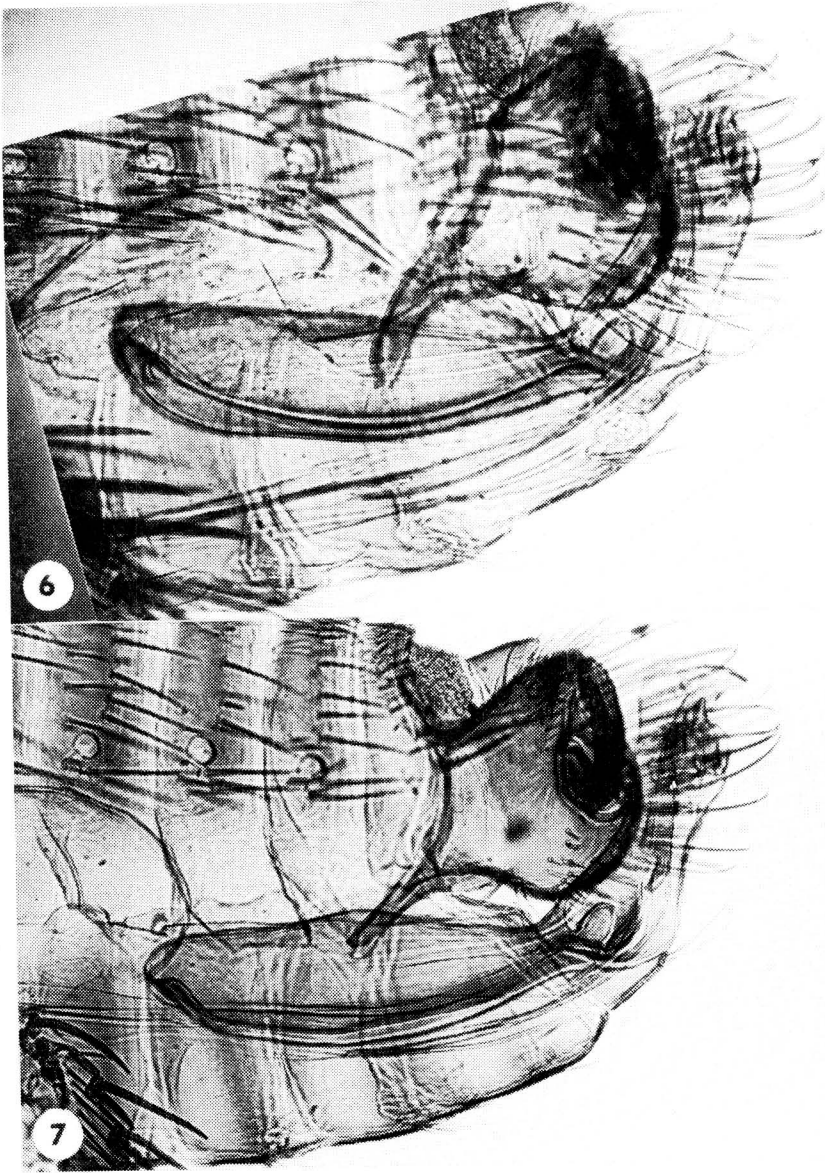


Fig. 6. *Chaetopsylla setosa* Rothschild, male. Genitalia (Boca de Quadra).
 Fig. 7. *Chaetopsylla floridensis* (J. Fox), male. Genitalia (Baranof Island).

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