Incidence of Louse-flies (*Hippoboscidae*) in Some Alaskan Birds

Jackson S. Whitman
Alaska Dept. Fish and Game
PO Box 230
McGrath AK 99627

Nixon Wilson
Dept. Biology
Univ. Northern Iowa
Cedar Falls IA 50613

INTRODUCTION

Information was gathered on the incidence of hippoboscid louse-flies (Diptera, Hippoboscidae) on passerine birds in interior Alaska during 1987. Other authors have discussed louse-fly infestations in birds, but always in areas with less severe climatic conditions. The hippoboscid species found (*Ornithomya bequaerti*) was described by Maa (1969) as a new species, and few data are available on abundance, hosts, or distribution. A total of 429 birds of 28 species was examined for louse-flies. This paper documents 10 avian hosts, from five families; eight of those hosts are newly described. Adult louse-flies were found during a 70-day period from 23 June through 29 August 1987.

Rates of ectoparasitism upon avian hosts are probably affected by a variety of factors, including feeding and preening practices by potential hosts. Birds that typically consume airborne insects are potential louse-fly predators, probably reducing the occurrence of these parasites. The lack of louse-flies on swallows supports this theory.

LOCALITY AND METHODS

Avian hosts were captured in the vicinity of McGrath, Alaska (latitude 62° 58' N, longitude 155° 37' W, elevation 103m) in mist nets or McCamey chickadee traps. Vegetation in the area is dominated by birch (*Betula papyrifera*), balsam popular (*Populus balsamifera*), and white spruce (*Picea glauca*), with willow (*Salix* spp.) and shrub- dominated ground cover.

Because of surrounding mountain ranges, weather in McGrath is typically that of the sheltered continental interior. Winter temperatures are cold (to -55° C) and generally dry. During summer, the climate is moderated by maritime influences, with short transition periods between seasons. Summer temperatures typically rise as high as 30° C. Thunder storms occur during June and July. The frost free period during 1987 was 92 days, from 30 May through 29 August.

Netting and trapping sessions were conducted sporadically through the day. Birds were removed from nets or traps within 15 min of capture. They were immediately weighed, banded, examined for ectoparasites, and released. Hippoboscid flies were collected directly from the birds and placed in small plastic vials of 70% ethyl alcohol before identification. Flies that avoided capture were assumed to be *O. bequaerti* and were included in the totals. No other species of ectoparasites were found. Unless stated otherwise, chi-square tests were used.

RESULTS AND DISCUSSION

During 1987, 429 birds of 28 species were captured a total of 473 times and examined for louse-flies. Louse-fly presence on birds was first noted on 23 June and the last occurrence documented on 31 August, although bird captures occurred during other seasons. Because six species of birds were not captured during the period when louse-flies were found, we will not discuss those species.

Of 301 individuals of 23 species captured during the period in which louse-flies were present (Table 1), 57 birds (19%) had one or more louse-flies. In contrast, 13 bird species (represented by 53 individuals) were not found to host louse-flies. During the season of louse-fly infestations 57 of 248 (23%) individuals of known host species were parasitized.

During the 70-day period when louse-fly were present, rates of infestation were not stable. Percent frequency of occurrence increased through June and early July, peaked in late July (11-20 July, 40%; 21-31 July, 43%), and declined thereafter (Figure 1). Other investigators have noted similar seasonal infestation rates in various genera and species of louse-flies (Maa 1969, Mueller et al. 1969, Main and Anderson 1970, Wilson and Haas 1980, Wood 1983, McClure 1984). However, in less severe climates, the period of active parasitism is extended both earlier in the summer and later into autumn.

Seventy-six louse-flies were documented on 57 individual hosts ($\overline{X}$=1.3 louse-flies per host). Seasonally, there appeared to be no difference in number of parasites per host, but this could have been a reflection of low sample size. Single adult flies were found on 43 hosts (75%), two flies on 10 hosts (18%), three flies on three hosts (5%), and four flies on one host (2%).

Sex was determined on 35 of the collected louse-flies. Ten were identified as males while 25 were females. According to McClure (1984), this skewed ratio is common in most louse-fly collections. He indicated that upon emergence the sex ratio is probably nearer 1:1, but because males are short-lived, need fewer blood meals, and are more active in flying from bird to bird in search of females, they are less likely to be encountered.

Overall, frequency of occurrence of louse-flies appears to be higher in young birds (HY=hatching year) than in adults (AHY=after hatching year). Although sample sizes were too low to be meaningful for individual cases, when all host species were lumped, 130 HY and 171 AHY birds were examined for louse-flies. Significantly more flies were recorded on HY birds (N=2, 25%) than on AHY birds (N=25, 15%) ($p<0.05$). No difference ($p>0.05$) was noted between male and female hosts in incidence of louse-flies.

During the period of documented louse-fly infestation, 13 avian species of six families were captured that did not host louse-flies: Common Snipe (*Gallinago gallinago*), Tree Swallow (*Tachycineta bicolor*), Violet-green Swallow (*Tachycineta thalassina*). Cliff Swallow (*Hirundo pyrrhonota*), Black-capped Chickadee (*Parus atricapillus*), Boreal Chickadee (*Parus hudsonicus*), Arctic Warbler (*Phylloscopus borealis*), Wilson's Warbler (*Wilsonia pusilla*), Yellow Warbler (*Dendroica petechia*), Northern Waterthrush (*Seiurus novaboracensis*), Savannah Sparrow (*Passerculus sandwichensis*), Fox Sparrow (*Melospiza iliaca*) and Pine Grosbeak (*Pinicola enucleator*). The 10 avian species which hosted louse-flies are discussed individually below.

Family Tyrannidae: Alder Flycatcher (*Empidonax alnorum*). One of seven was host to a single louse-fly (14%). This is the first known record of *O. bequaerti* on this species or family.

Family Corvidae: Gray Jay (*Perisoreus canadensis*). One of two Gray Jays captured during the louse-fly season was host to a single louse-fly (50%). Maa (1969) recorded the species from other Corvidae, but suggested that the occurrence is probably accidental or occasional. This is the first record of *O. bequaerti* on this species.

Family Muscicapidae: Swainson's Thrush (*Catharus ustulatus*). Five of six examined had one or more louse-flies. Four were host to a single fly, while the remaining thrush had four louse-flies. Wilson and Haas (1980) previously documented *O. bequaerti* on this species in Alaska. American Robin (*Turdus migratorius*). One of four (25%) robins was host to two *O. bequaerti.*

Family Emberizidae: Yellow-rumped Warbler (*Dendroica coronata*). One of five (20%) was host to two louse-flies. American Tree Sparrow (*Spizella arborea*). The single tree sparrow examined was host to a single louse-fly. Dark-eyed Junco (*Junco hyemalis*). Seventeen of 107 (16%) were found to be hosts. Both Wilson and Haas (1980) in Alaska and Main and Anderson (1970) in Massachusetts previously documented Dark-eyed Juncos as hosts to *O. bequaerti.* White-crowned Sparrow (*Zonotrichia leucophrys*). Ten of 43 (23%) examined were hosts to 13 louse-flies. Lincoln's Sparrow (*Melospiza lincolnii*). Both Lincoln's Sparrows captured during the louse-fly season were hosts. One had a single fly, while the other had three louse-flies. Except for the Dark-eyed Junco, all avian hosts from the family Emberizidae are new host records. As a family group, 30 of 184 individuals

examined (16%) were hosting louse-flies.

Family Fringillidae: Common Redpoll (*Carduelis flammea*). Nineteen of 70 (27%) had an average of 1.4 louse-flies per bird. Maa (1969) noted that *O. bequaerti* occurred on small passerines particularly Fringillidae. Indeed, as family groups Fringillidae and Muscicapidae had the highest incidence of louse-fly occurrence. Common Redpolls have not previously been recorded as a host species.

SUMMARY

A single species of louse-fly (*Ornithomya bequaerti*, Maa) was collected from 10 avian host species representing five families in west-central Alaska during 1987. Eight of the host species were new records. Nineteen percent of the individuals of all avian species examined were host to one or more louse-flies. Although birds were captured and examined both earlier in spring and later in autumn, infestations were recorded only during the 70-day period from late June through August. Rates of infestation were higher in young birds (25%) than in adults (15%), but no differences were noted between sexes of hosts. Fringillidae and Muscicapidae had the highest incidence of louse-fly occurrence. The health of infested birds was not thought to be compromised due to the presence of the parasites.

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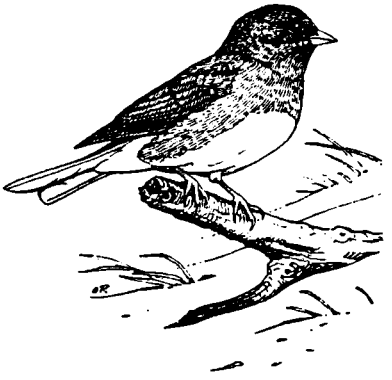

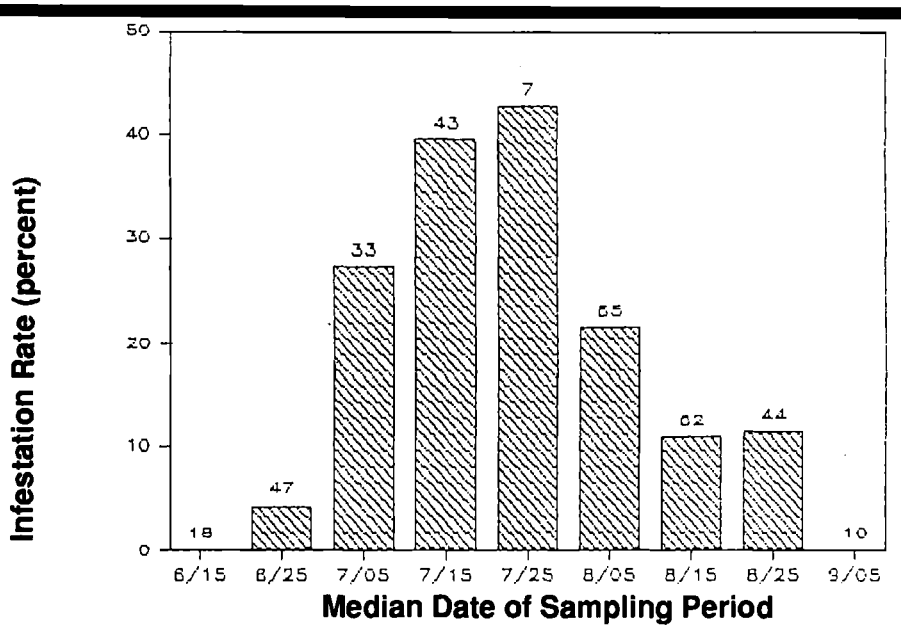

Figure 1. Rates of infestation of birds by the hippoboscid louse-fly *Ornithomya bequaerti* Maa in west-central Alaska by 10-day periods during summer 1987. Numbers above bars represent sample sizes.

Table 1. Occurrence of the hippoboscid fly *Ornithomya bequaerti* on birds captured in west central Alaska during summer 1987.

Name	No. with Flies	No. Checked	% Infested
Common Snipe	-	1	0
Alder Flycatcher	1	7	14
Tree Swallow	-	10	0
Violet-green Swallow	-	5	0
Cliff Swallow	-	1	0
Gray Jay	1	2	50
Black-capped Chickadee	-	6	0
Boreal Chickadee	-	2	0
Arctic Warbler	-	1	0
Swainson's Thrush	5	6	83
American Robin	1	4	25
Yellow Warbler	-	10	0
Yellow-rumped Warbler	1	5	20
Northern Waterthrush	-	9	0
Wilson's Warbler	-	2	0
American Tree Sparrow	1	2	50
Savannah Sparrow	-	4	0
Fox Sparrow	-	1	0
Lincoln's Sparrow	2	2	100
White-crowned Sparrow	9	43	21
Dark-eyed Junco	17	99	17
Pine Grosbeak	-	1	0
Common Redpoll	19	78	24
Totals	57	301	19%